



SECTION 1. INTRODUCTION

1.1 BACKGROUND

In response to the requirements of the Disaster Mitigation Act of 2000 (DMA 2000), Warren County, and the municipalities located therein, have developed this Hazard Mitigation Plan (HMP), which represent a regulatory update to the June 2011 “Warren County Pre-Disaster Multijurisdictional Hazard Mitigation Plan”. DMA 2000 amends the Stafford Act and is designed to improve planning for, response to, and recovery from, disasters by requiring State and local entities to implement pre-disaster mitigation planning and develop HMPs. The Federal Emergency Management Agency (FEMA) has issued guidelines for HMPs. The New York State Division of Homeland Security and Emergency Services (NYS DHSES), formerly the NYS Office of Emergency Management (NYSOEM), also supports plan development for jurisdictions in New York State.

Hazard Mitigation is any sustained action taken to reduce or eliminate the long term risk and effects that can result from specific hazards.

FEMA defines a **Hazard Mitigation Plan** as the documentation of a state or local government evaluation of natural hazards and the strategies to mitigate such hazards.

Specifically, DMA 2000 requires that States, with support from local governmental agencies, develop and update HMPs on a five year basis to prepare for and reduce the potential impacts of natural hazards. DMA 2000 is intended to facilitate cooperation between state and local authorities, prompting them to work together. This enhanced planning will better enable local and State governments to articulate accurate needs for mitigation, resulting in faster allocation of funding and more effective risk reduction projects.

1.1.1 DMA 2000 Origins -The Robert T. Stafford Disaster Relief and Emergency Assistance Act

The **Federal Emergency Management Agency** (FEMA) estimates that for every dollar spent on damage prevention (mitigation), twice that amount is saved through avoided post-disaster damage repair.

In the early 1990s, a new federal policy regarding disasters began to evolve. Rather than simply reacting whenever disasters strike communities, the federal government began encouraging communities to first assess their vulnerability to various disasters and proceed to take actions to reduce or eliminate potential risks. The logic is simply that a disaster-resistant community can rebound from a natural disaster with less loss of property or human injury, at much lower cost, and, consequently, more quickly. Moreover, other costs associated with disasters, such as the time lost from productive activity by business and industries, are minimized.

DMA 2000 provides an opportunity for States, tribes and local governments to take a new and revitalized approach to mitigation planning. DMA 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act by repealing the previous mitigation planning provisions (Section 409) and replacing them with a new set of requirements (Section 322). This section sets forth the requirements that communities evaluate natural hazards within their respective jurisdictions and develop an appropriate plan of action to mitigate those hazards, while emphasizing the need for State, tribal and local governments to closely coordinate mitigation planning and implementation efforts.

The amended Stafford Act requires that each local jurisdiction identify potential natural hazards to the health, safety and well-being of its residents and identify and prioritize actions that can be taken by the community to mitigate those hazards—before disaster strikes. For communities to remain eligible for hazard mitigation



assistance from the federal government, they must first prepare, and then maintain and update an HMP (this plan).

Responsibility for fulfilling the requirements of Section 322 of the Stafford Act and administering the FEMA Hazard Mitigation Program has been delegated to the State of New York, specifically to NYS DHSES. FEMA also provides support through guidance, resources, and plan reviews.

1.1.2 Benefits of Mitigation Planning

The planning process will help prepare citizens and government agencies to better respond when disasters occur. Also, mitigation planning allows Warren County as a whole, as well as the participating Warren County municipalities, to remain eligible for mitigation grant funding for mitigation projects that will reduce the impact of future disaster events. The long-term benefits of mitigation planning include:

- An increased understanding of hazards faced by Warren County and their inclusive municipalities
- A more sustainable and disaster-resistant community
- Financial savings through partnerships that support planning and mitigation efforts
- Focused use of limited resources on hazards that have the biggest impact on the community
- Reduced long-term impacts and damages to human health and structures and reduced repair costs

1.1.3 Organizations Involved in the Mitigation Planning Effort

Warren County and the participating jurisdictions intend to implement this HMP with full coordination and participation of County and local departments, organizations and groups, as well as by coordinating with relevant State and Federal entities. Coordination helps to ensure that stakeholders have established communication channels and relationships necessary to support mitigation planning and mitigation actions included in Section 6 and in the jurisdictional annexes in Section 9. In addition to Warren County, all of the 13 municipal governments in the County have participated in the 2015/16 planning process as indicated in Table 1-1 below.

Table 1-1. Participating Warren County Jurisdictions

Jurisdictions	
Warren County	Town of Lake George
Town of Bolton	Town of Lake Luzerne
Town of Chester	Town of Queensbury
City of Glens Falls	Town of Stony Creek
Town of Hague	Town of Thurman
Town of Horicon	Town of Warrensburg
Town of Johnsbury	Village of Lake George

Multiple Agency Support for Hazard Mitigation

Primary responsibility for the development and implementation of mitigation strategies and policies lies with local governments. However, local governments are not alone; various partners and resources at the regional, state and federal levels are available to assist communities in the development and implementation of mitigation strategies. Within New York State, NYS DHSES is the lead agency providing hazard mitigation

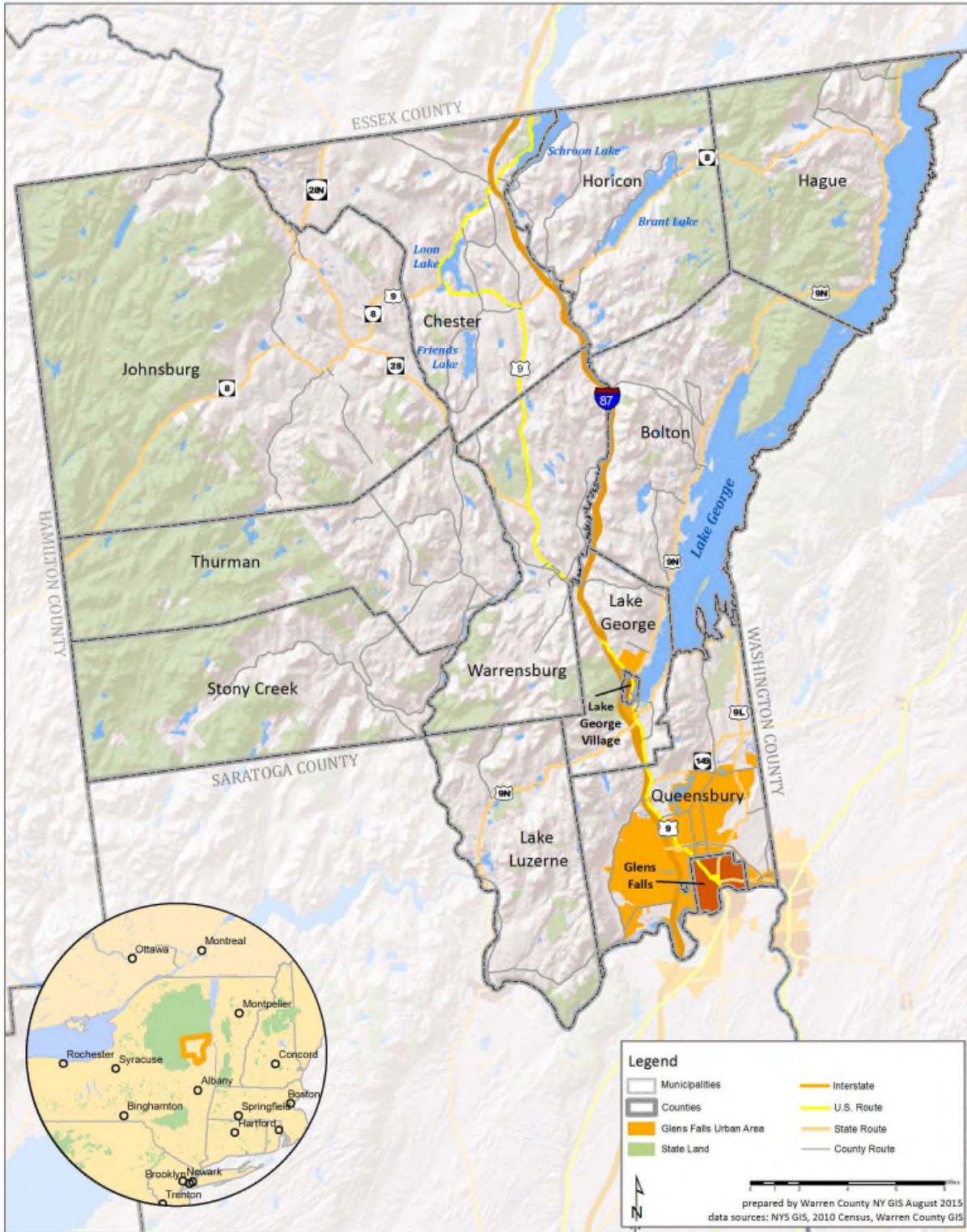


planning assistance to local jurisdictions. NYS DHSES provides guidance to support mitigation planning. In addition, FEMA provides grants, tools, guidance and training to support mitigation planning.

Additional input and support for this planning effort was obtained from a range of agencies and through public involvement (as discussed in Section 3). Project management and oversight of the planning process was provided by the Warren County Office of Emergency Services (WCOES), Warren County Soil and Water Conservation District (WC SWCD) and the Warren County Hazard Mitigation Steering Committee. While participating municipalities were asked to identify a primary and alternate local Point of Contact (POC), broad participation by municipal representatives was encouraged and supported throughout the planning process. A list of Steering Committee and municipal POCs is provided in Section 3, while Appendix D provides further documentation of the broader level of municipal involvement.



Figure 1-1. Warren County, New York Mitigation Plan Area





This HMP was prepared in accordance with the following regulations and guidance:

- FEMA “Local Mitigation Planning Handbook”, March 2013
- FEMA “Integrating Hazard Mitigation into Local Planning”, March 1, 2013
- FEMA “Plan Integration: Linking Local Planning Efforts”, July 2015
- Local Mitigation Plan Review Guide, October 1, 2011
- DMA 2000 (Public Law 106-390, October 30, 2000).
- 44 Code of Federal Regulations (CFR) Parts 201 and 206 (including: Feb. 26, 2002, Oct. 1, 2002, Oct. 28, 2003, and Sept. 13, 2004 Interim Final Rules).
- FEMA. 2004. “How-To Guide for Using HAZUS-MH for Risk Assessment.” FEMA Document No. 433. February.
- FEMA Mitigation Planning How-to Series (FEMA 386-1 through 4, 2002), available at: <http://www.fema.gov/fima/planhowto.shtm>.
- FEMA “Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards”, January 2013

Table 1-2 summarizes the requirements outlined in the DMA 2000 Interim Final Rule and where each of these requirements is addressed in this HMP.

Table 1-2. FEMA Local Mitigation Plan Review Crosswalk

Plan Criteria	Primary Location in Plan
Prerequisites	
Adoption by the Local Governing Body: §201.6(c)(5)	Section 2.0; Appendix A
Planning Process	
Documentation of the Planning Process: §201.6(b) and §201.6(c)(1)	Section 3.0
Risk Assessment	
Identifying Hazards: §201.6(c)(2)(i)	Sections 5.2
Profiling Hazards: §201.6(c)(2)(i)	Section 5.4
Assessing Vulnerability: Overview: §201.6(c)(2)(ii)	Section 5.4
Assessing Vulnerability: Identifying Structures: §201.6(c)(2)(ii)(A)	Section 4.0 Section 5.4
Assessing Vulnerability: Estimating Potential Losses: §201.6(c)(2)(ii)(B)	Section 5.4
Assessing Vulnerability: Analyzing Development Trends: §201.6(c)(2)(ii)(C)	Section 4.0; Section 9 Annexes
Mitigation Strategy	
Local Hazard Mitigation Goals: §201.6(c)(3)(i)	Section 6.0; Section 9 Annexes
Identification and Analysis of Mitigation Actions: §201.6(c)(3)(ii)	Section 6.0; Section 9 Annexes
Implementation of Mitigation Actions: §201.6(c)(3)(iii)	Section 6.0; Section 9 Annexes
Multi-Jurisdictional Mitigation Actions: : §201.6(c)(3)(iv)	Section 6.0; Section 9 Annexes
Plan Maintenance Process	
Monitoring, Evaluating, and Updating the Plan: §201.6(c)(4)(i)	Section 7.0
Incorporation into Existing Planning Mechanisms: §201.6(c)(4)(ii)	Section 7.0; Section 9 Annexes
Continued Public Involvement: §201.6(c)(4)(iii)	Section 7.0



Organization

The Warren County HMP has been organized into a two-volume plan to facilitate use of this plan as a resource for each participant. Volume I provides information on the overall planning process, and the natural hazard profiling and vulnerability assessments which served as a basis for the understanding of risk and identification of appropriate mitigation actions. As such, Volume I is intended for use as a resource for on-going mitigation analysis. Volume II consists of an annex dedicated to each participating jurisdiction. Each annex summarizes the jurisdiction's legal, regulatory, and fiscal capabilities; vulnerabilities to natural hazards; status of past mitigation actions; and provides an individualized mitigation strategy. The annexes are intended to provide an expedient resource for each jurisdiction for implementation of mitigation projects and future grant opportunities, as well as place for for each jurisdiction to record and maintain their local aspect of the countywide plan.

Hazards of Concern

Warren County and participating jurisdictions reviewed the natural hazards that caused measurable impacts based on events, losses and information available since the development of the original Warren County HMP (2011), and the New York State Hazard Mitigation Plan - 2013 Update. Warren County and participating jurisdictions evaluated the risk and vulnerability due to each of the hazards of concern on the assets of each participating jurisdiction. Although the resulting hazard risk rankings varied for each jurisdiction, the summary risk rankings corresponded with that of Warren County and are indicated in each jurisdictional annex. The hazard risk ranks were used to focus and prioritize individual jurisdictional mitigation strategies.

The Steering Committee further elected to include several non-natural hazards of concern in this plan update.

Goals and Objectives

The Steering Committee and participating communities reviewed and updated the prior mitigation goals and objectives as a basis for the planning process, and to guide the selection of appropriate mitigation actions addressing all hazards of concern. Further, the goal development process considered the mitigation goals expressed in the New York State HMP, as well as other relevant County and local planning documents, as discussed within Section 6.

Plan Integration into Other Planning Mechanisms

Effective mitigation is achieved when hazard awareness and risk management approaches and strategies become an integral part of public activities and decision-making. Within the County there are many existing plans and programs that support hazard risk management, and thus it is critical that this hazard mitigation plan integrate and coordinate with, and complement, those mechanisms.

The "Capability Assessment" section of Chapter 6 (Mitigation Strategy) provides a summary and description of the existing plans, programs and regulatory mechanisms at all levels of government (Federal, State, County and local) that support hazard mitigation within the County. Within each jurisdictional annex in Chapter 9, the County and each participating jurisdiction have identified how they have integrated hazard risk management into their existing planning, regulatory and operational/administrative framework ("integration capabilities"), and how they intend to promote this integration ("integration actions").

A further summary of these continued efforts to develop and promote a comprehensive and holistic approach to hazard risk management and mitigation is presented in Section 7.



1.1.4 Implementation of Prior and Existing Local Hazard Mitigation Plans

The status of the mitigation projects identified in the 2011 Warren County HMP are provided in Sections 6 (Mitigation Strategy) and Section 9 (Jurisdictional Annexes) of the plan. Numerous projects and programs have been implemented that have reduced hazard vulnerability to assets in the planning area. The County and municipal annexes, and plan maintenance procedures (Section 7), have been developed to encourage specific activities such as review of the HMP during update of codes, ordinances, zoning, and development to ensure that a more thorough integration, with its related benefits, will be completed within the upcoming 5-year planning period.

1.1.5 Implementation of the Planning Process

The planning process and findings are to be documented in local HMPs. To support the planning process in developing this HMP, Warren County and the participating jurisdictions have accomplished the following:

- Developed a Steering Committee and countywide planning partnership with municipalities and stakeholders,
- June 2011 “Warren County Pre-Disaster Multijurisdictional Hazard Mitigation Plan”,
- Identified/reviewed those hazards that are of greatest concern to the community (hazards of concern) to be included in the plan,
- Profiled these hazards,
- Estimated the inventory at risk and potential losses associated with these hazards,
- Reviewed and updated the hazard mitigation goals and objectives,
- Reviewed mitigation strategies identified in the 2011 County HMP,
- Developed new mitigation actions to address reduction of vulnerability of hazards of concern,
- Involved a wide range of stakeholders and the public in the plan process, and
- Developed mitigation plan maintenance procedures to be executed after obtaining approval of the plan from NYS DHSES and FEMA.

As required by DMA 2000, Warren County and participating jurisdictions have informed the public and provided opportunities for public comment and input. In addition, numerous agencies and stakeholders have participated as core or support members, providing input and expertise throughout the planning process.

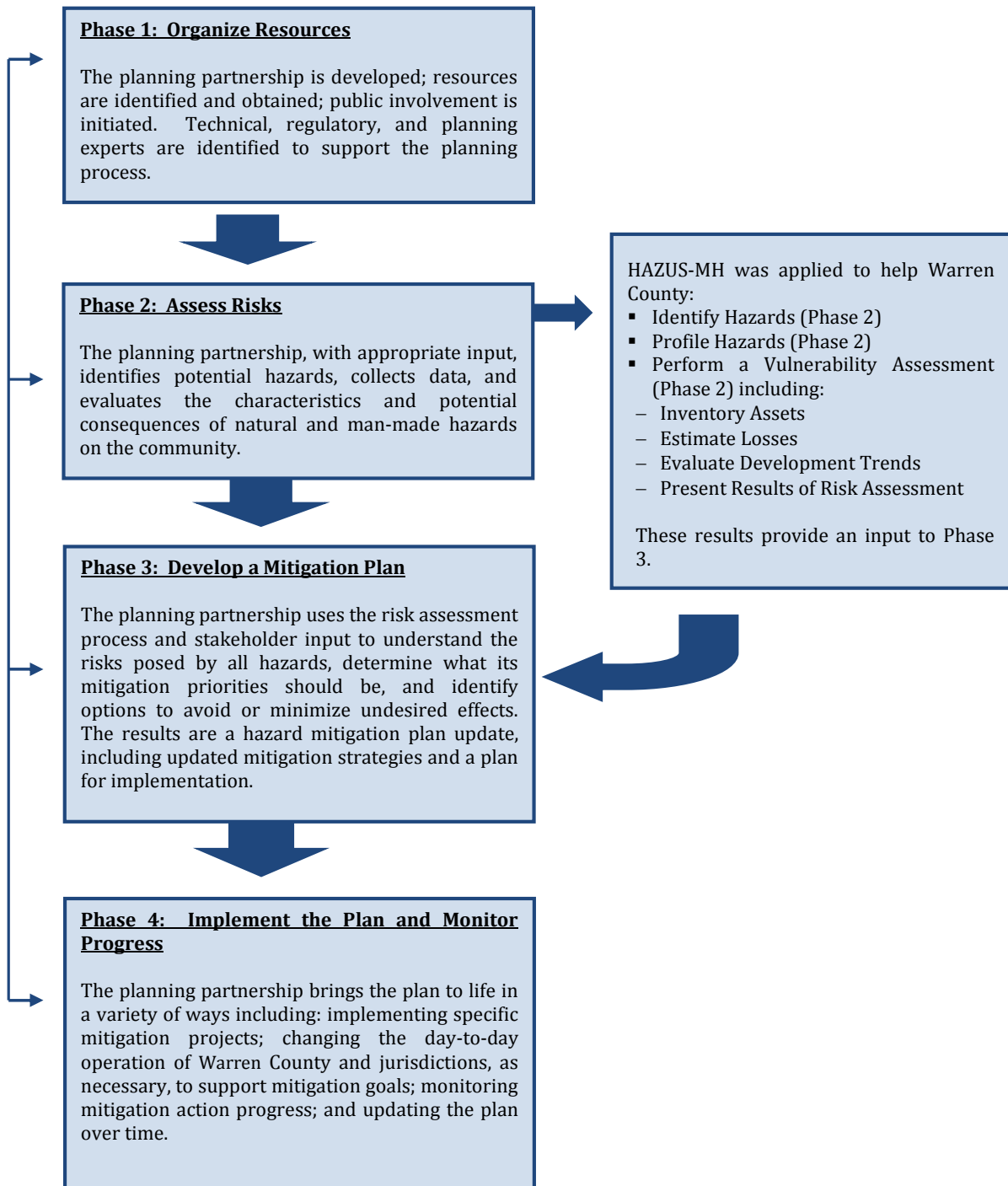
This Hazard Mitigation Plan documents the process and outcomes of Warren County and the jurisdictions’ efforts. Additional information on the plan process is included in Section 3, Planning Process. Documentation that the prerequisites for plan approval have been met is included in Section 2, Plan Adoption.

1.1.6 Organization of This Mitigation Plan

This Plan was organized in accordance with FEMA and NYS DHSES guidance. The structure of this Plan follows the four-phase planning process recommended by FEMA and summarized in Figure 1-2.



Figure 1-2. Warren County Hazard Mitigation Planning Process





The Plan is organized into two volumes: Volume I includes all information that applies to the entire planning area (Warren County); and Volume II includes participating jurisdiction-specific information.

Volume I of this Plan includes the following sections:

Section 1: Introduction: Overview of participants and planning process

Section 2: Plan Adoption: Information regarding the adoption of the Plan by Warren County and each participating jurisdiction.

Section 3: Planning Process: A description of the Plan methodology and development process, Planning Committee and stakeholder involvement efforts, and a description of how this Plan will be incorporated into existing programs.

Section 4: County Profile: An overview of Warren County, including: (1) general information, (2) economy, (3) land use trends, (4) population and demographics, (5) general building stock inventory and (6) critical facilities.

Section 5: Risk Assessment: Documentation of the hazard identification and hazard risk ranking process, hazard profiles, and findings of the vulnerability assessment (estimates of the impact of hazard events on life, safety and health; general building stock; critical facilities and the economy). Description of the status of local data and planned steps to improve local data to support mitigation planning.

Section 6: Mitigation Strategies: Information regarding the mitigation goals and objectives identified by the Steering Committee in response to priority hazards of concern, and the process by which County and local mitigation strategies have been developed or updated.

Section 7: Plan Maintenance Procedures: The system established by the Steering Committee to continue to monitor, evaluate, maintain and update the Plan.

Volume II of this plan includes the following sections:

Section 8: Planning Partnership: Description of the planning partnership, and jurisdictional annexes.

Section 9: Jurisdictional Annexes: A jurisdiction-specific annex for each participating jurisdiction and Warren County containing their hazards of concern, hazard risk ranking, capability assessments, mitigation actions, action prioritization specific only to Warren County or that jurisdiction, progress on prior mitigation activities (as applicable), and a discussion prior local hazard mitigation plan integration into local planning processes.

Appendices include:

Appendix A: Sample Resolution of Plan Adoption: Documentation that supports the plan approval signatures included in Section 2 of this plan.

Appendix B: Meeting Documentation: Agendas, attendance sheets, minutes, and other documentation (as available and applicable) of planning meetings convened during the development of the plan.

Appendix C: Public and Stakeholder Outreach Documentation: Documentation of the public and stakeholder outreach effort including webpages, informational materials, public and stakeholder meetings and presentations, surveys, and other methods used to receive and incorporate public and stakeholder comment and input to the plan process.



Appendix D: Participation Matrix

Appendix E: Action Worksheet Template and Instructions

Appendix F: FEMA Plan Review Tools: Examples of plan review templates available to support annual plan review

Appendix G: Municipal Letters of Intent to Participate



SECTION 2. PLAN ADOPTION

2.1 Overview

This section contains information regarding adoption of the plan by Warren County and each participating jurisdiction.

2.1.1 Plan Adoption by Local Governing Bodies

Adoption by the local governing bodies demonstrates the commitment of Warren County and each participating jurisdiction to fulfill the mitigation goals and strategies outlined in the plan. Adoption legitimizes the Plan and authorizes responsible agencies to execute their responsibilities.

The County and all participating jurisdictions will proceed with formal adoption proceedings when FEMA provides conditional approval of this plan. Following adoption or formal action on the plan, the jurisdiction must submit a copy of the resolution or other legal instrument showing formal adoption (acceptance) of the plan to NYS DHSES. This will then be submitted to FEMA with the resolution in Appendix A of this plan. The jurisdictions understand that FEMA will transmit acknowledgement of verification of formal plan adoption and the official approval of the plan to the mitigation plan coordinator.

The sample resolution issued to support adoption of the plan is included as Appendix A, Resolution of Plan Adoption.

In addition to being required by DMA 2000, adoption of the plan is necessary because:

- It lends authority to the plan to serve as a guiding document for all local and state government officials;
- It gives legal status to the plan in the event it is challenged in court;
- It certifies the program and grant administrators that the plan's recommendations have been properly considered and approved by the governing authority and jurisdictions' citizens; and
- It helps to ensure the continuity of mitigation programs and policies over time because elected officials, staff, and other community decision-makers can refer to the official document when making decisions about the community's future.

Source: FEMA. 2003. "How to Series"-*Bringing the Plan to Life* (FEMA 386-4).



SECTION 3. PLANNING PROCESS

3.1 INTRODUCTION

This section includes a description of the planning process used to update the June 2011 “Warren County Pre-Disaster Multijurisdictional Hazard Mitigation Plan” (HMP, also referred herein as the “Hazard Mitigation Plan” or the “plan”), including how it was prepared, who was involved in the process, and how the public was involved.

To ensure that the plan both met requirements of the DMA 2000, as well as to assure that the planning process would have the broad and effective support of the participating jurisdictions, regional and local stakeholders and the public, an approach to the planning process and plan documentation was developed to achieve the following:

- The plan will be multi-jurisdictional, with the intention of including all municipalities in the county. Warren County invited all jurisdictions in the county to join with them in the planning process. To date, all local municipal governments in the county have participated in the 2015/16 planning process as indicated in Table 3-1.

Table 3-1. Participating Warren County Jurisdictions

Jurisdictions	
Warren County	Town of Lake George
Town of Bolton	Town of Lake Luzerne
Town of Chester	Town of Queensbury
City of Glens Falls	Town of Stony Creek
Town of Hague	Town of Thurman
Town of Horicon	Town of Warrensburg
Town of Johnsbury	Village of Lake George

- The plan considers all natural hazards facing the area, thereby satisfying the natural hazards mitigation planning requirements specified in DMA 2000. In addition, non-natural hazards that pose concern to the County were considered.
- The plan was developed following the process outlined by DMA 2000, FEMA regulations, and prevailing FEMA and NYS DHSES guidance. Following this process ensures that all the requirements are met and support Plan review. In addition, this Plan will meet criteria for the National Flood Insurance Program (NFIP) Community Rating System (CRS) and the Flood Mitigation Assistance (FMA) programs.

The Warren County HMP update was written using the best available information obtained from a wide variety of sources. Throughout the HMP update process, a concerted effort was made to gather information from municipal and regional agencies and staff as well as stakeholders, federal and state agencies, and the residents of the county. The HMP Steering Committee solicited information from local agencies and individuals with specific knowledge of certain natural hazards and past historical events. In addition, the committees took into consideration planning and zoning codes, ordinances, and recent land use planning decisions. The hazard mitigation strategies identified in this HMP update have been developed through an extensive planning process involving local, county and regional agencies, residents, and stakeholders.

This section of the plan describes the mitigation planning process, including (1) Organization of Planning Process; (2) Planning Activities; (3) Stakeholder Outreach and Involvement; (4) Public Outreach; and



Involvement; (4) Integration of Existing Data, Plans, and Information; (5) Integration with Existing Planning Mechanisms and Programs; and (6) Continued Public Outreach.

3.2 ORGANIZATION OF PLANNING PROCESS

This section of the plan identifies how the planning process was organized with the many planning partners involved, and outlines the major activities that were conducted in the development of this HMP update.

3.2.1 Organization of Planning Partnership

Warren County applied for and was awarded a multi-jurisdictional planning grant under the Hazard Mitigation Grant Program (HMGP PL-4085-0022), which has supported the development of this HMP.

Project management and grant administration has been the responsibility of the Warren County Soil and Water Conservation District with support of the Warren County Office of Emergency Services. The Warren County Department of Planning and Community Development (WCCPCD) provided direct GIS support for the project. A contract planning consultant (Tetra Tech, Inc.) was tasked with:

- Assisting with the organization of a Steering Committee and municipal planning partnership;
- Assisting with the development and implementation of a public and stakeholder outreach program;
- Data collection;
- Facilitation and attendance at meetings (Steering Committee, municipal, stakeholder, public and other);
- Review and update of the hazards of concern, hazard profiling and risk assessment;
- Assistance with the review and update of mitigation planning goals and objectives;
- Assistance with the review of past mitigation strategies progress;
- Assistance with the screening of mitigation actions and the identification of appropriate actions;
- Assistance with the prioritization of mitigation actions; and
- Authoring of the draft and final plan documents.

In March 2015, the County notified all municipalities within the county of the pending planning process and invited them to formally participate. Jurisdictions were asked to formally notify the County of their intent to participate (via a Letter of Intent to Participate) and to identify planning points of contact to facilitate municipal participation and represent the interests of their respective communities.

To facilitate plan development, Warren County developed a Steering Committee to provide guidance and direction to the HMP update effort, and to ensure the resulting document will be embraced both politically and by the constituency within the planning area. All municipalities participating in the plan update authorized the Steering Committee to perform certain activities on their behalf, via the Letter of Intent to participate (FEMA mitigation planning “combination model”). Specifically, the Steering Committee was charged with:

- Providing guidance and oversight of the planning process on behalf of the general planning partnership;
- Attending and participating in Steering Committee meetings;
- Assisting with the development and completion of certain planning elements, including:
 - Reviewing and updating the hazards of concern,
 - Developing a public and stakeholder outreach program,
 - Assuring that the data and information used in the plan update process is the best available
 - Reviewing and updating the hazard mitigation goals,
 - Identification and screening of appropriate mitigation strategies and activities; and
- Reviewing and commenting on plan documents prior to submission to NYS DHSES and FEMA.



The Steering Committee provided guidance and leadership, oversight of the planning process, and acted as the point of contact for all participating jurisdictions and the various interest groups in the planning area.

All municipalities in the County were invited to participate in the planning process, and received a copy of the Planning Partner Expectations, outlining the responsibilities of the participants and the agreement of the partners to authorize the Steering Committee to represent the jurisdiction in the completion of certain planning elements as noted above. Within this plan, the greater universe of County and local departments, agencies and jurisdictions that formally participated in the planning process are referred to as the “planning partnership”, while the municipal government participants are referred to as the “municipal planning partnership”.

The municipal planning partnership was charged with the following:

- Represent their jurisdiction throughout the planning process;
- Assure participation of all department and functions within their community that have a stake in mitigation (e.g., planning, engineering, code enforcement, police and emergency services, public works, etc.);
- Assist in gathering information for inclusion in the plan update, including the use of previously developed reports and data;
- Support and promote the public involvement process;
- Report on progress of mitigation actions identified in prior or existing HMPs, as applicable;
- Identify, develop and prioritize appropriate mitigation initiatives;
- Report on progress of integration of prior or existing HMPs into other planning processes and municipal operations;
- Develop and author a jurisdictional annex for their jurisdiction;
- Review, amend, and approve all sections of the plan update; and
- Adopt, implement and maintain the plan update.

Table 3-2 shows the current members of the planning partnership as of the time of publication of this plan update.

Table 3-2. Warren County Hazard Mitigation Planning Partnership Members

Organization	Name	Title	Primary POC	Secondary POC
Warren County Soil and Water Conservation District (WC SWCD)	Jim Lieberum, CPESC	District Manager/County Hazard Mitigation Coordinator	Steering Committee	
	Dean L. Moore	Sr. District Technician	Steering Committee	
Warren County Office of Emergency Services (WCOES)	Amy Hirsch	Emergency Services Coordinator	Steering Committee	
	Brian A. LaFlure	Director/Fire Coordinator	Steering Committee	
Warren County Department of Planning and Community Development (WCCPCD)	Sara Frankenfeld	GIS Coordinator	Steering Committee	
Town of Queensbury – Planning Department	Laura Moore	Planner	Steering Committee	
Adirondack / Glens Falls Transportation Council	Kate Mance	Senior Transportation Planner	Steering Committee	
City of Glens Falls	James P. Schrammel	Fire Chief	Steering Committee	
Town of Bolton	Ronald Conover	Town Supervisor	X	-



Organization	Name	Title	Primary POC	Secondary POC
	Susan Wilson	Deputy Supervisor	-	X
Town of Chester	Craig R. Leggett	Supervisor	X	-
	Frederick H. Monroe	Supervisor (former)	X	-
	Jason Monroe	Highway Superintendent / Water Superintendent	-	X
City of Glens Falls	James P. Schrammel	Fire Chief	X	-
	Steve Gurzler	City Engineer	-	X
Town of Hague	Catherine Clark	Zoning Administrator, NFIP FPA	X	-
	Enda A. Frasier	Supervisor	-	X
Town of Horicon	Matthew J. Simpson	Supervisor	X	-
	Dawn Higgins	Secretary	-	X
Town of Johnsbury	Daniel Hitchcock	Highway Superintendent	X	-
	Ron Vanselow	Supervisor	-	X
Town of Lake George	Dennis Dickinson	Supervisor	X	-
	Dan Davis	Highway Superintendent	-	X
Town of Lake Luzerne	Allen Saheim	Zoning and Safety Officer/NFIP FPA	X	-
	Ron Deuel	Highway and Water Superintendent	-	X
Town of Queensbury	John F. Strough	Supervisor	X	-
	Craig Brown	Planning and Community Development Director/Zoning Administrator	-	X
Town of Stony Creek	Frank E. Thomas	Supervisor, NFIP FPA (per Town LOIP)	X	-
	Neil Bradley	Highway Superintendent	-	X
Town of Thurman	Evelyn M. Wood	Town Supervisor	X	-
	Patrick S. Wood	Superintendent of Highways	-	X
Town of Warrensburg	Edward Pennock	Superintendent of Highways	X	-
	Christopher Belden	Code Enforcement and Building Permits	-	X
Village of Lake George	Robert M. Blais	Mayor	X	-
	David Harrington	Public Works Superintendent	-	X

Notes: POC = Point of Contact; WC = Warren County
 *TBD = To Be Determined

It is noted that the jurisdictional Letter of Intent to Participate identifies the above “Planning Partner Expectations” as serving to identify those activities comprising overall participation by jurisdictions throughout the planning process. It is recognized that the jurisdictions in Warren County have differing levels of capabilities and resources available to apply to the plan update process, and further, have differing exposure and vulnerability to the natural hazard risks being considered in this plan. It was Warren County’s intent to encourage participation by all-inclusive jurisdictions, and to accommodate their specific needs and limitations while still meeting the intents and purpose of plan update participation. Such accommodations have included the establishment of a Steering Committee, engaging a contract consultant to assume certain elements of the plan update process on behalf of the jurisdictions, and the provision of additional and alternative mechanisms to meet the purposes and intent of mitigation planning.

Ultimately, jurisdictional participation is evidenced by a completed municipal annex to the HMP (Section 9) wherein jurisdictions have individually identified their planning points of contact, evaluated their risk to the





hazards of concern, identified their capabilities to effect mitigation in their community, and identified and prioritized an appropriate suite of mitigation initiatives, actions, and projects to mitigate their hazard risk; and eventually, by the adoption of the updated plan via resolution.

Appendix D, “Participation Matrix”, identifies those individuals who represented the municipalities during this planning effort, and indicates how they contributed to the planning process.

It is noted that all municipalities in the county actively participate in the National Flood Insurance Program, and have a designated NFIP Floodplain Administrator (FPA). All FPAs have been informed of the planning process, reviewed the plan documents, and provided direct input to the plan update. Local FPAs are identified in the “Administrative and Technical” portion of the local Capability Assessments presented within the jurisdictional annexes in Section 9, as well as in Appendix D.

3.2.2 Planning Activities

Members of the planning partnership (individually and as a whole), as well as key stakeholders, convened and/or communicated regularly to share information and participate in workshops to identify hazards; assess risks; review existing inventories of and identify new critical facilities; assist in updating and developing new mitigation goals and strategies; and provide continuity through the process to ensure that natural hazards vulnerability information and appropriate mitigation strategies were incorporated. All members of the planning partnership had the opportunity to review the draft plan and supported interaction with other stakeholders, and assisted with public involvement efforts.

A summary of planning partnership activities, including meetings held during the development of the plan, is included in Table 3-3. This summary table identifies only the formal meetings and milestone events held during the plan update process, and does not reflect the larger universe of planning activities conducted by individuals and groups throughout the planning process. In addition to these meetings, there was a great deal of communication between planning partnership members and the consultant through individual local meetings, phone and email.

After completion of the plan, implementation and ongoing maintenance will become a function of the planning partnership as described in Section 7. The planning partnership is responsible for reviewing the draft plan and soliciting public comment as part of an annual review and as part of the five-year mitigation plan updates.

Table 3-3 presents a summary of planning activities and general project planning efforts conducted during the plan development process. It also identifies which DMA 2000 requirements the activities satisfy. Documentation of meetings (agendas, sign-in sheets, minutes, etc.) may be found in Appendix B.

Table 3-3. Summary of Mitigation Planning Activities / Efforts

Date	DMA 2000 Requirement	Description of Activity	Participants
November 2013	1b, 2	SWCD approves resolution to apply for FEMA mitigation planning grant	WC SWCD
July 2014	1b, 2	County awarded HMGP Planning grant	WC SWCD, WCOES
March 2015	1b, 2	County conducts procurement process for contract planning support	WC SWCD, WCOES
March 2015	2	All municipalities invited to participate in the planning process.	WC SWCD, WCOES, all municipal governments



Date	DMA 2000 Requirement	Description of Activity	Participants
June – August 2015	1c, 2	Interested jurisdictions submit Letters of Intent to Participate in this planning process, acknowledging municipal participation requirements and identifying planning point(s) of contact.	WC SWCD, WCOES, all municipal governments
May 22, 2015	1b, 1c, 2, 3a, 3b, 3c, 4a, 5c	Project Start Up Meeting – SC #1 Discuss proposed planning process and scope of work including documenting participation, schedule, and public and stakeholder outreach and involvement. Review project schedule; review municipal participation, discuss municipal Kick Off meeting and local data collection; review and discuss sources and availability of county and regional data; discuss public and stakeholder outreach efforts.	WC Project Management Team and Steering Committee; Contract Planner. See Appendix B
June 19, 2015	1b, 1c, 2, 3a, 3b, 3c, 4a	Project presentation to County Board of Supervisors / Municipal Kick-Off Meeting: Complete overview of planning process, plan participant expectations, review of hazards and hazards of concern identification, discussion of data needs and data collection process explaining all provided worksheets (hard copy and on resource CD), discussion of public and stakeholder outreach efforts	County Board of Supervisors and municipal representatives and stakeholders. See Appendix B
July 6, 2015	1b, 1c, 2, 3a-c, 3e	Local Data Collection Meeting – Towns of Stony Creek and Thurman	See Appendix B
July 6, 2015	1b, 1c, 2, 3a-c, 3e	Local Data Collection Meeting – Town of Bolton	See Appendix B
July 7, 2015	1b, 1c, 2, 3a-c, 3e	County Data Collection Meeting	See Appendix B
July 7, 2015	1b, 1c, 2, 3a-c, 3e	Local Data Collection Meeting – Towns of Warren and Lake Luzerne	See Appendix B
July 7, 2015	1b, 1c, 2, 3a-c, 3e	Local Data Collection Meeting – Towns of Chester, Hague and Horicon	See Appendix B
July 8, 2015	1b, 1c, 2, 3a-c, 3e	Local Data Collection Meeting – Town and Village of Lake George	See Appendix B
July 8, 2015	1b, 1c, 2, 3a-c, 3e	Local Data Collection Meeting – Town of Queensbury	See Appendix B
July 9, 2015	1b, 1c, 2, 3a-c, 3e	Local Data Collection Meeting – Town of Johnsbury	See Appendix B
July 9, 2015	1b, 1c, 2, 3a-c, 3e	Local Data Collection Meeting – City of Glens Falls	See Appendix B
August 18, 2015	1b, 2, 3 (all), 4a, 4b, 5c	SC Meeting #2 - Review/finalize hazards of concern; review/update goals and objectives; review public and stakeholder outreach efforts; set date for Mitigation Strategy Workshop; review municipal progress and schedule	Steering Committee (See Appendix B)
August, 2015	2	Online Public Hazard Preparedness and Mitigation Survey launched	Steering Committee; Contract Planner; Public and Stakeholders
August, 2015	2	Online Stakeholder Hazard Mitigation Surveys (9) launched	Steering Committee; Contract Planner; Public and Stakeholders
September 4, 2015	2	Public project website launched: http://www.warrencountynyhmp.com	Steering Committee; Contract Planner; Public and Stakeholders
September 22, 2015	4b, 4c, 5b	FEMA Mitigation Workshop for all planning partners	Paul Hoole, FEMA Region II; all plan participants (see Appendix D)
Oct. 2015 – June 2016	4b, 4c, 5b	All jurisdictions update mitigation strategy, including project prioritization; and work to complete jurisdictional annexes	All plan participants with the support of the WC SC and contract consultant



Date	DMA 2000 Requirement	Description of Activity	Participants
January 2016	1b, 2	Draft Plan sections posted to public project website as available. Communities requested to use available outreach to notify the public of the draft plan for review. Online survey developed to support draft plan review comments from the public and stakeholders - https://www.surveymonkey.com/r/WarrenCountyPlanReview	Public and Stakeholders
February 2, 2016	2, 4b, 4c, 5(all)	SC Meeting #3 - Finalize main plan sections and hazard profiles, review municipal progress, review public and stakeholder outreach, work on County annex.	Steering Committee (See Appendix B)
March, 2016	1b, 2	Full draft plan posted on project website. Surrounding counties advised of the draft plan for their review and input.	Public and Stakeholders
July, 2016	2	Final Draft Plan submitted to NYS DHSES / FEMA Region II	NYS DHSES/FEMA Region II
December, 2016	1b, 2	Updated Final Draft Plan, addressing NYS DHSES comments, submitted to NYS DHSES / FEMA Region II	NYS DHSES/FEMA Region II
December, 2016	1b, 2	Full updated draft plan posted on project website.	Public and Stakeholders
Upon plan approval by FEMA	1a	Plan adoption by resolution by the governing bodies of all participating municipalities	All plan participants

Note: TBD = to be determined.

Each number in column 2 identifies specific DMA 2000 requirements, as follows:

- 1a – Prerequisite – Adoption by the Local Governing Body
- 1b – Public Participation
- 2 – Planning Process – Documentation of the Planning Process
- 3a – Risk Assessment – Identifying Hazards
- 3b – Risk Assessment – Profiling Hazard Events
- 3c – Risk Assessment – Assessing Vulnerability: Identifying Assets
- 3d – Risk Assessment – Assessing Vulnerability: Estimating Potential Losses
- 3e – Risk Assessment – Assessing Vulnerability: Analyzing Development Trends
- 4a – Mitigation Strategy – Local Hazard Mitigation Goals
- 4b – Mitigation Strategy – Identification and Analysis of Mitigation Measures
- 4c – Mitigation Strategy – Implementation of Mitigation Measures
- 5a – Plan Maintenance Procedures – Monitoring, Evaluating, and Updating the Plan
- 5b – Plan Maintenance Procedures – Implementation through Existing Programs
- 5c – Plan Maintenance Procedures – Continued Public Involvement

3.3 STAKEHOLDER OUTREACH AND INVOLVEMENT

This section details the outreach to, and involvement of, the many agencies, departments, organizations, non-profits, districts, authorities and other entities that have a stake in managing hazard risk and mitigation, commonly referred to as “stakeholders”.

Diligent efforts were made to assure broad regional, county, and local representation in this planning process. To that end, a comprehensive list of stakeholders was developed with the support of the Steering and Planning committees. Stakeholder outreach was performed early and throughout the planning process. In addition to “mass media” notification efforts, identified stakeholders were invited to attend the kick-off meeting, while key stakeholders were requested to participate on the Steering Committee. Information and input provided by these stakeholders has been included throughout this plan where appropriate, as identified in the references.

The following is a list of the various stakeholders that were invited to participate in the development of this plan, along with a summary of how these stakeholders participated and contributed to the plan. This summary listing cannot represent the sum total of stakeholders that were aware of and/or contributed to this plan since formal and informal outreach efforts were utilized throughout the process by the many planning partners involved in





the overall effort. Complete documentation of such broad-based and often locally-focused efforts is impossible. Instead, this summary is intended to demonstrate the scope and breadth of the stakeholder outreach efforts made during the planning process.

Federal Agencies

FEMA Region II: Provided updated planning guidance; provided summary and detailed NFIP data for planning area; attended meetings; conducted a Mitigation Strategy Workshop; conducted plan review.

National Weather Service – Albany, NY Office: Received draft sections of plan for review. Participated in Warren County HAZNY exercise.

State Agencies

New York State Department of Homeland Security and Emergency Services (NYS DHSES: Headquarters and Region I): Administered planning grant and facilitated FEMA review; provided updated planning guidance; provided information on grant applications from County and municipalities; provided review of Draft and Final Plan.

New York State Department of Environmental Conservation (NYSDEC): Provided data and information.

New York State Department of Transportation (NYSDOT): Provided data and information, identified mitigation projects on state-owned infrastructure within the county.

County and Regional Departments, Agencies, Commissions and Non-Profits

Warren County Soil and Water Conservation District (WC SWCD): Secured and administered FEMA planning grant, managed project, arranged and attended meetings, served on Steering Committee, provided data and information, facilitated and supported public and stakeholder outreach, identified ongoing and potential mitigation projects and initiatives, reviewed draft and final plan sections.

Warren County Office of Emergency Services (WCOES): Supported WC SWCD with project management, served on Steering Committee, arranged and attended meetings, provided data and information, facilitated and supported public and stakeholder outreach, identified ongoing and potential mitigation projects and initiatives, reviewed draft and final plan sections.

Warren County Department of Planning and Community Development (WCDPCD): Served on Steering Committee, provided critical data and information, conducted GIS vulnerability assessment analysis and provided GIS mapping, reviewed progress on original mitigation strategy, identified new projects/initiatives, reviewed and provided input on draft and final plan sections.

Warren County Board of Supervisors: Project presented to the Board; various Board members provided direct input to the project, including potential mitigation projects and initiatives.

Warren County Department of Public Works (WCDPW): Provided data and information, reviewed progress on original mitigation strategy, identified new projects/initiatives, reviewed and provided input on draft and final plan sections.

Warren County Department of Parks, Recreation and Railroad (part of WCDPW): Surveyed for data on infestation events in the County

Warren County Department of Information Technology: Provided data and information; reviewed and provided input on specific hazard profiles; identified possible mitigation actions.



Warren County Sheriff's Office: Provided data and information; reviewed and provided input on specific hazard profiles.

Warren County Health Services: Provided data and information; reviewed and provided input on specific hazard profiles; identified possible mitigation actions.

Warren County Emergency Preparedness and Response Committee: Provided data and information; reviewed and provided input on specific hazard profiles; identified mitigation actions

Regional and Local Stakeholders

Please see Appendix D (Participation Matrix) for further details regarding regional and local stakeholder agencies. The stakeholders listed below were directly contacted by Warren County Soil and Water Conservation District / Warren County Office of Emergency Services to take a stakeholder survey which included the identification of specific mitigation actions/projects. Results of the surveys can be found in Appendix C (Public and Stakeholder Outreach).

Academia (School districts and other academic institutions): Municipalities directly involved school district representatives in the planning process, as identified in Table 3-3 and Appendix C. All school districts, higher education and many technical/vocational institutions were provided the Academic Stakeholder survey and invited to provide input, while some have identified specific mitigation actions/projects included in the County or local mitigation strategies. The following have provided direct input to the planning process:

- Lake George School District– Completed Survey

Law Enforcement: Many municipalities directly involved police and other law enforcement representatives in the planning process, as identified in Table 3-3 and Appendix C. Further, through the Warren County OES, all police departments and law enforcement agencies in the County were notified of the Law Enforcement Stakeholder survey and invited to provide input, while some have identified specific mitigation actions/projects included in the County or local mitigation strategies. The following have provided direct input to the planning process:

- Warren County Sheriff's Office- Completed survey
- Glens Falls Police Department – Completed survey (multiple responses)

Fire Districts and Fire Departments: Many municipalities directly involved fire district/department representatives in the planning process, as identified in Table 3-3 and Appendix C. Further, the County Fire Coordinator advised all Fire Districts and Fire Departments of the Fire Fighting survey and invited them to provide input. The following have provided input to the planning process:

- Chestertown – Completed survey
- Bolton – Completed survey
- Bay Ridge Vol. Fire Company, Inc.– Completed survey
- City of Glens Falls – Completed survey (multiple)
- Minerva Vol. Fire Department and Rescue Squad– Completed survey
- South Queensbury Fire District – Completed survey
- West Glens Falls Fire Company– Completed survey
- Lake George– Completed survey
- Warren County Emergency Services – Completed survey
- Queensbury Central FD – Completed survey



- North River VFD – Completed survey
- Hague FD – Completed survey

Hospitals and Health-Care Facilities: The following hospitals and health-care facilities in the county were provided the Hospitals and Health-Care Stakeholder survey and invited to provide input, while some have identified specific mitigation actions/projects included in the County or local mitigation strategies. The following have provided input to the planning process:

- Countryside Adult Home (County-owned)
- Adirondack Tri-County Nursing and Rehabilitation Center

Ambulance/Emergency Medical Services: All ambulance and emergency medical service providers in the County were provided the Ambulance/Emergency Medical Services stakeholder survey and invited to provide input, while some have identified specific mitigation actions/projects included in the County or local mitigation strategies. The following have provided input to the planning process:

- North Warren Emergency Squad (Chester) – Completed survey (multiple)
- Mountain Lakes Regional EMS Council (Town of Hague) – Completed survey
- West Glens Falls EMS (Town of Queensbury) – Completed survey (multiple)

Business and Commercial Interests (including Camps): Businesses and commercial interests in the county were provided the Business and Commerce Stakeholder survey and invited to provide input, however to date no responses have been received.

Private Non-Profit Organizations: The following private non-profit organizations have provided input to the planning process:

- Southern Adirondack Economic Development Planning and Zoning: Project presented at Oct. 2015 meeting
- Champlain Watershed Improvement Coalition of New York, Inc. (CWICNY) - <https://www.cwicny.org/>
- Adirondack Park Invasive Plant Program (APIPP) - <http://adkinvasives.com/>

Transportation

Adirondack / Glens Falls Transportation Council: Steering Committee member. Provided vulnerability information and supported update of mitigation strategy.

Adjacent Counties:

The County has made an effort to keep surrounding counties and municipalities apprised of the project, and allowed the opportunity to provide input to this planning process. Specifically, the following adjoining and nearby County representatives were contacted in June 2016 to inform them about the availability of the project website, draft plan documents and surveys, and invited to provide input to the planning process:

- Essex County (NY)
 - Donald Jaquish, Director; Essex County Emergency Services
 - Wanda Wade; Essex County Emergency Services
- Washington County (NY)



- Jonathan Pease, Emergency Management and Hazard Mitigation Plan Coordinator; Washington County Department of Public Safety
- Glen Gosnell, Director; Washington County Department of Public Safety
- Corrina Aldrich, District Manager, Washington County Soil and Water Conservation District
- Saratoga County (NY)
 - Carl Zeilman, Director; Saratoga County Office of Emergency Services
 - Ed Trembley, Deputy Director/Fire Coordinator; Saratoga County Office of Emergency Services
- Hamilton County (NY)
 - Don Purdy, Emergency Manager; Hamilton County Emergency Management
 - Jay Griffen, Fire Coordinator; Hamilton County Emergency Management

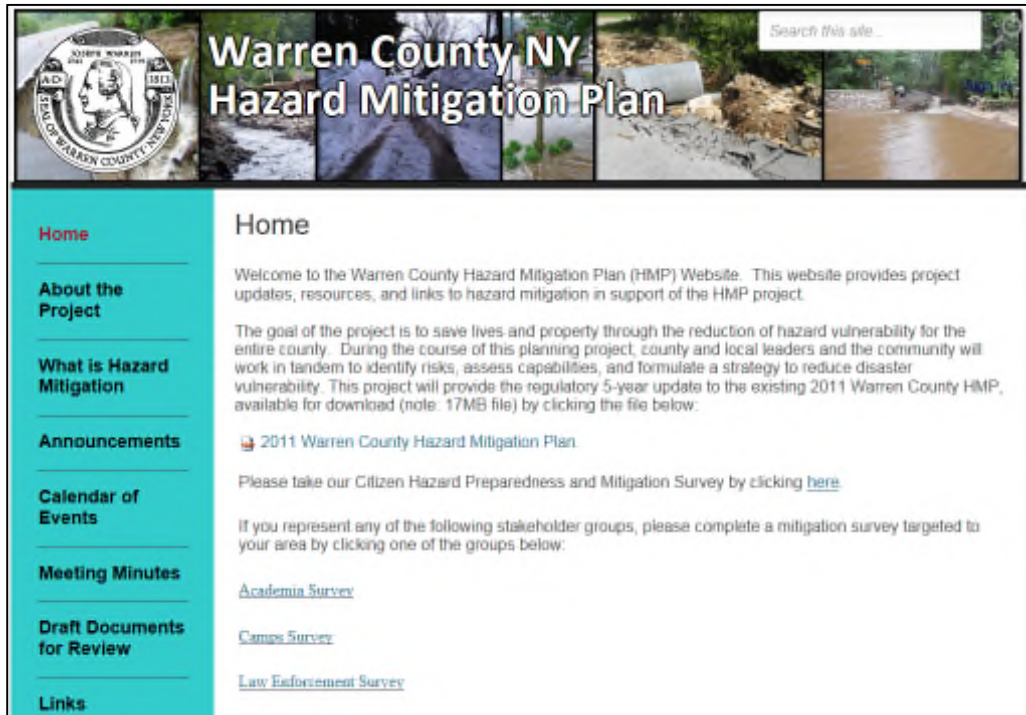
3.3.1 Public Outreach

The Steering Committee and Planning Partnership have made the following efforts toward public participation in the development and review of the Plan:

- A public project website was developed and is being maintained to facilitate communication between the Steering Committee, planning partnership, public and stakeholders (<http://www.warrencountynyhmp.com>). The public website contains a project overview, County and local contact information, access to the citizen's survey and various stakeholder surveys, and sections of the HMP for public review and comment (see Figure 3-1).
- Visibility for the project website has been facilitated through announcements and/or links on the following:
 - County website homepage
 - Warren County Emergency Management
 - Warren County Soil and Water Conservation District homepage
 - Participating municipalities requested to post on municipal homepages
 - County and local stakeholder meetings.



Figure 3-1. Warren County HMP Webpage



- An on-line natural hazards preparedness citizen survey was developed to gauge household preparedness that may impact Warren County and to assess the level of knowledge of tools and techniques to assist in reducing risk and loss of those hazards (<https://www.surveymonkey.com/r/522G53D>). The questionnaire asks quantifiable questions about citizen perception of risk, knowledge of mitigation, and support of community programs. The questionnaire also asks several demographic questions to help analyze trends. The questionnaire has been available on the public website since September 2015, and further advertised on the County website (see graphic below). A summary of survey results is provided in Appendix C of this plan.



- All participating municipalities have been encouraged to distribute press releases on the project, including links to the project webpage and citizen and stakeholder surveys. In addition, all participating municipalities have been requested to advertise the availability of the project website via local homepage links, and other available public announcement methods (e.g. Facebook, Twitter, email blasts, etc.)
- A tri-fold brochure describing the project and providing links to the project website and main project contacts was prepared and provided to municipalities and other stakeholders for distribution.
- Starting in January 2016, draft sections of the plan (as available) have been posted on the project website for public review and comment. The County Communications Director distributed a press release advertising the project website and the availability of the draft plan for review and comment. The full draft plan (less Appendices) was posted in March, 2016. Allowing at least two months for public review and comment. An online comment form (survey) was provided along with the draft plan sections to support the receipt and processing of public comment (<https://www.surveymonkey.com/r/WarrenCountyPlanReview>).
- To inform the public and county agencies of the ongoing plan update effort, updates regarding the mitigation planning process have been made at County-wide meetings including:
 - County Board of Supervisors - Dec 19, 2014
 - Public Meetings - Jan 8, 2015 (Glens Falls), Jan 13, 2015 (Warrensburg)
 - WC Emergency Preparedness and Response Quarterly Meetings - Jan 28, 2015; April 22, 2015
 - Emergency Stream Intervention Training, March 24 2015
 - Public Safety Committee Meetings: Aug 31, 2015; Nov 30, 2015
 - Southern Adirondack Economic Development Planning and Zoning Committee Meeting: Oct 1, 2015



- Comments and input to the draft plan have been recorded and provided to the County and municipal planning partners for consideration and inclusion within the updated plan document. While there has been no public comment received to date, significant input from stakeholders has been considered and included in the updated plan as appropriate.
- Once submitted to NYS DHSES/FEMA, the Final Plan will be available for public review and comment in the same manner and format as the Draft Plan, as well as in hard-copy format at the following as identified in Section 7, “Plan Maintenance”.

3.4 INCORPORATION OF EXISTING PLANS, STUDIES, REPORTS AND TECHNICAL INFORMATION

The Warren County plan strives to use the best available technical information, plans, studies and reports throughout the planning process to support hazard profiling; risk and vulnerability assessment; review and evaluation of mitigation capabilities; and the identification, development and prioritization of County and local mitigation strategies.

The asset and inventory data used for the risk and vulnerability assessments is presented in the County Profile (Section 4). Details of the source of this data, along with technical information on how the data was used to develop the risk and vulnerability assessment, is presented in the Hazard Profiling and Risk Assessment Section (Section 5), specifically within Section 5.3 (Data and Methodology), as well as throughout the hazard profiles in Section 5.4. Further, the source of technical data and information used may be found within the References Section.

Plans, reports and other technical information were identified and provided directly by the County, participating jurisdictions and numerous stakeholders involved in the planning effort, as well as through independent research by the planning consultant. The County and participating jurisdictions were tasked with updating the inventory of their Planning and Regulatory capabilities (see Capability Assessment section of each jurisdictional annex in Section 9), and providing relevant planning and regulatory documents as applicable. Relevant documents, including plans, reports, and ordinances were reviewed to identify:

- Existing municipal capabilities;
- Needs and opportunities to develop or enhance capabilities, which may be identified within the County or local mitigation strategies;
- Mitigation-related goals or objectives, considered in the review and update of the overall Goals [and Objectives] (see Section 6);
- Proposed, in-progress, or potential mitigation projects, actions and initiatives to be incorporated into the updated County and local mitigation strategies.

The following local regulations, codes, ordinances and plans were reviewed during this process in an effort to develop mitigation planning goals and objectives and mitigation strategies that are consistent across local and regional planning and regulatory mechanisms; and thus develop complementary and mutually supportive strategies, including:

- Comprehensive/Master Plans
- Building Codes
- Zoning and Subdivision Ordinances
- NFIP Flood Damage Prevention Ordinances
- Site Plan Requirements



- Local Waterfront Revitalization Plans
- Stormwater Management Plans
- Emergency Management and Response Plans
- Land Use and Open Space Plans
- Capital Plans
- New York State Standard Multi-Hazard Mitigation Plan, 2013

A partial listing of the plans, reports and technical documents reviewed in the preparation of this plan is included in Table 3-4.

Table 3-4. Record Review (Municipalities) - Record of the review of existing programs, policies, and technical documents for participating jurisdictions (all)

Existing plan, program or technical documents	Date	Jurisdictional Applicability
Town of Bolton Local Waterfront Revitalization Plan	July 2014	Bolton (T)
Chester Town-wide Recreation Plan	July 2015	Chester (T)
County Emergency Preparedness Assessment	March 17, 2014	Countywide
Warren County Soil & Water Conservation District - 2013 Annual Report	2013	Countywide
Warren County Pre-Disaster Multi-Jurisdictional Hazard Mitigation Plan	June 2011	Countywide
Warren County Comprehensive Emergency Management Plan	2015	Countywide
Hazardous Weather Annex	November 2014	Countywide
ESF #6 - Warren County Mass Care Annex	March 1, 2015	Countywide
Soil Survey of Warren County New York	January 1989	Countywide
Adirondack Gateway Council Broadband Inventory Study	July 15, 2014	Countywide
Infrastructure Enhancements to Grow our Regional Economy - A collaborative approach for building infrastructure in Upstate New York	2014	Countywide
Sewer Infrastructure Assessment	October 2014	Countywide
FEMA Flood Insurance Study	August 16, 1996	Countywide
2014 Annual Report City of Glens Falls Fire Department	2014	Glens Falls (C)
City of Glens Falls, New York Community Development Fourth Program Year Action Plan	2013	Glens Falls (C)
Glens Falls Consolidated Plan	2015	Glens Falls (C)
City of Glens Falls Green Infrastructure Plan	January 2014	Glens Falls (C)
Town of Horicon Comprehensive Plan	July 15, 2010	Horicon (T)
Town of Johnsbury Comprehensive Plan	July 19, 2005	Johnsbury (T)
Town of Johnsbury Zoning Law	September 1, 2007	Johnsbury (T)
Lake View Estates Watershed Assessment	July 2014	Lake George (T)
Michelli Drive and Front Street Neighborhood Drainage Report	August 12, 2005	Lake George (T)
Town of Lake George 2015 Comprehensive Plan	January 14, 2016	Lake George (T)
Trails Master Plan for the West Side of Lake George	April 2013	Lake George (V), Lake George (T), Bolton (T), Hague (T)
Transportation Project Report	February 2013	Queensbury (T)
Town of Queensbury Comprehensive Plan	August 6, 2007	Queensbury (T)
Aviation Road Corridor Study	September 2008	Queensbury (T)



Existing plan, program or technical documents	Date	Jurisdictional Applicability
Town of Warrensburg Comprehensive Plan and Waterfront Revitalization Strategy	March 2012	Warrensburg (T)
Town of Warrensburg Zoning	January 12, 2012	Warrensburg (T)

Notes:

* = *this document may or may not include all jurisdictions*

3.5 INTEGRATION WITH EXISTING PLANNING MECHANISMS AND PROGRAMS

Effective mitigation is achieved when hazard awareness and risk management approaches and strategies become an integral part of public activities and decision-making. Within the county there are many existing plans and programs that support hazard risk management, and thus it is critical that this hazard mitigation plan integrate and coordinate with, and complement, those existing plans and programs.

The “Capability Assessment” section of Chapter 6 (Mitigation Strategy) provides a summary and description of the existing plans, programs and regulatory mechanisms at all levels of government (Federal, State, County and local) that support hazard mitigation within the county. Within each jurisdictional annex in Chapter 9, the County and each participating jurisdiction have identified how they have integrated hazard risk management into their existing planning, regulatory and operational/administrative framework (“integration capabilities”) and how they intend to promote this integration (“integration actions”).

A further summary of these continued efforts to develop and promote a comprehensive and holistic approach to hazard risk management and mitigation is presented in Section 7.

3.6 CONTINUED PUBLIC INVOLVEMENT

Warren County and participating jurisdictions are committed to the continued involvement of the public in the hazard mitigation process. This Plan update will be posted on-line (currently at <http://www.warrencountynyhmp.com>), and municipalities will be encouraged to maintain links to the plan website. Further, the County will make hard copies of the Plan available for review at public locations as identified on the public plan website.

A notice regarding annual updates of the plan and the location of plan copies will be publicized annually after the Planning Committee’s annual evaluation and posted on the public website (currently <http://www.warrencountynyhmp.com>).

Each jurisdiction’s governing body shall be responsible for receiving, tracking, and filing public comments regarding this plan.

The public will have an opportunity to comment on the plan as a part of the annual mitigation planning evaluation process and the next five-year mitigation plan update. The HMP Coordinator (currently Mr. Jim Lieberum, CPESC of the Warren County Soil and Water Conservation District) is responsible for coordinating the plan evaluation portion of the meeting, soliciting feedback, collecting and reviewing the comments, and ensuring their incorporation in the 5-year plan update as appropriate; however, members of the Planning Committee will assist the HMP Coordinator. Additional meetings may also be held as deemed necessary by the Planning Committee. The purpose of these meetings would be to provide the public an opportunity to express concerns, opinions, and ideas about the plan.

Further details regarding continued public involvement are provided in Section 7.





After completion of this plan, implementation and ongoing maintenance will continue to be a function of the Planning Committee. The Planning Committee will review the plan and accept public comment as part of an annual review and as part of five-year mitigation plan updates.

A notice regarding annual updates of the plan and the location of plan copies will be publicized annually after the HMP Committee's annual evaluation and posted on the public web site.

Mr. Jim Lieberum, CPESC of the Warren County Soil and Water Conservation District has been identified as the ongoing Warren County Hazard Mitigation Plan Coordinator (see Section 7), and is responsible for receiving, tracking, and filing public comments regarding this plan. Contact information is:

Mailing Address: Warren County Soil and Water Conservation District
394 Schroon River Road
Warrensburg, NY 12885

Contact Name: Mr. Jim Lieberum, CPESC

Email Address: jim99@nycap.rr.com

Telephone: (518) 623-3119



SECTION 4 COUNTY PROFILE

This profile describes the general information of the County (physical setting, population and demographics, general building stock, and land use and population trends) as well as critical facilities located within Warren County. In Section 5, specific profile information is presented and analyzed to develop an understanding of the study area, including the economic, structural, and population assets at risk and the particular concerns that may be present related to hazards analyzed (for example, a high percentage of vulnerable persons in an area).

4.1 GENERAL INFORMATION

Warren County is located in the northeastern part of New York State. It is bounded on the east by Lake George and Washington County, to the west by Hamilton and Saratoga Counties, to the north by Essex and Hamilton Counties, and to the south by Saratoga County.

Warren County was formed in 1813 from Washington County. The County is included in the Glen Falls Metropolitan Statistical Area. Warren County consists of 13 municipalities, covering 932 square miles and 2013 estimated population of 65,584. The County is one of the 62 counties in New York State and is comprised of one city, 11 towns, and one incorporated village. As of the 2010 Census, Warren County is the 38th most populated County in the State and ranks 25 in total land area.

The County contains 11 town governments, 1 city government, 1 village government, and the County government. State and federal government statutes and regulations control how the local governments operate. Local governments include the city of Glen Falls; the towns of Bolton, Chester, Hague, Horicon, Johnsbury, Lake George, Lake Luzerne, Queensbury, Stony Creek, Thurman, and Warrensburg; and the village of Lake George. The County and each municipality operate under the limits prescribed by various rules and laws of New York State. Each government entity has various responsibilities, funding sources, staffing levels, elected positions, and administrative capacities.

4.1.1 Physical Setting

This section presents topography and geology, hydrology and hydrography, climate, land use and land cover.

Hydrography and Hydrology

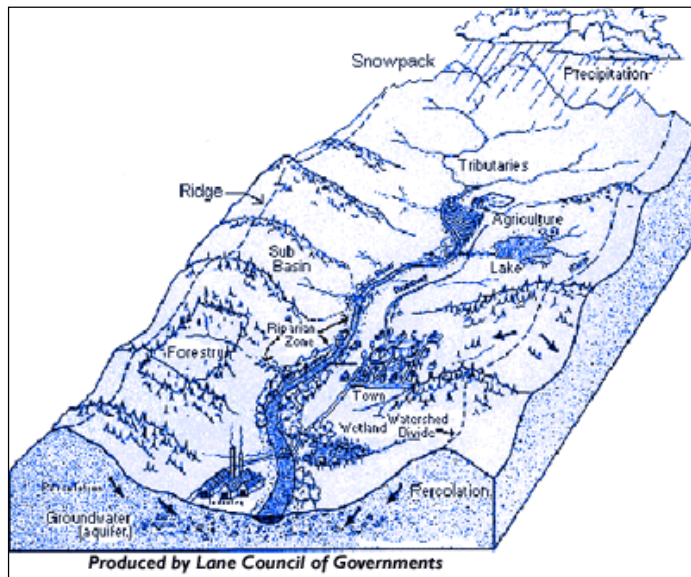
Numerous ponds, lakes, creeks, and rivers make up the waterscape of Warren County. The major waterways within the County include: the Hudson River, Schroon River, Lake George, Lake Luzerne, Brant Lake, Friends Lake, Thirteenth Lake, Glen Lake, and Garnet Lake. The County border also goes around Schroon Lake in the north.

Drainage Basins and Watersheds

A watershed is the area of land that drains into a body of water such as a river, lake, stream, or bay. It is separated from other systems by high points in the area such as hills or slopes. It includes not only the waterway itself but also the entire land area that drains to it. For example, the watershed of a lake would include not only the streams entering the lake but also the land area that drains into those streams and eventually the lake. Drainage basins generally refer to large watersheds that encompass the watersheds of many smaller rivers and streams. Figure 4-1 depicts the hydrologic system of a watershed.



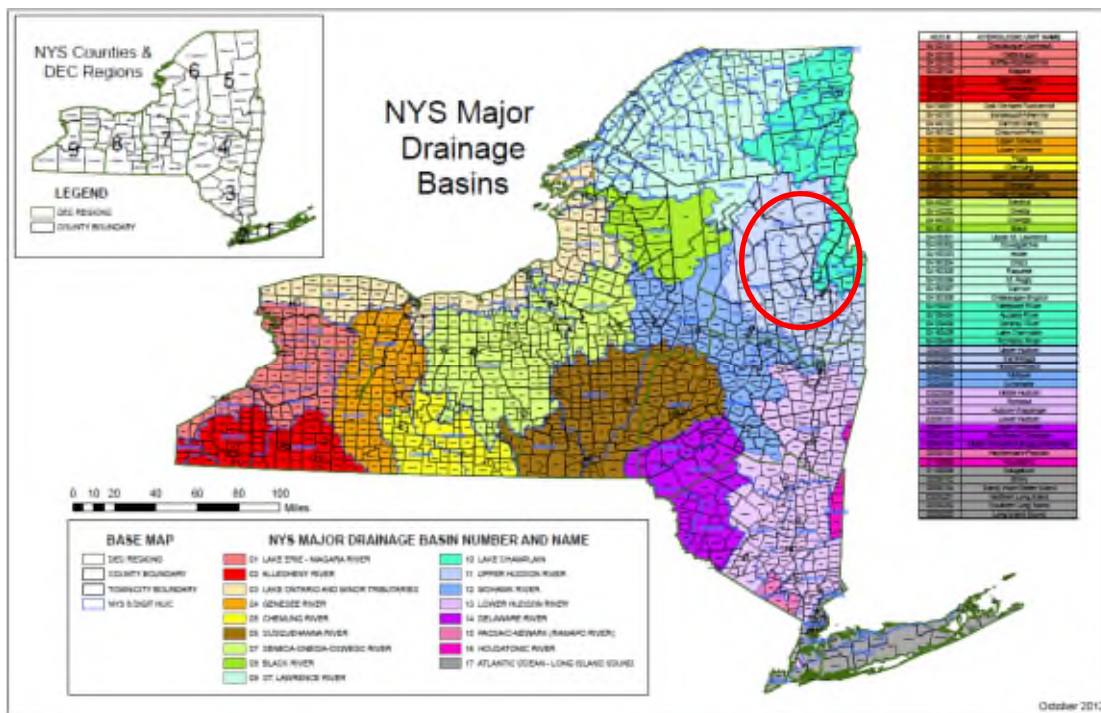
Figure 4-1. Watershed



Source: U.S. Environmental Protection Agency (EPA) 2012

Watersheds come in all shapes and sizes and can cross municipal and county boundaries. New York State's waters (lakes, rivers, and streams) fall within one of 17 drainage basins. Warren County lies within the Upper Hudson River and Lake Champlain drainage basins. Figure 4-2 shows the drainage basins and watersheds located in New York State, and Warren County's location.

Figure 4-2. Drainage Basins of New York State



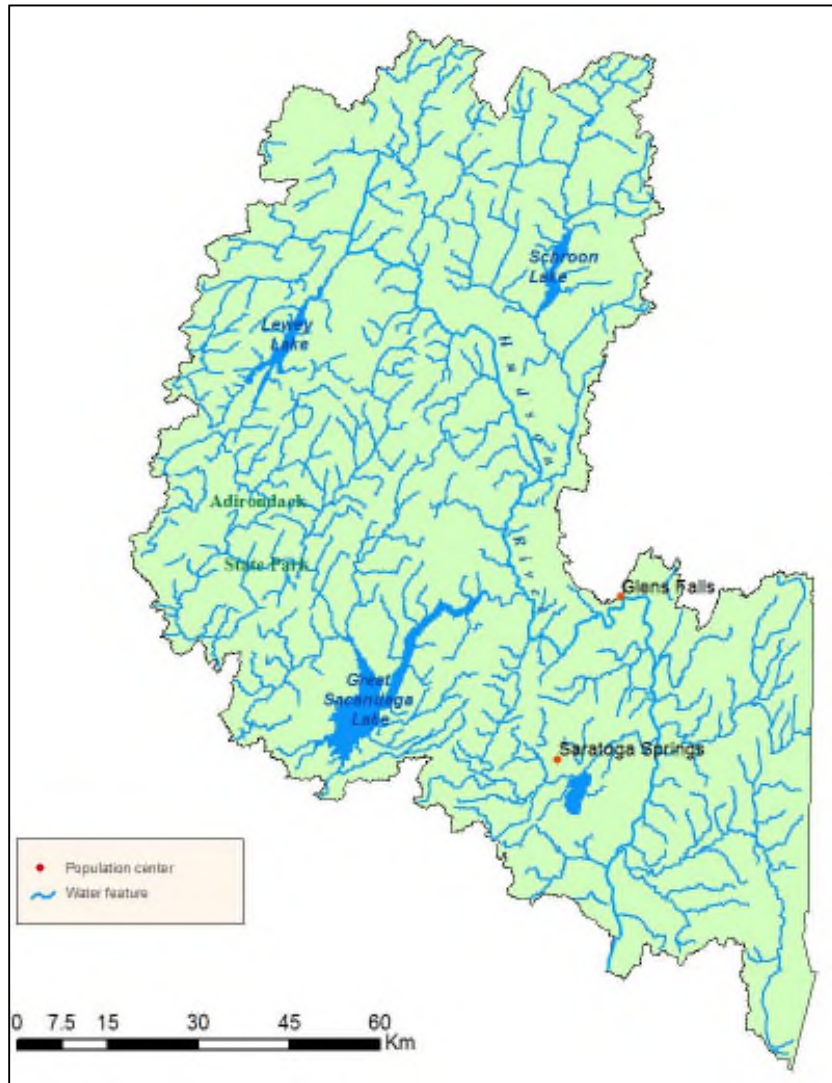
Source: NYSDEC 2012

Note: Warren County's approximate location is shown by the red oval.



Warren County is located in the Upper Hudson Drainage Basin (Figure 4-3). The Upper Hudson Drainage Basin makes up approximately one-third of the larger Hudson River Basin, which also includes the Mohawk River Watershed. The Upper Hudson Drainage Basin begins in the Adirondack Mountains and drains to the Troy Dam at the confluence of the Mohawk River. This watershed covers 4,620 square miles of land in New York State, and contains 7,140 miles of freshwater rivers and streams. There are 229 significant freshwater lakes, ponds and reservoirs located within the Drainage Basin that include: the Great Sacandaga Lake, Indian Lake, Schroon Lake, and Saratoga Lake (NYSDEC 2015).

Figure 4-3. Upper Hudson River Drainage Basin

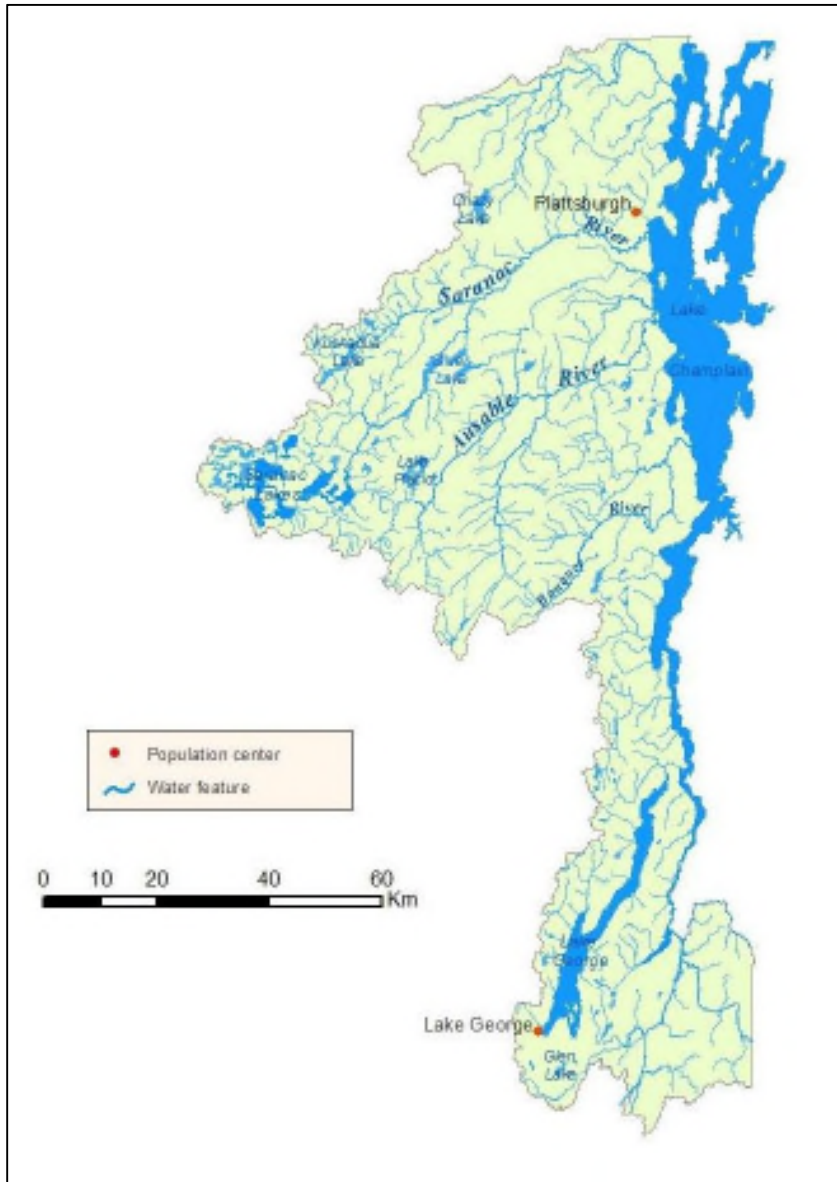


Source: NYSDEC 2015

The eastern part of the County is in the Lake Champlain Drainage Basin (Figure 4-4). The Lake Champlain Drainage Basin drains over 8,200 square miles (3,050 square miles in New York) of land between the Adirondack Mountains in New York and the Green Mountains in Vermont. It contains nearly 4,900 miles of freshwater rivers and streams. There are 235 significant freshwater lakes, ponds, and reservoirs located within the Drainage Basin that include: Lake George, Upper Saranac Lake, Lower Saranac Lake, and Lake Placid (NYSDEC 2015).



Figure 4-4. Lake Champlain Drainage Basin

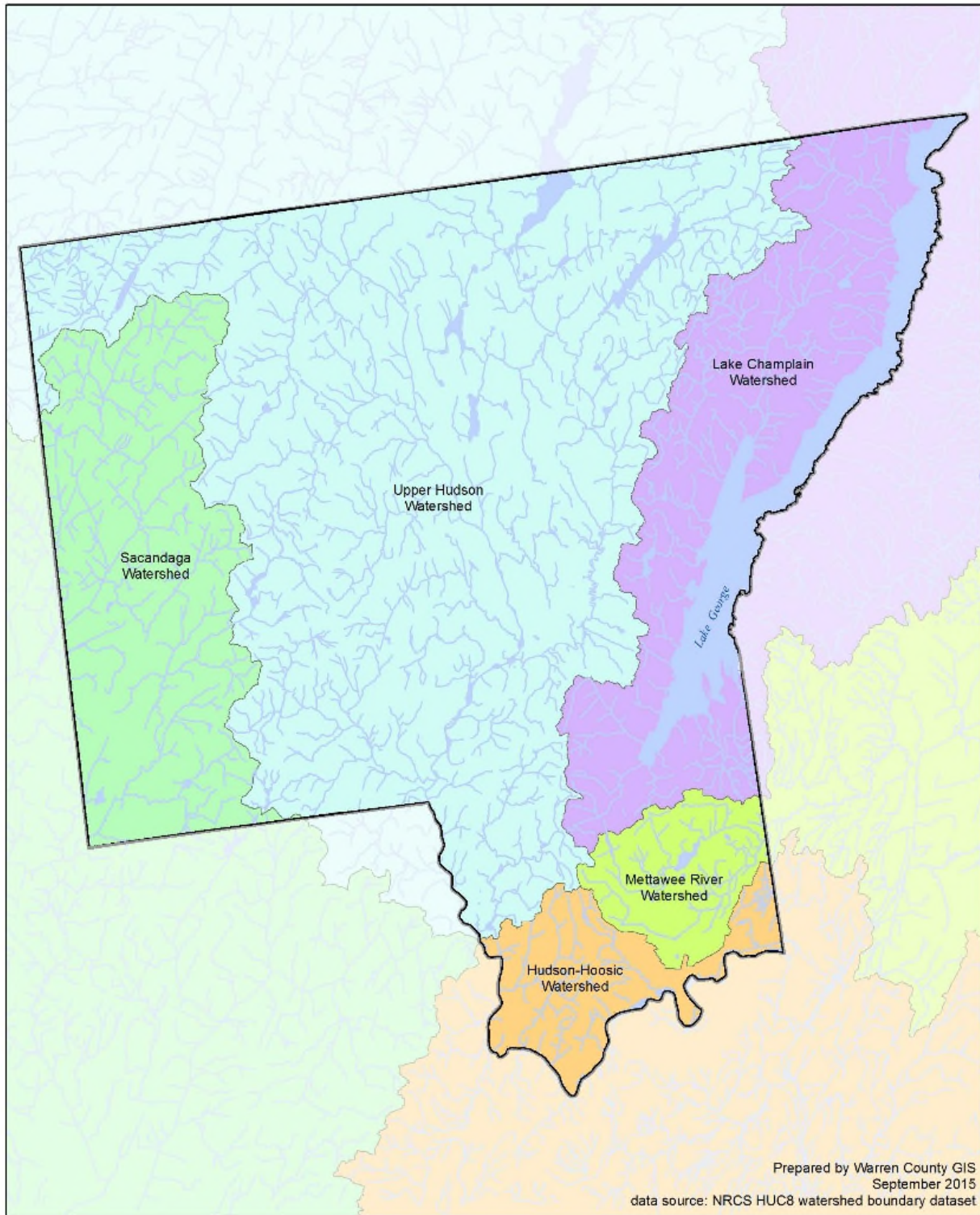


Source: NYSDEC 2015

The drainage basins are further divided into watersheds. Figure 4-5 shows the individual watersheds within Warren County. The Sacandaga Watershed, Upper Hudson Watershed, and Hudson-Hoosic Watershed are within the Upper Hudson Drainage Basin. The Mettawee River Watershed is within the Lake Champlain Drainage Basin.



Figure 4-5. Warren County Watersheds



Source: Warren County GIS 2015



Topography and Geology

Warren County is situated in the northeastern part of New York State. It is bounded by Essex County to the north, Washington County to the east, Saratoga County to the south, and Hamilton County to the west. The County lies mainly within the Adirondack physiographic province, though the far southeast corner does lie within the Ridge and Valley province (CARA 2002). The two provinces are distinguished by the sharp contrast in topography and bedrock. The contrast was caused by down-faulting of the mountains to the north and erosion of the limestone in the south (USDA SCS 1989). Elevations in the mountainous areas of the County typically range from 1,200 to 2,500 feet above sea level, with the top of Gore Mountain (the highest point in the County) reaching 3,583 feet. The lowland areas typically vary by less than 100 feet in elevation (USDA SCS 1989).

Geology in the Ridge and Valley province consists of sandstone and sedimented carbonates (e.g., limestone, dolomite), formed by an advancing sea and subsiding continental margin between the Paleozoic and Ordovician ages (USDA SCS 1989). The Adirondack province consists mostly of pre-Cambrian metamorphic rock, generally quartzofeldspathic gneiss (quartz and feldspar) overlain by marble, quartzite, and anorthosite (USDA SCS 1989).

The topography, soils, and drainage of the County have been significantly influenced by repeated periods of glaciation during the Pleistocene Epoch (USDA SCS 1989). Glaciers advanced through the valleys, gouging them and increasing the topographic relief. As the ice thickened, it covered the hills and rounded the County's peaks and ridges. The several-thousand-foot-thick ice created sag in the Earth's crust, which resulted in the land tilting to the north. This, in turn, impacted the formation of lakes and the County's drainage system.

Climate

Warren County has a continental climate. Airflow and weather systems that affect the area are primarily of continental origin. The climate also is designated as humid because the major circulation patterns of the atmosphere carry generous quantities of moisture toward the northeastern U.S. (NRCS 2004). The climate of Warren County is one of long summers and short winters. The average annual temperature is approximately 40-48°F, with extremes varying from -35°F to 100°F. The average annual precipitation for the County is approximately 38-47 inches.

Land Use and Land Cover

The most dominant land use in Warren County is forested land (over 81% of the County's area). The next highest land use is urban, with a little over 5% of the land area. Commercial and industrial land uses are found in and around the villages of the County and along Interstate 87, US-9, and State Routes 8, 9N, and 28. Industrial uses are scattered throughout the County and include the hospital, government buildings, non-profit affiliated facilities, and schools. Table 4-1 summarizes the land use for Warren County. Figure 4-6 shows the distribution of land use throughout the County.

Table 4-1. Land Use Summary for Warren County, 2006 & 2011

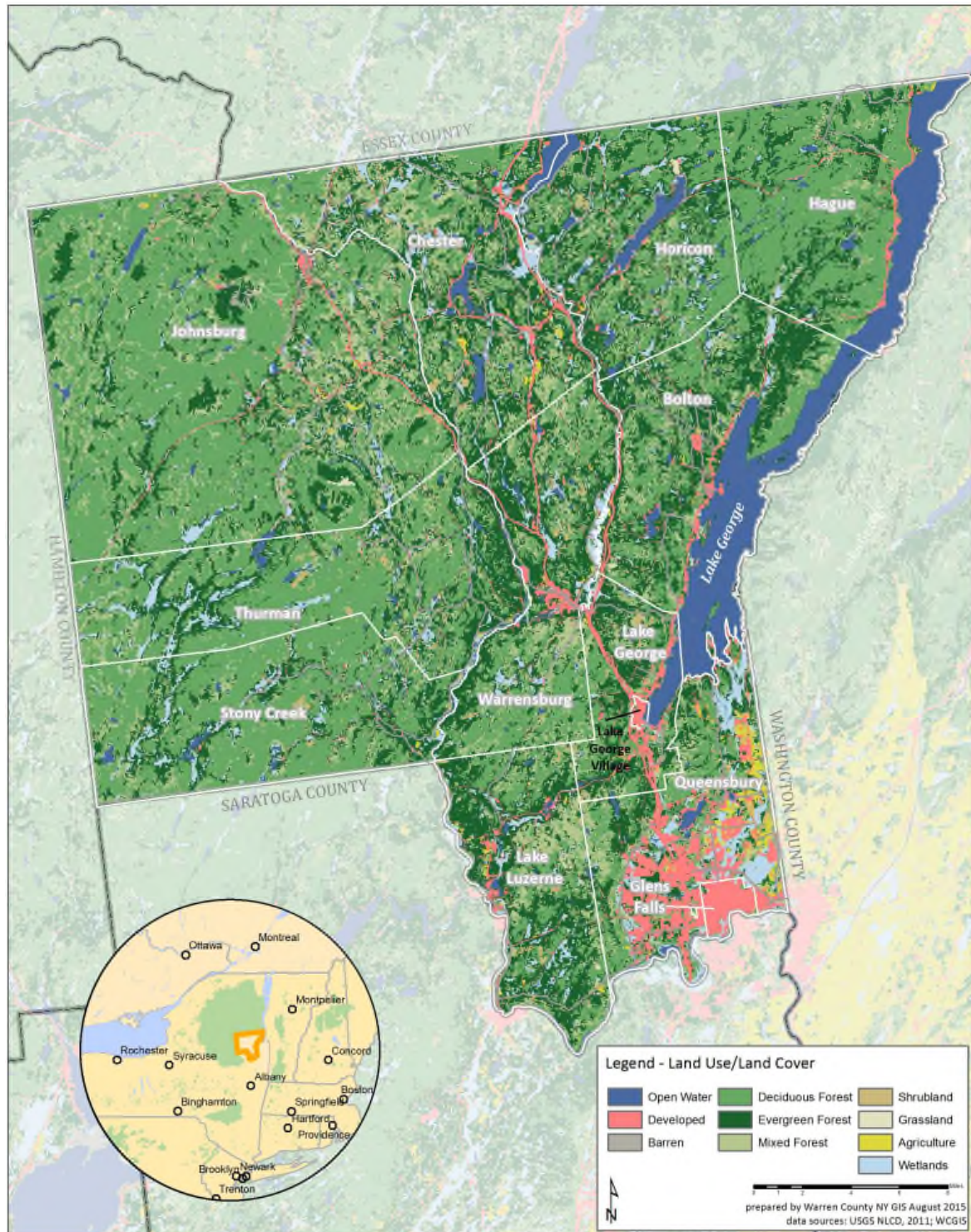
Land Use Category	2006 Data		2011 Data	
	Acreage	Percent of County	Acreage	Percent of County
Agriculture	4,338	0.70%	4,178	0.70%
Barren	354	0.00%	378	0.00%
Shrubland/Grassland	4,624	0.78%	5,561	0.90%
Forest	484,661	81.31%	483,514	81.11%
Urban	31,518	5.29%	32,016	5.37%
Wetlands	27,176	4.56%	27,199	4.56%





Source: National Land Cover Database – USGS 2006 and 2011
Note: Open water is excluded from the table above.

Figure 4-4. 2011 Land Use Land Cover for Warren County



Source: USGS National Land Cover Database, 2011

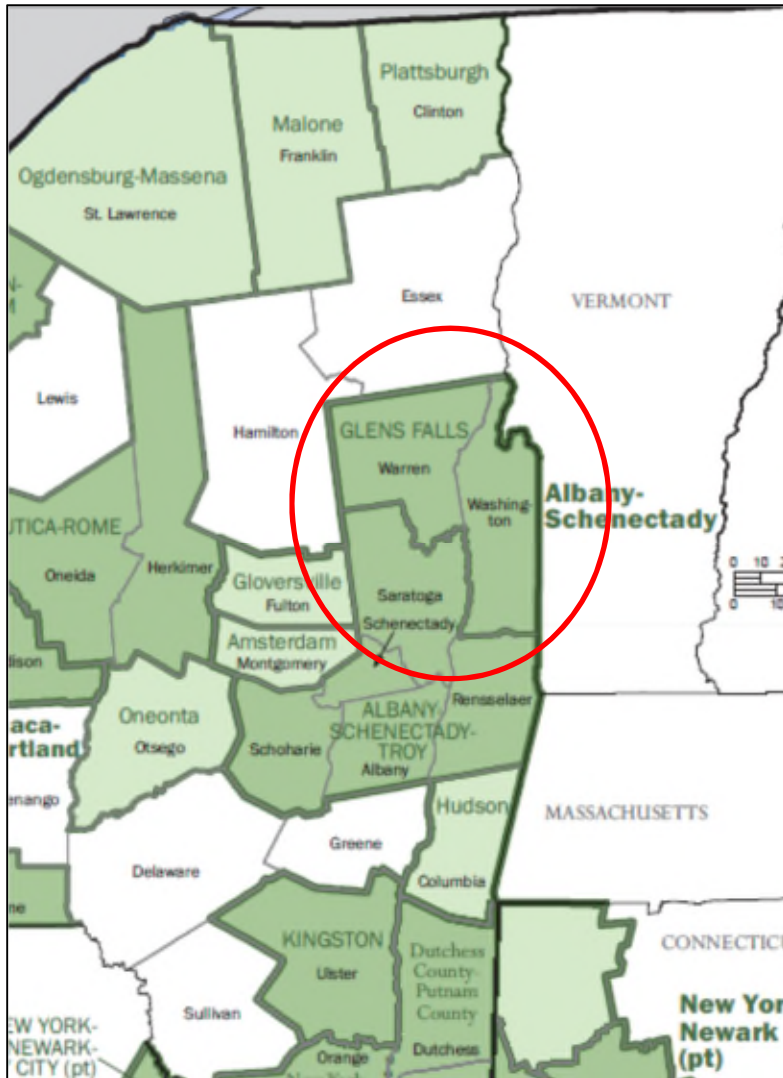




Metropolitan/Urban Area

Warren County is one of the 2 counties within the Glens Falls Metropolitan Statistical Area (MSA). This MSA covers a land area of 1,698 square miles. As of the 2010 Census (US Census Bureau 2010), there were 128,923 people living in the MSA, with a population density of 75.9 persons per square mile. This metropolitan area is made up of two divisions as indicated in Figure 4-5.

Figure 4-5. Glens Falls Metropolitan Statistical Area



Source: U.S. Census, 2012

Note: Warren County is located in the Glens Falls Metropolitan Statistical Area (red oval)



4.2 POPULATION AND DEMOGRAPHICS

According to the 2010 U.S. Census, Warren County had a population of 65,707 people which represents a slight increase from the 2000 U.S. Census population of 63,303 people. HAZUS-MH demographic data will be used in the loss estimation analyses in Section 5 of this plan. All demographic data in HAZUS corresponds to the 2000 U.S. Census data. Table 4-2 presents the population statistics for Warren County based on the 2000 and 2010 U.S. Census data. Figure 4-8 shows the distribution of the general population density (persons per square mile) in 2010 by Census block. For the purposes of this plan, the 2010 Census was used where the data was available and supplemented with HAZUS-MH data (representing 2000 data).

DMA 2000 requires that HMPs consider socially vulnerable populations. These populations can be more susceptible to hazard events, based on a number of factors including their physical and financial ability to react or respond during a hazard and the location and construction quality of their housing. For the purposes of this study, vulnerable populations shall include (1) the elderly (persons aged 65 and over) and (2) those living in low-income households.

Table 4-2. Warren County Population Statistics

Municipality	U.S. Census 2010					U.S. Census 2000				
	Total	Pop. 65+	% Pop. 65+	Low-Income Pop.*	% Low-Income Pop.	Total	Pop. 65+	% Pop. 65+	Low-Income Pop.*	% Low-Income Pop.
Town of Bolton	2,326	536	23.0	173	6.7	2,117	411	19.4	119	5.6
Town of Chester	3,355	666	19.9	256	9.6	3,614	561	15.5	385	12.5
City of Glen Falls	14,700	1,822	12.4	2,056	14.0	14,354	1,961	13.7	2,114	14.8
Town of Hague	699	226	32.3	45	5.6	854	222	26.0	63	7.5
Town of Horicon	1,389	355	25.6	127	8.7	1,479	281	19.0	143	9.7
Town of Johnsbury	2,395	497	20.8	193	10.5	2,450	461	18.8	418	17.7
Town of Lake George	2,609	305	11.7	224	8.6	2,593	395	15.2	132	5.1
Village of Lake George	906	141	15.6	159	16.3	985	137	13.9	110	11.1
Town of Lake Luzerne	3,347	561	16.8	239	7.1	3,219	437	13.6	330	10.3
Town of Queensbury	27,901	4,962	17.8	2,238	8.3	25,441	3,859	15.2	1,245	5.0
Town of Stony Creek	767	154	20.1	84	9.2	743	114	15.3	118	16.3
Town of Thurman	1,219	196	16.1	96	9.1	1,199	174	14.5	144	11.9
Town of Warrensburg	4,094	685	16.7	677	16.4	4,255	582	13.7	704	16.8
Warren County	65,707	11,247	17.1	6,567	10.0	63,303	9,595	15.2	6,025	9.5

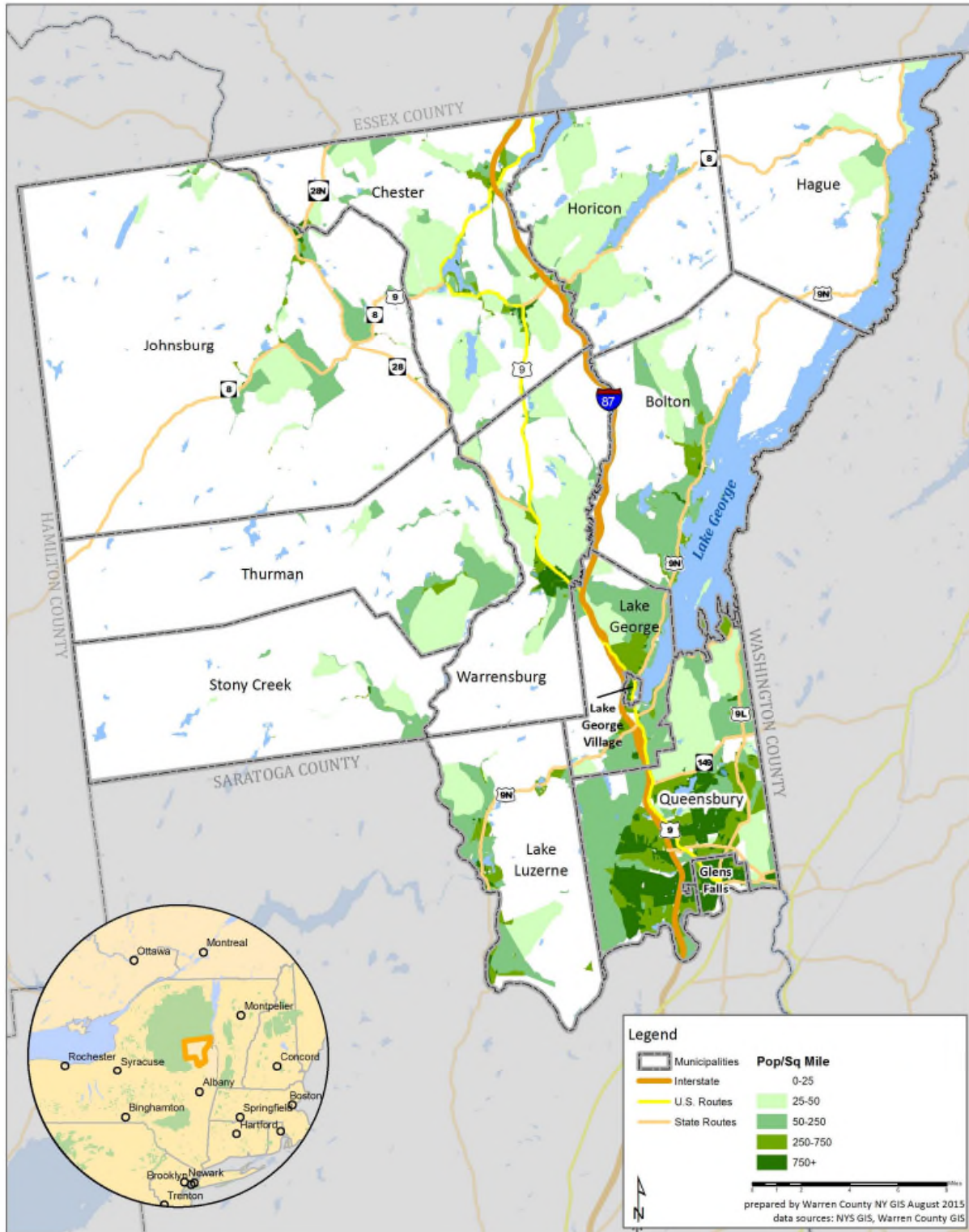
Source: Census 2010 (U.S. Census Bureau); HAZUS-MH (for 2000 U.S. Census data)

Note: Pop. = population; * Individuals below poverty level

The 2013 U.S. Census American Community Survey data identified approximately 7,060 individuals as having an annual income below the poverty level. Figure 4-7 shows the distribution of persons over age 65 in Warren County, while Figure 4-8 shows the distribution of low income persons. The following maps indicate distribution based on Census Block designations.



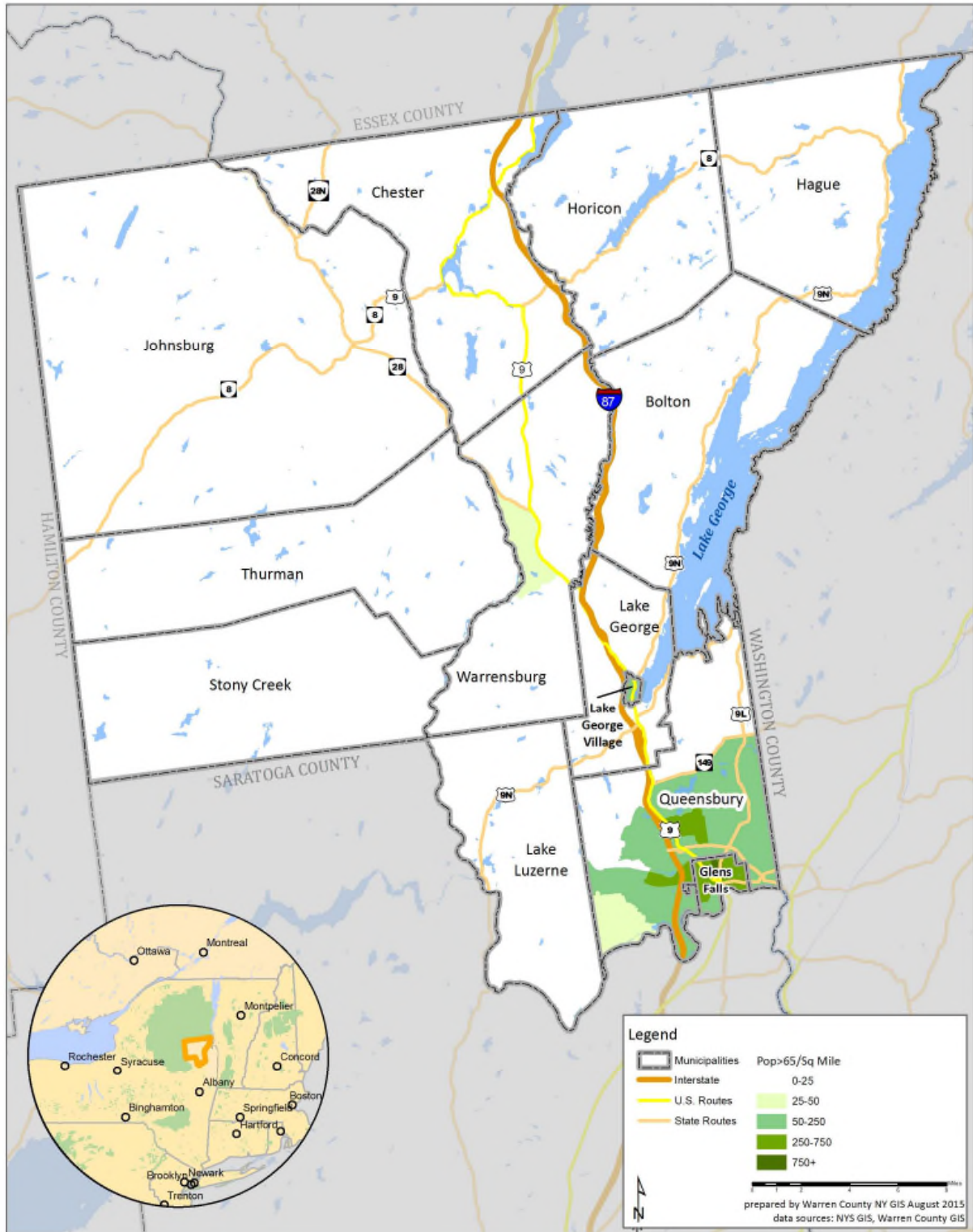
Figure 4-6. Distribution of General Population for Warren County, New York



Source: HAZUS-MH



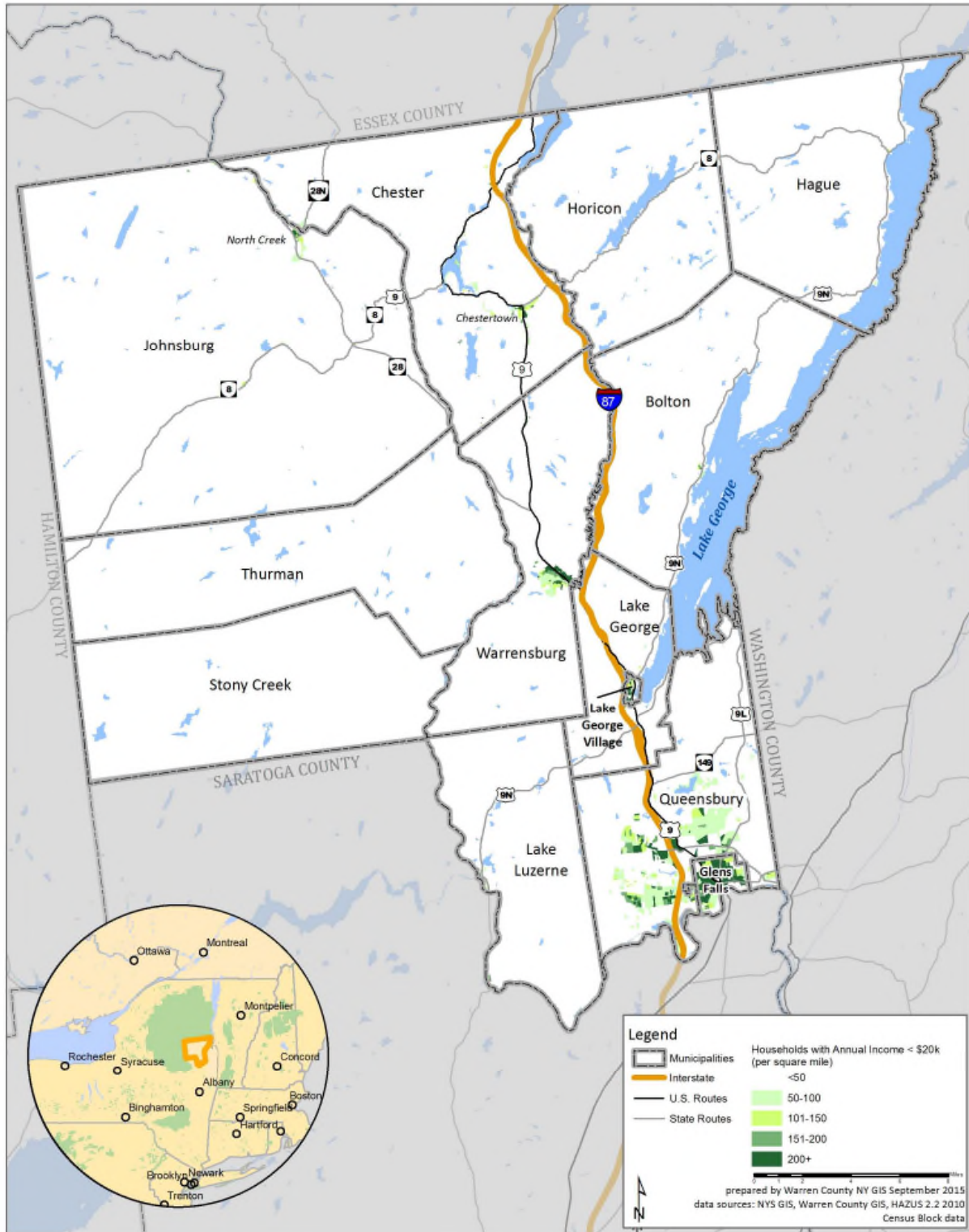
Figure 4-7. Distribution of Persons over the Age of 65 in Warren County, New York



Source: HAZUS-MH



Figure 4-8. Distribution of Low-Income Population in Warren County, New York



Source: Warren County 2015





Population and Demographic Trends

This section discusses population trends to use as a basis for estimating future changes that could result from the seasonal character of the population and significantly change the character of the area. Population trends can provide a basis for making decisions on the type of mitigation approaches to consider and the locations in which these approaches should be applied. This information can also be used to support planning decisions regarding future development in vulnerable areas.

According to the U.S. Census Bureau, the 2010 population for Warren County was 65,707 persons, which is a 3.8% increase from the 2000 Census population of 63,303. From 1900 to 2010, the County has seen an overall growth in population, with the exception of from 1910 to 1920. The largest increase was seen between 1950 and 1960 when the County experienced a 12.8% increase (4,797 persons). The smallest increase was experienced from 2000 to 2010 when the County saw only a 3.8% increase in population. The largest decrease in population occurred from 1910 to 1920, with the County seeing a 1.7% decrease. A smaller decrease has been estimated from 2010 to 2014 with a 1.1% decrease. Table 4-3 displays the population and change in population from 1900 to 2014 in Warren County.

Table 4-3. Warren County Population Trends, 1900 to 2014

Year	Population	Change in Population	Percent (%) Population Change
1900	29,943	N/A	N/A
1910	32,223	2,280	7.6%
1920	31,673	-550	-1.7%
1930	34,174	2,501	7.9%
1940	36,035	1,861	5.4%
1950	39,205	3,170	8.8%
1960	44,002	4,797	12.8%
1970	49,402	5,400	12.3%
1980	54,854	5,452	11.0%
1990	59,209	4,355	7.9%
2000	63,303	4,094	6.9%
2010	65,707	2,404	3.8%
2014*	64,973	-734	-1.1%

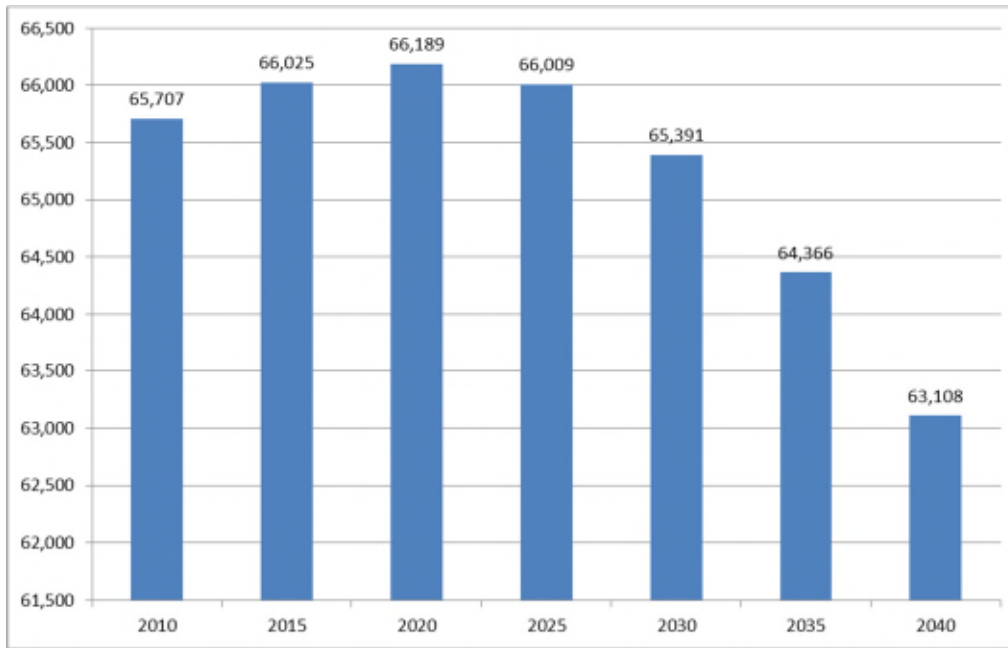
Source: U.S. Census 2010; U.S. Census 2015

Note: Change in population and percent in population change were calculated from available data.

Cornell University’s Program on Applied Demographics produced population projections by county and by age and sex for New York State. The projections were completed in 2011 and are in five year intervals up to the year 2040. The projections are based upon rates of change estimated from historic data. According to this data, over the next 25 years, Warren County has a projected population decline of 4.0%. By 2020, the County’s total population is projected to reach 66,189 persons before decreasing to 63,108 by 2040 (Figure 4-11).



Figure 4-9. Warren County Population Projections, 2010 to 2040



Source: Cornell University 2014

The following table provides population trends for the 13 municipalities of Warren County. The Town of Bolton saw the largest growth in population, a 9.9% increase. The Town of Hague saw the greatest decrease- a loss of 18.1%.

Table 4-4. Population Trends in Warren County by Municipality

Municipality	2000 Census	2010 Census	Change in Population	Percent Change
Town of Bolton	2,117	2,326	209	9.9%
Town of Chester	3,614	3,355	-259	-7.2%
City of Glen Falls	14,354	14,700	346	2.4%
Town of Hague	854	699	-155	-18.1%
Town of Horicon	1,479	1,389	-90	-6.1%
Town of Johnsbury	2,450	2,395	-55	-2.2%
Town of Lake George	2,593	2,609	16	0.6%
Village of Lake George	985	906	-79	-8.0%
Town of Lake Luzerne	3,219	3,347	128	4.0%
Town of Queensbury	25,441	27,901	2,460	9.7%
Town of Stony Creek	743	767	24	3.2%
Town of Thurman	1,199	1,219	20	1.7%
Town of Warrensburg	4,255	4,094	-161	-3.8%
Warren County	63,303	65,707	2,404	3.8%

Source: U.S. Census 2015

Note: Change in population and population change were calculated from available data.



4.3 GENERAL BUILDING STOCK

The 2000 U.S. Census data identified 25,726 households (34,852 housing units) in Warren County. The 2010 U.S. Census reported 27,990 households (38,726 housing units) in Warren County. The County experienced an increase in both households and housing units from 2000 to 2010. As for households, between 2000 and 2010, the County saw an 8.8% increase. As for housing units, the County experienced an increase of 11.1% between 2000 and 2010. The U.S. Census defines household as all the persons who occupy a housing unit, and a housing unit as a house, an apartment, a mobile home, a group of rooms, or a single room that is occupied (or if vacant, is intended for occupancy) as separate living quarters. Therefore, you may have more than one household per housing unit. The median value of an owner-occupied housing unit in Warren County was estimated at \$189,400 (U.S. Census, 2013).

For this Plan, the default general building stock in HAZUS-MH was verified against the County’s parcel data, and found to be aligned well. Therefore, the default HAZUS-MH data is used for this Plan.

Approximately 93% of the total buildings in the County are residential, which make up approximately 72.8% of the building stock structural value associated with residential housing. Table 4-6 presents building stock statistics by occupancy class for Warren County.

Table 4-5. Number of Buildings and Improvement Value by Municipality

Municipality	All Occupancies			
	Count	Estimated Structure RCV	Estimated Contents RCV	Total (Structure + Contents)
Town of Bolton	2,575	\$617,682,000	\$342,831,000	\$960,513,000
Town of Chester	2,668	\$507,248,000	\$293,524,000	\$800,772,000
City of Glen Falls	5,483	\$1,866,928,000	\$1,423,226,000	\$3,290,154,000
Town of Hague	1,136	\$258,080,000	\$142,584,000	\$400,664,000
Town of Horicon	1,907	\$386,333,000	\$203,386,000	\$589,719,000
Town of Johnsbury	1,762	\$349,807,000	\$213,198,000	\$563,005,000
Town of Lake George	1,949	\$459,912,000	\$253,011,000	\$712,923,000
Village of Lake George	623	\$237,788,000	\$159,761,000	\$397,549,000
Town of Lake Luzerne	2,215	\$477,064,000	\$266,926,000	\$743,990,000
Town of Queensbury	11,858	\$3,602,139,000	\$2,295,374,000	\$5,897,513,000
Town of Stony Creek	603	\$93,149,000	\$50,418,000	\$143,567,000
Town of Thurman	818	\$187,298,000	\$141,303,000	\$328,601,000
Town of Warrensburg	1,974	\$399,760,000	\$247,592,000	\$647,352,000
Warren County (Total)	34,078	\$9,443,188,000	\$6,033,134,000	\$15,476,322,000

Source: Hazus 2.2 (2010 Census)

Notes: RCV = Replacement cost value.



Table 4-6. Number of Buildings and Total Replacement Value by Occupancy Class

Municipality	Residential		Commercial		Industrial	
	Count	Total (Structure + Contents)	Count	Total (Structure + Contents)	Count	Total (Structure + Contents)
Town of Bolton	2448	\$822,981,000	94	\$115,676,000	20	\$7,686,000
Town of Chester	2,526	\$651,334,000	90	\$86,730,000	31	\$21,840,000
City of Glen Falls	4,791	\$1,701,949,000	504	\$1,246,369,000	96	\$148,838,000
Town of Hague	1101	\$353,406,000	22	\$21,734,000	7	\$8,222,000
Town of Horicon	1,857	\$551,024,000	32	\$26,186,000	10	\$4,837,000
Town of Johnsbury	1667	\$432,270,000	49	\$73,903,000	30	\$36,029,000
Town of Lake George	1,860	\$626,563,000	60	\$60,622,000	17	\$10,195,000
Village of Lake George	509	\$231,547,000	84	\$132,516,000	11	\$7,146,000
Town of Lake Luzerne	2,079	\$630,992,000	88	\$74,280,000	32	\$16,229,000
Town of Queensbury	10,883	\$4,109,512,000	693	\$1,348,304,000	188	\$239,326,000
Town of Stony Creek	578	\$127,417,000	16	\$10,906,000	3	\$1,412,000
Town of Thurman	703	\$139,453,000	95	\$175,935,000	11	\$5,176,000
Town of Warrensburg	1,834	\$456,079,000	89	\$138,060,000	28	\$19,863,000
Warren County (Total)	32,836	\$10,834,527,000	1,916	\$3,511,221,000	484	\$526,799,000

Source: Hazus 2.2 (2010 Census)

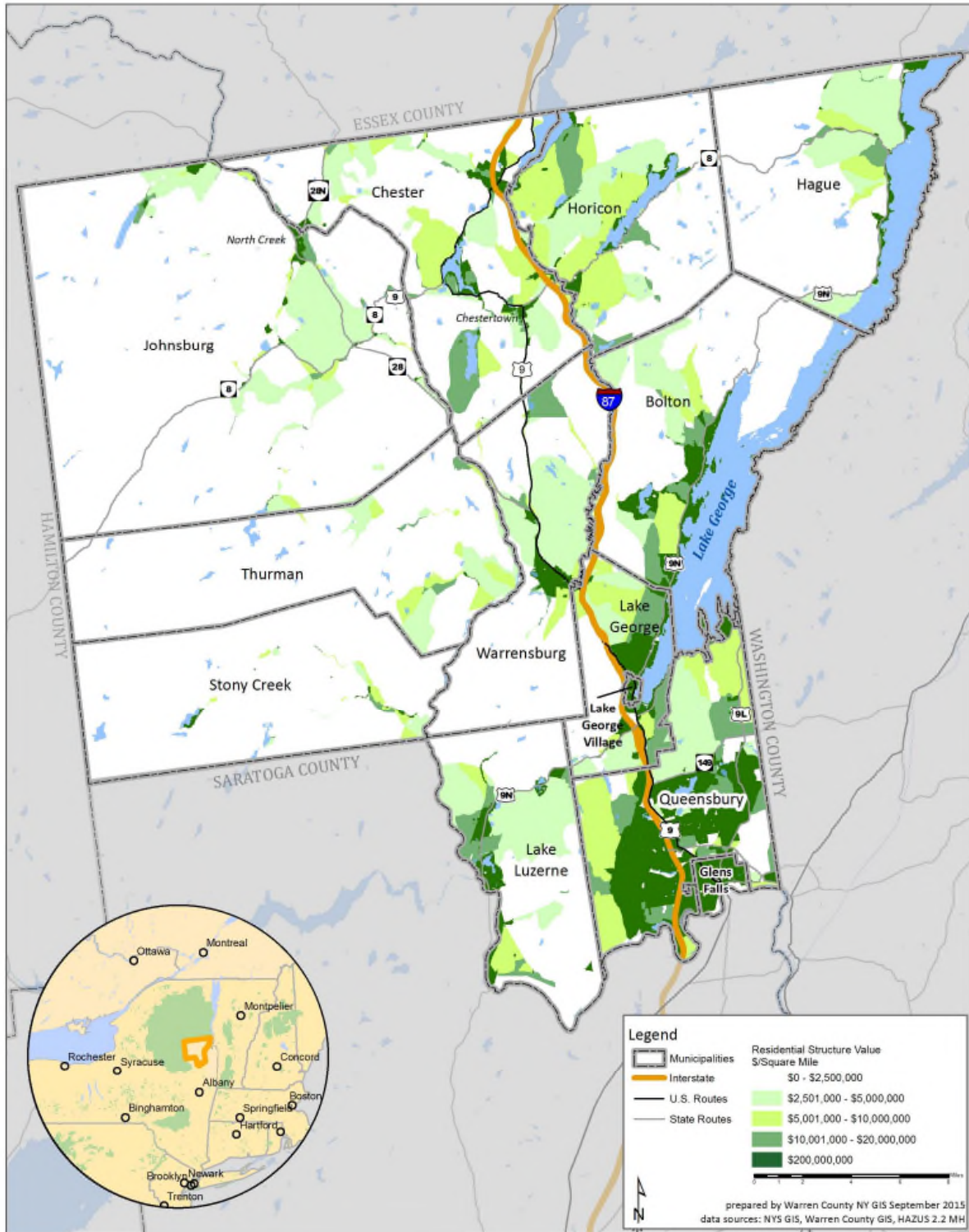
The 2013 American Community Survey data identified that the majority of housing units (71.7% or 27,771 units) in Warren County are single-family detached units. The 2013 U.S. Census Bureau’s County Business Patterns data identified 2,341 business establishments employing 30,701 people in Warren County. The retail trade industry has the most number of establishments in the County, with 431 establishments. This is followed by the accommodation and food services industry with 423 establishments and the health care and social assistance industry with 278 establishments (U.S. Census, 2013).

Figure 4-12 and Figure 4-13 show the distribution and exposure density of residential and commercial buildings, respectively, in Warren County based on the New York State Department of Taxation and Finance Property Class Code. Exposure density is the dollar value of structures per unit area, including building content value. Generally, contents for residential structures are valued at about 50 percent of the building’s value. For commercial facilities, the value of the content is generally about equal to the building’s structural value. Actual content value varies widely depending on the usage of the structure. The densities are shown in units of \$1,000 (\$K) per square mile.

Viewing exposure distribution maps, such as Figure 4-12 through Figure 4-13 can assist communities in visualizing areas of high exposure and in evaluating aspects of the study area in relation to the specific hazard risks.



Figure 4-10. Distribution of Residential Building Stock and Value Density in Warren County

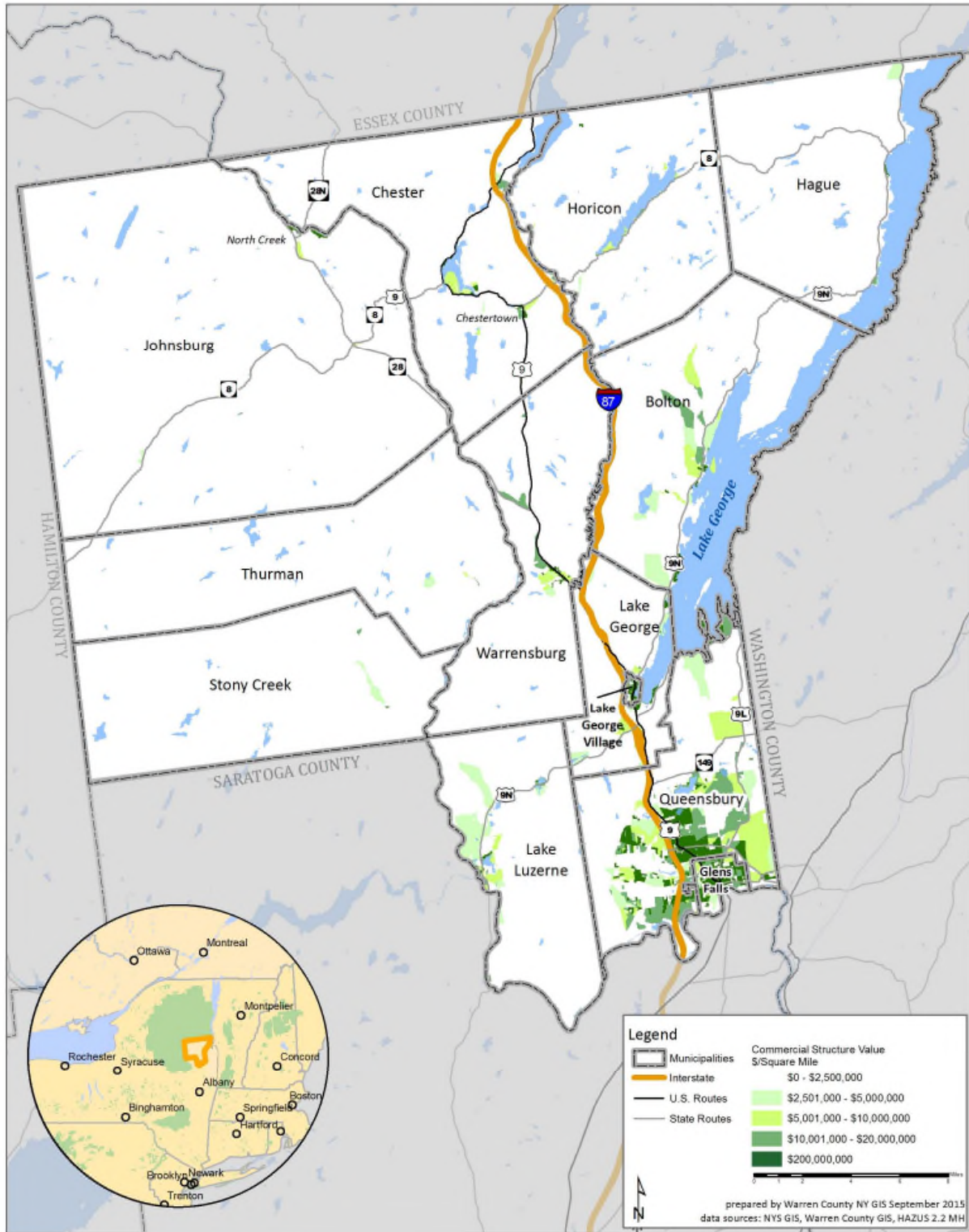


Source: Warren County 2015





Figure 4-11. Distribution of Commercial Building Stock and Exposure Density in Warren County



Source: Warren County 2015





4.3.1 Development Trends and New Development

In New York State, land use regulatory authority is vested in towns, villages, and cities. However, many development and preservation issues transcend local political boundaries. In Warren County, each town and village is empowered by the Municipal Home Rule Law to plan and zone within its boundaries. DMA 2000 requires that communities consider land use trends, which can impact the need for, and priority of, mitigation options over time. Land use trends can also significantly impact exposure and vulnerability to various hazards. For example, significant development in a hazard area increases the building stock and population exposed to that hazard.

This plan provides a general overview of land use trends and types of development occurring within the study area. An understanding of these development trends can assist in planning for further development and ensuring that appropriate mitigation, planning, and preparedness measures are in place to protect human health and community infrastructure.

Within the jurisdictional annexes in Section 9, the County and participating municipalities have identified development that has occurred in the last five years and potential future development in the next five years, along with the development's exposure to natural hazards.

While any development increases the risk of damage and loss to natural hazards, a number of factors indicate that this increase in risk is low and mitigated by existing Federal, State, County and local regulations, policies and programs. In general, development occurring in the County is outside of high hazard areas (e.g. floodplains and steep slopes). All communities have planning and regulatory mechanisms in place that control and limit the increased natural hazard risk of new development and re-development. All communities have planning boards and site plan review requirements that include review and appropriate consideration of hazard areas. All development and construction in the County requires conformance with NYS Building Code. Further all Warren County communities participate, and are in good standing, in the National Flood Insurance Program which by State regulation requires two-feet of freeboard above the FEMA 1% chance base flood elevation (BFE+2) for all new residential construction and substantial improvement, and BFE+1 for all other construction types.

Certain communities have adopted ordinances to further protect against natural hazards (e.g. Steep Slope Ordinances) and protect natural resources that provide natural mitigation benefits (e.g. wetlands and wetland buffers, stream courses and stream banks, areas of retention/detention). Warren County is categorized as a non-traditional Municipal Separate Storm Sewer System (MS4), under Part IV.A. of the New York State Department of Environmental Conservation General Permit for MS4 Stormwater Discharges (GP-0-15-002). Under this mandate, Warren County has developed a working Stormwater Management Program Plan which outlines the county's activities to address stormwater education, outreach, and implementation under the state requirements. The MS4 area designated by the NYS DEC in Warren County which falls under the purview of this program, is within the Town of Lake George, the Town of Queensbury, The City of Glens Falls and the Village of Lake George. The District Manager of the Warren County Soil and Water Conservation District is appointed to be the county's Stormwater Management Officer.

County and community capabilities to manage development so as to minimize increased natural hazard risk are discussed in the capability assessment subsection of Chapter 6, as well as within each jurisdictional annex in Section 9. Also identified within each annex are actions the community has or will take to further integrate the findings and recommendations of this plan into other planning mechanisms and programs, many of which support land use and development so as to minimize the increase of natural hazard risk.



4.3.2 Potential Sites for Temporary Housing and Relocation

Warren County notes that it is highly unlikely for a natural hazard event to occur in the county that would displace a significant number of its residents. However, the County has a vigorous tourism industry that supports a large inventory of hotels, motels, and camps. In the event temporary housing is needed, these facilities have the occupancy and have been historically used to support temporary relocation needs within the County.

Warren County has included a high-priority action, to be implemented in 2016, to work with all Warren County municipalities to identify:

- Locations within the County for the placement of temporary housing units to house residents displaced by disaster, and;
- Sites within the County and communities suitable for relocation of houses out of the floodplain, or building new houses once properties in the floodplain are razed.

It is noted that while a community may identify suitable sites, the use (including transfer of ownership) of suitable private property would be at the discretion of the property owner.



4.4 CRITICAL FACILITIES

A comprehensive inventory of critical facilities in Warren County was developed from various sources including input from the Planning Committees. The inventory of critical facilities presented in this section represents the current state of this effort at the time of publication of the HMP and was used for the risk assessment in Section 5. For detailed lists of the critical facilities, please refer to Appendix G.

4.4.1 Essential Facilities

This section provides information on emergency facilities, hospital and medical facilities, schools, shelters and senior care and living facilities. For the purposes of this Plan, emergency facilities include police, fire, emergency medical services (EMS) and emergency operations centers (EOC). Figure 4-12 displays the location of the essential facilities in Warren County.

Emergency Facilities

The Warren County Office of Emergency Services is responsible for aiding communities in emergency preparedness (including emergency planning and providing training for the County's first responders), response, recovery, and mitigation. Additionally, the Sheriff's Office operates a 24-hour Emergency Communications Center. The Emergency Communications Center staff is responsible for dispatching 25 fire departments, 14 emergency squads, and the Sheriff's Office and two local police departments; these organizations provide emergency response services to 11 towns, 1 village, and 1 city (Warren County Sheriff's Office 2010).

All of the County's municipalities are serviced by fire departments within their borders, supported by mutual aid departments throughout the County. Police enforcement and public safety is maintained by the New York State Police Department, the Warren County Sheriff's Office, and local departments. There are 36 fire facilities, 5 EMS facilities (some of which are fire facilities), 7 police facilities, and 3 EOCs located in Warren County.

Hospitals and Medical Facilities

The County has one hospital (Glen Falls Hospital) and multiple health care facilities. There are 12 healthcare facilities that provide urgent walk-in care in the County.

Schools

There are 22 primary educational facilities (elementary, middle and high schools) and 2 secondary educational facilities (SUNY-Adirondack and the Word of Life Bible Institute) located in Warren County. In times of need, schools can function as shelters and are an important resource to the community. For information regarding shelters, see the Shelters subsection of this document.

Senior Care and Living Facilities

The County has an extensive system of programs and services for the senior population. This includes 29 nursing homes, senior centers, and senior housing facilities. These facilities are highly vulnerable to potential impacts

Critical facilities are those facilities considered critical to the health and welfare of the population and that are especially important following a hazard. As defined for this HMP, critical facilities include essential facilities, transportation systems, lifeline utility systems, high-potential loss facilities and hazardous material facilities.

Essential facilities are a subset of critical facilities that include those facilities that are important to ensure a full recovery following the occurrence of a hazard event. For the County risk assessment, this category was defined to include police, fire, EMS, EOCs, schools, shelters, senior facilities and medical facilities.

Emergency Facilities are for the purposes of this Plan, emergency facilities include police, fire, emergency medical services (EMS) and emergency operations centers (EOC).



from disasters, and knowing the location and numbers of these types of facilities will be effective in managing a response plan pre- and post-disaster.

The County owns and operates the Countryside Retirement Home (assisted living) which has adequate backup power.

Shelters

With support and cooperation of the American Red Cross and local jurisdictions, the County references an inventory of suitable shelter locations and can assist with the coordination and communication of shelter availability as necessitated by the execution of local municipal emergency operation plans. There are 4 shelter facilities in the County. County-wide sheltering policies and procedures are documented in the Warren County Comprehensive Emergency Management Plan (CEMP) and Mass Care Annex-ESF #6. The County Animal Response Plan (CARP) identifies a list of pet-friendly hotels.

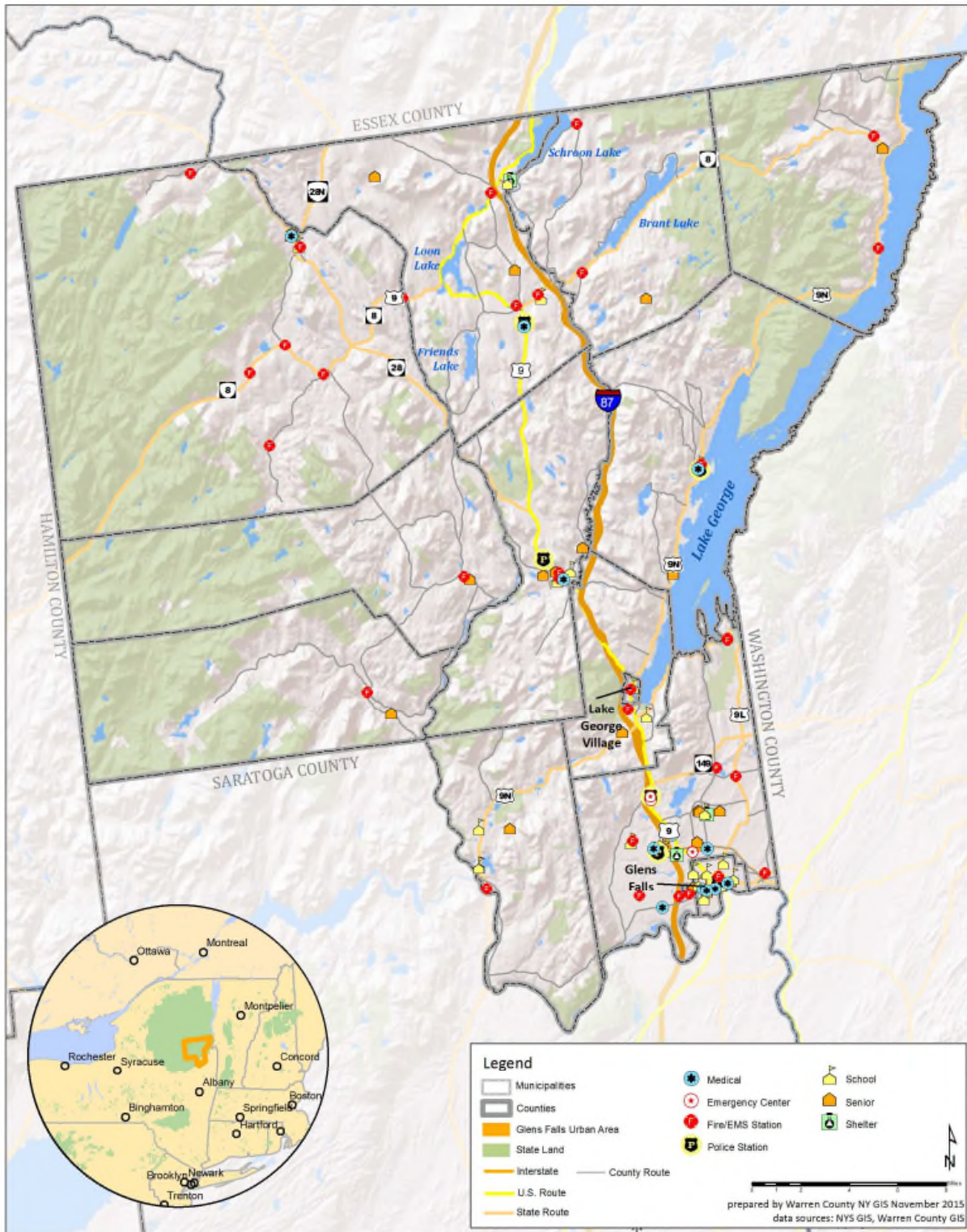
Evacuation Routes

Specific evacuation plans are identified in the Hazardous Materials Plan and Dam Safety Plans (Emergency Operations Plans). The County assists with the coordination and communication of evacuation routing as necessitated by the execution of local municipal emergency operation plans.

The County and municipalities have identified mitigation actions within their jurisdictional annexes to protect critical facilities and critical infrastructure, including facilities available to support sheltering, and transportation routes that facilitate evacuation and the movement of emergency vehicles.



Figure 4-12. Emergency Facilities in Warren County



Source: Warren County



4.4.2 Transportation Systems

One thousand, two hundred forty-six miles of road traverse Warren County. US Route 87, the Adirondack Northway, is the only interstate highway and runs north-south between the ‘local’ population centers of Plattsburgh (north) and Albany (south), and beyond - Montreal, Canada to the north and New York City to the south. The Northway and NYS Route 9 are “north-south” routes within the county, as are NYS Routes 28 and 9N. East-west roads serve as connecting roads to the interstate, state routes, and local population centers, and are dispersed in heavily forested and mountainous rural sections of the county. The City of Glens Falls has a network of state, and local roadways. Transportation facilities are shown in Figure 4-13.

Bus and Other Transit Facilities

There are three main bus services available in Warren County. Adirondack Trailways and Greyhound Lines operate from a bus station in Glens Falls, connecting to destinations throughout New York and beyond (Trailways 2015). Greater Glens Falls Transit (Greater Glens Falls Transit 2015) connects the City of Glens Falls and the Towns of Lake George and Queensbury to destinations in Washington and Saratoga Counties.

Railroad Facilities

Canadian Pacific Railroad provides main line service in Warren County, though Norfolk Southern service is available in Mechanicville (approximately 30 miles south of Glens Falls), and Amtrak has passenger rail stations in Albany-Rensselaer and Saratoga Springs (Warren County EDC 2015b). Passenger and freight rail service between Saratoga Springs in Saratoga County and North Creek in Warren County is available through the Saratoga & North Creek Railway (Warren County EDC 2015b).

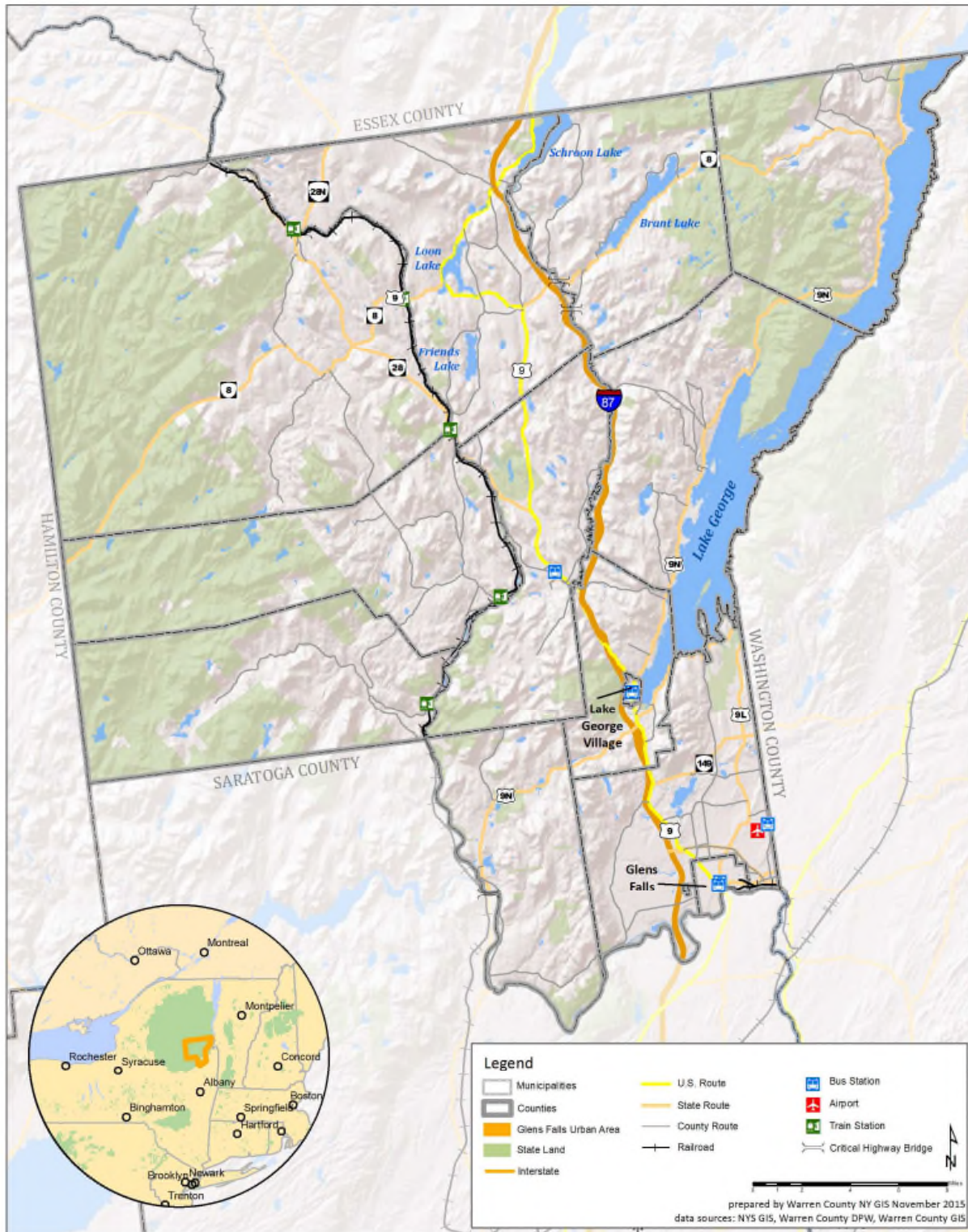
Airports

The Floyd Bennet Memorial Airport (Warren County 2015) is located three miles northeast of downtown Glens Falls, off of State Route 254. There are two runways at the airport- one 5,000 feet long and the other 4,000 feet long. The airport can serve aircraft as large as a C-5A Galaxy. There is also a private, grass-runway airport known as Bennetts Airport in North Creek.

The Glens Falls Hospital has a heli-pad to service medical emergencies. The County DPW Parks and Recreation Division Fish Hatchery facility (Warrensburg) has a helicopter landing area which can support emergency management functions, and is thus considered a county critical facility.



Figure 4-13. Transportation Facilities in Warren County



Source: Warren County



4.4.3 Lifeline Utility Systems

This section presents potable water, wastewater, energy resource, and communication utility system data. Due to heightened security concerns, local utility lifeline data sufficient to complete the analysis have only partially been obtained. Figure 4-14 shows the locations of the facilities for these various lifeline utility systems.

Potable Water

In Warren County, water is provided from various facilities as a public service or through private supplies, such as wells. Approximately 45% of the land parcels in Warren County are located within a water district, serving approximately 63% of the County population (WCDPCD 2016). Potable water supply infrastructure are located in the Towns of Bolton, Lake George, Queensbury, Hague (well and pump house), Lake Luzerne (water plant), Warrensburg (water plant), Chester (wells, water towers, pump house, and water plant), City of Glens Falls, and the North Creek Water District.

Wastewater Facilities

Approximately 27% of the land parcels in Warren County are located within a sewer district, serving approximately 33% of the County population (WCDPCD 2016). Wastewater treatment facilities are located in Bolton, Glens Falls (includes a number of pump stations), Hague, Lake George (town) and Queensbury.

Energy Resources

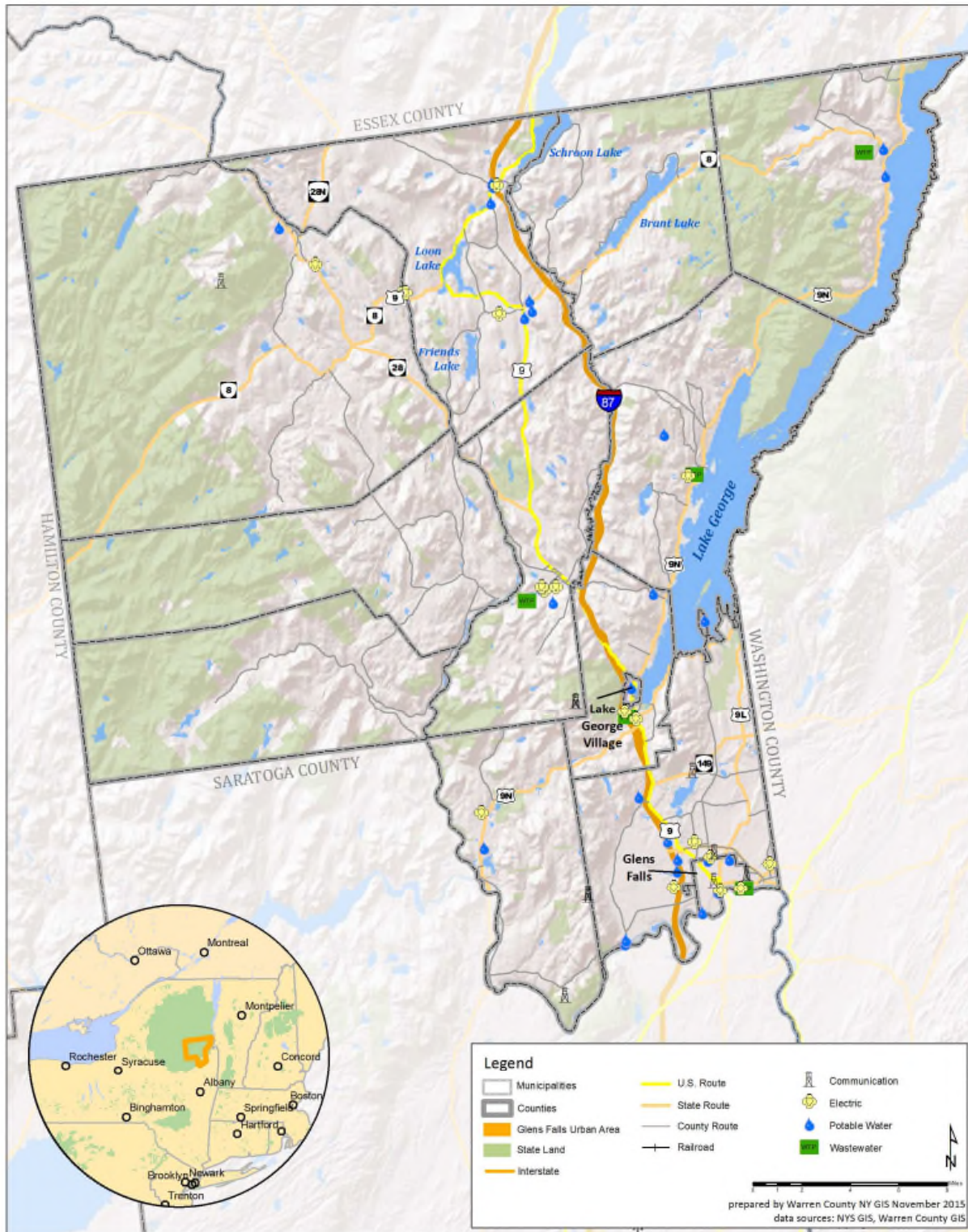
Power in Warren County is transmitted and distributed by National Grid. Homes in the county are heated by many different sources, with a majority using utility gas from National Grid, or fuel oil. There are 20 electric substations in Warren County.

Communications

Warren County is served by a variety of communications systems, including traditional land line, fiber optic, and cellular provided by multiple companies, such as Verizon, AT&T, FirstLight, PrimeLink, and Time Warner Cable (Warren County EDC 2015a). There are 26 communication facility in Warren County identified as critical facilities. Each carrier has individual plans for emergency situations during hazard events and post disaster recovery efforts. In addition to land line, fiber optic and cellular communications systems, Warren County has an extensive radio communications network that is utilized by emergency services agencies, hospitals, law enforcement, public works, transportation and other supporting organizations.



Figure 4-14. Utility Lifelines in Warren County



Source: Warren County



4.4.4 High-Potential Loss Facilities

High-potential loss facilities include dams, levees, hazardous materials facilities (HAZMAT), nuclear power plants, and military installations. Dams are discussed below. Figure 4-15 shows the locations of the High-Potential Loss Facilities in the county.

Dams and Levees

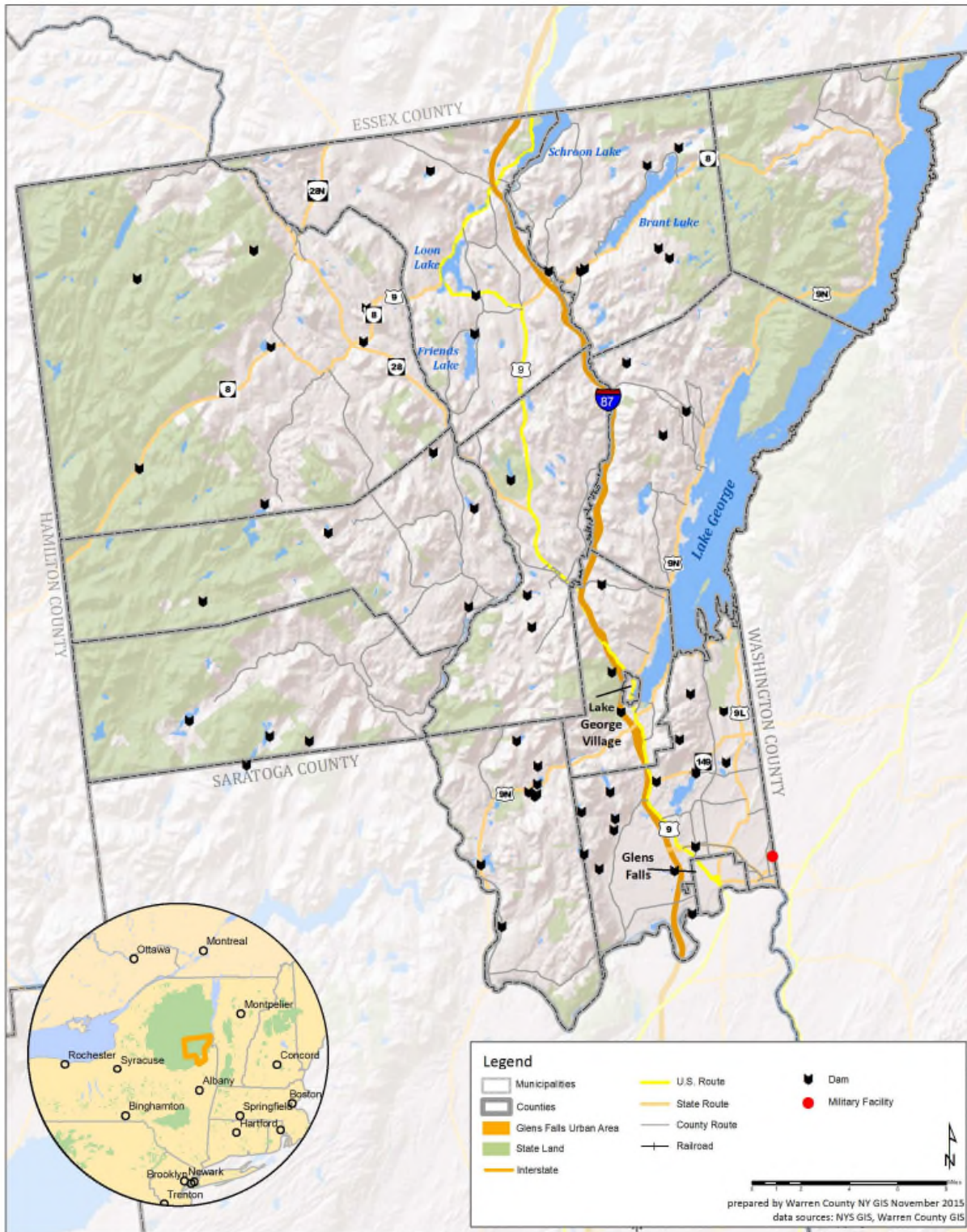
According to the NYSDEC Division of Water Bureau and Flood Protection and Dam Safety, there are three hazard classifications of dams in New York State. The dams are classified in terms of potential for downstream damage if the dam were to fail. The hazard classifications are as follows:

- *Low Hazard (Class A)* is a dam located in an area where failure will damage nothing more than isolated buildings, undeveloped lands, or township or county roads and/or will cause no significant economic loss or serious environmental damage. Failure or mis-operation would result in no probable loss of human life. Losses are principally limited to the owner's property
- *Intermediate Hazard (Class B)* is a dam located in an area where failure may damage isolated homes, main highways, minor railroads, interrupt the use of relatively important public utilities, and/or will cause significant economic loss or serious environmental damage. Failure or mis-operation would result in no probable loss of human life, but can cause economic loss, environment damage, disruption of lifeline facilities, or impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.
- *High Hazard (Class C)* is a dam located in an area where failure may cause loss of human life, serious damage to homes, industrial or commercial buildings, important public utilities, main highways or railroads and/or will cause extensive economic loss. This is a downstream hazard classification for dams in which excessive economic loss (urban area including extensive community, industry, agriculture, or outstanding natural resources) would occur as a direct result of dam failure.

According to the U.S. Army Corps of Engineers National Inventory of Dams (NID), there are 35 dams located within Warren County. These numbers differ from the National Performance of Dams Program (NPDP) which indicates that there are 42 dams in Warren County (5 high hazard, 23 significant hazard, 13 low hazard, and 1 undetermined). For the purpose of this plan, the NYSDEC data from the New York State GIS Clearinghouse will be used. According to County GIS data, there are 58 dams located in Warren County (33 Class A, 17 Class B, and 8 Class C).



Figure 4-15. High-Potential Loss Facilities in Warren County



Source: Warren County

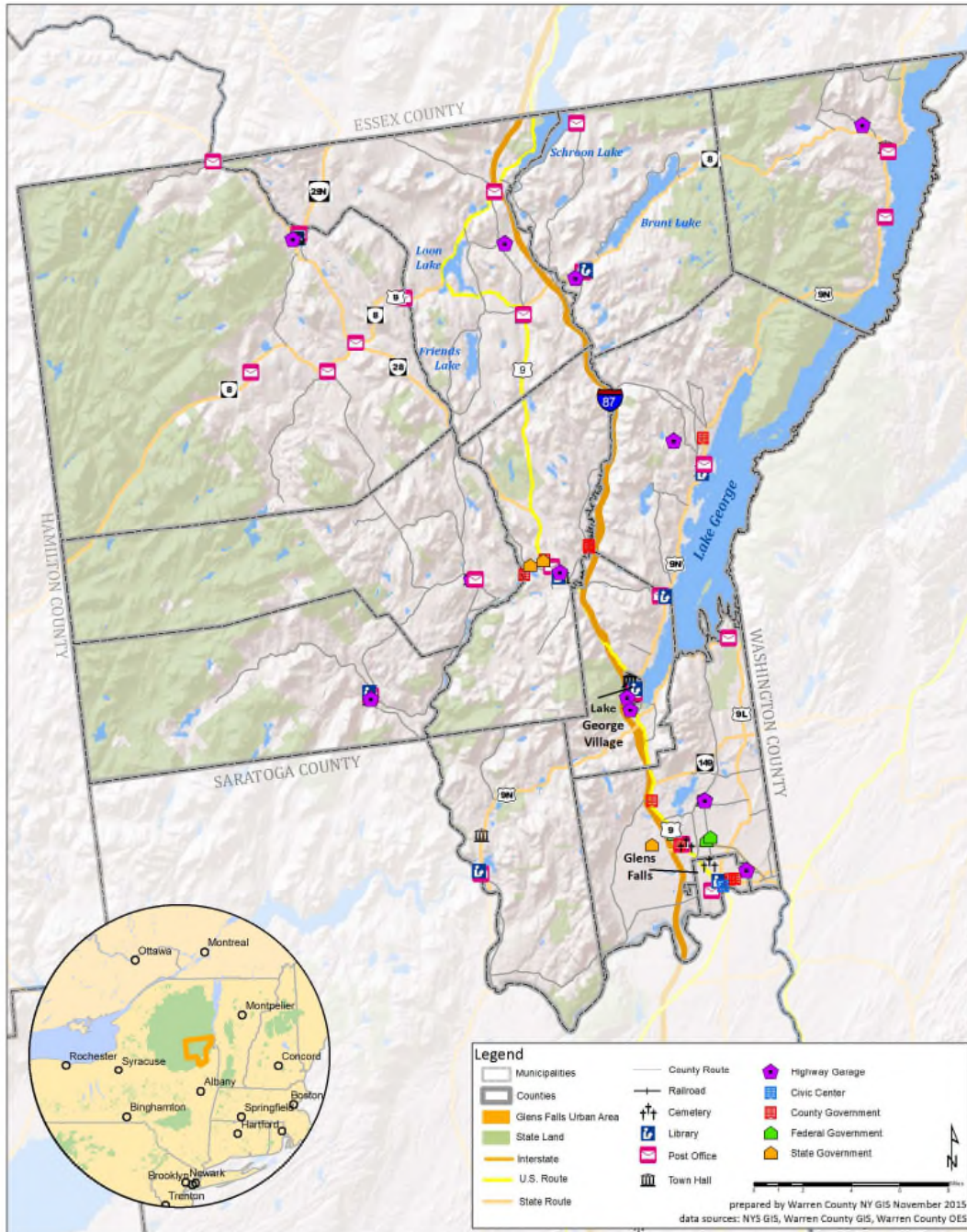




4.4.5 Other Facilities

The Planning Committee identified 86 additional facilities (user-defined facilities) as critical including municipal buildings and other government facilities. These facilities were included in the risk assessment conducted for the county. Figure 4-18 shows the locations of these facilities in the county.

Figure 4-16. Other Facilities in Warren County



Source: Warren County



5.1 METHODOLOGY AND TOOLS

This section describes the methodology and tools used to support the risk assessment process.

5.1.1 Methodology

The risk assessment process used for this Plan is consistent with the process and steps presented in FEMA 386-2, State and Local Mitigation Planning How-to-Guide, Understanding Your Risks – Identifying Hazards and Estimating Losses (FEMA, 2001). This process identifies and profiles the hazards of concern and assesses the vulnerability of assets (population, structures, critical facilities and the economy) at risk in the community. A risk assessment provides a foundation for the community’s decision makers to evaluate mitigation measures that can help reduce the impacts of a hazard when one occurs (Section 9 of this plan).

Step 1: The first step of the risk assessment process is to identify the hazards of concern. FEMA’s current regulations only require an evaluation of natural hazards. Natural hazards are natural events that threaten lives, property, and many other assets. Often, natural hazards can be predicted, where they tend to occur repeatedly in the same geographical locations because they are related to weather patterns or physical characteristics of an area.

Step 2: The next step of the risk assessment is to prepare a profile for each hazard of concern. These profiles assist communities in evaluating and comparing the hazards that can impact their area. Each type of hazard has unique characteristics that vary from event to event. That is, the impacts associated with a specific hazard can vary depending on the magnitude and location of each event (a hazard event is a specific, uninterrupted occurrence of a particular type of hazard). Further, the probability of occurrence of a hazard in a given location impacts the priority assigned to that hazard. Finally, each hazard will impact different communities in different ways, based on geography, local development, population distribution, age of buildings, and mitigation measures already implemented.

Steps 3 and 4: To understand risk, a community must evaluate what assets it possesses and which assets are exposed or vulnerable to the identified hazards of concern. Hazard profile information combined with data regarding population, demographics, general building stock, and critical facilities at risk, located in Section 4, prepares the community to develop risk scenarios and estimate potential damages and losses for each hazard.

5.1.2 Tools

To address the requirements of DMA 2000 and better understand potential vulnerability and losses associated with hazards of concern, Warren County used standardized tools, combined with local, state, and federal data and expertise to conduct the risk assessment. Our standardized tools used to support the risk assessment are described below.

Hazards U.S. – Multi-Hazard (HAZUS-MH)

In 1997, FEMA developed a standardized model for estimating losses caused by earthquakes, known as Hazards U.S. or HAZUS. HAZUS was developed in response to the need for more effective national-, state-, and community-level planning and the need to identify areas that face the highest risk and potential for loss. HAZUS was expanded into a multi-hazard methodology, HAZUS-MH with new models for



estimating potential losses from wind (hurricanes) and flood (riverine and coastal) hazards. HAZUS-MH is a Geographic Information System (GIS)-based software tool that applies engineering and scientific risk calculations, which have been developed by hazard and information technology experts, to provide defensible damage and loss estimates. These methodologies are accepted by FEMA and provide a consistent framework for assessing risk across a variety of hazards. The GIS framework also supports the evaluation of hazards and assessment of inventory and loss estimates for these hazards.

HAZUS-MH uses GIS technology to produce detailed maps and analytical reports that estimate a community's direct physical damage to building stock, critical facilities, transportation systems and utility systems. To generate this information, HAZUS-MH uses default HAZUS-MH provided data for inventory, vulnerability, and hazards; this default data can be supplemented with local data to provide a more refined analysis. Damage reports can include induced damage (inundation, fire, threats posed by hazardous materials and debris) and direct economic and social losses (casualties, shelter requirements, and economic impact) depending on the hazard and available local data. HAZUS-MH's open data architecture can be used to manage community GIS data in a central location. The use of this software also promotes consistency of data output now and in the future and standardization of data collection and storage. The guidance *Using HAZUS-MH for Risk Assessment: How-to Guide (FEMA 433)* was used to support the application of HAZUS-MH for this risk assessment and plan. More information on HAZUS-MH is available at <http://www.fema.gov/plan/prevent/hazus/index.shtm>.

In general, probabilistic analyses were performed to develop expected/estimated distribution of losses (mean return period losses) for the flood and earthquake hazards. The probabilistic hazard generates estimates of damage and loss for specified return periods (e.g., 100- and 500-year). For annualized losses, HAZUS-MH version 3.0 calculates the maximum potential annual dollar loss resulting from various return periods averaged on a "per year" basis. It is the summation of all HAZUS-supplied return periods (e.g., 10, 50, 100, 200, 500) multiplied by the return period probability (as a weighted calculation). In summary, the estimated cost of a hazard each year is calculated.

Custom methodologies in HAZUS-MH version 3.0 (HAZUS-MH) were used to assess potential exposure and losses associated with hazards of concern for Warren County:

Inventory: The 2010 U.S. Census data at the Census-block level was used to estimate hazard exposure at the municipal level. The default demographic data in HAZUS-MH 3.0, based on the 2010 U.S. Census, was used to estimate potential sheltering and injuries for this analysis.

Census blocks do not follow the boundaries of hazard areas and can over or under estimate the population exposed when using the centroid or intersects of the Census block with the hazard zone. For the purposes of this assessment, the population/demographic data presented include only those blocks whose geometric centers fall within the identified hazard areas. The limitations of these analyses are recognized, and as such the results are only used to provide a general estimate.

The default building inventory in HAZUS-MH 3.0 is based on 2010 U.S. Census estimates at the block level. Warren County compared the default inventory available in HAZUS-MH with parcel-specific tax data maintained by Warren County Real Property Tax. In most cases, the project team felt that the differences between the default data and the most current Real Property data maintained by the County were not significant, and the default building inventory was used for the majority of the HAZUS-MH based analyses. The exception was the flood hazard analysis, in which structure-level data maintained by the County was substituted for the default HAZUS-MH building inventory data. This substitution allowed



structures that fell within the flood plains to be located exactly, rather than by census block boundary, and resulted in a more accurate analysis. Because the other hazards (earthquake and wind), cover a larger and more general area of the county than the flood plains, building inventory information tallied by census block as opposed to individual structure is less of a concern.

The critical facility inventory (essential facilities, utilities, transportation features and user-defined facilities) was updated by Warren County GIS. The critical facility inventory was then reviewed by the Planning Committee. Once approved, the data was formatted to be compatible with HAZUS-MH and the updated inventories were used for the risk assessment.

Flood: FEMA has not developed digital DFIRM flood data for Warren County. Warren County previously georeferenced and digitized the hardcopy FIRM maps from the 1980's and 1990's and this digital data was used to evaluate exposure for the 1- and 0.2-percent annual chance flood events, as well as determine potential future losses for the 1-percent annual chance event. Hazus-MH was used to develop the depth grid for the County using a 1/3 Arc Second elevation model from USGS. The depth grid was integrated into HAZUS-MH and the model was run to estimate potential losses at the structure level using the County's custom building inventory.

Earthquake: A probabilistic assessment was conducted for Warren County for the 100-, 500- and 2,500-year MRPs through a Level 2 analysis in HAZUS-MH 3.0 to analyze the earthquake hazard and provide a range of loss estimates for Warren County. The probabilistic method uses information from historic earthquakes and inferred faults, locations and magnitudes, and computes the probable ground shaking levels that may be experienced during a recurrence period by Census tract.

As noted in the HAZUS-MH Earthquake User Manual '*Uncertainties are inherent in any loss estimation methodology. They arise in part from incomplete scientific knowledge concerning earthquakes and their effects upon buildings and facilities. They also result from the approximations and simplifications that are necessary for comprehensive analyses. Incomplete or inaccurate inventories of the built environment, demographics and economic parameters add to the uncertainty. These factors can result in a range of uncertainty in loss estimates produced by the HAZUS Earthquake Model, possibly at best a factor of two or more.*' However, HAZUS' potential loss estimates are acceptable for the purposes of this HMP.

Ground shaking is the primary cause of earthquake damage to man-made structures and soft soils amplify ground shaking. One contributor to the site amplification is the velocity at which the rock or soil transmits shear waves (S-waves). The NEHRP developed five soil classifications defined by their shear-wave velocity that impact the severity of an earthquake. The soil classification system ranges from A to E, where A represents hard rock that reduces ground motions from an earthquake and E represents soft soils that amplify and magnify ground shaking and increase building damage and losses.

When unchanged, HAZUS-MH default soil types are class "D". However, for this analysis HAZUS-MH was updated with the specific NEHRP soil types for Warren County as provided by the New York State Office of Emergency Management.

Land Failure Hazards: After reviewing available datasets and methodologies used to estimate areas of particular landslide risk, the Steering Committee decided to forgo conducting geo-spatial analysis of landslide risk in Warren County. In lieu of this, the vulnerability assessment information provided in the 2014 NYS Hazard Mitigation Plan was incorporated, along with local knowledge of known landslide hazard areas.



Severe Storm: After reviewing historic data, the HAZUS-MH methodology and model were used to analyze the severe storm hazard for Warren County. Data used to assess this hazard include data available in the HAZUS-MH 3.0 wind model, professional knowledge, and information provided by the Steering and Planning Committees.

HAZUS-MH contains data on historic hurricane events and wind speeds. It also includes surface roughness and vegetation (tree coverage) maps for the area. Surface roughness and vegetation data support the modeling of wind force across various types of land surfaces. A historic scenario was run for Warren County, based on the New England Hurricane of 1938, a strong Category 3 storm that tracked just to the east of Warren County. HAZUS-MH was used to calculate the impacts on current population, existing structures and critical facilities in the County if the 1938 storm were to hit in present times.

Wildfire: The WUI (interface and intermix) obtained through the SILVIS Lab, Department of Forest Ecology and Management, University of Wisconsin-Madison was used to define the wildfire hazard areas. The University of Wisconsin-Madison wildland fire hazard areas are based on the 2010 Census and 2006 National Land Cover Dataset and the Protected Areas Database. For the purposes of this risk assessment, the high-, medium- and low-density interface areas were combined and used as the ‘interface’ hazard area and the high-, medium- and low-density intermix areas were combined and used as the ‘intermix’ hazard areas.

The asset data (population, building stock and critical facilities) presented in the County Profile (Section 4) was used to support an evaluation of assets exposed and the potential impacts and losses associated with this hazard. To determine what assets are exposed to wildfire, available and appropriate GIS data was overlaid upon the hazard area. The limitations of this analysis are recognized, and as such the analysis is only used to provide a general estimate.

Other Hazards: For many of the hazards evaluated in this risk assessment, historic data are not adequate to model future losses at this time. For some of the other hazards of concern, areas and inventory susceptible to specific hazards were mapped and exposure was evaluated to help guide mitigation efforts discussed in Section 9. For other hazards, a qualitative analysis was conducted using the best available data and professional judgment.

For this risk assessment, the loss estimates, exposure assessments, and hazard-specific vulnerability evaluations rely on the best available data and methodologies. Uncertainties are inherent in any loss estimation methodology and arise in part from incomplete scientific knowledge concerning natural hazards and their effects on the built environment. Uncertainties also result from the following:

- 1) Approximations and simplifications necessary to conduct such a study
- 2) Incomplete or dated inventory, demographic, or economic parameter data
- 3) The unique nature, geographic extent, and severity of each hazard
- 4) Mitigation measures already employed by Warren County and the amount of advance notice residents have to prepare for a specific hazard event

These factors can result in a range of uncertainty in loss estimates, possibly by a factor of two or more. Therefore, potential exposure and loss estimates are approximate. These results do not predict precise



results and should be used to understand relative risk. Over the long term, Warren County will collect additional data to assist in developing refined estimates of vulnerabilities to natural hazards.



5.2 IDENTIFICATION OF HAZARDS OF CONCERN

To provide a strong foundation for mitigation actions considered in Sections 6 and 9, Warren County focused on considering a full range of hazards that could impact the area, and then identified and ranked those hazards that presented the greatest concern. The hazard of concern identification process incorporated input from the County and participating jurisdictions; review of the New York State Hazard Mitigation Plan (NYS HMP); review of the previous Warren County HMP; research and local, state, and federal information on the frequency, magnitude, and costs associated with the various hazards that have previously, or could feasibly, impact the region; and qualitative or anecdotal information regarding natural hazards and the perceived vulnerability of the study area's assets to them. Table 5.2-1 documents the process of identifying the natural hazards of concern for further profiling and evaluation.

Hazards of Concern are those hazards that are considered most likely to impact a community. These are identified using available data and local knowledge.

For the purposes of this planning effort, The Planning and Steering Committees chose to group some hazards together, based on the similarity of hazard events, their typical concurrence or their impacts, consideration of how hazards have been grouped in Federal Emergency Management Agency (FEMA) guidance documents (FEMA 386-2, "Understanding Your Risks, Identifying Hazards and Estimating Losses; FEMA's "Multi-Hazard Identification and Risk Assessment – The Cornerstone of the National Mitigation Strategy"; FEMA's Local Mitigation Planning Handbook), and consideration of hazard grouping in the NYS HMP.

The "Flood" hazard includes riverine flooding, flash flooding, ice jam flooding, dam failure flooding, and flooding due to beaver dams. Inclusion of the various forms of flooding under a general "Flood" hazard is consistent with that used in FEMA's "Multi-Hazard Identification and Risk Assessment" guidance and the NYS HMP.

The "Severe Storm" hazard includes windstorms that often entail a variety of other influencing weather conditions including thunderstorms, hail, lightning, and tornadoes. Tropical disturbances (hurricanes, tropical storms and tropical depressions) are often identified as a type of severe storm; however, for the purpose of this HMP, tropical disturbances were not identified as a hazard of concern for the county based on input from the planning and steering committees.

The "Severe Winter Storm" hazard includes heavy snowfall, blizzards, freezing rain/sleet, and ice storms. This grouping is consistent with the NYS HMP.

The "Landslide" hazard was added due to the County's concern of steep slopes near roads and the history of events occurring throughout the County.



Table 5.2-1. Identification of Hazards of Concern for Warren County

Hazard	Is this a hazard that may occur in Warren County?	If yes, does this hazard pose a significant threat to the County?	Why was this determination made?	Source(s)
Avalanche	No	No	<ul style="list-style-type: none"> Avalanches can occur in any situation where snow, slope and weather conditions combine to create proper conditions. About 90% of all avalanches start on slopes of 30 to 45 degrees and about 98% of all avalanches occur on slopes of 25 to 50 degrees. The topography of Warren County does not support the occurrence of an avalanche. New York State, in general, has a very low occurrence of avalanche events based on statistics provided by National Avalanche Center – American Avalanche Association (NAC-AAA) between 1998 and 2015. Avalanche was identified as a hazard in the NYS HMP and there have been occurrences in the State; however, there have been no occurrences in Warren County. 	<ul style="list-style-type: none"> NYS DHSES Input from Steering and Planning Committees Review of NAC-AAA database between 1998 and 2015
Coastal Erosion	No	No	<ul style="list-style-type: none"> The NYSHMP identifies coastal erosion as a hazard of concern for New York State. Erosion can impact all of the State’s coastal counties along: Lake Erie and the Niagara River, Lake Ontario and the St. Lawrence River, Atlantic Ocean and Long Island Sound, Hudson River south of the federal dam in Troy, the East River, the Harlem River, the Kill van Kull and Arthur Kill, and all connecting waterbodies, bays, harbors, shallows and wetlands. Warren County is not bordered by any coastal waters. Lake George and the Hudson River are subject to erosion; however, based on input from the planning committee, coastal erosion was not identified as a hazard of concern for the County. 	<ul style="list-style-type: none"> NYS DHSES Input from Steering and Planning Committees
Cyber Security	Yes	Yes	<ul style="list-style-type: none"> The 2014 NYS HMP does not identify cyber security as a hazard of concern for New York State. Cyber threats to Warren County’s critical infrastructures can be posed by anyone with the capability, technology, opportunity, and intent to do harm. To date, there have no major cyber security breaches in the County; however, the Steering and Planning Committees identified cyber security as a hazard of concern for Warren County. 	<ul style="list-style-type: none"> NYS DHSES Input from Steering and Planning Committees
Dam Failure	Yes	Yes	<ul style="list-style-type: none"> The 2014 NYS HMP identifies dam failure as a hazard of concern for New York State and includes it in the Flood hazard profiles. There are 58 dams located in Warren County: 33 Class A, 17 Class B and 8 Class C). The dams are located in Bolton, Chester, Horicon, Johnsburg, Lake George, Lake Luzerne, Queensbury, Stony Creek, Thurman, and Warrensburg. The Steering and Planning Committees identified dam failure as a hazard of concern for Warren County. Dam failure is included in the Flood hazard profile. 	<ul style="list-style-type: none"> NYS DHSES Input from Steering and Planning Committees NYSDEC
Disease Outbreak	Yes	Yes	<ul style="list-style-type: none"> The 2014 NYS HMP does not identify disease outbreak as a hazard of concern for New York State. Based on input from the Steering and Planning Committees, disease outbreak was identified as a hazard of concern for the County. The County identified influenza, Zika virus, and Ebola as 	<ul style="list-style-type: none"> NYS DHSES Input from Steering and Planning Committees



Table 5.2-1. Identification of Hazards of Concern for Warren County

Hazard	Is this a hazard that may occur in Warren County?	If yes, does this hazard pose a significant threat to the County?	Why was this determination made?	Source(s)
Drought	Yes	No	<p>disease that may lead to a pandemic outbreak and pose a threat to the County.</p> <ul style="list-style-type: none"> • The NYS HMP identifies drought as a hazard of concern for the State. Warren County has been impacted by several drought events that have occurred in New York State. • According to the NOAA-NCDC Storm Events Database, between 1950 and 2015, Warren County has experienced two drought events. • New York State has been included in one FEMA drought-related disaster declaration; however, Warren County was not included in the declaration. • Warren County has been included in two drought-related USDA disaster declarations: <ul style="list-style-type: none"> ○ S3441 – Drought – 2012 ○ S3887 – Drought – 2015 • According to the NRCC, Warren County is located within three climate divisions: Northern Plateau, Hudson Valley, and Champlain Valley. All of which have been impacted by periods of severe and extreme drought and include the following events: <ul style="list-style-type: none"> ○ August-November 1899 ○ October 1908-January 1909 ○ May-November 1911 ○ April-June 1915 ○ October 1930-April 1931 ○ July-December 1934 ○ November 1939-February 1942 ○ October 1947-December 1949 ○ February-May 1957 ○ August-November 1957 ○ December 1960-March 1961 ○ June 1964-August 1966 ○ April-May 1985 ○ August-September 1995 ○ July-August 1999 ○ November 2001-April 2002 • Based on previous occurrences and input from the Steering and Planning Committees, drought was not identified as a hazard of concern for Warren County. 	<ul style="list-style-type: none"> • NYS DHSES • FEMA • USDA • Input from Steering and Planning Committees • NOAA-NCDC • NRCC
Earthquake	Yes	Yes	<ul style="list-style-type: none"> • The NYS HMP identified earthquake as a hazard of concern for the State. • USGS indicates that the 2014 PGA for Warren County is between 3 and 4%. According to FEMA, any jurisdiction that has a PGA of 3% or greater is required to fully profile the 	<ul style="list-style-type: none"> • NYS DHSES • Input from Steering and Planning



Table 5.2-1. Identification of Hazards of Concern for Warren County

Hazard	Is this a hazard that may occur in Warren County?	If yes, does this hazard pose a significant threat to the County?	Why was this determination made?	Source(s)
			<p>earthquake hazard.</p> <ul style="list-style-type: none"> • According to the NYS HMP, between 1973 and 2012, there have been 189 earthquakes epicentered in the State. Of those 189 events, only four had an epicenter in Warren County. • There have been several earthquakes with epicenters located in close proximity to Warren County. • Based on previous occurrences and input from the Steering and Planning Committees, earthquakes were identified as a hazard of concern for Warren County. 	<p>Committees</p> <ul style="list-style-type: none"> • USGS – Earthquake Hazards Program, Review of USGS Seismic Maps
Expansive Soils	Yes	No	<ul style="list-style-type: none"> • The NYS HMP identified expansive soils has a hazard of concern for New York State. However, a majority of Warren County is underlain by soils with little to no swelling potential and contains areas with less than 50% of the area is underlain by soils with abundant clays of slight to moderate swelling potential. • The Steering and Planning Committees did not identify expansive soils as a hazard of concern for Warren County. 	<ul style="list-style-type: none"> • NYS DHSES • Input from Steering and Planning Committees • Review of USGS 1989 Swelling Clays Map of the Conterminous United States
Extreme Temperature	Yes	No	<ul style="list-style-type: none"> • The NYS HMP identified extreme temperatures as a hazard of concern for New York State. • According to the NOAA-NCDC database, between 1950 and 2015, there have been 59 extreme temperature events in Warren County. • Warren County has not been included in any FEMA disaster declarations for extreme temperature-related events; however, the County has been included in one USDA disaster declaration. • The Steering and Planning Committees did not identify extreme temperatures as a hazard of concern for the County. 	<ul style="list-style-type: none"> • NYS DHSES • Input from Steering and Planning Committees • NOAA-NCDC
Flood (riverine, ice jam, dam failure and flash)	Yes	Yes	<ul style="list-style-type: none"> • The NYS HMP identified flooding as a hazard of concern for New York State. • The County has been included in seven flood-related FEMA disaster declarations: <ul style="list-style-type: none"> ○ FEMA-DR-515 (Severe Storms and Flooding) – July 21, 1976 ○ FEMA-DR-1095 (Severe Storms and Flooding) – January 19-20, 1996 ○ FEMA-DR-1534 (Severe Storms and Flooding) – May-June 2004 ○ FEMA-DR-1564 (Severe Storms and Flooding) – August 13-September 16, 2003 ○ FEMA-DR-1899 (Severe Storms and Flooding) – March 13-31, 2010 ○ FEMA-DR-1993 (Severe Storms, Flooding, Tornadoes, and Straight-Line Winds) – April 26-May 8, 2011 ○ FEMA-DR-4129 (Severe Storms and Flooding) – Jun3 26-July 10, 2013 	<ul style="list-style-type: none"> • NYS DHSES • Input from Steering and Planning Committees • FEMA • NOAA-NCDC • USACE CRREL Ice Jam Database



Table 5.2-1. Identification of Hazards of Concern for Warren County

Hazard	Is this a hazard that may occur in Warren County?	If yes, does this hazard pose a significant threat to the County?	Why was this determination made?	Source(s)
			<ul style="list-style-type: none"> Between 1780 and 2015, there have been 27 ice jams in the County that have occurred along English Brook, Glen Creek, Hudson River, and Northwest Bay Brook. The Steering and Planning Committees identified flooding as a hazard of concern for the County. 	
Hailstorm	Yes	Yes	Please see Severe Storm	
Hazardous Materials	Yes	Yes	<ul style="list-style-type: none"> The 2014 NYS HMP does not identify hazardous materials as a hazard of concern for New York State. There are over 1,248 miles of roads located within the County; some of which are used to transport hazardous materials. There are been numerous hazardous material incidents in Warren County, which led to road closures and hazmat response. Based on the history of occurrences and input from the Steering and Planning Committees, hazardous materials was identified as a hazard of concern for Warren County. 	<ul style="list-style-type: none"> NYS DHSES Input from Steering and Planning Committees NYS DOT
Hurricane	Yes	No	Please see Severe Storms	
Ice Jams	Yes	Yes	Please see Flood	
Ice Storm	Yes	Yes	Please see Severe Winter Storm	
Infestation	Yes	Yes	<ul style="list-style-type: none"> The 2014 NYS HMP does not identify infestation as a hazard of concern for New York State; however, the Steering and Planning Committees identified infestation as a hazard of concern for Warren County. Infestations of Asian Longhorned Beetle, Balsam Woolly Adelgid, Hemlock Woolly Adelgid, Sirex woodwasp, Emerald Ash Borer, and Gypsy Moths have all been reported in or have the potential to impact Warren County. 	<ul style="list-style-type: none"> NYS DHSES Input from Steering and Planning Committees USDA NYSDEC
Land Subsidence	Yes	No	<ul style="list-style-type: none"> NYS HMP indicates New York State is vulnerable to land subsidence; however, this hazard is “extremely localized” and poses a “very low risk to population and property.” NYS HMP does not identify Warren County as a county that has experienced land subsidence in the past. In general, moderate to low land subsidence susceptibility exists for New York State, however, it was identified that this hazard has a very low risk to population or property. Sinkholes often occur in areas underlain by carbonate rock, limestone, salt beds or rocks that naturally dissolve by groundwater circulating through them. Portions of eastern Warren County are underlain by carbonate rock. The Steering and Planning Committees did not identify land subsidence as a hazard of concern for Warren County. 	<ul style="list-style-type: none"> NYS DHSES Input from Steering and Planning Committees USGS



Table 5.2-1. Identification of Hazards of Concern for Warren County

Hazard	Is this a hazard that may occur in Warren County?	If yes, does this hazard pose a significant threat to the County?	Why was this determination made?	Source(s)
Landslide	Yes	Yes	<ul style="list-style-type: none"> The NYS HMP includes landslide as a hazard of concern for New York State. According to the NYS HMP, 250 people in Warren County live within a high incidence of landslide area. The remainder of the population lives within a low incidence area. Between 1954 and 2015, New York State was included in one landslide-related disaster declaration; however, Warren County was not included in the declaration. However, FEMA-DR-1993 (Severe Storms, Flooding, Tornadoes and Straight-Line Winds) that occurred April 28-29, 2011, led to reported mudslides in the Towns of Johnsburg and Chester. The Steering and Planning Committees did identify landslide as a hazard of concern for Warren County. 	<ul style="list-style-type: none"> NYS DHSES Input from Steering and Planning Committees FEMA
Nor'Easters	Yes	No	<ul style="list-style-type: none"> The NYS HMP identified severe winter storm, which includes Nor'Easters as a hazard of concern for New York State. The NOAA-NCDC Storm Events Database did not identify any Nor'Easter events that impacted Warren County between 2010 and 2015. The Steering and Planning Committees did not identify Nor'Easters as a hazard of concern for Warren County. 	<ul style="list-style-type: none"> NYS DHSES NOAA-NCDC Input from Steering and Planning Committees
Severe Storm (windstorms, thunderstorms, hail and tornados)	Yes	Yes	<ul style="list-style-type: none"> The NYS HMP identified severe storm as a hazard of concern for New York State. However, for the State HMP, the hazards were profiled in individual sections: hailstorm, high wind, and hurricane. For the purpose of this County HMP, the hazards were combined into one profile, excluding hurricane. The NOAA-NCDC Storm Events Database indicated that Warren County was impacted by 264 severe storm-related events between 1950 and 2015. According to the SPC, three tornadoes have impacted Warren County between 1950 and 2015. FEMA included Warren County in 10 severe storm-related disaster declarations: <ul style="list-style-type: none"> FEMA-DR-515 (Severe Storms and Flooding) – July 21, 1976 FEMA-DR-1095 (Severe Storms and Flooding) – January 19-20, 1996 FEMA-DR-1296 (Hurricane Floyd) – September 16-18, 1999 FEMA-DR-1534 (Severe Storms and Flooding) – May-June 2004 FEMA-DR-1564 (Severe Storms and Flooding) – August 13-September 16, 2003 FEMA-DR-1899 (Severe Storms and Flooding) – March 13-31, 2010 FEMA-DR-1993 (Severe Storms, Flooding, Tornadoes, and Straight-Line Winds) – April 26-May 8, 2011 FEMA-DR-4020 (Hurricane Irene) – August 28, 2011 FEMA-EM-3351 (Hurricane Sandy) – October 28, 2012 FEMA-DR-4129 (Severe Storms and Flooding) – Jun3 26-July 10, 2013 The Steering and Planning Committees identified severe storms as a hazard of concern for 	<ul style="list-style-type: none"> NYS DHSES FEMA NOAA-NCDC SPC Input from Steering and Planning Committees



Table 5.2-1. Identification of Hazards of Concern for Warren County

Hazard	Is this a hazard that may occur in Warren County?	If yes, does this hazard pose a significant threat to the County?	Why was this determination made?	Source(s)
			Warren County.	
Severe Winter Storm (heavy snow, blizzards, ice storms)	Yes	Yes	<ul style="list-style-type: none"> The NYS HMP identified severe winter storm as a hazard of concern for New York State. The NOAA-NCDC Storm Events Database indicated that Warren County was impacted by 205 winter storm events between 1950 and 2015. FEMA included Warren County in one winter storm-related disaster declaration: <ul style="list-style-type: none"> FEMA-EM-3107 (Severe Blizzard) – March 14-17, 1993 The Planning and Steering Committees identified severe winter storm as a hazard of concern for Warren County. 	<ul style="list-style-type: none"> NYS DHSES FEMA NOAA-NCDC Input from Steering and Planning Committees
Tornado	Yes	Yes	Please see Severe Storm	
Tsunami	No	No	<ul style="list-style-type: none"> Tsunami is not identified as a hazard of concern in the NYS HMP. The Planning and Steering Committees does not consider tsunami to be a significant concern to the planning area. 	<ul style="list-style-type: none"> NYS DHSES Input from Steering and Planning Committees
Volcano	No	No	<ul style="list-style-type: none"> The NYS HMP did not identify volcano as a hazard of concern for New York State. The Planning and Steering Committees does not consider volcano to be a hazard of concern for the planning area. 	<ul style="list-style-type: none"> NYS DHSES Input from Steering and Planning Committees
Wildfire	Yes	Yes	<ul style="list-style-type: none"> The NYS HMP identified wildfire as a hazard of concern for New York State. Approximately 80.5% of the County’s total population is exposed to the Intermix or Interface wildfire hazard areas. The Planning and Steering Committees identified wildfire as a hazard of concern for Warren County. 	<ul style="list-style-type: none"> NYS DHSES Input from Steering and Planning Committees FEMA
Windstorm	Yes	Yes	Please see Severe Storm	

<i>CRREL</i>	<i>Cold Regions Research and Engineering Laboratory</i>	<i>SPC</i>	<i>Storm Prediction Center</i>
<i>DR</i>	<i>Presidential Disaster Declaration Number</i>	<i>USDA</i>	<i>U.S. Department of Agriculture</i>
<i>EM</i>	<i>Presidential Disaster Emergency Number</i>	<i>USGS</i>	<i>United States Geologic Survey</i>
<i>FEMA</i>	<i>Federal Emergency Management Agency</i>		
<i>NCDC</i>	<i>National Climatic Data Center</i>		
<i>NOAA</i>	<i>National Oceanic and Atmospheric Administration</i>		
<i>NRCC</i>	<i>Northeast Regional Climate Center</i>		
<i>NYS DHSES</i>	<i>New York State Division of Homeland Security and Emergency Services</i>		
<i>NYS HMP</i>	<i>New York State Hazard Mitigation Plan</i>		





In summary, a total of eight natural hazards of concern were identified as significant hazards affecting the entire planning area, to be addressed at the county level in this plan (shown here in alphabetical order):

- Earthquake
- Disease Outbreak/Pandemic
- Flood (riverine, dam failure, flash, ice jam, beaver dam)
- Infestation
- Landslide
- Severe Storm (thunderstorm, hail, wind, tornado)
- Severe Winter Storm
- Wildfire

Other natural hazards of concern that have occurred within Warren County, but have a low potential to occur and/or result in significant impacts, may be considered in future versions of the Plan.

Further, the Warren County Steering Committee has identified the following non-natural/mad-made hazards of concern for specific consideration in this plan update:

- Cyber-Security
- Hazardous Materials (In-Transit and Fixed Facility)



5.3 HAZARD RANKING

After the hazards of concern were identified for Warren County, the hazards were ranked to describe their probability of occurrence and their impact on population, property (general building stock including critical facilities) and the economy. Each participating city, township, or borough may have differing degrees of risk exposure and vulnerability compared to the County as a whole; therefore each jurisdiction ranked the degree of risk to each hazard as it pertains to their community using the same methodology as applied to the County-wide ranking. This assured consistency in the overall ranking of risk process. The hazard ranking for the County and each participating district can be found in their jurisdictional annex in Volume II of this plan.

5.3.1 Hazard Ranking Methodology

The methodology used to rank the hazards of concern for Warren County is described below. Estimates of risk for the County were developed using methodologies promoted by FEMA’s hazard mitigation planning guidance and generated by FEMA’s HAZUS-MH risk assessment tool.

Probability of Occurrence

The probability of occurrence is an estimate of how often a hazard event occurs. A review of historic events assists with this determination. Each hazard of concern is rated in accordance with the numerical ratings and definitions in Table 5.3-1.

Table 5.3-1. Probability of Occurrence Ranking Factors

Rating	Probability Category	Definition
1	Rare	Hazard event is not likely to occur within 100 years (>1% chance of occurrence in any given year)
2	Occasional	Hazard event is likely to occur within 100 years (1% chance of occurrence in any given year)
3	Frequent	Hazard event is likely to occur within 25 years (4% chance of occurrence in any given year)

Impact

The impact of each hazard is considered in three categories: impact on population, impact on property (general building stock including critical facilities), and impact on the economy. Based on documented historic losses and a subjective assessment by the Planning Committee, an impact rating of high, medium, or low is assigned with a corresponding numeric value for each hazard of concern. In addition, a weighting factor is assigned to each impact category: three (3) for population, two (2) for property, and one (1) for economy. This gives the impact on population the greatest weight in evaluating the impact of a hazard.

Table 5.3-2 presents the numerical rating, weighted factor and description for each impact category

Table 5.3-2. Numerical Values and Definitions for Impacts on Population, Property and Economy

Category	Weighting Factor	Low Impact* (1)	Medium Impact (2)	High Impact (3)
Population	3	14% or less of your population is exposed to a hazard with potential for	15% to 29% of your population is exposed to a hazard with potential for	30% or more of your population is exposed to a hazard with potential



Category	Weighting Factor	Low Impact* (1)	Medium Impact (2)	High Impact (3)
		measurable life safety impact, due to its extent and location	measurable life safety impact, due to its extent and location	for measurable life safety impact, due to its extent and location
Property	2	Property exposure is 14% or less of the total replacement cost for your community	Property exposure is 15% to 29% of the total replacement cost for your community	Property exposure is 30% or more of the total replacement cost for your community
Economy	1	Loss estimate is 9% or less of the total replacement cost for your community	Loss estimate is 10% to 19% of the total replacement cost for your community	Loss estimate is 20% or more of the total replacement cost for your community

Note: A numerical value of zero is assigned if there is no impact.

*For the purposes of this exercise, "impacted" means exposed for population and property and loss for economy.

Risk Ranking Value

The risk ranking for each hazard is then calculated by multiplying the numerical value for probability of occurrence by the sum of the numerical values for impact. The equation is as follows: Weighting Factor (1, 2, or 3) X Impact Value (6 to 18) = Hazard Ranking Value. Based on the total for each hazard, a priority ranking is assigned to each hazard of concern (high, medium, or low).

5.3.2 Hazard Ranking Results

Using the process described above, the risk ranking for the identified hazards of concern was determined for Warren County. Based on the combined risk values for probability of occurrence and impact to Warren County, a priority ranking of "high", "medium" or "low" risk was assigned. The hazard ranking for the Warren planning area is detailed in the subsequent tables that present the step-wise process for the ranking. The county-wide risk ranking includes the entire planning area and may not reflect the highest risk indicated for any of the participating jurisdictions. The resulting ranks of each municipality indicate the differing degrees of risk exposure, and vulnerability. The results support the appropriate selection and prioritization of initiatives to reduce the highest levels of risk for each municipality. Both the County and the participating jurisdictions have applied the same methodology to develop the county-wide risk and local rankings to ensure consistency in the overall ranking of risk.

This risk ranking exercise serves two purposes: 1) to describe the probability of occurrence for each hazard, and 2) to describe the impact each would have on the people, property and economy of Warren County. Estimates of risk for Warren County were developed using methodologies promoted by FEMA's hazard mitigation planning guidance and generated by FEMA's HAZUS-MH risk assessment tool.

Table 5.3-3 shows the probability ranking assigned for likelihood of occurrence for each hazard.

Table 5.3-3. Probability of Occurrence Ranking for Hazards of Concern for Warren County

Hazard of Concern	Probability	Numeric Value
Earthquake	Occasional	2
Flood	Frequent	3
Landslide	Frequent	3
Infestation	Frequent	3
Severe Storm	Frequent	3
Severe Winter Storm	Frequent	3
Wildfire	Frequent	3
Cyber Security	Occasional	2



Hazard of Concern	Probability	Numeric Value
Disease Outbreak	Frequent	3
Hazardous Material Incidents	Frequent	3

Table 5.3-4 shows the impact evaluation results for each hazard of concern, including impact on property, structures, and the economy on the County level. It is noted that several hazards that have a high impact on the local jurisdictional level, may have a lower impact when analyzed county-wide. Jurisdictional ranking results are presented in each local annex in Section 9 of this plan. The weighting factor results and a total impact for each hazard also are summarized.



Table 5.3-4. Impact Ranking for Hazards of Concern for Warren County

Hazard of Concern	Impact	Population		Impact	Property		Impact	Economy		Total Impact Rating (Population + Property + Economy)
		Numeric Value	Multiplied by Weighing Factor (3)		Numeric Value	Multiplied by Weighing Factor (2)		Numeric Value	Multiplied by Weighing Factor (1)	
Earthquake	H	3	9	H	3	6	L	1	1	16
Flood	L	1	3	L	1	2	L	1	1	6
Landslide	M	2	6	L	1	2	L	1	1	9
Infestation	L	1	3	M	2	4	L	1	1	8
Severe Storm	H	3	9	H	3	6	L	1	1	16
Severe Winter Storm	H	3	9	H	3	6	M	2	2	17
Wildfire	H	3	9	L	1	2	H	3	3	14
Cyber Security	L	1	3	L	1	2	L	1	1	6
Disease Outbreak	M	2	6	L	1	2	L	1	1	9
Hazardous Material Incidents	L	1	3	M	2	4	L	1	1	8



Table 5.3-5 presents the total ranking value for each hazard.

Table 5.3-5. Total Risk Ranking Value for Hazards of Concern for Warren County

Hazard of Concern	Probability	Impact	Total = (Probability x Impact)
Earthquake	2	16	32
Flood	3	6	18
Landslide	3	9	27
Infestation	3	8	24
Severe Storm	3	16	48
Severe Winter Storm	3	17	51
Wildfire	3	14	42
Cyber Security	2	6	12
Disease Outbreak	3	9	27
Hazardous Material Incidents	3	8	24

Table 5.3-6 presents the hazard ranking category by jurisdiction assigned for each hazard of concern. The ranking categories are determined by an evaluation of the total risk ranking score into three categories, low, medium, and high whereby a total score of 14 and below is categorized as low, 15 to 30 is medium, and 31 and over is considered a high risk category.

These rankings have been used as one of the bases for identifying the jurisdictional hazard mitigation strategies included in Section 9 of this plan. The summary rankings for the County reflect the results of the vulnerability analysis for each hazard of concern and vary from the specific results of each jurisdiction. For example the severe storm hazard may be ranked high in one jurisdiction, but due to the exposure and impact county-wide, it is ranked as a medium hazard and is addressed in the county mitigation strategy accordingly.

Table 5.3-6. Summary of Overall Ranking of Natural Hazards by Jurisdiction

Warren County Municipalities	Hazards of Concern									
	Earthquake	Flood	Landslide	Infestation	Severe Storm	Severe Winter Storm	Wildfire	Cyber Security	Disease Outbreak	Hazmat
Bolton (T)	Low	Medium	Low	Medium	High	High	High	Low	Medium	Medium
Chester (T)	Low	Medium	High	Medium	High	High	High	Low	Medium	Medium
Glens Falls (C)	High	Medium	Medium	Medium	High	High	High	Low	Medium	Medium
Hague (T)	Low	Medium	High	Medium	High	High	High	Low	Medium	Medium
Horicon (T)	Low	Medium	Medium	Medium	High	High	High	Low	Medium	Medium
Johnsburg (T)	Low	Medium	Medium	Medium	High	High	High	Low	Medium	Medium
Lake George (T)	Low	Medium	Medium	Medium	High	High	High	Low	Medium	Medium
Lake George (V)	Low	Medium	Low	Medium	High	High	Medium	Low	Medium	Medium



Section 5.3: Hazard Ranking

Warren County Municipalities	Hazards of Concern									
	Earthquake	Flood	Landslide	Infestation	Severe Storm	Severe Winter Storm	Wildfire	Cyber Security	Disease Outbreak	Hazmat
Lake Luzerne (T)	High	Medium	Low	Medium	High	High	High	Low	Medium	Medium
Queensbury (T)	High	Medium	Low	Medium	High	High	High	Low	Medium	Medium
Stony Creek (T)	Low	Medium	Low	Medium	High	High	High	Low	Medium	Medium
Thurman (T)	Medium	Medium	Medium	Medium	High	High	High	Low	Medium	Medium
Warrensburg (T)	High	High	Medium	Medium	High	High	High	Low	Medium	Medium



5.4.1 Earthquake

This section provides a profile and vulnerability assessment for the earthquake hazard.

5.4.1.1 Hazard Profile

This section provides profile information including description, extent, location, previous occurrences and losses and the probability of future occurrences.

Description

An earthquake is the sudden movement of the Earth’s surface caused by the release of stress accumulated within or along the edge of the Earth’s tectonic plates, a volcanic eruption, or by a manmade explosion (Federal Emergency Management Agency [FEMA] 2001; Shedlock and Pakiser 1997). Most earthquakes occur at the boundaries where the Earth’s tectonic plates meet (faults); less than 10% of earthquakes occur within plate interiors. New York is in an area where the rarer plate interior-related earthquakes occur. As plates continue to move and plate boundaries change geologically over time, weakened boundary regions become part of the interiors of the plates. These zones of weakness within the continents can cause earthquakes in response to stresses that originate at the edges of the plate or in the deeper crust (Shedlock and Pakiser 1997).

According to the U.S. Geological Society (USGS) Earthquake Hazards Program, an earthquake hazard is any disruption associated with an earthquake that may affect residents’ normal activities. This includes surface faulting, ground shaking, landslides, liquefaction, tectonic deformation, tsunamis, and seiches; each of these terms is defined below:

- *Surface faulting*: Displacement that reaches the earth's surface during a slip along a fault. Commonly occurs with shallow earthquakes—those with an epicenter less than 20 kilometers.
- *Ground motion (shaking)*: The movement of the earth's surface from earthquakes or explosions. Ground motion or shaking is produced by waves that are generated by a sudden slip on a fault or sudden pressure at the explosive source and travel through the Earth and along its surface.
- *Landslide*: A movement of surface material down a slope.
- *Liquefaction*: A process by which water-saturated sediment temporarily loses strength and acts as a fluid, like the wet sand near the water at the beach. Earthquake shaking can cause this effect. Liquefaction susceptibility is determined by the geological history, depositional setting, and topographic position of the soil (Stanford 2003). Liquefaction effects may occur along the shorelines of the ocean, rivers, and lakes and they can also happen in low-lying areas away from water bodies in locations where the ground water is near the earth’s surface.
- *Tectonic Deformation*: A change in the original shape of a material caused by stress and strain.
- *Tsunami*: A sea wave of local or distant origin that results from large-scale seafloor displacements associated with large earthquakes, major sub-marine slides, or exploding volcanic islands.
- *Seiche*: The sloshing of a closed body of water, such as a lake or bay, from earthquake shaking (USGS 2012a).

Extent

An earthquake’s magnitude and intensity are used to describe the size and severity of the event. Magnitude describes the size at the focus of an earthquake and intensity describes the overall felt severity of shaking during the event. The earthquake’s magnitude is a measure of the energy released at the source of the earthquake and is expressed by ratings on the Richter scale and/or the moment magnitude scale. The Richter Scale measures magnitude of earthquakes and has no upper limit; however, it is not used to express damage (USGS 2014). Table



5.4.1-1 presents the Richter scale magnitudes and corresponding earthquake effects. The moment magnitude scale (MMS) is used to describe the size of an earthquake. It is based on the seismic moment and is applicable to all sizes of earthquakes (USGS 2012). It is used by seismologists to measure the size of earthquakes in terms of the energy released. The Richter Scale is not commonly used anymore, as it has been replaced by the MMS which is a more accurate measure of the earthquake size (USGS 2014). The Richter Scale is described below.

Table 5.4.1-1. Richter Magnitude Scale

Richter Magnitude	Earthquake Effects
2.5 or less	Usually not felt, but can be recorded by seismograph
2.5 to 5.4	Often felt, but causes only minor damage
5.5 to 6.0	Slight damage to buildings and other structures
6.1 to 6.9	May cause a lot of damage in very populated areas
7.0 to 7.9	Major earthquake; serious damage
8.0 or greater	Great earthquake; can totally destroy communities near the epicenter

Source: Michigan Tech University Date Unknown

The intensity of an earthquake is based on the observed effects of ground shaking on people, buildings, and natural features, and varies with location. The Modified Mercalli (MMI) scale expresses intensity of an earthquake and describes how strong a shock was felt at a particular location in values. Table 5.4.1-2 summarizes earthquake intensity as expressed by the Modified Mercalli scale. Table 5.4.1-3 displays the MMI scale and its relationship to the areas Peak Ground Acceleration (PGA).

Table 5.4.1-2. Modified Mercalli Intensity Scale

Mercalli Intensity	Shaking	Description
I	Not Felt	Not felt except by a very few under especially favorable conditions.
II	Weak	Felt only by a few persons at rest, especially on upper floors of buildings.
III	Weak	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Light	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Moderate	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Strong	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Very Strong	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Severe	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Violent	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Extreme	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

Source: USGS 2014



Table 5.4.1-3. Modified Mercalli Intensity and PGA Equivalents

Modified Mercalli Intensity	Acceleration (%g) (PGA)	Perceived Shaking	Potential Damage
I	< .17	Not Felt	None
II	.17 – 1.4	Weak	None
III	.17 – 1.4	Weak	None
IV	1.4 – 3.9	Light	None
V	3.9 – 9.2	Moderate	Very Light
VI	9.2 – 18	Strong	Light
VII	18 – 34	Very Strong	Moderate
VIII	34 – 65	Severe	Moderate to Heavy
IX	65-124	Violent	Heavy
X	>124	Extreme	Very Heavy

Source: Freeman et al. (Purdue University) 2004

Note: PGA Peak Ground Acceleration

PGA expresses the severity of an earthquake and is a measure of how hard the earth shakes, or accelerates, in a given geographic area. PGA is expressed as a percent acceleration force of gravity (%g). For example, 1.0%g PGA in an earthquake (an extremely strong ground motion) means that objects accelerate sideways at the same rate as if they had been dropped from the ceiling. 10%g PGA means that the ground acceleration is 10% that of gravity (NJOEM 2011). Damage levels experienced in an earthquake vary with the intensity of ground shaking and with the seismic capacity of structures, as noted in Table 5.4.1-4.

Table 5.4.1-4. Damage Levels Experienced in Earthquakes

Ground Motion Percentage	Explanation of Damages
1-2%g	Motions are widely felt by people; hanging plants and lamps swing strongly, but damage levels, if any, are usually very low.
Below 10%g	Usually causes only slight damage, except in unusually vulnerable facilities.
10 - 20%g	May cause minor-to-moderate damage in well-designed buildings, with higher levels of damage in poorly designed buildings. At this level of ground shaking, only unusually poor buildings would be subject to potential collapse.
20 - 50%g	May cause significant damage in some modern buildings and very high levels of damage (including collapse) in poorly designed buildings.
≥50%g	May causes higher levels of damage in many buildings, even those designed to resist seismic forces.

Source: NJOEM 2011

Note: %g Peak Ground Acceleration

National maps of earthquake shaking hazards have been produced since 1948. They provide information essential to creating and updating the seismic design requirements for building codes, insurance rate structures, earthquake loss studies, retrofit priorities and land use planning used in the U.S. Scientists frequently revise these maps to reflect new information and knowledge. Buildings, bridges, highways and utilities built to meet modern seismic design requirements are typically able to withstand earthquakes better, with less damages and disruption. After thorough review of the studies, professional organizations of engineers update the seismic-risk maps and seismic design requirements contained in building codes (Brown et al., 2001).

The USGS updated the National Seismic Hazard Maps in 2014, which superseded the 2008 maps. New seismic, geologic, and geodetic information on earthquake rates and associated ground shaking were incorporated into these revised maps. The 2014 map represents the best available data as determined by the USGS. According to the data, Warren County has a PGA between 3%g and 5%g. (USGS 2014). The 2014 PGA map can be found at <http://earthquake.usgs.gov/hazards/products/conterminous/2014/2014pga10pct.pdf>.

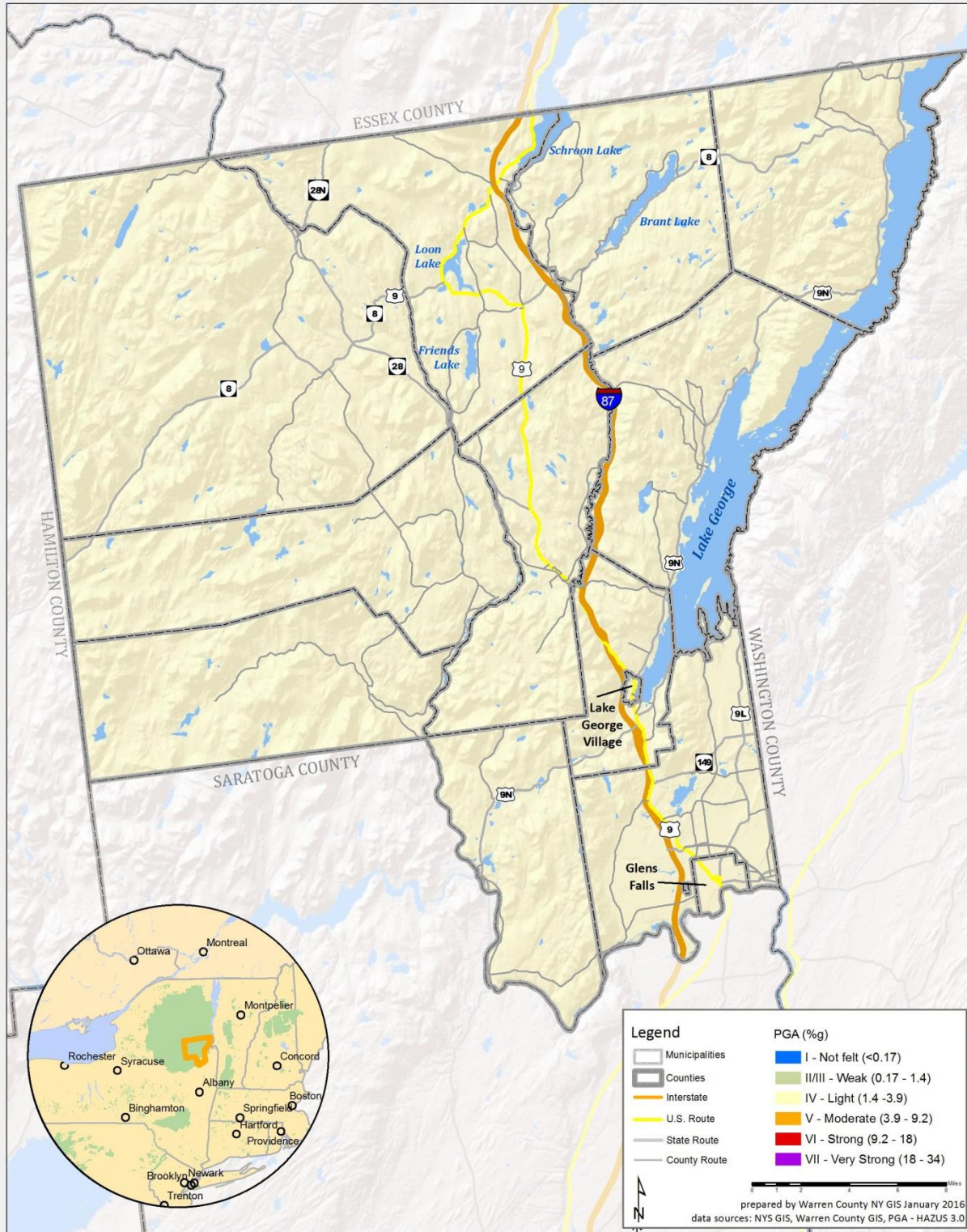


Section 5.4.1: Risk Assessment – Earthquake

A probabilistic assessment was conducted for the 100-, 500- and 2,500-year mean return periods (MRP) in HAZUS-MH 2.2 to analyze the earthquake hazard for Warren County. The HAZUS analysis evaluates the statistical likelihood that a specific event will occur and what consequences will occur. Figure 5.4.1-1 through Figure 5.4.1-3 illustrates the geographic distribution of PGA (g) across the County or 100-, 500- and 2,500-year MRP events by Census-tract.



Figure 5.4.1-1. Peak Ground Acceleration 100-Year Mean Return Period for Warren County



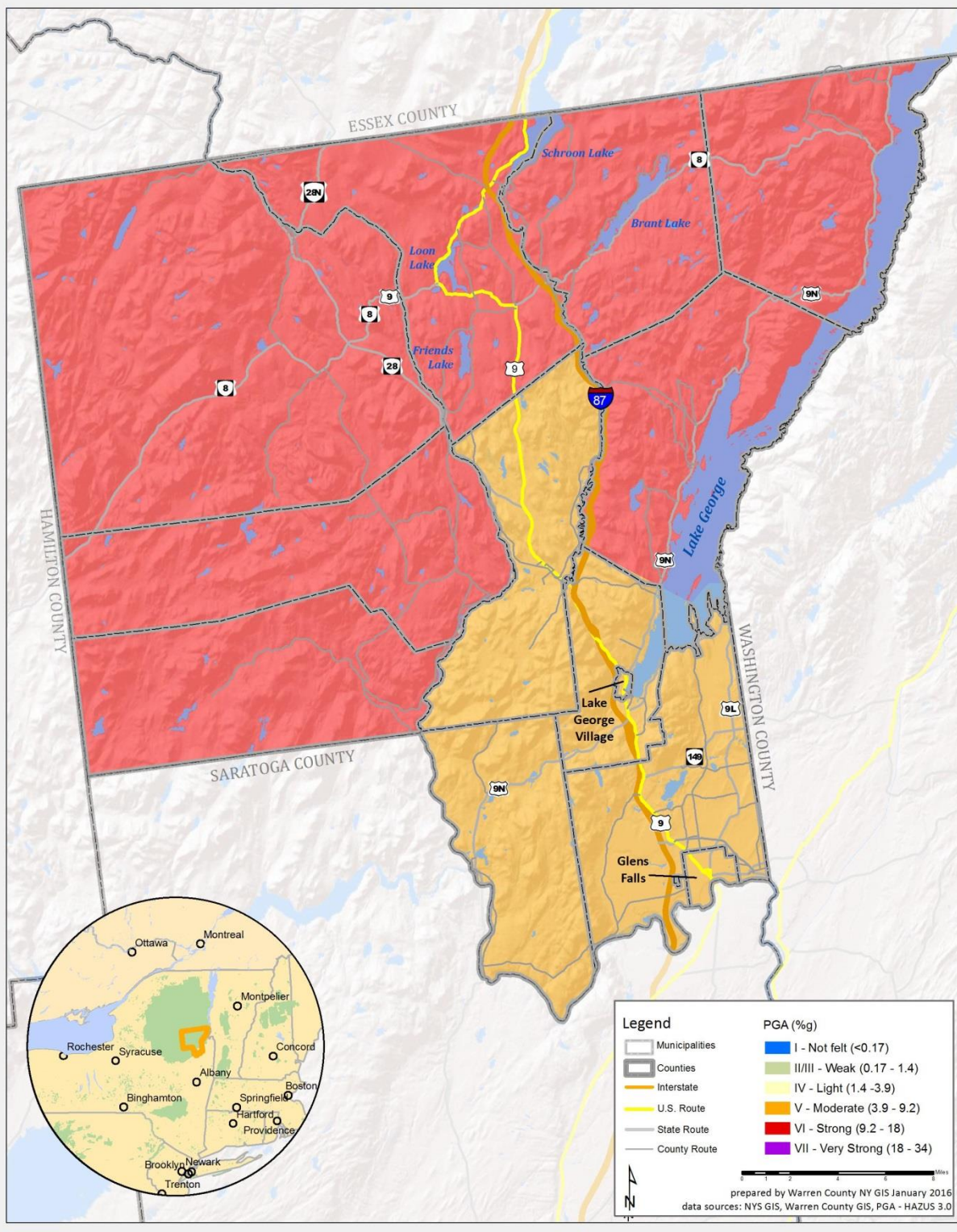
Source: HAZUS-MH 3.0

Note: The peak ground acceleration for the 100-year MRP is 2.7 to 3.2%g





Figure 5.4.1-2. Peak Ground Acceleration 500-Year Mean Return Period for Warren County

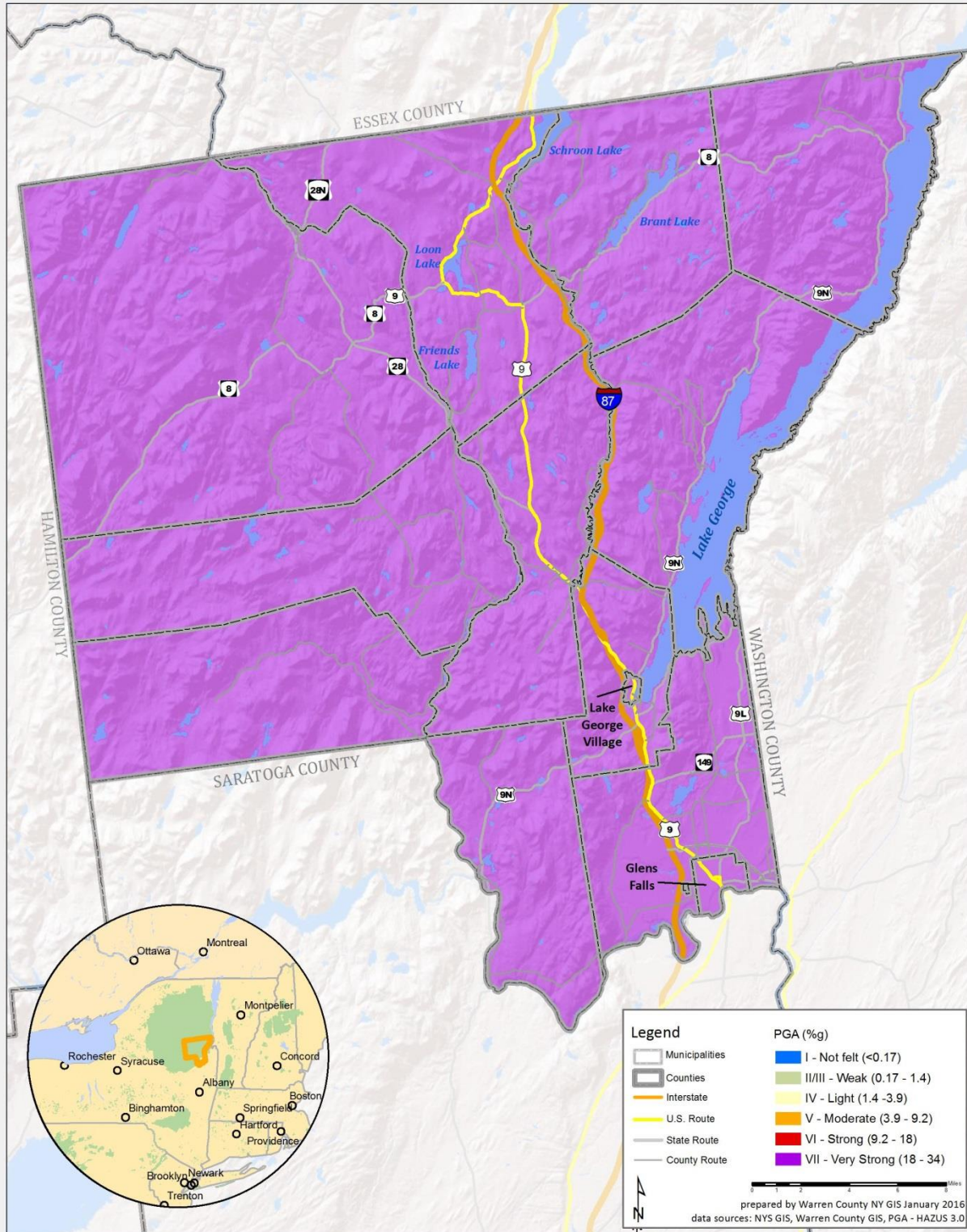


Source: HAZUS-MH 3.0
 Note: The peak ground acceleration for the 500-year MRP is 7.9 to 11.7%g





Figure 5.4.1-3. Peak Ground Acceleration 2,500-Year Mean Return Period for Warren County



Source: HAZUS-MH 3.0

Note: The peak ground acceleration for the 2500-year MRP is 20.6 to 32.6%g





The New York State Geological Survey conducted seismic shear-wave tests of the State’s surficial geology (glacial deposits). Based on these test results, the surficial geologic materials of New York State were categorized according to the National Earthquake Hazard Reduction Program’s (NEHRP) Soil Site Classifications. The NEHRP developed five soil classifications defined by their shear-wave velocity that impact the severity of an earthquake. The soil classification system ranges from A to E, as noted in Table 5.4.1-5, where A represents hard rock that reduces ground motions from an earthquake and E represents soft soils that amplify and magnify ground shaking and increase building damage and losses. Class E soils include water-saturated mud and artificial fill. The strongest amplification of shaking due is expected for this soil type. Seismic waves travel faster through hard rock than through softer rock and sediments. As the waves pass from harder to softer rocks, the waves slow down and their amplitude increases. Shaking tends to be stronger at locations with softer surface layers where seismic waves move more slowly. Ground motion above an unconsolidated landfill or soft soils can be more than 10 times stronger than at neighboring locations on rock for small ground motions (FEMA 2014).

Table 5.4.1-5. NEHRP Soil Classifications

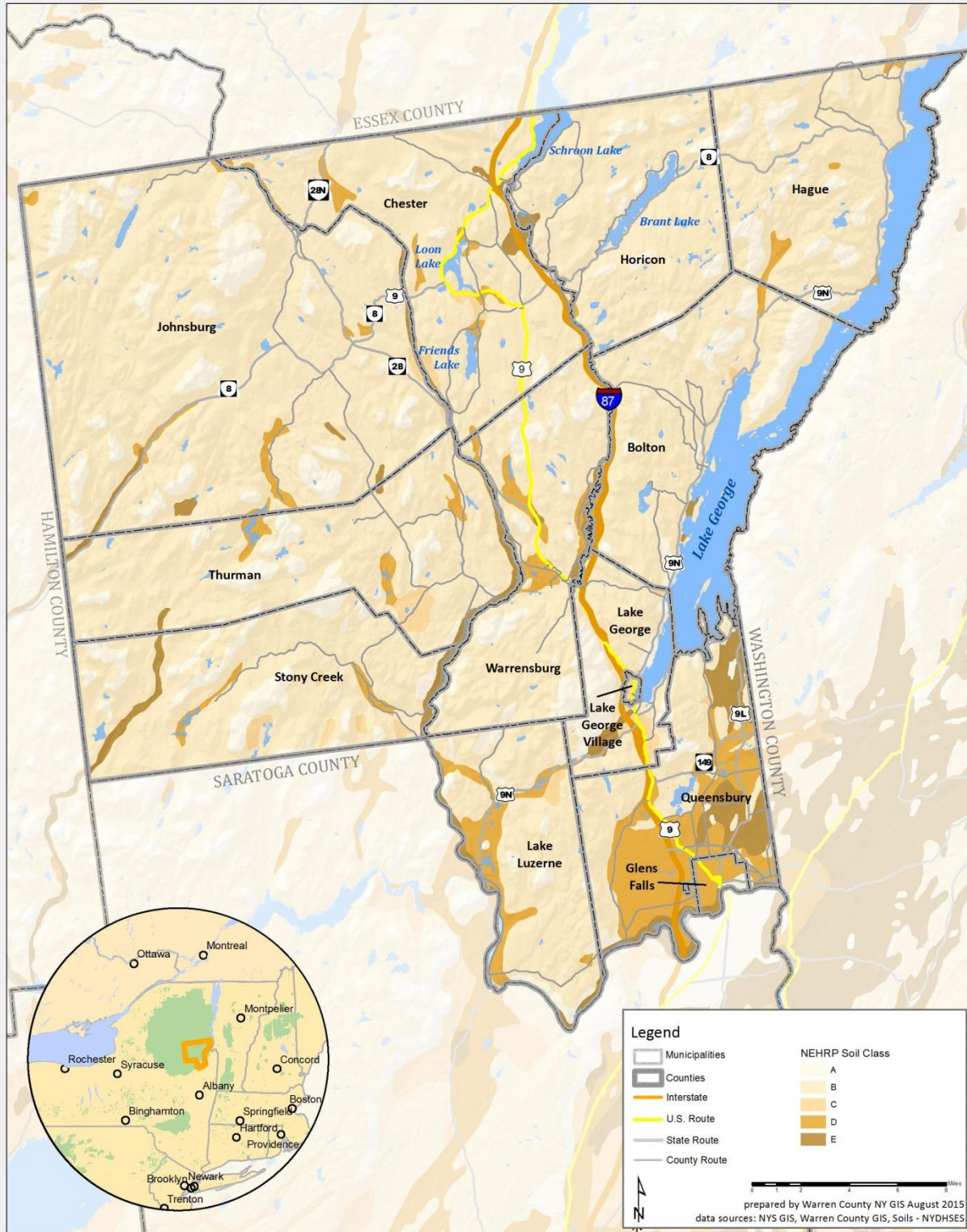
Soil Classification	Description
A	Hard Rock
B	Rock
C	Very dense soil and soft rock
D	Stiff soils
E	Soft soils

Source: FEMA 2013

Figure 5.4.1-4 illustrates the NEHRP soils located throughout Warren County. The data was available from the NYS DHSES. The available NEHRP soils information is incorporated into the HAZUS-MH earthquake model for the risk assessment (discussed in further detail later in this section). According to this figure, Warren County is predominately underlain by rock.



Figure 5.4.1-4. NEHRP Soils in Warren County



Source: NYSDHSES, 2014

Note: Warren County contains primarily B and A soil types.





Location

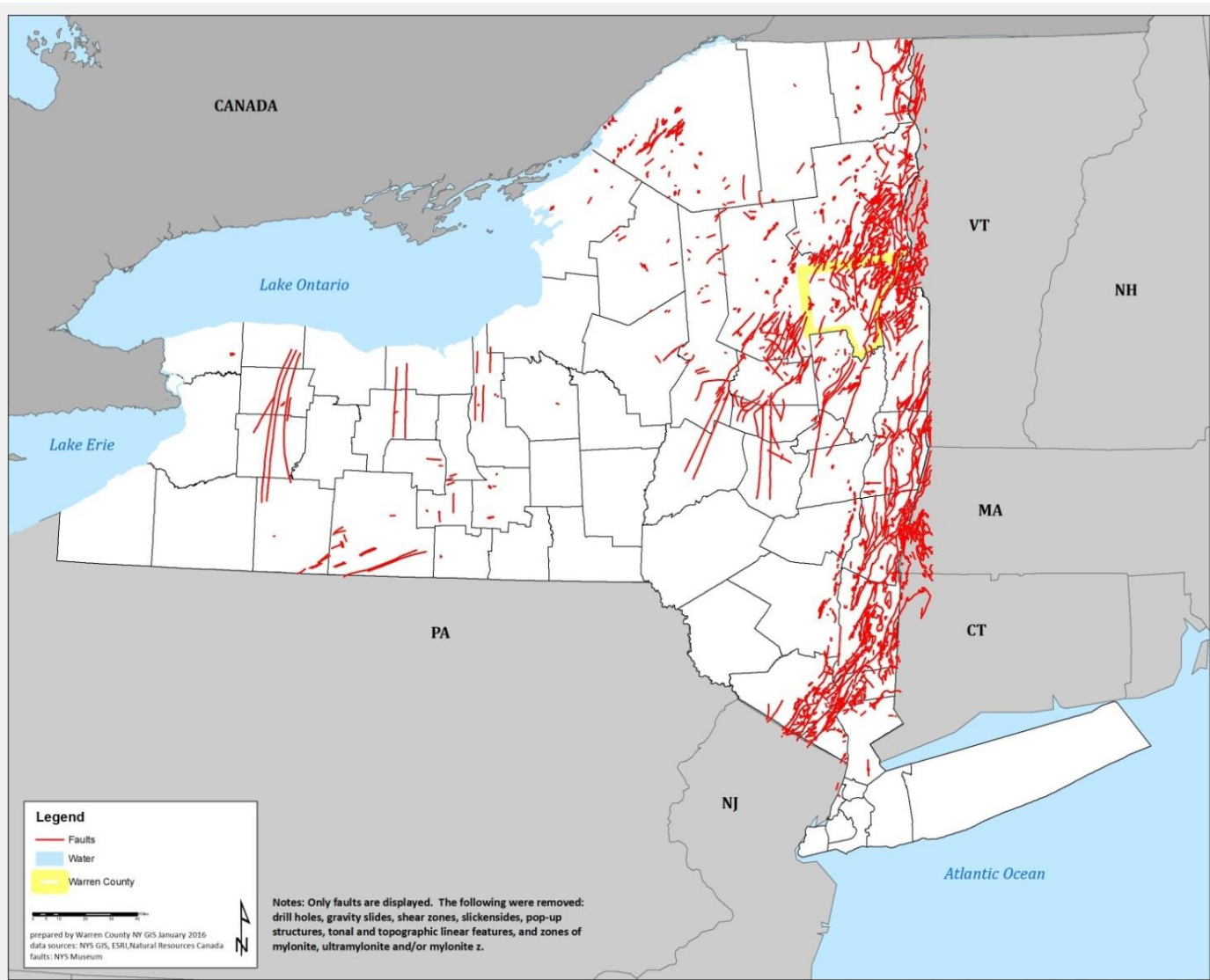
As noted in the NYS HMP, the importance of the earthquake hazard in New York State is often underestimated because other natural hazards (for example, hurricanes and floods) occur more frequently and because major floods and hurricanes have occurred more recently than a major earthquake event (NYS DHSES 2011). However, the potential for earthquakes exists across all of New York State and the entire northeastern U.S. The New York City Area Consortium for Earthquake Loss Mitigation (NYCEM) ranks New York State as having the third highest earthquake activity level east of the Mississippi River (Tantala et al., 2003).

There are three general regions in New York State that have a higher seismic risk compared to other parts of the State. These regions are: 1) the north and northeast third of the State, which includes the North Country/Adirondack region and a portion of the greater Albany-Saratoga region; 2) the southeast corner, which includes the greater New York City area and western Long Island; and 3) the northwest corner, which includes Buffalo and its surrounding area. Overall, these three regions are the most seismically active areas of the State, with the north-northeast portion having the higher seismic risk and the northwest corner of the State has the lower seismic risk (NYS DHSES 2014).

Fractures or fracture zones along with rocks on adjacent sides have broken and moved upward, downward, or horizontally are known as faults (Volkert and Witte 2015). Movement can take place at faults and cause an earthquake. There are numerous faults throughout New York State. Figure 5.4.1-5 illustrates the faults relative to Warren County (New York State Museum 2012). According to this figure, there are numerous fault lines that run throughout and surrounding the County.



Figure 5.4.1-5. Faults in Warren County



Source: New York State Museum 2012
Note: Warren County is outlined in yellow

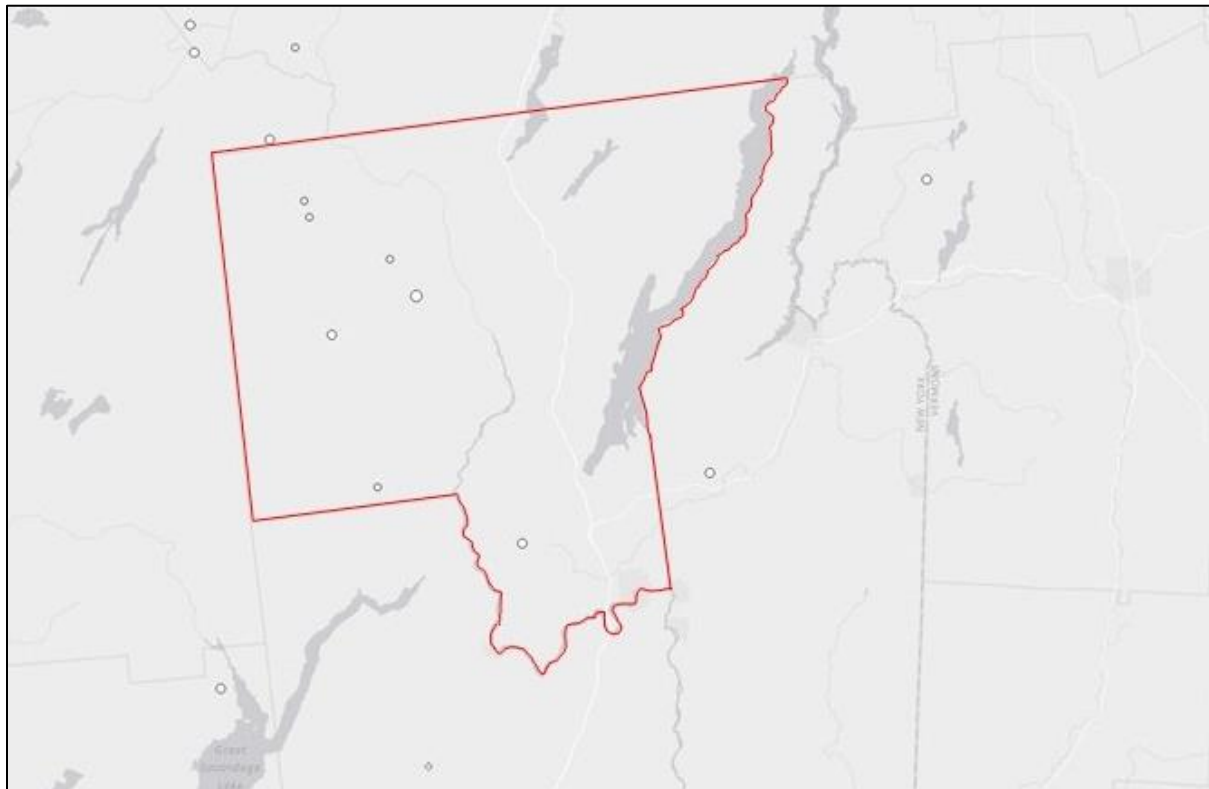




The Lamont-Doherty Cooperative Seismographic Network (LCSN) monitors earthquakes that occur primarily in the northeastern United States. The goal of the project is to compile a complete earthquake catalog for this region, to assess the earthquake hazards, and to study the causes of the earthquakes in the region. The LCSN operates 52 seismographic stations in the following seven states: Connecticut, Delaware, Maryland, New Jersey, New York, Pennsylvania, and Vermont. There are no seismic stations in Warren County; however, there are several within the vicinity of the County (LCSN 2014). In addition to the Lamont-Doherty Seismic Stations, the USGS operates a global network of seismic stations to monitor seismic activity. While no seismic stations are located in New York State, nearby stations are positioned in State College, Pennsylvania and Oak Ridge, Massachusetts.

Figure 5.4.1-6 illustrates historic earthquake epicenters in and surrounding Warren County between 1950 and 2015. According to this figure, there have been seven earthquakes with epicenters in Warren County (October 1984, January 2012, August 2013, November 2013, July 2014, February 2015, and May 2015). In addition to these earthquakes in Warren County, there have been numerous events originating outside of New York State that have been felt within the State. According to the NYS HMP, such events are considered significant for hazard mitigation planning because they could produce damage within the State in certain situations (NYS DHSES 2014). For details regarding these events, please refer to Table 5.4.1-6.

Figure 5.4.1-6. Earthquake Epicenters in Warren County and the Surrounding Area, 1950 – 2016



Source: USGS 2016

Note: Warren County is outlined in red.

Previous Occurrences and Losses

Many sources provided historical information regarding previous occurrences and losses associated with earthquakes throughout New York State. Therefore, with so many sources reviewed for the purpose of this HMP, loss and impact information for many events could vary depending on the sources. According to the New York



State 2014 HMP, between 1973 and 2012, 189 earthquakes were epicentered in New York State. Of those 189 earthquakes, four were reported in Warren County.

Between 1954 and 2016, New York State was included in one earthquake-related major disaster (DR) or emergency (EM) declaration. Generally, these disasters cover a wide region of the State; therefore, they may have impacted many counties. However, not all counties were included in the disaster declaration. Warren County was included in the disaster declaration (DR-1415) for an earthquake that occurred on April 20, 2002 (FEMA, 2014).

For this HMP, known earthquakes events that have impacted New York State and Warren County between 2002 and 2016 are identified in Table 5.4.1-6. Many sources were researched for historical information regarding earthquake events in Warren County; therefore, Table 5.4.1-6 may not include all earthquake events that have impacted the County.



Table 5.4.1-6. Earthquake Events Impacting Warren County Between 2002 and 2016

Dates of Event	Event Type	Location	FEMA Declaration Number	County Designated?	Losses / Impacts
April 20, 2002	Earthquake 5.1	Au Sable Forks	DR-1415	Yes	Approximately 12 residents throughout the County reported specific damage to WCDER, including cracked foundations and walls, structural damage, broken doors and windows, and septic system and other utility damage.
July 24, 2007	Earthquake 3.1	East Berne, NY	N/A	N/A	No reference and/or no damage reported.
February 27, 2008	Earthquake 2.7	Howes Cave, NY	N/A	N/A	No reference and/or no damage reported.
February 18, 2009	Earthquake 2.7	East Berne, NY	N/A	N/A	No reference and/or no damage reported.
February 20, 2009	Earthquake 2.7	Berne, NY	N/A	N/A	No reference and/or no damage reported.
February 23, 2009	Earthquake 2.1	Berne, NY	N/A	N/A	No reference and/or no damage reported.
March 22, 2009	Earthquake 2.8	Berne, NY	N/A	N/A	No reference and/or no damage reported.
May 18, 2009	Earthquake 3.0	Berne, NY	N/A	N/A	No reference and/or no damage reported.
October 21, 2009	Earthquake 2.9	East Berne, NY	N/A	N/A	No reference and/or no damage reported.
December 13, 2009	Earthquake 3.1	Berne, NY	N/A	N/A	No reference and/or no damage reported.
June 24, 2010	Earthquake	Ottawa, Canada	N/A	N/A	An earthquake centered north of Ottawa, Canada was felt in the Hudson Valley and elsewhere in New York State and across a wide swath of the northeast United States. There were reports of people having felt the event in Warren County, New York. Chestertown residents reported having felt it. There were no reports of injuries or damages in the County.
August 23, 2011	Earthquake 5.8	Mineral, Virginia	DR-4044 (Washington D.C.) DR-4022 (Virginia)	No	A 5.8 earthquake occurred during the afternoon of August 23 rd when a fault near Mineral, VA ruptured. It damaged older buildings, shut down much of Washington D.C. and impacted people from New England to the Carolinas. Many buildings in Virginia and Washington D.C. were damaged as a result of this event.
January 23, 2012	Earthquake 2.3	New York	N/A	N/A	No reference and/or no damage reported.
August 25, 2013	Earthquake 2.7	6 miles S/SE of Warrensburg, NY	N/A	N/A	The USGS confirmed a minor earthquake occurred in the Glens Falls area on the morning of August 25 th . The 2.7 earthquake was centered approximately 6 miles south/southeast of Warrensburg. Residents of Glens



Dates of Event	Event Type	Location	FEMA Declaration Number	County Designated?	Losses / Impacts
					Falls, Queensbury, Lake George, Lake Luzerne area all reported having felt the earthquake.
July 24, 2014	Earthquake 1.6	9 miles NW of Hadley, NY	N/A	N/A	No reference and/or no damage reported.
November 13, 2014	Earthquake 1.6	13 miles NW of Warrensburg, NY	N/A	N/A	No reference and/or no damage reported.
February 2, 2015	Earthquake 1.9	19 miles NW of Warrensburg, NY	N/A	N/A	No reference and/or no damage reported.
May 25, 2015	Earthquake 1.3	19 miles NW of Warrensburg, NY	N/A	N/A	No reference and/or no damage reported.

Source(s): NYS DHSES 2014; USGS 2015; FEMA 2016
DR Major Disaster Declaration (FEMA)
FEMA Federal Emergency Management Agency
N/A Not Applicable
NY New York
USGS U.S. Geological Survey



Probability of Future Events

Earthquake hazard maps illustrate the distribution of earthquake shaking levels that have a certain probability of occurring over a given time period. According to the USGS, in 2014 (the date of the most recent analysis), Warren County had a PGA of 3-5%g for earthquakes with a 10-percent probability of occurring within 50 years.

The NYS DHSES indicates that the earthquake hazard in New York State is often understated because other natural hazards occur more frequently (for example: hurricanes, tornadoes and flooding) and are much more visible. However, the potential for earthquakes does exist across the entire northeastern U.S., and New York State is no exception (NYS DHSES 2014).

Table 5.4.1-7. Probability of Future Occurrence of Earthquake Events

Hazard Type	Number of Occurrences Between 1950 and 2015	Rate of Occurrence	Recurrence Interval (in years)	Probability of event Occurring in Any Given Year	% Chance of Occurring in Any Given Year
Earthquake with Epicenter inside County	7	0.11	9.43	0.11	10.61
Earthquakes within the vicinity of the County	15	0.23	4.40	0.23	22.73
Total:	22	0.34	3.00	0.33	33.33

Source: USGS 2015

Earlier in this section, the identified hazards of concern for Warren County were ranked. NYS DHSES conducts a similar ranking process for hazards that affect the State. The probability of occurrence, or likelihood of the event, is one parameter used for ranking hazards. Based on historical records and input from the Planning Committee, the probability of occurrence for earthquakes in the County is considered ‘occasional’ (likely to occur within 100 years, as presented in Table 5.3-3). It is anticipated that the County will experience indirect impacts from earthquakes that may affect the general building stock, local economy and may induce secondary hazards such as ignite fires and cause utility failure.

Impact of Climate Change

The impacts of global climate change on earthquake probability are unknown. Some scientists say that melting glaciers could induce tectonic activity. As ice melts and water runs off, tremendous amounts of weight are shifted on the earth’s crust. As newly freed crust returns to its original, pre-glacier shape, it could cause seismic plates to slip and stimulate volcanic activity according to research into prehistoric earthquakes and volcanic activity. NASA and USGS scientists found that retreating glaciers in southern Alaska may be opening the way for future earthquakes (NASA 2004).

Secondary impacts of earthquakes could be magnified by climate change. Soils saturated by repetitive storms could experience liquefaction during seismic activity due to the increased saturation. Dams storing increased volumes of water due to changes in the hydrograph could fail during seismic events. There are currently no models available to estimate these impacts.



5.4.1.2 Vulnerability Assessment

To understand risk, a community must evaluate what assets are exposed or vulnerable in the identified hazard area. For the earthquake hazard, the entire County has been identified as exposed. Therefore, all assets in Warren County (population, structures, critical facilities and lifelines), as described in the County Profile (Section 4), are potentially vulnerable. The following section includes an evaluation and estimation of the potential impact of the earthquake hazard on Warren County including the following:

- Overview of vulnerability
- Data and methodology used for the evaluation
- Impact on: (1) life, health and safety of residents, (2) general building stock, (3) critical facilities, (4) economy, and (5) future growth and development
- Change of vulnerability as compared to that presented in the 2011 Warren County Hazard Mitigation Plan
- Effect of climate change on vulnerability
- Further data collections that will assist understanding this hazard over time

Overview of Vulnerability

Earthquakes usually occur without warning and can impact areas a great distance from their point of origin. The extent of damage depends on the density of population and building and infrastructure construction in the area shaken by the quake. Some areas may be more vulnerable than others based on soil type, the age of the buildings and building codes in place. Compounding the potential for damage – historically, Building Officials Code Administration (BOCA) used in the Northeast were developed to address local concerns including heavy snow loads and wind; seismic requirements for design criteria are not as stringent compared to the west coast’s reliance on the more seismically-focused Uniform Building Code). As such, a smaller earthquake in the Northeast can cause more structural damage than if it occurred out west.

The entire population and general building stock inventory of the County is at risk of being damaged or experiencing losses due to impacts of an earthquake. Potential losses associated with the earth shaking were calculated for Warren County for three probabilistic earthquake events, the 100-year, 500- and 2,500-year mean return periods (MRP). The impacts on population, existing structures, critical facilities and the economy within Warren County are presented below, following a summary of the data and methodology used.

Data and Methodology

A probabilistic assessment was conducted for Warren County for the 100-, 500- and 2,500-year MRPs through a Level 2 analysis in HAZUS-MH 3.0 to analyze the earthquake hazard and provide a range of loss estimates for Warren County. The probabilistic method uses information from historic earthquakes and inferred faults, locations and magnitudes, and computes the probable ground shaking levels that may be experienced during a recurrence period by Census tract. According to the New York City Area Consortium for Earthquake Loss Mitigation (NYCEM), probabilistic estimates are best for urban planning, land use, zoning and seismic building code regulations (NYCEM, 2003). The default assumption is a magnitude 7 earthquake for all return periods. In addition, an annualized loss run was also conducted in HAZUS-MH 3.0 to estimate the annualized general building stock dollar losses for Warren County.

Ground shaking is the primary cause of earthquake damage to man-made structures and soft soils amplify ground shaking. One contributor to the site amplification is the velocity at which the rock or soil transmits shear waves (S-waves). The NEHRP developed five soil classifications defined by their shear-wave velocity that impact the severity of an earthquake. The soil classification system ranges from A to E, where A represents hard rock that



reduces ground motions from an earthquake and E represents soft soils that amplify and magnify ground shaking and increase building damage and losses.

As illustrated in Figure 5.4.1-4 earlier in this section, Warren County is made up primarily of very hard rock (A) and rock or firm ground (B); areas of dense soil/soft rock (C), stiff/soft soils (D), and soft soils (E) are located primarily in Glens Falls and Queensbury, and along the Hudson River. When unchanged, HAZUS-MH default soil types are class “D”. However, for this analysis HAZUS-MH was updated with the specific NEHRP soil types for Warren County as provided by NYS DHSES.

In addition to the probabilistic scenarios mentioned, an annualized loss run was conducted in HAZUS 3.0 to estimate the annualized general building stock dollar losses for the County. The annualized loss methodology combines the estimated losses associated with ground shaking for eight return periods: 100, 250, 500, 750, 1000, 1500, 2000, 2500-year, which are based on values from the USGS seismic probabilistic curves. Annualized losses are useful for mitigation planning because they provide a baseline upon which to 1) compare the risk of one hazard across multiple jurisdictions and 2) compare the degree of risk of all hazards for each participating jurisdiction.

As noted in the HAZUS-MH Earthquake User Manual ‘*Uncertainties are inherent in any loss estimation methodology. They arise in part from incomplete scientific knowledge concerning earthquakes and their effects upon buildings and facilities. They also result from the approximations and simplifications that are necessary for comprehensive analyses. Incomplete or inaccurate inventories of the built environment, demographics and economic parameters add to the uncertainty. These factors can result in a range of uncertainty in loss estimates produced by the HAZUS Earthquake Model, possibly at best a factor of two or more.*’ However, HAZUS’ potential loss estimates are acceptable for the purposes of this HMP.

The occupancy classes available in HAZUS-MH 3.0 were condensed into the following categories (residential, commercial, industrial, agricultural, religious, government, and educational) to facilitate the analysis and the presentation of results. Residential loss estimates address both multi-family and single family dwellings. Impacts to critical facilities and utilities were also evaluated.

Data used to assess this hazard include data available in the HAZUS-MH 3.0 earthquake model, USGS data, data provided by NYS DHSES, professional knowledge, and information provided by the County’s Planning Committee.

Impact on Life, Health and Safety

Overall, the entire population of Warren County is exposed to the earthquake hazard event. The impact of earthquakes on life, health and safety is dependent upon the severity of the event. Risk to public safety and loss of life from an earthquake in Warren County is minimal with higher risk occurring in buildings as a result of damage to the structure, or people walking below building ornamentation and chimneys that may be shaken loose and fall as a result of the quake.

Populations considered most vulnerable are those located in/near the built environment, particularly near unreinforced masonry construction. In addition, the vulnerable population includes the elderly (persons over the age of 65) and individuals living below the Census poverty threshold. These socially vulnerable populations are most susceptible, based on a number of factors including their physical and financial ability to react or respond during a hazard and the location and construction quality of their housing. Refer to Section 4 (County Profile) for the vulnerable population statistics in Warren County.

An exposure analysis was performed using the NEHRP soils data and the 2010 Census population data. The sum of the population by Census Block within the NEHRP class “D” and “E” soil types were calculated and



summarized in Table 5.4.1-8 below. Overall, although only 9.4% of the county’s land area is classified as “D” and “E” soil types, because these soils lie primarily under the population centers of Glens Falls and Queensbury, approximately 63.6% of the County’s population is located on these two classes of soil.

Table 5.4.1-8. Approximate Population within NEHRP ‘D’ and ‘E’ Soils

Municipality	Total Population (2010 Census)	Population NEHRP Class "D" and "E" Soils	
		Number	%
Bolton	2,488	116	4.7%
Chester	3,341	197	5.9%
Glens Falls	14,700	13,856	94.3%
Hague	699	13	1.9%
Horicon	1,402	22	1.6%
Johnsburg	2,396	52	2.2%
Lake George	3,316	28	0.8%
Lake Luzerne	3,347	1,613	48.2%
Queensbury	27,924	23,780	85.2%
Stony Creek	765	109	14.2%
Thurman	1,219	45	3.7%
Warrensburg	4,110	1,936	47.1%
TOTAL	65,707	41,767	63.6%

Sources: NYS DHSES 2014; U.S. Census 2010

Residents may be displaced or require temporary to long-term sheltering due to an earthquake event. The number of people requiring shelter is generally less than the number displaced as some displaced persons use hotels or stay with family or friends following a disaster event. Table 5.4.1-9 summarizes the households HAZUS-MH 2.2 estimates will be displaced and population that may require short-term sheltering as a result of the 100-, 500- and 2,500-year MRP earthquake events.

Table 5.4.1-9. Summary of Estimated Sheltering Needs for Warren County

Scenario	Displaced Households	Persons Seeking Short-Term Shelter
100-Year Earthquake	2	1
500-Year Earthquake	26	14
2,500-Year Earthquake	212	112

Source: HAZUS-MH 3.0

According to the 1999-2003 NYCEM Summary Report (*Earthquake Risks and Mitigation in the New York / New Jersey / Connecticut Region*), there is a strong correlation between structural building damage and the number of injuries and casualties from an earthquake event. Further, the time of day also exposes different sectors of the community to the hazard. For example, HAZUS considers the residential occupancy at its maximum at 2:00 a.m., where the educational, commercial and industrial sectors are at their maximum at 2:00 p.m., and peak commute time is at 5:00 p.m. Whether directly impacted or indirectly impact, the entire population will have to deal with the consequences of earthquakes to some degree. Business interruption could keep people from working, road closures could isolate populations, and loss of functions of utilities could impact



populations that suffered no direct damage from an event itself. There are no injuries or casualties estimated for the 100-year event.

Table 5.4.1-10 and Table 5.4.1-11 summarize the County-wide injuries and casualties estimated for the 500- and 2,500-year MRP earthquake event.

Table 5.4.1-10. Estimated Number of Injuries and Casualties from the 500-Year MRP Earthquake Event.

Level of Severity	Time of Day		
	2:00 AM	2:00 PM	5:00 PM
Injuries	8	9	7
Hospitalization	1	1	1
Casualties	0	0	0

Source: HAZUS-MH 3.0

Table 5.4.1-11. Estimated Number of Injuries and Casualties from the 2,500-Year MRP Earthquake Event

Level of Severity	Time of Day		
	2:00 AM	2:00 PM	5:00 PM
Injuries	49	65	50
Hospitalization	9	13	10
Casualties	2	2	2

Source: HAZUS-MH 3.0

Impact on General Building Stock

After considering the population vulnerable to the earthquake hazard, the value of general building stock exposed to and damaged by 100-, 500- and 2,500-year MRP earthquake events was evaluated. In addition, annualized losses were calculated using HAZUS-MH 3.0. The entire County’s general building stock is considered at risk and exposed to this hazard.

As stated earlier, soft soils (NEHRP soil classed D and E) can amplify ground shaking to damaging levels even in a moderate earthquake (NYCEM, 2003). Therefore, buildings located on NEHRP soil classes D and E have an increased risk of damages from an earthquake. Table 5.4.1-12 summarizes the approximate number and value of buildings in Warren County on the approximately located NEHRP soils classed D and E. Numbers were calculated using 2010 census blocks, with HAZUS demographics, whose centroids fall within areas of D and E soils.

Table 5.4.1-12. Number and Improvement Value of Buildings within NEHRP ‘D’ and ‘E’ Soils

Municipality	Total Number of Buildings	Total Improvement (Value of Structure and Contents)	Buildings NEHRP Class "D" and "E" Soils		
			Number	Improvement	% of Total Improvement
Bolton	2,575	\$960,513,000	252	\$79,580,000	8.3%
Chester	2,668	\$800,772,000	200	\$70,135,000	8.8%
Glens Falls	5,483	\$3,290,154,000	5,216	\$3,065,337,000	93.2%
Hague	1,136	\$400,664,000	32	\$9,794,000	2.4%



Table 5.4.1-12. Number and Improvement Value of Buildings within NEHRP ‘D’ and ‘E’ Soils

Municipality	Total Number of Buildings	Total Improvement (Value of Structure and Contents)	Buildings NEHRP Class "D" and "E" Soils		
			Number	Improvement	% of Total Improvement
Horicon	1,907	\$589,719,000	17	\$4,881,000	0.8%
Johnsburg	1,762	\$563,005,000	60	\$22,210,000	3.9%
Lake George	1,949	\$712,923,000	16	\$5,102,000	0.7%
Lake George Village	623	\$397,549,000	0	0	0%
Lake Luzerne	2,215	\$743,990,000	1,208	\$429,925,000	57.8%
Queensbury	11,858	\$5,897,513,000	9,257	\$4,497,931,000	76.3%
Stony Creek	603	\$143,567,000	84	\$18,944,000	13.2%
Thurman	818	\$328,601,000	123	\$173,947,000	52.9%
Warrensburg	1,974	\$647,352,000	858	\$327,728,000	50.6%
TOTAL	35,571	\$15,476,322,000	17,323	\$8,705,514,000	56.3%

Sources: NYS DHSES 2008, Warren County, HAZUS 3.0

Note: RCV is the estimated replacement cost value of both structure and contents.

According to NYCEM, where earthquake risks and mitigation were evaluated in the New York, New Jersey and Connecticut region, most damage and loss caused by an earthquake is directly or indirectly the result of ground shaking (NYCEM, 2003). NYCEM indicates there is a strong correlation between PGA and the damage a building might experience. The HAZUS-MH model is based on the best available earthquake science and aligns with these statements. HAZUS-MH 3.0 methodology and model were used to analyze the earthquake hazard for the general building stock for Warren County. See Figure 5.4.1-1 through Figure 5.4.1-3 earlier in this profile which illustrate the geographic distribution of PGA (g) across the County for 100-, 500- and 2,500-year MRP events at the Census-Tract level.

In addition, according to NYCEM, a building’s construction determines how well it can withstand the force of an earthquake. The NYCEM report indicates that un-reinforced masonry buildings are most at risk during an earthquake because the walls are prone to collapse outward, whereas steel and wood buildings absorb more of the earthquake’s energy. Additional attributes that contribute to a building’s capability to withstand an earthquake’s force include its age, number of stories and quality of construction. HAZUS-MH considers building construction and the age of buildings as part of the analysis.

Potential building damage was evaluated by HAZUS-MH 3.0 across the following damage categories (none, slight, moderate, extensive and complete). Table 5.4.1-13 provides definitions of these five categories of damage for a light wood-framed building; definitions for other building types are included in HAZUS-MH technical manual documentation. General building stock damage for these damage categories by occupancy class and building type on a County-wide basis is summarized below for the 100-, 500- and 2,500-year events.

Table 5.4.1-13. Example of Structural Damage State Definitions for a Light Wood-Framed Building

Damage Category	Description
Slight	Small plaster or gypsum-board cracks at corners of door and window openings and wall-ceiling intersections; small cracks in masonry chimneys and masonry veneer.
Moderate	Large plaster or gypsum-board cracks at corners of door and window openings; small diagonal cracks across shear wall panels exhibited by small cracks in stucco and gypsum wall panels; large cracks in brick chimneys; toppling of tall masonry chimneys.
Extensive	Large diagonal cracks across shear wall panels or large cracks at plywood joints; permanent lateral movement of floors and roof; toppling of most brick chimneys; cracks in foundations; splitting of wood sill



Damage Category	Description
	plates and/or slippage of structure over foundations; partial collapse of room-over-garage or other soft-story configurations.
Complete	Structure may have large permanent lateral displacement, may collapse, or be in imminent danger of collapse due to cripple wall failure or the failure of the lateral load resisting system; some structures may slip and fall off the foundations; large foundation cracks.

Source: HAZUS-MH Technical Manual

Table 5.4.1-14 shows the estimated buildings damaged by occupancy class for both the 100- and 500-year MRP earthquake events. Table 5.4.1-13 shows the estimated buildings damaged by occupancy class for the 2,500-year MRP earthquake event.

Table 5.4.1-16 and Table 5.4.1-17 summarize the damage estimated for the 100-, 500- and 2,500-year MRP earthquake events by municipality. Damage loss estimates include structural and non-structural damage to the building and loss of contents.



Table 5.4.1-14. Estimated Buildings Damaged by General Occupancy for 100-year and 500-year MRP Earthquake Events

Category	Average Damage State									
	100-Year MRP					500-Year MRP				
	None	Slight	Moderate	Extensive	Complete	None	Slight	Moderate	Extensive	Complete
Residential	32,558	219	54	4	0	30,704	1,595	477	54	6
Commercial	1,889	21	6	1	0	1,733	125	50	7	1
Industrial	478	5	0	0	0	438	31	13	2	0
Agriculture, Education, Government, Religion	348	4	2	0	0	321	22	9	1	0

Source: HAZUS-MH 3.0

Table 5.4.1-15. Estimated Buildings Damaged by General Occupancy for 2,500-year MRP Earthquake Events

Category	Average Damage State				
	2,500-Year MRP				
	None	Slight	Moderate	Extensive	Complete
Residential	24,159	5,609	2,481	514	74
Commercial	1,144	386	298	78	10
Industrial	282	94	82	22	3
Agriculture, Education, Government, Religion	220	68	59	15	1

Source: HAZUS-MH 3.0



Table 5.4.1-16. Estimated Value (Building and Contents) Damaged by the 100-, 500- and 2,500-Year MRP Earthquake Events

Municipality	Total Improvement (Structure and Contents)	Estimated Total Damages*				Percent of Total Building and Contents **			
		Annualized Loss	100-Year	500-Year	2,500-Year	Annualized Loss	100-Year	500-Year	2,500-Year
Bolton	\$960,513,000	\$28,229	\$152,759	\$2,624,552	\$20,866,833	<1%	<1%	<1%	2.2%
Chester	\$800,772,000	\$33,571	\$155,010	\$3,017,067	\$24,484,586	<1%	<1%	<1%	3.1%
Glens Falls	\$3,290,154,000	\$80,141	\$424,898	\$7,126,053	\$56,222,937	<1%	<1%	<1%	1.7%
Hague and Horicon***	\$990,393,000	\$30,511	\$168,673	\$2,889,908	\$22,563,207	<1%	<1%	<1%	2.3%
Johnsburg	\$563,005,000	\$27,972	\$110,837	\$2,421,568	\$20,186,533	<1%	<1%	<1%	3.6%
Lake George	\$1,110,472,000	\$29,277	\$160,779	\$2,659,712	\$21,251,565	<1%	<1%	<1%	1.9%
Lake Luzerne	\$743,990,000	\$16,566	\$94,218	\$1,545,487	\$12,279,456	<1%	<1%	<1%	1.7%
Queensbury	\$5,897,513,000	\$136,863	\$770,680	\$12,521,301	\$98,420,339	<1%	<1%	<1%	1.7%
Stony Creek and Thurman***	\$472,168,000	\$15,111	\$68,745	\$1,319,145	\$10,933,884	<1%	<1%	<1%	2.3%
Warrensburg	\$647,352,000	\$20,426	\$106,882	\$1,822,240	\$14,748,961	<1%	<1%	<1%	2.3%
TOTAL	\$15,476,322,000	\$418,659	\$2,213,481	\$37,947,033	\$301,958,301	<1%	<1%	<1%	2.0%

Source: HAZUS-MH 3.0

Notes: *Total Damages is sum of damages for all occupancy classes (residential, commercial, industrial, agricultural, educational, religious, and government).

***Figures are reported in HAZUS by census tract. Hague and Horicon comprise a single census tract, as do Stony Creek and Thurman

Table 5.4.1-17. Estimated Value (Building and Contents) Damaged by the 100-, 500-, and 2,500-Year MRP Earthquake Events

Municipality	Total Improvement (Building and Contents)	Estimated Residential Damage			Estimated Commercial Damage		
		100-Year	500-Year	2,500-Year	100-Year	500-Year	2,500-Year
Bolton	\$960,513,000	\$127,839	\$2,158,234	\$17,110,463	\$20,811	\$389,155	\$3,139,286
Chester	\$800,772,000	\$123,437	\$2,325,882	\$19,015,052	\$18,772	\$401,006	\$3,170,069
Glens Falls	\$3,290,154,000	\$213,559	\$3,368,693	\$26,005,228	\$164,946	\$2,922,306	\$23,578,868
Hague and Horicon*	\$990,393,000	\$152,019	\$2,571,380	\$20,041,928	\$9,984	\$181,152	\$1,435,062
Johnsburg	\$563,005,000	\$85,862	\$1,781,212	\$15,052,533	\$15,222	\$364,511	\$2,936,000
Lake George	\$1,110,472,000	\$121,296	\$1,943,496	\$15,426,742	\$30,013	\$581,230	\$4,438,750
Lake Luzerne	\$743,990,000	\$77,846	\$1,251,882	\$9,879,780	\$10,744	\$191,702	\$1,572,845
Queensbury	\$5,897,513,000	\$511,866	\$8,056,102	\$62,493,482	\$203,428	\$3,401,610	\$27,330,640





Table 5.4.1-17. Estimated Value (Building and Contents) Damaged by the 100-, 500-, and 2,500-Year MRP Earthquake Events

Municipality	Total Improvement (Building and Contents)	Estimated Residential Damage			Estimated Commercial Damage		
		100-Year	500-Year	2,500-Year	100-Year	500-Year	2,500-Year
Stony Creek and Thurman*	\$472,168,000	\$40,432	\$678,372	\$5,568,856	\$25,363	\$581,230	\$4,871,371
Warrensburg	\$647,352,000	\$73,601	\$1,198,277	\$9,638,055	\$24,274	\$446,815	\$3,665,651
TOTAL	\$15,476,322,000	\$1,527,757	\$25,333,530	\$200,232,119	\$523,557	\$9,424,000	\$76,138,542

Source: HAZUS-MH 3.0

Note: Figures are reported in HAZUS by census tract. Hague and Horicon comprise a single census tract, as do Stony Creek and Thurman



HAZUS-MH estimated over \$2.2 million in damages to the building stock as a result of the 100-year earthquake event. It is also estimated that there would be nearly \$38 million in damages to buildings in the County as a result of a 500-year earthquake event. This includes structural damage, non-structural damage and loss of contents, representing less than one-percent of the total replacement value for general building stock in Warren County. For a 2,500-year MRP earthquake event, HAZUS-MH estimates over \$302 million, nearly two-percent of the total general building stock replacement value. Residential and commercial buildings account for most of the damage for earthquake events.

Earthquakes can cause secondary hazard events such as fires. HAZUS-MH estimates there will be no ignitions anticipated as a result of the 100-, 500-, and 2,500-year MRP events.

Impact on Critical Facilities

After considering the general building stock exposed to, and damaged by, 100-, 500- and 2,500-year MRP earthquake events, critical facilities were evaluated. All critical facilities (essential facilities, transportation systems, lifeline utility systems, high-potential loss facilities and user-defined facilities) in Warren County are considered exposed and potentially vulnerable to the earthquake hazard. Refer to subsection “Critical Facilities” in Section 4 (County Profile) of this Plan for a complete inventory of critical facilities in the County.

To estimate critical facility exposure to the potential impacts of an earthquake an exposure analysis was performed using the NEHRP soils data to determine the critical facility’s location in relation to these areas. The critical facilities and utilities in the areas were calculated and summarized in Table 5.4.1-18 below.



Table 5.4.1-18. Number of Critical Facilities Located in the NEHRP Soil Class D and E

Municipality	Facility Types																	
	Dam	DPW	EOC	Fire/EMS	Government	Library	Medical	Police	Post Office	Potable Pump	Rail Facility	School	Senior	Potable Storage	Town Hall	Well	Wastewater Pump	Wastewater Treatment
Bolton							3											
Chester	2	1							1	1		1				1		
Glens Falls		1		2	1	1		1	1	5		8	4		1			
Hague																		
Horicon																		
Johnsburg									1		1							
Lake George																		1
Lake Luzerne	6			1		1			1			3			1			
Queensbury	5	1	3	9	6		4	2	1	3		5	6	4	1			
Stony Creek	1	1		1		1			1		1		1		1			
Thurman											1							
Warrensburg	1				6				1			1	2					
TOTAL	15	4	3	13	13	3	7	3	7	9	3	18	13	4	4	1	0	1

Source: NYS DHSES, 2008, Warren County, NYSGIS

Note: DPW = Department of Public Works

EMS = Emergency Medical Services



HAZUS-MH 3.0 estimates the probability that critical facilities may sustain damage as a result of 100-, 500- and 2,500-year MRP earthquake events. Additionally, HAZUS-MH estimates percent functionality for each facility days after the event. Table 5.4.1-19 through Table 5.4.1-21 list the percent probability of critical facilities sustaining the damage category as defined by the column heading and percent functionality after the event for the 100-, 500- and 2,500-year MRP earthquake events.

Table 5.4.1-19. Estimated Damage and Loss of Functionality for Critical Facilities and Utilities in for the 100-Year MRP Earthquake Event

Name	Percent Probability of Sustaining Damage					Percent Functionality			
	None	Slight	Moderate	Extensive	Complete	Day 1	Day 7	Day 30	Day 90
Critical Facilities									
Medical	96%	3%	1%	0%	0%	96%	99%	100%	100%
Police	96%	3%	1%	0%	0%	96%	99%	100%	100%
Fire	96%	3%	1%	0%	0%	96%	99%	100%	100%
EOC	96%	3%	1%	0%	0%	96%	99%	100%	100%
School	96%	3%	1%	0%	0%	96%	99%	100%	100%
Utilities									
Wastewater	100%	0%	0%	0%	0%	100%	100%	100%	100%

Source: HAZUS-MH 3.0

Table 5.4.1-20. Estimated Damage and Loss of Functionality for Critical Facilities and Utilities for the 500-Year MRP Earthquake Event

Name	Percent Probability of Sustaining Damage					Percent Functionality			
	None	Slight	Moderate	Extensive	Complete	Day 1	Day 7	Day 30	Day 90
Critical Facilities									
Medical	83%	10%	5%	1%	0%	83%	93%	99%	99%
Police	82%	10%	5%	1%	0%	82%	93%	99%	99%
Fire	80%	12%	6%	1%	0%	80%	92%	98%	99%
EOC	81%	12%	6%	1%	0%	81%	92%	99%	99%
School	82%	11%	6%	1%	0%	82%	93%	99%	99%
Utilities									
Wastewater	82%	16%	2%	0%	0%	87%	100%	100%	100%

Source: HAZUS-MH 3.0

Table 5.4.1-21. Estimated Damage and Loss of Functionality for Critical Facilities and Utilities for the 2,500-Year MRP Earthquake Event

Name	Percent Probability of Sustaining Damage					Percent Functionality			
	None	Slight	Moderate	Extensive	Complete	Day 1	Day 7	Day 30	Day 90
Critical Facilities									
Medical	59%	20%	15%	5%	1%	59%	79%	94%	97%
Police	56%	21%	16%	5%	2%	56%	77%	93%	96%
Fire	49%	22%	19%	7%	2%	49%	71%	90%	94%
EOC	53%	22%	18%	6%	2%	53%	74%	92%	95%
School	56%	21%	16%	5%	2%	56%	77%	93%	96%
Utilities									
Wastewater	24%	43%	27%	5%	0%	41%	92%	95%	99%

Source: HAZUS-MH 2.2



Impact on Economy

Earthquakes also have impacts on the economy, including: loss of business function, damage to inventory, relocation costs, wage loss and rental loss due to the repair/replacement of buildings. A Level 2 HAZUS-MH analysis estimates the total economic loss associated with each earthquake scenario, which includes building- and lifeline-related losses (transportation and utility losses) based on the available inventory (facility [or GIS point] data only). Direct building losses are the estimated costs to repair or replace the damage caused to the building. This is reported in the “Impact on General Building Stock” subsection discussed earlier in this section. Lifeline-related losses include the direct repair cost to transportation and utility systems and are reported in terms of the probability of reaching or exceeding a specified level of damage when subjected to a given level of ground motion. Additionally, economic loss includes business interruption losses associated with the inability to operate a business due to the damage sustained during the earthquake as well as temporary living expenses for those displaced. These losses are discussed below.

For the 100-year event, HAZUS-MH 2.2 estimates \$1.1 million in income loss (wage, rental, relocation and capital-related losses) and \$2.22 million in capital stock losses (structural, non-structural, content and inventory losses). It is significant to note that for the 500-year event, HAZUS-MH 2.2 estimates the County will incur \$10.6 million in income losses (wage, rental, relocation and capital-related losses) in addition to the 500-year event structural, non-structural, content and inventory losses (\$38 million).

For the 2,500-year event, HAZUS-MH 2.2 estimates the County will incur approximately \$76.5 million in income losses, mainly to the residential and commercial occupancy classes associated with wage, rental, relocation and capital-related losses. In addition, the 2,500-year event structural, non-structural, content and inventory losses equate to greater than an estimated \$300 million.

Roadway segments and railroad tracks may experience damage due to ground failure and regional transportation and distribution of these materials will be interrupted as a result of an earthquake event. Losses to the community that result from damages to lifelines can be much greater than the cost of repair (HAZUS-MH 2.2 Earthquake User Manual, 2012).

Earthquake events can significantly impact road bridges. These are important because they often provide the only access to certain neighborhoods. Since softer soils can generally follow floodplain boundaries, bridges that cross watercourses should be considered vulnerable. A key factor in the degree of vulnerability will be the age of the facility or infrastructure, which will help indicate to which standards the facility was built. HAZUS-MH estimates the long-term economic impacts to the County for 15-years after the earthquake event. In terms of the transportation infrastructure, HAZUS-MH estimates \$350 thousand in direct repair costs to highway bridges as a result of the 500- and \$11 million in direct costs as a result of the 2,500-year event; HAZUS-MH estimates no long-term economic impacts as a result of the 100-year event.

HAZUS-MH 3.0 also estimates the volume of debris that may be generated as a result of an earthquake event to enable the study region to prepare and rapidly and efficiently manage debris removal and disposal. Debris estimates are divided into two categories: (1) reinforced concrete and steel that require special equipment to break it up before it can be transported, and (2) brick, wood and other debris that can be loaded directly onto trucks with bulldozers (HAZUS-MH Earthquake User’s Manual).

For the 100-year MRP event, HAZUS-MH 3.0 estimates less than 100 tons of brick and wood debris and around 200 tons of concrete and steel debris will be generated. For the 500-year MRP event, HAZUS-MH 3.0 estimates greater than 15 thousand tons of debris will be generated. For the 2,500-year MRP event, HAZUS-MH 3.0 estimates approximately 92 thousand tons of debris will be generated.



Table 5.4.1-22. Estimated Debris Generated by the 500- and 2,500-year MRP Earthquake Events

Municipality	500-Year		2,500-Year	
	Brick/Wood (tons)	Concrete/Steel (tons)	Brick/Wood (tons)	Concrete/Steel (tons)
Bolton	746	266	3,387	2,437
Chester	844	311	4,471	3,143
Glens Falls	2,239	953	9,430	8,501
Hague and Horicon	808	255	3,833	2,269
Johnsburg	663	287	3,757	3,108
Lake George	826	323	3,715	2,982
Lake Luzerne	486	157	2,204	1,358
Queensbury	3,807	1,480	16,535	13,120
Stony Creek and Thurman	358	143	1,866	1,486
Warrensburg	628	247	3,096	2,457
TOTAL	11,408	4,423	52,295	40,860

Source: HAZUS-MH 3.0

Future Growth and Development

It is anticipated that the human exposure and vulnerability to earthquake impacts in newly developed areas will be similar to those that currently exist within the County. Current building codes require seismic provisions that should render new construction less vulnerable to seismic impacts than older, existing construction that may have been built to lower construction standards.

New development located in areas with softer NEHRP soil classes may be more vulnerable to the earthquake hazard.

Change of Vulnerability

Warren County continues to be vulnerable to the earthquake hazard. The HAZUS-MH model was not used to estimate potential earthquake losses for the previous HMP. The best available data were used for the 2016 HMP update; probabilistic scenarios were evaluated using HAZUS-MH and updated critical facility inventories were developed and utilized.

Effect of Climate Change on Vulnerability

Providing projections of future climate change for a specific region is challenging. Some scientists feel that melting glaciers could induce tectonic activity. As ice melts and water runs off, tremendous amounts of weight are shifted on the Earth’s crust. As newly freed crust returns to its original, pre-glacier shape, it could cause seismic plates to slip and stimulate volcanic activity according to research into prehistoric earthquakes and volcanic activity. National Aeronautics and Space Administration (NASA) and USGS scientists found that retreating glaciers in southern Alaska might be opening the way for future earthquakes.

Secondary impacts of earthquakes could be magnified by future climate change. Soils saturated by repetitive storms could experience liquefaction during seismic activity because of the increased saturation. Dams storing increased volumes of water from changes in the hydrograph could fail during seismic events. There are currently no models available to estimate these impacts.



Additional Data and Next Steps

A Level 2 HAZUS-MH earthquake analysis was conducted for Warren County using the default model data, with the exception of the updated critical facility inventories which included user-defined data, and NEHRP soil data. Additional data needed to further refine the County’s vulnerability assessment include: (1) updated demographic data to update the default data in HAZUS-MH; and (2) soil liquefaction data. Additionally, the County can identify un-reinforced masonry critical facilities and privately-owned buildings (i.e., residences) using local knowledge and/or Pictometry/orthophotos. These buildings may not withstand earthquakes of certain magnitudes and plans to provide emergency response/recovery efforts for these properties can be set in place. Further mitigation actions include training of County and municipal personnel to provide post-hazard event rapid visual damage assessments, increase of County and local debris management and logistic capabilities, and revised regulations to prevent additional construction of non-reinforced masonry buildings.



5.4.2 Flood

The following section provides the hazard profile (hazard description, location, extent, previous occurrences and losses, probability of future occurrences, and impact of climate change) and vulnerability assessment for the flood hazard in Warren County.

5.4.2.1 Profile

Hazard Description

Floods are one of the most common natural hazards in the U.S. They can develop slowly over a period of days or develop quickly, with disastrous effects that can be local (impacting a neighborhood or community) or regional (affecting entire river basins, coastlines and multiple counties or states) (Federal Emergency Management Agency [FEMA], 2008). Most communities in the U.S. have experienced some kind of flooding, after spring rains, heavy thunderstorms, coastal storms, or winter snow thaws (George Washington University, 2001).

Floods are the most frequent and costly natural hazards in New York State in terms of human hardship and economic loss, particularly to communities that lie within flood prone areas or flood plains of a major water source. As defined in the NYS HMP (NYS DHSES, 2014), flooding is a general and temporary condition of partial or complete inundation on normally dry land from the following:

- Riverine overbank flooding;
- Flash floods;
- Alluvial fan floods;
- Mudflows or debris floods;
- Dam- and levee-break floods;
- Local draining or high groundwater levels;
- Fluctuating lake levels;
- Ice-jams; and
- Coastal flooding

For the purpose of this HMP and as deemed appropriate by the Warren County Steering Committee, riverine, ice jam, flash flood, urban/stormwater, dam failure and flooding due to beaver dams are the main flood types of concern for the County. These types of flooding are further discussed below.

Riverine (Inland) Flooding

Riverine floods are the most common flood type. They occur along a channel and include overbank and flash flooding. Channels are defined, ground features that carry water through and out of a watershed. They may be called rivers, creeks, streams, or ditches. When a channel receives too much water, the excess water flows over its banks and inundates low-lying areas (FEMA 2008; The Illinois Association for Floodplain and Stormwater Management 2006).

Flash floods are “a rapid and extreme flow of high water into a normally dry area, or a rapid water level rise in a stream or creek above a predetermined flood level, beginning within six hours of the causative event (e.g., intense rainfall, dam failure, ice jam). However, the actual time threshold may vary in different parts of the country. Ongoing flooding can intensify to flash flooding in cases where intense rainfall results in a rapid surge of rising flood waters” (National Weather Service [NWS] 2009).



Stormwater flooding described below is due to local drainage issues and high groundwater levels. Locally, heavy precipitation may produce flooding in areas other than delineated floodplains or along recognizable channels. If local conditions cannot accommodate intense precipitation through a combination of infiltration and surface runoff, water may accumulate and cause flooding problems. During winter and spring, frozen ground and snow accumulations may contribute to inadequate drainage and localized ponding. Flooding issues of this nature generally occur in areas with flat gradients and generally increase with urbanization which speeds the accumulation of floodwaters because of impervious areas. Shallow street flooding can occur unless channels have been improved to account for increased flows (FEMA 1997).

High groundwater levels can be a concern and cause problems even where there is no surface flooding. Basements are susceptible to high groundwater levels. Seasonally high groundwater is common in many areas, while elsewhere high groundwater occurs only after a long periods of above-average precipitation (FEMA 1997).

Urban drainage flooding is caused by increased water runoff due to urban development and drainage systems. Drainage systems are designed to remove surface water from developed areas as quickly as possible to prevent localized flooding on streets and other urban areas. They make use of a closed conveyance system that channels water away from an urban area to surrounding streams. This bypasses the natural processes of water filtration through the ground, containment, and evaporation of excess water. Since drainage systems reduce the amount of time the surface water takes to reach surrounding streams, flooding in those streams can occur more quickly and reach greater depths than prior to development in that area (FEMA 2008).

Ice Jam Flooding

An ice jam occurs when pieces of floating ice are carried with a stream's current and accumulate behind any obstruction to the stream flow. Obstructions may include river bends, mouths of tributaries, points where the river slope decreases, as well as dams and bridges. The water held back by this obstruction can cause flooding upstream, and if the obstruction suddenly breaks, flash flooding can occur as well (NOAA 2011). The formation of ice jams depends on the weather and physical condition of the river and stream channels. They are most likely to occur where the channel slope naturally decreases, in culverts, and along shallows where channels may freeze solid. Ice jams and resulting floods can occur during at different times of the year: fall freeze-up from the formation of frazil ice; mid-winter periods when stream channels freeze solid, forming anchor ice; and spring breakup when rising water levels from snowmelt or rainfall break existing ice cover into pieces that accumulate at bridges or other types of obstructions (NYS DHSES 2014).

There are two main types of ice jams: freeze-up and breakup. Freeze-up jams occur when floating ice may slow or stop due to a change in water slope as it reaches an obstruction to movement. Breakup jams occur during periods of thaw, generally in late winter and early spring. The ice cover breakup is usually associated with a rapid increase in runoff and corresponding river discharge due to a heavy rainfall, snowmelt or warmer temperatures (USACE 2002; NYS DHSES 2014).

Ice jams are common in the northeast U.S. and New York is not an exception. In fact, according to the USACE, New York State ranks second in the U.S. for total number of ice jam events, with over 1,500 incidents documented between 1867 and 2015. Areas of New York State that include characteristics leading to ice jam flooding include the northern counties of the Finger Lakes region and far western New York, the Mohawk Valley of central and eastern New York State, and the North Country (NYS DHSES 2013).

The Ice Jam Database, maintained by the Ice Engineering Group at the USACE Cold Regions Research and Engineering Laboratory (CRREL), currently consists of over 19,000 records from across the U.S. According to the USACE-CRREL, Warren County experienced 27 historic ice jam events between 1780 and 2015 (USACE 2015). Ice Jams typically have formed along the English Brook, Glen Creek, Hudson River, and Northwest Bay



Brook (USACE 2015). Historical events are further mentioned in the “Previous Occurrences” section of this hazard profile.

Dam Failure Flooding

A dam is an artificial barrier that has the ability to impound water, wastewater, or any liquid-borne material for the purpose of storage or control of water (FEMA, 2010). Dams are man-made structures built across a stream or river that impound water and reduce the flow downstream (FEMA, 2003). They are built for the purpose of power production, agriculture, water supply, recreation, and flood protection. Dam failure is any malfunction or abnormality outside of the design that adversely affect a dam’s primary function of impounding water (FEMA, 2011). Dams can fail for one or a combination of the following reasons:

- Overtopping caused by floods that exceed the capacity of the dam (inadequate spillway capacity);
- Prolonged periods of rainfall and flooding;
- Deliberate acts of sabotage (terrorism);
- Structural failure of materials used in dam construction;
- Movement and/or failure of the foundation supporting the dam;
- Settlement and cracking of concrete or embankment dams;
- Piping and internal erosion of soil in embankment dams;
- Inadequate or negligent operation, maintenance and upkeep;
- Failure of upstream dams on the same waterway; or
- Earthquake (liquefaction / landslides) (FEMA, 2010).

A break in a dam can produce extremely dangerous flood situations because of the high velocities and large volumes of water released by such a break. Sometimes they can occur with little to no warning. Breaching of dams often occurs within hours after the first visible sign of dam failure, leaving little or no time for evacuation (FEMA 2006).

According to the NYSDEC Division of Water Bureau of Flood Protection and Dam Safety, the hazard classification of a dam is assigned according to the potential impacts of a dam failure pursuant to 6 NYCRR Part 673.3 (NYSDEC, 2009). Dams are classified in terms of potential for downstream damage if the dam were to fail. These hazard classifications are identified and defined below:

- *Low Hazard (Class A)* is a dam located in an area where failure will damage nothing more than isolated buildings, undeveloped lands, or township or county roads and/or will cause no significant economic loss or serious environmental damage. Failure or mis-operation would result in no probable loss of human life. Losses are principally limited to the owner's property
- *Intermediate Hazard (Class B)* is a dam located in an area where failure may damage isolated homes, main highways, minor railroads, interrupt the use of relatively important public utilities, and/or will cause significant economic loss or serious environmental damage. Failure or mis-operation would result in no probable loss of human life, but can cause economic loss, environment damage, disruption of lifeline facilities, or impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.
- *High Hazard (Class C)* is a dam located in an area where failure may cause loss of human life, serious damage to homes, industrial or commercial buildings, important public utilities, main highways or railroads and/or will cause extensive economic loss. This is a downstream hazard classification for dams in which excessive economic loss (urban area including extensive community, industry, agriculture, or outstanding natural resources) would occur as a direct result of dam failure.



- *Negligible or No Hazard (Class D)* is a dam that has been breached or removed, or has failed or otherwise no longer materially impounds waters, or a dam that was planned but never constructed. Class "D" dams are considered to be defunct dams posing negligible or no hazard. The department may retain pertinent records regarding such dams.

According to the Dam Incident Notification (DIN) system maintained by the National Performance of Dam Program (NPDP), there are 42 dams in Warren County. Of the 42 dams, there are 13 classified as low hazard (Class A), 23 classified as significant hazard (Class B), and five classified as high hazard (Class C) (NPDP 2015). However, these numbers differ from the New York State Inventory of Dams, which identifies 81 dams in Warren County (40 Class A, 13 Class B, 8 class C and 20 Class D).

Flooding Due to Beaver Dams

The beaver is the largest rodent in North America and has a long history in New York State. Beavers construct dams which result in the formation of ponds. Within and around the pond formed by dams, the beaver constructs canals for security and to transport food and building materials. Beaver dams provide wildlife habitat for differ furbearer and waterfowl species. However, the beaver's dam building activity can result in widespread flooding of woodlands and agricultural land (NYS DEC 2015). Beavers can plug culvert pipes and create dams that impound water against roadbeds which may flood or wash out roads. This can damage the roadbed when they become saturated with water and settles (Jensen and Curtis 1999).

Location

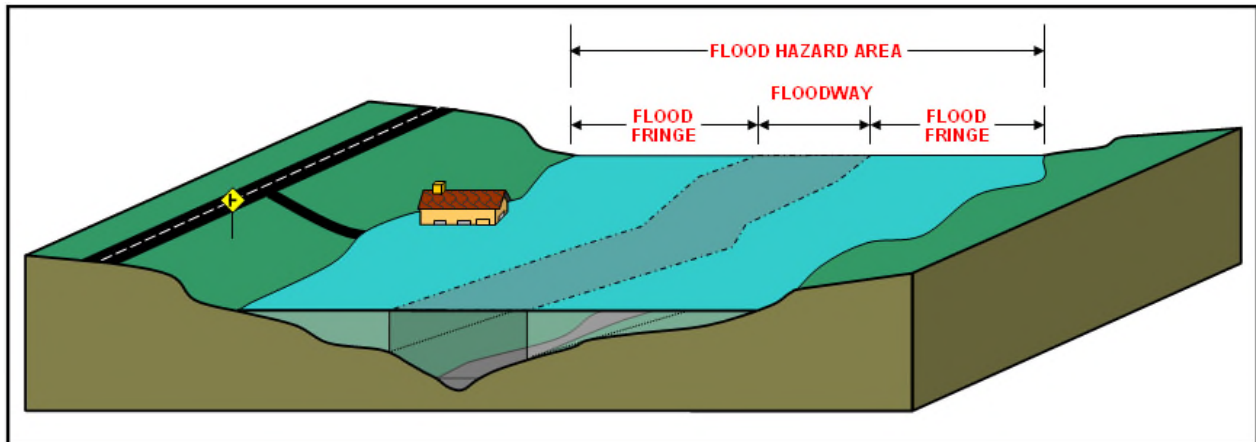
Flooding in Warren County occurs in two broad regions of the County: along the Schroon River in the Riverbank section and along the Hudson River where significant rainfall and rapid snowmelt led to considerable flooding of roadways. Flooding in the County also occurs in areas of beaver dams. Heavy rainfall has the potential to force the destruction of beaver dams on lakes, rivers and streams which leads to cascading effects of downstream flooding of roadways.

A floodplain is defined as the land adjoining the channel of a river, stream, ocean, lake, or other watercourse or water body that becomes inundated with water during a flood. Most often floodplains are referred to as 100-year floodplains. A 100-year floodplain is not a flood that will occur once every 100 years, rather it is a flood that has a 1% chance of being equaled or exceeded each year. Thus, the 100-year flood could occur more than once in a relatively short period of time. Due to this misleading term, FEMA has properly defined it as the 1% annual chance flood. This 1% annual chance flood is now the standard used by most federal and state agencies and by the NFIP (FEMA 2002). Similarly, the 500-year flood is more properly defined as the 0.2% annual chance flood.

Figure 5.4.2-1 depicts the flood hazard area, the flood fringe, and the floodway areas of a floodplain.



Figure 5.4.2-1. Floodplain

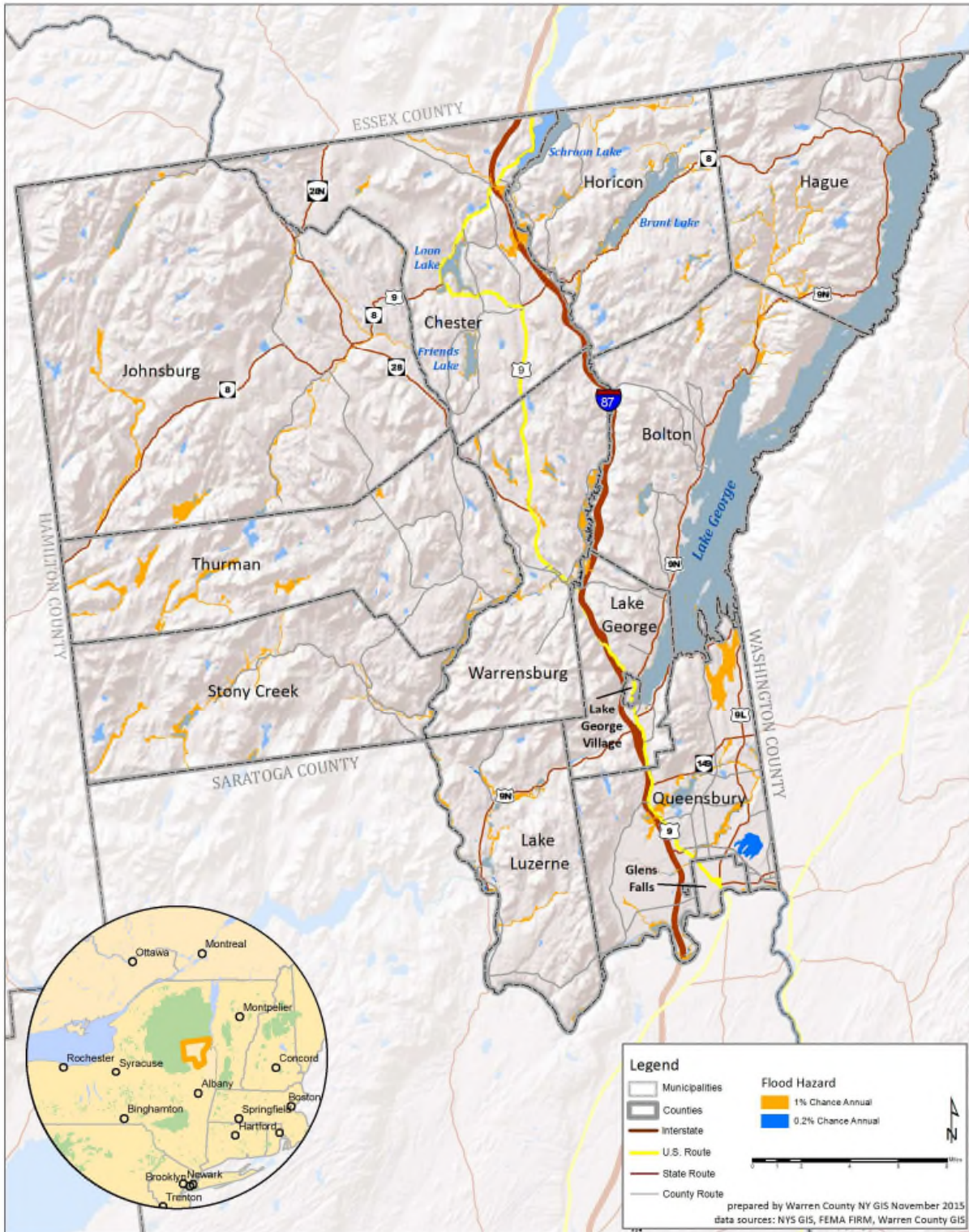


Source: NJDEP, Date Unknown

In Warren County, floodplains line the rivers and streams of the County. The boundaries of the floodplains are altered as a result of changes in land use, the amount of impervious surface, placement of obstructing structures in floodways, changes in precipitation and runoff patterns, improvements in technology for measuring topographic features, and utilization of different hydrologic modeling techniques. Figure 5.4.2-2 illustrates the FEMA flood hazard zones in Warren County. According to this figure, the 1% annual chance of flood hazard zones are located along the Sacandaga River, Schroon River, Hudson River, Stony Creek and southern Lake George.



Figure 5.4.2-2. FEMA Flood Hazard Areas in Warren County



Source: FEMA
 FEMA Federal Emergency Management Agency
 Note: Figure reflects total population of blocks with centroids in the flood zone





Please refer to Section 9 (Jurisdictional Annexes) for information regarding specific areas of flooding for each participating municipality in Warren County.

Extent

In the case of riverine flood hazard, once a river reaches flood stage, the flood extent or severity categories used by the NWS include minor flooding, moderate flooding, and major flooding. Each category has a definition based on property damage and public threat:

- Minor Flooding - minimal or no property damage, but possibly some public threat or inconvenience.
- Moderate Flooding - some inundation of structures and roads near streams. Some evacuations of people and/or transfer of property to higher elevations are necessary.
- Major Flooding - extensive inundation of structures and roads. Significant evacuations of people and/or transfer of property to higher elevations. (NWS 2011)

The severity of a flood depends not only on the amount of water that accumulates in a period of time, but also on the land's ability to manage this water. The size of rivers and streams in an area and infiltration rates are significant factors. When it rains, soil acts as a sponge. When the land is saturated or frozen, infiltration rates decrease and any more water that accumulates must flow as runoff (Harris 2001).

The frequency and severity of flooding are measured using a discharge probability, which is the probability that a certain river discharge (flow) level will be equaled or exceeded in a given year. Flood studies use historical records to determine the probability of occurrence for the different discharge levels. The flood frequency equals 100 divided by the discharge probability. For example, the 100-year discharge has a 1% chance of being equaled or exceeded in any given year. The “annual flood” is the greatest flood event expected to occur in a typical year. These measurements reflect statistical averages only; it is possible for two or more floods with a 100-year or higher recurrence interval to occur in a short time period. The same flood can have different recurrence intervals at different points on a river.

The extent of flooding associated with a 1% annual probability of occurrence (the base flood or 100-year flood) is used by the NFIP as the standard for floodplain management and to determine the need for flood insurance, as well as the regulatory flood boundary by many agencies. Also referred to as the Special Flood Hazard Area (SFHA), this boundary is a convenient tool for assessing vulnerability and risk in flood-prone communities. Many communities have maps that show the extent and likely depth of flooding for the base flood. Corresponding water-surface elevations describe the water elevation resulting from a given discharge level, which is one of the most important factors used in estimating flood damage. A structure located within a SFHA shown on an NFIP map has a 26% chance of suffering flood damage during the term of a 30-year mortgage.

The term “500-year flood” is the flood that has a 0.2% chance of being equaled or exceeded each year. The 500-year flood could occur more than once in a relatively short period of time. Statistically, the 0.2% (500-year) flood has a 6% chance of occurring during a 30-year period of time, the length of many mortgages. The 500-year floodplain is referred to as Zone X500 for insurance purposes on FIRMs. Base flood elevations or depths are not shown within this zone and insurance purchase is not required in this zone.

Previous Occurrences and Losses

Many sources provided flooding information regarding previous occurrences and losses associated with flooding events throughout Warren County. With so many sources reviewed for the purpose of this Hazard Mitigation Plan (HMP) update, loss and impact information for many events could vary depending on the source. Therefore,



the accuracy of monetary figures discussed is based only on the available information identified during research for this HMP update.

Between 1954 and 2015, FEMA included New York State in 54 flood-related major disaster (DR) or emergency (EM) declarations classified as one or a combination of the following disaster types: severe storms, flooding, hurricane, tropical depression, heavy rains, landslides, ice storm, high tides, Nor'Easter, tornado, snowstorm, severe winter storm, and inland/coastal flooding. Generally, these disasters cover a wide region of the State; therefore, they may have impacted many counties. Warren County was included in nine of these flood-related declarations.

For this 2015 Plan update, flood events were summarized from 2009 to 2015. Known flood events, including FEMA disaster declarations, which have impacted Warren County between 2009 and 2015 are identified in Table 5.4.2-1. Please see Section 9 for detailed information regarding impacts and losses to each municipality. For events prior to 2009, refer to the 2011 Warren County HMP.



Table 5.4.2-1. Flooding Events in Warren County, 2009 to 2015

Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
March 13-31, 2010	Severe Storms and Flooding	DR-1899	Yes	<p>Moderate to heavy rain fell across east-central New York State. The ground was already nearly saturated from recent snow melt, causing rivers and stream to run high.</p> <p>Flooding from this event caused damage to numerous roads in the northern section of Warren County. In the Town of Johnsbury, a bridge was reported washed out on Harrington Road due to a possible beaver dam break along Johnson Brook. Overall, the County had approximately \$25,000 in property damage from this event.</p>
October 1, 2010	Flooding (Remnants of Tropical Storm Nicole)	N/A	N/A	<p>The remnants of Tropical Storm Nicole brought very heavy rains to east-central New York State. Rainfall totals from this storm ranged from three to nine inches, resulting in widespread river and small stream and urban flooding, including water in basements. In Warren County, there was standing water reported in the City of Glens Falls at the intersection of Sherman Avenue and Elm Street due to the heavy rains.</p>
March 8-12, 2011	Ice Jam	N/A	N/A	<p>An ice jam began to form on March 7th near the Route 28N bridge in the hamlet of North Creek (Town of Johnsbury). The water that backed up from the ice jam began flooding Old River Road on March 10th, prompting the evacuation of some residents and forced the closing of the road. The water began to recede on March 13th when the ice jam release and moved downstream. As the ice jam moved down the river, it ripped trees from the river bank and then became lodged along the Route 418 bridge in the Town of Thurman on the evening of March 13th. Overall, damage was reported at the County fish hatchery in the Town of Warrensburg and damage to a recreational property from North Creek downstream to Lake Luzerne.</p>
April 28-30, 2011	Severe Storms, Flooding, Tornadoes, and Straight-Line Winds	DR-1993	Yes	<p>Heavy showers and thunderstorms impacted the western and central Mohawk Valley, Adirondack region, and the Upper Hudson River Valley, including the Lake George Region (Warren County). Thunderstorms produced severe weather and very heavy rainfall. The combination of the rainfall and rapid snowmelt due to warm temperatures led to increased runoff and rapid river rises.</p> <p>In Warren County, flooding from this event covered nearly two-thirds of the County. Flooding occurred along the Hudson River in the County from North River southward to the Saratoga County line. Numerous municipalities reported flooding of roadways, houses, and riverside camps. Some properties had several feet of water in them. Many major roadways were closed in the County due to flooding. The North Creek Trailer Park on Route 28 in the Town of Johnsbury was evacuated because water from the Hudson River entered the park. A mudslide in excess of 200 feet occurred on 13th Lake Road in North River/North Creek. In the hamlet of North Creek (Town of Johnsbury), a couple hundred feet of railway tracks were reported under two to five feet of water with several buildings at the train station</p>



Table 5.4.2-1. Flooding Events in Warren County, 2009 to 2015

Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
				being flooded as well. In the Town of Stony Creek, the 1,000 Acres Golf Course was flooded with the 9 th green under eight feet of water. Flood water receded through April 30 th . The County had approximately \$676,000 in property damage from this event.
May 27 – June 2, 2011	Flooding	N/A	N/A	Flooding caused severe damage along a thin line through the County and impacted the Towns of Stony Creek, Thurman, Warrensburg, Horicon, and Bolton. The County had \$13.125 million in damages from this event.
August 28-30, 2011	Hurricane Irene	DR-4020	Yes	<p>The greatest impact of Irene in eastern New York State was heavy to extreme rainfall which resulted in catastrophic flooding across portions of the region. Rainfall amounts averaged between four and eight inches with amounts of up to 12 inches falling in the eastern Catskills and Schoharie Valley. Three to six inches were common across the Lake George and Saratoga regions. The rainfall resulted in widespread flash flooding and river flooding across eastern New York State. Bridges were closed on major roadways in this area of the State.</p> <p>In Warren County, there was severe wind and flood damage throughout. In the Town of Lake George, Route 9N was flooded from the Route 9/9N spilt south to the ramp for Exit 21 for the Northway. Route 9L was also flooded between Route 9N and Bay Road. Two of the seven docks in the Village of Lake George floated off and were crushed.</p>
October 27 – November 8, 2012	Hurricane Sandy	EM-3351	Yes	<p>Hurricane Sandy moved up the east coast of the United States during the last week of October 2012. As the storm made landfall in southern New Jersey, bands of rain moved across eastern New York State. Rainfall totals in this part of the State were minimal and did not cause any flooding. The storm did bring strong and gusty winds to the area, bringing down trees and power lines across the region. Wind gusts ranged from 40 to 60 mph.</p> <p>In Warren County, wind gusts of 65 mph pushed down the length of Lake George, creating waves that threatened to spill over the shoreline. Some of the docks along the Lake were damaged but flooding did not occur. In Glens Falls, trees and wires were knocked down from the winds.</p>
February 1, 2013	Ice Jam	N/A	N/A	Massive ice chunks of up to 10 feet thick in spots, broke off near North Creek in Warren County. This created an ice jam on the upper Hudson River near the Town of Thurman. As the ice chunks became lodged, they caused the water behind them to jump the banks, with more than 100 yards of River Road in Thurman over 10 feet of ice chunks. The water receded by midday and the town highway department had to use loaders and backhoes to remove the ice from the roadway.
June 28, 2013	Severe Storms and Flooding	DR-4129	Yes	Heavy rain fell across the Mohawk Valley and western Adirondacks with rates of one inch per hour with three to five inches of rain falling in total. This event, with



Table 5.4.2-1. Flooding Events in Warren County, 2009 to 2015

Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
				<p>the combination of a previous rainfall event, led to significant flash flooding across both the Mohawk Valley and Adirondacks. Many roads were washed out and closed. Urbanized areas along the Mohawk River experienced flooding as well. Many communities declared state of emergencies and President Obama signed a major disaster declaration for New York State which included Herkimer, Montgomery and Warren Counties.</p> <p>In Warren County, the Town of Johnsbury experienced severe flooding from this event. Flash flooding occurred in the Bakers Mill section of the Town. Water rescue teams were deployed to several homes that were threatened by flooding. A state of emergency was declared for the Town as a result of flooding.</p>
January 12, 2014	Ice Jam	N/A	N/A	Harrington Road in the Town of Thurman had ice up to scraper banks in some locations and Glen Creek Road was closed due to flooding caused by an ice jam on the Hudson River.
April 13-21, 2014	Flooding	N/A	N/A	<p>Significant snow pack began to melt as a result of an extended period of warm weather. Up to 10 inches of liquid equivalent started melting between April 8th and April 15th. The snow melt caused many rivers and streams in and around the Adirondacks to become very high with a few reaching flood stages just from the snow melt.</p> <p>Heavy rain began to fall in the region on April 15th, bringing up to two inches of rain in the area. The rainfall, combined with the snow melt, caused many rivers to reach moderate flood stage. By April 21st, all rivers in the area were below flood stages.</p> <p>In Warren County, the Schroon River reached major flood stage and remained at this stage for several days. The flooding caused several private roads of homes and vacation properties to be impacted by water. Roads were closed due to flooding in the County.</p>
May 13-22, 2014	Flooding	N/A	N/A	A culvert was washed out in the County.

Sources: NYSDEC 2015; FEMA 2015; NOAA-NCDC 2015; NWS 2015

FEMA Federal Emergency Management Agency

Mph Miles Per Hour

NCDC National Climatic Data Center

NOAA National Oceanic and Atmospheric Administration

N/A Not Applicable





Probability of Future Occurrences

Based on the historic and more recent flood events in Warren County, it is clear that the County will experience flooding and its impacts in the future. It is estimated that Warren County will continue to experience direct and indirect impacts of flooding events annually that may induce secondary hazards such as erosion, infrastructure deterioration or failure, utility failures, power outages, water quality and supply concerns, and transportation delays, accidents and inconveniences.

According to the National Oceanic and Atmospheric Administration (NOAA) National Climate Data Center (NCDC) and the Cold Regions Research and Engineering Laboratory (CRREL) database, Warren County experienced 77 flood events between 1950 and 2015, including 27 floods, 26 flash floods, and 24 ice jams. The table below shows these statistics, as well as the annual average number of events and the percent chance of these individual flood hazards occurring in Warren County in future years (NOAA NCDC 2015; CRREL 2015).

Table 5.4.2-2. Probability of Future Occurrence of Flooding Events

Hazard Type	Number of Occurrences Between 1950 and 2015	Rate of Occurrence	Recurrence Interval (in years)	Probability of Event Occurring in Any Given Year	% Chance of Occurring in Any Given Year
Flash Flood	26	0.40	2.53	0.40	40%
Flood	27	0.41	2.44	0.41	41%
Ice Jam	24	0.37	2.75	0.36	36%

Source: NOAA-NCDC 2015; CRREL 2015

In Section 5.3, the identified hazards of concern for Warren County were ranked. The probability of occurrence, or likelihood of the event, is one parameter used for hazard rankings. Based on historical records and input from the Planning Committee, the probability of occurrence for flood in the County is considered ‘frequent’ (likely to occur within 25 years, as presented in Table 5.3-3).

Climate Change Impacts

The climate of Warren County is already changing, and will continue to change in the future. Climate change is beginning to affect both people and resources of the State and County and the impacts of climate change will continue. Impacts related to increasing temperatures are already being felt in the County. ClimAID: the Integrated Assessment for Effective Climate Change in New York State (ClimAID) was undertaken to provide decision-makers with information on the State’s vulnerability to climate change and to facilitate the development of adaptation strategies informed by both local experience and scientific knowledge (New York State Energy Research and Development Authority [NYSERDA], 2011).

Each region in New York State, as defined by ClimAID, has attributes that will be affected by climate change. Warren County is part of Region 7 (see Figure 5.4.2-3), Adirondack Mountains. Some of the issues in this region, affected by climate change, include: loss of high elevation plants, animals and ecosystem types; decline in winter recreation; decline in milk production, etc. (NYSERDA 2011).



Figure 5.4.2-3. Climate Regions of New York State



Source: NYSERDA 2011

Temperatures in New York State are warming, with an average rate of warming over the past century of 0.25° F per decade. Average annual temperatures are projected to increase across New York State by 2° F to 3.4° F by the 2020s, 4.1° F to 6.8° F by the 2050s, and 5.3° F to 10.1° F by the 2080s. By the end of the century, the greatest warming is projected to be in the northern section of the State (NYSERDA, 2014).

Regional precipitation across New York State is projected to increase by approximately one to eight-percent by the 2020s, three to 12-percent by the 2050s, and four to 15-percent by the 2080s. By the end of the century, the greatest increases in precipitation are projected to be in the northern areas of the State (NYSERDA, 2014).

In Region 7, it is estimated that temperatures will increase by 3.7°F to 7.4°F by the 2050s and 4.2°F to 11.8°F by the 2080s (baseline of 39.9°F). Precipitation totals will increase between 2 and 15% by the 2050s and 3 to 17% by the 2080s (baseline of 40.8 inches). Table 5.4.2-3 displays the projected seasonal precipitation change for the East Hudson and Mohawk River Valleys ClimAID Region (NYSERDA, 2014).

Table 5.4.2-3. Projected Seasonal Precipitation Change in Region 7, 2050s (% change)

Winter	Spring	Summer	Fall
+5 to +15	-5 to +10	-5 to +5	-5 to +10

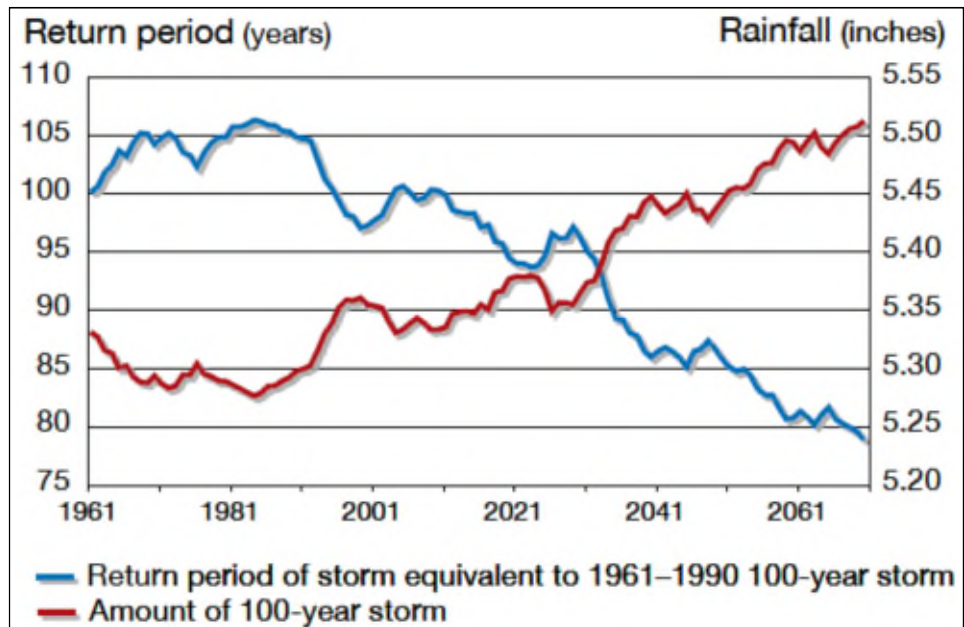
Source: NYSERDA 2011



The projected increase in precipitation is expected to fall in heavy downpours and less in light rains. The increase in heavy downpours has the potential to affect drinking water; heighten the risk of riverine flooding; flood key rail lines, roadways and transportation hubs; and increase delays and hazards related to extreme weather events (NYSERDA 2011).

Increasing air temperatures intensify the water cycle by increasing evaporation and precipitation. This can cause an increase in rain totals during events with longer dry periods in between those events. These changes can have a variety of effects on the State’s water resources (NYSERDA 2011). Figure 5.4.2-4 displays the project rainfall and frequency of extreme storms in New York State. The amount of rain fall in a 100-year event is projected to increase, while the number of years between such storms (return period) is projected to decrease. Rainstorms will become more severe and more frequent (NYSERDA 2011).

Figure 5.4.2-4. Projected Rainfall and Frequency of Extreme Storms



Source: NYSEDA 2011



5.4.2.2 Vulnerability Assessment

To understand risk, a community must evaluate what assets are exposed and vulnerable in the identified hazard area. For the flood hazard, areas identified as hazard areas include the 1-percent and 0.2-percent annual chance flood event boundaries (Figure 5.4.2-2). The following text evaluates and estimates the potential impact of flooding for Warren County including:

- Overview of vulnerability
- Data and methodology used for the evaluation
- Impact on: (1) life, health and safety of residents, (2) general building stock, (3) critical facilities, (4) economy, and (5) future growth and development
- Effect of climate change on vulnerability
- Change of vulnerability as compared to that presented in the 2011 Warren County HMP
- Further data collections that will assist understanding this hazard over time

Overview of Vulnerability

To assess vulnerability, exposure to the one- and 0.2-percent annual chance flood events was examined and potential losses were calculated for one- percent annual chance flood event. The flood hazard exposure and loss estimate analysis is presented below.

Data and Methodology

The 1- and 0.2-percent annual chance flood events were examined to evaluate the County’s risk to the flood hazard. These flood events are generally those considered by planners and evaluated under federal programs such as the NFIP. Figure 5.4.5-1 presented earlier in this section illustrates the flood boundaries used for this vulnerability assessment.

To estimate potential losses, the Hazards U.S. Multi-Hazard (HAZUS-MH) version 2.2 flood model was used. The depth grid generated for the 2014 State HMP was incorporated into HAZUS-MH. The 1-percent annual chance depth grid was integrated into HAZUS-MH 2.2 and the riverine flood model was run to estimate potential losses at the structure level using the County’s custom building and critical facility inventories. The HAZUS-MH 2.2 model uses 2010 U.S. Census demographic data, which was used to calculate displaced households and sheltering needs. Refer to Section 5.1 for additional details on the methodology.

Impact on Life, Health and Safety

The impact of the hydrologic hazards on life, health and safety is dependent upon several factors including the severity of the event and whether or not adequate warning time is provided to residents. Exposure represents the population living in or near the hazard areas that could be impacted should an event occur. Additionally, exposure should not be limited to only those who reside in a defined hazard zone, but everyone who may be affected by the cascading impacts of a hazard event (e.g., people are at risk while traveling in flooded areas, or their access to emergency services is compromised during an event).

Cascading impacts may also include exposure to pathogens such as mold. After flood events, excess moisture and standing water contribute to the growth of mold in buildings. Mold may present a health risk to building occupants, especially those with already compromised immune systems such as infants, children, the elderly and pregnant women. The degree of impact will vary and is not strictly measurable. Molds can grow in as short a period as 24-48 hours in wet and damaged areas of buildings that have not been properly cleaned. Very small mold spores can easily be inhaled, creating the potential for allergic reactions, asthma episodes, and other respiratory problems. Buildings should be properly cleaned and dried out to safely prevent mold growth (CDC, 2015).



Molds and mildews are not the only public health risk associated with flooding. Floodwaters can be contaminated by pollutants such as sewage, human and animal feces, pesticides, fertilizers, oil, asbestos, and rusting building materials. Common public health risks associated with flood events also include:

- Unsafe food
- Contaminated drinking and washing water and poor sanitation
- Mosquitos and animals
- Carbon monoxide poisoning
- Secondary hazards associated with re-entering/cleaning flooded structures
- Mental stress and fatigue

Current loss estimation models such as HAZUS-MH are not equipped to measure public health impacts. The best level of mitigation for these impacts is to be aware that they can occur, educate the public on prevention, and be prepared to deal with these vulnerabilities in responding to flood events.

To estimate the population exposed to the one- and 0.2-percent flood events, the floodplain boundaries were overlaid upon the 2010 Census population data in GIS (U.S. Census 2010). The 2010 Census blocks with their centroid in the flood boundaries were used to calculate the estimated population exposed to this hazard. Within the floodplain population, senior citizens and the population in poverty are two especially vulnerable groups that must be taken under special consideration when planning for disaster preparation, response, and recovery.

Census blocks do not follow the boundaries of the floodplain and can grossly over or under estimate the population exposed when using the centroid or intersect of the Census block with these zones. The limitations of these analyses are recognized, and as such the results are only used to provide a general estimate. The total land area located in the one-percent and 0.2-percent annual chance flood zones was calculated using the regulatory FIRM for each jurisdiction, as presented in Table 5.4.2-4.

The calculation of the 0.2-percent annual chance flood event results is cumulative in nature, as the population exposed to the 1-percent flood event will also be exposed to the 0.2-percent annual chance flood event. Using this approach, it was estimated that 3,447 people are exposed to the one-percent annual chance event and 4,136 people are exposed to the 0.2-percent annual chance flood event. Refer to Table 5.4.2-5 for results by municipality.

Table 5.4.2-4. Total Land Area in the 1-Percent and 0.2-Percent Annual Chance Flood Zones (Acres)

Municipality	Total Population	Population in the SFHA		Population in the 0.2-Percent Annual Chance Flood Zone	
		Total Exposed	% of Total	Total Exposed	% of Total
Town of Bolton	2,343	229	9.8%	229	9.8%
Town of Chester	3,354	185	5.5%	185	5.5%
City of Glens Falls	14,652	0	0.0%	0	0.0%
Town of Hague	856	67	7.8%	67	7.8%
Town of Horicon	1,578	83	5.3%	83	5.3%
Town of Johnsburg	1,956	75	3.8%	75	3.8%
Town of Lake George	3,508	9	0.3%	9	0.3%
Town of Lake Luzerne	3,342	330	9.9%	446	13.3%
Town of Queensbury	27,845	503	1.8%	564	2.0%



Municipality	Total Population	Population in the SFHA		Population in the 0.2-Percent Annual Chance Flood Zone	
		Total Exposed	% of Total	Total Exposed	% of Total
Town of Stony Creek	895	11	1.2%	11	1.2%
Town of Thurman	1,169	41	3.5%	41	3.5%
Town of Warrensburg	4,086	201	4.9%	212	5.2%
Warren County (total)	65,584	1,734	2.6%	1,922	2.9%

Sources: U.S. Census 2010; FEMA FIRMs; Warren County GIS

Impact on General Building Stock

After considering the population exposed and vulnerable to the flood hazard, the built environment was evaluated. Exposure in the flood zone includes those buildings located in the flood zone. Potential damage is the modeled loss that could occur to the exposed inventory, including structural and content value.

The total land area located in the 1-percent and 0.2-percent annual chance flood zones was calculated for each jurisdiction, as presented in Table 5.4.2-5 below.

Table 5.4.2-5. Total Land Area Located in the Flood Zones (Acres)

Municipality	Total Area (Acres)	1% Flood Event Hazard Area		0.2% Flood Event Hazard Area	
		Area (acres)	% of Total	Area (acres)	% of Total
Town of Bolton	40,853	1,298	3.2%	1,298	3.2%
Town of Chester	53,717	1,488	2.8%	1,488	2.8%
City of Glens Falls	2,486	62	2.5%	62	2.5%
Town of Hague	41,185	1,051	2.6%	1,051	2.6%
Town of Horicon	41,932	1,554	3.7%	1,554	3.7%
Town of Johnsbury	132,322	2,247	1.7%	2,247	1.7%
Town of Lake George	18,607	267	1.4%	267	1.4%
Village of Lake George	394	12	3.0%	12	3.0%
Town of Lake Luzerne	33,991	1,153	3.4%	1,207	3.6%
Town of Queensbury	39,873	2,627	6.6%	3,168	7.9%
Town of Stony Creek	53,058	1,406	2.6%	1,406	2.6%
Town of Thurman	56,931	2,010	3.5%	2,010	3.5%
Town of Warrensburg	40,861	1,776	4.3%	1,819	4.5%
Warren County (total)	556,210	16,951	3.0%	17,589	3.2%

Source: FEMA FIRMs; Warren County GIS

Note: Totals do not include waterbodies

To provide a general estimate of the structural/content replacement value exposure, the 1- and 0.2-percent DFIRM flood boundaries were overlaid upon the County’s updated building stock inventory at the structure level. The buildings with their centroid in the flood boundary were totaled for each municipality. Table 5.4.2-6 summarizes these results. In summary, there are 823 buildings located in the 1-percent annual chance flood boundary with an estimated \$265 million of building/contents exposed. This represents approximately 1.7% of the County’s total general building stock replacement value inventory (greater than \$15 billion).



There 876 buildings located in the 0.2-percent annual chance flood boundary with an estimated \$278 million of building/contents exposed. This represents approximately 1.8% of the County’s total general building stock replacement value inventory.



Table 5.4.2-6. Estimated General Building Stock Exposure to the 1-Percent and 0.2-Percent Annual Chance Flood Events – All Occupancies

Municipality	Total # Buildings	Total RCV (Structure and Contents)	Total (All Occupancies)							
			1% Chance Event				0.2% Chance Event			
			# Buildings	% Total	RCV	% Total	# Buildings	% Total	RCV	% Total
Bolton	2,575	\$960,513,000	39	1.5%	\$7,265,557	0.8%	39	1.5%	\$7,265,557	0.8%
Chester	2,668	\$800,772,000	244	9.1%	\$56,427,332	7.0%	244	9.1%	\$56,427,332	7.0%
Glens Falls	5,483	\$3,290,154,000	2	0.0%	\$18,934,062	0.6%	2	0.0%	\$18,934,062	0.6%
Hague	1,136	\$400,664,000	14	1.2%	\$6,321,928	1.6%	14	1.2%	\$6,321,928	1.6%
Horicon	1,907	\$589,719,000	91	4.8%	\$23,768,292	4.0%	91	4.8%	\$23,768,292	4.0%
Johnsburg	1,762	\$563,005,000	48	2.7%	\$16,254,734	2.9%	48	2.7%	\$16,254,734	2.9%
Lake George	1,949	\$712,923,000	4	0.2%	\$1,375,354	0.2%	4	0.2%	\$1,375,354	0.2%
Lake George Village	623	\$397,549,000	5	0.8%	\$5,837,503	1.5%	5	0.8%	\$5,837,503	1.5%
Lake Luzerne	2,215	\$743,990,000	137	6.2%	\$29,000,180	3.9%	160	7.2%	\$33,906,685	4.6%
Queensbury	11,858	\$5,897,513,000	158	1.3%	\$76,086,432	1.3%	175	1.5%	\$81,477,089	1.4%
Stony Creek	603	\$143,567,000	8	1.3%	\$1,828,467	1.3%	8	1.3%	\$1,828,467	1.3%
Thurman	818	\$328,601,000	3	0.4%	\$945,932	0.3%	3	0.4%	\$945,932	0.3%
Warrensburg	1,974	\$647,352,000	70	3.5%	\$20,854,712	3.2%	83	4.2%	\$24,216,725	3.7%
Warren County (total)	35,571	\$15,476,322,000	823	2.3%	\$264,900,485	1.7%	876	2.5%	\$278,559,660	1.8%

Sources: Total # buildings and total RCV from HAZUS 2.2, 2010 census

Notes: GBS exposure figures generated using WCGIS digitized FEMA FIRM floodplains, current address WCGIS rooftop points. RCV calculated using HAZUS 2015 RCV spreadsheet figures, adjusted for 2015, and WC Real Property data





Table 5.4.2-7. Estimated General Building Stock Exposure to the 1-Percent and 0.2-Percent Annual Chance Flood Events – Residential Occupancy Class

Municipality	Total # Buildings (residential)	Total RCV (Structure and Contents - Residential)	Residential							
			1% Chance Event				0.2% Chance Event			
			# Buildings	% Total	RCV	% Total	# Buildings	% Total	RCV	% Total
Town of Bolton	2,448	\$822,981,000	39	1.6%	\$7,265,557	0.9%	39	1.6%	\$7,265,557	0.9%
Town of Chester	2,526	\$651,334,000	237	9.4%	\$52,376,883	8.0%	237	9.4%	\$52,376,883	8.0%
City of Glens Falls	4,791	\$1,701,949,000	0	0.0%	\$0	0.0%	0	0.0%	\$0	0.0%
Town of Hague	1,101	\$353,406,000	11	1.0%	\$3,068,854	0.9%	11	1.0%	\$3,068,854	0.9%
Town of Horicon	1,857	\$551,024,000	87	4.7%	\$22,552,170	4.1%	87	4.7%	\$22,552,170	4.1%
Town of Johnsbury	1,667	\$432,270,000	44	2.6%	\$10,152,586	2.3%	44	2.6%	\$10,152,586	2.3%
Town of Lake George	2,369	\$626,563,000	4	0.2%	\$1,375,354	0.2%	4	0.2%	\$1,375,354	0.2%
Lake George Village	509	\$231,547,000	2	0.4%	\$829,188	0.4%	2	0.4%	\$829,188	0.4%
Town of Lake Luzerne	2,079	\$630,992,000	137	6.6%	\$29,000,180	4.6%	160	7.7%	\$33,906,685	5.4%
Town of Queensbury	10,883	\$4,109,512,000	141	1.3%	\$36,682,951	0.9%	154	1.4%	\$40,362,867	1.0%
Town of Stony Creek	578	\$127,417,000	8	1.4%	\$1,828,467	1.4%	8	1.4%	\$1,828,467	1.4%
Town of Thurman	703	\$139,453,000	3	0.4%	\$945,932	0.7%	3	0.4%	\$945,932	0.7%
Town of Warrensburg	1,834	\$456,079,000	65	3.5%	\$13,968,552	3.1%	76	4.1%	\$16,484,201	3.6%
Warren County (total)	33,345	\$10,834,527,000	778	2.3%	\$180,046,674	1.7%	825	2.5%	\$191,148,744	1.8%

Sources: Total # buildings and total RCV from HAZUS 2.2, 2010 census

Notes: GBS exposure figures generated using WCGIS digitized FEMA FIRM floodplains, current address WCGIS rooftop points. RCV calculated using HAZUS 2015 RCV spreadsheet figures, adjusted for 2015, and WC Real Property data



Table 5.4.2-8. Estimated General Building Stock Exposure to the 1-Percent and 0.2-Percent Annual Chance Flood Events – Commercial Occupancy Class

Municipality	Total # Buildings	Total RCV (Structure and Contents)	Commercial							
			1% Chance Event				0.2% Chance Event			
			# Buildings	% Total	RCV	% Total	# Buildings	% Total	RCV	% Total
Town of Bolton	94	\$115,676,000	0	0.0%	\$0	0.0%	0	0.0%	\$0	0.0%
Town of Chester	90	\$86,730,000	2	2.2%	\$774,139	0.9%	2	2.2%	\$774,139	0.9%
City of Glens Falls	504	\$1,246,369,000	1	0.2%	\$6,180,680	0.5%	1	0.2%	\$6,180,680	0.5%
Town of Hague	22	\$21,734,000	2	9.1%	\$2,588,221	11.9%	2	9.1%	\$2,588,221	11.9%
Town of Horicon	32	\$26,186,000	3	9.4%	\$1,035,354	4.0%	3	9.4%	\$1,035,354	4.0%
Town of Johnsbury	49	\$73,903,000	3	6.1%	\$2,134,911	2.9%	3	6.1%	\$2,134,911	2.9%
Town of Lake George	60	\$60,622,000	0	0.0%	\$0	0.0%	0	0.0%	\$0	0.0%
Village of Lake George	84	\$132,516,000	3	3.6%	\$5,008,315	3.8%	3	3.6%	\$5,008,315	3.8%
Town of Lake Luzerne	88	\$74,280,000	0	0.0%	\$0	0.0%	0	0.0%	\$0	0.0%
Town of Queensbury	693	\$1,348,304,000	15	2.2%	\$33,488,358	2.5%	19	2.7%	\$35,199,099	2.6%
Town of Stony Creek	16	\$10,906,000	0	0.0%	\$0	0.0%	0	0.0%	\$0	0.0%
Town of Thurman	95	\$175,935,000	0	0.0%	\$0	0.0%	0	0.0%	\$0	0.0%
Town of Warrensburg	89	\$138,060,000	5	5.6%	\$6,886,160	5.0%	7	7.9%	\$7,732,524	5.6%
Warren County (total)	1,916	\$3,511,221,000	34	1.8%	\$58,096,138	1.7%	40	2.1%	\$60,653,243	1.7%

Sources: Total # buildings and total RCV from HAZUS 2.2, 2010 census

Notes: GBS exposure figures generated using WCGIS digitized FEMA FIRM floodplains, current address WCGIS rooftop points. RCV calculated using HAZUS 2015 RCV spreadsheet figures, adjusted for 2015, and WC Real Property data



Table 5.4.2-9. Estimated General Building Stock Potential Loss to the 1-Percent Annual Chance Flood Event

Municipality	Total RCV	All Occupancies		Residential		Commercial	
		Estimated Loss (RCV)	% of Total	Estimated Loss (RCV)	% of Total	Estimated Loss (RCV)	% of Total
Bolton	\$960,513,000	\$6,386,000	0.7%	\$5,818,000	0.6%	\$0	0.0%
Chester	\$800,772,000	\$15,498,000	1.9%	\$12,713,000	1.6%	\$1,863,000	0.2%
Glens Falls	\$3,290,154,000	\$2,174,000	0.1%	\$0	0.0%	\$653,000	0.0%
Hague	\$400,664,000	\$225,000	0.1%	\$225,000	0.1%	\$0	0.0%
Horicon	\$589,719,000	\$16,599,000	2.8%	\$14,489,000	2.5%	\$1,477,000	0.3%
Johnsburg	\$563,005,000	\$8,912,000	1.6%	\$6,946,000	1.2%	\$362,000	0.1%
Lake George	\$712,923,000	\$1,495,000	0.2%	\$1,424,000	0.2%	\$0	0.0%
Lake George Village	\$397,549,000	\$3,277,000	0.8%	\$1,206,000	0.3%	\$1,866,000	0.5%
Lake Luzerne	\$743,990,000	\$23,399,000	3.1%	\$20,378,000	2.7%	\$0	0.0%
Queensbury	\$5,897,513,000	\$61,169,000	1.0%	\$23,984,000	0.4%	\$34,305,000	0.6%
Stony Creek	\$143,567,000	\$4,777,000	3.3%	\$4,364,000	3.0%	\$0	0.0%
Thurman	\$328,601,000	\$990,000	0.3%	\$837,000	0.3%	\$0	0.0%
Warrensburg	\$647,352,000	\$18,978,000	2.9%	\$10,472,000	1.6%	\$4,749,000	0.7%
Warren County (Total)	\$15,476,322,000	\$163,879,000	1.1%	\$102,856,000	0.7%	\$45,275,000	0.3%

Source: HAZUS MH 2.2, 2010 census data

NFIP Statistics

In addition to total building stock modeling, individual data available on flood policies, claims, Repetitive Loss properties (RL) and Severe Repetitive Loss properties (SRLs) were analyzed. FEMA Region 2 provided a list of properties with NFIP policies, past claims and multiple claims (RL/SRL) as of 11/30/2014.

According to the metadata provided: “The (*sic* National Flood Insurance Program) NFIP Repetitive Loss File contains losses reported from individuals who have flood insurance through the Federal Government. A property is considered a repetitive loss property when there are two or more losses reported which were paid more than \$1,000 for each loss. The two losses must be within 10 years of each other & be as least 10 days apart. Only losses from (*sic* since) 1/1/1978 that are closed are considered.”

According to section 1361A of the National Flood Insurance Act, as amended (NFIA), 42 U.S.C. 4102a, an SRL property is defined as a residential property that is covered under an NFIP flood insurance policy and:

- Has at least four NFIP claim payments (including building and contents) over \$5,000 each, and the cumulative amount of such claims payments exceeds \$20,000; or
- For which at least two separate claims payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building.
- For both of the above, at least two of the referenced claims must have occurred within any 10- year period, and must be greater than 10 days apart.

Table 5.4.2-10 summarizes the NFIP policies, claims and repetitive loss statistics for Warren County as of 11/30/2014.



Table 5.4.2-10. NFIP Policies, Claims and Repetitive Loss Statistics

Municipality	# Policies (1)	# Claims (Losses) (1)	Total Loss Payments (2)	# Rep. Loss Prop. (1)	Severe Rep. Loss Prop. (1)	# Policies in the 1% Flood Boundary (3)
Town of Bolton	13	5	\$40,328	0	0	2
Town of Chester	32	28	\$92,183	1	0	14
City of Glens Falls	8	0	\$0	0	0	1
Town of Hague	15	1	\$8,021	0	0	5
Town of Horicon	16	6	\$104,432	0	0	8
Town of Johnsbury	11	3	\$56,870	0	0	6
Town of Lake George	8	6	\$54,723	0	0	2
Village of Lake George	6	4	\$97,902	0	0	1
Town of Lake Luzerne	49	18	\$786,405	0	0	35
Town of Queensbury	76	42	\$1,159,853	0	0	29
Town of Stony Creek	2	1	\$2,355	0	0	1
Town of Thurman	2	4	\$85,530	0	0	2
Town of Warrensburg	21	3	\$11,649	0	0	13
Warren County (Total)	259	121	\$2,500,251	1	0	119

Source: FEMA, 2014

Note (1) Policies, claims, repetitive loss and severe repetitive loss statistics provided by FEMA and are current as of November 30, 2015 and are summarized by Community Name. Please note the total number of repetitive loss properties excludes the severe repetitive loss properties. The number of claims represents claims closed by 11/30/2015.

Note (2) Total building and content losses from the claims file provided by FEMA Region 2.

Note (3) The policies inside and outside of the flood zones is based on the latitude and longitude provided by FEMA Region 2 in the policy file.

Note (4) FEMA noted that where there is more than one entry for a property, there may be more than one policy in force or more than one GIS possibility.

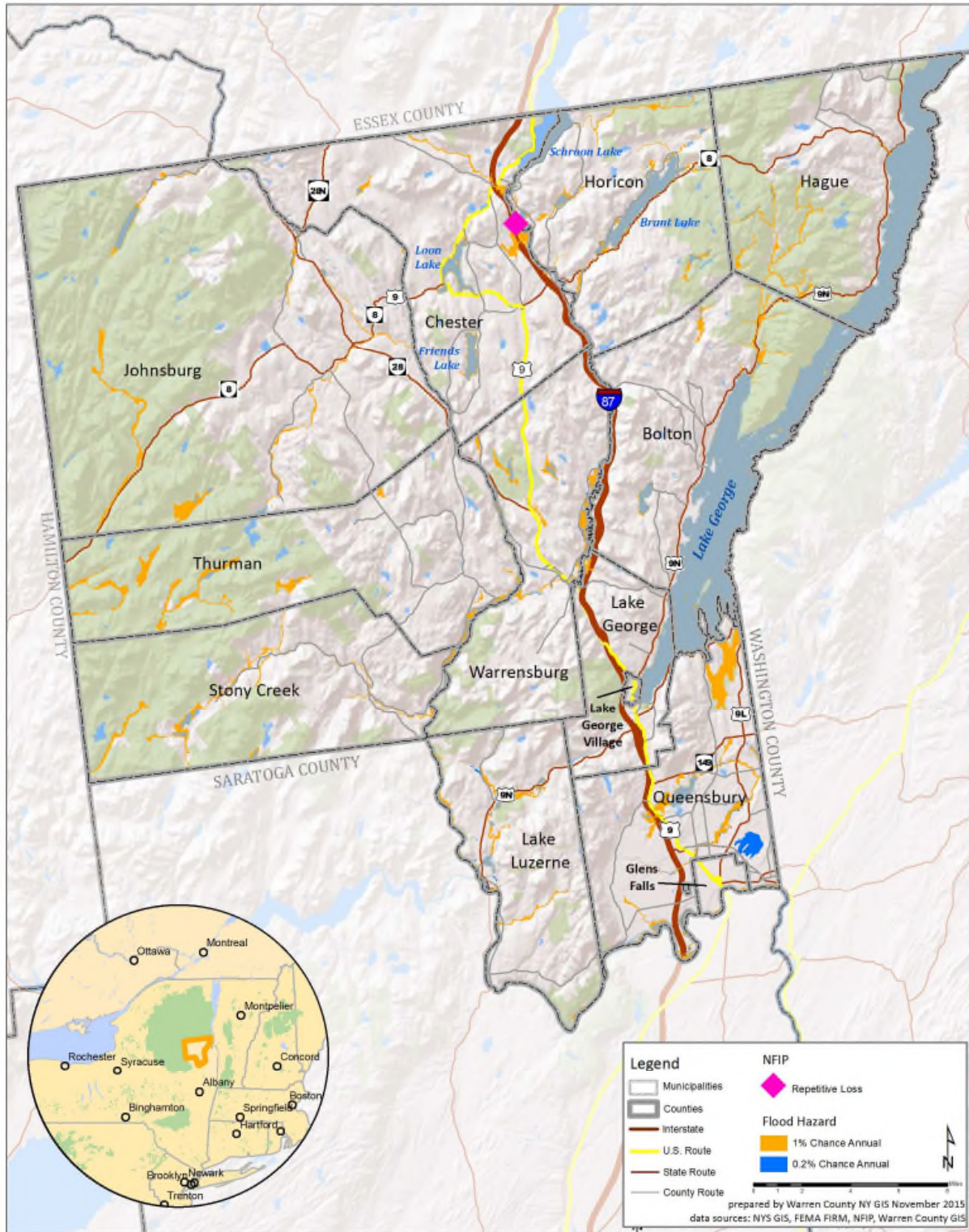
The NFIP provided data included only one RL property with the occupancy classes as follows:

- Town of Chester – Single-family residential

The location of the properties with policies, claims and repetitive and severe repetitive flooding were geocoded by FEMA with the understanding that there are varying tolerances between how closely the longitude and latitude coordinates correspond to the location of the property address, or that the indication of some locations are more accurate than others.



Figure 5.4.2-5. NFIP Repetitive Loss Areas – Warren County



Sources: NYS GIS; FEMA FIRM; NFIP; Warren County GIS

Note: Figure reflects total population of blocks with centroids in the flood zone



Impact on Critical Facilities

HAZUS-MH was used to estimate the flood loss potential to critical facilities exposed to the flood risk. Using depth/damage function curves, HAZUS estimates the percent of damage to the building and contents of critical facilities. Table 5.4.2-11 and Table 5.4.2-12 summarize the number of critical facilities located in the FEMA flood zones by type and by jurisdiction.

In cases where short-term functionality is impacted by a hazard, other facilities of neighboring municipalities may need to increase support response functions during a disaster event. Mitigation planning should consider means to reduce impact to critical facilities and ensure sufficient emergency and school services remain when a significant event occurs. Actions addressing shared services agreements are included in Section 9 (Mitigation Strategies) of this plan.

Table 5.4.2-11. Number of Critical Facilities Located in the 1-Percent Annual Chance Flood Boundaries

Municipality	Facility Types in 1% Chance Flood Boundary						
	Boat Facilities	Dam	Electric	Government	Highway Bridge	Rail Facility	Wastewater
Bolton	1	0	0	0	5	0	0
Chester	2	3	0	0	9	0	0
Glens Falls	0	0	0	0	0	0	1
Hague	1	0	0	0	2	0	0
Horicon	1	3	0	3	3	0	0
Johnsburg	2	2	0	1	22	0	0
Lake Luzerne	2	3	0	0	6	0	0
Lake George (T)	1	0	0	0	0	0	0
Lake George (V)	0	0	0	0	0	0	0
Queensbury	0	3	0	0	6	0	0
Stony Creek	0	1	0	0	6	0	0
Thurman	0	1	0	0	2	0	0
Warrensburg	0	1	0	2	7	0	0
Warren County	10	17	0	6	68	0	1

Table 5.4.2-12. Number of Critical Facilities Located in the 0.2-Percent Annual Chance Flood Boundaries

Municipality	Facility Types in 0.2% Chance Flood Boundary						
	Boat Facilities	Dam	Electric	Government	Highway Bridge	Rail Facility	Wastewater
Bolton	1	0	0	0	5	0	0



Municipality	Facility Types in 0.2% Chance Flood Boundary						
	Boat Facilities	Dam	Electric	Government	Highway Bridge	Rail Facility	Wastewater
Chester	2	3	0	0	9	0	0
Glens Falls	0	0	0	0	0	0	1
Hague	1	0	0	0	2	0	0
Horicon	1	3	0	3	3	0	0
Johnsburg	2	2	0	1	22	0	0
Lake Luzerne	2	3	0	0	6	0	0
Lake George (T)	1	0	0	0	0	0	0
Lake Gorge (V)	0	0	0	0	0	0	0
Queensbury	0	3	0	0	6	0	0
Stony Creek	0	1	0	0	6	0	0
Thurman	0	1	0	0	2	0	0
Warrensburg	0	1	0	2	7	0	0
Warren County	10	17	0	6	68	0	1

Impact on the Economy

For impact on economy, estimated losses from a flood event are considered. Losses include but are not limited to general building stock damages, agricultural losses, business interruption, impacts to tourism and tax base to Warren County. Damages to general building stock can be quantified using HAZUS-MH as discussed above. Other economic components such as loss of facility use, functional downtime and social economic factors are less measurable with a high degree of certainty.

Flooding can cause extensive damage to public utilities and disruptions to the delivery of services. Loss of power and communications may occur; and drinking water and wastewater treatment facilities may be temporarily out of operation. Flooded streets and road blocks make it difficult for emergency vehicles to respond to calls for service. Floodwaters can wash out sections of roadway and bridges (Foster, Date Unknown).

Direct building losses are the estimated costs to repair or replace the damage caused to the building. Refer to the ‘Impact on General Building Stock’ subsection which discusses these potential losses. These dollar value losses to the County’s total building inventory replacement value, in addition to damages to roadways and infrastructure, would greatly impact the local economy.

HAZUS-MH estimates the amount of debris generated from the 1-percent annual chance event. The model breaks down debris into three categories: 1) finishes (dry wall, insulation, etc.); 2) structural (wood, brick, etc.) and 3) foundations (concrete slab and block, rebar, etc.). The distinction is made because of the different types of equipment needed to handle the debris. Table 5.4.2-13 summarizes the debris HAZUS-MH 2.1 estimates for these events.



Table 5.4.2-13. Estimated Debris Generated from the 1-Percent Flood Event

Municipality	1% Flood Event			
	Total (tons)	Finish (tons)	Structure (tons)	Foundation (tons)
Bolton	1,511	318	704	489
Chester	2,500	509	1,112	879
Glens Falls	0	0	0	0
Hague	37	9	17	11
Horicon	2,868	585	1,254	1,029
Johnsburg	1,733	318	783	632
Lake George	198	52	79	67
Lake George Village	323	61	176	85
Lake Luzerne	3,779	761	1,678	1,340
Queensbury	3,604	768	1,584	1,252
Stony Creek	1,104	199	532	373
Thurman	183	37	79	67
Warrensburg	4,242	717	1,854	1,672
Warren County (total)	5,753	1,035	2,558	2,161

Effect of Climate Change on Vulnerability

Climate is defined not simply as average temperature and precipitation but also by the type, frequency and intensity of weather events. Both globally and at the local scale, climate change has the potential to alter the prevalence and severity of extremes such as flood events. While predicting changes of flood events under a changing climate is difficult, understanding vulnerabilities to potential changes is a critical part of estimating future climate change impacts on human health, society and the environment (U.S. Environmental Protection Agency [EPA] 2006).

Change of Vulnerability

Warren County and its municipalities continue to be vulnerable to the flood hazard. However, there are several differences between the exposure and potential loss estimates between this plan update to the results in the 2011 HMP. Their differences are due to the new and updated population (U.S. Census 2010 is now available) and building inventories used. Overall, this vulnerability assessment uses a more accurate and updated building inventory and updated flood mapping which provides more accurate estimated exposure and potential losses for Warren County.

Future Growth and Development

As discussed in Section 4, areas targeted for future growth and development have been identified across the County. Any areas of growth could be potentially impacted by the flood hazard if located within the identified hazard areas. It is the intention of the County to discourage development in vulnerable areas or to encourage higher regulatory standards on the local level.



Additional Data and Next Steps

A HAZUS-MH flood analysis was conducted for Warren County using the most current and best available data including updated building and critical facility inventories. For future plan updates, more accurate exposure and loss estimates can be produced by replacing the national default demographic inventory with 2010 U.S. Census data when it becomes available in the HAZUS-MH model. Specific mitigation actions addressing improved data collection and further vulnerability analysis is included in Volume II, Section 9 of this plan.



5.4.3 INFESTATION

This section provides a profile and vulnerability assessment for the infestation hazard.

5.4.3.1 Hazard Profile

This section provides profile information including description, location and extent, previous occurrences and losses and the probability of future occurrences.

Description

An infestation is defined as a state of being invaded or overrun by parasites that attack plants, animals and humans. Insect, fungi and parasitic infestations can result in destruction of various natural habitats and cropland, impact human health, and cause disease and death among native plant, wildlife and livestock. An infestation is the presence of a large number of pest organisms in an area or field, on the surface of a host, or in soil. They result from when an area is inhabited or overrun by these pest organisms, in numbers or quantities large enough to be harmful, threatening or obnoxious to native plants, animals and humans. Pests are any organism (insects, mammals, birds, parasite/pathogen, fungi, non-native species) that are a threat to other living species in its surrounding environment. Pests compete for natural resources or they can transmit diseases to humans, crops and livestock. Human populations are generally impacted by insect or animal infestations that can result in health impacts and can lead to potential epidemics or endemics.

New York State has been impacted by various past and present infestations including: Asian Longhorned Beetles, woolly adelgid species (balsam and hemlock), siren woodwasp, Emerald Ash Borer, and the gypsy moth. A majority of these insects are found within Warren County with the exception of Asian Longhorned Beetle, Emerald Ash Borer and hemlock woolly adelgid. However, the insects not currently found in the County are considered species of concern that have the potential of impacting Warren County. For the purpose of this HMP Update, these species will be discussed further.

Asian Longhorned Beetle

The Asian Longhorned Beetle (ALB) is a wood-boring beetle believed to have been introduced into the United States on wood pallets and wood packing material in cargo shipments from Asia. ALB larvae bore through wood of numerous hardwood species that include maples, elm, horsechestnut, willow, sycamore, and birch. ALB boring physically weakens the trees and disrupts sap flow. It was first discovered in the United States in 1996 on several hardwood trees in Brooklyn, New York. Currently, ALB is not found in Warren County; however, it is a species of concern for the County and the surrounding area and it is impacting surrounding areas.

Balsam Woolly Adelgid

The balsam woolly adelgid, *Adelges piceae* (Ratzeburg), is a tiny sucking insect that was introduced into North America from Europe. It first entered in the northeastern United States and southeastern Canada around 1900. This insect infects and kills fir trees, with North American species being the most sensitive to attack. As the adelgids feed on the bark of stems, they release toxins contained in their saliva. These toxins severely weaken the tree, affecting development and growth. Extensive tree mortality has occurred in the southeast and northwest United States. Currently, balsam woolly adelgid is not found in Warren County; however, it is a species of concern for the County and the surrounding area.

Hemlock Woolly Adelgid

The hemlock woolly adelgid (*Adelges tsugae*) is native to parts of Asia and was first discovered in New York in 1985. The adelgid uses long mouth parts to extract sap and nutrients from hemlock foliage, which prevents free



growth and causes needles to discolor from deep green to grayish green, and to drop prematurely. The loss of new shoots and needles seriously impairs tree health. Infestation is usually fatal to the host after several years. From the first discovery of the hemlock woolly adelgid in the Hudson Valley in the 1980's, the insect has spread north and west to the Catskills, the Capital Region and even the Finger Lakes and other parts of Western New York. Currently, 25 counties in New York State are infested with the hemlock woolly adelgid. Currently, hemlock woolly adelgid is not found in Warren County; however, it is a species of concern for the County and the surrounding area.

Sirex Woodwasp

Sirex woodwasp is a Eurasian native, which was first discovered in New York State in 2005. This was the first North American discovery of this exotic, invasive pest that is one of the top 10 most serious forest insect pest invaders worldwide. Native woodwasps utilize dead and dying pines, whereas the invasive sirex woodwasp attack healthy pines as well. Pines, with a diameter of six inches or greater, are susceptible; however, stressed, suppressed, and crowded pines are favored by the sirex woodwasp (NYIS, 2013). All pine species are believed to be at risk, particularly stressed Scots (or Scotch), red and eastern white pines (NYSDEC, 2013). Sirex woodwasp has been identified in Warren County and is a species of concern for the County and the surrounding area (Adirondack Park Invasive Plant Program 2016).

Emerald Ash Borer

Emerald Ash Borer (EAB) was first discovered in the United States in 2002 in southeastern Michigan. This Asian beetle infests and kills North American ash species, including green, white, black and blue ash; making all native ash trees susceptible to this insect. The insect are typically present from late May through early September and are most common in June and July. Signs of infection include tree canopy dieback, and yellowing and browning of leaves. Most trees die within two to four years of becoming infested. The emerald ash borer is responsible for the destruction of over 50 million ash trees in the United States since its discovery in Michigan. Currently, EAB is not found in Warren County; however, it is a species of concern for the County and the surrounding area.

Gypsy Moth

The gypsy moth (*Lymantria dispar*) is a non-native insect from France. Its caterpillar (larva) stage eats the leaves of a large variety of trees. A sample of some of the many species it eats includes oak, maple, apple, crabapple, aspen, willow, birch, mountain ash, pine and spruce. The populations of gypsy moths rise and fall in cycles. When populations are high, thousands of acres of trees can be damaged. Even though they do not pose a major threat to trees in New York State, gypsy moths are not native and their populations can reach high, destructive (outbreak) levels (NYSDEC 2016).

Extent and Location

The presence of invasive and nuisance species have been reported throughout New York State and Warren County. Information regarding the extent and location of these species is further discussed below.

Asian Long-horned Beetles (ALB)

Although it is believed that this beetle arrived in the U.S. between the 1980's and 1990's, the ALB was first discovered in McCarren Park of Greenpoint, Brooklyn on August 19, 1996 and soon after in Amityville, Long Island in September 1996. Since then, infestations were found in and around New York City, including on Long Island, Manhattan, Queens and Flushing Park. At present, it has been found in several areas in New York City and Long Island, the Chicago area (the quarantine having been lifted on July 12, 2006), New Jersey, and Toronto,



Canada. Additionally, the USDA’s Animal and Plant Health Inspection Service (APHIS) detected ALB in 26 warehouses and residential sites in 14 states. This detection led to actions that prevented the ALB from getting outdoors.

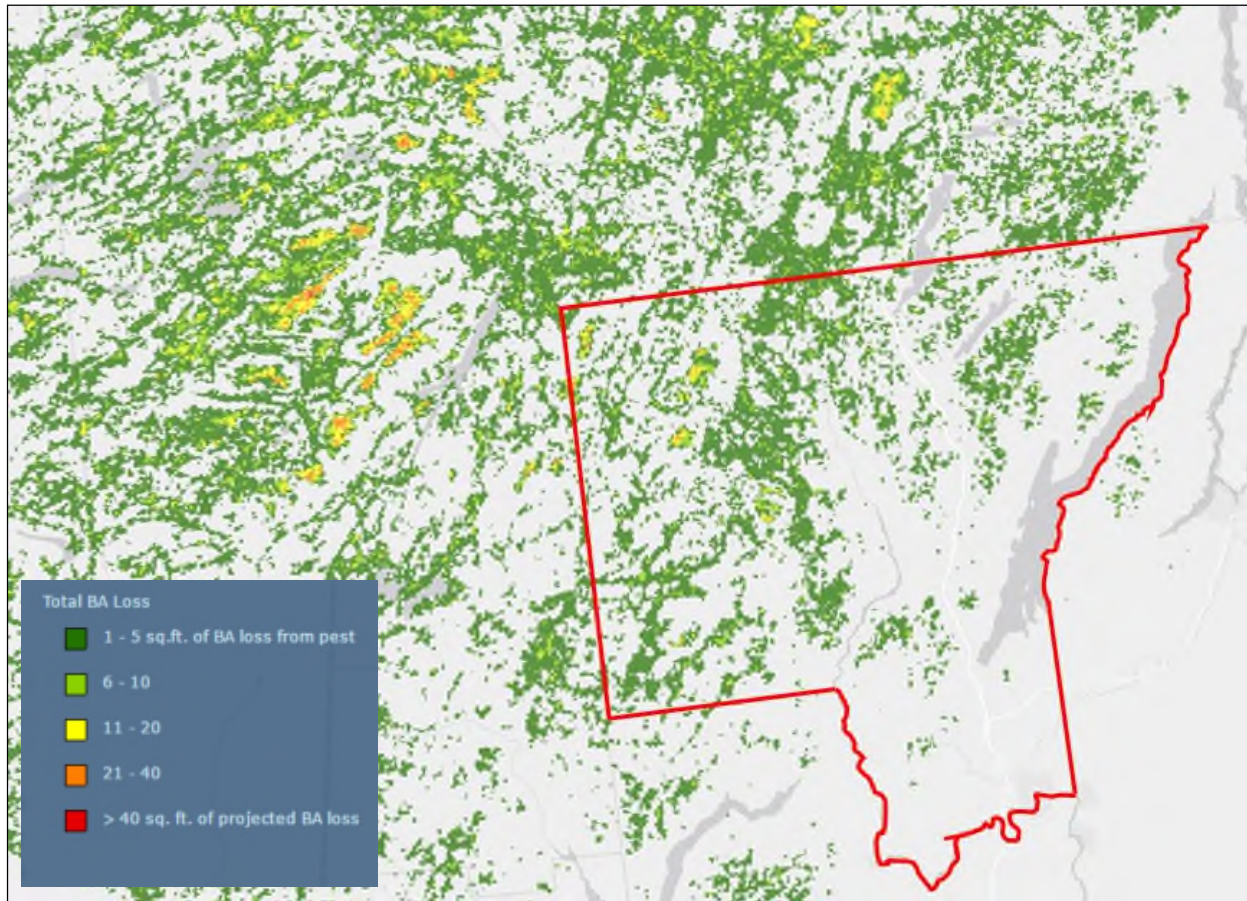
The USDA-APHIS Plant Protection and Quarantine (PPQ) has implemented quarantine and control strategies and restrictions in New York State, Illinois, and New Jersey that seek to eradicate this serious pest from the U.S. Quarantine areas have been established where beetles or their damage have been found, as a legal measure taken by a state or federal agency to prohibit the spread of a pest from one area to another. Code of Federal Regulations (e-CFR), Title 7: Agriculture, PART 301—Domestic Quarantine Notices, have been developed by the USDA-APHIS for handling wood and planting trees in these ALB quarantine zones. The Nature Conservancy has indicated that if ALBs were to break out of the established quarantine areas and spread into upstate New York State and New England, they could cause a devastating economic blow to the sugar maple, tourism, timber, and forest product industries. Over 1.5 billion trees are susceptible across New England (The Nature Conservancy, 2007). Quarantine zones in New York State have been limited to New York City and Long Island; there have been none in Warren County.

Balsam Woolly Adelgid

Balsam woolly adelgid infest and kill fir trees and the North American species of fir are the most sensitive to attack. According to the Adirondack Park Invasive Plant Program (APIPP) - <http://adkinvasives.com/>, balsam woolly adelgid is found within Warren County. As illustrated in Figure 5.4.3-1, the County has experienced losses from the impacts of balsam woolly adelgid. For those areas in the County impacted by balsam woolly adelgid, most saw one to five square feet of loss to balsam trees from this pest. A majority of losses occurred in the Adirondack State Park.



Figure 5.4.3-1. Total Loss from Balsam Woolly Adelgid



Source: USDA 2015

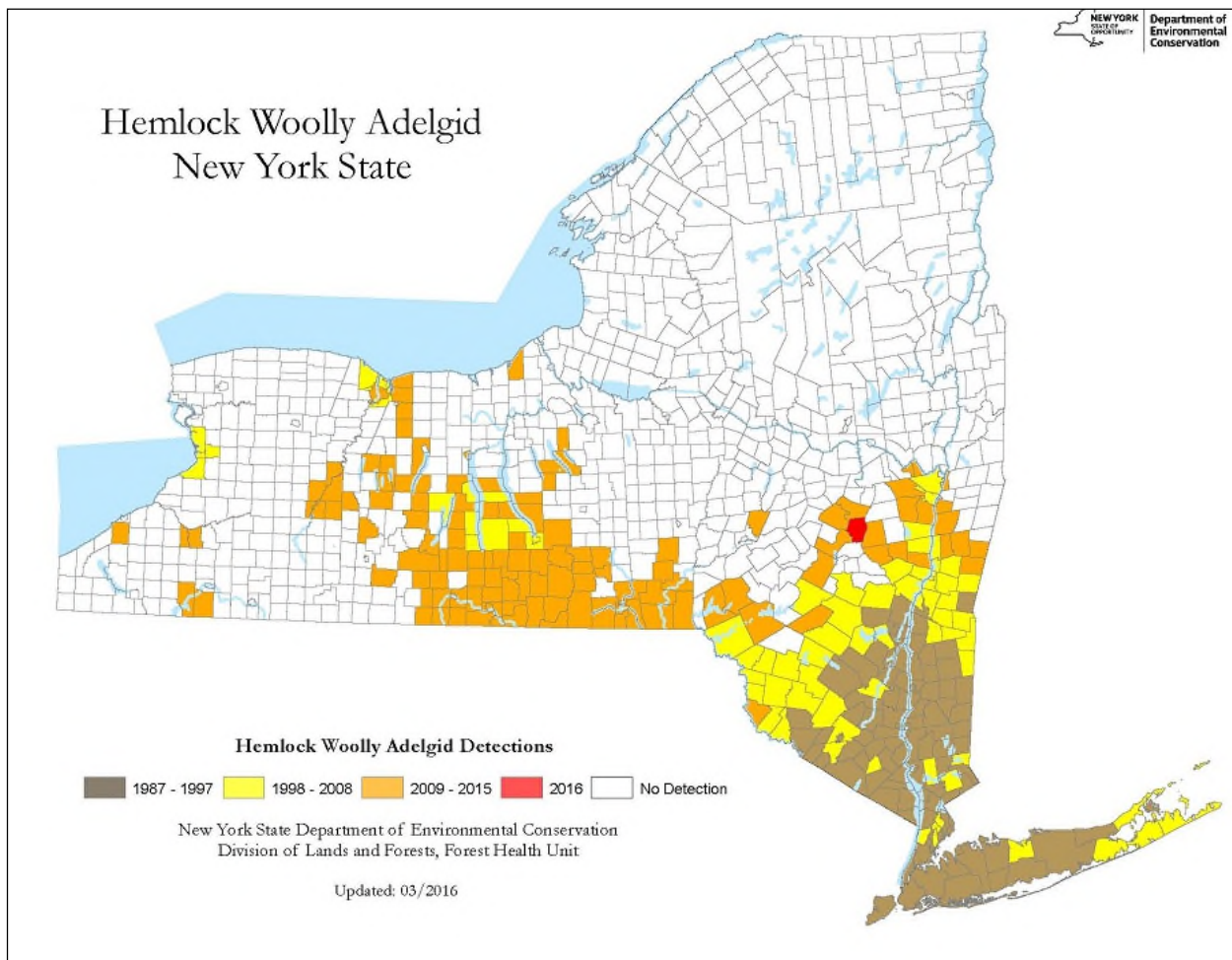
Note: Warren County is outlined in red.

Hemlock Woolly Adelgid

From the first discovery of the hemlock woolly adelgid in the Hudson Valley in the 1980's, the insect has spread north and west to the Catskills, the Capital Region and even the Finger Lakes and other parts of Western New York. Currently, 25 New York counties are infested with the hemlock woolly adelgid. Warren County has not had any detections of hemlock woolly adelgid; however, infestation of this insect is spreading throughout the State and the County has the potential to be impacted in the future.



Figure 5.4.3-2. Hemlock Woolly Adelgid in New York State



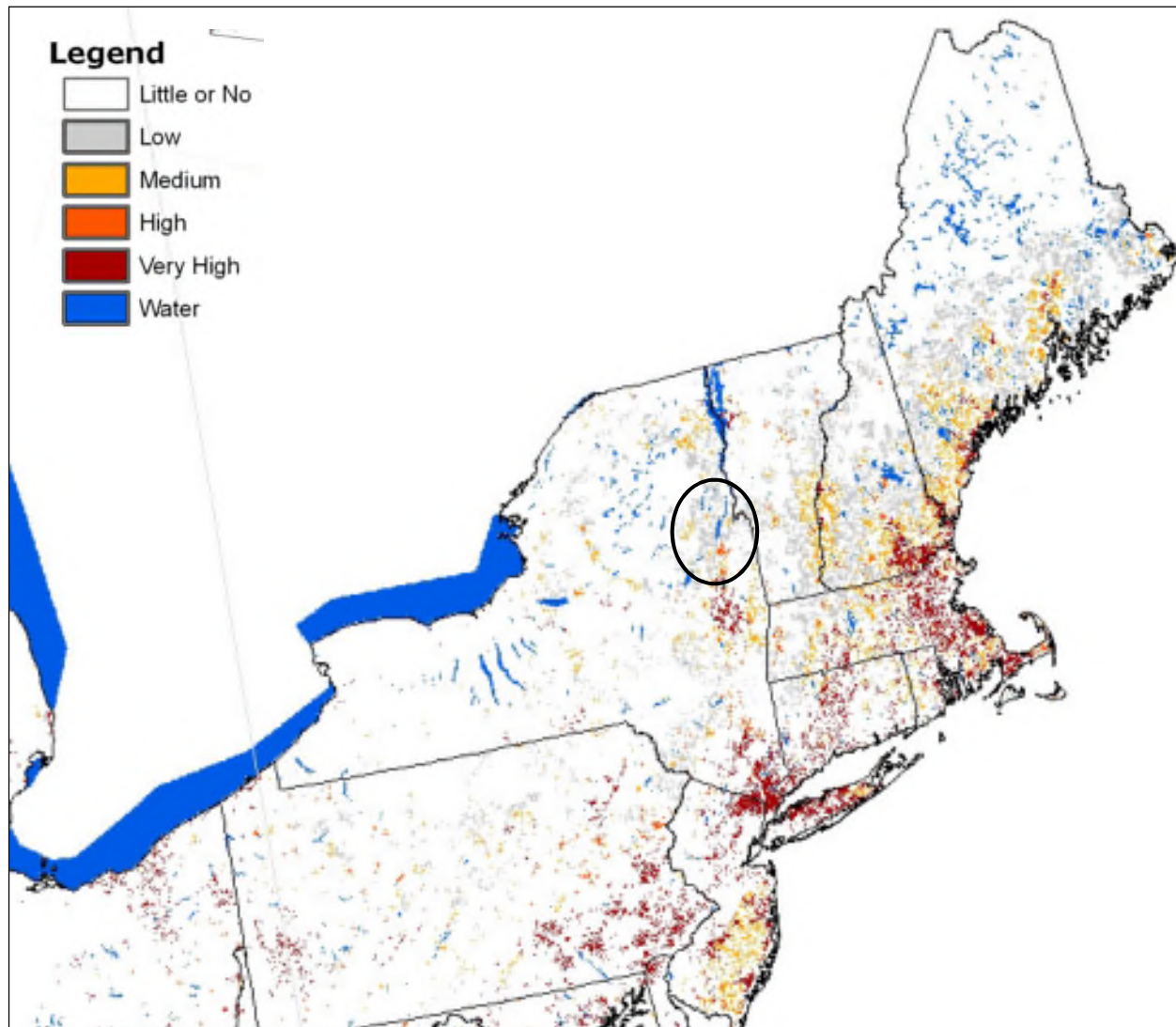
Source: NYSDEC 2015

Sirex Woodwasp

The species is native to Europe, Asia, and North Africa. It can now be found within the northeast United States ranging from Michigan to New Hampshire. In New York State, the largest damage is being seen in plantation Scots, Austrian, and red pine. These plantations were planted in the early to mid-20th century and were often unmanaged. Now, they are crowded, stressed and underperforming. According to the U.S. Forest Service, Warren County has low to high susceptibility potential of a Sirex woodwasp infestation (NYIS 2013). Figure 5.4.3-3 displays Sirex Woodwasp susceptibility in the northeast United States.



Figure 5.4.3-3. Sirex Woodwasp Susceptibility in the Northeast U.S.



Source: USDA Forest Service, 2006

Note: The black circle indicates the approximate location of Warren County.

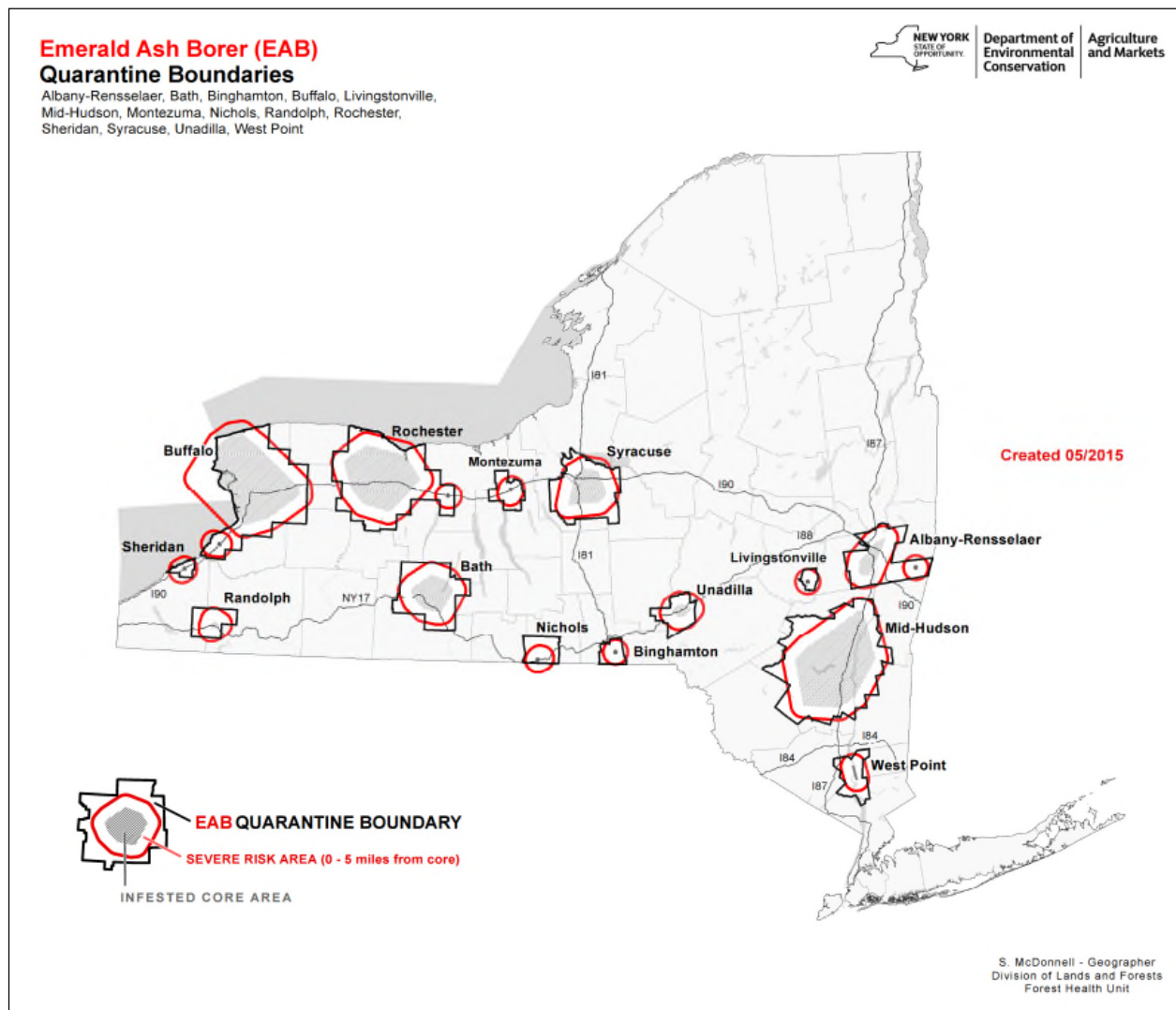
Emerald Ash Borer

As of early 2015, EAB has been confirmed in 24 states, including New York State, and in two Canadian provinces. It has killed millions of ash trees in southeastern Michigan along and tens of millions more in the infested states. EAB caused regulatory agencies and the USDA to enforce quarantines and fines to prevent potentially infested ash trees, logs or hardwood firewood from moving out of areas where EAB is found.

Figure 5.4.3-4 shows the location of the quarantine areas of New York State. The figure shows that Warren County is not in a quarantine area; however, ash trees are found in the County and has the potential of being impacted by EAB in the future.



Figure 5.4.3-4. Emerald Ash Borer Quarantine Areas in New York State



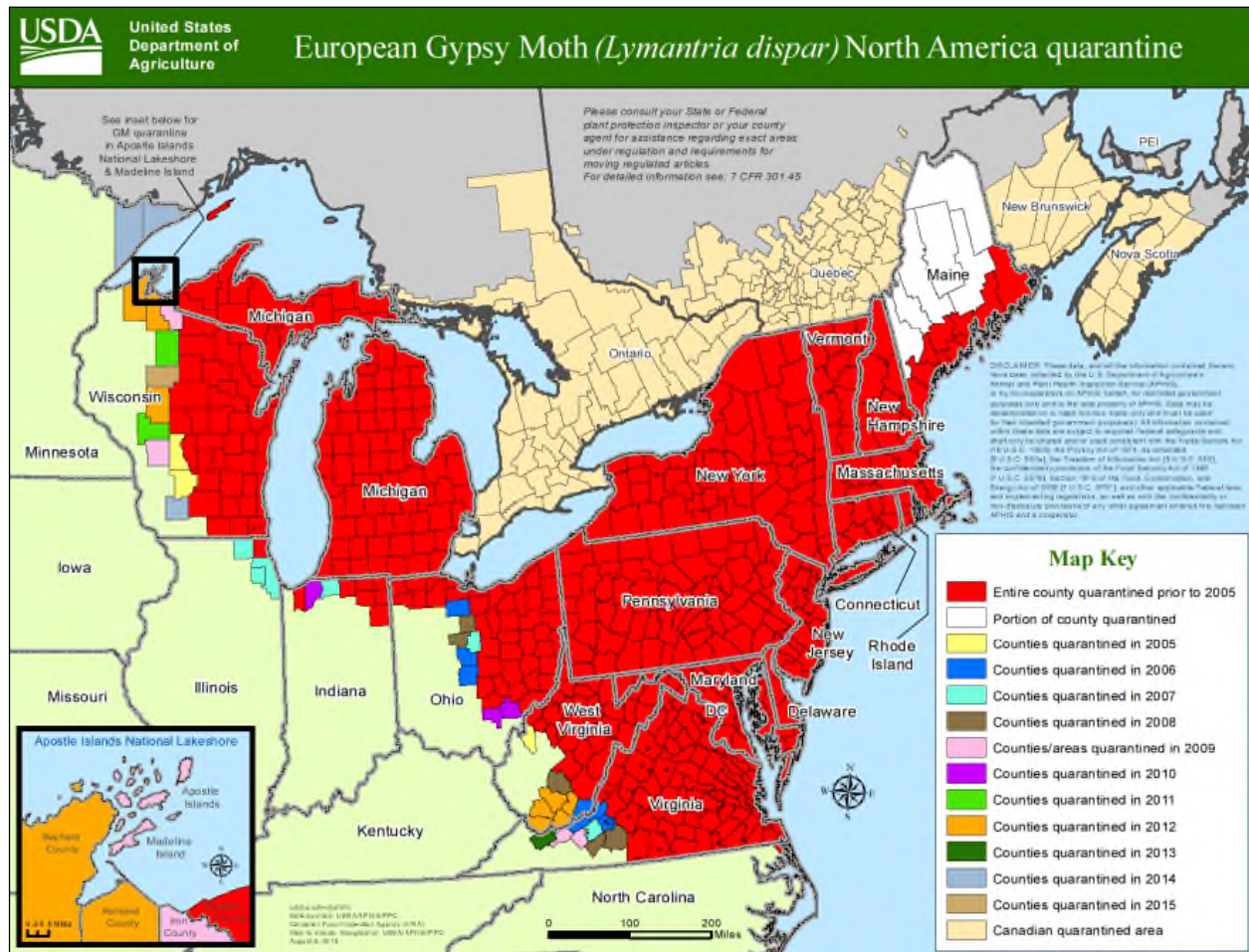
Source: NYSDEC 2015

Gypsy Moth

The gypsy moth is a significant non-native forest pest in the United States. The USDA as a gypsy moth program that regulates the movement of gypsy moth host material from infested areas to other areas of the country. This program is a federal-state partnership that prevents the establishment of gypsy moths in areas of the United States that are not contiguous to current regulated states and counties. Figure 5.4.3-5 illustrates the quarantine areas of the United States. Warren County is located within a gypsy moth quarantine area.



Figure 5.4.3-5. Gypsy Moth Quarantine Areas in the United States



Source: USDA 2015

Previous Occurrences and Losses

Many sources provided historical information regarding previous occurrences and losses associated with infestation events throughout New York State and Warren County. With so many sources reviewed for the purpose of this HMP, loss and impact information for many events could vary depending on the source. Therefore, the accuracy of monetary figures discussed is based only on the available information identified during research for this HMP.

Between 1953 and 2016, New York State has not been included in infestation-related FEMA emergency or major disaster declarations (FEMA 2016).

Based on all sources researched, Warren County is currently impacted by balsam woolly adelgid, sirex woodwasp and the gypsy moth. However, specific occurrences and losses were not identified for these infestations in the County.

Probability of Future Events

Based on historical documentation, increased incidences of infestation throughout New York and the overall impact of changing climate trends, it is estimated that Warren County and all its jurisdictions will continue to experience infestation events that may induce secondary hazards and health threats to the County population if





infestations are not prevented, controlled or eradicated effectively. The Planning Committee views this as a “Frequent” hazard of concern (hazard event that occurs more frequently than once in 25 years) (see Table 5.3-3 in Section 5.3).

Climate Change Impacts

Climate change is beginning to affect both people and resources in New York State, and these impacts are projected to continue growing. Impacts related to increasing temperatures and sea level rise are already being felt in the State. ClimAID: the Integrated Assessment for Effective Climate Change in New York State (ClimAID) was undertaken to provide decision-makers with information on the State’s vulnerability to climate change and to facilitate the development of adaptation strategies informed by both local experience and scientific knowledge (New York State Energy Research and Development Authority [NYSERDA], 2011).

Each region in New York State, as defined by ClimAID, has attributes that will be affected by climate change. Warren County is part of Region 7 (see Figure 5.4.3-6), Adirondack Mountains. Some of the issues in this region, affected by climate change, include: loss of high elevation plants, animals and ecosystem types; decline in winter recreation; decline in milk production, etc. (NYSERDA 2011).

Figure 5.4.3-6. Climate Regions of New York State



Source: NYSERDA 2011



Temperatures in New York State are warming, with an average rate of warming over the past century of 0.25° F per decade. Average annual temperatures are projected to increase across New York State by 2° F to 3.4° F by the 2020s, 4.1° F to 6.8° F by the 2050s, and 5.3° F to 10.1° F by the 2080s. By the end of the century, the greatest warming is projected to be in the northern section of the State (NYSERDA 2014).

Regional precipitation across New York State is projected to increase by approximately one to eight-percent by the 2020s, three to 12-percent by the 2050s, and four to 15-percent by the 2080s. By the end of the century, the greatest increases in precipitation are projected to be in the northern areas of the State (NYSERDA 2014).

In Region 7, it is estimated that temperatures will increase by 3.7°F to 7.4°F by the 2050s and 4.2°F to 11.8°F by the 2080s (baseline of 39.9°F). Precipitation totals will increase between 2 and 15% by the 2050s and 3 to 17% by the 2080s (baseline of 40.8 inches). Table 5.4.3-1 displays the projected seasonal precipitation change for the Adirondack Mountains ClimAID Region (NYSERDA, 2011).

Table 5.4.3-1. Projected Seasonal Precipitation Change in Region 7, 2050s (% change)

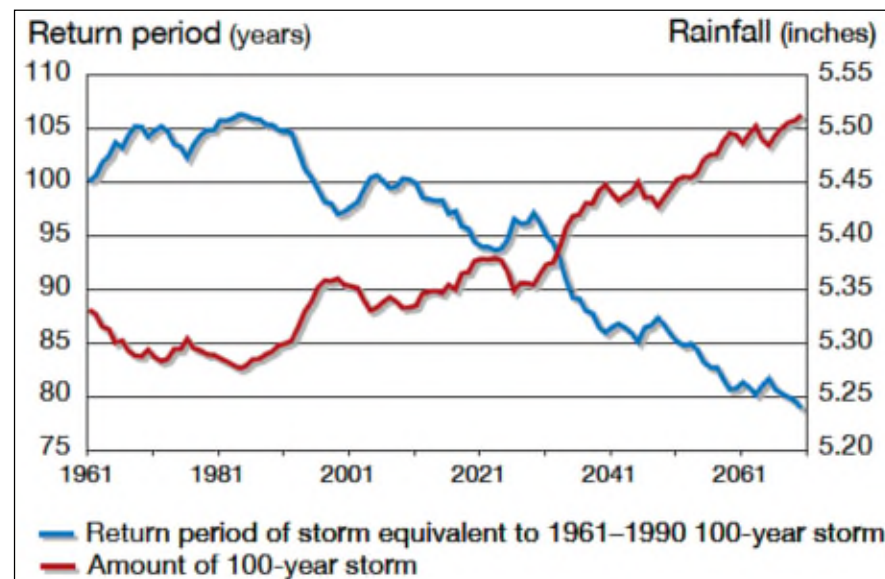
Winter	Spring	Summer	Fall
+5 to +15	-5 to +10	-5 to +5	-5 to +10

Source: *NYSERDA 2011*

The projected increase in precipitation is expected to fall in heavy downpours and less in light rains. The increase in heavy downpours has the potential to affect drinking water; heighten the risk of riverine flooding; flood key rail lines, roadways and transportation hubs; and increase delays and hazards related to extreme weather events (NYSERDA 2011). Less frequent rainfall during the summer months may impact the ability of water supply systems. Increasing water temperatures in rivers and streams will affect aquatic health and reduce the capacity of streams to assimilate effluent wastewater treatment plants (NYSERDA 2011).

Figure 5.4.3-7 displays the project rainfall and frequency of extreme storms in New York State. The amount of rain fall in a 100-year event is projected to increase, while the number of years between such storms (return period) is projected to decrease. Rainstorms will become more severe and more frequent (NYSERDA 2011).

Figure 5.4.3-7. Projected Rainfall and Frequency of Extreme Storms



Source: *NYSERDA 2011*



Total precipitation amounts have slightly increased in the northeast United States, by approximately 3.3 inches over the last 100 years. There has also been an increase in the number of two-inch rainfall events over a 48-hour period since the 1950s (a 67-percent increase). The number and intensity of extreme precipitation events are increasing in New York State as well. More rain heightens the danger of localized flash flooding, streambank erosion and storm damage (DeGaetano et al [Cornell University], 2011).

With the projection of temperature and rainfall increase due to climate change, there is evidence that climate change may be a factor in the expansion of infectious diseases in the U.S. Mosquitos capable of carrying and transmitting diseases now live in at least 28 states. As temperatures increase and rainfall patterns change, these insects can remain active for longer seasons and in wider areas. Lyme disease could expand throughout the United States and northward into Canada, as temperatures warm, allowing ticks to move into new regions. Warmer temperatures, heavy rainfall and high humidity have reportedly increased the rate of human infection of WNV (Natural Resources Defense Council 2013).



5.4.3.2 Vulnerability Assessment

To understand risk, a community must evaluate what assets are exposed or vulnerable in the identified hazard area. For infestation, Warren County has been identified as the hazard area. Therefore, all assets in Warren County, as described in the County Profile section, are vulnerable to infestation. The following text evaluates and estimates the potential impact of infestation on the County including:

- Overview of vulnerability
- Data and methodology used for the evaluation
- Impact on: (1) life, health and safety of residents, (2) general building stock, (3) critical facilities, (4) economy, and (5) future growth and development
- Effect of climate change on vulnerability
- Further data collections that will assist understanding this hazard over time

Overview of Vulnerability

Infestation is a significant concern to Warren County, mainly due to its impact on public health and natural resources. Estimated losses are difficult to quantify; however infestation can impact Warren County's population and economy. Direct impacts of infestation have cascading indirect impacts. As vegetation dies or becomes stressed/weakened by pests such as balsam woolly adelgid or sirex woodwasp, there is an increase in available fuel and increase in high intensity wildfires. As species composition changes due to infestation outbreaks, whole fire regimes can shift. Physical stresses on trees may also affect how street trees respond to physical stresses caused by other natural hazards such as hurricanes, drought and ice storms (Kurtz, 2007).

Data and Methodology

Due to a lack of quantifiable loss information, a qualitative assessment was conducted to evaluate the assets exposed to this hazard and the potential impacts associated with this hazard.

Impact on Life, Health and Safety

The entire population of Warren County is vulnerable to infestation.

Impact on General Building Stock and Critical Facilities

No structures are anticipated to be directly affected by infestation.

Impact on Economy

The impact infestation has on the economy and estimated dollar losses are difficult to measure and quantify. Costs associated with the activities and programs implemented to conduct surveillance and address infestation have not been quantified in available documentation. Instead, activities and programs implemented by the County to address this hazard are described below, all of which could impact the local economy.

Impact of Future Growth and Development

As discussed in Section 4, areas targeted for future growth and development have been identified across the County. Any areas of growth could be potentially impacted by the infestation hazard because the entire planning area is exposed and vulnerable.



Additional Data and Next Steps

For the Plan Update, any additional information regarding localized concerns and past impacts will be collected and analyzed. This data will be developed to support future revisions to the plan. Mitigation efforts could include building on existing New York State, Warren County, and local efforts.



5.4.4 Landslide

This section provides a profile and vulnerability assessment for the landslide hazard.

5.4.4.1 Hazard Profile

This section provides profile information including description, extent, location, previous occurrences and losses and the probability of future occurrences.

Description

According to the U.S. Geological Survey (USGS), the term landslide includes a wide range of ground movement, such as rock falls, deep failure of slopes, and shallow debris flows. Although gravity acting on an over steepened slope is the primary reason for a landslide, there are other contributing factors (USGS 2013). Among the contributing factors are: (1) erosion by rivers, glaciers, or ocean waves which create over-steepened slopes; (2) rock and soil slopes weakened through saturation by snowmelt or heavy rains; (3) earthquakes which create stresses making weak slopes fail; and (4) excess weight from rain/snow accumulation, rock/ore stockpiling, waste piles, or man-made structures. Scientists from the USGS also monitor stream flow, noting changes in sediment load in rivers and streams that may result from landslides. All of these types of landslides are considered aggregately in USGS landslide mapping.

Landslide materials may be composed of natural rock, soil, artificial fill, or a combination of these materials. They can be caused by numerous factors such as volcanic eruptions, earthquakes, fire, storms, and by human land modifications. Landslides can transpire quickly with little to no warning. Depending on the location of a landslide, they can pose significant risks to health, safety, transportation, as well as other services. Annually, landslides in the U.S. cause approximately \$3.5 billion in damages and between 25 and 50 fatalities (NYS HMP 2014).

Location

The entire U.S. experiences landslides, with 36 states having moderate to highly severe landslide hazards. Expansion of urban and recreational developments into hillside areas exposes more people to the threat of landslides each year. According to the USGS, Warren County has areas of high potential; however, the majority of the County has low landslide potential. For a figure displaying the landslide potential of the conterminous United States, please refer to <http://pubs.usgs.gov/fs/2005/3156/2005-3156.pdf> (USGS 2005).

The potential for landslides exists across New York State and in Warren County. Scientific and historical data exists for New York State which indicates that some areas of the State have a substantial landslide risk. It is estimated that 80% of New York State has a low susceptibility to the landslide hazard. In general, the highest potential for landslides can be found along major rivers and lake valleys that were formerly occupied by glacial lakes resulting in glacial lake deposits and usually associated with steeper slopes (for example, the Hudson and Mohawk River Valleys). Some natural variables such as soil properties, topographic position and slope, and historical incidence all contribute to determining the overall risk of landslide activity in any particular area.

Extent

To determine the extent of a landslide hazard, the affected areas need to be identified and the probability of the landslide occurring within some time period needs to be assessed. Natural variables that contribute to the overall extent of potential landslide activity in any particular area include soil properties, topographic position and slope, and historical incidence. Predicting a landslide is difficult, even under ideal conditions and with reliable



information. As a result, the landslide hazard is often represented by landslide incidence and/or susceptibility, as defined below:

- Landslide incidence is the number of landslides that have occurred in a given geographic area. High incidence means greater than 15% of a given area has been involved in landsliding; medium incidence means that 1.5 to 15% of an area has been involved; and low incidence means that less than 1.5% of an area has been involved (State of Alabama Date Unknown).
- Landslide susceptibility is defined as the probable degree of response of geologic formations to natural or artificial cutting, to loading of slopes, or to unusually high precipitation. It can be assumed that unusually high precipitation or changes in existing conditions can initiate landslide movement in areas where rocks and soils have experienced numerous landslides in the past. Landslide susceptibility depends on slope angle and the geologic material underlying the slope. Landslide susceptibility only identifies areas potentially affected and does not imply a time frame when a landslide might occur. High, medium, and low susceptibility are delimited by the same percentages used for classifying the incidence of landsliding (State of Alabama Date Unknown).

Previous Occurrences and Losses

Numerous sources provided historical information regarding previous occurrences and losses associated with geological hazard events throughout Warren County. According to the 2014 New York State HMP, Warren County has experienced one landslide between 1960 and 2012. Many sources were reviewed for the purpose of this HMP and loss and impact information could vary depending on the source. Therefore, the accuracy of monetary figures, if any, is based only on the available information identified during research for this HMP.

Between 1953 and 2015, FEMA issued a disaster (DR) or emergency (EM) declaration for the New York State for one geological hazard-related event, classified as severe storm, heavy rain, landslides and flooding (DR 487 in October 1975). This declaration did not include Warren County (FEMA 2015).

For this HMP, known landslide events that have impacted Warren County between 2010 and 2016 are identified below. Many sources were researched for historical information regarding landslide events in Warren County; however, limited information was found. Major land failure events that have impacted the County are summarized in Table 5.4.4-1.



Table 5.4.4-1. Landslide Events in Warren County Between 2010 and 2016

Dates of Event	Event Type	FEMA Declaration Number	County Declared?	Losses / Impact
April 28-29, 2011	Severe Storms, Flooding, Tornadoes, and Straight-line Winds	DR-1993	Yes	Flooding occurred along the Hudson River in Warren County, from North River southward to the Saratoga County line. Many towns reported flooding of roadways, homes, and riverside camps. Numerous roads were closed throughout the County. The river gauge at North Creek on the Hudson River crested at 13.65 feet (flood stage is 10 feet). In North Creek, a couple hundred feet of railway tracks were reported under two to five feet of water and several buildings in the train station flooded. There were washouts on 13 th Lake, Parrish and Beach Roads in the Town of Johnsbury due to the heavy rain from the thunderstorms. There was a reported mudslide in North River/North Creek (Town of Johnsbury) 13 th Lake Road. There was another reported incident at Laflure Lane and Old River Road in Chestertown (Town of Chester).
May 15, 2011	Mudslide	N/A	N/A	During a heavy rain event, a stone wall that supported State Route 9N in Hague gave way and set off a mudslide that sent guardrails, trees and debris into Lake George. The NYSDOT temporarily stabilized the area with fill to keep the road open.
April 12, 2014	Mudslide	N/A	N/A	A mudslide near Warrensburg closed a portion of Route 418, from Warrensburg to Thurman, in southeastern Adirondacks. Mud and trees covered approximately 100 feet of the roadway; however, there were no injuries as a result of this event.

Sources: NOAA-NCDC 2015; FEMA 2015; NASA 2015
 FEMA Federal Emergency management Agency
 NCDC National Climatic Data Center
 NOAA National Oceanic and Atmospheric Administration
 NYSDOT New York State Department of Transportation



Probability of Future Events

Based upon risk factors for and past occurrences, it is likely that landslides will occur in Warren County in the future. Landslide probabilities are largely a function of surface geology, but are also influenced by both weather and human activities. Based on recent occurrences, the County can expect to experience 0.4 landslides each year. It is estimated that the County will continue to experience direct and indirect impacts of geological hazards and its impacts on occasion, with the secondary effects causing potential disruption or damage to communities.

In Section 5.3, the identified hazards of concern for Warren County were ranked. The probability of occurrence, or likelihood of the event, is one parameter used for hazard rankings. Based on historical records and input from the Planning Committee, the probability of occurrence for landslides in the County is considered ‘frequent’ (likely to occur within 25 years, as presented in Table 5.3-3).

Climate Change Impacts

Climate change may impact storm patterns, increasing the probability of more frequent, intense storms with varying duration. Increase in global temperature could affect the snowpack and its ability to hold and store water. Warming temperatures also could increase the occurrence and duration of droughts, which would increase the probability of wildfire, reducing the vegetation that helps to support steep slopes. All of these factors would increase the probability for landslide occurrences.



5.4.4.2 Vulnerability Assessment

To understand risk, a community must evaluate what assets are exposed or vulnerable in the identified hazard area. For landslides, the known vulnerable areas as identified by New York State and others have been identified as the hazard area. The following text evaluates and estimates the potential impact of landslides on Warren County including:

- Overview of vulnerability
- Data and methodology used for the evaluation
- Impact on: (1) life, health and safety of residents, (2) general building stock, (3) critical facilities, (4) economy and environment, and (5) future growth and development
- Effect of climate change on vulnerability
- Further data collections that will assist understanding this hazard over time

Overview of Vulnerability

Vulnerability to ground failure hazards is a function of location, soil type, geology, type of human activity, use, and frequency of events. The effects of ground failure on people and structures can be lessened by total avoidance of hazard areas or by restricting, prohibiting, or imposing conditions on hazard-zone activity. Local governments can reduce ground failure effects by educating themselves on past hazard history of the site and by making inquiries to planning and engineering departments of local governments (National Atlas, 2007).

Data and Methodology

The 2014 New York State Hazard Mitigation Plan (NYS HMP) was used to assess the County's vulnerability to landslides. To determine the vulnerability within the State, each county jurisdiction accumulated points based on the value of each variable indicator; the higher the indication for landslide exposure the more points assigned, resulting in a final rating score. The results of the State's landslide vulnerability assessment present a collective review of counties most threatened by and vulnerable to the landslide hazard using readily available information. Based on this, Warren County received a rating score of 5 (out of 15). Figure 5.4.4-1 presents the landslide incidence and susceptibility in New York State. According to this figure, Warren County has an overall low incidence, with a very small area of high incidence in the southeast corner of the County.

Impact on Life, Health and Safety

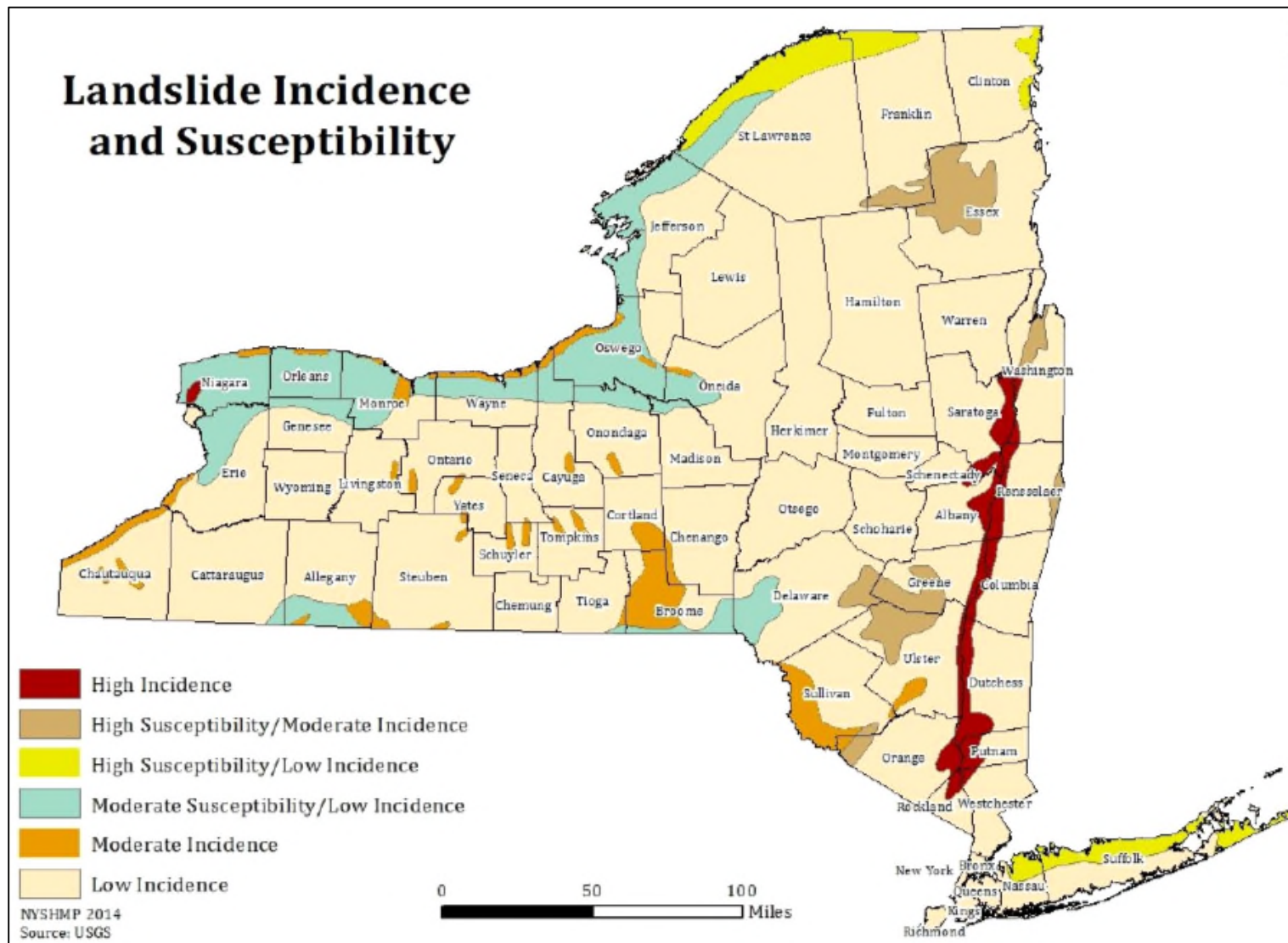
In order to determine the population risk of landslide incidence, the 2014 NYS HMP used data provided by the USGS. Populations located within landslide susceptibility zones were used to determine the number of people at risk of landslides. According to this data, 250 people in Warren County live within a high incidence zone, while the remaining population, 65,457, living within a low incidence zone.

Impact on General Building Stock and Critical Facilities

Losses incurred from landslides within Warren County have been associated with roads. The impact of closed roadways may be increased if the road is critical for hospitals and other emergency facilities.



Figure 5.4.4-1. Landslide Incidence and Susceptibility in New York State



Source: NYS HMP 2014





Impact on the Economy

Landslide impacts on the economy and estimated dollar losses are difficult to measure. As stated earlier, landslides can impose direct and indirect impacts on society. Direct costs include the actual damage sustained by buildings, property and infrastructure. Indirect costs, such as clean-up costs, business interruption, loss of tax revenues, reduced property values, and loss of productivity are difficult to measure. Additionally, land failure threatens transportation corridors, fuel and energy conduits and communication lines (USGS 2003). Estimated potential damages to general building stock can be quantified as discussed above. For the purposes of this analysis, general building stock damages are discussed further.

Future Growth and Development

As discussed in Section 4 and Volume II, Section 9, areas targeted for future growth and development have been identified across the County. It is anticipated that new development within the high landslide incidence areas identified by USGS will be exposed to landslide risks.

Effect of Climate Change on Vulnerability

Providing projections of future climate change for a specific region is challenging. Some scientists feel that melting glaciers could induce tectonic activity. As ice melts and water runs off, tremendous amounts of weight are shifted on the Earth's crust. As newly freed crust returns to its original, pre-glacier shape, it could cause seismic plates to slip and stimulate volcanic activity according to research into prehistoric earthquakes and volcanic activity. National Aeronautics and Space Administration (NASA) and USGS scientists found that retreating glaciers in southern Alaska might be opening the way for future earthquakes.

Secondary impacts of earthquakes could be magnified by future climate change. Soils saturated by repetitive storms could experience liquefaction during seismic activity because of the increased saturation. Dams storing increased volumes of water from changes in the hydrograph could fail during seismic events. There are currently no models available to estimate these impacts.

Additional Data and Next Steps

Obtaining historic damages to buildings and infrastructure incurred due to ground failure will help with loss estimates and future modeling efforts, given a margin of uncertainty. More detailed landslide susceptibility zones can be generated so that communities can more specifically identify high hazard areas. A pilot study was conducted for Schenectady County, New York as described in the 2011 New York State Hazard Mitigation Plan to develop higher resolution landslide susceptibility zones. The methodology included using the Natural Resource Conservation Services (NRCS) Digital Soil Survey soil units and their associated properties including the American of State Highway Transportation Officials (AASHTO) rating, liquid limit, hydrologic group, percentage of silt and clay, erosion potential and slope derived from high resolution digital elevation models. Further, research on rainfall thresholds for forecasting landslide potential may also be an option for Warren County.



5.4.5 Severe Storm

The following section provides the hazard profile (hazard description, location, extent, previous occurrences and losses, probability of future occurrences, and impact of climate change) and vulnerability assessment for the severe storm hazard in Warren County.

5.4.5.1 Profile

Hazard Description

For the purpose of this HMP and as deemed appropriated by the Warren County Steering and Planning Committees, the severe storm hazard includes: hail, high winds, and thunderstorms, which are defined below.

Hailstorms

Hail forms inside a thunderstorm where there are strong updrafts of warm air and downdrafts of cold water. If a water droplet is picked up by the updrafts, it can be carried well above the freezing level. Water droplets freeze when temperatures reach 32°F or colder. As the frozen droplet begins to fall, it may thaw as it moves into warmer air toward the bottom of the thunderstorm. However, the droplet may be picked up again by another updraft and carried back into the cold air and re-freeze. With each trip above and below the freezing level, the frozen droplet adds another layer of ice. The frozen droplet, with many layers of ice, falls to the ground as hail. Most hail is small and typically less than two inches in diameter (National Weather Service [NWS] 2010).

High Winds

High winds, other than tornadoes, are experienced in all parts of the United States. Areas that experience the highest wind speeds are coastal regions from Texas to Maine, and the Alaskan coast; however, exposed mountain areas experience winds at least as high as those along the coast (Federal Emergency Management Agency [FEMA] 1997; Robinson 2013). Wind begins with differences in air pressures. It is rough horizontal movement of air caused by uneven heating of the earth’s surface. Wind occurs at all scales, from local breezes lasting a few minutes to global winds resulting from solar heating of the earth (Ilicak 2005). High winds have the potential to down trees, tree limbs and power lines which lead to widespread power outages and damaging residential and commercial structures throughout Warren County. High winds are often associated by other severe storm events such as thunderstorms, tornadoes, hurricanes and tropical storms (all discussed further in this section). The following table provides the descriptions of winds used by the NWS.

Table 5.4.5-1. NWS Wind Descriptions

Descriptive Term	Sustained Wind Speed (mph)
Strong, dangerous, or damaging	≥40
Very Windy	30-40
Windy	20-30
Breezy, brisk, or blustery	15-25
None	5-15 or 10-20
Light or light and variable wind	0-5

Source: NWS 2015
mph miles per hour



Thunderstorms

A thunderstorm is a local storm produced by a cumulonimbus cloud and accompanied by lightning and thunder (NWS 2009). A thunderstorm forms from a combination of moisture, rapidly rising warm air, and a force capable of lifting air such as a warm and cold front, a sea breeze, or a mountain. Thunderstorms form from the equator to as far north as Alaska. Although thunderstorms generally affect a small area when they occur, they have the potential to become dangerous due to their ability in generating tornadoes, hailstorms, strong winds, flash flooding, and lightning. The NWS considers a thunderstorm severe only if it produces damaging wind gusts of 58 mph or higher or large hail one-inch (quarter size) in diameter or larger or tornadoes (NWS 2010).

Lightning is a bright flash of electrical energy produced by a thunderstorm. The resulting clap of thunder is the result of a shock wave created by the rapid heating and cooling of the air in the lightning channel. All thunderstorms produce lightning and are very dangerous. It ranks as one of the top weather killers in the United States and kills approximately 50 people and injures hundreds each year. Lightning can occur anywhere there is a thunderstorm.

Thunderstorms can lead to flooding, landslides, strong winds, and lightning. Roads may become impassable from flooding, downed trees or power lines, or a landslide. Downed power lines can lead to utility losses, such as water, phone and electricity. Lightning can damage homes and injure people. In the U.S., an average of 300 people are injured and 50 people are killed by lightning each year. Typical thunderstorms are 15 miles in diameter and last an average of 30 minutes. An estimated 100,000 thunderstorms occur each year in the U.S., with approximately 10% of them classified as severe. During the warm season, thunderstorms are responsible for most of the rainfall.

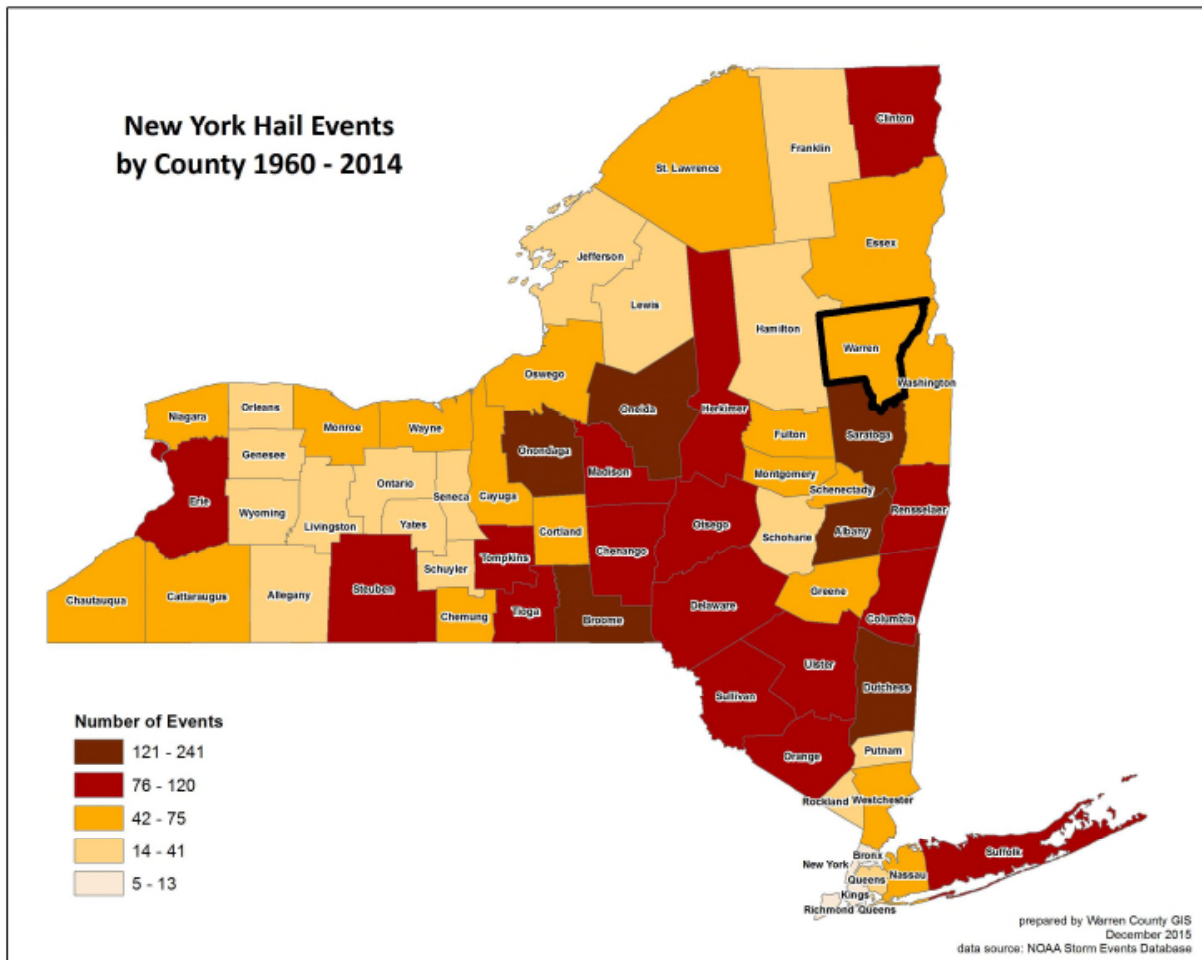
Location

Hailstorms

Hailstorms are most frequent in the southern and central plains states in the United States, where warm moist air off of the Gulf of Mexico and cold dry air from Canada collide, and thereby spawning violent thunderstorms. This area of the United States is known as hail alley and lies within the states of Texas, Oklahoma, Colorado, Kansas, Nebraska, and Wyoming. In New York State, hailstorms can occur anywhere within the State independently or during a tornado, thunderstorm or lightning event. Figure 5.4.5-1 shows the number of hail events from 1960 to 2014 across New York State. The figure indicates that Warren County experienced 47 hail events during this timeframe (National Oceanic and Atmospheric Administration [NOAA]).



Figure 5.4.5-1. New York Hail Events by County 1960-2014



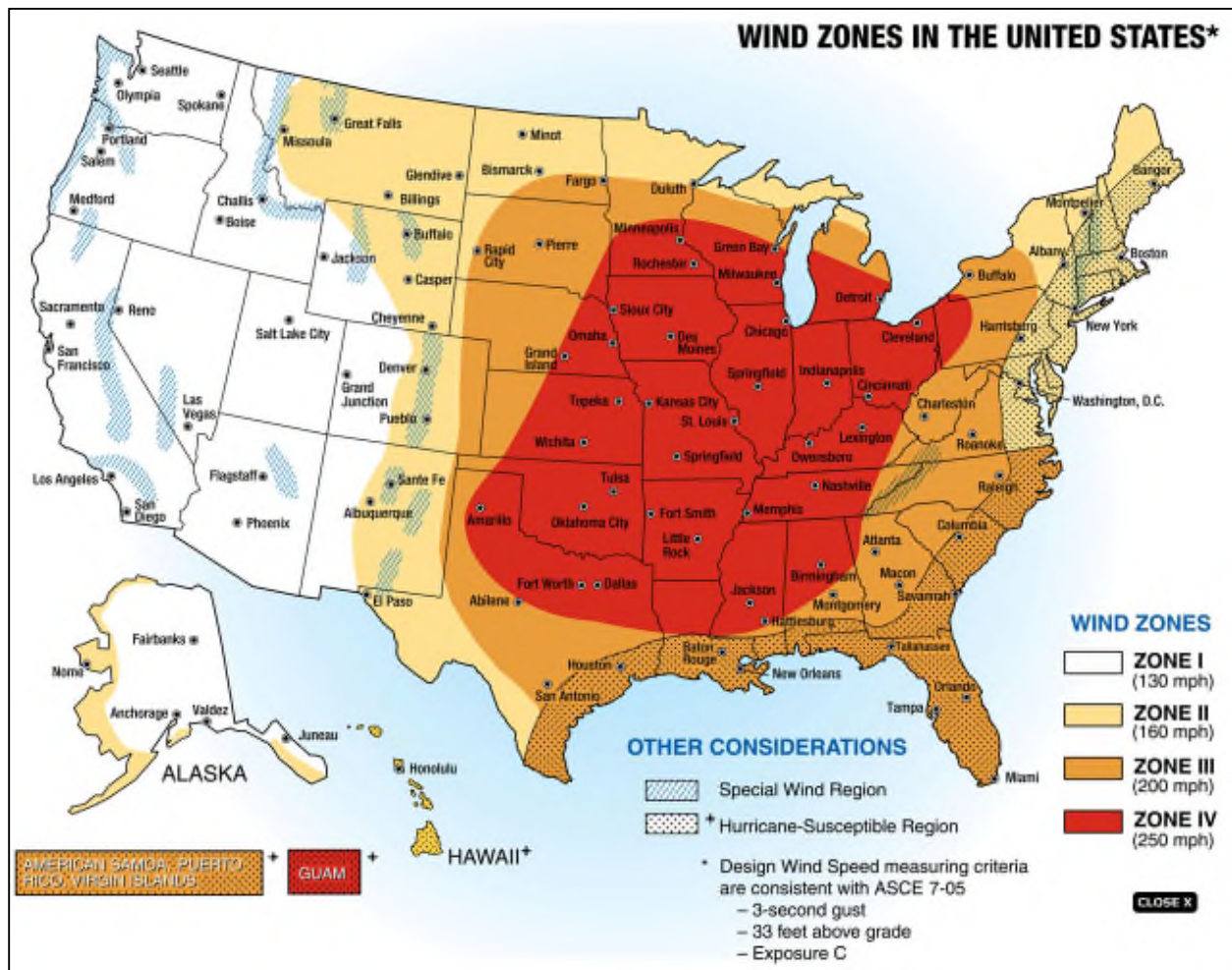
Source: NOAA Storm Events Database

High Winds

All of Warren County is subject to high winds from thunderstorms, hurricanes/tropical storms, tornadoes, and other severe storm events. According to Figure 5.4.5-2, the FEMA Winds Zones of the United States map, Warren County is located in Wind Zone II, where wind speeds can reach up to 160 mph. The County is also located in the Hurricane Susceptible Region, which extends along the entire east coast from Maine to Florida, the Gulf Coast, and Hawaii. This figure indicates how the frequency and strength of windstorms impacts the United States and the general location of the most wind activity. This is based on 40 years of tornado data and 100 years of hurricane data, collected by FEMA.



Figure 5.4.5-2. Wind Zones in the United States



Source: FEMA, 2001

Thunderstorms

Thunderstorms affect relatively small localized areas, rather than large regions like winter storms and hurricane events. Thunderstorms can strike in all regions of the United States; however, they are most common in the central and southern states. The atmospheric conditions in these regions of the country are ideal for generating these powerful storms. It is estimated that there are as many as 40,000 thunderstorms each day worldwide. The most thunderstorms are seen in the southeast United States, with Florida having the highest incidences (80 to over 100 thunderstorm days each year). According to NOAA, Warren County can experience between 20 and 30 thunderstorms each year (NWS 2010).

Extent

Hailstorms

The severity of hail is measured by duration, hail size, and geographic extent. All of these factors are directly related to thunderstorms, which creates hail. There is wide potential variation in these severity components. The most significant impact of hail is damage to crops. Hail also has the potential to damage structures and vehicles during hailstorms.



Hail can be produced from many different types of storms. Typically, hail occurs with thunderstorm events. The size of hail is estimated by comparing it to a known object. Most hailstorms are made up of a variety of sizes, and only the very largest hail stones pose serious risk to people, when exposed. Table 5.4.5-2 shows the different sizes of hail and the comparison to real-world objects.

Table 5.4.5-2. Hail Size

Size	Inches in Diameter
Pea	0.25 inch
Marble/mothball	0.50 inch
Dime/Penny	0.75 inch
Nickel	0.875 inch
Quarter	1.0 inch
Ping-Pong Ball	1.5 inches
Golf Ball	1.75 inches
Tennis Ball	2.5 inches
Baseball	2.75 inches
Tea Cup	3.0 inches
Grapefruit	4.0 inches
Softball	4.5 inches

Source: NWS 2015; NYS DHSES 2014

High Winds

The following table provides the descriptions of winds used by the NWS during wind-producing events.

Table 5.4.5-3. NWS Wind Descriptions

Descriptive Term	Sustained Wind Speed (mph)
Strong, dangerous, or damaging	≥40
Very Windy	30-40
Windy	20-30
Breezy, brisk, or blustery	15-25
None	5-15 or 10-20
Light or light and variable wind	0-5

Source: NWS 2010
mph miles per hour

The NWS issues advisories and warnings for winds. Issuance is normally site-specific. High wind advisories, watches and warnings are products issued by the NWS when wind speeds may pose a hazard or is life threatening. The criterion for each of these varies from state to state. Wind warnings and advisories for New York State are as follows:

- High Wind Warnings are issued when sustained wind speeds of 40 mph or greater lasting for one hour or longer or for winds of 58 mph or greater for any duration or widespread damage are possible.
- Wind Advisories are issues when sustained winds of 30 to 39 mph are forecast for one hour or longer, or wind gusts of 46 to 57 mph for any duration (NWS 2015).

Thunderstorms

Severe thunderstorm watches and warnings are issued by the local NWS office and Storm Prediction Center (SPC). The NWS and SPC will update the watches and warnings and will notify the public when they are no longer in effect. Watches and warnings for tornadoes in New York State are as follows:



- Severe Thunderstorm Warnings are issued when there is evidence based on radar or a reliable spotter report that a thunderstorm is producing, or forecast to produce, wind gusts of 58 mph or greater, structural wind damage, and/or hail one-inch in diameter or greater. A warning will include where the storm was located, what municipalities will be impacted, and the primary threat associated with the severe thunderstorm warning. After it has been issued, the NWS office will follow up periodically with Severe Weather Statements which contain updated information on the severe thunderstorm and will let the public know when the warning is no longer in effect (NWS 2009; NWS 2010).
- Severe Thunderstorm Watches are issued by the SPC when conditions are favorable for the development of severe thunderstorms over a larger-scale region for a duration of at least three hours. Tornadoes are not expected in such situations, but isolated tornado development may also occur. Watches are normally issued well in advance of the actual occurrence of severe weather. During the watch, the NWS will keep the public informed on what is happening in the watch area and also let the public know when the watch has expired or been cancelled (NWS 2009; NWS 2010).
- Special Weather Statements for Near Severe Thunderstorms are issued for strong thunderstorms that are below severe levels, but still may have some adverse impacts. Usually, they are issued for the threat of wind gusts of 40 to 58 mph or small hail less than one-inch in diameter (NWS 2010).

Previous Occurrences and Losses

Many sources provided historical information regarding previous occurrences and losses associated with severe storm events throughout Warren County. With so many sources reviewed for the purpose of this HMP, loss and impact information for many events could vary depending on the source. Therefore, the accuracy of monetary figures discussed is based only on the available information identified during research for this HMP.

Between 1954 and 2015, New York State was included in 54 FEMA declared severe storm-related disasters (DR) or emergencies (EM) classified as one or a combination of the following hazards: coastal storm, high tides, heavy rain, flooding, hurricane, ice storm, severe storms, thunderstorms, tornadoes, tropical storm, straight-line winds, and landslides. Generally, these disasters cover a wide region of the State; therefore, they may have impacted many counties. Of those declarations, Warren County has been included in ten declarations (FEMA 2015).

For this 2016 Plan update, known severe storm events, including FEMA disaster declarations, which have impacted Warren County between 2010 and 2015 are identified in Table 5.4.5-4. For detailed information on damages and impacts to each municipal, refer to Section 9 (jurisdictional annexes). Please note that not all events that have occurred in Warren County are included due to the extent of documentation and the fact that not all sources may have been identified or researched. Loss and impact information could vary depending on the source. Therefore, the accuracy of monetary figures discussed is based only on the available information identified during research for this plan.



Table 5.4.5-4. Severe Storm Events in Warren County between 2010 and 2015

Dates of Event	Event Type	FEMA Declaration Number	Location / County Designated?	Losses / Impacts
March 13 – 31, 2010	Severe Storms and Flooding	DR-1899	Yes	A low pressure system tracked northeast over northeastern United States on March 23rd, bringing a moderate to heavy rainfall to east central New York. The ground was already nearly saturated from recent snow melt, causing rivers and streams to run high. In Warren County, a bridge was reported washed out on Harrington Road in the Town of Johnsbury due to a possible beaver dam break along Johnson Brook. The County reported a total of \$25,000 in property damage.
October 1, 2010	Flooding (Remnants of Tropical Storm Nicole)	N/A	N/A	The remnants of Tropical Storm Nicole brought very heavy rains to east-central New York State. Rainfall totals from this storm ranged from three to nine inches, resulting in widespread river and small stream and urban flooding, including water in basements. In Warren County, there was standing water reported in the City of Glens Falls at the intersection of Sherman Avenue and Elm Street due to the heavy rains.
April 28-30, 2011	Severe Storms, Flooding, Tornadoes, and Straight-Line Winds	DR-1993	Yes	Heavy showers and thunderstorms impacted the western and central Mohawk Valley, Adirondack region, and the Upper Hudson River Valley, including the Lake George Region (Warren County). Thunderstorms produced severe weather and very heavy rainfall. The combination of the rainfall and rapid snowmelt due to warm temperatures led to increased runoff and rapid river rises. In Warren County, flooding from this event covered nearly two-thirds of the County. Flooding occurred along the Hudson River in the County from North River southward to the Saratoga County line. Numerous municipalities reported flooding of roadways, houses, and riverside camps. Some properties had several feet of water in them. Many major roadways were closed in the County due to flooding. The North Creek Trailer Park on Route 28 in the Town of Johnsbury was evacuated because water from the Hudson River entered the park. A mudslide in excess of 200 feet occurred on 13 th Lake Road in North River/North Creek. In the hamlet of North Creek (Town of Johnsbury), a couple hundred feet of railway tracks were reported under two to five feet of water with several buildings at the train station being flooded as well. In the Town of Stony Creek, the 1,000 Acres Golf Course was flooded with the 9 th green under eight feet of water. Flood water receded through April 30 th . The County had approximately \$676,000 in property damage from this event.
May 27 – June 2, 2011	Flooding, Thunderstorm Wind, Hail (Memorial Day Storm)	N/A	N/A	A combination of individual storms caused severe damage along a thin line through the County and impacted the Towns of Stony Creek, Thurman, Warrensburg, Horicon, and Bolton. A swath of heavy rainfall which fell in just a few hours causing flash flooding, resulting in road closures with significant damage to many roadways, washed-out culverts and a least a couple of washed-out bridges. In addition, a few of the storms were severe producing large hail up to the size of a golf ball and some trees were downed by strong thunderstorm winds.



Dates of Event	Event Type	FEMA Declaration Number	Location / County Designated?	Losses / Impacts
				<p>It was reported that seven area fire departments, three EMS crews, the Warren County Sheriff's Office, State Police, along with state, county and local highway departments all responded to the flooding.</p> <p>Numerous trees were reported down on wires in Chestertown, as well as in Thurman, and Warrensburg.</p> <p>Nickel size hail was reported in Chestertown and Stony Creek, quarter size hail was reported in Hague, ping-pong ball size hail was reported in Thurman, and golf ball size hail was reported in Warrensburg.</p> <p>The County had \$13.125 million in damages from this event.</p>
August 28-30, 2011	Hurricane Irene	DR-4020	Yes	<p>The greatest impact of Irene in eastern New York State was heavy to extreme rainfall which resulted in catastrophic flooding across portions of the region. Rainfall amounts averaged between four and eight inches with amounts of up to 12 inches falling in the eastern Catskills and Schoharie Valley. Three to six inches were common across the Lake George and Saratoga regions. The rainfall resulted in widespread flash flooding and river flooding across eastern New York State.</p> <p>Bridges were closed on major roadways in this area of the State.</p> <p>In Warren County, wind and flood damage occurred throughout the county. The most severe was limited to the Lake Champlain Watershed area, located on the eastern side of the County, and in the Lake George and West Mountain areas. In the Town of Lake George, Route 9N was flooded from the Route 9/9N split south to the ramp for Exit 21 for the Northway. Route 9L was also flooded between Route 9N and Bay Road. Two of the seven docks in the Village of Lake George floated off and were crushed.</p>
October 27 – November 8, 2012	Hurricane Sandy	EM-3351	Yes	<p>Hurricane Sandy moved up the east coast of the United States during the last week of October 2012. As the storm made landfall in southern New Jersey, bands of rain moved across eastern New York State. Rainfall totals in this part of the State were minimal and did not cause any flooding. The storm did bring strong and gusty winds to the area, bringing down trees and power lines across the region. Wind gusts ranged from 40 to 60 mph.</p> <p>In Warren County, wind gusts of 65 mph pushed down the length of Lake George, creating waves that threatened to spill over the shoreline. Some of the docks along the Lake were damaged but flooding did not occur. Numerous private boats were sunk or damaged. In Glens Falls, trees and wires were knocked down from the winds.</p>
June 28, 2013	Severe Storms and Flooding	DR-4129	Yes	<p>Heavy rain fell across the Mohawk Valley and western Adirondacks with rates of one inch per hour with three to five inches of rain falling in total. This event, with the combination of a previous rainfall event, led to significant flash flooding across both the Mohawk Valley and Adirondacks. Many roads were washed out and closed. Urbanized areas along the Mohawk River experienced flooding as well.</p>



Dates of Event	Event Type	FEMA Declaration Number	Location / County Designated?	Losses / Impacts
				<p>Many communities declared state of emergencies and President Obama signed a major disaster declaration for New York State which included Herkimer, Montgomery and Warren Counties.</p> <p>In Warren County, the Town of Johnsbury experienced severe flooding from this event. Flash flooding occurred in the Bakers Mill section of the Town. Water rescue teams were deployed to several homes that were threatened by flooding. A state of emergency was declared for the Town as a result of flooding.</p>

Sources: FEMA 2015; NYSDEC; Robinson 1999

FEMA Federal Emergency Management Agency

NYSDEC New York State Department of Environmental Conservation



Probability of Future Occurrences

Predicting future severe storm events in a constantly changing climate has proven to be a difficult task. Predicting extremes in New York State is particularly difficult because of the region’s geographic location. It is positioned roughly halfway between the equator and the North Pole and is exposed to both cold and dry airstreams from the south. The interaction between these opposing air masses often leads to turbulent weather across the region (Keim, 1997). The following table provides the probability of occurrences of severe storm events. Based on historic occurrences, thunderstorm events are the most common in Warren County, followed by hail events. However, the information used to calculate the probability of occurrences is only based on using NOAA-NCDC storm events database results.

Table 5.4.5-5. Probability of Occurrence of Severe Storm Events

Hazard Type	Number of Occurrences Between 1950 and 2015	Rate of Occurrence or Annual Number of Events (average)	Recurrence Interval (in years) (# Years/Number of Events)	Probability of Event in any given year	% chance of occurrence in any given year
Hail	47	0.72	1.40	0.71	71.21
High or Strong Wind	42	0.65	1.57	0.64	63.64
Thunderstorm	163	2.51	0.40	1	100
Lightning	7	0.11	9.43	0.11	10.61

Source: NOAA-NCDC 2015

Note: Probability was calculated using the available data provided in the NOAA-NCDC storm events database.

It is estimated that Warren County will continue to experience direct and indirect impacts of severe storms annually that may induce secondary hazards such as flooding, infrastructure deterioration or failure, utility failures, power outages, water quality and supply concerns, and transportation delays, accidents and inconveniences.

In Section 5.3, the identified hazards of concern for Warren County were ranked. The probability of occurrence, or likelihood of the event, is one parameter used for ranking hazards. Based on historical records and input from the Planning Committee, the probability of occurrence for severe storms in the County is considered ‘frequent’ (likely to occur more than once every 25 years, as presented in Table 5.3-3).

Climate Change Impacts

Climate change is beginning to affect both people and resources in New York State, and these impacts are projected to continue growing. Impacts related to increasing temperatures and sea level rise are already being felt in the State. ClimAID: the Integrated Assessment for Effective Climate Change in New York State (ClimAID) was undertaken to provide decision-makers with information on the State’s vulnerability to climate change and to facilitate the development of adaptation strategies informed by both local experience and scientific knowledge (New York State Energy Research and Development Authority [NYSERDA], 2011).

Each region in New York State, as defined by ClimAID, has attributes that will be affected by climate change. Warren County is part of Region 7 (see Figure 5.4.5-3), Adirondack Mountains. Some of the issues in this region, affected by climate change, include: loss of high elevation plants, animals and ecosystem types; decline in winter recreation; decline in milk production, etc. (NYSERDA 2011).



Figure 5.4.5-3. Climate Regions of New York State



Source: NYSERDA 2011

Temperatures in New York State are warming, with an average rate of warming over the past century of 0.25° F per decade. Average annual temperatures are projected to increase across New York State by 2° F to 3.4° F by the 2020s, 4.1° F to 6.8° F by the 2050s, and 5.3° F to 10.1° F by the 2080s. By the end of the century, the greatest warming is projected to be in the northern section of the State (NYSERDA 2014).

Regional precipitation across New York State is projected to increase by approximately one to eight-percent by the 2020s, three to 12-percent by the 2050s, and four to 15-percent by the 2080s. By the end of the century, the greatest increases in precipitation are projected to be in the northern areas of the State (NYSERDA 2014).

In Region 7, it is estimated that temperatures will increase by 3.7°F to 7.4°F by the 2050s and 4.2°F to 11.8°F by the 2080s (baseline of 39.9°F). Precipitation totals will increase between 2 and 15% by the 2050s and 3 to 17% by the 2080s (baseline of 40.8 inches). Table 5.4.5-6 displays the projected seasonal precipitation change for the Adirondack Mountains ClimAID Region (NYSERDA, 2011).

Table 5.4.5-6. Projected Seasonal Precipitation Change in Region 7, 2050s (% change)

Winter	Spring	Summer	Fall
+5 to +15	-5 to +10	-5 to +5	-5 to +10

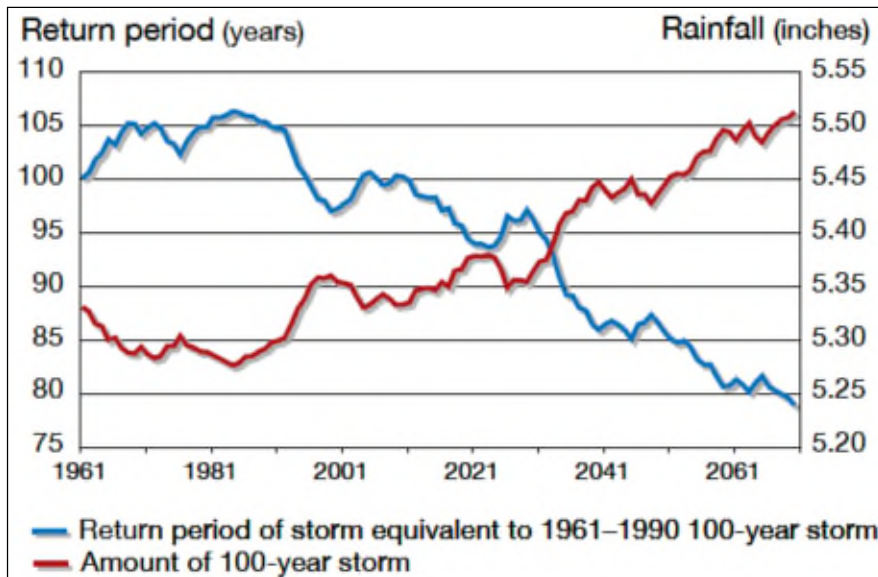
Source: NYSERDA 2011



The projected increase in precipitation is expected to fall in heavy downpours and less in light rains. The increase in heavy downpours has the potential to affect drinking water; heighten the risk of riverine flooding; flood key rail lines, roadways and transportation hubs; and increase delays and hazards related to extreme weather events (NYSERDA 2011). Less frequent rainfall during the summer months may impact the ability of water supply systems. Increasing water temperatures in rivers and streams will affect aquatic health and reduce the capacity of streams to assimilate effluent wastewater treatment plants (NYSERDA 2011).

Figure 5.4.5-4 displays the project rainfall and frequency of extreme storms in New York State. The amount of rain fall in a 100-year event is projected to increase, while the number of years between such storms (return period) is projected to decrease. Rainstorms will become more severe and more frequent (NYSERDA 2011).

Figure 5.4.5-4. Projected Rainfall and Frequency of Extreme Storms



Source: *NYSERDA 2011*



5.4.5.2 Vulnerability Assessment

To understand risk, a community must evaluate what assets are exposed or vulnerable in the identified hazard area. For the severe storm hazard, all of Warren County is exposed and vulnerable. Therefore, all assets in the County (population, structures, critical facilities and lifelines), as described in Section 4 (County Profile), are exposed and potentially vulnerable. The following text evaluates and estimates the potential impact of severe storm on the County including:

- Overview of vulnerability
- Data and methodology used for the evaluation
- Impact on: (1) life, health and safety of residents, (2) general building stock, (3) critical facilities, (4) economy, and (5) future growth and development
- Effect of climate change on vulnerability
- Change of vulnerability as compared to that presented in the 2011 Warren County Hazard Mitigation Plan
- Further data collections that will assist understanding this hazard over time

Overview of Vulnerability

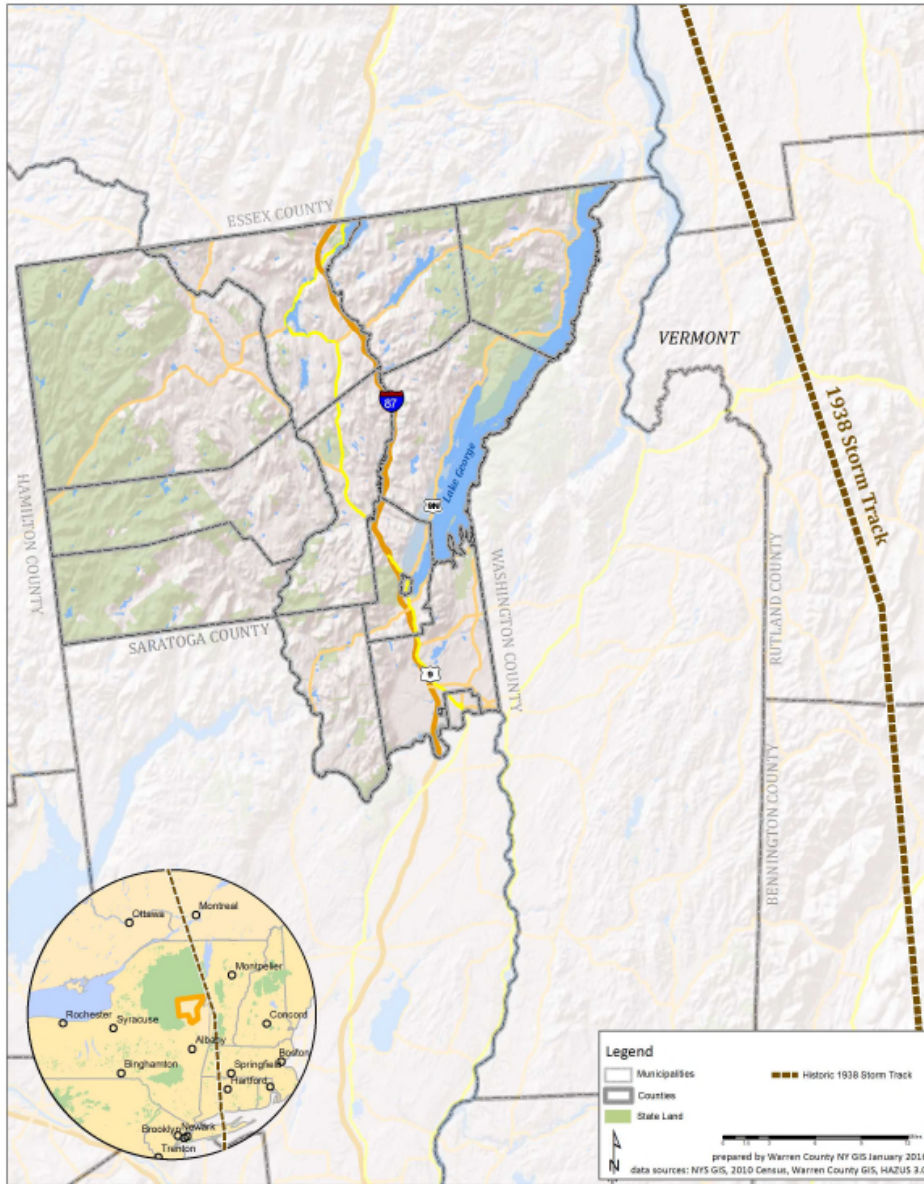
The high winds and air speeds of any severe storm often result in power outages, disruptions to transportation corridors and equipment, loss of workplace access, significant property damage, injuries and loss of life, and the need to shelter and care for individuals impacted by the events. A large amount of damage can be inflicted by trees, branches, and other objects that fall onto power lines, buildings, roads, vehicles, and, in some cases, people. The risk assessment for severe storm evaluates available data for a range of storms included in this hazard category.

Losses from wind are primarily associated with severe thunderstorm or tropical depression/storm-related winds and rain (see flooding discussion in Section 5.4.2 [Flood]). Secondary flooding associated with the torrential downpours during severe storms is also a primary concern in Warren County. The County has experienced flooding in association with numerous severe storms in the past.

The entire inventory of Warren County is at risk of being damaged or lost due to impacts of severe storms (severe wind). Certain areas, infrastructure, and types of building are at greater risk than others due to proximity to falling hazards and manner of construction. Potential losses associated with high wind events were calculated for Warren County using a historic scenario, based on the New England Hurricane of 1938 (“Long Island Express”), a strong Category 3 storm that tracked just to the east of Warren County. Wind gusts reached Category 5 strength as the storm made landfall in southern New England, and the storm is considered to be the worst hurricane to strike New England in modern times. The storm is believed to have entered Vermont as a Category 2 and exited into Quebec as a Category 1. The storm track is shown below in Figure 5.4.5-6.



Figure 5.4.5-6. 1938 Historic Storm Track



Source: Warren County GIS; HAZUS 3.0

HAZUS 3.0 was used to calculate the impacts on current population, existing structures and critical facilities in the County if the 1938 storm were to hit in present times. Results are presented below, following a summary of the data and methodology used.

Data and Methodology

At the recommendation of FEMA HAZUS technical support staff, and with input from the Steering and Planning Committees, the severe storm hazard for Warren County was analyzed using a historic scenario based on the New England Hurricane of 1938, described in the section above. The historic scenario was run using the HAZUS-MH 3.0 methodology and model. The 2010 U.S. Census population and general building stock data



available in HAZUS 3.0 were used to support an evaluation of assets exposed to the 1938 storm and the potential impacts associated with this hazard. Figure 5.4.5-6 shows the storm track used in the model.

HAZUS-MH 3.0 contains data on historic wind speeds, surface roughness and vegetation (tree coverage). Surface roughness and vegetation data support the modeling of wind force across various types of land surfaces. Hurricane and inventory data available in HAZUS-MH 3.0 were used to evaluate potential losses from a repeat of the 1938 storm in the present day. The default data in HAZUS-MH was determined to be the best available for use in this evaluation.

Impact on Life, Health and Safety

For the purposes of this HMP, the entire population of Warren County (65,707 people) is exposed to severe storm events (U.S. Census 2010). Residents may be displaced or require temporary to long-term sheltering due to severe storm events. In addition, downed trees, damaged buildings, and debris carried by high winds can lead to injury or loss of life. Socially vulnerable populations are most susceptible, based on a number of factors including their physical and financial ability to react or respond during a hazard and the location and construction quality of their housing.

Economically disadvantaged populations are more vulnerable because they are likely to evaluate their risk and make decisions based on the major economic impact to their family and may not have funds to evacuate. The population of individuals with access or functional needs or over the age of 65 is also more vulnerable and, physically, they may have more difficulty evacuating. The elderly are considered most vulnerable because they require extra time or outside assistance during evacuations and are more likely to seek or need medical attention which may not be available due to isolation during a storm event. Please refer to Section 4 for the statistics of these populations.

People located outdoors (i.e., recreational activities and farming) are considered most vulnerable to hailstorms, thunderstorms and tornadoes. This is because there is little to no warning and shelter may not be available. Moving to a lower risk location will decrease a person's vulnerability.

Impact on General Building Stock

After considering the population exposed to the severe storm hazard, the general building stock replacement value exposed to and damaged by a repeat of the historic 1938 storm was examined. Wind-only impacts from the storm are reported based on the model run in HAZUS-MH 3.0. Potential damage is the modeled loss that could occur to the exposed inventory, including damage to structural and content value based on the wind-only impacts associated with the storm.

It is assumed that the entire County's general building stock is exposed to the severe storm wind hazard (approximately \$9.4 billion structure only). Expected building damage was evaluated by HAZUS across the following wind damage categories: no damage/very minor damage, minor damage, moderate damage, severe damage, and total destruction. Table 5.4.5-7 summarizes the definition of the damage categories.



Table 5.4.5-7. Description of Damage Categories

Qualitative Damage Description	Roof Cover Failure	Window Door Failures	Roof Deck	Missile Impacts on Walls	Roof Structure Failure	Wall Structure Failure
No Damage or Very Minor Damage Little of no visible damage from the outside. No broken windows, or failed roof deck. Minimal loss of roof over, with no or very limited water penetration.	≤ 2%	No	No	No	No	No
Minor Damage Maximum of one broken window, door or garage door. Moderate roof cover loss that can be covered to prevent additional water entering the building. Marks or dents on walls requiring painting or patching for repair.	> 2% and ≤ 15%	One window, door, or garage door failure	No	< 5 Impacts	No	No
Moderate Damage Major roof cover damage, moderate window breakage. Minor roof sheathing failure. Some resulting damage to interior of building from water.	> 15% and ≤ 50%	> the larger of 20% & 3 and ≤ 50%	1 to 3 Panels	Typically 5 to 10 Impacts	No	No
Severe Damage Major window damage or roof sheathing loss. Major roof cover loss. Extensive damage to interior from water.	> 50%	> one and ≤ the larger of 20% & 3	> 3 and ≤ 25%	Typically 10 to 20 Impacts	No	No
Destruction Complete roof failure and/or failure of wall frame. Loss of more than 50% of roof sheathing.	Typically > 50%	> 50%	> 25%	Typically > 20 Impacts	Yes	Yes

Source: HAZUS-MH Hurricane Technical Manual

HAZUS estimates the 3-second peak wind gusts for Warren County in the 1938 historic storm scenario to range from 57 to 71mph, characteristic of a Tropical Storm. HAZUS estimates \$9,124,700 in damages to the general building stock (structure only). This estimated damage total is less than one percent of Warren County’s building inventory. The residential buildings are estimated to experience approximately 98% of the total loss. Table 5.4.5-8 summarizes the building value (structure only) damage estimated for the historic event, by occupancy class.

Because of differences in building construction, residential structures are generally more susceptible to wind damage than commercial and industrial structures. Wood and masonry buildings in general, regardless of their occupancy class, tend to experience more damage than concrete or steel buildings. The damage counts include buildings damaged at all severity levels from minor damage to total destruction. Total dollar damage reflects the overall impact to buildings at an aggregate level.

Table 5.4.5-8. Estimated Building Replacement Value (Structure Only) Damaged by Historic 1938 Storm Scenario

Municipality	Total Building Replacement Value (Structure Only)	Total Building Damage (All Occupancies)		Residential Buildings	All Other Occupancies
		Loss	% of GBS RCV Total		
Bolton	\$617,682,000	\$586,152	0.09%	\$561,263	\$24,889
Chester	\$507,248,000	\$211,264	0.04%	\$211,264	\$0
Glens Falls	\$1,866,928,000	\$1,003,829	0.05%	\$930,810	\$73,019
Hague	\$258,080,000	\$222,965	0.09%	\$220,750	\$2,215
Horicon	\$386,333,000	\$429,354	0.11%	\$427,489	\$1,865



Municipality	Total Building Replacement Value (Structure Only)	Total Building Damage (All Occupancies)		Residential Buildings	All Other Occupancies
		Loss	% of GBS RCV Total		
Johnsburg	\$349,807,000	\$33,985	0.01%	\$33,985	\$0
Lake George	\$459,912,000	\$356,068	0.08%	\$351,936	\$4,132
Lake George Village	\$237,788,000	\$75,368	0.03%	\$67,072	\$8,296
Lake Luzerne	\$477,064,000	\$359,799	0.07%	\$354,206	\$5,593
Queensbury	\$3,602,139,000	\$2,605,680	0.07%	\$2,520,428	\$85,252
Stony Creek	\$93,149,000	\$30,608	0.03%	\$30,608	\$0
Thurman	\$187,298,000	\$33,193	0.02%	\$33,193	\$0
Warrensburg	\$399,760,000	\$162,005	0.04%	\$152,496	\$9,509
Warren County (Total)	\$9,443,188,000	\$6,110,270	0.06%	\$5,895,500	\$214,770

Source: HAZUS – MH 3.0, default (2010 Census) data. “All Other Occupancies” includes commercial, industrial, agricultural, religious, government and education buildings.

Impact on Critical Facilities

The HAZUS-MH 1938 historic storm scenario was used to estimate the probability that critical facilities (i.e., medical facilities, fire/EMS, police, EOC, schools, and user-defined facilities such as shelters and municipal buildings) may sustain damage as a result of a wind-only event. Additionally, HAZUS-MH estimates the loss of use for each facility in number of days. HAZUS does not predict a loss of days for any critical facility, but does predict moderate damage to Glens Falls Hospital based on the 1938 historic storm track.

Table 5.4.5-9. Estimated Impacts to Critical Facilities for the 1938 Historic Storm Scenario (# of facilities)

Facility Type	500-Year Event				
	Loss of Days	Percent-Probability of Sustaining Damage			
		Minor	Moderate	Severe	Complete
EOC	0	0	0	0	0
Medical	0	0	1	0	0
Police	0	0	0	0	0
Fire	0	0	0	0	0
Schools	0	0	0	0	0

Source: HAZUS-MH 3.0

At this time, HAZUS-MH 3.0 does not estimate losses to transportation lifelines and utilities as part of the hurricane model. Transportation lifelines are not considered particularly vulnerable to the wind hazard; they are more vulnerable to cascading effects such as flooding, falling debris etc. Impacts to transportation lifelines affect both short-term (e.g., evacuation activities) and long-term (e.g., day-to-day commuting) transportation needs.

Utility structures could suffer damage associated with falling tree limbs or other debris. Such impacts can result in the loss of power, which can impact business operations and can impact heating or cooling provision to citizens (including the young and elderly, who are particularly vulnerable to temperature-related health impacts).



Impact on Economy

Severe storms also impact the economy, including: loss of business function (e.g., tourism, recreation), damage to inventory, relocation costs, wage loss and rental loss due to the repair/replacement of buildings. HAZUS-MH estimates the total economic loss associated with each storm scenario (direct building losses and business interruption losses). Direct building losses are the estimated costs to repair or replace the damage caused to the building. This is reported in the “Impact on General Building Stock” section discussed earlier. Business interruption losses are the losses associated with the inability to operate a business because of the wind damage sustained during the storm or the temporary living expenses for those displaced from their home because of the event.

HAZUS-MH estimates a minimal \$5,500 in business interruption costs sustained mainly by the residential occupancy class from relocation and rental costs as a result of the historic storm scenario.

HAZUS-MH 3.0 also estimates the amount of debris that may be produced a result of a wind storm scenario. Table 5.4.5-10 estimates the debris produced based on the 1938 historic model. Because the estimated debris production does not include flooding, this is likely a conservative estimate and may be higher if multiple impacts occur. According to the HAZUS-MH Hurricane User Manual: *‘The Eligible Tree Debris columns provide estimates of the weight and volume of downed trees that would likely be collected and disposed at public expense. As discussed in Chapter 12 of the HAZUS-MH Hurricane Model Technical Manual, the eligible tree debris estimates produced by the Hurricane Model tend to underestimate reported volumes of debris brought to landfills for a number of events that have occurred over the past several years. This indicates that that there may be other sources of vegetative and non-vegetative debris that are not currently being modeled in HAZUS. For landfill estimation purposes, it is recommended that the HAZUS debris volume estimate be treated as an approximate lower bound. Based on actual reported debris volumes, it is recommended that the HAZUS results be multiplied by three to obtain an approximate upper bound estimate. It is also important to note that the Hurricane Model assumes a bulking factor of 10 cubic yards per ton of tree debris. If the debris is chipped prior to transport or disposal, a bulking factor of 4 is recommended. Thus, for chipped debris, the eligible tree debris volume should be multiplied by 0.4’.*



Table 5.4.5-10. Debris Production (Tons) for 1938 Historic Storm Scenario

Municipality	Brick and Wood (tons)	Concrete and Steel (tons)	Trees (tons)	Eligible Tree Weight (tons)	Eligible Tree
					Volume (cubic yards)
Bolton	7	0	5,474	368	3,740
Chester	0	0	2,721	163	1,715
Glens Falls	45	0	288	205	2,065
Hague	4	0	4,776	137	1,377
Horicon	3	0	6,449	294	2,990
Johnsburg	0	0	6,399	114	1,163
Lake George	3	0	1,860	161	1,664
Lake George Village	0	0	18	13	213
Lake Luzerne	0	0	2,606	166	1,744
Queensbury	55	0	4,411	807	8,102
Stony Creek	0	0	2,592	55	564
Thurman	0	0	2,987	77	780
Warrensburg	0	0	2,228	159	1,652
Warren County (Total)	117	0	42,809	2,720	27,771

Source: HAZUS-MH 3.0

Effect of Climate Change on Vulnerability

Climate is defined not simply as average temperature and precipitation but also by the type, frequency and intensity of weather events. Both globally and at the local scale, climate change has the potential to alter the prevalence and severity of severe storm events. While predicting changes to the prevalence or intensity of severe storm events under a changing climate is difficult, understanding vulnerabilities to potential changes is a critical part of estimating future climate change impacts on human health, society and the environment (U.S. Environmental Protection Agency [EPA], 2006). Refer to 'Climate Change Impacts' which is discussed earlier in this section for information regarding climate change and severe storm events.

Future Growth and Development

As discussed in Sections 4 and 9, areas targeted for future growth and development have been identified across the Planning Area. Any areas of growth could be potentially impacted by the severe storm hazard because the entire planning area is exposed and vulnerable. Please refer to the specific areas of development indicated in tabular form and/or on the hazard maps included in the jurisdictional annexes in Volume II, Section 9 of this plan.

Change of Vulnerability

Overall, this vulnerability assessment using a more accurate and updated building inventory which provides more accurate estimated exposure and potential losses for Warren County.

Additional Data and Next Steps

The collection of additional/actual valuation data for general building stock, critical infrastructure and economic losses would further support future estimates of potential exposure and damage for these inventories and the economy.



5.4.6 Severe Winter Storm

The following section provides the hazard profile (hazard description, location, extent, previous occurrences and losses, probability of future occurrences, and impact of climate change) and vulnerability assessment for the Severe Winter Storm hazard in Warren County.

5.4.6.1 Profile

Hazard Description

A winter storm is a weather event in which the main types of precipitation are snow, sleet or freezing rain. They can be a combination of heavy snow, blowing snow, and/or dangerous wind chills. There are three basic components needed to make a winter storm. Below freezing temperatures (cold air) in the clouds and near the ground are necessary to make snow and ice. Lift, something to raise the moist air to form clouds and cause precipitation, is needed. Examples of this is warm air colliding with cold air and being forced to rise over the cold dome or air flowing up a mountainside. The last thing needed to make a winter storm is moisture to form clouds and precipitation. Air blowing across a body of water, such as a large lake or the ocean (National Severe Storms Laboratory 2014).

Some winter storms are large enough to immobilize an entire region while others may only affect a single community. Winter storms are typically accompanied by low temperatures, high winds, freezing rain or sleet, and heavy snowfall. The aftermath of a winter storm can have an impact on a community or region for days, weeks, or even months; potentially causing cold temperatures, flooding, storm surge, closed and/or blocked roadways, downed utility lines, and power outages. In Warren County, winter storms include blizzards, snow storms, and ice storms. Extreme cold temperatures and wind chills are also associated with winter storms; however, based on input from the Planning Committee, these events are not discussed in the 2016 HMP.

Heavy Snow

According to the National Snow and Ice Data Center (NSIDC), snow is precipitation in the form of ice crystals. It originates in clouds when temperatures are below the freezing point (32°F), when water vapor in the atmosphere condenses directly into ice without going through the liquid stage. Once an ice crystal has formed, it absorbs and freezes additional water vapor from the surrounding air, growing into a snow crystals or snow pellet, which then falls to the earth. Snow falls in different forms: snowflakes, snow pellets, or sleet. Snowflakes are clusters of ice crystals that form from a cloud. Snow pellets are opaque ice particles in the atmosphere. They form as ice crystals fall through super-cooled cloud droplets, which are below freezing but remain a liquid. The cloud droplets then freeze to the crystals. Sleet is made up of drops of rain that freeze into ice as they fall through colder air layers. They are usually smaller than 0.30 inches in diameter (NSIDC 2013).

Blizzards

A blizzard is a winter snowstorm with sustained or frequent wind gusts of 35 mph or more, accompanied by falling or blowing snow reducing visibility to or below 0.25 mile. These conditions must be the predominant over a 3-hour period. Extremely cold temperatures are often associated with blizzard conditions, but are not a formal part of the definition. The hazard, created by the combination of snow, wind, and low visibility, significantly increases when temperatures are below 20°F. A severe blizzard is categorized as having temperatures near or below 10°F, winds exceeding 45 mph, and visibility reduced by snow to near zero. Storm systems powerful enough to cause blizzards usually form when the jet stream dips far to the south, allowing cold air from the north to clash with warm, moister air from the south. Blizzard conditions often develop on the northwest side of an intense storm system. The difference between the lower pressure in the storm and the higher



pressure to the west creates a tight pressure gradient, resulting in strong winds and extreme conditions caused by the blowing snow (The Weather Channel 2012).

Ice Storms

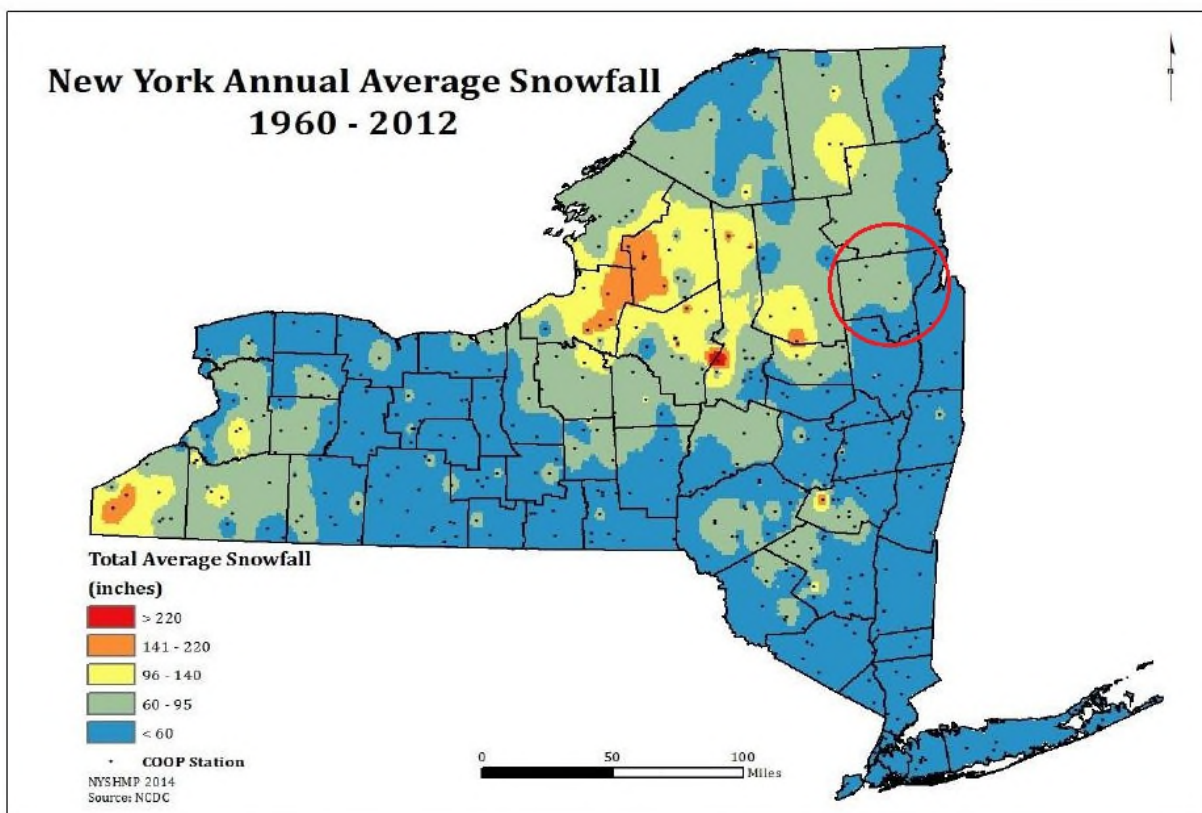
An ice storm describes those events when damaging accumulations of ice are expected during freezing rain situations. Significant ice accumulations are typically accumulations of 0.25-inches or greater (NWS 2013). Heavy accumulations of ice can bring down trees, power lines and utility poles, and communication towers. Ice can disrupt communications and power for days. Even small accumulations of ice can be extremely dangerous to motorists and pedestrians (NWS 2008).

Location

Snow and Blizzards

On average, New York State receives more snowfall than any other states within the United States, with the easternmost and west-central portions of the State most likely to suffer under severe winter storm occurrences than the southern portion. Average snowfall in the State is about 65 inches, but varies greatly in the different regions of the State. Between 1960 and 2012, most of Warren County had a total average annual snowfall of between 60 – 90 inches, while the southern and northeastern-most parts of the county averaged less than 60 inches. Figure 5.4.7-2 and Figure 5.4.6-3 below show annual average snowfall in New York State from 1960-2012, and annual snow fall normals from 1981 through 2010 in the northeastern United States, respectively.

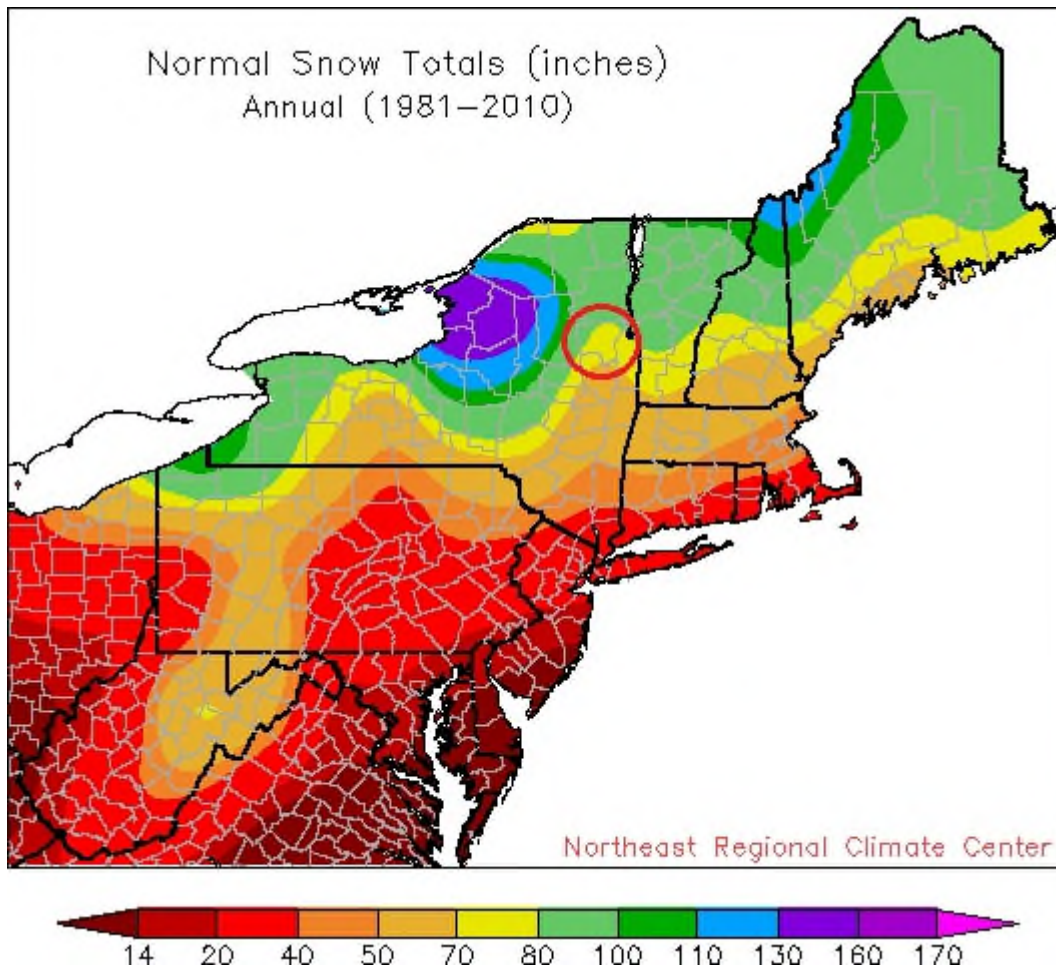
Figure 5.4.6-1. New York annual average snowfall



Source: NYSHMP, 2014



Figure 5.4.6-2. Normal Snow Totals



Source: NRCC, 2015. Red circle indicates the location of Warren County.

Ice Storms

The Midwest and Northeast United States are prime areas for freezing rain and ice storm events. These events can occur anytime between November and April, with most events occurring during December and January. Warren County has an average of five to six days with freezing rain.

Extent

The magnitude or severity of a severe winter storm depends on several factors including a region’s climatological susceptibility to snowstorms, snowfall amounts, snowfall rates, wind speeds, temperatures, visibility, storm duration, topography, and time of occurrence during the day (e.g., weekday versus weekend), and time of season.

The extent of a severe winter storm can be classified by meteorological measurements and by evaluating its societal impacts. NOAA’s National Climatic Data Center (NCDC) is currently producing the Regional Snowfall Index (RSI) for significant snowstorms that impact the eastern two-thirds of the United States. The RSI ranks snowstorm impacts on a scale from 1 to 5. It is based on the spatial extent of the storm, the amount of snowfall, and the interaction of the extent and snowfall totals with population (based on the 2000 Census). The NCDC has analyzed and assigned RSI values to over 500 storms since 1900 (NOAA-NCDC 2011). Table 5.4.6-1 presents the five RSI ranking categories.



Table 5.4.6-1. RSI Ranking Categories

Category	Description	RSI Value
1	Notable	1-3
2	Significant	3-6
3	Major	6-10
4	Crippling	10-18
5	Extreme	18.0+

Source: NOAA-NCDC 2011

Note: RSI = Regional Snowfall Index

The NWS operates a widespread network of observing systems such as geostationary satellites, Doppler radars, and automated surface observing systems that feed into the current state-of-the-art numerical computer models to provide a look into what will happen next, ranging from hours to days. The models are then analyzed by NWS meteorologists who then write and disseminate forecasts (NWS 2013).

The NWS uses winter weather watches, warnings and advisories to ensure that people know what to expect in the coming hours and days. A winter storm watch means that severe winter conditions (heavy snow, ice, etc.) may affect a certain area, but its occurrence, location and timing are uncertain. A winter storm watch is issued when severe winter conditions (heavy rain and/or significant ice accumulations) are possible within in the next day or two. A winter storm warning is issued when severe winter conditions are expected (heavy snow seven inches or greater in 12 hours or nine inches or greater in 24 hours; ice storm with ½ inch or more). A winter weather advisory is used when winter conditions (snow, sleet and/or freezing rain/ice) are expected to cause significant inconvenience and may be hazardous (snow and/or sleet with amounts of four to six inches; freezing rain and drizzle in any accretion of ice on roads but less than ½ inch). A blizzard warning is issued when snow and strong winds will combine to produce a blinding snow, visibility near zero/whiteouts, and deep snow drifts (NWS 2015).

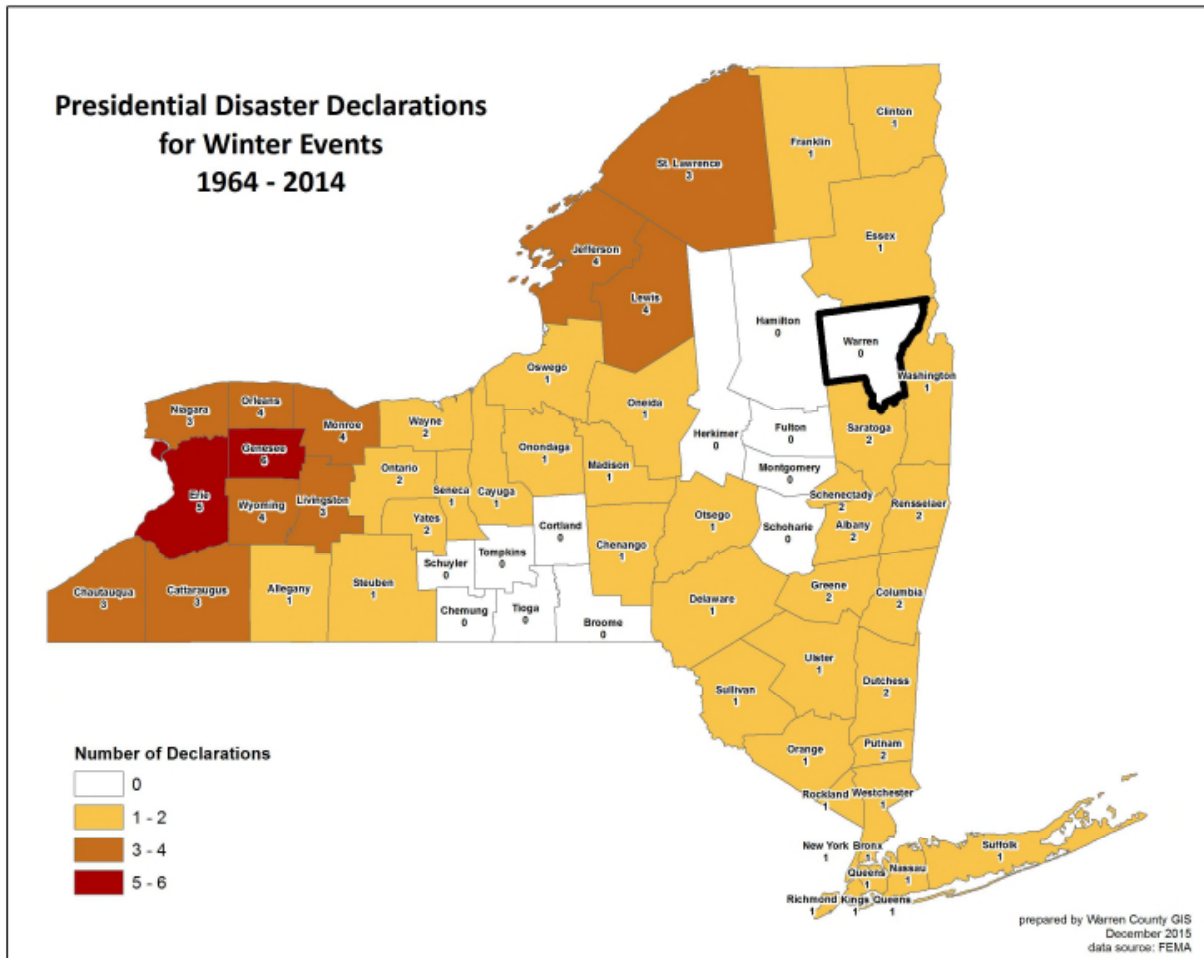
Previous Occurrences and Losses

Many sources provided winter storm information regarding previous occurrences and losses associated with winter storm events throughout Warren County. With so many sources reviewed for the purpose of this Hazard Mitigation Plan (HMP), loss and impact information for many events could vary depending on the source. Therefore, the accuracy of monetary figures discussed is based only on the available information identified during research for this HMP.

Between 1954 and 2015, FEMA included New York State in 24 winter storm-related major disaster (DR) or emergency (EM) declarations classified as one or a combination of the following disaster types: severe winter storm, snowstorm, snow, ice storm, winter storm, blizzard, and flooding. Generally, these disasters cover a wide region of the State; therefore, they may have impacted many counties. Warren County was included in one of these declarations. Presidential disaster declarations for winter events across New York State are shown in Figure 5.4.7-3, which indicates that there have been no Disaster Declarations for winter storms in Warren County.



Figure 5.4.6-3. Presidential Disaster Declarations for Winter Events in New York State



Source: FEMA, 2015

For this Plan, winter weather events were summarized from 2009 to 2015. Known severe winter storm events, including FEMA disaster declarations, which have impacted Warren County are identified in Table 5.4.6-2. For detailed information on damages and impacts to each municipal, refer to Section 9 (jurisdictional annexes). Please note that not all events that have occurred in Warren County are included due to the extent of documentation and the fact that not all sources may have been identified or researched. Loss and impact information could vary depending on the source. Therefore, the accuracy of monetary figures discussed is based only on the available information identified during research for this HMP Update.



Table 5.4.6-2. Severe Winter Weather Events in Warren County Between 2009 and 2015

Dates of Event	Event Type	FEMA Declaration Number	Location / County Designated?	Losses / Impacts
January 28-29, 2009	Winter Storm	N/A	N/A	A winter storm spread a significant wintry mix of precipitation across eastern New York State, with heavy snow and sleet across much of the southern Adirondacks into the Lake George Saratoga region. Snow and sleet amounts ranged from 8 to 12 inches across the southern Adirondacks and the Lake George Saratoga region. This wintry mix resulted in the closure of numerous schools and businesses across east central New York for both Wednesday and Thursday mornings, and also created treacherous travel conditions. Snowfall totals in Warren County ranged from 8 to 9 inches in the city of Glens Falls.
February 18, 2009	Winter Weather	N/A	N/A	Winter storm system swept northeast across eastern New York State early Thursday morning, preceded and accompanied by moderate to locally heavy wet snow. The snow began Wednesday afternoon, and tapered off early Thursday morning. The heaviest snowfall amounts occurred across the Lake George Saratoga region, where 6 to 10 inches fell.
February 23, 2010	Heavy Snow	N/A	N/A	A powerful storm impacted the region, the second in just a couple of days bringing heavy rainfall and a heavy wet snow to the local area. The heavy wet snow resulted in additional and continued widespread power outages across east central New York, downed trees and power lines, treacherous travel, road closures, train delays, building collapses and snow emergencies. In Warren County, up to 2 feet of snow fell in the west portion of the county in the higher elevations. Route 9N at Pinewoods Road in the Town of Lake Luzerne was reported closed for a couple of hours late Tuesday evening, February 23rd, due to downed power lines. No property damages were reported. Snowfall totals in Warren County ranged from 10.5 inches in the City of Glens Falls to 21.3 inches at the Town of Lake Luzerne.
February 25, 2010	Winter Storm	N/A	N/A	This storm system produced a widespread swath of heavy wet snow across the greater Capital District and surrounding area, the Lake George Saratoga region, the Mohawk River Valley, Schoharie Valley and southern Adirondacks during the day Friday. Snowfall rates of 1 to 2 inches per hour occurred, beginning during the early morning hours, and persisting until late afternoon. Snowfall amounts reached 12 to 15 inches across northern portions of the Capital Region extending into the east central Mohawk River Valley and Lake George Saratoga region. The heavy snow created treacherous travel conditions for the morning and evening commutes on Friday, with numerous accidents reported, including along portions of the Adirondack Northway, as well as Interstate 90. The heavy wet snow also led to numerous school and business closings across much of eastern New York on Friday.



Dates of Event	Event Type	FEMA Declaration Number	Location / County Designated?	Losses / Impacts
				Snowfall totals in Warren County ranged from 4 inches at Warrensburg to 24 inches at Garnet Hill in North River hamlet.
December 10-11, 2013	Winter Weather	N/A	N/A	As very cold air passed over the relatively warm water of Lake Ontario, a heavy, long-lasting band of lake effect snow developed on the evening of the 10 th , extending east across the entire western and southern Adirondacks. By the time the band ended late in the evening of December 11 th , over one foot of snow was common across the western Adirondacks. Snowfall totals included 4.5 inches at Gore Mountain in Warren County.
December 14-15, 2013	Winter Storm	N/A	N/A	A light snow slowly spread across New York State from southwest to northeast during the day on December 14 th , followed by a steadier and heavier snowfall moved across the region during the evening hours and into the overnight. Snow fell at rates in excess of one inch per hour over much of the region and snow rates locally were as high as up to three inches per hour at times. The bulk of the accumulating snow was finished by the late overnight hours, but light snow showers and flurries continued into the mid-morning hours, especially across the Adirondacks and Capital Region. By the end of the storm, many places around the eastern Catskills, Capital Region and Lake George Saratoga Region received around a foot of snowfall. Snowfall totals in Warren County ranged from 9 inches at Brant Lake hamlet to 12.2 inches at the Town of Lake Luzerne.
February 13-14, 2014	Heavy Snow	N/A	N/A	<p>An exceptional winter storm impacted all of eastern New York between Thursday, February 13th and the morning of Friday, February 14th. The snow began falling in the morning hours at rates of up to three inches per hour, causing significant travel issues across the region. After a late afternoon break in the snowfall, heavy precipitation returned in the late evening hours. Once again, the snow fell at significant rates of up to 3 inches per hour. In addition, lightning and thunder accompanied the snow across far southern and eastern areas at times as well.</p> <p>By the time snow ended, between one and two feet of snow fell across much of the Lake George Saratoga Region, with lower amounts of 4 to 10 inches across the Adirondacks. Very strong winds, gusting as high as 40 mph, occurred as the storm pulled away. This led to significant blowing and drifting of the snowfall through the entire day on February 14th.</p> <p>As a result of the storm, Governor Andrew M. Cuomo declared a state of emergency for the Mid-Hudson as well other counties, including Warren, across east central New York. Restrictions were put on travel. Many towns and cities had difficulty with snow removal, as much of the snowfall also remained from a recent early February snowstorm as well. The weight of snow caused a few roof collapses and power outages across the region.</p>



Dates of Event	Event Type	FEMA Declaration Number	Location / County Designated?	Losses / Impacts
				Snowfall totals in Warren County ranged from 6 inches at North Creek hamlet to 12 inches at the Town of Lake Luzerne.
November 26-27, 2014	Nor'Easter / Snowstorm	DR-4204	No	<p>An early season winter storm impacted eastern New York State during Thanksgiving. The storm began the morning of the 26th and once the snow began, it increased in intensity, falling at rates at or greater than one inch per hour. Temperatures dropped to or below freezing across the entire region. There were heavy bands of snow occurring in some locations, especially across the Taconics, Mohawk Valley and southeastern Adirondacks. Snowfall totals ranged from six to 12 inches, with up to 15 inches in the southeastern Adirondacks. The weight of the snow caused power outages in the area, especially across the mid-Hudson Valley. Warren County DPW reported numerous damages, including automobile damages from falling trees and icy conditions, transportation blockages, and phone wires falling on and entangling a truck. Snowfall totals in Warren County ranged from 10 inches at the City of Glens Falls to 14.5 inches at North Creek hamlet.</p>

Sources: NYSDEC, NWS, NYS DHSES, NOAA-NCDC, FEMA
 FEMA Federal Emergency Management Agency
 NCDC National Climatic Data Center
 NOAA National Oceanic and Atmospheric Administration
 NWS National Weather Service
 NYSDEC New York State Department of Environmental Conservation
 NYS DHSES New York State Division of Homeland Security and Emergency Services



Probability of Future Occurrences

Winter storm hazards in New York State are virtually guaranteed yearly since the State is located at relatively high latitudes resulting in winter temperatures that range between 0°F and 32 °F for a good deal of the fall through early spring season (late October until mid-April). In addition, the State is exposed to large quantities of moisture from both the Great Lakes and the Atlantic Ocean. While it is almost certain that a number of significant winter storms will occur during the winter and fall season, what is not easily determined is how many such storms will occur during that time frame (NYS DHSES 2014).

The New York State HMP includes a similar ranking process for hazards that affect the State. Based on historical records and input from the Planning Committee, the probability of at least one winter snow storm of emergency declaration proportions, occurring during any given calendar year is virtually certain in the State. Based on historical snow related disaster declaration occurrences, New York State can expect a snow storm of disaster declaration proportions, on average, once every three to five years. Similarly, for ice storms, based on historical disaster declarations, it is expected that on average, ice storms of disaster proportions will occur once every seven to 10 years within the State (NYS DHSES 2014). It is estimated that Warren County will continue to experience direct and indirect impacts of severe winter storms annually.

According to the 2014 New York State HMP Update, between 1960 and 2012, Warren County had 109 severe winter storm events and resulted in five fatalities, 63 injuries, over \$47 million in property damage and over \$219,000 in crop damage. These statistics showed that the County had a 365% chance of severe winter storm events occurring in the future with a recurrence interval of 0.27 (NYS DHSES 2014).

The following table provides the probability of occurrences of severe winter storm events in Warren County, based on data from 1950 - 2015. Based on historic occurrences, winter storm events are the most common in Warren County, followed by winter weather. However, the information used to calculate the probability of occurrences is only based on using NOAA-NCDC storm events database results.

Table 5.4.6-3. Probability of Future Occurrences of Severe Winter Storm Events

Hazard Type	Number of Occurrences Between 1950 and 2015	Rate of Occurrence or Annual Number of Events (average)	Recurrence Interval (in years) (# Years/Number of Events)	Probability of Event in any given year	% chance of occurrence in any given year
Heavy Snow	43	0.66	1.53	0.65	65.15
Ice Storm	5	0.08	13.20	0.08	7.58
Winter Storm	81	1.25	0.81	1	100
Winter Weather	74	1.14	0.89	1	100

Sources: NOAA-NCDC

Note: Probability was calculated using the available data provided in the NOAA-NCDC storm events database.

In Section 5.3, the identified hazards of concern for Warren County were ranked. The probability of occurrence, or likelihood of the event, is one parameter used for hazard rankings. Based on historical records and input from the Planning Committee, the probability of occurrence for severe winter storms in the County is considered ‘frequent’ (event that occurs within 25 years, as presented in Table 5.3-3).

Climate Change Impacts

New York State averages more than 40 inches of snow each year. Snowfall varies regionally, based on topography and the proximity to large lakes and the Atlantic Ocean. Maximum snowfall is more than 175 inches





in parts of the Adirondacks and Tug Hill Plateau, as well as in the westernmost parts of the State. The warming influence of the Atlantic Ocean keeps snow in the New York City and Long Island areas below 36 inches each year.

Climate change is beginning to affect both people and resources in New York State, and these impacts are projected to continue growing. Impacts related to increasing temperatures and sea level rise are already being felt in the State. ClimAID: the Integrated Assessment for Effective Climate Change in New York State (ClimAID) was undertaken to provide decision-makers with information on the State’s vulnerability to climate change and to facilitate the development of adaptation strategies informed by both local experience and scientific knowledge (New York State Energy Research and Development Authority [NYSERDA] 2011).

Each region in New York State, as defined by ClimAID, has attributes that will be affected by climate change. Warren County is part of Region 7 (see Figure 5.4.6-4), Adirondack Mountains. Some of the issues in this region, affected by climate change, include: loss of high elevation plants, animals and ecosystem types; decline in winter recreation; decline in milk production, etc. (NYSERDA 2011).

Figure 5.4.6-4. Climate Regions of New York State



Source: NYSERDA 2011

Temperatures in New York State are warming, with an average rate of warming over the past century of 0.25° F per decade. Average annual temperatures are projected to increase across New York State by 2° F to 3.4° F



by the 2020s, 4.1° F to 6.8° F by the 2050s, and 5.3° F to 10.1° F by the 2080s. By the end of the century, the greatest warming is projected to be in the northern section of the State (NYSERDA 2014).

Regional precipitation across New York State is projected to increase by approximately one to eight-percent by the 2020s, three to 12-percent by the 2050s, and four to 15-percent by the 2080s. The results for future time periods are compared to the model results for the baseline period (1971 to 2000). By the end of the century, the greatest increases in precipitation are projected to be in the northern areas of the State (NYSERDA 2014).

In Region 7, it is estimated that temperatures will increase by 3.7°F to 7.4°F by the 2050s and 4.2°F to 11.8°F by the 2080s (baseline of 39.9°F). Precipitation totals will increase between 2 and 15% by the 2050s and 3 to 17% by the 2080s (baseline of 40.8 inches). While annual precipitation and temperature projections are more certain than seasonal results, much of this additional precipitation is expected to occur during the winter months, which may result in greater annual snowfall in Warren County.

It is uncertain how climate change will impact winter storms. Based on historical data, it is expected that the following will occur at least once per 100 years:

- Up to eight inches of rain fall in the rain band near the coast over a 36-hour period
- Up to four inches of freezing rain in the ice band near central New York State, of which between one and two inches of accumulated ice, over a 24-hour period
- Up to two feet of accumulated snow in the snow band in northern and western New York State over a 48-hour period (NYSERDA 2011)

New York State is already experiencing the effects of climate change during the winter season. Winter snow cover is decreasing and spring comes, on average, about a week earlier than it did a few years ago. Nighttime temperatures are measurably warmer, even during the colder months (NYSDEC Date Unknown). Overall winter temperatures in New York State are almost five degrees warmer than in 1970 (NYSDEC Date Unknown). The State has seen a decrease in the number of cold winter days (below 32°F) and can expect to see a decrease in snow cover, by as much as 25 to 50% by end of the next century. The lack of snow cover may jeopardize opportunities for skiing, snowmobiling and other types of winter recreation; and natural ecosystems will be affected by the changing snow cover (Cornell University College of Agriculture and Life Sciences 2011).

Some climatologists believe that climate change may play a role in the frequency and intensity of Nor'Easters. Two ingredients are needed to produce strong Nor'Easters and intense snowfall: (1) temperatures which are just below freezing, and (2) massive moisture coming from the Gulf of Mexico. When temperatures are far below freezing, snow is less likely. As temperatures increase in the winter months they will be closer to freezing rather than frigidly cold. Climate change is expected to produce more moisture, thus increasing the likelihood that these two ingredients (temperatures just below freezing and intense moisture) will cause more intense snow events.



5.4.6.2 Vulnerability Assessment

To understand risk, a community must evaluate what assets are exposed or vulnerable in the identified hazard area. For the severe winter storm hazard, all of Warren County has been identified as the hazard area. Therefore, all assets in the County (population, structures, critical facilities and lifelines), as described in the County Profile (Section 4), are vulnerable to a winter storm. The following text evaluates and estimates the potential impact of the severe winter storm hazard on the County including:

- Overview of vulnerability
- Data and methodology used for the evaluation
- Impact on: (1) life, health and safety of residents, (2) general building stock, (3) critical facilities, (4) economy, and (5) future growth and development
- Change of vulnerability as compared to that presented in the 2011 Warren All-Hazard Mitigation Plan
- Effect of climate change on vulnerability
- Further data collections that will assist understanding this hazard over time

Overview of Vulnerability

Severe winter storms are of significant concern to the County because of the frequency and magnitude of these events in the region, the direct and indirect costs associated with these events, delays caused by the storms, and impacts on the people and facilities of the region related to snow and ice removal, health problems, cascade effects such as utility failure (power outages) and traffic accidents, and stress on community resources.

Data and Methodology

Updated population and general building stock data were used to support an evaluation of assets exposed to this hazard and the potential impacts associated with this hazard. Additionally, as available economic losses were provided by the Planning Committee to support this vulnerability assessment.

Impact on Life, Health and Safety

According to the NOAA National Severe Storms Laboratory (NSSL); every year, winter weather indirectly and deceptively kills hundreds of people in the U.S., primarily from automobile accidents, overexertion and exposure. Winter storms are often accompanied by strong winds creating blizzard conditions with blinding wind-driven snow, drifting snow and extreme cold temperatures and dangerous wind chill. They are considered deceptive killers because most deaths and other impacts or losses are indirectly related to the storm. People can die in traffic accidents on icy roads, heart attacks while shoveling snow, or of hypothermia from prolonged exposure to cold. Heavy accumulations of ice can bring down trees and power lines, disabling electric power and communications for days or weeks. Heavy snow can immobilize a region and paralyze a city, shutting down all air and rail transportation and disrupting medical and emergency services. Storms near the coast can cause coastal flooding and beach erosion as well as sink ships at sea. The economic impact of winter weather each year is huge, with costs for snow removal, damage and loss of business in the millions (NSSL, 2006).

Heavy snow can immobilize a region and paralyze a city, stranding commuters, stopping the flow of supplies, and disrupting emergency and medical services. Accumulations of snow can collapse buildings and knock down trees and power lines. In rural areas, homes and farms may be isolated for days, and unprotected livestock may be lost. In the mountains, heavy snow can lead to avalanches. The cost of snow removal, repairing damages, and loss of business can have large economic impacts on cities and towns (NSSL, 2006).

Heavy accumulations of ice can bring down trees, electrical wires, telephone poles and lines, and communication towers. Communications and power can be disrupted for days while utility companies work to repair the



extensive damage. Even small accumulations of ice may cause extreme hazards to motorists and pedestrians. Bridges and overpasses are particularly dangerous because they freeze before other surfaces (NSSL, 2006).

For the purposes of this HMP, the entire population of Warren County (65,707 people) is exposed to severe winter storm events (U.S. Census, 2010). Snow accumulation and frozen/slippery road surfaces increase the frequency and impact of traffic accidents for the general population, resulting in personal injuries. Refer to Section 4 (County Profile) for population statistics for each participating municipality.

The elderly are considered most susceptible to this hazard due to their increased risk of injuries and death from falls and overexertion and/or hypothermia from attempts to clear snow and ice. In addition, severe winter storm events can reduce the ability of these populations to access emergency services. Residents with low incomes may not have access to housing or their housing may be less able to withstand cold temperatures (e.g., homes with poor insulation and heating supply).

Impact on General Building Stock

The entire general building stock inventory is exposed and vulnerable to the severe winter storm hazard. In general, structural impacts include damage to roofs and building frames, rather than building content. Table 5.4.6-4 presents the total replacement cost value for general building stock (structure only) for each participating municipality.

Current modeling tools are not available to estimate specific losses for this hazard. As an alternate approach, this plan considers percentage damages that could result from severe winter storm conditions. Table 5.4.6-5 below summarizes percent damages that could result from severe winter storm conditions for the Planning Area’s total general building stock. Given professional knowledge and the currently available information, the potential loss for this hazard is many times considered to be overestimated because of varying factors (building structure type, age, load distribution, building codes in place, etc.). Therefore, the following information should be used as estimates only for planning purposes with the knowledge that the associated losses for severe winter storm events vary greatly.

Table 5.4.6-5. General Building Stock RCV and Estimated Losses from Severe Winter Storm Events

Municipality	Total RCV (Structure only)	1% Damage Loss Estimate	5% Damage Loss Estimate	10% Damage Loss Estimate
Town of Bolton	\$617,682,000	\$6,176,820	\$30,884,100	\$61,768,200
Town of Chester	\$507,248,000	\$5,072,480	\$25,362,400	\$50,724,800
City of Glens Falls	\$1,866,928,000	\$18,669,280	\$93,346,400	\$186,692,800
Town of Hague	\$258,080,000	\$2,580,800	\$12,904,000	\$25,808,000
Town of Horicon	\$386,333,000	\$3,863,330	\$19,316,650	\$38,633,300
Town of Johnsbury	\$349,807,000	\$3,498,070	\$17,490,350	\$34,980,700
Town of Lake George	\$459,912,000	\$4,599,120	\$22,995,600	\$45,991,200
Lake George Village	\$237,788,000	\$2,377,880	\$11,889,400	\$23,778,800
Town of Lake Luzerne	\$477,064,000	\$4,770,640	\$23,853,200	\$47,706,400
Town of Queensbury	\$3,602,139,000	\$36,021,390	\$180,106,950	\$360,213,900
Town of Stony Creek	\$93,149,000	\$931,490	\$4,657,450	\$9,314,900
Town of Thurman	\$187,298,000	\$1,872,980	\$9,364,900	\$18,729,800
Town of Warrensburg	\$399,760,000	\$3,997,600	\$19,988,000	\$39,976,000
TOTAL	\$9,443,188,000	\$94,431,880	\$472,159,400	\$944,318,800

Source: HAZUS 2.2 (2010 census data)



A specific area that is vulnerable to the severe winter storm hazard is the floodplain. Severe winter storms can cause flooding through blockage of streams or through snow melt. At-risk residential infrastructures are presented in the flood hazard profile (Section 5.4.2). Generally, losses resulting from flooding associated with severe winter storms should be less than that associated with a 100-year flood.

Impact on Critical Facilities

Full functionality of critical facilities such as police, fire and medical facilities is essential for response during and after a severe winter storm event. These critical facility structures are largely constructed of concrete and masonry; therefore, they should only suffer minimal structural damage from severe winter storm events. Because power interruption can occur, backup power is recommended. Infrastructure at risk for this hazard includes roadways that could be damaged due to the application of salt and intermittent freezing and warming conditions that can damage roads over time. Severe snowfall requires the clearing roadways and alerting citizens to dangerous conditions; following the winter season, resources for road maintenance and repair are required.

Impact on Economy

The cost of snow and ice removal and repair of roads from the freeze/thaw process can drain local financial resources. Another impact on the economy includes impacts on commuting into, or out of, the area for work or school. The loss of power and closure of roads prevents the commuter population traveling to work within and outside of the County. Table 5.4.6-6 shows the estimated annual costs from Warren County jurisdictions on winter road maintenance costs. These estimates include costs for employee time, fuel, supplies and materials.

Table 5.4.6-6. Estimated Annual Winter Roadway Maintenance Costs

Jurisdiction	Estimate
Warren County	\$1,071,000.00
Bolton (T)	\$280,000.00
Chester (T)	\$530,000.00
Glens Falls (C)	\$752,000.00
Hague (T)	\$220,000.00
Horicon (T)	\$300,000.00
Johnsburg (T)	\$300,000.00
Lake George (T)	\$150,000.00
Lake George (V)	\$43,000.00
Lake Luzerne (T)	\$225,000.00
Queensbury (T)	\$682,000.00
Stony Creek (T)	\$380,000.00
Thurman (T)	\$218,300.00
Warrensburg (T)	\$200,000.00
Total	\$ 5,351,300.00

Source: Warren County, 2015

Future Growth and Development

As discussed in Sections 4 and 9, areas targeted for future growth and development have been identified across the County. Any areas of growth could be potentially impacted by the severe winter storm hazard because the entire planning area is exposed and vulnerable. Areas targeted for potential future growth and development in the next five (5) years have been identified across the County at the municipal level. Refer to the jurisdictional annexes in Volume II of this HMP.



Current New York State land use and building codes incorporate standards that address and mitigate snow accumulation. Some local municipalities in the State have implemented the following activities to eliminate loss of life and property and infrastructure damages during winter storm events:

- Removal of snow from roadways
- Removal of dead trees and trim trees/brush from roadways to lessen falling limbs and trees
- Ensure proper road signs are visible and installed properly
- Bury electrical and telephone utility lines to minimize downed lines
- Removal of debris/obstructions in waterways and develop routine inspections/maintenance plans to reduce potential flooding
- Replace substandard roofs of critical facilities to reduce exposure to airborne germs resulting from leakage
- Purchase and install backup generators in evacuation facilities and critical facilities to essential services to residents
- Install cell towers in areas where limited telecommunication is available to increase emergency response and cell phone coverage (NYS DHSES, 2014)

Change of Vulnerability

Overall, the entire County remains vulnerable to severe winter storms.

Effect of Climate Change on Vulnerability

Climate is defined not simply as average temperature and precipitation but also by the type, frequency and intensity of weather events. Both globally and at the local scale, climate change has the potential to alter the prevalence and severity of extremes such as winter storms. While predicting changes of winter storm events under a changing climate is difficult, understanding vulnerabilities to potential changes is a critical part of estimating future climate change impacts on human health, society and the environment (U.S. Environmental Protection Agency [EPA], 2013).

The 2011 ‘Responding to Climate Change in New York State’ report was prepared for New York State Energy Research and Development Authority to study the potential impacts of global climate change on New York State. According to the synthesis report, it is uncertain how climate change will influence extreme winter storm events. Winter temperatures are projected to continue to increase. In general, warmer winters may lead to a decrease in snow cover and an earlier arrival in spring; all of which have numerous cascading effects on the environment and economy. Annual average precipitation is also projected to increase. The increase in precipitation is likely to occur during the winter months as rain, with the possibility of slightly reduced precipitation projected for the late summer and early fall. Increased rain on snowpack may lead to increased flooding and related impacts on water quality, infrastructure, and agriculture in the State. Overall, it is anticipated that winter storms will continue to pass through New York State (NYSERDA, 2011). Future enhancements in climate modeling will provide an improved understanding of how the climate will change and impact the Northeast.

Additional Data and Next Steps

The assessment above identifies vulnerable populations and economic losses associated with this hazard of concern. Historic data on structural losses to general building stock are not adequate to predict specific losses to this inventory; therefore, the percent of damage assumption methodology was applied. This methodology is based on FEMA’s How to Series (FEMA 386-2), Understanding Your Risks, Identifying and Estimating Losses (FEMA, 2001) and FEMA’s Using HAZUS-MH for Risk Assessment (FEMA 433) (FEMA, 2004). The



collection of additional/actual valuation data for general building stock and critical infrastructure losses would further support future estimates of potential exposure and damage for the general building stock inventory. Mitigation strategies addressing early warning, dissemination of hazard information, provisions for snow removal and back-up power are included in Volume II, Section 9 of this plan.



5.4.7 Wildfire

The following section provides the hazard profile (hazard description, location, extent, previous occurrences and losses, probability of future occurrences, and impact of climate change) and vulnerability assessment for the wildfire hazard in Warren County.

5.4.7.1 Profile

Hazard Description

According to the New York State Hazard Mitigation Plan (NYS HMP), wildfire is defined as an uncontrolled fire spreading through natural or unnatural vegetation that often has the potential to threaten lives and property if not contained. Wildfires that burn in or threaten to burn buildings and other structures are referred to as wildland urban interface fires. Wildfires include common terms such as forest fires, brush fires, grass fires, wildland urban interface fires, range fires or ground fires. Wildfires do not include those fires, either naturally or purposely ignited, that are controlled for a defined purpose of managing vegetation for one or more benefits (NYS DHSES, 2014).

Wildfire in New York State is based on the same science and environmental factors as any wildfire in the world. Fuels, weather, and topography are the primary factors that determine the natural spread and destruction of every wildfire. New York State, including Warren County, has large tracts of diverse forest lands, many of which are the result of historic destructive wildfires. Although destructive fires do not occur on an annual basis, the State's fire history shows a cycle of fire occurrence that result in human death, property loss, forest destruction, and air pollution (NYS DHSES, 2014).

There are three different classes of wildfires: surface fires, ground fires, and crown fires. Surface fires are the most common type and burns along the forest floor, moving slowly and killing or damaging trees. Ground fires are usually started by lightning and burns on or below the forest floor. Crown fires spread rapidly by wind and move quickly by jumping along the tops of trees.



FEMA indicates that there are four categories of wildfires that are experienced throughout the U.S. These categories are defined as follows:

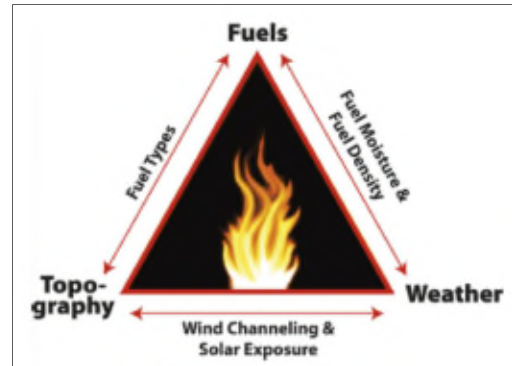
- Wildland fires – fueled almost exclusively by natural vegetation. They typically occur in national forests and parks, where Federal agencies are responsible for fire management and suppression.
- Interface or intermix fires – urban/wildland fires in which vegetation and the built-environment provide fuel
- Firestorms – events of such extreme intensity that effective suppression is virtually impossible. Firestorms occur during extreme weather and generally burn until conditions change or the available fuel is exhausted.
- Prescribed fires and prescribed natural burns – fires that are intentionally set or selected natural fires that are allowed to burn for beneficial purposes (FEMA, 1997).



Fire Ecology and Wildfire Behavior

The “wildfire behavior triangle” illustrates how three primary factors influence wildfire behavior: fuel, topography, and weather. Each point of the triangle represents one of the three factors; the sides represent the interplay between the factors. For example, drier and warmer weather combined with dense fuel loads and steeper slopes will cause more hazardous fires than light fuels on flat ground.

A fire needs all of the following three elements in the right combination to start and grow: a heat source, fuel, and oxygen. The growth of the fire primarily depends on the characteristics of available fuel, weather conditions, and terrain. Climate change is also considered a potential source of influence. These four factors are described below:



- Fuel
 - Lighter fuels such as grasses, leaves, and needles quickly expel moisture and burn rapidly, while heavier fuels such as tree branches, logs, and trunks take more time to warm and ignite.
 - Snags and hazard trees—especially those that are diseased, dying, or dead—are quickly engulfed and allow fires to spread quickly.
- Weather
 - Strong winds within the vicinity of the flames produce extreme fire conditions. Of particular concern are wind events that potentially persist for longer periods of time, or ones with significant wind speeds, which can sustain and quickly promote the spread of fire through movement of embers or exposure within tree crowns.
 - Spring and summer months, which can experience drought-like conditions extending beyond the normal season, also expand the average fire season. Likewise, the passage of a dry, cold front through the region can result in a sudden increase in wind speeds and a change in wind direction affecting fire spread.
 - Thunderstorm activity, which typically begins with wet storms, turns dry with little or no precipitation reaching the ground as the seasons progress.
- Terrain
 - Regional and local topography influence the amount and moisture of fuel.
 - Barriers such as highways and lakes can affect the spread of fire.
 - Elevation and slope of landforms affect fire spread; flames move more easily uphill than downhill.
- Changes to Environment
 - Without an increase in summer precipitation (greater than any predicted by climate models), areas susceptible to future burning are very likely to increase.
 - Infestation from insects is also of concern as it may impact forest health. Potential insect populations may increase with warmer temperatures as a result of warmer temperatures. Infested, stressed trees increase the fuel load.
 - Tree species composition will change as species respond uniquely to a changing climate.
 - Wildfires cause both short-term and long-term losses. Short-term losses can include destruction of timber, wildlife habitat, scenic vistas, and watersheds. Long-term effects include smaller timber harvests, reduced access to affected recreational areas, and the destruction of cultural and economic resources and community infrastructure.



Location

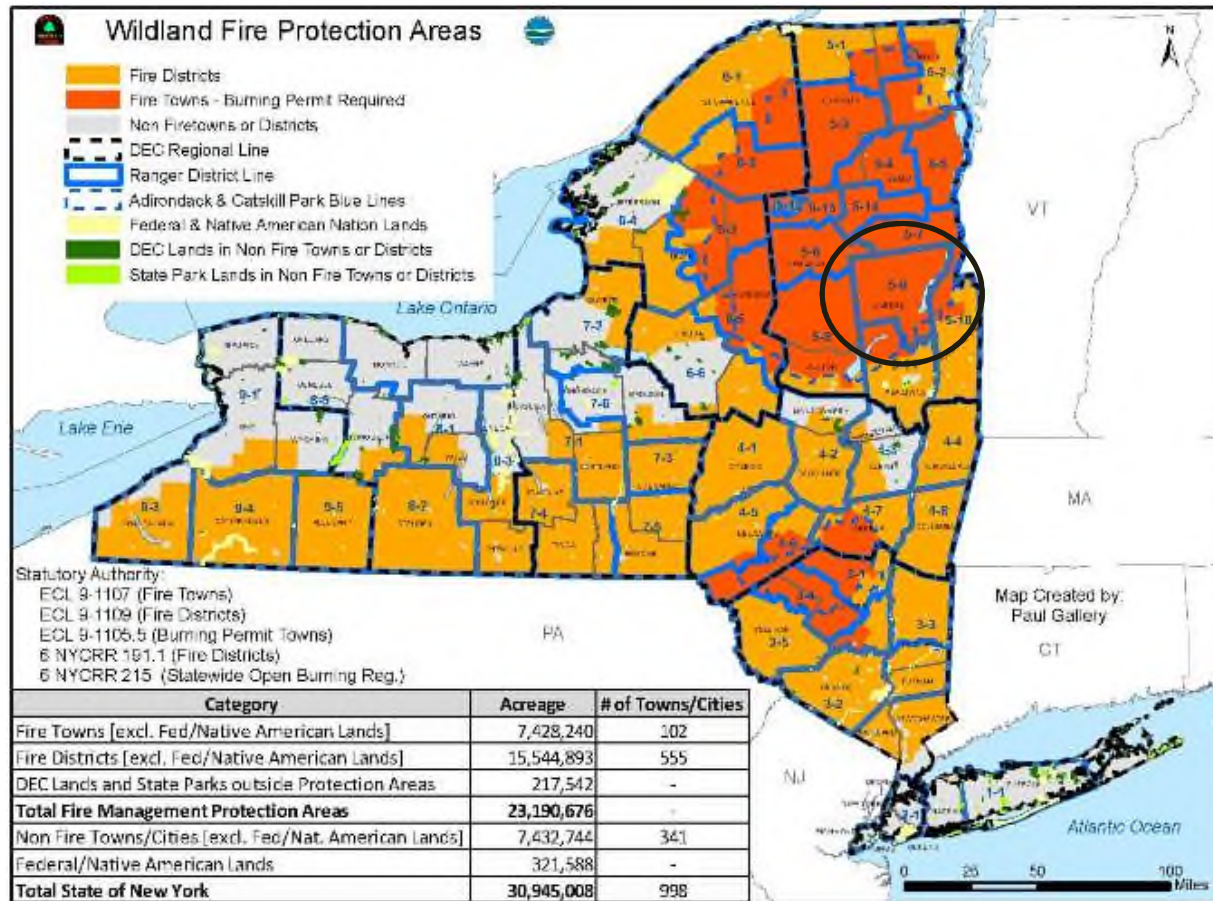
According to the U.S. Fire Administration (USFA), the fire problem in the U.S. varies from region to region. This often is a result of climate, poverty, education, demographics, and other causal factors (USFA, 2013). Wildfires do occur in New York State. Many areas in the State, particularly those that are heavily forested or contain large tracts of brush and shrubs, are prone to fires. New York State has over 18 million acres of non-Federal forested land, along with an undetermined amount of open space and wetlands. The Adirondacks, Catskills, Hudson Highlands, Shawangunk Ridge, and Long Island Pine Barrens are examples of fire-prone areas (NYSDEC 2013).

In New York State, the NYSDEC’s Division of Forest Protection (Forest Ranger Division) is designated as the State’s lead agency for wildfire mitigation. The Forest Ranger Division has a statutory requirement to provide a forest fire protection system for 657 of the 932 jurisdictions throughout New York State. It includes cities and villages and cover 23.1 million acres of land, including all state-owned land outside of the jurisdictions. The Lake Ontario Plains and New York City-Long Island areas are the general areas not included in the statutory requirement.

Figure 5.4.7-1 displays the fire protection areas in New York State. This figure indicates that, as of 2015, Warren County is located in Ranger District 5-9, almost completely within the Adirondack and Catskill Park area, and is fully comprised of fire towns where burning permits are required. Warren County Department of Building Codes takes enforcement responsibilities for all jurisdictions except for the Town of Queensbury or the City of Glens Falls, who administer their own permits (Warren County, 2015).



Figure 5.4.7-1. Forest Ranger Division Wildfire Protection Areas



Source: NYSDEC 2015

Note: Warren County is indicated by the black oval.

Forest Ranger District Region 5 is further split into management zones, and Warren County lies within Zone E. The majority of Forest Ranger department-administered lands in Warren County are within Lake George and Wilcox Lake wild forests and Siamese Ponds Wilderness Area. Also in Warren County is a portion of the Pharaoh Lake Wilderness Area, six DEC public campgrounds with 1,284 campsites combined, Prospect Mountain Memorial Highway Intensive Use Area and the Hudson River Special Management Area. According to the DEC Division of Forest Protection 2009 Annual Report, Zone E is a “hot spot” for wildfire activity in Region 5 and the entire Adirondack Park.

New York State is divided into 10 fire danger rating areas (FDRAs). FDRAs are defined by areas of similar vegetation, climate, and topography in conjunction with agency regional boundaries, National Weather Service (NWS) fire weather zones, political boundaries, fire occurrence history, and other influences. The Forest Ranger Division issues daily fire danger warnings when the fire danger rating is at high or above in one or more FDRAs. Warren County is located in the Adirondack FDRA.

Adirondack Park

The Adirondack Park Agency (APA) is a New York State government agency, created in 1971 by the State Legislature to develop long-range land use plans for both public and private lands within the Adirondack Park, including the 200,000 acre Lake George Park in Warren, Washington, and Essex Counties. The Agency classifies state lands in the Park according to the physical characteristics of the land or water which have a direct bearing



upon the capacity of the land to accept human use. The following nine basic categories result from this classification: Wilderness, Primitive, Canoe, Wild Forest, Intensive Use, Historic, State Administrative, Wild, Scenic and Recreational Rivers, Travel Corridors.

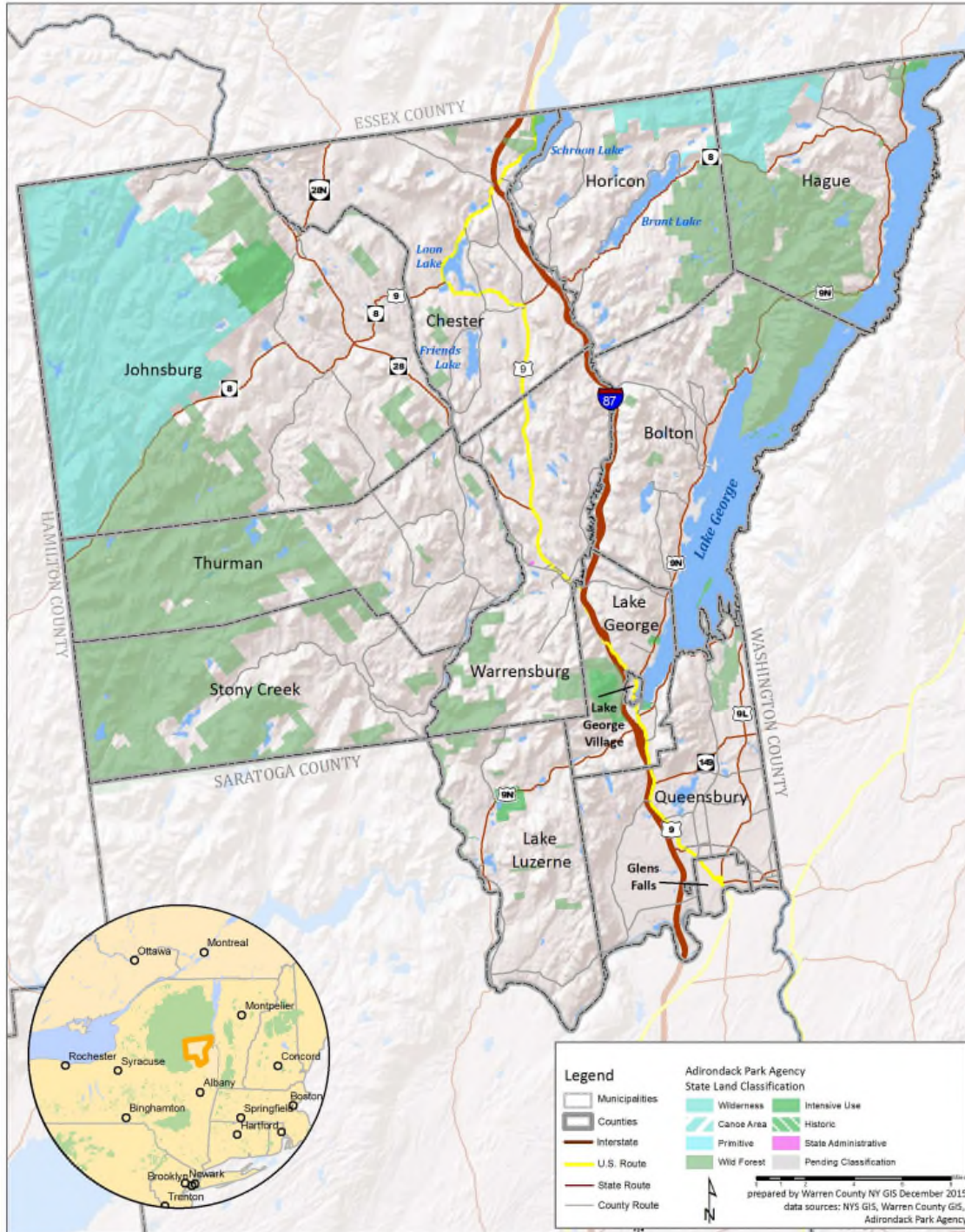
According to the 2014 Adirondack Park State Land Master Plan, Warren County contains areas within the park designated as Wilderness, Primitive, Wild Forest, State Administrative, and Travel Corridor Areas, as illustrated in Figure 5.4.7- 1., and discussed in further detail below. Each of these classifications has specific fire and burn regulations based on the permitted uses and environmental characteristics of the areas, and all of the designated Wilderness, Primitive, Wild Forest areas have Unit Management Plans adopted. Specific lands within Warren County falling within the Wilderness, Primitive, and Wild Forest lands include:

- Wilderness
 - Pharaoh Lake Wilderness Area is located in the Towns of Horicon and Hague in Warren County and in the Towns of Schroon and Ticonderoga in Essex County. Part of the Pharaoh Lake Wilderness Area lies within the Lake George Park. Fires have burned over most of the region in the past. Coupled with the relative dryness of the area, there is a proliferation of conifers mixed with some white birch. The white pine-white birch mixture along the shores of several of the lakes and ponds adds immeasurably to their attractiveness. Stands of some of the best quality Adirondack hardwoods exist in the cove-like pockets of the unburned area in the northeast. Pharaoh Lake Wilderness Area consists of 44,588 Acres of state land, including 1,587 Acres of water.
- Primitive
 - Chatiemac Lake primitive area consists of 2 acres of state land and 0.5 Miles of public road, located in the Town of Johnsburg, Warren County.
 - First Brother primitive area is located in the Town of Horicon, Warren County. The northwestern corner of the area abuts the southern boundary of the Pharaoh Lake Wilderness. The area consists of 99 acres of state land.
- Canoe
- Wild Forest
 - Lake George wild forest area is mostly located within Lake George Park in Essex, Warren, and Washington counties. It is bounded on the north by Pharaoh Lake Wilderness.
 - Vanderhacker Mountain wild forest area is located in the Towns of Chester, Johnsburg, Keene, Minerva, Newcomb, North Hudson, and Schroon in Essex and Warren Counties (APA 2014).

There are also nine State Administrative Areas in Warren County in the towns of Lake George, Chester SS, Chestertown, Johnsburg, Warrensburg, and Queensbury; and one designated Travel Corridor, a 3-mile stretch of State Route 418 from Warrensburg to Thurman.



Figure 5.4.7-2. Adirondack Park Land Classification Map



Source: Adirondack Park Agency, 2014

There are two main fire seasons in the Adirondack region, one in the spring and the other in the fall. The spring fire season stretches from the time that the snow melts until green leaves start to appear, usually from April until late May. During this time there is an abundance of dead leaves and vegetation on the ground from the previous autumn. Spring winds dry out this material, creating fuel for fires. Once foliage appears in late May the risk of



fire decreases because of a greater amount of moisture held in at ground level. The most destructive fires burn during the fall (Adirondack Museum 2016).

The Adirondack Park Invasive Plant Program (APIPP) serves as the Adirondack Partnership for Regional Invasive Species Management, one of eight regional partnerships across New York whose mission is to protect the Adirondack region from the negative impacts of invasive species. According to APIPP, a number of terrestrial invasive species that are or have been present in the Adirondack region may impact Warren County’s susceptibility to the wildfire hazard. Table 5.4.7-1 shows the species of concern, whether or not they are present within the Adirondack Park, and the impacts they may have on Warren County relative to the wildfire hazard.

Table 5.4.7-1. APIPP Terrestrial Invasive Species Hazard Assessment

Invasive Species	Adirondack Park Status	Potential Impact	Potential Hazard
Terrestrial Invasive Insects			
Sirex Wood Wasp	Present	Sick, Dead or Dying Trees in abundance	Human Health Hazard, Wildfire Hazard, Storm Hazard, Water Quality Hazard
Balsam Woolly Adelgid	Present		
Asian Gypsy Moth	Present		
Hemlock Woolly Adelgid	Absent		
Emerald Ash Borer	Absent		
Asian Long-horned Beetle	Absent		
Terrestrial Invasive Plants			
Phragmites	Present	Large, Dense Thickets of Dead Plant Stems Blocked signage and line of sight distances	Fire Hazard, Human Health Hazard
Knotweed species	Present	Large, Dense Thickets of Dead Plant Stems Damaged Infrastructure Blocked signage and line of sight distances	Fire Hazard Human Health Hazard
Oriental Bittersweet	Present	Tree destabilization and fragmentation	Human Health Hazard, Fire Hazard, Storm Hazard

Source: APIPP, 2015

Wildfire/Urban Interface (WUI) in New York State/Warren County

Wildland/Urban Interface (WUI) is the area where houses and wildland vegetation coincide. Interface neighborhoods are found all across the U.S., and include many of the sprawling areas that grew during the 1990s. Housing developments alter the structure and function of forests and other wildland areas. The outcomes of the fire in the WUI are negative for residents; some may only experience smoke or evacuation, while others may lose their homes to a wildfire. All states have at least a small amount of land classified as WUI. To determine the WUI, structures per acre and population per square mile are used. Across the U.S., 9.3-percent of all land is classified as WUI. The WUI in the area is divided into two categories: intermix and interface. Intermix areas have more than one house per 40 acres and have more than 50-percent vegetation. Interface areas have more than one house per 40 acres, have less than 50-percent vegetation, and are within 1.5 miles of an area over 1,235 acres that is more than 75-percent vegetated (Stewart et al., 2006).

The NYS HMP indicates that New York State has all three types of WUI interfaces. The Adirondack and Catskill Mountains contain large tracts of forests with the mixed, and to a lesser extent, the classic interface occurring

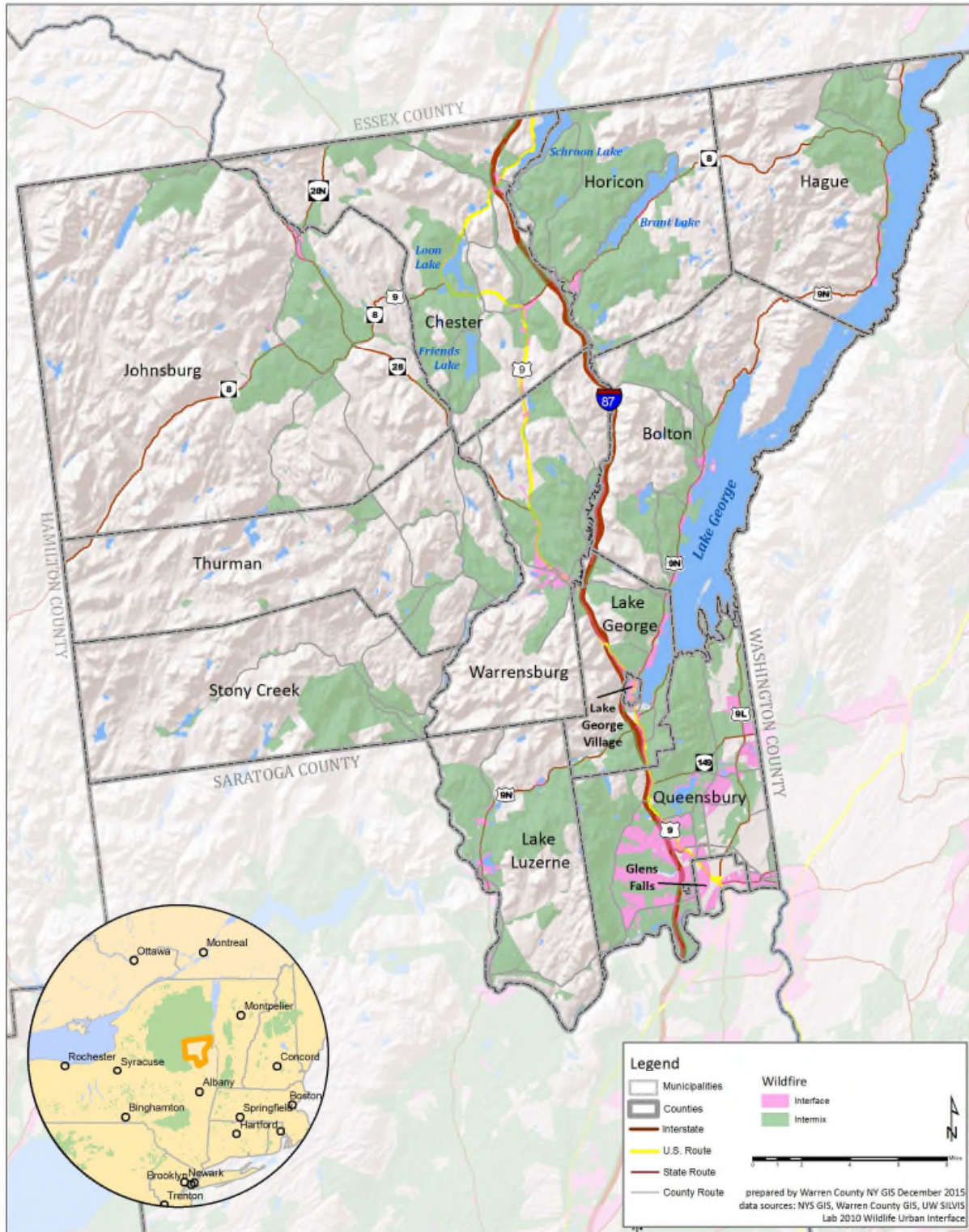


throughout. The remainder of the State contains classic and mixed interfaces with some major cities containing an occluded interface. The population migration from an urban to suburban and rural living will continue, increasing the possibility of loss and/or damage to structures in the WUI. Many property owners are unaware that a threat from a wildfire exists or that their homes are not defensible from it. Water supplies at the scene in the WUI are often inadequate. Access by firefighting equipment is often blocked or hindered by driveways that are either narrow, winding, dead-ended, have tight turning radii or have weight restrictions. Most wildland fire suppression personnel are inadequately prepared for fighting structural fires and local fire departments are not usually fully-trained or equipped for wildfire suppression. Further, the mix of structures, ornamental vegetation and wildland fuels may cause erratic fire behavior. These factors and others substantially increase the risk to life, property and economic welfare in the WUI. While there are many interface communities throughout New York and Warren County, an official list that details the location, type of interface and surrounding fuel make-up does not exist (NYS DHSES 2014).

A detailed WUI (interface and intermix) was obtained through the SILVIS Lab, Department of Forest Ecology and Management, University of Wisconsin-Madison which also defines the wildfire hazard area. The California Fire Alliance determined that areas within 1.5 miles of wildland vegetation are the approximate distance that firebrands can be carried from a wildland fire to the roof of a house. Therefore, even structures not located within the forest are at risk to wildfire. This buffer distance, along with housing density and vegetation type were used to define the WUI illustrated in Figure 5.4.7-3, below (Radeloff, et al, 2005). Using this WUI, approximately 261 square miles, or approximately 30% of the County's land area is located in the WUI (interface and intermix).



Figure 5.4.7-3. SILVIS Wildland Urban Interface and Intermix in Warren County



Source: Radeloff, et al. 2005





Extent

The extent (that is, magnitude or severity) of wildfires depends on weather and human activity. Warren County officials suggest that fires within the County are typically less than 20 acres. There are several tools available to estimate fire potential, extent, danger and growth including, but not limited to the following:

Wildland Fire Assessment System (WFAS) is an internet-based information system that provides a national view of weather and fire potential, including national fires danger, weather maps and satellite-derived “greenness” maps. It was developed by the Fire Behavior unit at the Fire Sciences Laboratory in Missoula, Montana and is currently supported and maintained at the National Interagency Fire Center (NIFC) in Boise, Idaho (USFS, Date Unknown).

Each day during the fire season, national maps of selected fire weather and fire danger components of the National Fire Danger Rating System (NFDRS) are produced by the WFAS (USFS, Date Unknown). Fire Danger Rating level takes into account current and antecedent weather, fuel types, and both live and dead fuel moisture. This information is provided by local station managers (USFS, Date Unknown). Table 5.4.7-2 shows the fire danger rating and color code, which is also used by the NYSDEC to update their fire danger rating maps, which is identified later in this section.

Table 5.4.7-2. Description of Fire Danger Ratings in New York State

Adjective Rating Class and Color Code	Class Description
Red Flag	A short-term, temporary warning, indicating the presence of a dangerous combination of temperature, wind, relative humidity, fuel or drought conditions which can contribute to new fires or rapid spread of existing fires. A Red Flag Warning can be issued at any Fire Danger level.
Extreme (Red)	Fires start quickly, spread furiously, and burn intensely. All fires are potentially serious. Development into high intensity burning will usually be faster and occur from smaller fires than in the very high fire danger class. Direct attack is rarely possible and may be dangerous except immediately after ignition. Fires that develop headway in heavy slash or in conifer stands may be unmanageable while the extreme burning condition lasts. Under these conditions the only effective and safe control action is on the flanks until the weather changes or the fuel supply lessens.
Very High (orange)	Fires start easily from all causes and, immediately after ignition, spread rapidly and increase quickly in intensity. Spot fires are a constant danger. Fires burning in light fuels may quickly develop high intensity characteristics such as long-distance spotting and fire whirlwinds when they burn into heavier fuels.
High (yellow)	All fine dead fuels ignite readily and fires start easily from most causes. Unattended brush and campfires are likely to escape. Fires spread rapidly and short-distance spotting is common. High-intensity burning may develop on slopes or in concentrations of fine fuels. Fires may become serious and their control difficult unless they are attacked successfully while small.
Moderate (blue)	Fires can start from most accidental causes but, with the exception of lightning fires in some areas, the number of starts is generally low. Fires in open cured grasslands will burn briskly and spread rapidly on windy days. Timber fires spread slowly to moderately fast. The average fire is of moderate intensity, although heavy concentrations of fuel, especially draped fuel, may burn hot. Short-distance spotting may occur, but is not persistent. Fires are not likely to become serious and control is relatively easy.
Low (green)	Fuels do not ignite readily from small firebrands although a more intense heat source, such as lightning, may start fires in duff or punky wood. Fires in open cured grasslands may burn freely a few hours after rain, but woods fires spread slowly by creeping or smoldering, and burn in irregular fingers. There is little danger of spotting.

Source: NYS DHSES 2014

The **Fire Potential Index (FPI)** is derived by combining daily weather and vegetation condition information and can identify the areas most susceptible to fire ignition. The combination of relative greenness and weather information identifies the moisture condition of the live and dead vegetation. The weather information also



identifies areas of low humidity, high temperature, and no precipitation to identify areas most susceptible to fire ignition. The FPI enables local and regional fire planners to quantitatively measure fire ignition risk (USGS, 2005). FPI maps are provided on a daily basis by the U.S. Forest Service. The scale ranges from 0 (low) to 100 (high). The calculations used in the NFDRS are not part of the FPI, except for a 10-hour moisture content (Burgan et al, 2000).

Fuel Moisture (FM) content is the quantity of water in a fuel particle expressed as a percent of the oven-dry weight of the fuel particle. FM content is an expression of the cumulative effects of past and present weather events and must be considered in evaluating the effects of current or future weather on fire potential. FM is computed by dividing the weight of the “water” in the fuel by the oven-dry weight of the fuel and then multiplying by 100 to get the percent of moisture in a fuel (Burgan et al, 2000).

There are two kinds of FM: live and dead. Live fuel moistures are much slower to respond to environmental changes and are most influenced by things such as a long drought period, natural disease and insect infestation, annuals curing out early in the season, timber harvesting, and changes in the fuel models due to blow down from windstorms and ice storms (Burgan et al, 2000). Dead fuel moisture is the moisture in any cured or dead plant part, whether attached to a still-living plant or not. Dead fuels absorb moisture through physical contact with water (such as rain and dew) and absorb water vapor from the atmosphere. The drying of dead fuels is accomplished by evaporation. These drying and wetting processes of dead fuels are such that the moisture content of these fuels is strongly affected by fuel sizes, weather, topography, decay classes, fuel composition, surface coatings, fuel compactness and arrangement (Schroeder and Buck, 1970).

Fuels are classified into four categories which respond to changes in moisture. This response time is referred to as a time lag. A fuel’s time lag is proportional to its diameter and is loosely defined as the time it takes a fuel particle to reach two-thirds of its way to equilibrium with its local environment. The four categories include:

- 1-hour fuels: up to ¼-inch diameter – fine, flashy fuels that respond quickly to weather changes. Computed from observation time, temperature, humidity, and cloudiness.
- 10-hour fuels: ¼-inch to one-inch in diameter - computed from observation time, temperature, humidity, and cloudiness or can be an observed value.
- 100-hour fuels: one-inch to three-inch in diameter - computed from 24-hour average boundary condition composed of day length (daylight hours), hours of rain, and daily temperature/humidity ranges.
- 1000-hour fuels: three-inch to eight-inch in diameter - computed from a seven-day average boundary condition composed of day length, hours of rain, and daily temperature/humidity ranges (National Park Service, Date Unknown).

The **Keetch-Byram Drought Index (KBDI)** is a drought index designed for fire potential assessment. It is a number representing the net effect of evapotranspiration and precipitation in producing cumulative moisture deficiency in deep duff and upper soil layers (USFS, Date Unknown). The index increases each day without rain and decreases when it rains. The scale ranges from 0 (no moisture deficit) to 800 (maximum drought possible). The range of the index is determined by assuming that there is eight inches of moisture in a saturated soil that is readily available to the vegetation. For different soil types, the depth of soil required to hold eight inches of moisture varies. A prolonged drought influences fire intensity, largely because more fuel is available for combustion. The drying of organic material in the soil can lead to increased difficulty in fire suppression (Florida Forest Service, Date Unknown).

The **Haines Index**, also known as the Lower Atmosphere Stability Index, is a fire weather index based on stability and moisture content of the lower atmosphere that measures the potential for existing fires to become large fires. It is named after its developer, Donald Haines, a Forest Service research meteorologist, who did the initial work and published the scale in 1988 (Storm Prediction Center [SPC], Date Unknown).



The Haines Index can range between 2 and 6. The drier and more unstable the lower atmosphere is, the higher the index. It is calculated by combining the stability and moisture content to the lower atmosphere into a number that correlates well with large fire growth. The stability term is determined by the temperature difference between two atmospheric layers; the moisture term is determined by the temperature and dew point different. The index, as listed below, has shown to correlate with large fire growth on initiating and existing fires where surface winds do not dominate fire behavior (USFS, Date Unknown).

- Very Low Potential (2) – moist, stable lower atmosphere
- Very Low Potential (3)
- Low Potential (4)
- Moderate Potential (5)
- High Potential (6) – dry, unstable lower atmosphere (USFS, Date Unknown)

The Haines Index is intended to be used all over the U.S. It is adaptable for three elevation regimes: low elevation, middle elevation, and high elevation. Low elevation is for fires at or very near sea level. Middle elevation is for fires burning in the 1,000 to 3,000 feet in elevation range. High elevation is intended for fires burning above 3,000 feet in elevation (SPC, Date Unknown).

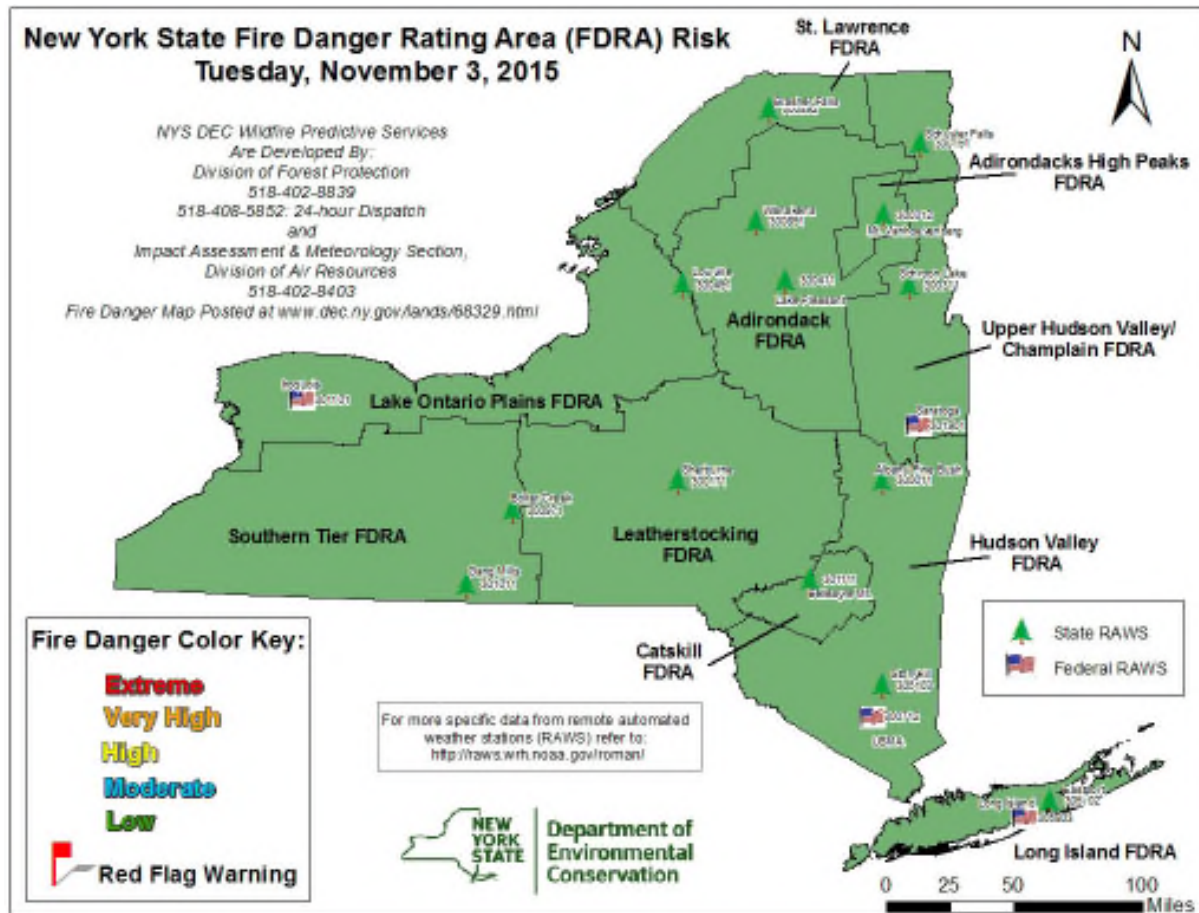
The **Buildup Index (BUI)** is a number that reflects the combined cumulative effects of daily drying and precipitation in fuels with a 10 day time lag constant. The BUI can represent three to four inches of compacted litter or can represent up to six inches or more of loose litter (North Carolina Forest Service, 2007).

NYSDEC Fire Danger Rating Map

A current fire danger rating map is updated daily on the NYSDEC website (<http://www.dec.ny.gov/lands/68329.html>). The map is developed by information obtained from the Division of Forest Protection and Division of Air Resources (impact assessment and meteorology section). Figure 5.4.7-4 shows the FDRAs in New York State and the current (as of November 3, 2015) fire danger risk for each of the areas. The figure is color coded and indicates where there are red flag warning areas. Table 5.4.7-2, above, describes the fire danger ratings for New York State.



Figure 5.4.7-4. New York State Fire Danger Rating Areas



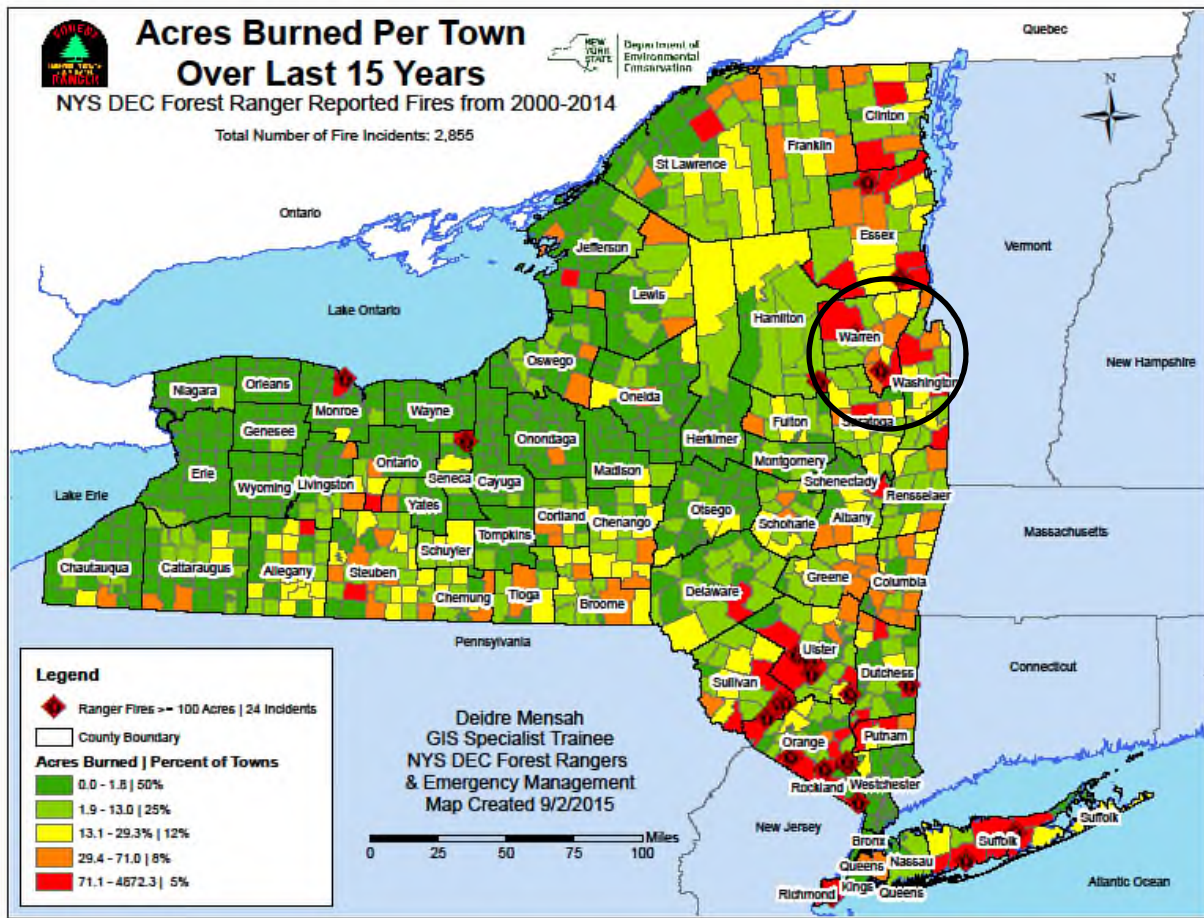
Source: NYSDEC, 2015

Previous Occurrences and Losses

Wildfire occurrence in New York State is based on two data sources – the New York State Forest Ranger force and the New York State Office of Fire Prevention and Control. The New York State Forest Ranger is a division of the NYSDEC and has fought fires and retained records for over 125 years. Between 1965 and 2014, there were 23,025 wildfires in New York State burning 165,165 acres. According to the Ranger Division wildfire occurrence data from 1988 through 2012, 95% of wildfires in the State were human-caused. Debris burning accounted for 35%; arson accounted for 17%; campfires accounted for 14%; children accounted for 5%; smoking, equipment, and railroads accounted for 30%; and lightning accounted for 5% of all wildfires (NYSDEC 2013). Figure 5.4.7-5 illustrates the acres burned by towns in New York State, as reported by NYS DEC forest rangers between 2000 and 2014.



Figure 5.4.7-5. Average Acres Burned by Town New York State, 2000-2014



Source: NYS DEC 2015

Note: The black oval indicates the location of Warren County.

Between January 1, 2009 and December 31, 2015, the NYS Forest Rangers reported 58 wildfires in Warren County that burned a total of 271.20 acres.

Many sources provided wildfire information regarding previous occurrences and losses associated with wildfire throughout New York State and Warren County. With so many sources reviewed for the purpose of this HMP Update, loss and impact information for many events could vary depending on the source. Therefore, the accuracy of monetary figures discussed is based only on the available information identified during research for this HMP.

Between 1954 and 2015, New York State was included in two FEMA fire management assistance (FMA) declarations. Generally, these disasters cover a wide range of the State; therefore, the disaster may have impacted many counties. Warren County was not included in any FMA declarations. For this 2015 HMP, significant wildfire events in Warren County were summarized from 2009 to 2015 are identified in Table 5.4.7-3. Please note that not all events that have occurred in Warren County are included due to the extent of documentation and the fact that not all sources may have been identified or researched. Loss and impact information could vary depending on the source. Therefore, the accuracy of monetary figures discussed is based only on the available information identified during research for this HMP.



Table 5.4.7-3. Wildfire Events in Warren County Between 2009 and 2015

Dates of Event	Event Type	FEMA Declaration Number	NYS DEC Incident Number	Losses / Impacts
April 30 – May 7, 2009	Wildfire - Tongue Mtn 1	N/A	NYS-2009-0133	A lightning strike started a forest fire in a forest preserve in the Town of Hague, resulting in 13 acres burned.
May 16 – 27, 2013	Wildfire - Pine Mountain Fire	N/A	NYS-2013-0099	A lightning strike started a forest fire in a forest preserve in the Town of Warrensburg, resulting in 16.8 acres burned.
November 4-10, 2014	Wildfire	N/A	NYS-2014-0139	In 2014, the largest wildfire to occur in New York State was the 173-acre Darling Mountain Fire in the Town of Queensbury that began on November 4. This fire occurred on private land and spread quickly because of strong winds blowing fallen leaves. Smoke from the fire triggered automatic alarm systems six miles away in the City of Glens Falls. Little mop up was needed for this surface fire, and it was declared out three days later. This fire was caused by hunters leaving an unextinguished campfire.
May 8 – 17, 2015	Wildfire	N/A	NYS-2015-0105	A campfire in the Town of Queensbury was reported to spark forest fires on private property, resulting in 14 acres burned.

Sources: NYSDEC 2013; NYSDEC 2015
 FEMA Federal Emergency Management Agency
 NYSDEC New York State Department of Environmental Conservation



Probability of Future Occurrences



According to the New York State Forest Ranger Division, wildfire occurrence data from 1988 to 2012 have shown that New York State, including Warren County, will always be susceptible to wildfires. Ninety-five percent of wildfires in New York State are caused by humans, while lightning is responsible for only five percent. Beginning in 2010, New York State enacted revised open burning regulations that ban brush burning statewide from March 15th through May 15th. This time period is when 47% of all fire department-response wildfires occur. Forest ranger data indicates that this new statewide ban resulted in 74% fewer wildfires caused by debris burning in upstate New York from 2010 to 2012. Debris

burning has been prohibited in New York City and Long Island for more than 40 years. Since compliance with this regulation, forest ranger and fire department historical fire occurrence data will serve as a benchmark for analysis of wildfire occurrence (NYS DHSES, 2014).

The State's large size, diverse topography, and variety of climates require the State be divided into distinct units for describing wildfire potential and risk. See the Location section of this profile for information regarding the risk areas.

Wildfire experts say there are four reasons why wildfire risks are increasing:

- Fuel, in the form of fallen leaves, branches and plant growth, have accumulated over time on the forest floor. Now this fuel has the potential to “feed” a wildfire.
- Increasingly hot, dry weather in the U.S.
- Changing weather patterns across the country.
- More homes built in the areas called the Wildland/Urban Interface, meaning homes are built closer to wildland areas where wildfires can occur (NYS DHSES 2014).

It is likely that New York State will experience small wildfires throughout the state on a yearly basis (as the State has regularly experienced in the past). However, advanced methods of wildfire management and control and a better understanding of the fire ecosystems should reduce the number of devastating fires in the future (NYS DHSES 2014).

Estimating the approximate number of wildfires to occur in Warren County is difficult to predict in a probabilistic manner. This is because a number of variable factors impact the potential for a fire to occur and because some conditions (for example, ongoing land use development patterns, location, fuel sources, and construction sites) exert increasing pressure on the WUI zone. Based on available data, wildfires will continue to present a risk to Warren County. Given the numerous factors that can impact urban fire and wildfire potential, the likelihood of a fire event starting and sustaining itself should be gauged by professional fire managers on a daily basis.

In Section 5.3, the identified hazards of concern for Warren County were ranked. The probability of occurrence, or likelihood of the event, is one parameter used for ranking hazards. Based on historical records and input from the Planning Committee, the probability of occurrence for wildfire in the County is considered ‘frequent’ (event likely to occur within 25 years, as presented in Section 5.3)



Climate Change Impacts

Climate change directly and indirectly affects the growth and productivity of forests: directly due to changes in atmospheric carbon dioxide and climate, and indirectly through complex interactions in forest ecosystems. Climate also affects the frequency and severity of many forest disturbances, such as infestations, invasive species, wildfires, and storm events. As temperatures increase, the suitability of a habitat for specific types of trees changes. There is also evidence that prolonged heat waves are likely to lead to a greater number of wildfire incidents. Stronger winds from larger storms may lead to more fallen branches for wildfires to consume. An increase in rain and snow events primes forests for fire by growing more fuel. Drought and warmer temperatures lead to drier forest fuels (NYS DHSES 2014).

Climate change is beginning to affect both people and resources in New York State, and these impacts are projected to continue growing. Impacts related to increasing temperatures and sea level rise are already being felt in the State. ClimAID: the Integrated Assessment for Effective Climate Change in New York State (ClimAID) was undertaken to provide decision-makers with information on the State’s vulnerability to climate change and to facilitate the development of adaptation strategies informed by both local experience and scientific knowledge (New York State Energy Research and Development Authority [NYSERDA] 2011).

Each region in New York State, as defined by ClimAID, has attributes that will be affected by climate change. Warren County is part of Region 7 (see Figure 5.4.7-6), Adirondack Mountains. Some of the issues in this region, affected by climate change, include: loss of high elevation plants, animals and ecosystem types; decline in winter recreation; decline in milk production, etc. (NYSERDA 2011).



Figure 5.4.7-6. Climate Regions of New York State



Source: NYSERDA 2011

Temperatures in New York State are warming, with an average rate of warming over the past century of 0.25° F per decade. Average annual temperatures are projected to increase across New York State by 2° F to 3.4° F by the 2020s, 4.1° F to 6.8° F by the 2050s, and 5.3° F to 10.1° F by the 2080s. By the end of the century, the greatest warming is projected to be in the northern section of the State (NYSERDA 2014).

Regional precipitation across New York State is projected to increase by approximately one to eight-percent by the 2020s, three to 12-percent by the 2050s, and four to 15-percent by the 2080s. By the end of the century, the greatest increases in precipitation are projected to be in the northern areas of the State (NYSERDA 2014).

In Region 7, it is estimated that temperatures will increase by 3.7°F to 7.4°F by the 2050s and 4.2°F to 11.8°F by the 2080s (baseline of 39.9°F). Precipitation totals will increase between 2 and 15% by the 2050s and 3 to 17% by the 2080s (baseline of 40.8 inches). Table 5.4.7-4 displays the projected seasonal precipitation change for the Adirondack Mountains ClimAID Region (NYSERDA 2011).

Table 5.4.7-4. Projected Seasonal Precipitation Change in Region 7, 2050s (% change)

Winter	Spring	Summer	Fall
+5 to +15	-5 to +10	-5 to +5	-5 to +10

Source: NYSERDA 2011



With the increase in temperatures, heat waves will become more frequent and intense, increasing heat-related illness and death and posing new challenges to the energy system, air quality and agriculture. Summer droughts are projected to increase, affecting water supply, agriculture, ecosystems, and energy projects (NYSERDA 2011).

Fire is determined by climate variability, local topography, and human intervention. Climate change has the potential to affect multiple elements of the wildfire system: fire behavior, ignitions, fire management, and vegetation fuels. Hot dry spells create the highest fire risk. With the increasing temperatures occurring in New York State, wildfire danger may intensify by warming and drying out vegetation. When climate alters fuel loads and fuel moisture, forest susceptibility to wildfires changes. Climate change also may increase winds that spread fires. Faster fires are harder to contain, and thus are more likely to expand into residential neighborhoods.



5.4.7.2 Vulnerability Assessment

To understand risk, a community must evaluate what assets are exposed or vulnerable in the identified hazard area. For the wildfire hazard, the portions of Warren County in the Wildland/Urban Interface zones (Interface and Intermix) have been identified as the hazard area. Therefore, all assets in the county (population, structures, critical facilities and lifelines), as described in the County Profile (Section 4), located in the hazard area are exposed and potentially vulnerable to wildfire. The following text evaluates and estimates the potential impact of the wildfire hazard on the County including:

- Overview of vulnerability
- Data and methodology used for the evaluation
- Impact on: (1) life, health and safety of residents, (2) general building stock, (3) critical facilities, (4) economy, and (5) future growth and development
- Effect of climate change on vulnerability
- Change of vulnerability as compared to that presented in the 2011 Warren County HMP
- Further data collections that will assist understanding this hazard over time

Overview of Vulnerability

Wildfire hazards can impact significant areas of land, as evidenced by wildfires throughout the State and United States over the past several years. Fire in urban areas has the potential for great damage to infrastructure, loss of life, and strain on lifelines and emergency responders because of the high density of population and structures that can be impacted in these areas. Wildfire, however can spread quickly, become a huge fire complex consisting of thousands of acres, and present greater challenges for allocating resources, defending isolated structures, and coordinating multi-jurisdictional response. If a wildfire occurs at a WUI, it can also cause an urban fire and in this case has the potential for great damage to infrastructure, loss of life, and strain on lifelines and emergency responders because of the high density of population and structures that can be impacted in these areas.

Potential losses from wildfire include human life, structures and other improvements, and natural resources. Given the immediate response times to reported wildfires, the likelihood of injuries and casualties is minimal. Smoke and air pollution from wildfires can be a health hazard, especially for sensitive populations including children, the elderly, and those with respiratory and cardiovascular diseases. Wildfire may also threaten the health and safety of those fighting the fires. First responders are exposed to the dangers from the initial incident and after-effects from smoke inhalation and heat stroke. In addition, wildfire can lead to ancillary impacts such as landslides in steep ravine areas and flooding caused by the impacts of silt in local watersheds.

Data and Methodology

The WUI (interface and intermix) obtained through the SILVIS Lab, Department of Forest Ecology and Management, University of Wisconsin – Madison was referenced to define the wildfire hazard areas. The University of Wisconsin-Madison wildland fire hazard areas are based on the 2010 Census and 2006 National Land Cover Dataset and the Protected Areas Database. For the purposes of this risk assessment, the high-, medium-, and low-density interface areas were combined and used as the “interface” hazard area, and the high-, medium-, and low-density intermix areas were combined and used as the “intermix” hazard areas. Figure 5.4.7-3 shown above display the 2010 Wildfire Urban Interface for Warren County by 2010 U.S. Census block.

The asset data (population, building stock, and critical facilities) presented in the County Profile (Section 4) was used to support an evaluation of assets exposed and potential impacts and losses associated with this hazard. To determine what assets are exposed to wildfire, available and appropriate Geographic Information System (GIS)



data were overlaid upon the hazard area. Limitations of this analysis are recognized, and as such, the analysis is used only to provide a general estimate.

Impact on Life, Health and Safety

As demonstrated by historic wildfire events in New York and other parts of the country, potential losses include human health and life of residents and responders, structures, infrastructure and natural resources. In addition, wildfire events can have major economic impacts on a community from the initial loss of structures and the subsequent loss of revenue from destroyed business and decrease in tourism. The most vulnerable populations include emergency responders and those within a short distance of the interface between the built environment and the wildland environment.

Wildfires can cost thousands of taxpayer dollars to suppress and control and involve hundreds of operating hours on fire apparatus and thousands of volunteer man hours from the volunteer firefighters. There are also many direct and indirect costs to local businesses that excuse volunteers from work to fight these fires.

As a way to estimate the county’s population vulnerable to the wildfire hazard, the population located within the WUI was overlaid upon the 2010 Census population data (U.S. Census 2010). Census blocks with centers within the hazard area were used to calculate the estimated population exposed to the wildfire hazard. Table 5.4.7-5 summarizes the estimated population exposed by municipality.

Based on the analysis, 23,022 individuals, or 35% of the County’s population, are exposed to the Intermix wildfire hazard, while 29,883 individuals, or 45% of the County’s population, are exposed to the Interface wildfire hazard. Overall, the city of Glens Falls and towns of Queensbury and Warrensburg have the greatest number of individuals located in the hazard area.

Table 5.4.7-5. Estimated Vulnerable Population

Municipality	U.S. Census 2010 Population	Estimated Population Exposed			% of Total Exposed
		Intermix	Interface	Total	
Town of Bolton	2,326	1,894	395	2,289	98%
Town of Chester	3,355	2,052	607	2,659	79%
City of Glens Falls	14,700	60	7,005	7,065	48%
Town of Hague	699	562	99	661	95%
Town of Horicon	1,389	1,254	75	1,329	96%
Town of Johnsbury	2,395	1,265	472	1,737	73%
Town of Lake George	3,515	1,916	1,522	3,438	98%
Town of Lake Luzerne	3,347	2,033	864	2,897	87%
Town of Queensbury	27,901	9,369	16,393	25,762	92%
Town of Stony Creek	767	517	6	523	68%
Town of Thurman	1,219	798	8	806	66%
Town of Warrensburg	4,094	1,302	2,437	3,739	91%
TOTAL	65,707	23,022	29,883	52,905	80.5%

Sources: U.S. Census 2010, Radeloff et al. 2005



Impact on General Building Stock

The most vulnerable structures to wildfire events are those located within the WUI areas. Buildings constructed of wood or vinyl siding are generally more likely to be impacted by the fire hazard than buildings constructed of brick or concrete. To estimate the buildings exposed to the wildfire hazard, the hazard areas were overlaid upon the building inventory in the County (Census block). The replacement cost value of the structures with their center in the hazard area were totaled. Table 5.4.7-6 summarizes the estimated building stock inventory exposed by municipality. The limitations of this analysis are recognized, and as such the analysis is only used to provide a general estimate.

Table 5.4.7-6. Building Stock Replacement Value Located in WUI Hazard Area

Municipality	Total RV (Structure and Contents)	Building RV Exposed			% of Total Exposed
		Intermix	Interface	Total	
Town of Bolton	\$960,513,000	\$564,709,000	\$226,637,000	\$791,346,000	82%
Town of Chester	\$800,772,000	\$447,494,000	\$90,263,000	\$537,757,000	67%
City of Glens Falls	\$3,290,154,000	\$2,792,000	\$1,660,964,000	\$1,663,756,000	51%
Town of Hague	\$400,664,000	\$245,399,000	\$41,838,000	\$287,237,000	72%
Town of Horicon	\$589,719,000	\$409,303,000	\$55,375,000	\$464,678,000	79%
Town of Johnsbury	\$563,005,000	\$249,218,000	\$120,674,000	\$369,892,000	66%
Town of Lake George	\$712,923,000	\$421,075,000	\$231,290,000	\$652,365,000	92%
Lake George Village	\$397,549,000	\$0	\$384,848,000	\$384,848,000	97%
Town of Lake Luzerne	\$743,990,000	\$381,903,000	\$229,985,000	\$611,888,000	82%
Town of Queensbury	\$5,897,513,000	\$1,657,654,000	\$2,924,084,000	\$4,581,738,000	78%
Town of Stony Creek	\$143,567,000	\$88,929,000	\$1,818,000	\$90,747,000	63%
Town of Thurman	\$328,601,000	\$82,078,000	\$525,000	\$82,603,000	25%
Town of Warrensburg	\$647,352,000	\$200,130,000	\$387,830,000	\$587,960,000	91%
TOTAL	\$15,476,322,000	\$4,750,684,000	\$6,356,131,000	\$11,106,815,000	72%

Sources: Warren County, HAZUS 2.2 – 2010 census data; Radeloff et al. 2005
RV = Replacement value

Impact on Critical Facilities

It is recognized that a number of critical facilities are located in the wildfire hazard area, and are also vulnerable to the threat of wildfire. Many of these facilities are the locations for vulnerable populations (i.e., schools, senior facilities) and responding agencies to wildfire events (i.e., fire, police). Table 5.4.8-6 and 5.4.8-7 summarize the critical facilities located within the wildfire hazard area by jurisdiction.



Table 5.4.8-6. Facilities in WUI (Interface and Intermix) Hazard Area

Municipality	Dam	DPW	Fire/EMS	Government	Library	Medical	Police	Post Office	Potable Pump	School	Senior	Potable Storage	Well	Wastewater Facility
Bolton		1	1	1	1	1	1	1		1	1			1
Chester	1		3	1	1		2	2	1		1	2	2	
Glens Falls		1		1		3			1	6	3			
Hague		1	1	1				1	1		1		1	1
Horicon	3		2	1				2						
Johnsburg			5	2	1			5		1	1			
Lake George	1	2	2	2	2		1	2		2	1	2		
Lake Luzerne	6		1	1	1			1		3	1	1		
Queensbury	7	1	8	4		3	1	2	1	5	4	2		
Stony Creek	1	1	1	1	1			1			1			
Thurman								1						
Warrensburg	2	1	2	5	1	1	1	1		2	3	1		
Total	21	8	26	20	8	8	6	19	4	20	17	8	3	2

Source: Warren County, NYGIS
 Note: DPW – Department of Public Works
 EMS – Emergency Medical Services

Table 5.4.8-7 Critical Facilities Located in the Wildfire Hazard Areas

Municipality	Facility Name	Facility Type	Wildfire
Bolton	Hudson Headwaters Health Network - Bolton	Health Care	Interface
Bolton	Bolton Police Dept	Police Station	Interface
Bolton	Bolton Central School	School	Interface
Bolton	Bolton Senior Citizens, Inc.	Senior Facility	Intermix
Bolton	Bolton Wastewater Treatment Plant	Wastewater Facility	Intermix
Bolton	Bolton Town Hall	Town Hall	Interface
Bolton	Bolton Highway Department	Town Highway Garage	Intermix
Bolton	Bolton Free Library	Library	Interface
Bolton	Bolton Landing Post Office	Post Office	Interface
Bolton	Up Yonda Farm	County Educational Center	Intermix
Municipality	Facility Name	Facility Type	Wildfire
Bolton	Bolton Fire Station/EMS	Fire/EMS	Interface
Chester	Chestertown wells	Water Facility	Intermix



Section 5.4.7: Risk Assessment – Wildfire

Municipality	Facility Name	Facility Type	Wildfire
Chester	Pottersville Water Plant	Water Facility	Intermix
Chester	Chester Water Tower	Water Facility	Intermix
Chester	Olmstedville wells	Water Facility	Intermix
Chester	Austin St Pump House	Water Facility	Interface
Chester	Chester Town Hall	Town Hall	Intermix
Chester	Chestertown Library	Library	Intermix
Chester	Chestertown Post Office	Post Office	Intermix
Chester	Pottersville Post Office	Post Office	Interface
Chester	Chestertown Fire Station	Fire/EMS	Intermix
Chester	North Warren Emergency Squad	Fire/EMS	Intermix
Chester	New York State Police	Police Station	Intermix
Chester	Warren County Sheriff's Substation	Police Station	Intermix
Chester	Town Of Chester 50 + Club	Senior Facility	Intermix
Chester	Pottersville Fire Station	Fire/EMS	Intermix
Glens Falls	Glens Falls Hospital - Broad Street Medical Group	Health Care	Interface
Glens Falls	Southern Adirondack Planned Parenthood	Health Care	Interface
Glens Falls	Glens Falls Hospital	Health Care	Interface
Glens Falls	Glens Falls High School	School	Interface
Glens Falls	Glens Falls Middle School	School	Interface
Glens Falls	Kensington Elementary School	School	Interface
Glens Falls	Sanford Street School/BOCES	School	Interface
Glens Falls	Abe Wing Elementary School	School	Interface
Glens Falls	St. Mary's/St. Alphonsus Catholic School	School	Interface
Glens Falls	Stichman Towers	Senior Facility	Interface
Glens Falls	Stanton Hallmark Nursing Home	Senior Facility	Interface
Glens Falls	Eden Park Nursing Home	Senior Facility	Interface
Glens Falls	Thornberry Pumping Station	Water Facility	Intermix
Glens Falls	Mental Health - OCS	County Government	Interface
Glens Falls	Glens Falls Cemetery	Cemetery	Interface
Glens Falls	Glens Falls DPW	City Highway Garage	Interface
Hague	Hague Fire Station	Fire/EMS	Intermix
Hague	Hague Senior Citizens Club, Inc.	Senior Facility	Intermix
Hague	Graphite Mt well	Water Facility	Intermix
Hague	Nottingham Hill pump house	Water Facility	Intermix
Hague	Hague Wastewater Treatment Plant	Wastewater Facility	Intermix
Municipality	Facility Name	Facility Type	Wildfire
Hague	Hague Town Hall	Town Hall	Intermix
Hague	Hague Post Office	Post Office	Intermix



Municipality	Facility Name	Facility Type	Wildfire
Hague	Hague Highway Garage	Town Highway Garage	Intermix
Horicon	Adirondack Fire Substation	Fire/EMS	Intermix
Horicon	Horicon Fire Station	Fire/EMS	Intermix
Horicon	Horicon Town Hall	Town Hall	Intermix
Horicon	Adirondack Post Office	Post Office	Interface
Horicon	Brant Lake Post Office	Post Office	Intermix
Johnsburg	Bakers Mills Fire Station	Fire/EMS	Intermix
Johnsburg	Johnsburg Fire Station	Fire/EMS	Intermix
Johnsburg	Johnsburg Central School	School	Interface
Johnsburg	White Water Manor	Senior Facility	Interface
Johnsburg	Johnsburg Town Hall	Town Hall	Interface
Johnsburg	Bakers Mills Post Office	Post Office	Interface
Johnsburg	Johnsburg Post Office	Post Office	Intermix
Johnsburg	North Creek Post Office	Post Office	Interface
Johnsburg	North River Post Office	Post Office	Interface
Johnsburg	Wevertown Post Office	Post Office	Intermix
Johnsburg	Johnsburg Library	Library	Interface
Johnsburg	Tannery Pond Community Center	Municipal Government	Interface
Johnsburg	North Creek Fire Station	Fire/EMS	Intermix
Johnsburg	Johnsburg EMS	Fire/EMS	Intermix
Johnsburg	North River Fire Station	Fire/EMS	Intermix
Lake George	Lake George Fire Station	Fire/EMS	Interface
Lake George	Lake George Emergency Squad	Fire/EMS	Interface
Lake George	Lake George Elementary School	School	Intermix
Lake George	Lake George Junior/Senior High School	School	Interface
Lake George	Lake George Senior Citizens Club	Senior Facility	Intermix
Lake George	Lake George Water Filtration Plant	Water Facility	Interface
Lake George	Diamond Point Water	Water Facility	Intermix
Lake George	Lake George Town Hall	Town Hall	Interface
Lake George	Diamond Point Post Office	Post Office	Intermix
Lake George	Lake George Post Office	Post Office	Interface
Lake George	Caldwell Lake George Free Library	Library	Interface
Lake George	Hillview Free Library	Library	Intermix
Lake George	Lake George Village Highway Department	Village Highway Garage	Interface
Lake George	Lake George Highway Department	Town Highway Garage	Interface
Municipality	Facility Name	Facility Type	Wildfire
Lake George	Lake George Village Hall	Village Hall	Interface
Lake Luzerne	Luzerne-Hadley Fire Station	Fire/EMS	Interface



Section 5.4.7: Risk Assessment – Wildfire

Municipality	Facility Name	Facility Type	Wildfire
Lake Luzerne	Hadley Luzerne Senior High	School	Interface
Lake Luzerne	Hadley Luzerne Elementary School	School	Interface
Lake Luzerne	Stuart M. Townsend Middle School	School	Intermix
Lake Luzerne	Tri-Town Senior Citizens Club	Senior Facility	Intermix
Lake Luzerne	Lake Luzerne Water Plant	Water Facility	Intermix
Lake Luzerne	Lake Luzerne Town Hall	Town Hall	Intermix
Lake Luzerne	Hadley-Luzerne Public Library	Library	Interface
Lake Luzerne	Lake Luzerne Post Office	Post Office	Interface
Queensbury	North Queensbury Fire Station	Fire/EMS	Intermix
Queensbury	North Queensbury Rescue Squad	Fire/EMS	Intermix
Queensbury	Adirondack Urgent Care	Health Care	Interface
Queensbury	West Mountain Primary Care - Queensbury (HHN)	Health Care	Interface
Queensbury	Queensbury Family Health Center (HHN)	Health Care	Interface
Queensbury	Queensbury Central Fire Station	Fire/EMS	Interface
Queensbury	Queensbury Central Fire Station #2	Fire/EMS	Interface
Queensbury	West Glens Falls Fire Station #2	Fire/EMS	Interface
Queensbury	West Glens Falls Fire Station	Fire/EMS	Interface
Queensbury	West Glens Falls Emergency Squad	Fire/EMS	Intermix
Queensbury	Bay Ridge Rescue Squad	Fire/EMS	Intermix
Queensbury	New York State Police	Police Station	Interface
Queensbury	Warren County Sheriff's Dept	Police Station	Intermix
Queensbury	Queensbury High School	School	Interface
Queensbury	Queensbury Middle School	School	Interface
Queensbury	Queensbury Elementary School	School	Interface
Queensbury	Queensbury 4-5 School	School	Interface
Queensbury	Prospect School	School	Intermix
Queensbury	Solomon Heights	Senior Facility	Interface
Queensbury	Cedars Senior Living Community	Senior Facility	Intermix
Queensbury	Adirondack Manor Home For The Elderly	Senior Facility	Interface
Queensbury	The Landings Of Queensbury	Senior Facility	Interface
Queensbury	Queensbury Water Plant	Water Facility	Intermix
Queensbury	Shore Colony Water Plant	Water Facility	Intermix
Queensbury	Weeks Rd pump station	Water Facility	Interface
Queensbury	Queensbury Town Hall	Town Hall	Interface
Queensbury	Cleverdale Post Office	Post Office	Interface
Municipality	Facility Name	Facility Type	Wildfire
Queensbury	Army/Air Force Recruitment Office	Federal Government	Interface
Queensbury	Queensbury Post Office	Post Office	Interface



Municipality	Facility Name	Facility Type	Wildfire
Queensbury	One Stop Career Center	County Government	Interface
Queensbury	NYS OEM	State Government	Interface
Queensbury	Pine View Cemetery	Cemetery	Interface
Queensbury	Queensbury Highway Garage	Town Highway Garage	Interface
Stony Creek	Stony Creek Fire Station	Fire/EMS	Intermix
Stony Creek	Stony Creek 50+ Citizens Club	Senior Facility	Intermix
Stony Creek	Stony Creek Town Hall	Town Hall	Intermix
Stony Creek	Stony Creek Post Office	Post Office	Intermix
Stony Creek	Stony Creek Free Library	Library	Intermix
Stony Creek	Stony Creek Highway Garage	Town Highway Garage	Intermix
Thurman	Athol Post Office	Post Office	Intermix
Warrensburg	Hudson Headwaters Health Network - Warrensburg	Health Care	Interface
Warrensburg	Warrensburg Fire Station	Fire/EMS	Interface
Warrensburg	Warrensburg Emergency Squad	Fire/EMS	Interface
Warrensburg	New York State Police	Police Station	Intermix
Warrensburg	Warrensburg Central School	School	Interface
Warrensburg	Warrensburg High School	School	Intermix
Warrensburg	Austin Perry Corners	Senior Facility	Interface
Warrensburg	Countryside Adult Home	Senior Facility	Intermix
Warrensburg	50 Plus Club Of Warrensburg	Senior Facility	Interface
Warrensburg	Warrensburg Water Plant	Water Facility	Intermix
Warrensburg	Warrensburg Town Hall	Town Hall	Interface
Warrensburg	Richards Library	Library	Interface
Warrensburg	Warrensburg Post Office	Post Office	Intermix
Warrensburg	Warren County DPW	County Government	Intermix
Warrensburg	Cornell Cooperative Extension	County Government	Intermix
Warrensburg	Warren County Soil and Water	County Government	Intermix
Warrensburg	NYS DOT	State Government	Interface
Warrensburg	Warrensburg Highway Garage	Town Highway Garage	Interface

Sources: Warren County, NYGIS; Radeloff et al. 2005

Impact on Economy

Wildfire events can have major economic impacts on a community from the initial loss of structures and the subsequent loss of revenue from destroyed business and decrease in tourism. Wildfires can cost thousands of taxpayer dollars to suppress and control and involve hundreds of operating hours on fire apparatus and thousands of volunteer man hours from the volunteer firefighters. There are also many direct and indirect costs to local businesses that excuse volunteers from working to fight these fires.



Future Growth and Development

Areas targeted for potential future growth and development in the next five years have been identified across Warren County at the municipal level. Refer to the jurisdictional annexes in Volume II of this HMP. It is anticipated that any new development and new residents in the WUI areas will be exposed to the wildfire hazard.

Effect of Climate Change on Vulnerability

According to the U.S. Fire Service (USFS), climate change will likely alter the atmospheric patterns that affect fire weather. Changes in fire patterns will, in turn, impact carbon cycling, forest structure, and species composition. Climate change associated with elevated greenhouse gas concentrations may create an atmospheric and fuel environment that is more conducive to large, severe fires (USFS, 2011). Under a changing climate, wildfires are expected to increase by 50% across the U.S. (USFS, 2013).

Fire interacts with climate and vegetation (fuel) in predictable ways. Understanding the climate/fire/vegetation interactions is essential for addressing issues associated with climate change that include:

- Effects on regional circulation and other atmospheric patterns that affect fire weather
- Effects of changing fire regimes on the carbon cycle, forest structure, and species composition, and
- Complications from land use change, invasive species and an increasing wildland-urban interface (USFS, 2011).

It is projected that higher summer temperatures will likely increase the high fire risk by 10 to 30-percent. Fire occurrence and/or area burned could increase across the U.S. due to the increase of lightning activity, the frequency of surface pressure and associated circulation patterns conducive to surface drying, and fire-weather conditions, in general, which is conducive to severe wildfires. Warmer temperatures will also increase the effects of drought and increase the number of days each year with flammable fuels and extending fire seasons and areas burned (USFS, 2011).

Future changes in fire frequency and severity are difficult to predict. Global and regional climate changes associated with elevated greenhouse gas concentrations could alter large weather patterns, thereby affecting fire-weather conducive to extreme fire behavior (USFS, 2011).

Change of Vulnerability

A wildfire exposure analysis was not conducted as part of the 2011 HMP risk assessment. The updated vulnerability assessment provides a more current exposure analysis for the County.

Additional Data and Next Steps

As the custom building inventory is updated additional building attributes regarding the construction of structures, such as roofing material, fire detection equipment, structure age, etc. may be incorporated as available. As stated earlier, buildings constructed of wood or vinyl siding are generally more likely to be impacted by the fire hazard than buildings constructed of brick or concrete. The proximity of these building types to the fuel hazard areas should be identified for further evaluation. Development and availability of such data would permit a more detailed estimate of potential vulnerabilities, including loss of life and potential structural damages.



5.4.8 Cyber Security

This section provides a profile and vulnerability assessment for the cyber security hazard.

5.4.8.1 Hazard Profile

This section provides profile information including description, extent, location, previous occurrences and losses and the probability of future occurrences.

Description

A cyber-attack is a crime both intentional and malicious in nature. It compromises the digital infrastructure of a person or organization, often for financial or terror-related reasons. Such attacks vary in nature and are perpetrated using digital mediums or sometimes social engineering to target human operators. Generally, attacks last minutes to days, but large-scale events and their impacts can last much longer (NYS HMP 2014). Some common types of cyber security threats include:

- Phishing and Spear Phishing are high-tech scams that use email to deceive a person into disclosing personal information. It puts that personal information at risk. Spear phishing is a type of targeted phishing that appears to be directed towards a specific individual or group of individuals.
- Malicious code is software that does damage and/or creates unwanted behaviors. This includes: viruses, Trojan horses, worms, keyloggers, spyware, rootkits, and backdoors.
- Weak and default password usage creates easily exploitable system vulnerabilities.
- Unpatched or outdated software vulnerabilities and opportunities for adversaries to access information systems.
- Removable media is any type of storage device that can be added to and removed from a computer while the system is running. Adversaries may use removable media to gain access to an individual's computer. Examples of removal media include: thumb drives, flash drives, CDs, DVDs, and external hard drives (U.S. Department of Defense Center for Development of Security Excellence 2016).

Cyber-attacks differ by motive, attack type and vector, and perpetrator profile. Motives for cyber-attacks can vary, ranging from the pursuit of financial gain to political or social aims. Types of threats include viruses erasing entire systems, intruders breaking into systems and altering files, intruders using someone's personal computer to attack others, or intruders stealing confidential information. The spectrum of cyber risks is limitless, with threats having a wide-range of effects on the individual, community, organizational, and national threat (FEMA 2013). These risks include:

- Organized cybercrime, state-sponsored hackers, and cyber espionage.
- Transportation, power, and other service disruptions from large scale cyber incidents.

Extent

The extent, nature, and timing of cyber incidents are impossible to predict and there may or may not be any warning. Some cyber incidents take a long time (weeks, months or even years) to be discovered and identified (FEMA 2013). The magnitude of severity of an incident will vary greatly based on the extent and duration of the impact. The extent will also vary based upon which specific system is affected by an attack, the warning time, and the ability to preempt an attack.

Currently, there is not an official scale or index used to measure the severity of a cyber-attack. However, the Gibson Index is a ranking system for the relative severity of cyber-attacks. It ranges from 0 to 7, with 7 being



the most severe class of attack (resulting in multiple intentional deaths and/or extreme financial/economic damage).

Table 5.4.8-1. Gibson Index

Gibson Level	Description
0	Causes little or no disruption/damage, or is the result of a mitigating circumstance
1	Some small real-world consequences, but can often have non-malicious explanations; typically, such an event would only target one website or computer network
2	Has a clear malicious intent and can result in longer outages, more significant privacy issues
3	Minor financial damages and moderate privacy implications, generally stemming from a partial penetration of systems
4	Major financial damages or privacy implications. Well-defended systems breached by vulnerability, with a clear intention of theft or destruction
5	Systematic, coordinated, broad penetration of a multitude of networks, likely perpetrated by a well-funded large team or nation-state
6	Remain mostly theoretical. They consist of attacks that manifest themselves in real-world, targeted, intentional damage
7	would result in mass casualties from intentional, targeted efforts

Source: Gibson Index 2016

Location

Cyber threats to Warren County’s critical infrastructures can be posed by anyone with the capability, technology, opportunity, and intent to do harm. Potential threats can be foreign or domestic, internal or external, State-sponsored or a single rogue element. Terrorists, insiders, disgruntled employees, and hackers are included in this profile.

Previous Occurrences and Losses

To date, there have been no major cyber security breaches to Warren County. There have been significant incidents in New York State and the United States. Some of which may have directly or indirectly impacted those living and working within Warren County.

Phishing emails, viruses, Trojans, ransom-ware and all other forms of malicious software are a form of cyber-attack that should not be discredited. While Warren County has been able to protect against the worst impacts of cyber security threats, Warren County has been attacked and these attacks are ever present. To maintain a record of successful prevention and mitigation requires an on-going and consistent vigilance. Successful cyber security is a partnership between management, IT and an educated and compliant workforce.

Probability of Future Events

Cyber threats and attacks are often difficult to identify and can include a range of dangers that include: viruses erasing entire systems, intruders breaking into systems and altering files, intruders using one computer or device to attack others, or intruders stealing confidential information. According to FEMA, the spectrum of cyber risks is limitless and threats can have a wide-range of effects on an individual, community, organizational, and national level (FEMA 2016).

Since 2006, there have been approximately 188 significant cyber incidents impacting government agencies, defense and high tech companies throughout the world. Of those 188 events, 71 of them occurred within the United States (Center for Strategic & International Studies 2015). These numbers do not include all incidents that have occurred in the United States. There are millions of incidents each year in the United States alone; however, a majority of these cyber-attacks are other computer security incidents, primarily spyware, adware,





phishing and spoofing (U.S. Department of Justice 2008). Based on the number of previous occurrences throughout the United States, cyber-attacks will continue to occur on an annual basis. With the extent of cyber-attacks throughout recent history, Warren County and its businesses and residents will be subject to on-going attacks.

In Section 5.3, the identified hazards of concern for Warren County were ranked. The probability of occurrence, or likelihood of the event, is one parameter used for hazard rankings. Based on historical records and input from the Planning Committee, the probability of occurrence for cyber security breaches in the County is considered ‘frequent’ (likely to occur within 25 years, as presented in Table 5.3-3).



5.4.8.2 Vulnerability Assessment

To understand risk, a community must evaluate what assets are exposed or vulnerable in the identified hazard area. For the cyber security hazard, all of Warren County is exposed to this hazard. Therefore, all assets in the County (population, structures, critical facilities and lifelines), as described in the County Profile (Section 4), are exposed and potentially vulnerable to a cyber security breach. The following text evaluates and estimates the potential impact of the cyber security hazard on the County including:

- Overview of vulnerability
- Data and methodology used for the evaluation
- Impact on: (1) life, health and safety of residents, (2) general building stock, (3) critical facilities, (4) economy, and (5) future growth and development
- Effect of climate change on vulnerability
- Further data collections that will assist understanding this hazard over time

Overview of Vulnerability

The entire County is vulnerable to a cyber security breach. Because it is difficult to predict the particular target of cyber terrorism, assessing vulnerability to the hazard is also difficult. All populations who directly use a computer or those receiving services from automated systems are vulnerable to cyber terrorism. Although all individuals in Warren County are vulnerable to an attack, certain types of attacks would impact specific segments of the population.

If the cyber-attack targeted the State's power or utility grid, individuals with medical needs would be impacted the greatest. These populations are most vulnerable because many of the life-saving systems they rely on require power. Also, if an attack occurred during months of extreme hot or cold weather, the County's elderly population (those 65 years of age and older) would be vulnerable to the effects of the lack of climate control. These individuals would require shelter or admission to a hospital. Other populations vulnerable to the secondary effects of cyber terrorism are young children.

If a cyber-attack targeted a facility storing or manufacturing hazardous materials, individuals living adjacent to these facilities would be vulnerable to the secondary effects, should the attack successfully cause a critical failure at that facility.

Data and Methodology

For this hazard, data was obtained from Warren County and the Planning Committee.

Impact on Life, Health and Safety

Any individual in the County could be a victim of a cyber security breach. If the attack targets infrastructure (such as the power grid) or individual life support systems in a healthcare facility, the effects of a cyber-attack on life, health, and safety could be dire. Likewise, if a cyber security breach affects the emergency response system, such as by rendering the 911 system or the radio network inoperable, emergency services in the County could be hindered, which may result in increased injury or loss of life during emergency situations.

Impact on General Building Stock and Critical Facilities

A cyber security breach may affect structures if any critical electronic systems suffer service disruption. For instance, a cyber-attack may cripple the electronic system that controls a cooling system or pressure system within critical infrastructure. This may result in physical damage to the structure from components overheating, or an explosion if pressure relief systems are rendered inoperable.



Impact on Economy

Economic impacts of cyber-attacks could be severe, depending on the nature of the attack itself. Even simple malware that slows the performance of individual computers could result in lost business productivity. Any prolonged period of down time could significantly affect a business’s financial performance. Retailers and financial institutions may be targeted to steal personal information so that the attacks’ perpetrators can steal money from their victims, such as by opening credit cards with the stolen information.

Future Growth and Development

As discussed in Sections 4 and 9, areas targeted for future growth and development have been identified across Warren County. Any areas of growth could be potentially impacted by the cyber-attack hazard because the entire County is exposed and vulnerable. Please refer to the specific areas of development indicated in tabular form and/or on the hazard maps included in the jurisdictional annexes in Volume II, Section 9 of this plan.

Additional Data and Next Steps

For the Plan Update, any additional information regarding localized concerns and past impacts will be collected and analyzed. This data will be developed to support future revisions to the plan. Mitigation efforts could include building on existing New York State, Warren County, and local efforts. The Warren County Information Technology Department will continue to protect the County’s network from viruses, hacking and other abuse by implementing and maintaining appropriate firewalls and security software. They will continue to install, administer, maintain and troubleshoot the County’s computer network and servers to keep the County “up and running” (Warren County Information Technology 2016).



5.4.9 Disease Outbreak

The following section provides the hazard profile (hazard description, location, extent, previous occurrences and losses, probability of future occurrences, and impact of climate change) and vulnerability assessment for the disease outbreak hazard in Warren County.

5.4.9.1 Profile

Hazard Description

An outbreak or an epidemic exists when there are more cases of a particular disease than expected in a given area, or among a specific group of people, over a particular period of time. An aggregation of cases in a given area over a particular period, regardless of the number of the number of cases, is called a cluster. In an outbreak or epidemic, it is presumed that the cases are related to one another or that they have a common cause (Center for Disease Control [CDC] 2004). There are other diseases that impact Warren County which includes foodborne illness, vaccine-preventable disease, and vector-borne diseases (tick-borne and mosquito-borne). However, for the disease outbreak profile, the County identified influenza, the Zika virus and the Ebola virus as the main diseases that may lead to a pandemic outbreak.

Influenza

The risk of a global influenza pandemic has increased over the last several years. This disease is capable of claiming thousands of lives and adversely affecting critical infrastructure and key resources. An influenza pandemic has the ability to reduce the health, safety, and welfare of the essential services workforce; immobilize core infrastructure; and induce fiscal instability.

Pandemic influenza is different from seasonal influenza (or "the flu") because outbreaks of seasonal flu are caused by viruses that are already among people. Pandemic influenza is caused by an influenza virus that is new to people and is likely to affect many more people than seasonal influenza. In addition, seasonal flu occurs every year, usually during the winter season, while the timing of an influenza pandemic is difficult to predict. Pandemic influenza is likely to affect more people than the seasonal flu, including young adults. A severe pandemic could change daily life for a time, including limitations on travel and public gatherings (Barry-Eaton District Health Department 2013).

At the national level, the CDC's Influenza Division has a long history of supporting the World Health Organization (WHO) and its global network of National Influenza Centers (NIC). With limited resources, most international assistance provided in the early years was through hands-on laboratory training of in-country staff, the annual provision of WHO reagent kits (produced and distributed by CDC), and technical consultations for vaccine strain selections. The Influenza Division also conducts epidemiologic research including vaccine studies and serologic assays and provided international outbreak investigation assistance (CDC 2011).

Ebola Virus

Ebola, previously known as Ebola hemorrhagic fever, is a rare and deadly disease caused by infection with one of the Ebola virus strains. According to the CDC, the 2014 Ebola epidemic is the largest in history affecting multiple countries in West Africa. Two imported cases, including one death, and two locally-acquired cases in healthcare workers have been reported in the United States. CDC and partners are taking precautions to prevent the further spread of Ebola in the United States (CDC, 2014).



Zika Virus

Zika is a flavivirus related to dengue, West Nile, yellow fever and Japanese encephalitis. It was first isolated in 1947 from a Rhesus monkey in the Zika region of Uganda and in 1968 from a human in Nigeria. Since that time, serologic evidence of human infections has been reported in several countries in tropical Africa and parts of Southeast Asia. In addition, Zika virus has been implicated as the cause of three mosquito-borne disease outbreaks outside of Africa and Asia, including Micronesia in 2007, French Polynesia in 2013, and the current outbreak in the Americas, which was first identified in May 2015 (New York State Department of Health [NYS DOH] 2016).

Infection with Zika virus is usually mild. About one in five people develop symptoms; hospitalization is rare. If someone is going to have symptoms, they usually start between two and seven days following the bite of an infected mosquito. Additionally, there have been reports of the virus impacting women who are pregnant and their child. In Brazil and other countries, there have been reports of microcephaly in babies of mothers who were infected with Zika virus while pregnant. While more studies are needed to learn more about the risks of Zika virus infection during pregnancy, public health authorities are recommending that pregnant women, women actively trying to become pregnant, or women of child-bearing age take special precautions to reduce their risk of exposure to Zika virus (NYS DOH 2016).

Location

Due to the geographic location and demographic characteristics of Warren County, make it vulnerable to importation and spread of infectious diseases. Additionally, the County is a tourist destination all year long, leading to people from all over coming into contact with each other and making the County more susceptible to the spread of diseases. Disease outbreaks pose serious threats to the County and could strain the capacity of hospitals, clinics and other healthcare facilities to respond to those seeking medical attention.

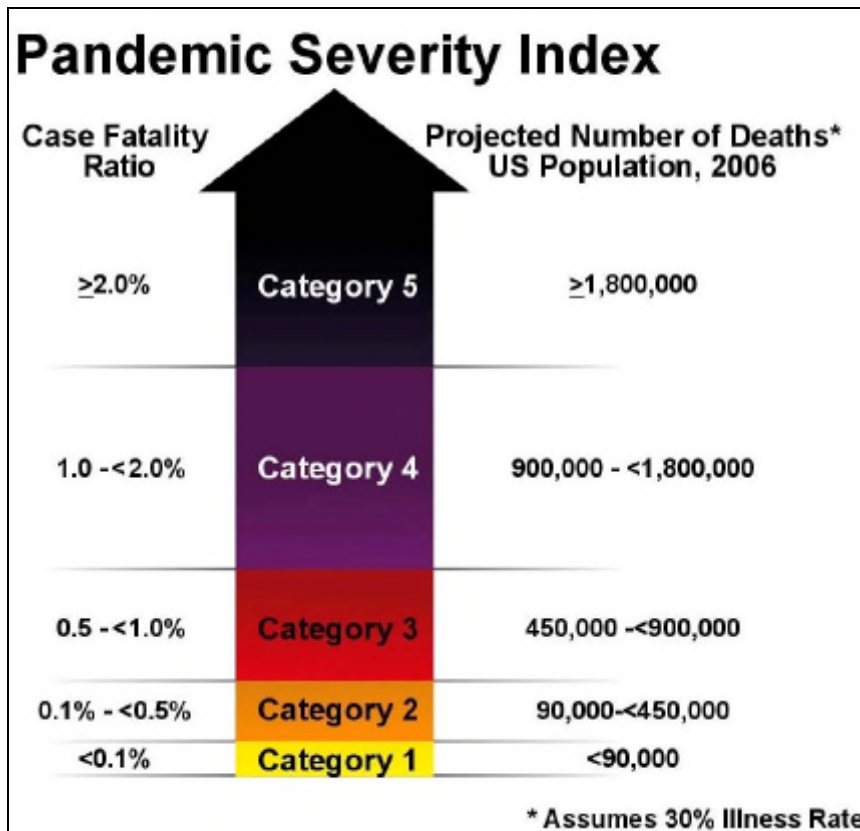
Extent

The exact size and extent of an infected population depends on how easily the illness is spread, the mode of transmission, and the amount of contact between infected and uninfected individuals. The transmission rates of pandemic illnesses are often higher in more densely populated areas. The transmission rate of infectious diseases will depend on the mode of transmission of a given illness. The Ebola virus is spread to others through direct contact; it is not spread through the air like influenza.

The CDC and Prevention Community Strategy for Pandemic Influenza Mitigation guidance introduced a Pandemic Severity Index (PSI), which uses the case fatality ratio as the critical driver for categorizing the severity of a pandemic. The index is designed to estimate the severity of a pandemic on a population to allow better forecasting of the impact of a pandemic, and to enable recommendations on the use of mitigation interventions that are matched to the severity of influenza pandemic. Pandemics are assigned to one of five discrete categories of increasing severity (Category 1 to Category 5) (CDC 2012). Figure 5.4.9-1 illustrates the five categories of the PSI.



Figure 5.4.9-1. Pandemic Severity Index



Source: CDC 2015

There are number of pandemic levels that are identified by the WHO and CDC. Additionally, NYSDOH and State EOC have their own activation levels in response to a pandemic event. Multiple waves of pandemic can be anticipated throughout the life cycle of an event. Refer to <https://www.health.ny.gov/diseases/communicable/influenza/pandemic/> for information regarding the various levels in New York State.

Previous Occurrences and Losses

Between 1954 and 2015, New York State was included in one disease outbreak-related emergency (EM) declaration, classified as a virus threat due to West Nile Virus impacting the State (EM-3155, May – November 2000). Generally, these disasters cover a wide region of the State; therefore, they may have impacted many counties. However, not all counties were included in the disaster declarations. Warren County was included in this declaration (FEMA 2016).

Each year, cases of influenza have been reported in Warren County. As for Ebola and Zika, there have been no reported cases.

Probability of Future Occurrences

Predicting the future occurrences of disease outbreaks is difficult to predict; however, based on the history of occurrences in Warren County, the likelihood of a disease outbreak impacting the County is possible. Additionally, increases in population and population density and increase in tourism numbers in the County have the potential to increase exposure and susceptibility of its residents to outbreaks.



In Section 5.3, the identified hazards of concern for Warren County were ranked. The probability of occurrence, or likelihood of the event, is one parameter used for hazard rankings. Based on historical records and input from the Planning Committee, the probability of occurrence for disease outbreaks in the County is considered ‘frequent’ (likely to occur within 25 years, as presented in Table 5.3-3).

Climate Change Impacts

Climate change is beginning to affect both people and resources in New York State, and these impacts are projected to continue growing. Impacts related to increasing temperatures and sea level rise are already being felt in the State. ClimAID: the Integrated Assessment for Effective Climate Change in New York State (ClimAID) was undertaken to provide decision-makers with information on the State’s vulnerability to climate change and to facilitate the development of adaptation strategies informed by both local experience and scientific knowledge (New York State Energy Research and Development Authority [NYSERDA] 2011).

Each region in New York State, as defined by ClimAID, has attributes that will be affected by climate change. Warren County is part of Region 7, Adirondack Mountains. Some of the issues in this region, affected by climate change, include: loss of high elevation plants, animals and ecosystem types; decline in winter recreation; decline in milk production, etc. (NYSERDA 2011).

Temperatures in New York State are warming, with an average rate of warming over the past century of 0.25° F per decade. Average annual temperatures are projected to increase across New York State by 2° F to 3.4° F by the 2020s, 4.1° F to 6.8° F by the 2050s, and 5.3° F to 10.1° F by the 2080s. By the end of the century, the greatest warming is projected to be in the northern section of the State (NYSERDA 2014).

Regional precipitation across New York State is projected to increase by approximately one to eight-percent by the 2020s, three to 12-percent by the 2050s, and four to 15-percent by the 2080s. The results for future time periods are compared to the model results for the baseline period (1971 to 2000). By the end of the century, the greatest increases in precipitation are projected to be in the northern areas of the State (NYSERDA 2014).

In Region 7, it is estimated that temperatures will increase by 3.7°F to 7.4°F by the 2050s and 4.2°F to 11.8°F by the 2080s (baseline of 39.9°F). Precipitation totals will increase between 2 and 15% by the 2050s and 3 to 17% by the 2080s (baseline of 40.8 inches). While annual precipitation and temperature projections are more certain than seasonal results, much of this additional precipitation is expected to occur during the winter months, which may result in greater annual snowfall in Warren County.

An increase in temperature and humidity may also lead to a larger number of influenza outbreaks. Studies have shown that warmer winters led to an increase in influenza cases. During warm winters, fewer people contract influenza which causes a large number in population to remain vulnerable into the next season. This causes an early and strong occurrence of the virus (Spross 2013).



5.4.9.2 Vulnerability Assessment

To understand risk, a community must evaluate what assets are exposed or vulnerable in the identified hazard area. For disease outbreaks, all of Warren County is considered exposed to the hazard. Therefore, all assets in the County, as described in the County Profile (Section 4), are exposed and potentially vulnerable. The following text evaluates and estimates the potential impact of disease outbreaks on the County including:

- Overview of vulnerability
- Data and methodology used for the evaluation
- Impact on: (1) life, health and safety of residents, (2) general building stock, (3) critical facilities, (4) economy, and (5) future growth and development
- Effect of climate change on vulnerability
- Further data collections that will assist understanding this hazard over time

Overview of Vulnerability

Disease outbreaks are a significant concern to Warren County, mainly due to its impact on public health and natural resources. Estimated losses are difficult to quantify; however, disease outbreaks can impact the County's population and economy. Areas with a higher population density will have a higher exposure to disease outbreaks, especially those populations living in areas prone to mosquitoes and ticks. Additionally, vulnerable populations such as the young and elderly are considered at higher risk.

Data and Methodology

Due to a lack of quantifiable loss information, a qualitative assessment was conducted to evaluate the assets exposed to this hazard and the potential impacts associated with this hazard.

Impact on Life, Health and Safety

The entire population of Warren County is vulnerable to the disease outbreak hazard. Healthcare providers and first responders have an increased risk of exposure due to their frequent contact with infected populations.

Impact on General Building Stock and Critical Facilities

No structures are anticipated to be directly affected by disease outbreaks.

Impact on Economy

The impact disease outbreaks have on the economy and estimated dollar losses are difficult to measure and quantify. Costs associated with the activities and programs implemented to conduct surveillance and address disease outbreaks have not been quantified in available documentation. Instead, activities and programs implemented by the County to address this hazard are described below, all of which could impact the local economy.

Effect of Climate Change on Vulnerability

The relationship between climate change and infectious diseases is somewhat controversial. The notion that rising temperatures will increase the number of mosquitoes that can transmit diseases among humans (rather than just shift their range) has been the subject of debate over the past decade. Some believe that climate change may affect the spread of disease, while others are not convinced. However, many



researchers point out that climate is not the only force at work in increasing the spread of infectious diseases into the future. Other factors, such as expanded rapid travel and evolution of resistance to medical treatments, are already changing the ways pathogens infect people, plants, and animals. Climate change accelerates may likely to work synergistically with many of these factors, especially in populations increasingly subject to massive migration and malnutrition (Harmon 2010).

Impact of Future Growth and Development

As discussed in Section 4, areas targeted for future growth and development have been identified across the County. Any areas of growth could be potentially impacted by the disease outbreak hazard because the entire planning area is exposed and vulnerable.

Additional Data and Next Steps

For the Plan Update, any additional information regarding historic costs incurred to conduct surveillance, prevent, treat and eradicate disease outbreaks may help with quantifying losses, given a margin of uncertainty. This data will be developed to support future revisions to the plan. Mitigation efforts could include building on existing New York State, Warren County, and local efforts.



5.4.10 Hazardous Materials Release

The following section provides the hazard profile (hazard description, location, extent, previous occurrences and losses, probability of future occurrences, and impact of climate change) and vulnerability assessment for the hazardous materials hazard in Warren County.

5.4.10.1 Profile

Hazard Description

Hazardous materials are substances that are considered severely harmful to human health and the environment, as defined by the United States Environmental Protection Agency (USEPA) Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (Superfund Law). Many are commonly used substances which are harmless in their normal uses, but are quite dangerous if released. The Superfund law designates more than 800 substances as hazardous and identifies many more as potentially hazardous due to their characteristics and the circumstances of their release (USEPA 2013). Superfund's definition of a hazardous substance includes the following:

- Any element, compound, mixture, solution, or substance designated as hazardous under section 102 of CERCLA.
- Any hazardous substance designated under section 311(b)(2)(a) of the Clean Water Act (CWA), or any toxic pollutant listed under section 307(a) of the CWA. There are over 400 substances designated as either hazardous or toxic under the CWA.
- Any hazardous waste having the characteristics identified or listed under section 3001 of the Resource Conservation and Recovery Act.
- Any hazardous air pollutant listed under section 112 of the Clean Air Act, as amended. There are over 200 substances listed as hazardous air pollutants under the Clean Air Act (CAA).
- Any imminently hazardous chemical substance or mixture which the EPA Administrator has "taken action under" section 7 of the Toxic Substances Control Act (USEPA 2015).

If released or misused, hazardous substances can cause death, serious injury, long-lasting health effects, and damage to structures and other properties, as well as the environment. Many products containing hazardous substances are used and stored in homes and these products are shipped daily on highways, railroads, waterways, and pipelines.

Transportation of hazardous substances on highways involves tanker trucks or trailers, which are responsible for the greatest number of hazard substance release incidents. The highway system in Warren County comprises over 1,248 miles of roads maintained by New York Department of Transportation (NYSDOT), the County and its towns and villages (NYSDOT 2015). Some of these roads are used to transport hazardous substances; if an incident were to occur, the surrounding areas may be impacted.

Warren County's hazardous materials response capabilities include the expertise of the Warren County HAZMAT Type 3 Team, an industrial HAZMAT Team and the resources of 23 fire departments (capable of DECON), 3 law enforcement agencies and 13 EMS agencies. Further, hazardous materials planning and response activities are supported by private-sector organizations, numerous professional organizations, public safety training programs, the Adirondack Regional HAZMAT Consortium and specialized response teams at the state and federal levels (County Hazardous Materials Response Plan 2015).



Location

A hazardous material incident can occur anywhere in the County. This includes a fixed site that may or may not be subject to the planning requirements of SARA Title III or during transportation. An incident in a neighboring county may also pose a threat to Warren County. Warren County has numerous fixed facilities at the southern end of the County and transportation systems are located throughout the County. Any part of Warren County may be subject to airborne material during a release of a hazardous material (County Hazardous Materials Response Plan 2015). The following provides information regarding the location of hazardous substance incidents.

Hazardous Substances Fixed Site

For the purpose of this plan update, Warren County indicated their main concern for fixed sites were those that filed Tier II forms. In addition to incidents occurring at the fixed sites, impacts of natural hazards on these facilities can cause major incidents with severe secondary impacts on the population and the environment.

Authorized by Title III of the Superfund Amendments and Reauthorization Act (SARA), the Emergency Planning & Community Right-to-Know Act (EPCRA) was enacted by Congress as the national legislation on community safety. This law is designed to help local communities protect public health, safety, and the environment from chemical hazards (USEPA 2015). Under Section 312 of the EPCRA, facilities that use or store a hazardous chemical above a threshold quantity must annually submit their chemical inventory to off-site officials each year (Tier II form). The inventory information must be submitted to the fire department having jurisdiction over the facility, the respective county local emergency planning committee (LEPC), and the state emergency response commission (SERC) (NYSDHSES 2012). In Warren County, for the 2015 reporting year, 38 facilities filed Tier II forms, with a majority of the facilities being located in Glens Falls and Queensbury.



Figure 5.4.10-1. Tier II Facilities in Warren County



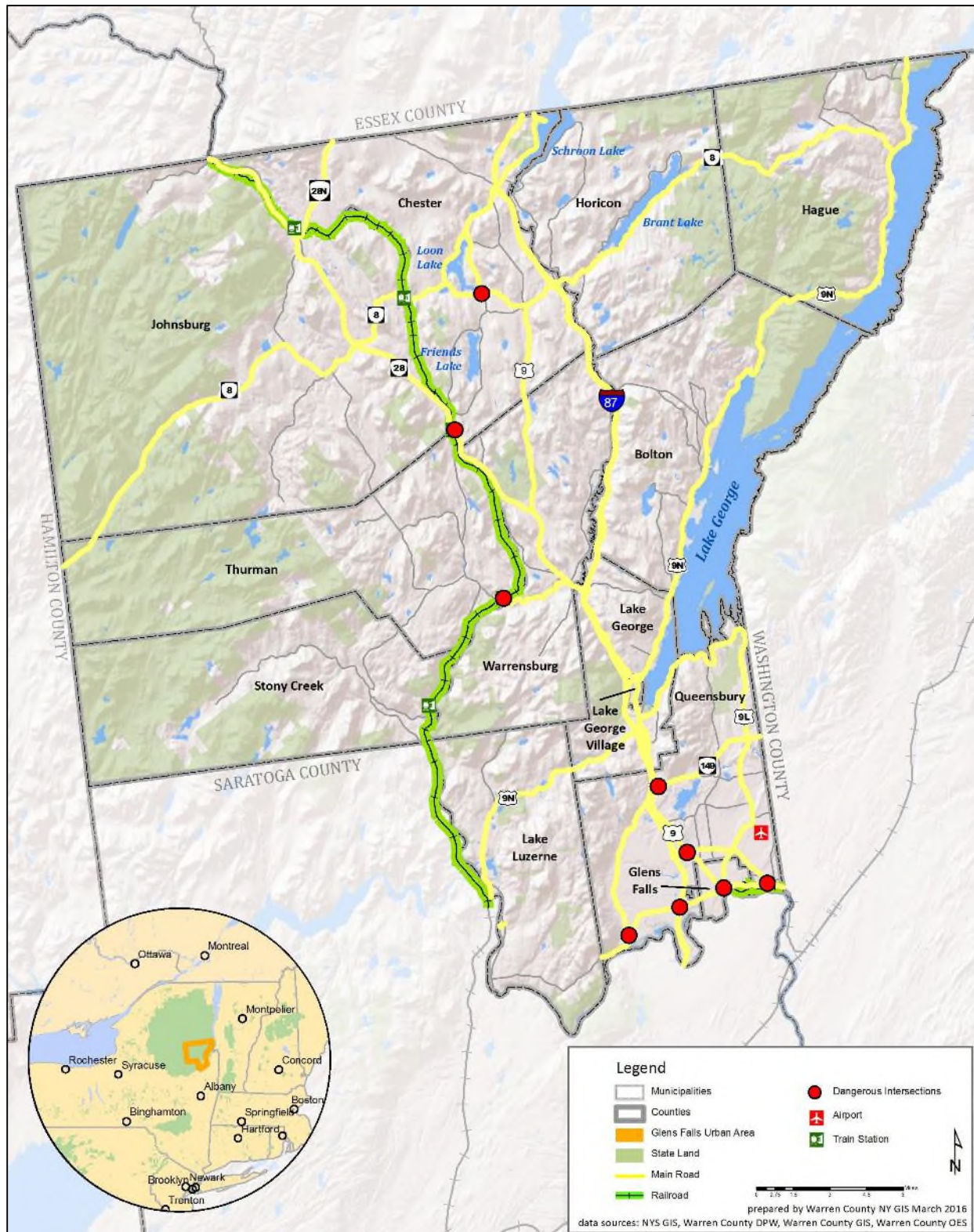


Hazardous Substances In-Transit

Incidents involving hazardous substances in transit can occur anywhere in Warren County. The main concerns in the County include highways (including the New York State Northway), railroads (east-west and north-south), and air (non-towered). These transportation systems are located throughout the County and an incident could occur anywhere. Figure 5.4.10-2 shows the major transportation routes in Warren County.



Figure 5.4.10-2. Major Transportation Routes in Warren County



Source: Warren County GIS 2016





Extent

The extent (or severity) of a hazardous material release relates primarily to its impact on human health and safety and on the threat to the environment. As for hazardous material incidents through transportation, the severity is similar to that of a fixed-site incident. Threat to human health and safety includes: poisoning of water or food sources and/or supply; presence of toxic fumes or explosive conditions; damage to personal property; need for the evacuation of people; and interference with public or commercial transportation. Threats to the environment include: injury or loss of animals or plants or habitats that are of economic or ecological importance such as commercial, recreation, or subsistence fisheries or livestock; impact to recreational areas such as public beaches; and impact to ecological reserves, forests, parks, archaeological and cultural sites.

In Warren County, there is a system used for classifying hazardous material incidents and referred to as levels of magnitude and express the impact of a hazardous materials incident upon the community.

- Level 0 - A hazardous materials incident that is not likely to adversely impact or threaten life, health, property or the environment; where control of the incident is within the capabilities of resources available to the local response jurisdictions.
- Level 1 - A hazardous materials incident that may adversely impact or threaten life, health, property or the environment within an area immediately surrounding the point of release or potential release; where control of the incident is within the capabilities of the resources locally available to responders in Warren County.
- Level 2 - A hazardous materials incident that may adversely impact or threaten life, health, property or the environment beyond the point of release; may be across municipal jurisdictions; where control of the incident is within the capabilities of the resources based within Warren County.
- Level 3 - A hazardous materials incident that adversely impacts or threatens life, health, property or the environment in a large geographic area. Additional resources are required to supplement those available within Warren County (Warren County Hazardous Materials Response Plan 2015).

Previous Occurrences and Losses

Many sources were researched to identify hazardous materials incidents that have occurred in Warren County. However, not all events that occurred in the County were identified due to the extent of documentation and the fact that not all sources were readily available and researched. Loss and impact information could vary depending on the source. Therefore, the accuracy of monetary figures discussed is based only on the available information identified during research for this HMP Update.

Between 1954 and 2016, New York State has been included in two FEMA emergency (EM) declarations related to chemical waste. Warren County was not included in either declaration. For this 2016 Plan Update, known hazardous materials incidents that have impacted Warren County between 2007 and 2015 are identified in Table 5.4.10-1. According to the NYSDEC Spill Incident Database, between 2007 and 2015, there have been 1,149 spill incidents reported to the NYSDEC. These incidents include records of chemical and petroleum spills. Due to the extent of events, these were not included in the table below. For additional information regarding these events, refer to: <http://www.dec.ny.gov/cfmx/extapps/dereexternal/index.cfm?pageid=2>



Table 5.4.10-1. Hazardous Materials Incidents in Warren County, 2007 to 2015

Dates of Event	Event Type	FEMA Declaration Number (if applicable)	County Designated?	Losses / Impacts
April 3, 2007	Hazardous Materials Incident	N/A	N/A	Warren County responded to an incident in Hudson Falls (Washington County). According to the County, the spill was a pesticide and there were no injuries or fatalities associated with this event.
August 5, 2008	Hazardous Materials Incident	N/A	N/A	There was a chemical spill in the parking lot of the Town of Chester municipal building and resulted in a massive response from local emergency personnel. Two five-gallon contains of zinc phosphate were spilled in the parking lot as they were being delivered to the town by a tractor trailer. The chemical was going to be used in the Pottersville Water District to prevent copper pipes from corroding. The Spill Response Team of the state Department of Environmental Conservation, state Health Department officials, the North Warren Emergency Squad and other fire companies also responded to wash away the chemical and clean up the spill. Emergency personnel remained at the scene for over four hours. There were no injuries or fatalities associated with this event.
November 11, 2008	Chemical Spill	N/A	N/A	In Glens Falls, a large refrigeration unit was brought to the Geer Street junkyard and it was not drained properly. When two employees of the junkyard began to dismantle the unit, they were sprayed with sulfur dioxide and hospitalized.
December 7, 2008	Chemical Spill	N/A	N/A	Route 17 and Route 17M in Chester, near exit 127, were closed when a tanker truck carrying muriatic acid began to leak. The leak began after the axel of the truck began to burn and resulted in a chemical leakage. Residents in the area of the spill were evacuated and a full hazmat condition was declared. There were no injuries or fatalities associated with this event.

Sources: North American Hazmat Situations and Deployments Map 2016; Input from Warren County Planning Committee



Probability of Future Occurrences

Predicting future hazardous substance incidents in Warren County is difficult. They can occur at anytime and anywhere in the County. Incidents can be sudden without any warning or slowly develop. Small spills, both fixed site and in-transit, occur throughout the year and the probability for these events are high. The risk of major incidents in a given year is rare. It is estimated that the County will continue to experience direct and indirect impacts of hazardous substance incidents annually that may induce secondary hazards such as infrastructure deterioration or failure, water quality and supply concerns, and transportation delays, accidents and inconveniences.

In order to determine the probability of future occurrences of hazardous materials events, data from the NYSDEC Spill Incident Database was used to calculate the recurrence interval and the average annual number of events in Warren County. The table below shows these statistics, as well as the annual average number of events and the estimated percent chance of an incident occurring in a given year (NYSDEC 2016).

Table 5.4.10-2. Probability of Future Occurrence of Hazardous Materials Events, 2007 – 2015

Hazard Type	Number of Occurrences Between 2007 – 2015	Rate of Occurrence	Recurrence Interval (in years)	Probability of event Occurring in Any Given Year	% Chance of Occurring in Any Given Year
Hazardous Materials (chemical and petroleum)	1,149	17.68	0.06	1	100

Source: NYSDEC 2016

In Section 5.3, the identified hazards of concern for Warren County were ranked. The probability of occurrence, or likelihood of the event, is one parameter used for hazard rankings. Based on historical records and input from the Planning Committee, the probability of occurrence for the release of hazardous substances in the County is considered ‘frequent’ (likely to occur within 25 years, as presented in Table 5.3-3).

Climate Change Impacts

Hazardous substance incidents are non-natural incidents; therefore, there are no implications for impacts from climate change.



5.4.10.2 Vulnerability Assessment

To understand risk, a community must evaluate what assets are exposed or vulnerable in the identified hazard area. For the hazardous substances hazard, all of Warren County is exposed to the hazard. Therefore, all assets in the County (population, structures, critical facilities and lifelines), as described in the County Profile (Section 4), are exposed and potentially vulnerable to the release of hazardous substances. The following text evaluates and estimates the potential impact of the hazardous substances hazard on the County including:

- Overview of vulnerability
- Data and methodology used for the evaluation
- Impact on: (1) life, health and safety of residents, (2) general building stock, (3) critical facilities, (4) economy, and (5) future growth and development
- Effect of climate change on vulnerability
- Further data collections that will assist understanding this hazard over time

Overview of Vulnerability

Overall, it is difficult to quantify potential losses of hazardous substances incidents due to the many variables and human elements. Human safety and welfare can become compromised from negative health effects of poisoning or exposure to toxic substances, fires, or explosions.

Data and Methodology

For this hazard, data was obtained from the USEPA and NYSDEC.

Impact on Life, Health and Safety

Depending on the type and quantity of chemicals released and the weather conditions, an incident can affect larger areas that cross jurisdictional boundaries. When hazardous substances are released in the air, water or on land they may contaminate the environment and pose greater danger to human health. The general population may be exposed to a hazardous substances release through inhalation, ingestion, absorption, injection or dermal exposure. Exposure may be either acute or chronic, depending upon the nature of the substance and extent of release and contamination.

Due to the location of these different hazardous substance and waste sites in Warren County, the entire County is considered vulnerable to this hazard. Those particularly vulnerable to the effects of hazardous substances incidents are populations located along major transportation routes because of the quantities of chemicals transported on these major thoroughfares. Potential losses from hazardous substances incidences include human health and life and property resources. These types of incidents can lead to injury, illnesses, and/or death from both the involved persons and those living in the impacted areas.

Impact on General Building Stock

Potential losses to the general building stock caused by a hazardous substances incident is difficult to quantify. The degree of damages to the general building stock depends on the scale of the incident. Potential losses may include inaccessibility, loss of service, contamination and/or potential structural and content losses if an explosion occurs.

Impact on Critical Facilities

Potential losses to critical facilities caused by a hazardous substances incident is also difficult to quantify. Potential losses may include inaccessibility, loss of service, contamination and/or potential structural and content



losses if an explosion occurs. Refer to Section 4 (County Profile) which summarizes the number and type of critical facilities in Warren County.

Impact on Economy

If a significant hazardous substances incident occurred, not only would life, safety, and building stock be at risk, but the economy of Warren County may be impacted as well. A significant incident in an urban area or popular tourist area may force businesses to close for an extended period of time because of contamination or direct damage caused by an explosion, if one occurred. The exact impact on the economy is difficult to determine, given the uncertain nature of the size and scope of incidents.

Hazardous substances incidents have the potential to lead to major transportation route closures in Warren County. The closure of waterways, railroads, airports, and highways as a result of these incidents has the potential to impact the ability to deliver goods and services efficiently. Potential impacts may be local, regional, or statewide, depending on the magnitude of the event and the level of services disruptions.

Future Growth and Development

As discussed in Sections 4 and 9, areas targeted for future growth and development have been identified across Warren County. Any areas of growth could be potentially impacted by hazardous substances incidents because the entire County is exposed and vulnerable. An increase in development and population has the ability to increase the likelihood of a hazardous substance incident. Future migration to larger jurisdictions may also increase the likelihood of an incident. Please refer to the specific areas of development indicated in tabular form and/or on the hazard maps included in the jurisdictional annexes in Volume II, Section 9 of this plan.

Effect of Climate Change on Vulnerability

A hazardous substance incident is a human-caused hazard; therefore, no climate change impacts are associated with the hazard.

Additional Data and Next Steps

For the Plan Update, any additional information regarding localized concerns and past impacts will be collected and analyzed. This data will be developed to support future revisions to the plan. Mitigation efforts could include building on existing New York State, Warren County, and local efforts.



SECTION 6. MITIGATION STRATEGIES

This section presents mitigation actions for Warren County to reduce potential exposure and losses identified as concerns in the Risk Assessment portion of this plan. The Steering 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. Overview of Mitigation Strategy Development
3. Review and Update of Mitigation Goals and Objectives
4. Capability Assessment
5. Review and Update of Mitigation Strategies
6. Mitigation Strategy Prioritization, including Review of Cost-Effectiveness

Hazard mitigation reduces the potential impacts of, and costs associated with, emergency and disaster-related events.

Mitigation actions address a range of impacts, including impacts on the population, property, the economy, and the environment.

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

6.1 Background and Past Mitigation Accomplishments

In accordance with the requirements of the Disaster Mitigation Act of 2000 (refer to Page 1-1 for more detail on DMA 2000), a discussion regarding past mitigation activities and an overview of past efforts is provided as a foundation for understanding the mitigation goals, objectives, and activities outlined in this plan update. 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 June 2011 “Warren County Pre-Disaster Multijurisdictional Hazard Mitigation Plan”. The current planning process represents the regulatory five-year plan update process, which includes participation of all municipal governments in the County, along with 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.
- The County and municipalities have implemented mitigation actions to protect critical facilities and infrastructure throughout the planning area.
 - Dippikill Road Culvert replacement (Town of Thurman)
 - Combs Road Bridge replacement - washed out during the Memorial Day Storm
- Municipalities have actively participated in available mitigation grant funding opportunities to implement mitigation projects, as identified in their jurisdictional annexes in Chapter 9.
- Numerous studies have been conducted by Federal, State, County and local agencies/entities to examine natural hazards affecting Warren County, and have been reviewed and incorporated into this plan update as appropriate (see Section 3 and References).



- Municipalities in Warren County have adopted regulatory standards regarding land-use and zoning that exceed minimum requirements and provide the communities with greater capability to manage development without increasing hazard risk and vulnerability. Examples of these standards are presented in the Capability Assessment subsection later in this chapter.
- The Warren County Soil and Water Conservation District sponsors and instructs on the NYS Post-Food Stream Intervention program for public and municipalities. Other trainings that deal with stormwater management to improve water quality and reduce water quantity are offered as well.
- Warren County was recognized as a National Weather Service (NWS) - National Oceanic and Atmospheric Administration (NOAA) StormReady County in 2015.

6.2 General Mitigation Planning Approach

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

- DMA 2000 regulations, specifically 44 CFR 201.6 (local mitigation planning)
- FEMA “Local Mitigation Planning Handbook”, March 2013
- FEMA Local Mitigation Plan Review Guide, October 1, 2011
- FEMA “Integrating Hazard Mitigation into Local Planning”, March 1, 2013
- FEMA “Plan Integration: Linking Local Planning Efforts”, July 2015
- 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 approach includes the following steps that are further detailed in later subsections of this section:

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

6.3 Review and Update of Mitigation Goals and Objectives

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

6.3.1 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, rather it is broad in scope, and provides a direction for the Plan.



During the original Warren County hazard mitigation planning process, the Mitigation Planning Committee subscribed to the Hazard Mitigation Vision Statement developed by the State Mitigation Summit of 2002 and 2008. As part of the update process, the Steering Committee reviewed the mission statement and elected to maintain it without edit or amendment, as:

To create communities whose daily activities reflect a comprehensive commitment by government, business, non-profit organizations and the public to eliminate or reduce risks and adverse impacts from natural, technological and human-caused hazards.

6.3.2 Goals and Objectives

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

For the purposes of this plan, goals and objectives 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).

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.

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

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

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

During the 2015/16 plan update process, the Steering Committee reviewed the goals and objectives established in the 2011 HMP. The 2011 goals and objectives were reviewed in consideration of the hazard events and losses since the 2011 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 2016 update have been amended, as presented in Table 6-1. Amendments include additions/edits to goals and/or objectives to express the planning partnership’s interests in integrating this plan with other planning mechanisms/programs, and to support mitigation through the protection and preservation of natural systems, including particular reference to certain goals and objectives in the NYS 2014 HMP update as identified in the table below.

Table 6-1. Warren County Hazard Mitigation Plan Goals and Objectives

Goal	Objective
Goal 1: Protect Life and Property.	1.1: Introduce mitigation activities that will make homes, businesses and critical facilities and infrastructure more hazard resistant.
	1.2: In areas vulnerable to hazards, encourage businesses and homeowners to take preventive actions when possible.
	1.3: Periodically review existing building codes, safety procedures, municipal and county ordinances to update recent standards for building protection.
	1.4: Immediately enforce existing building codes within the jurisdiction.



Goal	Objective
	1.5: Encourage owners of home and businesses and renters to purchase appropriate insurance coverage for potential damages from hazards.
<p><u>Goal 2:</u> Increase Public Awareness</p>	2.1: Continue developing and integrating education and outreach programs in an effort to enhance public awareness of the hazards, providing information on specific activities for individuals in anticipation of a hazard event.
	2.2: Provide information on current government programs and funding resources to assist with mitigation.
<p><u>Goal 3:</u> Provide for Emergency Services</p>	3.1: Coordinate hazard mitigation activities with existing local emergency plans.
	3.2: Identify and plan for acquiring any specific emergency services and equipment needed to improve response capabilities for specific hazards.
<p><u>Goal 4:</u> Support comprehensive county and local mitigation through the integration of hazard mitigation planning into related state, regional, county and local plans and programs. (Modified from NYS 2014 HMP – Goal 1 and associated objectives)</p>	4.1: Promote land use planning to encourage resilient and sustainable efforts throughout statewide and regional programs that address zoning, building codes, capital improvement programs, open space preservation, and storm water management regulations.
	4.2: Continue to participate in state, regional and local programs and efforts that focus on practices that support or enhance resiliency.
<p><u>Goal 5:</u> Encourage the development and implementation of long-term, cost-effective, and resilient mitigation projects to preserve or restore the functions of natural systems. (Modified from NYS 2014 HMP – Goal 4 and associated objectives)</p>	4.3: Improve hazard data through participation in studies, research, and mapping to enhance information related to the impacts of hazards and related risks, vulnerability, and losses.
	5.1: Encourage the use of green and natural infrastructure.
	5.2: Provide technical assistance to communities and stakeholders in the application and implementation of mitigation projects that preserve or restore natural systems.
	5.3: Maintain and encourage ongoing relationships between state agencies and partners to play an active and vital role in preservation and restoration of vulnerable natural systems.
	5.4: Promote climate change adaption strategies that protect against long-term effects on the environment.

6.4 Capability Assessment

According to FEMA Mitigation Planning How-To Guide #3, a capability assessment is an inventory of a community’s missions, programs and policies; and an analysis of its capacity to carry them out. This assessment is an integral part of the planning process. The assessment process enables identification, review and analysis



of local and state programs, policies, regulations, funding and practices currently in place that may either facilitate or hinder mitigation.

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

- Limitations that may exist on undertaking actions;
- The range of local and/or state administrative, programmatic, regulatory, financial and technical resources available to assist in implementing their mitigation actions;
- Action is currently outside the scope of capabilities;
- Types of mitigation actions that may be technically, legally (regulatory) administratively, politically or fiscally challenging or infeasible;
- Opportunities to enhance local capabilities to support long term mitigation and risk reduction.

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

County and municipal capabilities in the areas of Planning and Regulatory, Administrative and Technical, and Fiscal may be found in the Capability Assessment section of their jurisdictional annexes in Section 9. Within each annex, participating jurisdictions have identified how they have integrated hazard risk management into their existing planning, regulatory and operational/administrative framework (“integration capabilities”), and how they intend to promote this integration (“integration actions”). A further summary of these continued efforts to develop and promote a comprehensive and holistic approach to hazard risk management and mitigation is presented in Section 7.

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

6.4.1 Planning and Regulatory Capabilities - County and Local

Municipal Land Use Planning and Regulatory Authority

The County and municipalities have various land use planning mechanisms that can be leveraged to mitigate flooding and support natural hazard risk reduction. Specific County and local planning and regulatory capabilities are identified in their jurisdictional annexes in Section 9. The Warren County Department of Planning and Community Development (WCDPCD) and the Warren County Soil and Water Conservation District (WCSWCD) both provide local land use planning support to the municipalities (see Section 6.4.3).

WCDPCD does not have any, or implement any, County-level land use plans. The County Planning Department does fulfil the General Municipal Law 239 review for Sections 239-l and 239-m of the law. The County does not review subdivisions as identified under Section 239-n of the law. With the exception of Thurman and Stony Creek, all municipalities within the County have some form of land use regulations.



National Flood Insurance Program (NFIP)

The U.S. Congress established the NFIP with the passage of the National Flood Insurance Act of 1968 (FEMA's 2002 National Flood Insurance Program (NFIP): Program Description). The NFIP is a Federal program enabling property owners in participating communities to purchase insurance as a protection against flood losses in exchange for State and community floodplain management regulations that reduce future flood damages. Please refer to the Flood Hazard Profile in Section 5.4 for information on recent legislation related to reforms to the NFIP.

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

All municipalities in Warren County actively participate in the NFIP. As of November 30, 2015, there were 259 NFIP policies in Warren County. There have been 121 claims made, totaling approximately \$2.5 million for damages to structures and contents. There is a NFIP Repetitive Loss (RL) property and no 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 Section 5.

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

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

Freeboard: By law, NYS requires Base Flood Elevation plus 2 feet (BFE+2) for all single- and two-family residential construction, and BFE+1 for all other types of construction. Communities may go beyond this requirement, providing for additional freeboard or requiring BFE+2 for all types of construction.

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

NFIP Community Rating System (CRS)

As an additional component of the NFIP, the Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting



from the community actions meeting the three goals of the CRS: (1) reduce flood losses; (2) facilitate accurate insurance rating; and (3) promote the awareness of flood insurance (FEMA, 2012). Municipalities and the county as a whole could expect significant cost savings on premiums if enrolled in the CRS program.

Currently there are no municipalities in Warren County participating in the CRS program.

Local Waterfront Revitalization Program

The Waterfront Revitalization of Coastal Areas and Inland Waterways Act offers local governments the opportunity to participate in the State's Coastal Management Program (CMP) on a voluntary basis by preparing and adopting a Local Waterfront Revitalization Program (LWRP), providing more detailed implementation of the State's CMP through use of such existing broad powers as zoning and site plan review. A number of Warren County communities have LWRPs, as identified within the Capability Assessment section of the municipal annexes (Section 9).

The LWRPs funded for Warren County and local municipalities tend to be more economic development based. Some communities have utilized these funds to update local codes and ordinances. The County is utilizing LWRP funding for wetland restoration at the southern end of the Lake George basin.

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

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

An LWRP follows a step-by-step process by which a community can advance community planning from a vision to implementation, which is described in the Making the Most of Your Waterfront Guidebook developed by the Department of State. Additionally, the Opportunities Waiting to Happen Guidebook, developed by the Department of State, provides help to assist all New Yorkers to redevelop abandoned buildings as part of the overall vision for their community.

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

An approved LWRP reflects community consensus and provides a clear direction for appropriate future development. It establishes a long-term partnership among local government, community-based organizations, and the State. Also, funding to advance preparation, refinement, or implementation of Local Waterfront



Revitalization Programs is available under Title 11 of the New York State Environmental Protection Fund Local Waterfront Revitalization Program (EPF LWRP) among other sources.

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

6.4.2 Planning and Regulatory Capabilities – State and Federal

New York State Floodplain Management

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

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.

6.4.3 Administrative and Technical Capabilities - County and Local

Warren County Soil & Water Conservation District (WC SWCD)

The District's mission is to implement projects and programs to improve and protect the lakes, streams, and other natural resources of Warren County. The SWCD was created in 1956 to develop and carry out a program of soil, water and related natural resource conservation by providing technical assistance and programs to residents, landowners and units of government. Environmental planners and other WCDP staff provide support to the seven-member citizen Board of Directors. The SWCD has developed a program with a distinct urban/suburban conservation orientation and considers a wide range of soil and water resources conservation concerns.

Mitigation related services provided include:

- Technical assistance and site reviews for private and public properties that may include assistance with, but not limited to – erosion and sediment control, habitat improvement, stormwater, forestry, drainage, regulatory permits.



- Water/stormwater management through general assistance and grant programs
- Stream crossing assistance for proper permit requirements
- Agricultural assessments
- Soil survey interpretation and WebSoil survey assistance
- Pond site investigations
- Educational information and outreach on conservation and water quality
- Provide low cost seedlings for the conservation purposes
- Organize and host the Warren County Envirothon
- The District instructs on the NYSDEC 4 Hour Contractor's Training for Erosion and Sediment Control
- The District instructs on the NYS Post-Flood Stream Intervention program
- The SWCD Manager is the current Hazard Mitigation Coordinator and MS4 Stormwater Management officer for Warren County.

The District assists both public and private landowners with identifying and addressing Hazard Mitigation issues through their conservation assistance programs and Hazard Mitigation Coordinator. The District has directly assisted communities with hazard mitigation through grants to reduce soil migration, stream corridor improvements and stormwater runoff reduction. In addition the District has assisted communities through the initial application of Letters of Intent for FEMA grant programs.

The District does not have a specific budget item for hazard mitigation projects. Projects that fall under the hazard mitigation umbrella have been funded from current natural resource grants that have been awarded to the SWCD and which are justifiable expenses from the grant requirements.

Warren County Office of Emergency Services (WC OES)

The Warren County OES manages and administrates a program of quality training for Fire and EMS agencies in accordance with State and Federal guidelines, manages an advanced life support system, maintains a stockpile of emergency supplies and equipment as may be required and oversees a variety of special response teams – who are prepared and equipped to respond to any situation of event

The OES subcontracts with the Glens Fall Fire Department for hazardous material spill response.

Specific emergency management activities includes, but is not limited to:

- Emergency Planning - The OES plans for all large-scale emergencies within the County, such as snowstorms, floods, hurricanes, tornadoes, hazardous material incidents, and public health emergencies.
- Emergency Operations Center Activation – OES is responsible for activation and operation of the County Emergency Operations Center for long-term, large-scale emergencies to manage the emergency through coordination, communication and sharing of resources, all through the National Incident Management System.
- Presidential Disaster Declaration – The OES gathers documentation for submission to federal and state governments for monetary disaster relief.
- Weather Alerts for Schools and Public Officials – The OES relays severe weather alerts to The Queensbury school campus and notifies various county agencies, local governments and private organizations during other watches and warnings. Warren County was recognized as a NOAA StormReady County in 2015.
- Radio Amateur Civil Emergency Services (RACES) – The OES has a robust group of RACES volunteers that regularly meet, train and exercise.



Warren County Department of Planning and Community Development (WCDPCD)

The WCDPCD provides the following services:

General Planning:

- Planning and administrative support services to the Warren County Planning Board for monthly review meetings
- Providing technical services to local planning and zoning boards for matters related to community master plans, zoning ordinances and related land use regulations.
- Design and implementation of planning and economic development initiatives involving multiple county communities.
- Providing planning review and technical support for the Adirondack/Glens Falls Transportation Advisory Council and Policy Committee.

Community Development:

- Proposal development and funding requests for federal and state programs relating to housing, community facilities, and economic development projects and programs.
- Administration and management of home improvement and new home ownership programs that benefit low and moderate income persons.
- Administration and management of programs that improve or develop public facilities within local communities.
- Special project planning and development as identified by the Warren County Board of Supervisors (e.g. Tourist Rail Line Extension and Connection to Saratoga Springs).
- Project Coordination for the First Wilderness Heritage Corridor.
- Development and management of a county-wide "Main Street Program" consistent with the program objectives initiated by the National Trust for Historic Preservation.

Geographic Information Systems:

- Administration of the County's spatial data and "circuit rider" assistance to local communities that utilize geospatial technology.
- Management of the County's online mapping system
- E-911 Coordination, providing physical addresses and maintaining road information for emergency dispatch.
- Assistance to County Department managers with utilizing digital files and for project specific applications.
- Providing analysis, custom mapping, and data development services.

Warren County Department of Public Works (WCDPW)

WCDPW responsibilities include overseeing all county highway and bridge construction, maintenance of all road machinery and snow removal as well as managing the following seven divisions: Floyd Bennett Memorial Airport, Sewer Administration, Parks & Recreation, Recycling, Highway & Traffic, Engineering, and Buildings and Grounds. The Department works closely with the town highway superintendents.

Warren County Health Services

The Goals of the Warren County Public Health are:





- Prevent epidemics and the spread of disease
- Protect against environmental hazards
- Prevent injuries
- Promote and encourage healthy behaviors
- Respond to disasters and assist communities in recovery
- Assure the quality and accessibility of Health Services

6.4.4 Administrative and Technical Capabilities - State and Federal

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

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

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

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

Within the NYSDEC – Division of Water, the Bureau of Flood Protection and Dam Safety (<http://www.dec.ny.gov/about/61432.html>) cooperates with federal, state, regional, and local partners to protect lives and property from floods, coastal erosion and dam failures through floodplain management and both structural and non-structural means; and, provides support for information technology needs in the Division. The Bureau consists of the following Sections:

- Coastal Management: Works to reduce coastal erosion and storm damage to protect lives, natural resources, and properties through structural and non-structural means.
- Dam Safety: Is responsible for reviewing repairs and modifications to dams, and assuring that dam owners operate and maintain dams in a safe condition through inspections, technical reviews, enforcement, and emergency planning.
- Flood Control Projects: Is responsible for reducing flood risk to life and property through construction, operation and maintenance of flood control facilities.
- Floodplain Management: Is responsible for reducing flood risk to life and property through proper management of activities including, development in flood hazard areas and review and development of revised flood maps.



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

Technical Bulletins for the 2010 Codes of New York State

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

Forms and Publications

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

6.4.5 Fiscal Capabilities – County and Local

Municipal Fiscal Capabilities

Warren County municipalities are able to fund mitigation projects through existing local budgets, local appropriations (including referendums and bonding), and through a variety of federal and state loan and grant programs. Many municipalities noted throughout the planning process that they are faced with increasing fiscal constraints, including decreasing revenues, budget constraints and tax caps. In an effort to overcome these fiscal challenges, municipalities have continued to leverage the sharing of resources and combining available funding with grants and other sources, and note that plans and inter-municipal cooperation are beneficial in obtaining grants.

6.4.6 Fiscal Capabilities – State and Federal

Refer to Section 4 of the 2014 New York State Hazard Mitigation Plan for information pertaining to the various funding sources available for mitigation projects: <http://www.dhSES.ny.gov/recovery/mitigation/documents/2014-shmp/Section-4-Mitigation-Strategy.pdf>

Federal Hazard Mitigation Funding Opportunities

Federal mitigation grant funding is available to all communities with a current hazard mitigation plan (this plan); however most of these grants require a “local share” in the range of 10-25% of the total grant amount. Details about this program and a further description of these opportunities can be found at: <https://www.fema.gov/hazard-mitigation-assistance>. The FEMA mitigation grant programs are described below.

Hazard Mitigation Grant Program (HMGP)

The HMGP is a post-disaster mitigation program. It is made available to states by FEMA after each Federal disaster declaration. The HMGP can provide up to 75% funding for hazard mitigation measures. The HMGP can be used to fund cost-effective projects that will protect public or private property in an area covered by a federal disaster declaration or that will reduce the likely damage from future disasters. Examples of projects include acquisition and demolition of structures in hazard prone areas, flood-proofing or elevation to reduce future



damage, minor structural improvements and development of state or local standards. Projects must fit into an overall mitigation strategy for the area identified as part of a local planning effort. All applicants must have a FEMA-approved Hazard Mitigation Plan (this plan).

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

For additional information regarding HMGP, please refer to: <https://www.fema.gov/hazard-mitigation-grant-program>

Flood Mitigation Assistance (FMA) Program

The FMA combines the previous Repetitive Flood Claims and Severe Repetitive Loss Grants into one grant program. FMA provides funding to assist states and communities in implementing measures to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the NFIP. The FMA is funded annually; no federal disaster declaration is required. Only NFIP insured homes and businesses are eligible for mitigation in this program. Funding for FMA is very limited and, as with the HMGP, individuals cannot apply directly for the program. Applications must come from local governments or other eligible organizations. The federal cost share for an FMA project is 75%. At least 25% of the total eligible costs must be provided by a non-federal source. Of this 25%, no more than half can be provided as in-kind contributions from third parties. At minimum, a FEMA-approved local flood mitigation plan is required before a project can be approved. FMA funds are distributed from FEMA to the state. NYS DHSES serves as the grantee and program administrator for FMA.

For additional information regarding FMA, please refer to: <https://www.fema.gov/flood-mitigation-assistance-grant-program>

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. For additional information regarding the PDM program, please refer to: <https://www.fema.gov/pre-disaster-mitigation-grant-program>

Federal and State Disaster and Recovery Assistance Programs

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

Individual Assistance (IA)

IA provides help for homeowners, renters, businesses and some non-profit entities after disasters occur. This program is largely funded by the U.S. Small Business Administration. For homeowners and renters, those who suffered uninsured or underinsured losses may be eligible for a Home Disaster Loan to repair or replace damaged real estate or personal property. Renters are eligible for loans to cover personal property losses. Individuals may



borrow up to \$200,000 to repair or replace real estate, \$40,000 to cover losses to personal property and an additional 20% for mitigation. For businesses, loans may be made to repair or replace disaster damages to property owned by the business, including real estate, machinery and equipment, inventory and supplies. Businesses of any size are eligible. Non-profit organizations such as charities, churches, private universities, etc. are also eligible. An Economic Injury Disaster Loan provides necessary working capital until normal operations resume after a physical disaster. These loans are restricted, by law, to small businesses only. For additional information regarding IA, please refer to: <https://www.fema.gov/individual-disaster-assistance>

Public Assistance (PA)

PA provides cost reimbursement aid to local governments (state, county, local, municipal authorities and school districts) and certain non-profit agencies that were involved in disaster response and recovery programs or that suffered loss or damage to facilities or property used to deliver government-like services. This program is largely funded by FEMA with both local and state matching contributions required. For additional information regarding PA, please refer to: <https://www.fema.gov/public-assistance-local-state-tribal-and-non-profit>

Small-Business Administration (SBA) Loans

Small Business Administration (SBA) provides low-interest disaster loans to homeowners, renters, business of all sizes, and most private nonprofit organizations. SBA disaster loans can be used to repair or replace the following items damaged or destroyed in a declared disaster: real estate, personal property, machinery and equipment, and inventory and business assets.

Homeowners may apply for up to \$200,000 to replace or repair their primary residence. Renters and homeowners may borrow up to \$40,000 to replace or repair personal property—such as clothing, furniture, cars, and appliances – damaged or destroyed in a disaster. Physical disaster loans of up to \$2 million are available to qualified businesses or most private nonprofit organizations. For additional information regarding SBA loans, please refer to: <https://www.sba.gov/managing-business/running-business/emergency-preparedness/disaster-assistance>

Social Services Block Grant Program (SSBG)

To address the needs of critical health and human service providers and the populations they serve, the State of New York will receive a total of \$235.4 million in federal Superstorm Sandy Social Services Block Grant funding. The State will distribute \$200,034,600 through a public and transparent solicitation for proposals. The State is also allocating \$35.4 million in State Priority Projects, using the SSBG funding. Sandy SSBG resources are dedicated to covering necessary expenses resulting from Superstorm Sandy, including social, health and mental health services for individuals, and for repair, renovation and rebuilding of health care facilities, mental hygiene facilities, child care facilities and other social services facilities. For additional information regarding the SSBG program, please refer to: <https://www.acf.hhs.gov/ocs/programs/ssbg>

Department of Homeland Security

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



Community Development Block Grants (CDBG)

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

U.S. Economic Development Administration

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

Homeownership Repair and Rebuilding Fund

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

Empire State Relief Fund

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

Federal Highway Administration - Emergency Relief

The Federal Highway Administration Emergency Relief is a grant program that may be used for repair or reconstruction of Federal-aid highways and roads on Federal lands which have suffered serious damage as a



result of a disaster. NYS is serving as the liaison between local municipalities and FHWA. \$30 Million in funding was released in October-November of 2012 for emergency repair work conducted in first 180 days following Hurricane Sandy. Another \$220 Million in additional funding became available February 2013. For information regarding the FHWA Emergency Relief Program, please refer to: <https://www.fhwa.dot.gov/programadmin/erelief.cfm>

Federal Transit Administration - Emergency Relief

The Federal Transit Authority Emergency Relief is a grant program that funds capital projects to protect, repair, reconstruct, or replace equipment and facilities of public transportation systems. Administered by the Federal Transit Authority at the U.S. Department of Transportation and directly allocated to MTA and Port Authority. This transportation-specific fund was created as an alternative to FEMA PA. Currently, a total of \$5.2 Billion has been allocated to NYS-related entities. For information regarding the FTA Emergency Relief Program, please refer to: <https://www.transit.dot.gov/funding/grant-programs/emergency-relief-program/emergency-relief-program>

Empire State Development

Empire State Development offers a wide range of financing, grants and incentives to promote business and employment growth, and real estate development throughout the State. Several programs address infrastructure construction associated with project development, acquisition and demolition associated with project development and brownfield remediation and redevelopment. For additional information regarding Empire State Development, please refer to: <https://esd.ny.gov/>

New York State Department of Transportation (NYSDOT)

Damaged Roads and Signals

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

Scour Around Culverts and Bridges

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

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

Emergency Watershed Protection Program

The purpose of the Emergency Watershed Protection Program (EWP) was established by Congress to respond to emergencies created by natural disasters. The EWP Program is designed to help people and conserve natural resources by relieving imminent hazards to life and property caused by floods, fires, drought, windstorms, and



other natural occurrences. The U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) administers the EWP Program; EWP-Recovery, and EWP-Floodplain Easement (FPE). For additional information regarding the EWP, please refer to: <https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/ewpp/>

EWP - Recovery

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

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

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

EWP - Floodplain Easement (FPE)

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

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

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

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

New York State Department of Environmental Conservation Climate Smart Communities (CSC) Program

The Climate Smart Communities (CSC) program is jointly sponsored by the following six New York State agencies: Department of Environmental Conservation; Energy Research and Development Authority; Public Service Commission; Department of State; Department of Transportation; and the Department of Health. The program encourages municipalities to minimize the risks of climate change and reduce long-term costs through actions which reduce greenhouse gas (GHG) emissions and adapt to a changing climate. The program offers free technical support on energy and climate and guidance tailored to New York State communities. As of April, 2016, more than 170 communities, representing 6.6 million New Yorkers in every region of the state, have committed to acting on climate through New York State's Climate Smart Communities program.



Benefits of participating in the program include saving taxpayer dollars, improving operations and infrastructure, increasing energy independence and security, demonstrating leadership, and positioning for economic growth. Registered Climate Smart Communities receive notification of state and federal assistance that they can leverage to help adopt low-carbon technologies, and of programs and support for efficiency improvements and energy conservation. Further, they receive an advantage in accessing some state assistance programs. They can call on the help of other local governments that already have adopted climate smart practices and policies, and their climate-smart accomplishments receive statewide recognition. Key elements of the Climate Smart Communities program are described below.

For additional information regarding the CSC program, please refer to: <http://www.dec.ny.gov/energy/50845.html>

Climate Smart Communities Pledge

Any city, town, village or county in New York can join the program by adopting the Climate Smart Communities Pledge. To become a registered Climate Smart Community, the municipality's governing body must adopt a resolution that includes all ten elements of the Pledge and inform DEC of the passage of the resolution. The required ten elements of the Pledge are as follows:

- Pledge to be a Climate Smart Community.
- Set goals, inventory emissions, plan for climate action.
- Decrease community energy use.
- Increase community use of renewable energy.
- Realize benefits of recycling and other climate-smart solid waste management practices.
- Reduce greenhouse gas emissions through use of climate-smart land-use tools.
- Enhance community resilience and prepare for the effects of climate change.
- Support development of a green innovation economy.
- Inform and inspire the public.
- Commit to an evolving process of climate action.

The following Warren County jurisdictions have passed the Climate Smart Communities Pledge via resolution: City of Glens Falls, Town of Lake George and Village of Lake George.

Climate Smart Communities Certification (CSC) Program

The Climate Smart Communities Certification (CSC) program enables high-performing registered communities to achieve recognition for their leadership. Designed around the existing ten pledge elements, the certification program recognizes communities achieving any on over 130 total possible actions through a rating system leading to four levels of award: Certified, Bronze, Silver and Gold. Recertification of completed actions is required every five years. Details of the program and the specific documentation required for each action are described in the CSC Certification Manual at http://www.dec.ny.gov/docs/administration_pdf/certman.pdf.

Climate Smart Communities Grant Program

In April, 2016, DEC announced an expansion of the Environmental Protection Fund to support communities ready to reduce greenhouse gas emissions and prepare for the effects of climate change. Climate Smart Community Implementation grants support mitigation and adaptation projects and range from \$100,000 to \$2 million. Competitive grants ranging from \$25,000 to \$100,000 will also provide support for local governments to become certified Climate Smart Communities. All counties, cities, towns and villages of the State of New York are eligible to receive funding. The CSC grant program will provide 50/50 matching grants for eligible projects in the following categories.



Funding is available for **implementation projects** that advance a variety of climate adaptation and mitigation actions, including the following:

- Construction of natural resiliency measures
- Relocation or retrofit of climate-vulnerable facilities
- Conservation or restoration of riparian areas and tidal marsh migration area
- Reduction of flood risk
- Clean transportation
- Reduction or recycling of food waste

Funding is also available for **certification projects** that advance several specific actions aligned with Climate Smart Communities Certification requirements:

- Right-sizing of government fleets
- Developing natural resource inventories
- Conducting vulnerability assessments
- Developing climate adaptation strategies
- Updating hazard mitigation plans to address changing conditions and reduce climate vulnerability

In scoring grant applications, increasing points are awarded to communities who have already taken the CSC pledge and to those that have achieved certification status. All grant recipients must take the Climate Smart Communities Pledge within the term of their grant contract. For climate mitigation projects, grant recipients must provide a report of estimates of emissions reduction. Certification actions must adhere to the requirements and standards described in the Climate Smart Communities Certification Manual - <http://www.dec.ny.gov/energy/96511.html>. For implementation projects involving property (construction, improvements, restoration, rehabilitation) – if the property is not owned by the grant recipient, they must obtain a climate change mitigation easement.

The 2016 Climate Smart Communities Grant Program was available through the NYS Consolidated Funding Application. Applications for the first round of funding were due July 29, 2016.

The Climate Smart Communities Toolkit was developed to educate New York communities on recommended practices that will help to reduce greenhouse gas emissions and adapt to the effects of climate change, specifically in the areas of land-use, transportation policy, green buildings, infrastructure investment, green infrastructure, housing policy, and adaptation and resilience. The Climate Smart Communities Guide to Local Action contains overviews of possible community actions, how-to's and case studies to help communities implement the CSC pledge. The Climate Smart Communities Land Use Toolkit allows New York communities to find recommended practices that will help to reduce greenhouse gas emissions in the areas of land use, transportation policy, green building, infrastructure investment, green infrastructure and housing policy.

Community Risk and Resiliency Act (CRRA)

On September 22, 2014, Governor Andrew Cuomo signed bill A06558/S06617-B, the Community Risk and Resiliency Act (CRRA). The purpose of the bill is to strengthen New York's preparedness for climate change by ensuring that certain state monies, facility-siting regulations and permits include consideration of the effects of climate risk and extreme-weather events. The bill's provisions will apply to all applications and permits no later than January 1, 2017.

CRRA includes two key provisions to advance New York's climate change adaptation:



- Applicants to certain State programs must demonstrate that they have taken into account future physical climate risks from storm surges, sea-level rise or flooding.
- DEC must establish official State sea-level rise projections by January 1, 2016. These projections provide the basis for State adaptation decisions and will be available for use by all decision makers.

CRRA applies to specific State permitting, funding and regulatory decisions, including smart growth assessments; funding for wastewater treatment plants; siting of hazardous waste facilities; design and construction of petroleum and chemical bulk storage facilities; oil and gas drilling, and State acquisition of open space.

6.5 Mitigation Strategy Development and Update

6.5.1 Update of Municipal Mitigation Strategies

To evaluate progress on local mitigation actions, each jurisdiction was provided with a Mitigation Action Plan Review Worksheet, pre-populated with those actions identified for their jurisdiction in the prior (2011) plan. For each action, municipalities were asked to indicate the status of each action (“No Progress/Unknown”, “In Progress/Not Yet Complete”, “Continuous”, “Completed”, “Discontinued”) and provide review comments on each. Municipalities were requested to quantify the extent of progress, and provide reasons for the level of progress or why actions were discontinued. Each jurisdictional annex provides a table identifying their prior mitigation strategy, the status of those actions and initiatives, and their disposition within their updated strategy.

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

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

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

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

To help support the selection of an appropriate, risk-based mitigation strategy, each annex provided a summary of hazard vulnerabilities identified during the plan update process, either directly by municipal representatives,



through review of available county and local plans and reports, and through the hazard profiling and vulnerability assessment process.

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

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

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

In consideration of federal and state mitigation guidance, the Steering Committee recognized that municipalities would benefit from the inclusion of certain mitigation initiatives. These include initiatives to address vulnerable public and private properties, including RL and SRL properties; initiatives to support continued and enhanced participation in the NFIP; improved public education and awareness programs; and initiatives to support countywide and regional efforts to build greater local mitigation capabilities. Municipalities have included such initiatives as appropriate, typically amended with specific details to best meet the needs and interests of their community and promote implementation.

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

- An overarching effort has been made to better focus local mitigation strategies to clearly defined, readily actionable projects and initiatives that meet the definition or characteristics of mitigation. Broadly defined mitigation objectives have been eliminated from the updated strategy unless accompanied by discrete actions, projects or initiatives.



- Certain continuous or ongoing strategies that represent programs that are, or since prior and existing plans have become, fully integrated into the normal operational and administrative framework of the community have been identified within the Capabilities section of each annex, and removed from the updated mitigation strategy.
- Where applicable, mitigation projects have been documented with an Action Worksheet, based on FEMA's Action Worksheet templates and recent guidance documents.

FEMA Action Worksheets have been included for new physical projects identified by the County and participating municipalities. Physical projects being carried forward from the prior plan strategies are not necessarily documented on Action Worksheets as the project screening, identification and development, and prioritization process was accomplished during the last planning process. Whether or not the projects were new or “carry forward”, and documented on Action Worksheets or not, all projects included in the updated County and local mitigation strategies have identified hazards addressed, project description, benefits, costs, responsible party, sources of funding, timeline and priority. Further, non-physical actions (e.g. integration actions, studies, etc.) are typically not documented on Action Worksheets.

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

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

6.5.2 Update of County Mitigation Strategy

The update of the county-level mitigation strategies included a review of progress on the actions/initiatives identified in the 2011 HMP, using a process similar to that used to review municipal mitigation strategy progress. The County, through their various department representatives, was provided with a Mitigation Action Plan Review Worksheet identifying all of the county-level actions/initiatives from the 2011 plan. For each action, relevant county representatives were asked to indicate the status of each action (“No Progress/Unknown”, “In Progress/Not Yet Complete”, “Continuous”, “Completed”, or “Discontinued”), and provide review comments on each.

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

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

- Review of the results and findings of the updated risk assessment;



- Review of available regional and county plans, reports and studies;
- Direct input from County departments and other county and regional agencies, including:
 - Warren County Soil and Water Conservation District (WC SWCD)
 - Warren County Office of Emergency Services (WCOES)
 - Warren County Department of Planning and Community Development (WCDPCD)
 - Warren County Department of Public Works
 - Warren County Board of Supervisors
 - Adirondack / Glens Falls Transportation Council
- Input received through the public and stakeholder outreach process.

As discussed within the hazard profiles in Section 5.4, the long term effects of climate change are anticipated to exacerbate the impacts of weather-related hazards including flood, severe storm, severe winter storm and wildfire. As such, the Steering Committee added Objective 5.4: “Promote climate change adaptation strategies that protect against long-term effects on the environment” to the updated mitigation planning goals and objectives to support recognition and consideration of this risk throughout the plan update process. Further, the County has included mitigation actions and initiatives, including continuing and long term planning and emergency management support, to address these long term implications and potential impacts.

Various County departments and agencies have included mitigation actions to address vulnerable critical facilities. These actions have been proposed in consideration of protection against 500-year events, or worst-case scenarios.

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

6.5.3 Mitigation Strategy Evaluation and Prioritization

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

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

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

The fourteen (14) evaluation/prioritization criteria used in the 2015/16 update process are:

1. Life Safety – How effective will the action be at protecting lives and preventing injuries?



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

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

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

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

It is noted that jurisdictions may be carrying forward mitigation actions and initiatives from prior mitigation strategies that were prioritized using a different, but not inherently contrary, approach. Mitigation actions in the prior (2011) Warren County HMP were prioritized “by considering cost, staffing availability, and benefit to the jurisdiction, with high indicating a low cost, broad impact action, medium indicating a future project with potential funds available and low priority indicating a long term endeavor, with an alternate funding source necessary.”

At their discretion, jurisdictions carrying forward prior initiatives were encouraged to re-evaluate their priority, particularly if conditions that would affect the prioritization criteria had changed. Where communities have



determined that their original priority ranking for “carry forward” initiatives remained valid, their earlier priority ranking is indicated on the prioritization table, however the plan update criteria ratings are indicated with a null “-“ marking.

For the plan update there has been an effort to develop more clearly defined and action-oriented mitigation strategies. These local strategies include projects and initiatives that have been well-vetted, and are seen by the community as the most effective approaches to advance their local mitigation goals and objectives within their capabilities. As such, many of the initiatives in the updated mitigation strategy were ranked as “High” or “Medium” priority, as reflective of the community’s clear intent to implement, available resources notwithstanding. In general, initiatives that would have had “low” priority rankings were appropriately screened out during the local action evaluation process.

6.5.4 Benefit/Cost Review

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

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

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

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

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

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

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

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



Table 6-2. Qualitative Cost and Benefit Ratings

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

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

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



SECTION 7. PLAN MAINTENANCE PROCEDURES

This section describes the system that Warren County and all participating jurisdictions have established to monitor, evaluate, and update the mitigation plan; implement the mitigation plan through existing programs; and solicit continued public involvement for plan maintenance.

7.1 Monitoring, Evaluating and Updating the Plan

The procedures for monitoring, evaluating, and updating the plan are provided below.

Each participating jurisdiction is expected to maintain a representative on the mitigation Planning Committee who shall fulfill the monitoring, evaluation and updating responsibilities identified in this Section. As of the date of this plan, primary and secondary mitigation planning representatives (points-of-contact) are identified in each jurisdictional annex in Section 9.

It is recognized that individual commitments change over time, and it shall be the responsibility of each jurisdiction and its representatives to inform the HMP Coordinator of any changes in representation. The HMP Coordinator will strive to keep the committee makeup as a uniform representation of planning partners and stakeholders within the planning area.

Currently, the Warren County HMP Coordinator is designated as:

Mr. Jim Lieberum, CPESC
District Manager/County Hazard Mitigation Coordinator
Warren County Soil and Water Conservation District
394 Schroon River Road
Warrensburg, NY 12885
(518) 623-3119
jim99@nycap.rr.com

7.1.1 Monitoring

The Planning Committee shall be responsible for monitoring progress on, and evaluating the effectiveness of, the plan, and documenting annual progress. Each year, beginning one year after plan development, County and local Planning Committee representatives will collect and process information from the departments, agencies and organizations involved in implementing mitigation projects or activities identified in their jurisdictional annexes (Volume II, Section 9) of this plan, by contacting persons responsible for initiating and/or overseeing the mitigation projects.

To standardize and facilitate collection of progress data and information on specific mitigation actions, Warren County Soil and Water Conservation District (WC SWCD) shall develop a progress matrix that will continue to be updated and distributed to the Planning Committee members prior to the scheduled annual Planning Committee meeting. FEMA guidance worksheets and a sample progress matrix template are provided in Appendix F. This information shall be provided to the planning area HMP Coordinator prior to the annual Planning Committee meeting to be held approximately one year from the date of local adoption of this update, and successively thereafter.

The information that Planning Committee representatives shall be expected to document, as needed and appropriate include:



- Any grant applications filed on behalf of any of the participating jurisdictions
- Hazard events and losses occurring in their jurisdiction,
- Progress on the implementation of mitigation actions, including efforts to obtain outside funding,
- Obstacles or impediments to implementation of actions,
- Additional mitigation actions believed to be appropriate and feasible,
- Public and stakeholder input.

7.1.2 Evaluating

The evaluation of the mitigation plan is an assessment of whether the planning process and actions have been effective, if the Plan goals are being reached, and whether changes are needed. The Plan will be evaluated on an annual basis to determine the effectiveness of the programs, and to reflect changes that may affect mitigation priorities or available funding.

The status of the HMP will be discussed and documented at an annual plan review meeting of the Mitigation Planning Committee, to be held approximately one year from the date of local adoption of this update, and successively thereafter. At least two weeks before the annual plan review meeting, the Warren County HMP Coordinator will advise Planning Committee members of the meeting date, agenda and expectations of the members.

The Warren County HMP Coordinator will be responsible for calling and coordinating the annual plan review meeting, and assessing progress toward meeting plan goals and objectives. These evaluations will assess whether:

- Goals and objectives address current and expected conditions.
- The nature or magnitude of the risks has changed.
- Current resources are appropriate for implementing the HMP and if different or additional resources are now available.
- Actions were cost effective.
- Schedules and budgets are feasible.
- Implementation problems, such as technical, political, legal or coordination issues with other agencies are presents.
- Outcomes have occurred as expected.
- Changes in County, City, Town or Village resources impacted plan implementation (e.g., funding, personnel, and equipment)
- New agencies/departments/staff should be included, including other local governments as defined under 44 CFR 201.6.

Specifically, the Planning Committee will review the mitigation goals, objectives, and activities using performance based indicators, including:

- New agencies/departments
- Project completion
- Under/over spending
- Achievement of the goals and objectives



- Resource allocation
- Timeframes
- Budgets
- Lead/support agency commitment
- Resources
- Feasibility

Finally, the Planning Committee will evaluate how other programs and policies have conflicted or augmented planned or implemented measures, and shall identify policies, programs, practices, and procedures that could be modified to accommodate hazard mitigation actions (see the “Implementation of Mitigation Plan through Existing Programs” subsection later in this Section). Other programs and policies can include those that address:

- Economic Development
- Environmental Preservation
- Historic Preservation
- Redevelopment
- Health and/or safety
- Recreation
- Land use/zoning
- Public Education and Outreach
- Transportation

The Planning Committee may refer to the evaluation forms, Worksheets #2 and #4 in the FEMA 386-4 guidance document, to assist in the evaluation process. Further, the Planning Committee may refer to any process and plan review deliverables developed by the County or participating jurisdictions as a part of the plan review processes established for prior or existing local HMPs within the County.

The Planning Committee Coordinator shall be responsible for preparing an Annual HMP Progress Report, based on the provided local annual progress reports from each participant, information presented at the annual Planning Committee meeting, and other information as appropriate and relevant. These annual reports will provide data for the 5-year update of this HMP and will assist in pinpointing implementation challenges. By monitoring the implementation of the Plan on an annual basis, the Planning Committee will be able to assess which projects are completed, which are no longer feasible, and what projects may require additional funding.

This report shall apply to all planning partners, and as such, shall be developed according to an agreed format and with adequate allowance for input and comment of each planning partner prior to completion and submission to the State Hazard Mitigation Officer. Each planning partner will be responsible for providing this report to its governing body for their review. During the annual Planning Committee meeting, the planning partners shall establish a schedule for the draft development, review, comment, amendment and submission of the Annual HMP Progress Report to NYS DHSES.

The Annual HMP Progress Report shall be posted on the Warren County Hazard Mitigation Plan website (currently <http://www.warrencountynyhmp.com>) to keep the public apprised of the plan’s implementation. For communities who may choose to join the NFIP Community Rating System (CRS) program, this report will also be provided to each CRS participating community in order to meet annual CRS recertification



requirements. To meet this recertification timeline, the Planning Committee will strive to complete the review process and prepare an Annual HMP Progress Report by the end of September.

The plan will also be evaluated and revised following any major disasters, to determine if the recommended actions remain relevant and appropriate. The risk assessment will also be revisited to see if any changes are necessary based on the pattern of disaster damages or if data listed in the Section 5.4 (Hazard Profiles) of this plan has been collected to facilitate the risk assessment. This is an opportunity to increase the community's disaster resistance and build a better and stronger community.

7.1.3 Updating

44 CFR 201.6.d.3 requires that local hazard mitigation plans be reviewed, revised as appropriate, and resubmitted for approval in order to remain eligible for benefits awarded under DMA 2000. It is the intent of the Warren County HMP Planning Committee to update this plan on a five-year cycle from the date of initial plan adoption.

To facilitate the update process, the Warren County HMP Coordinator, with support of the Planning Committee, shall use the second annual Planning Committee meeting to develop and commence the implementation of a detailed plan update program. The Warren County HMP Coordinator shall invite representatives from NYS DHSES to this meeting to provide guidance on plan update procedures. This program shall, at a minimum, establish who shall be responsible for managing and completing the plan update effort, what needs to be included in the updated plan, and a detailed timeline with milestones to assure that the update is completed according to regulatory requirements.

At this meeting, the Planning Committee shall determine what resources will be needed to complete the update. The Warren County HMP Coordinator shall be responsible for assuring that needed resources are secured.

Following each five-year update of the mitigation plan, the updated plan will be distributed for public comment. After all comments are addressed, the HMP will be revised and distributed to all planning group members and the New York State Hazard Mitigation Officer.

7.2 Implementation of Mitigation Plan through Existing Programs

Effective mitigation is achieved when hazard awareness and risk management approaches and strategies become an integral part of public activities and decision-making. Within the county there are many existing plans and programs that support hazard risk management, and thus it is critical that this hazard mitigation plan integrate and coordinate with, and complement, those existing plans and programs.

The “Capability Assessment” section of Chapter 6 (Mitigation Strategy) provides a summary and description of the existing plans, programs and regulatory mechanisms at all levels of government (Federal, State, County and local) that support hazard mitigation within the county. Within each jurisdictional annex in Chapter 9, the County and each participating jurisdiction have identified how they have integrated hazard risk management into their existing planning, regulatory and operational/administrative framework (“integration capabilities”) and how they intend to promote this integration (“integration actions”).

It is the intention of Planning Committee representatives to incorporate mitigation planning as an integral component of daily government operations. Planning Committee representatives will work with local government officials to integrate the newly adopted hazard mitigation goals and actions into the general operations of government and partner organizations. Further, the sample adoption resolution (Appendix A –



Sample Adoption Resolution) includes a resolution item stating the intent of the local governing body to incorporate mitigation planning as an integral component of government and partner operations. By doing so, the Planning Committee anticipates that:

- 1) Hazard mitigation planning will be formally recognized as an integral part of overall emergency management efforts;
- 2) The Hazard Mitigation Plan, Comprehensive Plans, Emergency Management Plans and other relevant planning mechanisms will become mutually supportive documents that work in concert to meet the goals and needs of County residents.

During the annual plan evaluation process, the Planning Committee representatives will identify additional policies, programs, practices, and procedures that could be modified to accommodate hazard mitigation actions, and include these findings and recommendations in the Annual HMP Progress Report.

7.3 Continued Public Involvement

Warren County and participating jurisdictions are committed to the continued involvement of the public in the hazard mitigation process. This Plan update will be posted on-line (currently at <http://www.warrencountynyhmp.com>). The County and municipalities may make hard copies of the Plan available for review at public locations (e.g. County offices, municipal halls, public libraries).

In addition, public outreach and dissemination of the Plan will include:

- Links to the plan on municipal websites of each jurisdiction with capability.
- Continued utilization of existing social media outlets (Facebook, Twitter) to inform the public of flood hazards and severe storm events. Educate the public via the jurisdictional websites on how these applications can be used in an emergency situation.
- Development of annual articles or workshops on flood hazards to educate the public and keep them aware of the dangers of flooding.

Local Planning Committee representatives and the Warren County HMP Coordinator will be responsible for receiving, tracking, and filing public comments regarding this HMP. The public will have an opportunity to comment on the plan via the hazard mitigation website at any time. The HMP Coordinator will maintain this website, posting new information and maintaining an active link to collect public comments.

The public can also provide input at the annual review meeting for the HMP and during the next 5-year plan update. The Warren County HMP Coordinator is responsible for coordinating the plan evaluation portion of the meeting, soliciting feedback, collecting and reviewing the comments, and ensuring their incorporation in the five-year plan update as appropriate. Additional meetings may also be held as deemed necessary by the planning group. The purpose of these meeting would be to provide the public an opportunity to express concerns, opinions, and ideas about the mitigation plan.

The Planning Committee representatives shall be responsible to assure that:

- Public comment and input on the plan, and hazard mitigation in general, are recorded and addressed, as appropriate.



- Copies of the latest approved plan (or draft in the case that the five year update effort is underway) are available for review at the town hall and public library, along with instructions to facilitate public input and comment on the Plan.
- Appropriate links to the Warren County Hazard Mitigation Plan website (currently <http://www.warrencountynyhmp.com>) are included on municipal websites.
- Public notices are made as appropriate to inform the public of the availability of the plan, particularly during Plan update cycles.

The Warren County HMP Coordinator shall be responsible to assure that:

- Public and stakeholder comment and input on the plan, and hazard mitigation in general, are recorded and addressed, as appropriate.
- The Warren County HMP website is maintained and updated as appropriate.
- Copies of the latest approved plan (or draft in the case that the five year update effort is underway) are available for review at appropriate County facilities (e.g. libraries), along with instructions to facilitate public input and comment on the plan.
- Public notices, including media releases, are made as appropriate to inform the public of the availability of the plan, particularly during plan update cycles.



SECTION 8. PLANNING PARTNERSHIP

8.1 Background

Section 201.6.a(4) of Chapter 44 of the Code of Federal Regulations (44CFR) states: “Multi-jurisdictional plans (e.g. watershed plans) may be accepted, as appropriate, as long as each jurisdiction has participated in the process and has officially adopted the plan.” The Federal Emergency Management Agency (FEMA) and New York State Division of Homeland Security and Emergency Services (NYS DHSES) both encourage multi-jurisdictional planning. Therefore, in the preparation of the “Warren County Pre-Disaster Multijurisdictional Hazard Mitigation Plan” update, a planning partnership was formed meet requirements of the federal Disaster Mitigation Act of 2000 (DMA) for as many eligible local governments in Warren County as possible.

The DMA defines a local government as follows: “Any county, municipality, city, town, township, public authority, school district, special district, intrastate district, council of governments (regardless of whether the council of governments is incorporated as a nonprofit corporation under State law), regional or interstate government entity, or agency or instrumentality of a local government; any Indian tribe or authorized tribal organization, or Alaska Native village or organization; and any rural community, unincorporated town or village, or other public entity.”

In addition to the County’s participation, Warren County Office of Emergency Services (WCOES) and Warren County Soil and Water Conservation District (WC SWCD) solicited the participation of all incorporated municipalities within the County at the outset of this project. Jurisdictions that expressed interest signed a “Letter of Intent” and/or an authorizing resolution committing their participation and resources to the development of the Warren County HMP Update.

Table 8-1 lists those jurisdictions that elected to participate in the 2016 Warren County HMP Update process, and have met the minimum requirements of participation as established by the County and Steering Committee:

Table 8-1. Participating Jurisdictions in Warren County

Jurisdictions	
Warren County	Town of Lake George
Town of Bolton	Town of Lake Luzerne
Town of Chester	Town of Queensbury
City of Glens Falls	Town of Stony Creek
Town of Hague	Town of Thurman
Town of Horicon	Town of Warrensburg
Town of Johnsbury	Village of Lake George

8.1.1 Jurisdictional Annexes

This update is organized to include a jurisdictional annex (chapter) for each participating jurisdiction. While the local annex format is designed to document and assure local compliance with the DMA 2000 regulations, its greater purpose and function includes:



- Providing a locally-relevant synthesis of the overall mitigation plan that can be readily presented, distributed, and maintained;
- Facilitating local understanding of the community’s risk to natural hazards;
- Facilitating local understanding of the community’s capabilities to manage natural hazard risk, including opportunities to improve those capabilities;
- Facilitating local understanding of the efforts the community has taken, and plans to take, to reduce their natural hazard risk;
- Facilitating the implementation of mitigation strategies, including the development of grant applications;
- Providing a framework by which the community can continue to capture relevant data and information for future plan updates.

It is recognized that each jurisdiction’s annex is a “living” document, and will continue to be improved as resources permit. As such, its design is intended to promote and accommodate continued efforts to maintain the currency and improve the effectiveness of the annex as the key tool, reference and guiding document by which the jurisdiction will implement hazard mitigation locally.

The following provides a description of the various elements of the jurisdictional annex.

Section 9.X.1: Hazard Mitigation Plan Points of Contact: Identifies the hazard mitigation planning primary and alternate(s) contacts, as identified by the jurisdiction.

Section 9.X.2: Municipal Profile: Provides an overview and profile of the jurisdiction, including an identification of areas of known and anticipated future development and the vulnerability of those areas to the hazards of concern.

Section 9.X.3: Natural Hazard Event History Specific to the Municipality: Identifies hazard events that have caused significant impacts within the jurisdiction, including a summary characterization of those impacts as identified by the jurisdiction. The documentation of events and losses is critical to supporting the identification and justification of appropriate mitigation actions, including providing critical data for benefit-cost analysis. It is recognized that this “inventory” of events and losses is a work-in-progress, and may continue to be improved as resources permit. As such, the lack of data or information for a specific event does not necessarily mean that the jurisdiction did not suffer significant losses during that event.

Section 9.X.4: Hazard Vulnerabilities and Ranking: This subsection provides information regarding each plan participant’s vulnerability to the identified hazards. Full data and information on the hazards of concern, the methodology used to develop the vulnerability assessments, and the results of those assessments that serve as the basis of these local risk rankings may be found in Section 5.

- **Hazard Risk/Vulnerability Risk Ranking:** The Warren County HMP Update identifies and characterizes the broad range of hazards that pose risk to the entire planning area; however each jurisdiction has differing degrees of risk exposure and vulnerability aside from the whole. The local risk ranking serves to identify each jurisdiction’s degree of risk to each hazard as it pertains to them, supporting the appropriate selection and prioritization of initiatives that will reduce the highest levels of risk for each community.



- **National Flood Insurance Program (NFIP) Summary:** Provides NFIP summary statistics for the jurisdiction.
- **Critical Facilities:** Identifies potential flood losses to critical facilities in the jurisdiction, based on the flood vulnerability assessment process presented in Section 5.
- **Other Vulnerabilities Identified by the Municipality:** Presents other specific hazard vulnerabilities as identified by the jurisdiction.

Section 9.X.5: Capability Assessment: This subsection provides an inventory and evaluation of the jurisdiction's tools, mechanisms and resources available to support hazard mitigation and natural hazard risk reduction. Within the municipal annexes, tables provide an inventory of the municipality's planning and regulatory, administrative and technical, and fiscal, capabilities, respectively. Further, another table identifies the municipality's level of participation in state and federal programs designed to promote and incentivize local risk reduction efforts.

National Flood Insurance Program (NFIP): This subsection documents the NFIP as implemented within the jurisdiction. This summary was based on surveys prepared by, and/or interviews conducted with, the NFIP Floodplain Administrators for each NFIP-participating community in the County.

This subsection also identifies actions to enhance implementation and enforcement of the NFIP within the community.

Integration of Hazard Mitigation into Existing Planning Mechanisms: This subsection identifies how the jurisdiction has integrated hazard risk management into their existing planning, regulatory and operational/administrative framework ("integration capabilities"), and/or how they intend to promote this integration ("integration actions").

Further information regarding Federal, State and local capabilities may be found in the Capability Assessment portion of Section 6.

Section 9.X.6: Mitigation Strategy and Prioritization: This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and prioritization.

Past Mitigation Initiative Status: Where applicable, a review of progress on the jurisdiction's prior mitigation strategy is presented, identifying the disposition of each prior action, project or initiative in the jurisdiction's updated mitigation strategy. Other completed or on-going mitigation activities that were not specifically part of a prior local mitigation strategy may be included in this sub-section as well.

Proposed Mitigation Strategy: Table 9.X-11 presents the jurisdiction's updated mitigation strategy. As indicated, applicable mitigation actions, projects and initiatives are further documented on an Action Worksheet which provides details on the project identification, evaluation, prioritization and implementation process. Table 9.X-12 provides a summary of the local mitigation strategy prioritization process discussed in Section 6.

Section 9.X.7: Future Needs to Better Understand Risk/Vulnerability: During the development of each annex, each jurisdiction identified if there are any anticipated needs in order to better understand risk and vulnerability going forward. If a jurisdiction identified such needs, they are captured in this section.

Section 9.X.8: Hazard Area Extent and Location Map: Each annex includes a map (or series of maps) illustrating identified hazard zones, critical facilities, and areas of NFIP Repetitive Loss/Severe Repetitive Loss (RL/SRL).



Section 9.X.9: Additional Comments: Each annex contains an additional comments section to address identified issues or considerations that are not addressed in other annex sections.



9.1 Warren County

This section presents the jurisdictional annex for Warren County.

9.1.1 Hazard Mitigation Plan Point of Contact

The following individuals have been identified as the hazard mitigation plan’s (HMP) primary and alternate points of contact.

Primary Point of Contact	Alternate Point of Contact
Jim Lieberum, CPESC - District Manager/County Hazard Mitigation Coordinator Warren County Soil and Water Conservation District 394 Schroon River Road, Warrensburg, NY (518) 623-3119 jim99@nycap.rr.com	Amy Hirsch - Emergency Services Coordinator Warren County Office of Emergency Services 1340 State Route 9, Lake George, NY (518) 761-6490 hirscha@warrencountyny.gov

9.1.2 County Profile

Please refer to Section 4 of this Plan for details on Warren County’s population, location, climate, history, growth and development.

9.1.3 Natural Hazard Event History Specific to the County

Warren County has a history of hazard events as detailed in Section 5.0 of this plan. A summary of historical events is provided in each of the hazard profiles and includes a chronology of events that have affected the County and its municipalities.

9.1.4 Hazard Vulnerabilities and Ranking

Table 9.1-1 below summarizes the hazard risk/vulnerability rankings of potential natural hazards for Warren County.

Table 9.1-1. Natural Hazard Risk/Vulnerability Risk Ranking

Hazard type	Estimate of Potential Dollar Losses to Structures Vulnerable to the Hazard ^{a, b}	Probability of Occurrence	Risk Ranking Score (Probability x Impact)	Hazard Ranking ^a
Earthquake	100-year MRP: \$2,213,481.00 500-year MRP: \$37,947,033 2,500-Year MRP: \$301,958,301.00	Occasional	32	High
Flood	RCV Exposed to 1% Annual Chance: \$264,900,485	Frequent	18	Medium
Landslide	Damage estimate not available	Frequent	27	Medium
Infestation	Damage estimate not available	Frequent	24	Medium
Severe Storm	RCV Exposed to 1938 storm-winds: \$6,110,270	Frequent	48	High
Severe Winter Storm	GBS 1% Loss: \$94,431,880 GBS 5% Loss: \$472,159,400	Frequent	51	High
Wildfire	RCV Exposed to Intermix: \$4,750,684,000 RCV Exposed to Interface: \$6,356,131,000	Frequent	42	High



Hazard type	Estimate of Potential Dollar Losses to Structures Vulnerable to the Hazard ^{a, b}	Probability of Occurrence	Risk Ranking Score (Probability x Impact)	Hazard Ranking ^a
Cyber Security	Damage estimate not available	Occasional	12	Low
Disease Outbreak	Damage estimate not available	Frequent	27	Medium
Hazardous Material Incidents	Damage estimate not available	Frequent	24	Medium

Notes:

- a. The general building stock valuation is based on the custom inventory generated for the municipality and based on improved value.
 High = Total hazard priority risk ranking score of 31 and above
 Medium = Total hazard priority risk ranking of 20-30+
 Low = Total hazard risk ranking below 20
- b. Loss estimates for the severe storm and severe winter storm hazards are structural values only and do not include the estimated value of contents. The earthquake was evaluated by Census tract. The Census tracts do not exactly align with municipal boundaries; therefore, a total is reported for each Town inclusive of the Villages. Loss estimates for the flood and earthquake hazards represent both structure and contents. Potential flood loss estimates were generated using Hazus-MH 2.2 and digitized FIRM maps from the 1980s and 1990s for the 1-percent annual chance event; NED DEM was used to generate a depth grid. The County's 2015 Real Property data was used to generate the values for flood and includes structure and contents. For the wildfire hazard, the improved value and estimated contents of buildings located within the identified hazard zones is provided.

GBS General building stock
 MRP Mean return period
 RCV Replacement Cost Value

National Flood Insurance Program (NFIP) Summary

Table 9.1-2 below summarizes the NFIP statistics for the County.

Table 9.1-2. NFIP Summary

Municipality	# Policies (1)	# Claims (Losses) (1)	Total Loss Payments (2)	# Rep. Loss Prop. (1)	# Severe Rep. Loss Prop. (1)	# Policies in 100-year Boundary (3)
Warren County	259	121	\$2,500,251	1	0	119

Source: FEMA, 2014

Notes:

- (1) Policies, claims, repetitive loss, and severe repetitive loss statistics are provided by FEMA, are current as of November 30, 2015, and are summarized by community name. Total number of repetitive loss properties includes severe repetitive loss properties. Number of claims represents claims closed by November 30, 2015.
- (2) Total building and content losses from the claims file provided by FEMA Region 2.
- (3) Number of policies inside and outside of flood zones is based on latitude and longitude provided by FEMA Region 2 in the policy file.
- (4) FEMA noted that for a property with more than one entry, more than one policy may have been in force or more than one Geographic Information System (GIS) specification was possible.

Other Vulnerabilities Identified

Law Enforcement providers throughout Warren County noted that wireless communications are undependable during good weather in Warren County. Most of the power utilities in the County are above ground and more likely to be effected by severe weather events.

EMS providers throughout the County reported that the County has some gaps in radio communications, and therefore does not have much room for system interruptions. In other words, if a cell/radio tower or two go down in a storm, County officials will be struggling to communicate effectively. That said, there are redundancies in the radio communications systems.



9.1.5 Capability Assessment

This section identifies the following capabilities of the County:

- Planning and regulatory capability
- Administrative and technical capability
- Fiscal capability
- Community classification
- NFIP
- Integration of mitigation planning into existing and future planning mechanisms.

Planning and Regulatory Capability

Table 9.1-3 below summarizes regulatory tools available to the County.

Table 9.1-3. Planning and Regulatory Tools

Tool / Program (code, ordinance, plan)	Authority (local, county, state, federal)	Code Citation and Comments (Code Chapter, date of adoption, name of plan, explanation of authority, etc.)
Building Code	State, Local	Chapter 150: State Uniform Fire Prevention And Building Code And State Energy Conservation Construction Code; Fire Prevention and Building Code Enforcement (except in Queensbury and Glens Falls)
Zoning Ordinance	Local	WC Department of Planning and Community Development and Warren County (WC) Planning Board provides technical services to local planning and zoning boards for matters related to community master plans, zoning ordinances and related land use regulations.
Subdivision Ordinance	Local	See above.
Site Plan Review Requirements	Local	See above.
National Flood Insurance Program (NFIP) Flood Damage Protection Ordinance	Federal, State, Local	-
Comprehensive Plan / Master Plan	County and Local	No County Comprehensive Plan; WC Department of Planning and Community Development and WC Planning Board provides technical services to local planning and zoning boards for matters related to community master plans, zoning ordinances and related land use regulations.
Capital Improvements Plan	County	-
Stormwater Management Plan/Ordinance	County, Local	Warren County MS4 Stormwater Management Program Plan – Oct. 2014 (WC Soil and Water Conservation District [SWCD])
Floodplain Management / Basin Plan	Local	-
Open Space or Greenway Plan	County	-
Emergency Management and/or Response Plan	County and Local	Comprehensive Emergency Management Plan, 2015
Economic Development Plan	County	-
Local Waterfront Revitalization Plan (for waterfront communities)	Local	-
Post Disaster Recovery Plan and/or	County	-



Tool / Program (code, ordinance, plan)	Authority (local, county, state, federal)	Code Citation and Comments (Code Chapter, date of adoption, name of plan, explanation of authority, etc.)
Ordinance		
Growth Management	Local	-
Real Estate Disclosure req.	State and local	New York State (NYS) mandate, Property Condition Disclosure Act, <i>NY Code</i> – Article 14 §460-467
Habitat Conservation Plan	-	-
Other (Special Purpose Ordinances [i.e., sensitive areas, steep slope])	Local	-

Note: NYS Subdivision laws provide a general framework, but allow room for local ordinances and interpretation.

Administrative and Technical Capability

Table 9.1-4 below summarizes potential staff and personnel resources available to the County.

Table 9.1-4. Administrative and Technical Capabilities

Staff/ Personnel Resources	Available (Yes or No)	Department/ Agency/Position
Planner(s) or engineer(s) with knowledge of land development and land management practices	Yes	Warren County Planning Board; Warren County Department of Planning and Community Development; WC SWCD
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Yes	WC Fire Prevention and Building Codes; WC Department of Public Works; WC SWCD
Planners or engineers with an understanding of natural hazards	Yes	WC Department of Planning and Community Development and WC Planning Board; WC SWCD
NFIP Floodplain Administrator (FPA)	-	-
Surveyor(s)	-	-
Personnel skilled or trained in GIS and/or Hazards United States (HAZUS) – Multi-Hazards (MH) applications	Yes	Warren County Department of Planning and Community Development
Scientist familiar with natural hazards in the County.	Yes	WC SWCD
Emergency Manager	Yes	WC OES
Grant writer(s)	Yes	WC SWCD
Staff with expertise or training in benefit/cost analysis	Yes	WC SWCD

Fiscal Capability

Table 9.1-5 below summarizes financial resources available to the County.

Table 9.1-5. Fiscal Capabilities

Financial Resources	Accessible or Eligible to Use (Yes/No/Don't Know)
Community Development Block Grants (CDBG, CDBG-DR)	Yes
Capital improvements project funding	Yes
Authority to Levy Taxes for specific purposes	Yes
User fees for water, sewer, gas or electric service	No
Impact fees for homebuyers or developers of new development/homes	No



Financial Resources	Accessible or Eligible to Use (Yes/No/Don't Know)
Incur debt through general obligation bonds	Yes
Incur debt through special tax bonds	Yes
Incur debt through private activity bonds	No
Withhold public expenditures in hazard-prone areas	No
Federal and state grant programs	Yes, the County has historically applied for mitigation grant funding (e.g. generators)
Other	No

Community Classifications

Table 9.1-6 below summarizes classifications for community program available to the County.

Table 9.1-6. Community Classifications

Program	Classification	Date Classified
Community Rating System (CRS)	N/A	N/A
Building Code Effectiveness Grading Schedule (BCEGS)	N/A	N/A
Public Protection	N/A	N/A
Storm Ready	County Participant	2015
Firewise	NP	N/A

Note:

N/A Not applicable

NP Not participating

- Unavailable

The classifications listed above relate to the County’s ability to provide effective services to lessen its vulnerability to the hazards identified. These classifications can be viewed as a gauge of the community’s capabilities in all phases of emergency management (preparedness, response, recovery and mitigation) and are used as an underwriting parameter for determining the costs of various forms of insurance. The CRS class applies to flood insurance while the BCEGS and Public Protection classifications apply to standard property insurance. The Community Rating System (CRS) class applies to flood insurance, while the Building Code Effectiveness Grading Schedule (BCEGS) and Public Protection classifications apply to standard property insurance. CRS classifications range on a scale of 1 to 10, with class 1 being the best possible classification, and class 10 representing no classification benefit. Firewise classification is higher if the subject property is more than 1000 feet from a creditable fire hydrant and is within 5 road miles of a recognized Fire Station.

Criteria for classification credits are outlined in the following documents:

- The Community Rating System Coordinators Manual
- The Building Code Effectiveness Grading Schedule
- The ISO Mitigation online ISO’s Public Protection website at <https://www.isomitigation.com/ppc/>
- The National Weather Service Storm Ready website at <http://www.stormready.noaa.gov/index.html>
- The National Firewise Communities website at <http://firewise.org/>



Integration of Hazard Mitigation into Existing and Future Planning Mechanisms

It is the intention of the County to incorporate hazard mitigation planning and natural hazard risk reduction as an integral component of the County’s administrative, regulatory and operational framework. Such efforts which are now an ongoing part of County operations are identified in the Capability Assessment of Section 6, as well as in the completed mitigation initiatives identified in the following Section 9.1.6. In addition, the County identified specific integration activities that will be incorporated into procedures and are included in their updated mitigation strategy.

9.1.6 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and prioritization.

Past Mitigation Initiative Status

Table 9.1-7 below indicates progress on the County’s mitigation strategy identified in the 2011 Plan. Previous actions that are now ongoing programs and capabilities are indicated as such in Table 9.1-7, and also appear under “Capability Assessment” presented previously in this annex. Actions carried forward as part of this Plan update are included in the following subsection (in Table 9.1-8) with prioritization.



Table 9.1-7. Past Mitigation Initiative Status

Description	Status	Review Comments
Reconstruct Corinth Road at the Main Street Corridor in the Town of Queensbury and City of Glens Falls. Total reconstruction, upgrade utilities, and widen to 3 lanes.	Complete.	Discontinue
Replace the Middleton Bridge over the Schroon River in the Towns of Bolton and Warrensburg	Ongoing evaluation.	Project/mitigation alternatives here continued to be evaluated. Carry forward in 2016 strategy.
Replace the Tannery Road Bridge over Stony Creek in the Town of Stony Creek	Complete	Discontinue
Replace the Grist Mill Road Bridge over Stony Creek in the Town of Stony Creek	Complete	Discontinue
Replace the Woolen Mill Bridge (Milton Street) over the Schroon River in the Town of Warrensburg	Complete	Discontinue
Reconstruct Beach Road in the Town and Village of Lake George. Reconstruction, utility and drainage upgrade and multi modal safety improvements.	County work complete.	Discontinue in 2016 strategy. Project has both County and State elements; State needs to complete.
Replace the Harrington Road Bridge over Mill Creek in the Town of Thurman	Complete.	Project was actually in Johnsbury.
Alder Brook Road Bridge over Trout Brook in Chestertown	Complete.	Discontinue
Educate county residents with information regarding steps to be taken to decrease the impact of natural hazards (including ice storms, wild/forest fires, severe storms, tornado, earthquakes, and all other natural hazards) on property by developing, enhancing and implementing education programs, brochures, school presentations informing groups about ways to reduce risk, and other outreach activities.	Ongoing, with active support of OES, SWCD, WC Public Health, WC Cornell Cooperative.	The intent of this initiative shall be carried forward in a comprehensive public education and outreach initiative(s).
Monitor and remove trees/limbs in storm areas that present potential hazards to keep trees from threatening lives, property, and public infrastructure during storm events.	Ongoing.	The County has an ongoing, annually funded, contract with tree surgeons. This action is being removed from the updated strategy and identified as a mitigation capability.
Obtain funding to purchase generators for municipally-owned critical facilities.	Ongoing.	Getting estimates (summer 2015) to install permanent generators at county DPW facilities in Warrensburg, North End and South End. South End generator died recently. County DPW Facilities i.e. Old Shop, New Shop and Administration Building all have back-up generator power. North End Shop has a generator, which must be manually started. County Airport has very old generators which may not be located optimally. Toney Pit Facility has water and heat, but no backup power.
Survey functional needs populations and service facilities as to their specific and unique requirements during hazard and emergency events	Complete/Ongoing	The County has an online database/registry for functional needs populations. Mitigation actions for critical facilities have been addressed otherwise throughout the plan update.
Coordinate/create mutual aid agreements between emergency services, public works departments, and public utilities to ensure efficient use of resources during and after storm events.	Ongoing/Continuous	Discontinue in 2016 strategy. This is an established and ongoing process in the County (mitigation capability).



Table 9.1-7. Past Mitigation Initiative Status

Description	Status	Review Comments
Develop plans for debris management after hazard events, including severe winter snow/ice events, and other severe storms.	In progress – working on funding.	5-Year County plan to be coordinated with DPW, all municipalities and NYSDEC. Funding TBD.
Design a network of citizens that will check in on elderly, functional needs, and low- income individuals during major events.	Ongoing	Discontinue in 2016 strategy. This is an established and ongoing process in the County (mitigation capability).
County Office of Emergency Services will conduct a review of “FireWise Communities” guidelines to develop a Best Practices summary. Each municipality will review the summary and make modifications to their zoning practices.	No specific progress.	The intent of this initiative shall be carried forward in a comprehensive public education and outreach initiative(s).
Each jurisdiction will send a representative to the NYS Wildland Fire Suppression Training.	Ongoing/Continuous	Discontinue in 2016 strategy. This is an established and ongoing process in the County (mitigation capability). The County offers training annually and all municipalities attend.
DEC will inform county about shared services in Draft Plan to educate fire departments on DEC Wildfire Management Draft Plan.	No progress – this is a DEC responsibility.	Discontinue in 2016 strategy.
Municipal executive to require Code Enforcement Officer to present building guideline details in the jurisdiction relating to severe storms, earthquake, and other natural hazard events to ensure existing storm-related building codes are enforced per the current code. Provide training for local code enforcement officials to implement building codes that reflect disaster resistant construction for new structures and renovation.	Ongoing/Continuous.	The intent of this initiative to be incorporated into the County-wide capability building initiatives.
Provide residents with information listing steps taken to lessen potential flood damage and increase knowledge of NFIP services to reduce the impact of flooding.	Ongoing/Continuous	The intent of this initiative shall be carried forward in a comprehensive public education and outreach initiative(s).
Maintain cleared areas around roadways (obstructions of groundwater, infestation), including: <ul style="list-style-type: none"> - areas around Truesdale Hill Road, Prospect Mountain, Sewell Street area, Town of Lake George - areas around Riverside Station Road, River Road, Town of Johnsburg - all county roads 	Ongoing	Discontinue. Beaver Dams are being addressed in other initiatives. This is a monitoring and management program.



Table 9.1-7. Past Mitigation Initiative Status

Description	Status	Review Comments
<p>Elevate or reroute roadways and bridges to avoid flooding. Specific locations include:</p> <ul style="list-style-type: none"> - River Road, Sky-High Road, West Stony Creek Road (Town of Thurman) - Pack Forest Road Bridge, Alden Avenue Extension (Town of Warrensburg) - Hill Road, Hayford Road, River Road (Town of Horicon) - Barney Hill Road Baker’s Mills area (Town of Johnsbury) - All county roads 	Ongoing	<p>A number of these projects have been completed (see earlier in this table). Several locations are susceptible to ice jam flooding, however no plans are in the works to elevate.</p> <p>Most of the bridge replacements have been federally funded.</p> <p>They are really getting a good handle on bridges. After 2011, by the time they put things together they had addressed a lot of drainage issues.</p> <p>DPW and Transportation council to help develop a list – bridges and roads and culverts.</p>
<p>Encourage participating NFIP communities within the County to begin participation in CRS and inquire as to their points toward current status</p>	No progress	<p>This initiative is being discontinued as the flood risk throughout the County is not sufficient to support extensive County-led efforts to promote CRS local participation. However, the County shall continue to include NFIP and CRS information within its public education and outreach programs.</p>
<p>Identify and examine culverts in affected areas regularly, remove obstructions to surface water drainage as necessary</p>	Ongoing	<p>Bloody Pond Road (Lake George) – large culvert replacement done.</p> <p>County continues to look at areas for culvert upgrades that are much more cost effective and efficient than roadway elevations.</p>
<p>Identify and examine stormwater drains and catch basins in affected areas, follow County DPW guidelines for maintenance</p>	Ongoing	<p>Carry forward in 2016 strategy. The County is an MS4 community within the Glen Falls and Lake George area. SWCD is the County SW Management Officer and have done all the mapping within the MS4 area. By end of next year they will have the whole county mapped by end of 2016. County GIS (Planning) maintains all of this data.</p> <p>SWCD gets the grants to fund the county projects – improvements.</p>
<p>Create effective flood mitigation activities for “hot spots” within the county by encouraging and supporting mitigation action implementation in flood areas.</p>	Ongoing.	<p>Discontinue. This has been replaced by specific actions and initiatives in the updated strategies (County and local).</p>
<p>Educate the community on benefits of carrying NFIP policies</p>	Ongoing.	<p>This shall be incorporated in County-Level Public Outreach and Education Initiative(s)</p>



Table 9.1-7. Past Mitigation Initiative Status

Description	Status	Review Comments
Planning 1: Identify new flood data and prioritize areas, and ensure County web site has all current and updated information on flood prone areas.	Ongoing.	A modified version of this initiative has been carried forward, as well as included within the County-Level Public Outreach and Education Initiative(s).
Planning 2: Review and update, as necessary, all municipal zoning and emergency codes to ensure all jurisdictions have flood damage prevention codes that identify flood hazard areas	Limited progress. The County can review and provide recommendations and continued support as requested by locals.	A modified version of this initiative has been carried forward in the updated County mitigation strategy.
Planning 3: Review and update local plans to integrate goals, objectives, and activities from this HMP which are not found in existing regulatory documents, as appropriate	No progress. The County has no implicit authority to make such updates to local plans.	A modified version of this initiative has been carried forward in the updated County mitigation strategy.
Disseminate via Warren County web page of all warning systems in place and how the public should notify officials of a potential hazard to increase public awareness of hazard warning systems	Ongoing.	The intent of this initiative shall be carried forward in a comprehensive public education and outreach initiative(s).
Planning 4: Maintain a current inventory of at-risk buildings and infrastructure and continually update inventory of at-risk structures in each jurisdiction	Ongoing, including as part of this plan update effort.	A modified version of this initiative has been carried forward in the updated County mitigation strategy.
Planning 5: Maintain list of year built and level of protection for each critical facility relating to all applicable hazards <ul style="list-style-type: none"> - Conduct a study to determine year built, and level of vulnerability for each critical facility 	Ongoing, including as part of this plan update effort.	A modified version of this initiative has been carried forward in the updated County mitigation strategy.
Apply for grants to assist with mitigation activities needed to provide a level of protection for critical facilities.	Ongoing/Continuous	Discontinue in 2016 strategy. Efforts to secure grant funding is part of the implementation process of a number of the mitigation projects identified in the updated strategy.
Develop and hold public hearings related to the inclusion of mitigation activities in local laws. Encourage the public collaborate on mitigation efforts and foster communication and collaboration between the County and municipalities.	Ongoing.	The intent of this initiative shall be carried forward in a comprehensive public education and outreach initiative(s).
Increase communication and cooperation between County/local DPW and County/local emergency services. Link emergency services with hazard mitigation programs.	Ongoing	Discontinue. County has cooperative agreements with municipalities for use of personnel and equipment.
Develop an outreach program to inform public about options available for hazard insurance, and encourage homeowners to buy when possible.	Ongoing.	The intent of this initiative shall be carried forward in a comprehensive public education and outreach initiative(s).
Continue education, training and updated information to Municipal Floodplain Administrators to ensure code enforcement and inspection services.	Ongoing/Continuous	The intent of this initiative to be incorporated into the County-wide capability building initiatives.



Table 9.1-7. Past Mitigation Initiative Status

Description	Status	Review Comments
Implement zoning regulations to discourage building new structures in disaster prone areas.	No progress.	Discontinue. The County has no regulatory authority to implement.
Create a centralized library of all documents used and required for mitigation activities.	Complete.	Physical and electronic “libraries” maintained at SWCD and WCOES. Further, many of these documents are maintained and made available on the County website.



Completed Mitigation Initiatives not Identified in the Previous Mitigation Strategy

Warren County has identified the following mitigation projects/activities that have also been completed but were not identified in the previous mitigation strategy in the 2011 Plan:

- 2008 New upgraded gate installation for County-owned lower dam on Mill Pond (aka Lower Brant Lake Dam) in the Town of Horicon.

Proposed Hazard Mitigation Initiatives for the Plan

Warren County participated in a mitigation action workshop in September 2015 and was provided the following Federal Emergency Management Agency (FEMA) publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 ‘Selecting Appropriate Mitigation Measures for Floodprone Structures’ (March 2007) and FEMA ‘Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards’ (January 2013).

Table 9.1-9 summarizes the comprehensive-range of specific mitigation initiatives Warren County would like to pursue in the future to reduce the effects of hazards. Some of these initiatives may be previous actions carried forward for this plan update. Implementation of these initiatives will depend on available funding (grants and local match availability), and some initiatives may be modified or omitted at any time based on occurrence of new hazard events and changes in County priorities. The four FEMA mitigation action categories are listed in Table 9.1-9 to further demonstrate the wide range of activities and mitigation measures selected.

As discussed in Section 6, 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing your actions as ‘High’, ‘Medium’, or ‘Low.’ The table below summarizes the evaluation of each mitigation initiative, listed by Action Number.

Table 9.1-9 summarizes prioritization of all proposed mitigation initiatives for the Plan update.



Table 9.1-8. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals / Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
Department of Public Works											
WC-1	Remove the Middleton Bridge over the Schroon River in the Towns of Bolton and Warrensburg. (Revised from 2011 strategy)										
	See above.	Existing	Flood; Severe Storm	1	WCDPW, A/GFTC, Towns of Bolton and Warrensburg	High – reduced local flood risk	High	FHWA/NYS DOT	2018	Low	SIP
WC-2	Backup Power for Critical DPW Facilities: Install or upgrade backup power systems at the County DPW facilities including the Toney Pit Facility and DPW facilities at Warrensburg, North End and South End.										
	See above.	Existing	All Hazards resulting in loss of electricity	1, 3	WCDPW	High – Maintain critical facilities and services	High – Site specific	County budgets; FEMA grants as available	Short Term - In progress	Medium - High	SIP
WC-3	Backup Power for County Airport: Replace/upgrade backup power systems at the county-owned Floyd Bennett Memorial Airport (GFL) in Queensbury, considered a county critical facilities. 2 generators, one portable. Will handle runway lights, building and gas pumps, but only when portable generator is started. Multiple generators here are very old, and may not be located optimally. Evaluate the need for replacement/upgrades, including consideration of relocation.										
	See above.	Existing	All Hazards resulting in loss of electricity	1, 3	County DPW – Airport Administration Division	High – Maintain critical facilities and services	Medium	County budgets; FEMA grants as available	Long term DOF	Medium - DOF	SIP
WC-4	Human Services Building Backup Power Improvements: Install a new transfer switch to all systems in building. Generator will handle entire building at this time though it is not set up to do so.										
	See above.	Existing	All Hazards resulting in loss of electricity	1, 3	WCDPW – Facilities Committee	High – Maintain critical facilities and services	Medium	County budget	Short Term- In progress	Low	SIP
WC-5	County Fuel Supply Resiliency: Assure that the County has adequate fueling facilities, resistant to power outages and properly distributed, so that emergency vehicles and equipment are able to respond to, and support recovery from, hazard events and disasters in the County and region. County has half a dozen fueling locations. <ul style="list-style-type: none"> • DPW Locations: North End and Warrensburg have backup power. South End has no fueling. • County Airport has a fueling station – portable backup power covers their fueling station. • County Center - Gas pumps will operate from existing generator at the complex. Unleaded fuel only; no diesel. • Johnsburg-North Creek: Has generator, but is manual. Should have a transfer switch and may be better off replacing entire system due to cost, age and NYSDEC requirements of the fueling setup. • County-owned fueling facilities, located in the following Towns: <ul style="list-style-type: none"> ○ Hague ○ Bolton ○ Horicon ○ Luzerne 										
	See above.	Existing	All hazards requiring	1, 3	WCDPW	High - Maintain	Medium - High	County budget	Short	Low	EM*





Table 9.1-8. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals / Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
			DPW response and recovery support			critical facilities and services					
WC-6	County DPW Projects: Bridges, Roads, Culvert upgrades/mitigation. Specific projects noted are: <ul style="list-style-type: none"> • Back To Sodom Road Bridge (Johnsburg) • Market Street Bridge (Horicon) • Padanarum Road Bridge #2 (Bolton) • Blair Road Bridge (Horicon) • Bay Road (Queensbury) - Reconstruction • Round Pond Road, Queensbury Avenue, and Boulevard Road (Queensbury) – Rehabilitation • Continuing Maintenance of all bridges and culverts Assure that any mitigation addresses the 500-year flood event or “worst damage scenario”.										
	See above.	Existing	Flood, Severe Storm, Severe Winter Storm; Earthquake; Landslide	1	WCDPW, A/GFTA; working with local municipalities and NYSDOT	High	High	County Budget, FHWA Grant and NYSDOT Grants	Long Term	Medium	SIP
WC-7 (HMGP LOI)	County Route 11 Flood Mitigation Project: At this time, the Warren County Department of Public Works is seeking assistance to: <ol style="list-style-type: none"> (1) Develop a hydrologic study and, (2) Develop a remediation plan. The hydrologic study will identify the existing and potential water inputs into the watershed and will detail out storm derived water volumes, detention volumes and, peak unit discharges. The remediation plan will be developed based off of the technical data that the hydrologic study has calculated. The remediation plan will incorporate traditional and alternative designs for stabilization, drainage and roadway construction at this location. Once completed, the study and plan will provide guidance to the County DPW with its decision making to mitigate for future losses of this roadway. Assure that any mitigation addresses the 500-year flood event or “worst damage scenario”.										
	See above.	Existing	Flood, Severe Storm	1, 5	WCDPW	Medium – improved understanding to develop appropriate mitigation measures	Low	County Budget	Long Term	Low	SIP, NSP
WC-8	Landslide – 13 th Lake Road (County Route 78) – Unstable slope – vulnerability is County Road. Continue to evaluate possible mitigation actions; implement once designed and funding is secured. Added Gabion baskets. There is a private property issue – land rights, acquisition issues here. No determinations as to what to do. Tough spot with not much room. In Johnsburg next to Hamilton County line.										



Table 9.1-8. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals / Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	See above.	N/A	Landslide	1	WCDPW	Medium	Medium	County Budget	Long Term	Low	SIP
Office of Emergency Services											
WC-9	Countywide Debris Management Plan: Develop plans for debris management after hazard events, including severe winter snow/ice events, and other severe storms. 5-Year County plan to be coordinated with DPW, all municipalities and NYSDEC. Include consideration of invasive species (e.g. Asian Longhorn Beetle, Emerald Ash Borer) on the generation of vegetative debris, and the overall management of that debris. This plan shall consider the debris management challenges presented by the 500-year event.										
	See above.	N/A	Severe Storm; Severe Winter Storm; Infestation	3, 4	WCOES, WCDPW; A/GFTC; all municipalities	Medium - High	\$50,000-75,000	OES 5-year Capital Plan; available grants; A/GFTPA	5 Years	Medium - DOF	LPR, EM*
WC-10	Develop County COOP/COG Plan: A County COOP/COG plan will have provisions in place for notification, what facilities/services must be continuous, which ones must be available when, alternate locations. Municipalities would need to develop their own COOP plans.										
	See above.	See above.	See above.	See above.	See above.	See above.	See above.	See above.	See above.	See above.	See above.
WC-11	County-Wide Housing Location/Relocation Planning Initiative for Disaster Displaced Residents and Structures: Warren County Office of Emergency Services to develop and implement a program to work with all Warren County municipalities to identify sites within the community suitable for relocation of houses out of the floodplain, or building new houses once properties in the floodplain are demolished. As part of this program, all communities will be surveyed to identify potential sites, including any pre-disaster actions that may be required to make them viable for these purposes. Further, this effort will include working with other County departments and regional and local stakeholders who own or manage potentially suitable sites (e.g. County parks) for the potential siting of temporary housing, and determining what improvements would need to be made to accommodate temporary housing (e.g. water, electric, sanitary services, bathing facilities), and that outside funding would likely be needed if such improvements were not already available.										
	See above.	Both	All hazards requiring temporary or permanent relocation	1, 2, 4, 5	WCOES, working with all municipalities and other County departments and agencies	Improved ability to temporarily or permanently relocate hazard-prone or disaster affected residents and property	Low - Medium	County and local budgets (identification of suitable sites); grant funding for site improvements as needed	Within one year of plan update approval	High	SIP
Department of Planning and Community Development											
WC-12	As new NFIP flood data and mapping is made available, ensure County web site has all current and updated information on flood prone areas.										
	See above.	N/A	Flood; Severe Storm	1, 2	WCDPCD; working with WCOES	Medium	Low	Department Budget	As information is made available	High	LPR, EAP
WC-13	Encourage local municipalities to review their codes (specifically municipal zoning and emergency codes), and provide support for such reviews and amendments at the request of local governments. This review should help to ensure that all jurisdictions have flood damage prevention codes that appropriately regulate activities in flood hazard areas. It is noted that the County does not have any Land Use Codes and cannot require local municipalities to adopt or modify their local codes. The County can and will encourage local municipalities to review										





Table 9.1-8. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals / Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	their codes to determine if there are any mitigations measures that can be included in any amendments.										
	See above.	N/A	All Hazards	1, 3	WCDPCD; working with municipalities	Medium	Low	Department Budget	Ongoing	High	LPR
WC-14	Review and update County and municipal plans to integrate goals, objectives, and activities from this HMP which are not found in existing regulatory documents, as appropriate.										
	See above.	N/A	All Hazards	1, 3	WCDPCD and WCSWCD; working with municipalities as appropriate	Medium	Low	Department Budget	Ongoing	High	LPR
WC-15	Continue to enhance and maintain the critical facility database developed during, and as a critical part of, this hazard mitigation plan update process. Continue to leverage this database to identify vulnerable critical facilities in support of mitigation action WC-18 and -19 below.										
	See above.	Existing	All Hazards	1, 3, 4	WCDPCD; working with municipalities and WCOES	Medium	Low	Department Budget	Ongoing	High	LPR
Soil and Water Conservation District											
WC-16	County Stormwater Management/MS4: Complete county-wide mapping for stormwater management and MS4 compliance. Continue to support and implement stormwater improvement projects as funding is made available (typically through State). The County is an MS4 community within the Glens Falls and Lake George area. SWCD is the County S/W Management Officer and have done all the mapping within the MS4 area. They will have the countywide MS4 area mapped by end of 2016.										
	See above.	N/A	Flood; Severe Storm	2, 4, 5	WC SWCD; working with all MS4 municipalities	Medium	Medium	District Budget	Ongoing-mapping will be completed by end of 2016.	High - Ongoing	LPR, NSP, EAP
Office of Emergency Services / Soil and Water Conservation District											
WC-17	Provide applicable support to municipalities as they maintain local compliance with and good-standing in the NFIP including adoption and enforcement of floodplain management requirements (e.g. regulating all new and substantially improved construction in Special Hazard Flood Areas), floodplain identification and mapping, and flood insurance outreach to the community. Further assist communities with meeting and/or exceeding the minimum NFIP standards and criteria through the following NFIP-related actions identified in subsequent initiatives, as follows: <ul style="list-style-type: none"> Local Support of Private-Property Mitigation Public Outreach <ul style="list-style-type: none"> Website Direct outreach and information program to RL/SRL and other flood-prone property owners Promote local participation in ongoing map update efforts Flood Damage Prevention Ordinance (FDPO) Updates, and Higher Regulatory Standards Building Local Floodplain Management Capabilities through training and seminars 										
	See above.	New and Existing	Flood	1, 2, 4, 5	County (WCSWCD and WCOES), working with municipalities (primarily through local floodplain administrator); with support from NYS DEC, NYS DHSES,	Medium - High	Low-Medium	County Budget	Ongoing	High	LPR, EAP





Table 9.1-8. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals / Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category	
					ISO, FEMA							
WC-18	Promote the mitigation of vulnerable structures via retrofit (e.g. elevation, flood-proofing) or acquisition/relocation to protect structures from future damage, with Critical Facilities and NFIP Repetitive Loss (RL) and Severe Repetitive Loss (SRL) properties as a priority. The County shall provide local support as applicable and feasible, which may include direct outreach to flood-prone property owners, specifically those identified as Critical Facilities, as NFIP RL/SRL or otherwise identified as flood-prone, and working with interested and voluntary property owners to mitigate their properties based on available funding from FEMA and local match availability.	See above.	Existing	Flood	1, 2, 4	County (WCSWCD and WCOES), working with municipalities (primarily through local floodplain administrator); with support from NYS DEC, NYS DHSES, ISO, FEMA	High	Low - Medium (for County level support of local efforts)	County Budget to provide local (non-funding) support; FEMA Mitigation Grant Programs and local budget (or property owner) for cost share to implement mitigation projects	Ongoing (outreach and specific project identification); Long term DOF (specific project application and implementation)	High	EAP
WC-19	Develop and implement an enhanced all-hazards, public outreach / education / mitigation information program on natural hazard risks and what they can do in the way of mitigation, preparedness (including flood insurance), and response in the event of an emergency. This program will: <ul style="list-style-type: none"> • Provide links to available natural hazard risk reduction information, including County, State and Federal websites. • Provide seasonal education, notification and warnings (flooding, severe storms, structural and wildfires) via the county webpages, newsletters, mobile application and other media. • Prepare and distribute the Emergency Preparedness booklets, distributed at fairs, open houses, public offices and places of mass gathering. • Promote the HyperReach Emergency Notification System, as well as the County public education and notification application (supports evacuation and sheltering notification and instructions). • Leverage recent participation in NOAA’s StormReady program. • Increase outreach to promote subscription to the Special Needs Registry. • Promote “Climate Smart Community” and “Firewise” programs in the County. <p>In addition, the County will work with municipalities to provide outreach to special purpose districts (e.g. school districts, fire districts) and private owners of critical facilities that have been identified as specifically vulnerable (e.g. within an NFIP-delineated 100- or 500-year floodplain) explaining their risk and identifying mitigation options, including the availability of grant funding. This outreach shall identify the need to protect critical facilities to the 500-year event or “worst damage scenario”.</p>	See above.	N/A	All hazards	1, 2, 3, 4	WCSWCD; WCOES; other County Departments as applicable	Medium	Low	County Budget	Ongoing	High	EAP
WC-20	County and Local Mitigation Capability Building: Arrange/facilitate and/or promote regional workshops, trainings and continuing education (prepared and offered by others) in the following areas: <ul style="list-style-type: none"> • Floodplain Management and the Certified Floodplain Managers (CFM) certification • Community Rating System (CRS) – Limited to promoting workshops or training opportunities offered by others as available • Stream Intervention Programs (ongoing with WCSWCD) • Benefit-Cost Analysis (BCA) 											



Table 9.1-8. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals / Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	<ul style="list-style-type: none"> Substantial Damage Estimating (SDE) NFIP Elevation Certificates (EC) 										
	See Above	N/A	All hazards including climate change	1, 2, 3, 4	County, through WCSWCD and WCOES; as supported by NYS DHSES, FEMA and ISO; with participation of all municipalities and other County department and agencies	High – Improved county and local floodplain management, mitigation and recovery capabilities	Medium	County and local Budgets (generally limited to staff time)	Ongoing – as programs are available	Medium	EAP, EM*
WC-21	The City of Glens Falls and the Towns of Lake Luzerne and Queensbury are currently in an active process to update NFIP mapping within the Hudson-Hoosic Watershed. As of November 2016, FEMA and NYS DEC are presenting work maps for the Hudson-Hoosic Watershed, and seeking public and stakeholder comment. To the extent applicable and feasible, the County shall use all available means of promoting broad local government and public involvement through announcing meetings and providing available supporting data as applicable.										
	See above.	N/A	Flood	1, 2, 4	County, through WCSWCD and WCOES; promoting FEMA and NYS DEC map update efforts	Medium	Low	County Budget	Short; Ongoing	High	EAP, LPR
WC-22	Provide support to municipalities as they work to update and enhance local floodplain management regulatory capabilities through the following activities: <ul style="list-style-type: none"> Update and adopt the local Flood Damage Protection Ordinance (FDPO) to conform to latest regulations and guidance (see http://www.dec.ny.gov/lands/39341.html for guidance on model ordinances), including the following: <ul style="list-style-type: none"> Proper identification of “Administrator” Proper reference to current regulatory mapping and any other “best available data” being used Higher Regulatory Standards (per local interest): <ul style="list-style-type: none"> Additional Freeboard Cumulative Substantial Damages/Improvements 										
	See above.	New and Existing	Flood	1, 4	County, through WCSWCD and WCOES; promoting FEMA and NYS DEC	Medium	Low	County Budget	Short; Ongoing	High	LPR
WC-23	The County shall review and incorporate the latest information on climate change projections while considering planning, engineering and undertaking mitigation actions and other projects throughout the County. Specifically, the County shall refer to the latest ClimAID “Responding to Climate Change in New York State” reports (2011, and 2014 Supplement) developed by the New York State Energy Research and Development Authority (NYSERDA), as well as other state and nationally-recognized, peer-reviewed, science-based sources of climate projection data and information, as available.										
	See Above	N/A	All hazards including climate change	All Goals	All County departments and agencies	High	Low	County Budgets	Short; Ongoing	Medium	LPR





Table 9.1-8. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals / Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
WC-24	The County shall promote both County and municipal participation in the NYSDEC Climate Smart Communities (CSC) program through the following activities: Include information on the CSC program, benefits and participation requirements and activities on the County website. See: http://www.dec.ny.gov/energy/76483.html Inform County and municipal representatives of Climate Smart Community Webinar offerings, and other related informational events offered through the Program. See: http://www.dec.ny.gov/energy/76910.html										
	See Above	N/A	All hazards including climate change	All Goals	All County departments and agencies; municipalities	High	Low	County Budgets	Short; Ongoing	Medium	LPR
WC-25	<p>Floodprone Critical Facilities in Warren County –</p> <ol style="list-style-type: none"> 1. Identify Critical Facilities at which the structures or the parcel are located wholly or partially within the 100-year floodplain. The County will compile the names, types, locations of facilities and their relationships to the flood zone(s). 2. Once the Critical Facilities are identified, identify appropriate level of protection for the facilities. Indicate whether there is no history of flooding and conditions exist where future damage is unlikely or if there is a history of flooding or future damage is likely based on existing conditions. For those facilities that have been damaged previously, identify any known protection measures already in place. <ol style="list-style-type: none"> a. If protective measures are in place, evaluate potential long-term mitigation actions to eliminate the need for response b. If no protective measures are in place, assemble a planning team to collaborate on mitigation alternatives to reduce or eliminate the vulnerability to flooding. The Critical Facilities that fall into this category will be protected to a 500-year flood event. 3. Timeframe for this action is as follows: <ol style="list-style-type: none"> a. 6 months: convene a meeting of communities and stakeholders for critical facilities in the floodplain to assess response or mitigation measures; develop a prioritized list based on extent of past damages, the relative isolation of the facility, the number of residents dependent on it, etc. b. 12 months: meet and then conduct site visits with NYS DHSES mitigation staff using the prioritized list; c. 24 months: prepare complete on-site information for the stakeholders; who is responsible for coordinating the action; what is needed for each facility during a flooding event; who is contacted to obtain the needed supplies d. 24 months: complete worksheets for all vulnerable critical infrastructure in Warren County 										
	See Above	New and Existing	Flood	All Goals	County OEM and NYS DHSES	High	Medium	County Budget, Grant Funding where Available	Short Term (see above)	High	LPR, EAP
Regional PNP Initiatives (from LOIs)											
LOI - PNP	Generator Installations - NYSARC, Inc., Warren-Washington and Albany Counties Chapter: Installation of generators at 19 residential site and 1 day habilitation site (used for emergency evacuations). The installation of generators at these sites will provide back-up power to facilitate the ongoing care of individuals with sensitive medical and behavioral needs.										
	See above.	Existing	All hazards resulting in loss of electric service	1, 3	NYSARC, Inc., Warren-Washington and Albany Counties Chapter	High – maintenance of critical facility operations serving vulnerable populations	Medium - High	Applied for HMGP funding (Sandy); NYSARC for local share	TBD	TBD	SIP
LOI - PNP	Generator for emergency shelter at administrative offices - NYSARC, Inc., Warren-Washington and Albany Counties Chapter: The mitigation measure we are proposing is to install a 200 KW backup power system that will provide sufficient power to our facility in the event of a natural disaster that required us to evacuate all of our group homes. This would allow us to use our facility as a shelter to meet the medical, behavioral, and other unique needs of the vulnerable population we serve and not tax other community shelters.										
	See above.	Existing	All hazards resulting in loss of electric	1, 3	NYSARC, Inc., Warren-Washington and Albany Counties Chapter	High – maintenance of critical facility operations	Medium - High	Applied for HMGP funding (Sandy); NYSARC for	TBD	TBD	SIP



Table 9.1-8. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals / Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
			service			serving vulnerable populations		local share			

Notes:

*EM = Emergency Management initiative; not necessarily “mitigation”

Not all acronyms and abbreviations defined below are included in the table.

*Does this mitigation initiative reduce the effects of hazards on new and/or existing buildings and/or infrastructure? Not applicable (N/A) is inserted if this does not apply.

Acronyms and Abbreviations:

- CAV Community Assistance Visit
- CRS Community Rating System
- DPW Department of Public Works
- FEMA Federal Emergency Management Agency
- FPA Floodplain Administrator
- HMA Hazard Mitigation Assistance
- N/A Not applicable
- NFIP National Flood Insurance Program
- WC Warren County
- WCOES Warren County Office of Emergency Services
- WCDPCD Warren County Department of Planning and Community Development
- WCSWCD Warren County Soil and Water Conservation District
- WCDPW Warren County Department of Public Works

Potential FEMA HMA Funding Sources:

- FMA Flood Mitigation Assistance Grant Program
- HMGP Hazard Mitigation Grant Program
- PDM Pre-Disaster Mitigation Grant Program
- RFC Repetitive Flood Claims Grant Program (discontinued)
- SRL Severe Repetitive Loss Grant Program (discontinued)

Timeline:

- Short 1 to 5 years
- Long Term 5 years or greater
- OG On-going program
- DOF Depending on funding

Costs:

Where actual project costs have been reasonably estimated:

- Low < \$10,000
- Medium \$10,000 to \$100,000
- High > \$100,000

Where actual project costs cannot reasonably be established at this time:

- Low Possible to fund under existing budget. Project is part of, or can be part of an existing on-going program.
- Medium Could budget for under existing work plan, but would require a reapportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.
- High Would require an increase in revenue via an alternative source (i.e., bonds, grants, fee increases) to implement. Existing funding levels are not adequate to cover the costs of the proposed project.

Benefits:

Where possible, an estimate of project benefits (per FEMA’s benefit calculation methodology) has been evaluated against the project costs, and is presented as:

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

Where numerical project benefits cannot reasonably be established at this time:

- Low Long-term benefits of the project are difficult to quantify in the short term.
- Medium Project will have a long-term impact on the reduction of risk exposure to life and property, or project will provide an immediate reduction in the risk exposure to property.
- High Project will have an immediate impact on the reduction of risk exposure to life and property.

Mitigation Category:

- Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.





- *Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*
- *Natural Systems Protection (NSP) – These are actions that minimize damage and losses, and also preserve or restore the functions of natural systems.*
- *Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities*



Table 9.1-9. Summary of Prioritization of Actions

Mitigation Action / Project Number	Mitigation Action/Initiative	Life Safety	Property Protection	Cost-Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
WC-1	Remove the Middleton Bridge over the Schroon River	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Low
WC-2	Backup Power for Critical DPW Facilities	1	1	1	1	0	0	0	0	1	1	1	0	1	0	8	Medium - High
WC-3	Backup Power for County Airport	1	1	1	1	0	0	0	0	1	1	1	0	0	0	7	Medium
WC-4	Human Services Building Backup Power Improvements	1	1	1	1	0	0	0	0	1	0	1	0	0	0	6	Low
WC-5	County Fuel Supply Resiliency	1	1	1	1	0	0	0	0	0	1	1	0	0	0	6	Low
WC-6	County DPW Projects: Bridges, Roads, Culvert upgrades/mitigation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Medium
WC-7	County Route 11 Flood Mitigation Project	1	1	1	1	0	0	0	0	0	1	1	0	0	0	6	Low
WC-8	Address unstable slope at 13 th Lake Road (County Route 78)	1	1	1	1	0	0	0	0	0	1	1	0	0	0	6	Low
WC-9	Develop Countywide Debris Management Plan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Medium
WC-10	Develop County COOP/COG Plan	1	1	1	1	0	1	0	0	1	1	1	0	1	0	9	High
WC-11	County-Wide Housing Location/Relocation Planning Initiative for Disaster Displaced Residents and Structures	1	1	1	1	0	1	0	0	1	1	1	0	1	0	9	High
WC-12	Support FEMA efforts to update Countywide NFIP mapping	1	1	1	1	0	1	0	0	1	1	1	0	1	0	9	High
WC-13	Support local code updates, particularly where it relates to hazard risk issues	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	High
WC-14	Integrate County and local plans with this HMP Update	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	High
WC-15	Maintain the critical facility database developed during this hazard mitigation plan update process	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	High
WC-16	County Stormwater Management/MS4	1	1	1	1	0	1	0	0	1	1	1	0	1	0	9	High
WC-17	Continued and Enhanced local NFIP participation support	1	1	1	1	1	1	0	0	1	1	1	1	1	1	12	High
WC-18	Promote mitigation of vulnerable structures, including RL/SRL	1	1	1	1	0	1	0	0	1	1	1	1	1	1	11	High
WC-19	Develop and implement an enhanced all-hazards, public outreach / education / mitigation information program on natural hazard risks	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	High
WC-20	County and Local Mitigation Capability Building	1	1	1	1	0	0	0	0	1	1	1	0	1	0	8	Medium
WC-21	County level support to Hudson-Hoosic watershed communities during ongoing NFIP map updates	0	1	1	1	1	1	0	0	1	1	0	1	1	1	10	High
WC-22	County level support to municipalities as they update and enhance local floodplain management regulatory capabilities	1	1	1	1	1	0	0	0	1	1	1	1	1	1	11	High
WC-23	Incorporate climate change science into relevant county	0	1	1	0	0	1	0	1	1	1	1	1	0	1	9	Medium





Mitigation Action / Project Number	Mitigation Action/Initiative	Life Safety	Property Protection	Cost-Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
	plans, programs and projects																
WC-24	Promote both County and municipal participation in the NYSDEC Climate Smart Communities (CSC) program	0	1	1	0	0	1	0	1	1	1	1	1	0	1	9	Medium
WC-25	Floodprone Critical Facilities in Warren County	1	1	1	1	1	0	0	1	1	1	0	1	1	0	10	High
LOI - PNP	Generator Installations –20 sites operated by NYSARC, Inc., Warren-Washington and Albany Counties Chapter	1	1	1	1	0	1	0	0	1	1	1	0	1	0	9	High
LOI - PNP	Generator for emergency shelter at administrative offices - NYSARC, Inc., Warren-Washington and Albany Counties Chapter	1	1	1	1	0	1	0	0	1	1	1	0	1	0	9	High

Note: Refer to Section 6 which contains the guidance on conducting the prioritization of mitigation actions. Where the community has determined that the original priority ranking for “carry forward” initiatives remains valid, the earlier priority ranking is indicated on the prioritization table, however the 2016 criteria ratings are indicated with a null “-” marking.



9.1.7 Future Needs To Better Understand Risk/Vulnerability

None at this time.

9.1.8 Hazard Area Extent and Location

Hazard area extent and location maps have been generated for Warren County that illustrate the areas probable to be impacted within the County. These maps are based on the best available data at the time of the preparation of this Plan, and are considered to be adequate for planning purposes. Maps have been generated for those hazards (i.e., landslide, wildfire and flooding) that can be clearly identified using mapping techniques and technologies, and to which the County has significant exposure. These maps appear in the hazard profiles within Section 5.4, Volume I of this Plan.

9.1.9 Additional Comments

None at this time.



Name of Jurisdiction:	Warren County
Name and Title Completing Worksheet:	Jeffrey Tennyson, P.E., DPW Superintendent
Action Number:	WC-1
Action Name:	Remove the Middleton Bridge over the Schroon River in the Towns of Bolton and Warrensburg

Assessing the Risk	
Hazard(s) addressed:	Flood; Severe Storm
Specific problem being mitigated:	Bridge is in need of removal
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	1. Remove the Middleton Bridge over the Schroon River in the Towns of Bolton and Warrensburg
	2. Do nothing – current problem continues
	3. No other feasible options were identified
Action/Project Intended for Implementation	
Description of Selected Action/Project	Remove the Middleton Bridge over the Schroon River in the Towns of Bolton and Warrensburg. (Revised from 2011 strategy)
Mitigation Action/Project Type	SIP
Goals Met	1
Applies to existing structures/infrastructure, future, or not applicable	Existing
Benefits (losses avoided)	High – reduced local flood risk
Estimated Cost	High
Priority*	Low
Plan for Implementation	
Responsible Organization	WCDPW, A/GFTC, Towns of Bolton and Warrensburg
Local Planning Mechanism	Capital Improvement
Potential Funding Sources	FHWA/NYS DOT
Timeline for Completion	2018
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:

* Refer to results of Prioritization (see next page)



Action Number: WC-1
Action Name: Remove the Middleton Bridge over the Schroon River in the Towns of Bolton and Warrensburg

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	0	No direct impact on life safety.
Property Protection	1	Reduces local flood risk.
Cost-Effectiveness	-1	Cost-effectiveness is unlikely, but not fully determined
Technical	1	County has the technical capabilities to implement
Political	0	Multi-jurisdictional; removal not supported universally
Legal	0	Multi-jurisdictional; removal not supported universally
Fiscal	-1	High cost, funding not secured.
Environmental	1	No environmental constraints. Some minor benefits (stream restoration)
Social	1	No social constraints
Administrative	1	County has the administrative capabilities to implement
Multi-Hazard	0	
Timeline	-1	Long Term
Agency Champion	0	
Other Community Objectives	0	
Total	2	
Priority (High/Med/Low)	Low	



Name of Jurisdiction:	Warren County
Name and Title Completing Worksheet:	Jeffrey Tennyson, P.E., DPW Superintendent
Action Number:	WC-2
Action Name:	Backup Power for Critical DPW Facilities

Assessing the Risk	
Hazard(s) addressed:	All Hazards resulting in loss of electricity
Specific problem being mitigated:	Lack of backup power for critical facilities; prevents facilities from functioning properly during power outages
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	Other than installing stand-alone backup power generation, no feasible or cost-effective alternatives are available for serious consideration. Tree-trimming is an on-going effort throughout the County. Alternatives such as burying all power lines, secondary grid feeds and "micro-grids" are cost-prohibitive and outside the capabilities of the DPW.
Action/Project Intended for Implementation	
Description of Selected Action/Project	Backup Power for Critical DPW Facilities: Install or upgrade backup power systems at the County DPW facilities including the Toney Pit Facility and others at Warrensburg, North End and South End. The County is currently (summer 2015) getting estimates for new installations and/or upgrades. The South End generator died recently. County DPW Facilities i.e. Old Shop, New Shop and Administration Building all have back-up generator power. North End Shop has a generator, which must be manually started. The Toney Pit Facility has water and heat, no backup power supply.
Mitigation Action/Project Type	SIP
Goals Met	1, 3
Applies to existing structures/infrastructure, future, or not applicable	Existing
Benefits (losses avoided)	High – Maintain critical facilities and services
Estimated Cost	High – Site specific
Priority*	Medium - High
Plan for Implementation	
Responsible Organization	WCDPW
Local Planning Mechanism	Emergency Management, Hazard Mitigation
Potential Funding Sources	County budgets; FEMA grants as available
Timeline for Completion	Short Term- In progress
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:

* Refer to results of Prioritization (see next page)



Action Number:

WC-2

Action Name:

Backup Power for Critical DPW Facilities

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	
Property Protection	1	Allow facility to function during periods of power outages
Cost-Effectiveness	1	
Technical	1	
Political	0	
Legal	0	
Fiscal	0	
Environmental	0	
Social	1	
Administrative	1	
Multi-Hazard	1	All Hazards resulting in loss of electricity
Timeline	0	
Agency Champion	1	
Other Community Objectives	0	
Total	8	
Priority (High/Med/Low)	Medium - High	



Name of Jurisdiction: Warren County
Name and Title Completing Worksheet: Amy Hirsch, County Emergency Services Coordinator
Action Number: WC-3
Action Name: Backup Power for County Airport

Assessing the Risk	
Hazard(s) addressed:	All Hazards resulting in loss of electricity
Specific problem being mitigated:	Lack of backup power for critical facilities; prevents facilities from functioning properly during power outages
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	Other than installing stand-alone backup power generation, no feasible or cost-effective alternatives are available for serious consideration. Tree-trimming is an on-going effort throughout the County. Alternatives such as burying all power lines, secondary grid feeds and "micro-grids" are cost-prohibitive and outside the capabilities of the DPW.
Action/Project Intended for Implementation	
Description of Selected Action/Project	Replace/upgrade backup power systems at the county-owned Floyd Bennett Memorial Airport (GFL) in Queensbury, considered a county critical facilities. 2 generators, one portable. Will handle runway lights, building and gas pumps, but only when portable generator is started. Multiple generators here are very old, and may not be located optimally. Evaluate the need for replacement/upgrades, including consideration of relocation.
Mitigation Action/Project Type	SIP
Goals Met	1, 3
Applies to existing structures/infrastructure, future, or not applicable	Existing
Benefits (losses avoided)	High – Maintain critical facilities and services
Estimated Cost	Medium
Priority*	Medium - DOF
Plan for Implementation	
Responsible Organization	County DPW – Airport Administration Division
Local Planning Mechanism	Emergency Management, Hazard Mitigation
Potential Funding Sources	County budgets; FEMA grants as available
Timeline for Completion	Long term DOF
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:

* Refer to results of Prioritization (see next page)



Action Number: WC-3
Action Name: Backup Power for County Airport

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	
Property Protection	1	Allow facility to function during periods of power outages
Cost-Effectiveness	1	
Technical	1	
Political	0	
Legal	0	
Fiscal	0	
Environmental	0	
Social	1	
Administrative	1	
Multi-Hazard	1	All Hazards resulting in loss of electricity
Timeline	0	
Agency Champion	0	
Other Community Objectives	0	
Total	7	
Priority (High/Med/Low)	Medium - DOF	



Name of Jurisdiction: Warren County
Name and Title Completing Worksheet: Amy Hirsch, County Emergency Services Coordinator
Action Number: WC-4
Action Name: Human Services Building Backup Power Improvements

Assessing the Risk	
Hazard(s) addressed:	All Hazards resulting in loss of electricity
Specific problem being mitigated:	Lack of backup power for critical facilities; prevents facilities from functioning properly during power outages
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	Other than installing stand-alone backup power generation, no feasible or cost-effective alternatives are available for serious consideration. Tree-trimming is an on-going effort throughout the County. Alternatives such as burying all power lines, secondary grid feeds and "micro-grids" are cost-prohibitive and outside the capabilities of the DPW.
Action/Project Intended for Implementation	
Description of Selected Action/Project	Install a new transfer switch to all systems in building. Generator will handle entire building at this time though it is not set up to do so.
Mitigation Action/Project Type	SIP
Goals Met	1, 3
Applies to existing structures/infrastructure, future, or not applicable	Existing
Benefits (losses avoided)	High – Maintain critical facilities and services
Estimated Cost	Medium
Priority*	Low
Plan for Implementation	
Responsible Organization	WCDPW – Facilities Committee
Local Planning Mechanism	Emergency Management, Hazard Mitigation
Potential Funding Sources	County Budget
Timeline for Completion	Short Term- In progress
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:

* Refer to results of Prioritization (see next page)



Action Number:

WC-4

Action Name:

Human Services Building Backup Power Improvements

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	
Property Protection	1	Allow facility to function during periods of power outages
Cost-Effectiveness	1	
Technical	1	
Political	0	
Legal	0	
Fiscal	0	
Environmental	0	
Social	1	
Administrative	0	
Multi-Hazard	1	All Hazards resulting in loss of electricity
Timeline	0	
Agency Champion	0	
Other Community Objectives	0	
Total	6	
Priority (High/Med/Low)	Low	



Name of Jurisdiction: Warren County
Name and Title Completing Worksheet: Jeffrey Tennyson, P.E., DPW Superintendent
Action Number: WC-6
Action Name: County DPW Projects: Bridges, Roads, Culvert upgrades/mitigation

Assessing the Risk	
Hazard(s) addressed:	Flood, Severe Storm, Severe Winter Storm; Earthquake; Landslide
Specific problem being mitigated:	Bridges, roads and culverts in the County are in need of upgrades and/or mitigation
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	Various construction alternatives are considered during the design and engineering phase of the individual sub-projects for this initiative, however except for complete structural replacements (cost-prohibitive), the fundamental approach (structural upgrades and improvements) is the only practical and cost-effective alternative.
Action/Project Intended for Implementation	
Description of Selected Action/Project	<p>County DPW Projects: Bridges, Roads, Culvert upgrades/mitigation. Specific projects noted are:</p> <ul style="list-style-type: none"> • Back To Sodom Road Bridge (Johnsburg) • Market Street Bridge (Horicon) • Padanarum Road Bridge #2 (Bolton) • Blair Road Bridge (Horicon) • Bay Road (Queensbury) - Reconstruction • Round Pond Road, Queensbury Avenue, and Boulevard Road (Queensbury) – Rehabilitation • Continuing Maintenance of all bridges and culverts <p>Assure that any mitigation addresses the 500-year flood event or “worst damage scenario”.</p>
Mitigation Action/Project Type	SIP
Goals Met	1
Applies to existing structures/infrastructure, future, or not applicable	Existing
Benefits (losses avoided)	High
Estimated Cost	High
Priority*	Medium
Plan for Implementation	
Responsible Organization	WCDPW, A/GFTA; working with local municipalities and NYSDOT
Local Planning Mechanism	Capital Improvement
Potential Funding Sources	County Budget, FHWA Grant and NYSDOT Grants
Timeline for Completion	Long Term
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:

* Refer to results of Prioritization (see next page)





Action Number:

WC-6

Action Name:

County DPW Projects: Bridges, Roads, Culvert upgrades/mitigation

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	
Property Protection	1	
Cost-Effectiveness	0	To be determined on a sub-project specific basis.
Technical	1	County has the technical capabilities to implement
Political	0	Must be approved in annual County budgets
Legal	1	
Fiscal	0	Must be part of long-term capital plans
Environmental	0	On a sub-project specific basis
Social	1	Benefits all segments of the population equally
Administrative	1	County has the administrative capabilities to implement
Multi-Hazard	1	
Timeline	0	Long-term - pending design, engineering, funding being approved/secured
Agency Champion	1	
Other Community Objectives	1	Maintenance of County infrastructure
Total	9	
Priority (High/Med/Low)	Medium	



Name of Jurisdiction: Warren County
Name and Title Completing Worksheet: Jeffrey Tennyson, P.E., DPW Superintendent
Action Number: WC-7
Action Name: County Route 11 Flood Mitigation Project

Assessing the Risk	
Hazard(s) addressed:	Flood, Severe Storm
Specific problem being mitigated:	There is a need for a study and plan of County Route 11 which is prone to flooding and damages caused by flooding.
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	The very purpose of this initiative is to identify and evaluate available alternatives to address the problem of Route 11 flooding.
Action/Project Intended for Implementation	
Description of Selected Action/Project	County Route 11 Flood Mitigation Project: At this time, the Warren County Department of Public Works is seeking assistance to: (1) Develop a hydrologic study and, (2) Develop a remediation plan. The hydrologic study will identify the existing and potential water inputs into the watershed and will detail out storm derived water volumes, detention volumes and, peak unit discharges. The remediation plan will be developed based off of the technical data that the hydrologic study has calculated. The remediation plan will incorporate traditional and alternative designs for stabilization, drainage and roadway construction at this location. Once completed, the study and plan will provide guidance to the County DPW with its decision making to mitigate for future losses of this roadway. Assure that any mitigation addresses the 500-year flood event or "worst damage scenario".
Mitigation Action/Project Type	SIP, NSP
Goals Met	1, 5
Applies to existing structures/infrastructure, future, or not applicable	Existing
Benefits (losses avoided)	Medium – improved understanding to develop appropriate mitigation measures
Estimated Cost	Low
Priority*	Low
Plan for Implementation	
Responsible Organization	WCDPW
Local Planning Mechanism	Capital Improvement
Potential Funding Sources	County Budget
Timeline for Completion	Long Term
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:

* Refer to results of Prioritization (see next page)





Action Number:

WC-7

Action Name:

County Route 11 Flood Mitigation Project

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	
Property Protection	1	Study will identify the existing and potential water inputs into the watershed and will detail out storm derived water volumes, detention volumes and, peak unit discharges
Cost-Effectiveness	1	
Technical	1	
Political	0	
Legal	0	
Fiscal	0	
Environmental	0	
Social	0	
Administrative	1	
Multi-Hazard	1	Flood, Severe Storm
Timeline	0	
Agency Champion	0	
Other Community Objectives	0	
Total	6	
Priority (High/Med/Low)	Low	



Name of Jurisdiction: Warren County
Name and Title Completing Worksheet: Jeffrey Tennyson, P.E., DPW Superintendent
Action Number: WC-8
Action Name: 13th Lake Road - Unstable Slope

Assessing the Risk	
Hazard(s) addressed:	Landslide
Specific problem being mitigated:	The slope along 13th Lake Road is unstable and poses a threat to this county road.
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	The very purpose of this initiative is to identify and evaluate available alternatives to address the problem of slope instability along 13 th Lake Road.
Action/Project Intended for Implementation	
Description of Selected Action/Project	Continue to evaluate possible mitigation actions; implement once designed and funding is secured. Added Gabion baskets. There is a private property issue – land rights, acquisition issues here. No determinations as to what to do. Tough spot with not much room. In Johnsburg next to Hamilton County line.
Mitigation Action/Project Type	SIP
Goals Met	1
Applies to existing structures/infrastructure, future, or not applicable	N/A
Benefits (losses avoided)	Medium
Estimated Cost	Medium
Priority*	Low
Plan for Implementation	
Responsible Organization	WCDPW
Local Planning Mechanism	Capital Improvement
Potential Funding Sources	County Budget
Timeline for Completion	Long Term
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:

* Refer to results of Prioritization (see next page)



Action Number: WC-8
Action Name: 13th Lake Road - Unstable Slope

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	
Property Protection	1	Protect roadway from future damages
Cost-Effectiveness	1	
Technical	1	
Political	0	
Legal	0	
Fiscal	0	
Environmental	0	
Social	0	
Administrative	1	
Multi-Hazard	0	Landslide
Timeline	0	
Agency Champion	0	
Other Community Objectives	0	
Total	5	
Priority (High/Med/Low)	Low	



Name of Jurisdiction:	Warren County
Name and Title Completing Worksheet:	Amy Hirsch, County Emergency Services Coordinator
Action Number:	WC-19
Action Name:	County-Wide Housing Location/Relocation Planning Initiative for Disaster Displaced Residents and Structures

Assessing the Risk	
Hazard(s) addressed:	All hazards requiring temporary or permanent relocation
Specific problem being mitigated:	There is a need for a program that identifies sites within the county suitable for relocation of homes out of the floodplain or building new homes once properties in floodplains are demolished.
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	Develop and implement a program to work with all Warren County municipalities to identify sites within the community suitable for relocation of houses out of the floodplain, or building new houses once properties in the floodplain are demolished.
Action/Project Intended for Implementation	
Description of Selected Action/Project	Warren County Office of Emergency Services to develop and implement a program to work with all Warren County municipalities to identify sites within the community suitable for relocation of houses out of the floodplain, or building new houses once properties in the floodplain are demolished. As part of this program, all communities will be surveyed to identify potential sites, including any pre-disaster actions that may be required to make them viable for these purposes. Further, this effort will include working with other County departments and regional and local stakeholders who own or manage potentially suitable sites (e.g. County parks) for the potential siting of temporary housing, and determining what improvements would need to be made to accommodate temporary housing (e.g. water, electric, sanitary services, bathing facilities), and that outside funding would likely be needed if such improvements were not already available. It is noted that while a community may identify suitable sites for relocation, the use (including transfer of ownership) of suitable private property would be at the discretion of the property owner.
Mitigation Action/Project Type	SIP
Goals Met	1, 2, 4, 5
Applies to existing structures/infrastructure, future, or not applicable	Both
Benefits (losses avoided)	Improved ability to temporarily or permanently relocate hazard-prone or disaster affected residents and property
Estimated Cost	Low - Medium
Priority*	High
Plan for Implementation	
Responsible Organization	WCOES, working with all municipalities and other County departments and agencies
Local Planning Mechanism	Emergency Management, Hazard Mitigation
Potential Funding Sources	County and local budgets (identification of suitable sites); grant funding for site improvements as needed
Timeline for Completion	Within one year of plan update approval
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:

* Refer to results of Prioritization (see next page)





Action Number:

WC-19

Action Name:

County-Wide Housing Location/Relocation Planning Initiative for Disaster Displaced Residents and Structures

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Provide a place for residents to go to during disasters
Property Protection	1	
Cost-Effectiveness	1	
Technical	1	
Political	0	
Legal	1	
Fiscal	0	
Environmental	0	
Social	1	
Administrative	1	
Multi-Hazard	1	All hazards requiring temporary or permanent relocation
Timeline	0	
Agency Champion	1	
Other Community Objectives	0	
Total	9	
Priority (High/Med/Low)	High	



9.2 TOWN OF BOLTON

This section presents the jurisdictional annex for the Town of Bolton.

9.2.1 Hazard Mitigation Plan Point of Contact

The following individuals have been identified as the hazard mitigation plan’s (HMP) primary and alternate points of contact.

Primary Point of Contact	Alternate Point of Contact
Ronald Conover, Town Supervisor 4949 Lake Shore Drive Bolton Landing, NY 12814 (518) 644-2461 supervisor@town.bolton.ny.us	Susan Wilson, Deputy Supervisor 4949 Lake Shore Drive Bolton Landing, NY 12814 (518) 644-3056 (518) 796-0493 susanwilson.bolton@gmail.com

9.2.2 Municipal Profile

The Town of Bolton is in the Adirondack Mountains in New York State and is located between the shores of Lake George to the east and the Schroon River to the west. It is found in eastern Warren County. The Town is bordered to the north by the Towns of Horicon and Hague, to the south by the Town of Lake George and Lake George, to the east by Lake George, and to the west by the Town of Warrensburg. The following hamlets are found in the Town of Bolton: Bolton, Bolton Landing, North Bolton, and Riverbank. Basin Bay, Boon Bay, Huddle Bay, Northwest Bay, Lake George, and Trout Lake are the major bodies of water found throughout the Town. Additionally, Cat Mountain and Tongue Mountain Range are mountainous areas within the community.

The Town has a total area of 90.1 square miles, of which, 63.4 square miles is land and 26.7 square miles is water. According to the 2010 Census, the community’s population was 2,326. The Town is governed by the Town Board consisting of town board members and the town supervisor.

Glens Falls Hospital serves the region. A new facility in Warrensburg also has medical capabilities.

Growth/Development Trends

Table 9.2-1 summarizes recent residential/commercial development in the Town of Bolton since 2010 to present and lists any known or anticipated major residential/commercial development and major infrastructure development that has been identified in the next five years within the municipality. Refer to the maps following Section 9.2.9 of this annex: Figure 9.2-1 that illustrates landslide hazard areas, and Figure 9.2-2 that illustrates the flood and wildfire hazard areas.

Table 9.2-1. Growth and Development

Property or Development Name	Type (e.g. Res., Comm.)	# of Units / Structures	Location (address and/or Parcel ID)	Known Hazard Zone(s)	Description/Status of Development
Recent Development from 2010 to present					
Bolton Cross LLC	Residential	10	171.19-1-55	None	10 unit townhouse complex, complete
Camp Walden	Children’s Camp	500 kids	185.00-1-32	None	Ongoing



Property or Development Name	Type (e.g. Res., Comm.)	# of Units / Structures	Location (address and/or Parcel ID)	Known Hazard Zone(s)	Description/Status of Development
Known or Anticipated Development in the Next Five (5) Years					
Blue Water Manor	Resort	58	200.06-1-191	None	Under review by planning board
Bolton Landing Marina	Commercial	1	171.19-2-3	None	Under review by planning board
FOY	Residential	4	171.15-3-28	None	Under review by planning board

Note: Only location-specific hazard zones or vulnerabilities are identified

9.2.3 Natural Hazard Event History Specific to the Municipality

Warren County has a history of natural and non-natural hazard events as detailed in Volume I, Section 5.0 of this Plan. A summary of historical events appears in each hazard profile, and includes a chronology of events that have affected the County and its municipalities. For the purpose of this Plan update, events that have occurred in the County from 2010 to present were summarized to indicate the range and impact of hazard events in the community. Information regarding specific damages is included, if available, based on reference material or local sources. This information is presented in Table 9.2-2 below. For details of these and additional events, refer to Volume I, Section 5.0 of this Plan.

Table 9.2-2. Hazard Event History

Dates of Event	Event Type (FEMA Disaster Declaration if applicable)	Warren County Designated?	Summary of Damages/Losses
April 27-28, 2011	Severe Storms, Flooding, Tornadoes and Straight-Line Winds (DR-1993)	Yes	Flooding occurred along the Hudson River in Warren County from North River southward to the Saratoga County line. Numerous reports of flooding. The County had approximately \$676,000 in damages. Nearly two-thirds of the County was damaged. In the Town of Bolton, River Rd. and Ridin Hy Roads were closed from flooding. The Town brought in six loads of #4 fill to fix both roads. In addition, there was one washout on Padanarum Rd., which the Town used two loads of #4 fill to fix.
May 27 – June 2, 2011	Flooding “Memorial Day Storm”	N/A	Flooding occurred in the County and there was severe damage along a thin line through the County (Stony Creek, Thurman, Warrensburg, Horicon and Bolton) that resulted in \$13.125 million in damages. Extensive flood damage to transportation infrastructure occurred throughout the Town of Bolton, including Combs Road Bridge which was washed out. A 30’ deep x 50’ wide segment of Hendricks Road washed out. Skye Farm Road was completely washed out, along with sections of Trout Falls and Padanarum Roads. A 4’ x 60’ culvert on Ricer Rd. was also washed out.
August 27-29, 2011	Hurricane Irene (DR-4020)	Yes	There was severe wind and flooding damage throughout the County. Very little damage occurred in the Town of Bolton. A few trees came down. The Town Highway Crew worked 15 overtime hours. Highway and Parks Departments kept all the culverts cleaned out.
May 29, 2012	Hail and Wind	N/A	Debris removal occurred in the County as a result of this event. A generator at a fire station, a patrol car, and the canopy of a patrol boat were all damaged. Very little damage occurred in the Town of Bolton. Clean up was needed for a few downed trees. Highway crews swept debris from roadways.
October 29, 2012	Hurricane Sandy (EM-3351)	Yes	Heavy rain fell throughout the County. In the Town of Bolton, trees came down in Cotton Point. Highway crews swept debris from roadways.

Notes:





EM Emergency Declaration (FEMA)
 FEMA Federal Emergency Management Agency
 DR Major Disaster Declaration (FEMA)
 N/A Not applicable

9.2.4 Hazard Vulnerabilities and Ranking

The hazard profiles in Section 5.0 of this Plan convey detailed information regarding each plan participant’s vulnerability to the identified hazards. The following summarizes the hazard vulnerabilities and their ranking in the Town of Bolton. For additional vulnerability information relevant to this jurisdiction, refer to Section 5.0.

Hazard Risk/Vulnerability Risk Ranking

Table 9.2-3 below summarizes hazard risk/vulnerability rankings of potential hazards for the Town of Bolton.

Table 9.2-3. Hazard Risk/Vulnerability Risk Ranking

Hazard type	Estimate of Potential Dollar Losses to Structures Vulnerable to the Hazard ^{a, b}	Probability of Occurrence	Risk Ranking Score (Probability x Impact)	Hazard Ranking ^a
Earthquake	100-year MRP: \$28,229.00 500-year MRP: \$2,624,552 2,500-Year MRP: \$20,866,833.00	Occasional	12	Low
Flood	RCV Exposed to 1% Annual Chance: \$7,265,557	Frequent	18	Medium
Landslide	Damage estimate not available	Occasional	12	Low
Infestation	Damage estimate not available	Frequent	24	Medium
Severe Storm	RCV Exposed to 1938 storm-winds: \$586,152	Frequent	48	High
Severe Winter Storm	GBS 1% Loss: \$6,176,820 GBS 5% Loss: \$30,884,100	Frequent	51	High
Wildfire	RCV Exposed to Intermix: \$564,709,000 RCV Exposed to Interface: \$226,637,000	Frequent	42	High
Cyber Security	Damage estimate not available	Occasional	12	Low
Disease Outbreak	Damage estimate not available	Frequent	27	Medium
Hazardous Material Incidents	Damage estimate not available	Frequent	24	Medium

Notes:

- a. The general building stock valuation is based on the custom inventory generated for the municipality and based on improved value.
 High = Total hazard priority risk ranking score of 31 and above
 Medium = Total hazard priority risk ranking of 20-30+
 Low = Total hazard risk ranking below 20
- b. Loss estimates for the severe storm and severe winter storm hazards are structural values only and do not include the estimated value of contents. The earthquake was evaluated by Census tract. The Census tracts do not exactly align with municipal boundaries; therefore, a total is reported for each Town inclusive of the Villages. Loss estimates for the flood and earthquake hazards represent both structure and contents. Potential flood loss estimates were generated using Hazus-MH 2.2 and digitized FIRM maps from the 1980s and 1990s for the 1-percent annual chance event; NED DEM was used to generate a depth grid. The County’s 2015 Real Property data was used to generate the values for flood and includes structure and contents. For the wildfire hazard, the improved value and estimated contents of buildings located within the identified hazard zones is provided.

GBS General building stock
 MRP Mean return period
 RCV Replacement Cost Value





National Flood Insurance Program (NFIP) Summary

Table 9.2-4 summarizes the NFIP statistics for the Town of Bolton.

Table 9.2-4. NFIP Summary

Municipality	# Policies (1)	# Claims (Losses) (1)	Total Loss Payments (2)	# Rep. Loss Prop. (1)	# Severe Rep. Loss Prop. (1)	# Policies in 100-year Boundary (3)
Town of Bolton	13	5	\$40,328	0	0	2

Source: FEMA, 2014

Notes:

- (1) Policies, claims, repetitive loss, and severe repetitive loss statistics are provided by FEMA, are current as of November 30, 2015, and are summarized by community name. Total number of repetitive loss properties includes severe repetitive loss properties. Number of claims represents claims closed by November 30, 2015.
- (2) Total building and content losses from the claims file provided by FEMA Region 2.
- (3) Number of policies inside and outside of flood zones is based on latitude and longitude provided by FEMA Region 2 in the policy file.
- (4) FEMA noted that for a property with more than one entry, more than one policy may have been in force or more than one Geographic Information System (GIS) specification was possible.

Critical Facilities

Table 9.2-5 below identifies critical facilities within the municipality located on parcels that intersect the current regulatory NFIP 1% chance flood boundary (aka: “Special Flood Hazard Area” (SFHA)), however it is recognized that the actual facility structure(s) may lie outside of the SFHA. Please refer to the Flood Hazard Profile (Section 5.4.2) for further details of estimated flood losses throughout the County, as well as the “Other Vulnerabilities Identified” section following.

Table 9.2-5. Potential Flood Losses to Critical Facilities

Municipality	Facility Types in 1% Chance Flood Boundary						
	Boat Facilities	Dam	Electric	Government	Highway Bridge	Rail Facility	Wastewater
Town of Bolton	1	0	0	0	5	0	0

Source: Warren County Real Property 2015 tax roll; HAZUS-MH 2.2; FEMA 2015

Notes:

- (1) HAZUS-MH 2.2 provides a general indication of the maximum restoration time for 100% operations. Clearly, a great deal of effort is needed to quickly restore essential facilities to full functionality; therefore, this will be an indication of the maximum downtime (HAZUS-MH 2.2 User Manual).
- (2) Some facilities may be within the Digital Flood Insurance Rate Map (DFIRM) flood hazard boundary; however, HAZUS did not calculate potential loss, perhaps because depth of flooding would not cause any damages to these structures according to the depth damage function used in HAZUS for that facility type. Further, HAZUS-MH may estimate potential damage to a facility outside the DFIRM if the model generates a depth grid beyond DFIRM boundaries.

Other Vulnerabilities Identified

The municipality has identified the following vulnerabilities within their community:

- Dam Failure
 - Edgecomb Pond Dam (Class C): Owned by Bolton Water District, this dam is in need of some improvements, including an auxiliary spillway. The dam provides water to the hamlet (built-up) area. The District just secured drainage easements where they could install an





auxiliary spillway. The Town is working with an engineering contractor to evaluate potential improvements.

- Hendricks Road – Major washout in 2011 Memorial Day storm. Towns of Thurman and Bolton had the greatest damage. The Town will be up-grading the culvert in 2016.
- Vulnerable populations have unique medical needs, and are often on specific nutritional programs. There are people who are home-bound with certain medical conditions and home care needs. The Town recommends a list documenting who these people are, and what their needs might be during an event. The Town recommends the development of a county-wide vulnerable population/special needs registry.
- Sheltering – Town Hall or school would be good to provide short-term comfort station/sheltering needs. School would be the better facility, due to a larger capacity and existing kitchen facilities. Neither of these locations currently have backup power – backup generators would be needed.
 - Joint application submitted (Sandy HMGP) with the Bolton school district submitted to improve (back-up power) and designate it for sheltering.
 - Town hall (includes police) needs backup power
- Beaver damming is considered a severe risk in the Town, and dams are threatening roadways throughout the Town, including County Route 11, Schroon River Road, and Northway. The Town notes about 6 dams in the Trout Falls area. A beaver dam failure took out Route 11 in 2007.
- Roadway damage
 - Route 9 and County Route 11 are critical for access to medical services.
 - St. Hwy. 9 needs to be re-evaluated by NYSDOT – Drainage infrastructure is old, rusted. Major drainage issues noted here. Serious icing problems on Rt. 9N
 - County Route 11 between Valley Woods and New Vermont Road – 3’ culvert (undersized) has never been repaired or serviced.
 - New Vermont Road – This road has been seriously damaged several times in the past decade. In one storm, the road lost connection to every driveway on one side for nearly 2 miles. A house was also moved off its foundation by floodwaters on this road. FEMA recovery funds replaced a culvert in-kind, but that culvert really needed a significant upgrade which was eventually performed by the Town.
 - The Town installed a concrete box, four new culverts, and stabilized the creek here after hurricane Irene.
 - Two bridges are still out on Padanarum road from storm/flood damage.
 - Cotton Point Road – This is a sole access road which recently lost a segment to ice. The Town is working with NYS DEC on what to do.
 - Riding High Road – A segment of this road along East Schroon River Road was raised roughly 6’, but flooding is still a problem. Mitigation to one of these roads is needed, but the Town has not decided which the most cost-effective project is.
 - East River Road – Floods in two locations



- There are many private roads in the Town, which results in isolated populations.
- The Town has a capital program (~\$1 Million for highway). Smaller neighboring towns have a capital issue that complicates doing infrastructure upgrades.
- The Town would benefit by an evaluation of capabilities to:
 - Manage traffic control,
 - Conduct emergency communications (radio system is poor, and cell coverage is spotty).
- Dry hydrants: There are 6 dry hydrants in the Town currently. SWCD has a map of all dry hydrants.
 - The Town is evaluating a dry hydrant at parking area of Veteran’s Park
 - Additional need for a dry hydrant at Edgecomb Pond at the water company property

9.2.5 Capability Assessment

This section identifies the following capabilities of the local jurisdiction:

- Planning and regulatory capability
- Administrative and technical capability
- Fiscal capability
- Community classification
- NFIP
- Integration of mitigation planning into existing and future planning mechanisms.

Planning and Regulatory Capability

Table 9.2-6 below summarizes regulatory tools available to the Town of Bolton.

Table 9.2-6. Planning and Regulatory Tools

Tool / Program (code, ordinance, plan)	Do you have this? (Yes/No) If Yes, date of adoption or update	Authority (local, county, state, federal)	Dept. /Agency Responsible	Code Citation and Comments (Code Chapter, name of plan, explanation of authority, etc.)
Planning Capability				
Master Plan	Yes, 05/2003	Local	Zoning/Planning	Comprehensive Plan, Hamlet Strategic Plan, and Bolton Landing Hamlet Sustainability Plan (Sept. 2009)
Capital Improvements Plan	No	-	-	-
Floodplain Management / Basin Plan	Yes	Local	Zoning/Planning	-
Stormwater Management Plan	Yes	Local	Town Board	Chapter 125 (Stormwater and Erosion Control)
Open Space Plan	No	-	-	-
Stream Corridor Management Plan	No	-	-	-
Watershed Management or Protection Plan	No	-	-	-
Economic Development Plan	No	-	Bolton Community Development	-



Tool / Program (code, ordinance, plan)	Do you have this? (Yes/No) If Yes, date of adoption or update	Authority (local, county, state, federal)	Dept. /Agency Responsible	Code Citation and Comments (Code Chapter, name of plan, explanation of authority, etc.)
			Program	
Comprehensive Emergency Management Plan	Yes	Local	-	The Town has an Emergency Action Plan (EAP) which is updated annually (includes evacuation protocols).
Emergency Response Plan	Yes	Local	-	See above.
Post-Disaster Recovery Plan	No	-	-	-
Transportation Plan	No	-	-	-
Strategic Recovery Planning Report	No	-	-	-
Other Plans:	Yes, draft	-	-	Local Waterfront Revitalization Plan Draft
Regulatory Capability				
Building Code	Yes	State & Local	Town Building Inspector	-
Zoning Ordinance	Yes	Local	Zoning/Planning	Chapter 200 (Zoning)
Subdivision Ordinance	Yes	Local	Zoning/Planning	Chapter 150 (Subdivision of Land)
NFIP Flood Damage Prevention Ordinance	Yes	Federal, State, Local	Zoning Administrator	-
NFIP: Cumulative Substantial Damages	No	-	-	-
NFIP: Freeboard	Yes	State, Local	Zoning Administrator	State mandated BFE+2 for single and two-family residential construction, BFE+1 for all other construction types
Growth Management Ordinances	No	-	-	-
Site Plan Review Requirements	Yes	Local	Zoning/Planning	Chapter 200, Article 5 (Approval of Site Plans and Certain Uses)
Stormwater Management Ordinance	Yes	Local	Zoning Administrator/ Town Board	Chapter 125 (Stormwater and Erosion Control)
Municipal Separate Storm Sewer System (MS4)	No	-	-	-
Natural Hazard Ordinance	No	-	-	-
Post-Disaster Recovery Ordinance	No	-	-	-
Real Estate Disclosure Requirement	Yes	State	-	New York State (NYS) mandate, Property Condition Disclosure Act, <i>NY Code – Article 14 §460-467</i>
Other (Special Purpose Ordinances [i.e., sensitive areas, steep slope])	No	-	-	-

Administrative and Technical Capability

Table 9.2-7 below summarizes potential staff and personnel resources available to the Town of Bolton.





Table 9.2-7. Administrative and Technical Capabilities

Resources	Is this in place? (Yes or No)	Department/ Agency/Position
Administrative Capability		
Planning Board	Yes	Planning Board
Mitigation Planning Committee	No	-
Environmental Board/Commission	No	-
Open Space Board/Committee	No	-
Economic Development Commission/Committee	Yes	Bolton Community Development Program
Maintenance programs to reduce risk	No	-
Mutual aid agreements	Yes	Neighboring Municipalities, DPW
Technical/Staffing Capability		
Planner(s) or engineer(s) with knowledge of land development and land management practices	Yes	Town Engineer
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Yes	Town Engineer
Planners or engineers with an understanding of natural hazards	Yes	Town Engineer
NFIP Floodplain Administrator (FPA)	Yes	Zoning Administrator (Pamela Kenyon)
Surveyor(s)	No	
Personnel skilled or trained in GIS and/or Hazards United States (HAZUS) – Multi-Hazards (MH) applications	Yes	Zoning Administrator
Scientist familiar with natural hazards	No	-
Emergency Manager	No	-
Grant writer(s)	Yes	Contract with firms
Staff with expertise or training in benefit/cost analysis	Yes	Contract with firms
Professionals trained in conducting damage assessments	Yes	Building Department/Code Officials, Contract with firms

Fiscal Capability

Table 9.2-8 below summarizes financial resources available to the Town of Bolton.

Table 9.2-8. Fiscal Capabilities

Financial Resources	Accessible or Eligible to Use (Yes/No)
Community Development Block Grants (CDBG, CDBG-DR)	No
Capital improvements project funding	Yes
Authority to Levy Taxes for specific purposes	Yes
User fees for water, sewer, gas or electric service	Yes
Impact fees for homebuyers or developers of new development/homes	Yes
Stormwater utility fee	No
Incur debt through general obligation bonds	Yes
Incur debt through special tax bonds	Yes
Incur debt through private activity bonds	Unknown
Withhold public expenditures in hazard-prone areas	No





Financial Resources	Accessible or Eligible to Use (Yes/No)
Other federal or state funding programs	No
Open Space Acquisition funding programs	No
Other	

Community Classifications

Table 9.2-9 below summarizes classifications for community program available to the Town of Bolton.

Table 9.2-9. Community Classifications

Program	Do you have this? (Yes/No)	Classification (if applicable)	Date Classified (if applicable)
Community Rating System (CRS)	No	NP	NP
Building Code Effectiveness Grading Schedule (BCEGS)	No	NP	NP
Public Protection (ISO Fire Protection Classes 1 to 10)	No	NP	NP
Storm Ready	No	NP	NP
Firewise	No	NP	NP
Disaster/safety programs in/for schools	No	NP	NP
Organizations with mitigation focus (advocacy group, non-government)	No	NP	NP
Public education program/outreach (through website, social media)	No	NP	NP
Public-Private Partnerships	No	NP	NP

Note:

- N/A Not applicable
- NP Not participating
- Unavailable

The classifications listed above relate to the community’s ability to provide effective services to lessen its vulnerability to the hazards identified. These classifications can be viewed as a gauge of the community’s capabilities in all phases of emergency management (preparedness, response, recovery and mitigation) and are used as an underwriting parameter for determining the costs of various forms of insurance. The Community Rating System (CRS) class applies to flood insurance, while the Building Code Effectiveness Grading Schedule (BCEGS) and Public Protection classifications apply to standard property insurance. CRS classifications range on a scale of 1 to 10, with class 1 being the best possible classification, and class 10 representing no classification benefit. Firewise classification is higher if the subject property is more than 1000 feet from a creditable fire hydrant and is within 5 road miles of a recognized Fire Station.

Criteria for classification credits are outlined in the following documents:

- The Community Rating System Coordinators Manual
- The Building Code Effectiveness Grading Schedule
- The ISO Mitigation online ISO’s Public Protection website at <https://www.isomitigation.com/ppc/>
- The National Weather Service Storm Ready website at <http://www.stormready.noaa.gov/index.html>
- The National Firewise Communities website at <http://firewise.org/>

Self-Assessment of Capability





Table 9.2-10 below provides an approximate measure of the Town of Bolton’s capability to work in a hazard-mitigation capacity and/or effectively implement hazard mitigation strategies to reduce hazard vulnerabilities.

Table 9.2-10. Self-Assessment Capability for the Municipality

Area	Degree of Hazard Mitigation Capability		
	Limited (If limited, what are your obstacles?)*	Moderate	High
Planning and Regulatory Capability		X	
Administrative and Technical Capability		X	
Fiscal Capability		X	
Community Political Capability		X	
Community Resiliency Capability		X	
Capability to Integrate Mitigation into Municipal Processes and Activities.		X	

National Flood Insurance Program

NFIP Floodplain Administrator (FPA)

Pamela Kenyon – Zoning Administrator, Zoning Department

Flood Vulnerability Summary

As of November 30, 2015, 13 policies were in force, two of which were within the 100-year flood boundary. Since 1978, five claims have been paid within the Town, totaling \$40,327. There are no repetitive loss property and no severe repetitive loss properties in the Town of Bolton. According to current NFIP statistics at the time of this Plan, NFIP policies in the Town of Bolton insured over \$1.6 million of property with total annual insurance premiums of \$3,712.

The Town does not maintain lists/inventories of properties that have been flood damaged, nor does it make Substantial Damage estimates. However, no structures were damaged during Floyd, Irene, Sandy or other events, and no residents have expressed interest mitigation (elevation or acquisition). The Town is unaware of any residents undertaking mitigation activities.

Resources

The floodplain administrator is the sole person assuming the responsibilities of floodplain administration. The FPA provides permit review, record-keeping, and GIS services, but does not currently provide any education or outreach to the community regarding flood hazards/risk, and flood risk reduction through NFIP insurance, mitigation, etc. While the Town FPA does not report any barriers to running an effective floodplain management program in the community, the FPA does not feel adequately supported and trained to fulfill the responsibilities as the municipal floodplain administrator. The FPA would consider attending continuing education and/or certification training on floodplain management if it were offered in the County for all local floodplain administrators.

Compliance History

The Town is in good-standing in the NFIP, but is unaware of the date of the most recent compliance audit [e.g. Community Assistance Visit (CAV)].





The Town intends to continue active participation in the NFIP, and maintain compliance with all requirements of participation. Further, the Town has identified several actions to support both continued and improved participation in the NFIP as identified in Table 9.2-13.

Regulatory

The Town's floodplain management regulations/ordinances do not exceed the FEMA and State minimum requirements, however there are existing local ordinances, plans or programs (e.g. zoning, site plan review) that support floodplain management and meeting the NFIP requirements as detailed further below.

The Town does not currently participate in the Community Rating System, and is not considering joining the program.

Integration of Hazard Mitigation into Existing and Future Planning Mechanisms

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, each community was surveyed to obtain a better understanding of their community's progress in plan integration. A summary is provided below. In addition, the community identified specific integration activities that will be incorporated into municipal procedures.

Planning

Comprehensive Plan and Strategic Plan: The Town of Bolton Comprehensive Plan and Hamlet Strategic Plan was adopted by the Town of Bolton Town Board on May 6, 2003, and shall be the policy of the Town of Bolton to reference the Comprehensive Plan and Hamlet Strategic Plan for all rezoning and infrastructure projects planned by the Town and proposals from other government agencies. The Plan does not directly address natural hazard mitigation, but many of the recommendations of the plan are consistent with mitigation principles.

Local Water Front Revitalization Plan: The Town of Bolton Waterfront Revitalization Program is a locally prepared, comprehensive land and water use plan for the Town's natural, public, and developed waterfront resources, which seeks to provide a balance of environmental, recreational, and economic development actions, while aspiring to coordinate local and state policies for a sustainable revitalization of the local waterfront and preservation of its unique character. The plan includes many policies that will enhance the Town's mitigation program, especially for floodplain management.

Emergency Action Plan (EAP): Updated annually; includes evacuation protocols.

Regulatory and Enforcement (Ordinances)

Stormwater and Erosion Control: The Town of Bolton Code, Chapter 125, Stormwater and Erosion Control includes provisions that regulate development in order to reduce flooding and erosion.

Zoning: The Town of Bolton Code, Chapter 200, Zoning includes standards for the consideration of natural hazard risk in the review of proposed development.

The Town's municipal zoning and subdivision regulations, and/or site plan review process, require developers to take additional actions to mitigate natural hazard risk (e.g. undergrounding utilities, stormwater detention, creating easements in areas/zones of hazard risk).



Operational and Administration

Pre-Event Operational: Prior to anticipated hurricane, tropical storm and other severe weather events, the Town clears the culverts.

Public/Private Partnerships: Private side assists in mitigation efforts (e.g. Beckam Quarry/Stone, private contractors).

Some Town staff have job descriptions that specifically include identifying and/or implementing mitigation projects/actions or other efforts to reduce natural hazard risk. The Town has experience pursuing grant funds for mitigation-related projects.

Funding

The Town has the following fiscal resources:

- Capital Improvements Project Funding - Capital Improvements Budget (~\$1 Million for highway) may include budget for mitigation-related projects (e.g. improved stormwater management/drainage, hardening of critical facilities and infrastructure)
- Authority to Levy Taxes for specific purposes
- User fees for water, sewer, gas or electric service
- Impact Fees for homebuyers or developers of new development/homes
- Incur debt through general obligation bonds
- Incur debt through special tax bonds

Occasionally, the Town's municipal operating budget includes line items for mitigation projects and activities.

Education and Outreach

In coordination with the Town of Bolton Police Department, the Town is currently in the process of initiating an emergency notification system, CodeRed, for residents of the Town. The Town is also in the process of developing a registry for full and part-time residents that may need additional assistance during an emergency for use by local emergency responders. Additionally, the Town posts all public notices on their municipal website (<http://www.boltonnewyork.com/public-notices/>).

9.2.6 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and prioritization.

Past Mitigation Initiative Status

Table 9.2-11 below indicates progress on the community's mitigation strategy identified in the 2011 Plan. Previous actions that are now ongoing programs and capabilities are indicated as such in Table 9.2-11, and also appear under "Capability Assessment" presented previously in this annex. Actions carried forward as part of this plan update are included in the following subsection (in Table 9.2-12) with prioritization.



Table 9.2-11. Past Mitigation Initiative Status

Description	Status	Review Comments
Replace the Middleton Bridge over the Schroon River in the Towns of Bolton and Warrensburg	No progress.	This is a County owned bridge. Discontinue in Town of Bolton strategy. This is a one lane bridge, and part of the TIP – 5 year transportation plan. Won't be put back in the Town of Bolton. County still considers this a priority. This is a County bridge, and a state forest preserve.
Educate residents regarding steps to be taken to decrease the impact of natural hazards (including ice storms, wild/forest fires, severe storms, tornado, earthquakes, and all other natural hazards) on property by developing, enhancing, and implementing education programs, brochures, school presentations informing groups about ways to reduce risk, and other outreach activities.	No Progress	No outreach happening currently. The Town suggests that this type of outreach is better done through County Emergency Management. Not applicable to town. Discontinue.
Monitor and remove trees/limbs in storm areas that present potential hazards to keep trees from threatening lives, property, and public infrastructure during storm events	Complete	Completed by Bolton DPW. Discontinue.
Obtain funding to purchase generators for municipally-owned critical facilities.	No Progress	Generators needed in the school (for emergency sheltering) and town hall. The Town submitted a grant application for this roughly 3 years ago, but was not awarded funding. Continue in 2016 HMP.
Coordinate/create mutual aid agreements between emergency services, public works departments, and public utilities to ensure efficient use of resources during and after storm events.	Complete	Ongoing Operational Capability. Discontinue.
Develop plans for debris management after hazard events, including severe winter snow/ice events, and other severe storms.	In Progress	Town DPW Ongoing Operational Capability. Discontinue.
Design a network of citizens that will check in on elderly, functional needs, and low- income individuals during major events.	In Progress	County-wide, there are people who are home-bound with certain medical conditions and home care needs. The Town recommends a list documenting who these people are, and what their needs might be during an event. The vulnerable populations list should be County-wide, the care providers should be involved in the development. Care providers and public health representatives (i.e. health department) should also be involved in HMP planning process. Not applicable to the Town. Discontinue.
Send a town representative to the NYS Wildland Fire Suppression Training	Unknown	Fire Department, Town Supervisor Continue in 2016 HMP.
Provide training for local code enforcement officials to implement building codes that reflect disaster resistant construction for new structures and renovation	In Progress	Building code enforcement is performed by Warren County. Not applicable to town. Discontinue.
Provide residents with information listing steps taken to lessen potential flood damage to reduce the impact of flooding.	No Progress	No outreach happening currently. The Town suggests that this type of outreach is better done through County Office of Emergency Services. Not applicable to town. Discontinue.
Educate the community on benefits of carrying NFIP policies and increase knowledge of NFIP services	No Progress	Continue in 2016 HMP. Distribute county-provided educational materials on benefits of carrying NFIP policies and increase knowledge of NFIP services, and provide residents with information listing steps taken to lessen potential flood damage to reduce the impact of flooding.
Review and update local plans to integrate goals,	No	Town Board, Planning Department



Table 9.2-11. Past Mitigation Initiative Status

Description	Status	Review Comments
objectives, and activities from this HMP which are not found in existing regulatory documents, as appropriate	Progress	Not applicable. Discontinue.
Maintain a current inventory of at-risk buildings and infrastructure and continually update inventory of at-risk structures in each jurisdiction	Complete	Town Board, Building Inspector
Apply for grants to assist with mitigation activities needed to provide a level of protection for critical facilities	No Progress	Continue in 2016 HMP. Apply for grants to assist with mitigation activities including Edgecombe Pond Dam projects and backup power provisions for the school and Town Hall.
Provide continuing education and training for local Floodplain Administrator to ensure code enforcement and proper inspections	No Progress	Not applicable. The Town FPA will attend any training or continuing education offered at the County or State level. Discontinue.
Implement zoning regulations to discourage building new structures in disaster prone areas – if such regulations are not already written into Town Zoning code or Floodplain Ordinance.	In Progress	Town Zoning Department, Floodplain Administrator Not applicable to Town. Discontinue.

Completed Mitigation Initiatives not Identified in the Previous Mitigation Strategy

The Town of Bolton has identified the following mitigation projects/activities that have also been completed but were not identified in the previous mitigation strategy in the 2011 Plan:

- The Town has made some improvements at the Edgecomb Pond Dam (owned by the Bolton Water District)
- The County did an inventory of public fueling facilities, many of which have interconnects or backup power
- The Town does tree management (local contractors) in the case of dangerous trees that are not being addressed by utilities (spec. National Grid).
- Severe storm (e.g. hurricane, tropical storm) preparation in the Town includes clearing of all culverts; meeting with effective parties including the County OEM.
- The Town relined a culvert on Betts Pond Road.
- The Town improved a major bridge on Potter Hill Road.
- Public Education and Outreach
 - The Town instituted and is currently setting up a Code Red broad-blast (text, email, phone, etc.). The notification system is currently used to announce water breaks, Dam breaks, etc., but the system could have many additional applications.
 - The Town recently sent out flyers with sewer bills to get more people signed up for the Code Red system, and another will go out with tax bill.
 - The Town maintains a phone line at the Town Hall with an event status message which is used as a number for people to call and receive updates.
 - Town website.
 - Fire Department signage.
- Mutual aid agreements – shared services within Town Departments, and the Town of Bolton departments also support and are supported by departments in neighboring municipalities for road paving and other activities.
- Back-up Power
 - The Town funded installation of a generator at the Health Center.



- Operations during an emergency are conducted out of volunteer fire department building, which is equipped with back-up power.
- The Highway Department and its gas pumps are all equipped with backup power.

Proposed Hazard Mitigation Initiatives for the Plan Update

The Town of Bolton participated in a mitigation action workshop in September 2015 and was provided the following Federal Emergency Management Agency (FEMA) publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 ‘Selecting Appropriate Mitigation Measures for Floodprone Structures’ (March 2007) and FEMA ‘Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards’ (January 2013).

Table 9.2-12 summarizes the comprehensive-range of specific mitigation initiatives the Town of Bolton would like to pursue in the future to reduce the effects of hazards. Some of these initiatives may be previous actions carried forward for this plan update. Implementation of these initiatives will depend on available funding (grants and local match availability), and some initiatives may be modified or omitted at any time based on occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in Table 9.2-12 to further demonstrate the wide range of activities and mitigation measures selected.

As discussed in Section 6, 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing your actions as ‘High’, ‘Medium’, or ‘Low.’ The table below summarizes the evaluation of each mitigation initiative, listed by Action Number.

Table 9.2-13 summarizes the prioritization of all proposed mitigation initiatives for the Plan update.



Table 9.2-12. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category	CRS Category
BT-1	Develop a Hamlet-wide Stormwater Drainage System plan for the Hamlet of Bolton	Both	Flood	1	Planning, Town Board	Medium	Medium	Town, County	DOF	High	LPR	PR
BT-2	Adopt and implement the Local Waterfront Revitalization Plan (draft released in July, 2014).	Existing	All Hazards	1, 2	Town Board	Medium	Low	Town Operating Budget	Short	High	LPR	PR
BT-3 (carryover)	Edgecomb Pond Dam Auxiliary Spillway Development Project: Install an auxiliary spillway for the dam which provides water to hamlet (built-up) area. Drainage easements have been acquired in area where new spillway would be built.	Existing	Flood	1	Bolton Water District, Town Board	High	High	Water Department Operating budget, State/County Grants	Long	High	SIP	SP
BT-4	Edgecomb Pond Dam Upgrades: Make structural upgrades and improvements of the existing Edgecomb Pond Dam as called for by the upcoming structural evaluation. The Dam (owned by Bolton Water District) is in need of some improvements. The Town is in the process of contracting for a structural evaluation of the existing dam.	Existing	Flood	1	Bolton Water District, Town Board	High	High	Water Department Operating budget, State/County Grants	Long	High	SIP	SP
BT-5 (carryover)	Obtain funding to purchase generators for municipally-owned critical facilities, including the School and town hall.	Existing	All Hazards	1, 3	Town Supervisor, County Office of Emergency Services	High	Medium	HMGP	Short	High	SIP	ES
BT-6 (carryover)	Send a town representative to the NYS Wildland Fire Suppression Training.	N/A	Wildfire	1, 3	Fire Department, Town Supervisor	Low	Low	Operating budget, State/County Grants	Short	High	EAP	ES
BT-7 (carryover)	Distribute county-provided educational materials on benefits of carrying NFIP policies and increase knowledge of NFIP services, and provide residents with information	Both	Flood	1, 2	County Office of Emergency Services, Town Floodplain Administrator,	Medium	Low	Operating budget	Short	High	EAP	PI





Table 9.2-12. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category	CRS Category
	listing steps taken to lessen potential flood damage to reduce the impact of flooding.				Town Board							
BT-8	Apply for grants to assist with mitigation activities including Edgecombe Pond Dam projects and backup power provisions for the school and Town Hall.	Existing	All Hazards	1, 3	Town Board	Medium	Low	Town Operating Budget	Short	High	LPR	PR
BT-9	Conduct an advanced mapping of all households, businesses, and other property owners who have signed up for Red Alert notification system, and where they lie in relationship to hazard areas.	Existing	All Hazards	3	Town Planning, Town Board	High	Low	Operating budget, State/County Grants	Short	High	EAP	ES
BT-10	Develop and implement a strategy to mitigate risk to public and property from beaver dam breaches.	N/A	Flood	1	Town Board, County	Medium	Low	Operating budget, State/County Grants	Short	Medium	LPR	PR
BT-11	Culverts improvements, as called for by the Town Highway Department. Specifically, the following culverts will be replaced: <ul style="list-style-type: none"> 6 culverts on Padanarum Rd 8 culverts on Wall Street 12 culverts on E. Schroon River Rd 8 culverts on S. Trout Lake Rd 5 culverts on Upper/Lower Brerton with catch basins 7 culverts on Finkle Rd. 8 culverts on Mohican Rd, 3 with catch basins 	N/A	Flood	1	Town Highway Department	High	High	Town Capital Improvements Budget, Grants	Short	High	SIP	SP
BT-12	Install dry hydrants at the	N/A	Fire	3	Town DPW	High	Medium	Town Capital	Short	High	SIP	SP,





Table 9.2-12. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category	CRS Category
	following locations: <ul style="list-style-type: none"> Water company property at Edgecomb Pond Veterans Park 							Improvements Budget, Grants				ES

Notes:

Not all acronyms and abbreviations defined below are included in the table.

*Does this mitigation initiative reduce effects of hazards on new and/or existing buildings and/or infrastructure? Not applicable (N/A) is inserted if this does not apply.

Acronyms and Abbreviations:

CAV	Community Assistance Visit
CDBG	Community Development Block Grant
GCRS	Community Rating System
DPW	Department of Public Works
FEMA	Federal Emergency Management Agency
FPA	Floodplain Administrator
HMA	Hazard Mitigation Assistance
N/A	Not applicable
NFIP	National Flood Insurance Program
OEM	Office of Emergency Management

Potential FEMA HMA Funding Sources:

FMA	Flood Mitigation Assistance Grant Program
HMGP	Hazard Mitigation Grant Program
PDM	Pre-Disaster Mitigation Grant Program
RFC	Repetitive Flood Claims Grant Program (discontinued)
SRL	Severe Repetitive Loss Grant Program (discontinued)

Timeline:

Short	1 to 5 years
Long Term	5 years or greater
OG	On-going program
DOF	Depending on funding

Costs:

Where actual project costs have been reasonably estimated:

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

Where actual project costs cannot reasonably be established at this time:

Low	Possible to fund under existing budget. Project is part of, or can be part of, an existing ongoing program.
Medium	Could budget for under existing work plan, but would require a reapportionment of the budget or a budget amendment, or cost of the project would have to be spread over multiple years.
High	Would require an increase in revenue via an alternative source (i.e., bonds, grants, fee increases) to implement. Existing funding levels are not adequate to cover costs of the proposed project.

Benefits:

Where possible, an estimate of project benefits (per FEMA's benefit calculation methodology) has been evaluated against the project costs, and is presented as:

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

Where numerical project benefits cannot reasonably be established at this time:

Low	Long-term benefits of the project are difficult to quantify in the short term.
Medium	Project will have a long-term impact on reduction of risk exposure to life and property, or project will provide an immediate reduction in risk exposure to property.
High	Project will have an immediate impact on reduction of risk exposure to life and property.





Mitigation Category:

- *Local Plans and Regulations (LPR)* – Actions that include government authorities, policies, or codes that influence the way land and buildings are developed and built.
- *Structure and Infrastructure Project (SIP)* – Actions that involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures, as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce impacts of hazards.
- *Natural Systems Protection (NSP)* – Actions that minimize damage and losses, and also preserve or restore the functions of natural systems.
- *Education and Awareness Programs (EAP)* – Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities

CRS Category:

- *Preventative Measures (PR)* – Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and stormwater management regulations.
- *Property Protection (PP)* – Actions include public activities to reduce hazard losses or 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.
- *Public Information (PI)* – 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 educational programs for school-age children and adults.
- *Natural Resource Protection (NR)* – 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.
- *Structural Flood Control Projects (SP)* – Actions that involve construction of structures to reduce impacts of a hazard. Such structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.
- *Emergency Services (ES)* – Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and protection of essential facilities



Table 9.2-13. Summary of Prioritization of Actions

Mitigation Action/Project Number	Mitigation Action/Initiative	Life Safety	Property Protection	Cost-Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
BT-1	Develop a Hamlet-wide Stormwater Drainage System plan for the Hamlet of Bolton	0	1	0	1	1	1	0	1	0	1	1	0	1	0	8	High
BT-2	Adopt and implement the Local Waterfront Revitalization Plan (draft released in July, 2014).	0	0	1	1	1	1	1	1	1	1	0	0	1	1	10	High
BT-3	Edgecomb Pond Dam Auxiliary Spillway Development Project: Install an auxiliary spillway for the dam which provides water to hamlet (built-up) area. Drainage easements have been acquired in area where new spillway would be built.	1	1	0	1	1	1	0	1	1	1	0	0	1	0	9	High
BT-4	Edgecomb Pond Dam Upgrades: Make structural upgrades and improvements of the existing Edgecomb Pond Dam as called for by the upcoming structural evaluation. The Dam (owned by Bolton Water District) is in need of some improvements. The Town is in the process of contracting for a structural evaluation of the existing dam.	1	1	0	1	0	1	0	1	1	1	0	0	1	0	8	High





Table 9.2-13. Summary of Prioritization of Actions

Mitigation Action/Project Number	Mitigation Action/Initiative	Life Safety	Property Protection	Cost-Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
BT-5	Obtain funding to purchase generators for municipally-owned critical facilities, including the School and town hall.	1	1	0	1	1	1	0	1	1	1	1	0	1	1	11	High
BT-6	Send a town representative to the NYS Wildland Fire Suppression Training.	1	1	1	1	0	0	1	0	1	1	0	1	0	0	8	High
BT-7	Distribute county-provided educational materials on benefits of carrying NFIP policies and increase knowledge of NFIP services, and provide residents with information listing steps taken to lessen potential flood damage to reduce the impact of flooding.	1	1	1	1	1	1	1	0	1	1	0	1	0	0	10	High
BT-8	Apply for grants to assist with mitigation activities including Edgecombe Pond Dam projects and backup power provisions for the school and Town Hall.	1	1	1	0	1	1	-1	0	0	1	1	1	1	1	9	High
BT-9	Conduct an advanced digital mapping of all households, businesses, and other property owners who have signed up for Red Alert notification system, and where they lie in	1	0	1	1	0	1	1	0	0	1	1	1	1	1	10	High





Table 9.2-13. Summary of Prioritization of Actions

Mitigation Action/Project Number	Mitigation Action/Initiative	Life Safety	Property Protection	Cost-Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
	relationship to hazard areas.																
BT-10	Develop and implement a strategy to mitigate risk to public and property from beaver dam breaches.	0	1	1	0	0	0	0	1	0	1	0	1	1	0	6	Med
BT-11	Culverts improvements, as called for by the Town Highway Department.	1	1	1	0	0	1	1	0	1	1	1	1	1	0	10	High
BT-12	Install dry hydrants (2)	1	1	1	1	0	1	1	1	0	1	0	1	1		10	High

Note: Refer to Section 6, which conveys guidance on prioritizing mitigation actions.



9.2.7 Future Needs To Better Understand Risk/Vulnerability

None at this time.

9.2.8 Hazard Area Extent and Location

Hazard area extent and location maps have been generated for the Town of Bolton that illustrate the areas probable to be impacted within the municipality (see Figure 9.2-1 and Figure 9.2-2 below). These maps are based on the best available data at the time of the preparation of this Plan, and are considered to be adequate for planning purposes. Maps have been generated for those hazards (i.e., landslide, wildfire and flooding) that can be clearly identified using mapping techniques and technologies, and to which the Town of Bolton has significant exposure. These maps also appear in the hazard profiles within Section 5.4, Volume I of this Plan.

9.2.9 Additional Comments

None at this time.



Figure 9.2-1. Town of Bolton Landslide Hazard Area Map

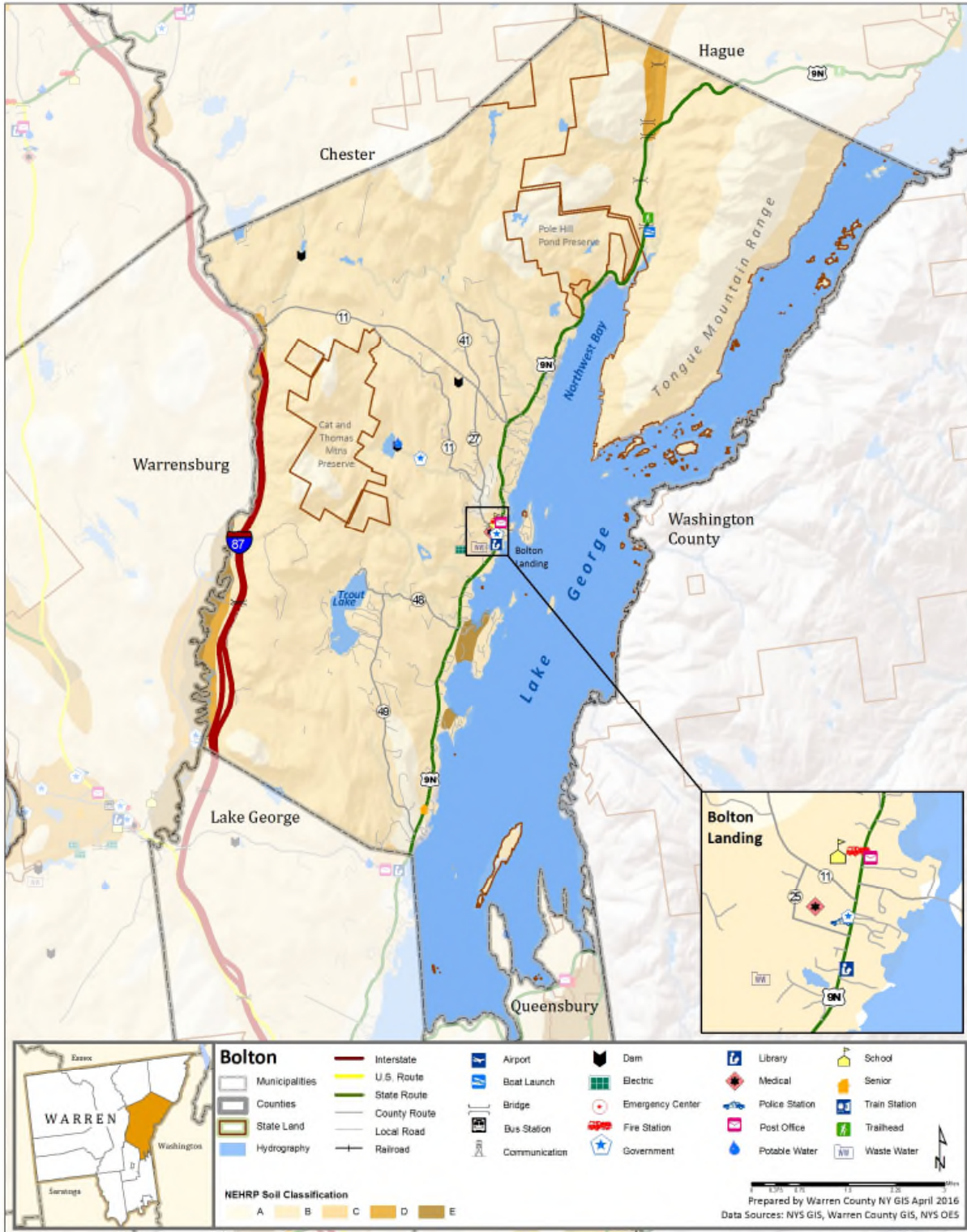
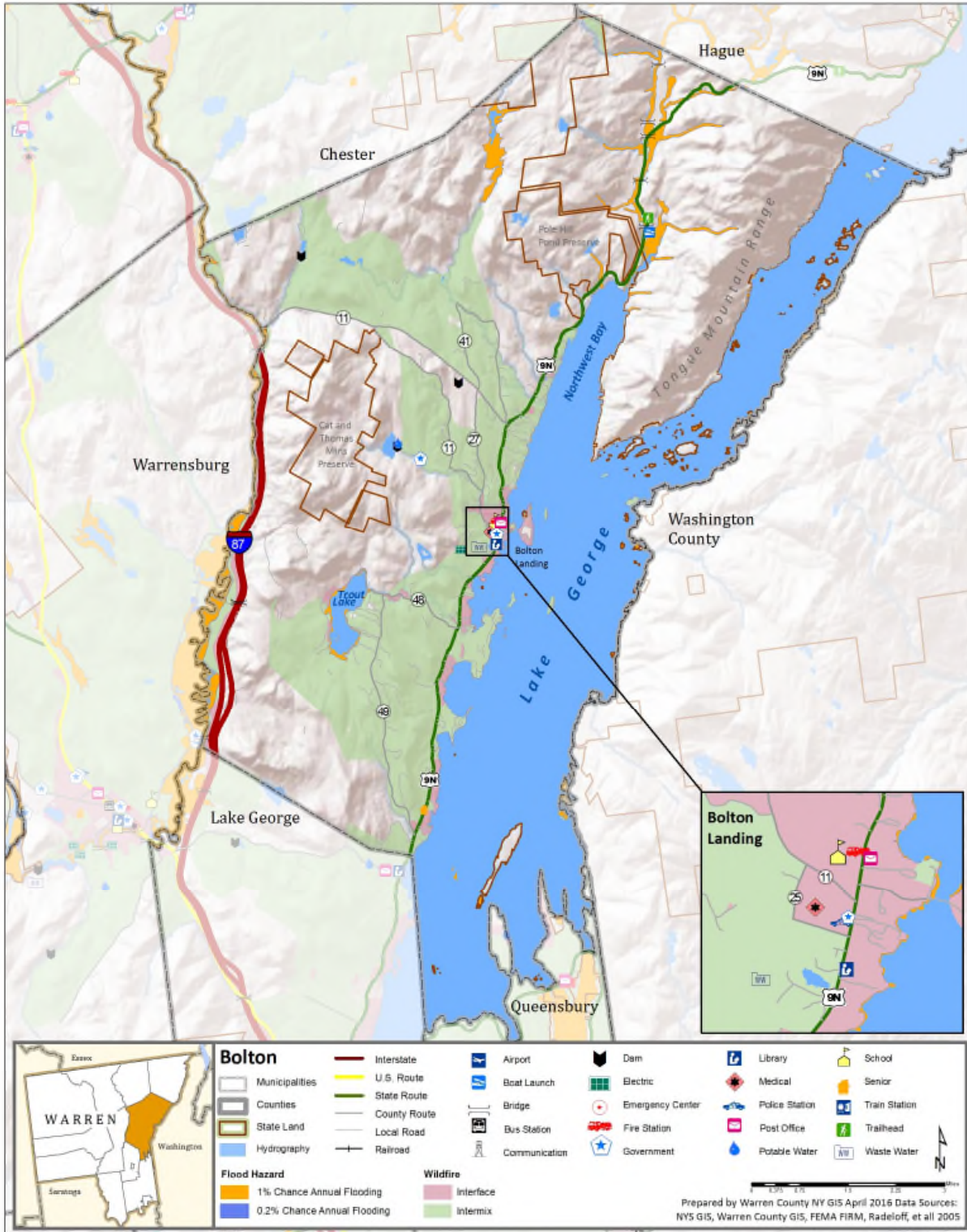




Figure 9.2-2. Town of Bolton Flood and Wildfire Hazard Area Extent and Location Map





Name of Jurisdiction: Town of Bolton
 Name and Title Completing Worksheet: Ronald Conover, Town Supervisor
 Action Number: BT-3
 Mitigation Action/Initiative: Edgecomb Pond Dam Auxiliary Spillway Development Project

Assessing the Risk	
Hazard(s) addressed:	Flood
Specific problem being mitigated:	Current configuration does not allow for sufficient controlled releases to minimize flooding.
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	There are no other technically viable alternatives than to install an auxiliary spillway.
Action/Project Intended for Implementation	
Description of Selected Action/Project	Install an auxiliary spillway for the dam which provides water to hamlet (built-up) area. Drainage easements have been acquired in area where new spillway would be built. Efforts to mitigate critical facilities shall recognize Federal and State directives for protection to the 500-year flood level or “worst case scenario”.
Action/Project Category	SIP
Goals Met	1
Applies to existing and or new development, or not applicable	Existing
Benefits (losses avoided)	High – avoid flood damages and risk to life and property
Estimated Cost	High
Priority*	High
Plan for Implementation	
Responsible Organization	Bolton Water District, Town Board & NYDEC
Local Planning Mechanism	Comprehensive Plan, Capital Budgeting
Potential Funding Sources	Water Department Operating budget, State/County Grants
Timeline for Completion	Long Term
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:



Action Number:

BT-3

Mitigation Action/Initiative:

Edgecomb Pond Dam Auxiliary Spillway Development Project

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Project will reduce risk to life from flooding
Property Protection	1	Project will reduce risk of localized flood damages and risk and property
Cost-Effectiveness	0	
Technical	1	The mitigation action is technically feasible
Political	1	
Legal	1	The Town has legal jurisdiction over the property.
Fiscal	0	High cost
Environmental	1	Reduce nearby roadway flooding, thereby reducing waterways pollutants
Social	1	Reduce flooding of numerous residential properties.
Administrative	1	Town has administrative capability to manage the project
Multi-Hazard	0	
Timeline	0	May take longer than 5 years to implement
Agency Champion	1	Town Board supports the project
Other Community Objectives		
Total	9	
Priority (High/Med/Low)	High	



Name of Jurisdiction: Town of Bolton
 Name and Title Completing Worksheet: Ronald Conover, Town Supervisor
 Action Number: BT-4
 Mitigation Action/Initiative: Edgecomb Pond Dam Upgrades

Assessing the Risk	
Hazard(s) addressed:	Flood
Specific problem being mitigated:	Current dam is old and at risk of failure.
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	The Town is currently in the process of contracting for a structural evaluation of the existing dam. This study will examine the engineering options available. Installing an auxiliary spillway for the dam will not protect existing aging infrastructure from failing.
Action/Project Intended for Implementation	
Description of Selected Action/Project	Make structural upgrades and improvements of the existing Edgecomb Pond Dam as called for by the upcoming structural evaluation. The Dam (owned by Bolton Water District) is in need of some improvements. The Town is in the process of contracting for a structural evaluation of the existing dam. Efforts to mitigate critical facilities shall recognize Federal and State directives for protection to the 500-year flood level or “worst case scenario”.
Action/Project Category	SIP
Goals Met	1
Applies to existing and or new development, or not applicable	Existing
Benefits (losses avoided)	High – avoid flood damages and risk to life and property
Estimated Cost	High
Priority*	High
Plan for Implementation	
Responsible Organization	Bolton Water District, Town Board
Local Planning Mechanism	Comprehensive Plan, Capital Budgeting
Potential Funding Sources	Water Department Operating budget, State/County Grants
Timeline for Completion	Long Term
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:



Action Number:

BT-4

Mitigation Action/Initiative:

Edgecomb Pond Dam Upgrades

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Project will reduce risk to life from dam failure
Property Protection	1	Project will reduce risk of localized flood damages from dam failure
Cost-Effectiveness	0	
Technical	1	The mitigation action is technically feasible
Political	0	
Legal	1	The Town has legal jurisdiction over the property.
Fiscal	0	High cost
Environmental	1	Reduce threat of dam failure which would disrupt habitats
Social	1	Reduce risk of flooding numerous residential properties.
Administrative	1	Town has administrative capability to manage the project
Multi-Hazard	0	
Timeline	0	May take longer than 5 years to implement
Agency Champion	1	Town Board supports the project
Other Community Objectives		
Total	8	
Priority (High/Med/Low)	high	



Name of Jurisdiction: Town of Bolton
Name and Title Completing Worksheet: Ronald Conover, Town Supervisor
Action Number: BT-5
Mitigation Action/Initiative: Obtain funding to purchase generators

Assessing the Risk	
Hazard(s) addressed:	All hazards
Specific problem being mitigated:	Lack of backup power at critical facilities in the Town
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	There are no practical or cost-effective alternatives to installing back-up power generation to maintain these critical facilities. Tree-trimming is an on-going effort throughout the County. Alternatives such as burying all power lines, secondary grid feeds and "micro-grids" are cost-prohibitive and outside the capabilities of the Town.
Action/Project Intended for Implementation	
Description of Selected Action/Project	Obtain funding to purchase generators for municipally-owned critical facilities, including the School and Town Hall.
Action/Project Category	SIP
Goals Met	1, 3
Applies to existing and or new development, or not applicable	Existing
Benefits (losses avoided)	High
Estimated Cost	Medium
Priority*	High
Plan for Implementation	
Responsible Organization	Town Supervisor, County Office of Emergency Services
Local Planning Mechanism	Emergency Management
Potential Funding Sources	HMGP
Timeline for Completion	Short Term
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:



Action Number: BT-5
Mitigation Action/Initiative: Obtain funding to purchase generators

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	
Property Protection	1	Allow critical facilities to function in the event of a power outage
Cost-Effectiveness	0	
Technical	1	
Political	1	
Legal	1	
Fiscal	0	Need to seek grant funding
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	All hazards
Timeline	0	
Agency Champion	1	
Other Community Objectives	1	
Total	11	
Priority (High/Med/Low)	High	



Name of Jurisdiction:	Town of Bolton
Name and Title Completing Worksheet:	Ronald Conover, Town Supervisor
Action Number:	BT-11
Mitigation Action/Initiative:	Culverts Improvements

Assessing the Risk	
Hazard(s) addressed:	Flood
Specific problem being mitigated:	Roadway flooding from undersized or failing culverts
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	Various construction alternatives are considered during the design and engineering phase of the individual sub-projects for this initiative. There are no practical or cost-effective alternatives to addressing this problem than directly at the drainage structure(s).
Action/Project Intended for Implementation	
Description of Selected Action/Project	<p>Culverts improvements, as called for by the Town Highway Department. Specifically, the following culverts will be replaced:</p> <ul style="list-style-type: none"> • 6 culverts on Padanarum Rd • 8 culverts on Wall Street • 12 culverts on E. Schroon River Rd • 8 culverts on S. Trout Lake Rd • 5 culverts on Upper/ Lower Breton with catch basins • 7 culverts on Finkle Rd. • 8 culverts on Mohican Rd, 3 with catch basins <p>All mitigation efforts shall be made in consideration of Federal and State directives to mitigate critical infrastructure to address protection to the 500-year flood event or “worst damage scenario”.</p>
Action/Project Category	SIP
Goals Met	1
Applies to existing and or new development, or not applicable	Existing
Benefits (losses avoided)	High – avoid flood damages and risk to life and property
Estimated Cost	High
Priority*	High
Plan for Implementation	
Responsible Organization	Town Highway Department
Local Planning Mechanism	Town Highway Department Operations
Potential Funding Sources	Town Capital Improvements Budget, Grants
Timeline for Completion	Short
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:



Action Number: BT-11
Mitigation Action/Initiative: Culverts Improvements

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Project will reduce risk to life from culvert failure and roadway washout
Property Protection	1	Project will reduce risk of local roadway flood damages
Cost-Effectiveness	1	Action will reduce repair expenditures over time
Technical	1	The mitigation action is technically feasible
Political	0	
Legal	1	Town has legal authority to implement the action
Fiscal	0	High cost
Environmental	0	
Social	1	Transportation safety improvement benefits all members of population.
Administrative	1	Town has administrative capability to manage the project
Multi-Hazard	1	Addresses flooding and severe storms
Timeline	1	Implement within 5 years
Agency Champion	1	Supervisor's Office
Other Community Objectives	0	
Total	10	
Priority (High/Med/Low)	High	



Name of Jurisdiction: Town of Bolton
Name and Title Completing Worksheet: Ronald Conover, Town Supervisor
Action Number: BT-12
Mitigation Action/Initiative: Install dry hydrants (2) - Water company property at Edgecomb Pond; Veterans Park

Assessing the Risk	
Hazard(s) addressed:	Wildfire, fire
Specific problem being mitigated:	Currently no hydrant or water source at these locations
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	There are no feasible or cost-effective alternatives to provide fire-fighting capabilities in these areas, other than the installation of dry hydrants.
Action/Project Intended for Implementation	
Description of Selected Action/Project	Install dry hydrants at the water company property at Edgecomb Pond, and at Veterans Park.
Action/Project Category	SIP
Goals Met	3
Applies to existing and or new development, or not applicable	N/A
Benefits (losses avoided)	High – avoid damages and risk to life and property
Estimated Cost	High
Priority*	High
Plan for Implementation	
Responsible Organization	Town DPW
Local Planning Mechanism	Capital Improvements
Potential Funding Sources	Town Capital Improvements Budget, Grants
Timeline for Completion	Short
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:



Action Number:

BT-12

Mitigation Action/Initiative:

Install dry hydrants (2) - Water company property at Edgecomb Pond; Veterans Park

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Project will reduce risk to life from fire
Property Protection	1	Project will reduce risk of property damages from fire
Cost-Effectiveness	1	Action is cost-effective – High benefits for medium cost
Technical	1	The mitigation action is technically feasible
Political	0	
Legal	1	Town has legal authority to implement the action
Fiscal	1	This is feasible under town operating budget
Environmental	1	This will allow fire company to not draw from the drinking water
Social	0	
Administrative	1	Town has administrative capability to manage the project
Multi-Hazard	0	
Timeline	1	Implement within 5 years
Agency Champion	1	Supervisor’s Office
Other Community Objectives	1	
Total	11	
Priority (High/Med/Low)	High	



9.3 TOWN OF CHESTER

This section presents the jurisdictional annex for the Town of Chester.

9.3.1 Hazard Mitigation Plan Point of Contact

The following individuals have been identified as the hazard mitigation plan’s (HMP) primary and alternate points of contact.

Primary Point of Contact	Alternate Point of Contact
Craig Leggett, Supervisor P.O. Box 423 Chestertown, New York 12817 (518) 275-5484 townofchestersuper@gmail.com	Jason Monroe, Highway Superintendent P.O. Box 423 Chestertown, New York 12817 (518) 796-7698 chesterhighway@yahoo.com

9.3.2 Municipal Profile

The Town of Chester is in northern Warren County, between the Schroon River and the Hudson River in the southeastern corner of the Adirondack Park. The New York legislature created the Town on March 25, 1799.

The town had a total area of 87.1 square miles of which 84.5 square miles are land and 2.6 square miles are water. The Town includes five hamlets: Chestertown, Darrowsville, Ignera, Pottersville and Riparius. According to the 2010 Census, the community's population was 3,355. There are three lakes located in or partially in the Town: Friends Lake, Loon Lake and Schroon Lake. The entire Town is within the Adirondack Park.

The Town is governed by a Town Board that consists of four councilpersons and a Town Supervisor.

Growth/Development Trends

The following table summarizes recent residential/commercial development in the Town of Chester since 2010 to present and lists any known or anticipated major residential/commercial development and major infrastructure development that has been identified in the next five years within the municipality. Refer to the maps following Section 9.3.9 of this annex: Figure 9.3-1 that illustrates landslide hazard areas, and that illustrates the flood and wildfire hazard areas.

Table 9.3-1. Growth and Development

Property or Development Name	Type (e.g. Res., Comm.)	# of Units / Structures	Location (address and/or Parcel ID)	Known Hazard Zone(s)	Description/Status of Development
Recent Development from 2010 to present					
Loon Lake RV Park	Commercial	One	5400-5408 State Route 8 TM #: 103.1-18.1	None	Camp Store
Northwoods Holdings LLC	Residential	One Structure / 8 units	7 Panther Mountain Drive TM #: 104.14-1-11	None	Apartment Complex
Etain, LLC	Commercial	One Structure	6030-6032 State Route 8 TM #: 121.1-48	None	Medical Marijuana Cultivation and Production Facility
Word of Life Fellowship	Religious Institution	One Structure	4200 Glendale Road TM #: 36.1-20	None	Student Life Center





Property or Development Name	Type (e.g. Res., Comm.)	# of Units / Structures	Location (address and/or Parcel ID)	Known Hazard Zone(s)	Description/Status of Development
Known or Anticipated Development in the Next Five (5) Years					
DHC of Chestertown, LLC	Commercial	One	State Route 8 TM #: 87.20-1-11	None	Dollar General retail store
House & Vanvorris	Commercial	One	6272 State Route 9 TM #: 104.14-1-39	None	Addition and renovation to existing structure (Rite Aid)

Note: Only location-specific hazard zones or vulnerabilities are identified

9.3.3 Natural Hazard Event History Specific to the Municipality

Warren County has a history of natural and non-natural hazard events as detailed in Volume I, Section 5.0 of this Plan. A summary of historical events appears in each hazard profile, and includes a chronology of events that have affected the County and its municipalities. For the purpose of this Plan update, events that have occurred in the County from 2010 to present were summarized to indicate the range and impact of hazard events in the community. Information regarding specific damages is included, if available, based on reference material or local sources. This information is presented in Table 9.3-2 below. For details of these and additional events, refer to Volume I, Section 5.0 of this Plan.

Table 9.3-2. Hazard Event History

Dates of Event	Event Type (FEMA Disaster Declaration if applicable)	County Designated?	Summary of Damages/Losses
March 23, 2010	Severe Storms and Flooding (DR-1899)	Yes	Fish Hollow Road and North Gore Road washed out requiring regrading and the replacement of asphalt. Debris removal was also required.
March 10-14, 2011	Ice Jam	N/A	Flooding on Rover Road, although no road damage occurred.
April 27-28, 2011	Severe Storms, Flooding, Tornadoes and Straight-Line Winds (DR-1993)	Yes	In the Town of Chester, East Hudson River Drive was closed for a few days; there was damage to Cobb Creek Road; and damage was also reported to the Loon Lake dam. Personnel costs and debris removal costs were incurred as a result of the damage.
May 27 – June 2, 2011	Flooding	N/A	Loss of service from washouts occurred on Pucker Street and Potter Brook Road. The washout caused damage to the sewer and asphalt. In addition debris removal costs were incurred.
August 27-29, 2011	Hurricane Irene (DR-4020)	Yes	There was severe wind and flooding damage throughout the County. The Town of Chester experienced power loss and several road closures lasting several days. Roads impacted included Igerna Road, Vanderwalker Road, Perry Road and Hidden Lake Road. Structural damage was reported from trees falling on houses.
June 28, 2013	Severe Storm and Flooding (DR-4192)	Yes	Bird Pond Road was closed for one day. Ryan Brook overwhelmed the flood culvert causing subsidence of road material and asphalt loss. Debris removal was required.





July 8, 2014	Thunderstorms and Tornado (F0) (DR-4180)	No	Homes were damaged.
2014	Beaver Dam Breach	No	Stock Farm road was washed out.

Notes:

- EM Emergency Declaration (FEMA)
- FEMA Federal Emergency Management Agency
- DR Major Disaster Declaration (FEMA)
- N/A Not applicable

9.3.4 Hazard Vulnerabilities and Ranking

The hazard profiles in Section 5.0 of this Plan convey detailed information regarding each plan participant’s vulnerability to the identified hazards. The following summarizes the hazard vulnerabilities and their ranking in the Town of Chester. For additional vulnerability information relevant to this jurisdiction, refer to Section 5.0.

Natural Hazard Risk/Vulnerability Risk Ranking

Table 9.3-3 below summarizes hazard risk/vulnerability rankings of potential natural hazards for the Town of Chester.

Table 9.3-3. Natural Hazard Risk/Vulnerability Risk Ranking

Hazard type	Estimate of Potential Dollar Losses to Structures Vulnerable to the Hazard ^{a, b}	Probability of Occurrence	Risk Ranking Score (Probability x Impact)	Hazard Ranking ^a
Earthquake	100-year MRP: \$33,571.00 500-year MRP: \$3,017,067 2,500-Year MRP: \$24,484,586.00	Occasional	12	Low
Flood	RCV Exposed to 1% Annual Chance: \$56,427,332	Frequent	18	Medium
Landslide	Damage estimate not available	Frequent	33	High
Infestation	Damage estimate not available	Frequent	24	Medium
Severe Storm	RCV Exposed to 1938 storm-winds: \$211,264	Frequent	48	High
Severe Winter Storm	GBS 1% Loss: \$5,072,480 GBS 5% Loss: \$25,362,400	Frequent	51	High
Wildfire	RCV Exposed to Intermix: \$447,494,000 RCV Exposed to Interface: \$90,263,000	Frequent	48	High
Cyber Security	Damage estimate not available	Occasional	12	Low
Disease Outbreak	Damage estimate not available	Frequent	27	Medium
Hazardous Material Incidents	Damage estimate not available	Frequent	24	Medium

Notes:

- a. The general building stock valuation is based on the custom inventory generated for the municipality and based on improved value.
High = Total hazard priority risk ranking score of 31 and above
Medium = Total hazard priority risk ranking of 20-30+
Low = Total hazard risk ranking below 20
- b. Loss estimates for the severe storm and severe winter storm hazards are structural values only and do not include the estimated value of contents. The earthquake was evaluated by Census tract. The Census tracts do not exactly align with municipal boundaries; therefore, a total is reported for each Town inclusive of the Villages. Loss estimates for the flood and earthquake hazards represent both structure and contents. Potential flood loss estimates were generated using Hazus-MH 2.2 and digitized FIRM maps from the 1980s and 1990s for the 1-percent annual chance event; NED DEM was used to generate a depth grid. The County’s 2015 Real





Property data was used to generate the values for flood and includes structure and contents. For the wildfire hazard, the improved value and estimated contents of buildings located within the identified hazard zones is provided.

GBS General building stock
 MRP Mean return period
 RCV Replacement Cost Value

National Flood Insurance Program (NFIP) Summary

Table 9.3-4 below summarizes NFIP statistics for the Town of Chester.

Table 9.3-4. NFIP Summary

Municipality	# Policies (1)	# Claims (Losses) (1)	Total Loss Payments (2)	# Rep. Loss Prop. (1)	# Severe Rep. Loss Prop. (1)	# Policies in 100-year Boundary (3)
Town of Chester	32	28	\$92,183	1	0	14

Source: FEMA Region 2, 2014

- (1) Policies, claims, repetitive loss, and severe repetitive loss statistics are provided by FEMA, are current as of November 30, 2015, and are summarized by community name. Total number of repetitive loss properties includes severe repetitive loss properties. Number of claims represents claims closed by November 30, 2015.
- (2) Total building and content losses from the claims file provided by FEMA Region 2.
- (3) Number of policies inside and outside of flood zones is based on latitude and longitude provided by FEMA Region 2 in the policy file.
- (4) FEMA noted that for a property with more than one entry, more than one policy may have been in force or more than one Geographic Information System (GIS) specification was possible.

Critical Facilities

Table 9.3-5 identifies critical facilities within the municipality located on parcels that intersect the current regulatory NFIP 1% chance flood boundary (aka: “Special Flood Hazard Area” (SFHA)), however it is recognized that the actual facility structure(s) may lie outside of the SFHA. Please refer to the Flood Hazard Profile (Section 5.4.2) for further details of estimated flood losses throughout the County, as well as the “Other Vulnerabilities Identified” section following.

Table 9.3-5. Potential Flood Losses to Critical Facilities

Municipality	Facility Types in 1% Chance Flood Boundary						
	Boat Facilities	Dam	Electric	Government	Highway Bridge	Rail Facility	Wastewater
Town of Chester	2	3	0	0	9	0	0

Source: Warren County Real Property 2015 tax roll; HAZUS-MH 2.2; FEMA 2015

Notes:

- (1) HAZUS-MH 2.2 provides a general indication of the maximum restoration time for 100% operations. Clearly, a great deal of effort is needed to quickly restore essential facilities to full functionality; therefore, this will be an indication of the maximum downtime (HAZUS-MH 2.2 User Manual).
- (2) Some facilities may be within the Digital Flood Insurance Rate Map (DFIRM) flood hazard boundary; however, HAZUS did not calculate potential loss, perhaps because depth of flooding would not cause any damages to these structures according to the depth damage function used in HAZUS for that facility type. Further, HAZUS-MH may estimate potential damage to a facility outside the DFIRM if the model generates a depth grid beyond DFIRM boundaries.

Other Vulnerabilities Identified

The municipality has identified the following vulnerabilities within their community:





- Old River Road Flooding – Area residents were evacuated in 2011 when rising waters from an ice jam on the Hudson River left over 100 yards of the road impassable. One mile of road elevation is needed at a cost of \$1 million to mitigate the problem.
- Loon Lake Dam (High Hazard Dam) is owned by Loon Lake Park District and managed by Town Board. The Board completed a structural analysis which recommended to enlarge spillway and face upgrades. The Town has an Emergency Action Plan (EAP) for the dam dated June 5, 2008, which was prepared for NYS DEC. An update to this EAP is needed.
- Beaver Dams on private property create flood risk, specifically at:
 - Caused a washout on Pottersville-Olmstedville Road
 - Stock Farm Road – lost part of road on July 4th 2014
 - Perry Road (big problem here)
 - County Route 11 - \$3 million damage when this dam blew out
 - Byrnes Road and Bird Pond Road
 - Beaver Pond Road
- Culverts that need replacing:
 - Stock Farm Road
 - Wood Wells Road
- Needs backup power:
 - Chestertown Hall
 - Town Hall Emergency Shelter
 - Hudson Headwaters
 - North Warren Emergency Squad Headquarters (located in Chester, serves Chester and Horicon).
- Residential areas that are flood vulnerable:
 - Schroon Lake Dam (Moderate Hazard): Needs an EAP developed.
 - Word of Life Bible College (Pottersville, 600 students) – Has B/U Power
 - Valley Farm Road, south of Pottersville along Schroon River
 - East Hudson River Drive, south of bridge
- Water Supplies – Chestertown and Pottersville hamlets both have interconnects and they have mobile generators that fulfill their needs.
- North Warren Central School has backup power and could serve as an emergency shelter.



9.3.5 Capability Assessment

This section identifies the following capabilities of the local jurisdiction:

- Planning and regulatory capability
- Administrative and technical capability
- Fiscal capability
- Community classification
- NFIP
- Integration of mitigation planning into existing and future planning mechanisms.

Planning and Regulatory Capability

Table 9.3-6 below summarizes regulatory tools available to the Town of Chester.

Table 9.3-6. Planning and Regulatory Tools

Tool / Program (code, ordinance, plan)	Do you have this? (Yes/No) If Yes, date of adoption or update	Authority (local, county, state, federal)	Dept. /Agency Responsible	Code Citation and Comments (Code Chapter, name of plan, explanation of authority, etc.)
Planning Capability				
Master Plan	Yes, 1988 (first adopted)	Local	Town Board	Chester Comprehensive Plan
Capital Improvements Plan	No	-	-	The Town is working on a capital improvement plan, which is expected to be completed in 2017.
Floodplain Management / Basin Plan	No	-	-	-
Stormwater Management Plan	No	-	-	Town has a stormwater mapping report which could be basis for a future plan.
Open Space Plan	No	-	-	-
Stream Corridor Management Plan	No	-	-	-
Watershed Management or Protection Plan	No	-	-	-
Economic Development Plan	No	-	-	-
Comprehensive Emergency Management Plan	Yes	Warren County	-	-
Emergency Response Plan	Yes, 2008 (first adopted)	Local	Town Board	Chester Emergency Plan
Post-Disaster Recovery Plan	No	-	-	-
Transportation Plan	No	-	-	-
Strategic Recovery Planning Report	No	-	-	-
Other Plans:	No	-	-	-
Regulatory Capability				
Building Code	Yes	State, Local	Warren County	-
Zoning Ordinance	Yes, 1971 (first adopted)	Local, Adirondack	Town Board, APA	Last amended July 2011



Tool / Program (code, ordinance, plan)	Do you have this? (Yes/No) If Yes, date of adoption or update	Authority (local, county, state, federal)	Dept. /Agency Responsible	Code Citation and Comments (Code Chapter, name of plan, explanation of authority, etc.)
		Park Agency (APA)		
Subdivision Ordinance	Yes, 1971 (first adopted)	Local, Adirondack Park Agency (APA)	Town Board, APA	Last amended July 2011
NFIP Flood Damage Prevention Ordinance	Yes	Federal, State, Local	Town Board, Zoning Administrator	-
NFIP: Cumulative Substantial Damages	No	-	-	-
NFIP: Freeboard	Yes	State, Local	-	State mandated BFE+2 for single and two-family residential construction, BFE+1 for all other construction types
Growth Management Ordinances	No	-	-	-
Site Plan Review Requirements	Yes	Local	Town Board, Zoning and Planning	-
Stormwater Management Ordinance	No	-	-	-
Municipal Separate Storm Sewer System (MS4)	No	-	-	-
Natural Hazard Ordinance	No	-	-	-
Post-Disaster Recovery Ordinance	No	-	-	-
Real Estate Disclosure Requirement	Yes	State	State	New York State (NYS) mandate, Property Condition Disclosure Act, NY Code – Article 14 §460-467
Other (Special Purpose Ordinances [i.e., sensitive areas, steep slope])	Yes	Local	Zoning and Planning	Town of Chester Warren County, New York Zoning Local Law

Administrative and Technical Capability

Table 9.3-7 below summarizes potential staff and personnel resources available to the Town of Chester.

Table 9.3-7. Administrative and Technical Capabilities

Resources	Is this in place? (Yes or No)	Department/ Agency/Position
Administrative Capability		
Planning Board	Yes	Planning Board; Zoning and Planning
Mitigation Planning Committee	No	-
Environmental Board/Commission	No	-
Open Space Board/Committee	No	-





Resources	Is this in place? (Yes or No)	Department/ Agency/Position
Economic Development Commission/Committee	No	-
Maintenance programs to reduce risk	Yes	Highway Superintendent
Mutual aid agreements	Yes	Fire Company / EMS Squad
Technical/Staffing Capability		
Planner(s) or engineer(s) with knowledge of land development and land management practices	Yes	Zoning and Planning; County Planning Offices
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Yes	Town Engineer
Planners or engineers with an understanding of natural hazards	Yes	Town Engineer
NFIP Floodplain Administrator (FPA)	Yes	Zoning Administrator
Surveyor(s)	No	-
Personnel skilled or trained in GIS and/or Hazards United States (HAZUS) – Multi-Hazards (MH) applications	Yes	Assessor; Zoning office
Scientist familiar with natural hazards	No	-
Emergency Manager	Yes	Town Supervisor
Grant writer(s)	Yes	Town Supervisor
Staff with expertise or training in benefit/cost analysis	No	Consultant support
Professionals trained in conducting damage assessments	No	-

Fiscal Capability

Table 9.3-8 below summarizes financial resources available to the Town of Chester.

Table 9.3-8. Fiscal Capabilities

Financial Resources	Accessible or Eligible to Use (Yes/No)
Community Development Block Grants (CDBG, CDBG-DR)	Yes
Capital improvements project funding	Yes
Authority to Levy Taxes for specific purposes	Yes
User fees for water, sewer, gas or electric service	Yes – water and cable TV
Impact fees for homebuyers or developers of new development/homes	No
Stormwater utility fee	No
Incur debt through general obligation bonds	Yes
Incur debt through special tax bonds	Yes
Incur debt through private activity bonds	No
Withhold public expenditures in hazard-prone areas	Unknown
Other federal or state funding programs	Yes
Open Space Acquisition funding programs	Yes
Other	No

Community Classifications

Table 9.3-9 below summarizes classifications for community program available to the Town of Chester.





Table 9.3-9. Community Classifications

Program	Do you have this? (Yes/No)	Classification (if applicable)	Date Classified (if applicable)
Community Rating System (CRS)	NP	N/A	N/A
Building Code Effectiveness Grading Schedule (BCEGS)	NP	N/A	N/A
Public Protection (ISO Fire Protection Classes 1 to 10)	NP	N/A	N/A
Storm Ready	NP	N/A	N/A
Firewise	NP	N/A	N/A
Disaster/safety programs in/for schools	NP	N/A	N/A
Organizations with mitigation focus (advocacy group, non-government)	NP	N/A	N/A
Public education program/outreach (through website, social media)	Yes	N/A	N/A
Public-Private Partnerships	Yes	N/A	N/A

N/A Not applicable
 NP Not participating
 - Unavailable

The classifications listed above relate to the community’s ability to provide effective services to lessen its vulnerability to the hazards identified. These classifications can be viewed as a gauge of the community’s capabilities in all phases of emergency management (preparedness, response, recovery and mitigation) and are used as an underwriting parameter for determining the costs of various forms of insurance. The Community Rating System (CRS) class applies to flood insurance, while the Building Code Effectiveness Grading Schedule (BCEGS) and Public Protection classifications apply to standard property insurance. CRS classifications range on a scale of 1 to 10, with class 1 being the best possible classification, and class 10 representing no classification benefit. Firewise classification is higher if the subject property is more than 1000 feet from a creditable fire hydrant and is within 5 road miles of a recognized Fire Station.

Criteria for classification credits are outlined in the following documents:

- The Community Rating System Coordinators Manual
- The Building Code Effectiveness Grading Schedule
- The ISO Mitigation online ISO’s Public Protection website at <https://www.isomitigation.com/ppc/>
- The National Weather Service Storm Ready website at <http://www.stormready.noaa.gov/index.html>
- The National Firewise Communities website at <http://firewise.org/>

Self-Assessment of Capability

Table 9.3-10 below provides an approximate measure of the Town of Chester’s capability to work in a hazard-mitigation capacity and/or effectively implement hazard mitigation strategies to reduce hazard vulnerabilities.

Table 9.3-10. Self-Assessment Capability for the Municipality

Area	Degree of Hazard Mitigation Capability		
	Limited (If limited, what are your obstacles?)*	Moderate	High
Planning and Regulatory Capability		X	





Area	Degree of Hazard Mitigation Capability		
	Limited (If limited, what are your obstacles?)*	Moderate	High
Administrative and Technical Capability		X	
Fiscal Capability		X	
Community Political Capability			X
Community Resiliency Capability			X
Capability to Integrate Mitigation into Municipal Processes and Activities.			X

National Flood Insurance Program

NFIP Floodplain Administrator (FPA)

Walt Tennyson – Zoning/Floodplain Administrator

Flood Vulnerability Summary

As of November 30, 2015, 32 policies were in force, 13 of which were within the 100-year flood boundary. Since 1978, 28 claims have been paid totaling \$92,183. There is one repetitive loss property and no severe repetitive loss properties in the Town of Chester. According to current NFIP statistics at the time of this Plan, NFIP policies in the Town of Chester insured over \$5.1 million of property with total annual insurance premiums of \$18,588.

Resources

The floodplain administrator is adequately supported and trained to administer the duties, although opportunities for continued education or certification would be welcome.

When a property owner amends/submits a zoning certification application and their property is located in the flood zone, this officer requires the applicant obtain an elevation certificate from a state-licensed surveyor, architect or engineer before any approval or permit is granted.

Currently no education or outreach is conducted regarding flood hazards.

Compliance History

The Town of Chester’s floodplain regulations meet the minimum State and FEMA requirements. The most recent Community Assistance Visit was in 2010.

The Town intends to continue active participation in the NFIP, and maintain compliance with all requirements of participation. Further, the Town has identified several actions to support both continued and improved participation in the NFIP as identified in Table 9.3-13.

Regulatory

The Town’s floodplain management regulations/ordinances do not exceed the FEMA and State minimum requirements, however there are existing local ordinances, plans or programs (e.g. LWRP, zoning, site plan review) that support floodplain management and meeting the NFIP requirements as detailed further below.

The Town does not currently participate in the Community Rating System, and does not believe the program would be beneficial to their community.





Integration of Hazard Mitigation into Existing and Future Planning Mechanisms

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, each community was surveyed to obtain a better understanding of their community's progress in plan integration. A summary is provided below. In addition, the community identified specific integration activities that will be incorporated into municipal procedures.

Planning

Land Use Planning: The Town of Chester is a member of the Adirondack Park Agency, and has an Agency-approved local land use program, including a shared regulatory scheme in which the community and the agency work from the same set of rules, with one zoning map, the town acts on the Class B regional projects instead of the Agency and typically, with only one permit required. The Town has a Planning Board and Zoning Board.

Town of Chester Comprehensive Plan: The Town of Chester Comprehensive Plan is not currently integrated with the hazard mitigation plan.

Local Waterfront Revitalization Plan: The Town of Chester Local Waterfront Revitalization Plan addresses natural hazards in the implementation element.

COOP/COG: There is no formal COOP / COG plan for the Town. The Deputy Supervisor fills in if Town Supervisor is not able to carry out duties, as defined by the municipal law.

Regulatory and Enforcement (Ordinances)

Zoning: The Town of Chester zoning regulations consider natural hazard risk. The Planning Board and Zoning Board have maps, GIS and staff to assist in making determinations.

Operational and Administration

Stormwater Management: The Planning Board assumes stormwater management responsibilities.

Grant Support: The Town has contract support for grant applications, and is currently seeking funds for the following programs:

- Bridge and culvert flood mitigation
- Brush cutting program
- Generator for water district, and
- Loon Lake Dam Emergency Plan.

Funding

Funds Awarded: The Town has been awarded unspecified funds from FEMA.

Budget: The highway budget includes road, bridge and culvert upgrades.

Education and Outreach

Emergency Notifications: The Town of Chester has reverse 911 capabilities for emergency notifications.

Education: No outreach program is currently in place. A source is needed for posters, pamphlets and note cards.

9.3.6 Mitigation Strategy and Prioritization





This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and prioritization.

Past Mitigation Initiative Status

Table 9.3-11 below indicates progress on the community’s mitigation strategy identified in the 2011 Plan. Previous actions that are now ongoing programs and capabilities are indicated as such in Table 9.3-11, and also appear under “Capability Assessment” presented previously in this annex. Actions carried forward as part of this plan update are included in the following subsection (in Table 9.3-12) with prioritization.

Table 9.3-11. Past Mitigation Initiative Status

Description	Status	Review Comments
Repair Alder Brook Road Bridge over Trout Brook in Chestertown	Complete.	County repaired Trout Brook and the Town of Chester repaired Alder Brook.
Educate residents regarding steps to be taken to decrease the impact of natural hazards (including ice storms, wild/forest fires, severe storms, tornado, earth-quakes, and all other natural hazards) by developing, enhancing, and implementing education programs, brochures, school presentations informing groups about ways to reduce risk, and other outreach activities.	No progress	Educational materials are needed from County, State or Federal sources. Initiative to be included in 2016 plan.
Monitor and remove trees/limbs in storm areas that present potential hazards to keep trees from threatening lives, property, and public infrastructure during storm events	Continuing Ongoing operational capability.	Routine removal has occurred and will continue.
Obtain funding to purchase generators for municipally-owned critical facilities.	Continuing	Generators have been purchased for municipal wells in Chestertown and Pottersville. Funding is still needed for Town Hall Emergency Shelter generator. Initiative to be included in 2016 plan – Acquire funding and install backup generator for Town Hall Emergency Shelter.
Coordinate/create mutual aid agreements between emergency services, public works departments, and public utilities to ensure efficient use of resources during and after storm events.	Continuing Ongoing operational capability.	Mutual aid agreements have been established between fire companies in Chestertown, Pottersville, North Creek, and Riparius.
Develop plans for debris management after hazard events, including severe winter snow/ice events, and other severe storms.	No progress	Collection occurs at the end of the season. A tub grinder is needed. Initiative to be included in 2016 plan – Purchase/acquire a tub grinder to support debris management after hazard event.
Design a network of citizens that will check in on elderly, functional needs, and low- income individuals during major events.	No progress	The Town intends to establish volunteers within the next 2 years.
Send a town representative to the NYS Wildland Fire Suppression Training	No progress	Initiative to be included in 2016 plan. Money to send attendees will be needed, assuming no schedule conflicts. Representatives will be selected in 2016 to attend training in 2017.
Provide training for local code enforcement officials to implement building codes that reflect disaster resistant construction for new structures and renovation	Ongoing operational capability.	County Responsibility
Provide residents with information listing steps taken to lessen potential flood damage to reduce the impact of flooding.	No progress	Materials for distribution are needed. Initiative to be included in 2016 plan – Develop and disseminate materials to inform residents on steps to lessen potential flood damage to reduce the impact of flooding.
Educate the community on benefits of carrying NFIP policies and increase knowledge of NFIP services	No progress	Materials for distribution are needed. Initiative to be included in 2016 plan – Develop/collect and disseminate materials to educate the community on benefits of carrying NFIP policies and increase knowledge of NFIP services.



Table 9.3-11. Past Mitigation Initiative Status

Description	Status	Review Comments
Review and update local plans to integrate goals, objectives, and activities from this HMP which are not found in existing regulatory documents, as appropriate	No progress	Assistance and advice is needed. Initiative to be included in 2016 plan – Integrate the risk assessment and recommendations of the hazard mitigation plan with the comprehensive plan.
Maintain a current inventory of at-risk buildings and infrastructure and continually update inventory of at-risk structures in each jurisdiction	No progress	Funding is needed to create the inventory. Initiative to be included in 2016 plan. Duty of Zoning Administration Office. Will begin compiling inventory in 2016 and will continue with annual review and revision.
Apply for grants to assist with mitigation activities needed to provide a level of protection for critical facilities	No progress	No grant writers are available on staff. Will work with Warren County to apply for grants.
Provide continuing education and training for local Floodplain Administrator to ensure code enforcement and proper inspections	In progress	Training was received by New York State Department of Environmental Conservation (NYS DEC). More training may be needed due to personnel turnover. Initiative to be included in 2016 plan.
Implement zoning regulations to discourage building new structures in disaster prone areas – if such regulations are not already written into Town Zoning code or Floodplain Ordinance.	In progress	Advice or model language is needed. Initiative to be included in 2016 plan - Work with Warren County to implement zoning regulations to discourage building new structures in disaster prone areas.

Completed Mitigation Initiatives not Identified in the Previous Mitigation Strategy

The Town of Chester has identified the following mitigation projects/activities that have also been completed but were not identified in the previous mitigation strategy in the 2011 Plan:

- Emergency evaluation of Loon Lake Dam report and structural analysis was completed in May of 2015. Funding is needed for dam rehabilitation.

Proposed Hazard Mitigation Initiatives for the Plan Update

The Town of Chester participated in a mitigation action workshop in September and was provided the following Federal Emergency Management Agency (FEMA) publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 ‘Selecting Appropriate Mitigation Measures for Floodprone Structures’ (March 2007) and FEMA ‘Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards’ (January 2013).

Table 9.3-12 summarizes the comprehensive-range of specific mitigation initiatives the Town of Chester would like to pursue in the future to reduce the effects of hazards. Some of these initiatives may be previous actions carried forward for this plan update. Implementation of these initiatives will depend on available funding (grants and local match availability), and some initiatives may be modified or omitted at any time based on occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in Table 9.3-12 to further demonstrate the wide range of activities and mitigation measures selected.

As discussed in Section 6, 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing your actions as ‘High’, ‘Medium’, or ‘Low.’ The table below summarizes the evaluation of each mitigation initiative, listed by Action Number.

Table 9.3-12 summarizes the prioritization of all proposed mitigation initiatives for the Plan update.





Table 9.3-12. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category	CRS Category
TCH-1	Align the highway budget with mitigation actions identified in the hazard mitigation plan.	Both	All hazards	1, 3	Town Board, Highway Department, Planning Department	Low-Medium	Low	Local Budget	Short	High	LPR	PR
TCH-2	Complete one mile of roadway elevation on Old River Road.	Existing	Flood	1, 3	Town DPW, Planning Department	Medium-High	\$1 million	FEMA (HMGP, FMA, PDM)	DOF	High	SIP NSP	NR, SP
TCH-3 (carryover)	Acquire funding and install backup generators at critical facilities, including Town Hall Emergency Shelter, Chestertown Hall, Hudson Headwaters, and North Warren Emergency Squad Headquarters (located in Chester, serves Chester and Horicon).	Existing	All hazards resulting in loss of electricity	3	Town Board, Town Planning Department	Medium	Low	FEMA (HMGP, FMA, PDM), NYS DHSES, Local Budget	Short	High	LPR SIP	PR, ES
TCH-4	Replace culverts and/or expand culvert capacity at Stock Farm Road and Wood Wells Road to meet 50-year storm requirements and reduce flooding overflow.	Existing	Flood, severe storm	1	Town Public Works / Highway	Medium	Medium	FEMA (HMGP, FMA, PDM), CDBG, NYS DHSES, County, Local Budget	Short	High	SIP	PP, PR, SP
TCH-5	Identify and pursue funding for Lake Loon dam rehabilitation and EAP.	Existing	Flood, severe storms, earthquake	1, 3	Owned by Loon Lake Park District, managed by Town Board	Medium	Low	NYS DEC, Local Budget	Short	Medium	SIP	PR, ES
TCH-6	Develop and implement a strategy to mitigate risk to public and property from beaver dam breaches.	Both	Flood	1, 5	Planning Department, NYS DEC, Private property owners, Warren	Low	Low	FMA, HMGP, PDM	DOF	Medium	LPR NSP	PR, NR





Table 9.3-12. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category	CRS Category
					County Soil and Water Conservation District (SWCD)							
TCH-7 (carryover)	Integrate the risk assessment and recommendations of the hazard mitigation plan with the comprehensive plan.	Both	All hazards	1, 4	Town Board, Planning Department	Low-Medium	Low	Local Budget	Short	High	LPR	PR
TCH-8 (carryover)	Purchase/acquire a tub grinder to support debris management after hazard event.	N/A	Infestation, severe storm, severe winter storm, wildfire	3	Town Public Works/ Highway, Engineer, Local Utilities/ Developers	Medium – High	Low	NYS DHSES, Local Budget	Short	Medium	NRP	NR, PR
TCH-9 (carryover)	Provide residents with information listing steps taken to lessen potential flood damage to reduce the impact of flooding. Information may include brochures, FEMA handouts, posters, pamphlets, note cards and online links.	Existing	Flood	1, 2, 3	Town Board, County Office of Emergency Services	Low-Medium	Low	DHSES, County, Local Budget	OG	High	EAP	PI, ES
TCH-10 (carryover)	Educate specific homeowners who have property in the floodplain areas on carrying NFIP policies.	Existing	Flood	2	Town Floodplain Administrator	Low-Medium	Low	DHSES, County, Local Budget	OG	Medium	EAP	PI
TCH-11 (carryover)	Work with Warren County to implement zoning regulations to discourage building new structures in disaster prone areas.	Both	All hazards	1, 4	Town Board, Planning Department	Low-Medium	Low	DHSES, County, Local Budget	Short	High	LPR	PR
TCH-12	Participate in the StormReady program.	Both	Flood, severe storm	1, 2	Town Board, Planning Department	Medium	Low	Local Budget	Short	Medium	LPR	PR





Table 9.3-12. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category	CRS Category
TCH-13 (carryover)	Design a network of citizens that will check in on elderly, functional needs, and low- income individuals during major events.	N/A	All hazards	1, 2	Town Board, County Office of Emergency Services	High	Low	Local Budget	Short	High	EAP	PR ES
TCH-14 (carryover)	Acquire funding to send a town representative to the 2017 NYS Wildland Fire Suppression Training	N/A	Wildfire	3	Local Fire Departments, County Office of Emergency Services	High	Low	DHSES, County, Local FD Budget	DOF	Medium	EAP	PI ES
TCH-15 (carryover)	Maintain a current inventory of at-risk buildings and infrastructure and continually update inventory of at-risk structures in each jurisdiction with annual review and revision.	Existing	All hazards	3, 4	Zoning Administration Office	Medium	Medium	FEMA (HMGP, FMA, PDM), DHSES, County, Local Budget	DOF	Medium	LPR	PR ES
TCH-16 (carryover)	Provide continuing education and training for local Floodplain Administrator to ensure code enforcement and proper inspections	Existing	Flood, severe storms	3	Floodplain Administrator	Medium	Low	DHSES, County, Local Budget	Short	High	EAP	PR PI

Notes:

Not all acronyms and abbreviations defined below are included in the table.

*Does this mitigation initiative reduce effects of hazards on new and/or existing buildings and/or infrastructure? Not applicable (N/A) is inserted if this does not apply.

Acronyms and Abbreviations:

CAV Community Assistance Visit
 CDBG Community Development Block Grant
 GCRS Community Rating System
 DPW Department of Public Works
 FEMA Federal Emergency Management Agency

Potential FEMA HMA Funding Sources:

FMA Flood Mitigation Assistance Grant Program
 HMGP Hazard Mitigation Grant Program
 PDM Pre-Disaster Mitigation Grant Program
 RFC Repetitive Flood Claims Grant Program (discontinued)
 SRL Severe Repetitive Loss Grant Program (discontinued)

Timeline:

Short 1 to 5 years
 Long Term 5 years or greater
 OG On-going program
 DOF Depending on funding





Acronyms and Abbreviations:

FPA	Floodplain Administrator
HMA	Hazard Mitigation Assistance
N/A	Not applicable
NFIP	National Flood Insurance Program
OEM	Office of Emergency Management

Potential FEMA HMA Funding Sources:

Timeline:

Costs:

Where actual project costs have been reasonably estimated:

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

Where actual project costs cannot reasonably be established at this time:

Low	Possible to fund under existing budget. Project is part of, or can be part of, an existing ongoing program.
Medium	Could budget for under existing work plan, but would require a reapportionment of the budget or a budget amendment, or cost of the project would have to be spread over multiple years.
High	Would require an increase in revenue via an alternative source (i.e., bonds, grants, fee increases) to implement. Existing funding levels are not adequate to cover costs of the proposed project.

Benefits:

Where possible, an estimate of project benefits (per FEMA's benefit calculation methodology) has been evaluated against the project costs, and is presented as:

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

Where numerical project benefits cannot reasonably be established at this time:

Low	Long-term benefits of the project are difficult to quantify in the short term.
Medium	Project will have a long-term impact on reduction of risk exposure to life and property, or project will provide an immediate reduction in risk exposure to property.
High	Project will have an immediate impact on reduction of risk exposure to life and property.

Mitigation Category:

- Local Plans and Regulations (LPR) – Actions that include government authorities, policies, or codes that influence the way land and buildings are developed and built.
- Structure and Infrastructure Project (SIP) – Actions that involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures, as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce impacts of hazards.
- Natural Systems Protection (NSP) – Actions that minimize damage and losses, and also preserve or restore the functions of natural systems.
- Education and Awareness Programs (EAP) – Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities

CRS Category:

- Preventative Measures (PR) – Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and stormwater management regulations.
- Property Protection (PP) – Actions include public activities to reduce hazard losses or 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.
- Public Information (PI) – 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 educational programs for school-age children and adults.
- Natural Resource Protection (NR) – 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.
- Structural Flood Control Projects (SP) – Actions that involve construction of structures to reduce impacts of a hazard. Such structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.
- Emergency Services (ES) – Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and protection of essential facilities





Table 9.3-13. Summary of Prioritization of Actions

Mitigation Action / Project Number	Mitigation Action/Initiative	Life Safety	Property Protection	Cost-Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
TCH-1	Align the highway budget with mitigation actions identified in the hazard mitigation plan.	0	1	1	1	0	1	1	0	0	1	1	1	1	0	9	High
TCH-2	Complete one mile of roadway elevation on Old River Road.	1	1	1	1	1	1	0	0	1	1	0	1	1	0	11	High
TCH-3 (carryover)	Acquire funding and install backup generators at critical facilities, including Town Hall Emergency Shelter, Chestertown Hall, Hudson Headwaters, and North Warren Emergency Squad Headquarters (located in Chester, serves Chester and Horicon).	1	0	1	1	1	1	0	0	1	1	1	1	0	1	11	High
TCH-4	Replace culverts and/or expand culvert capacity at Stock Farm Road and Wood Wells Road to reduce flooding overflow.	0	1	1	1	1	1	0	1	0	1	1	1	0	0	9	High
TCH-5	Identify funding for Lake Loon dam rehabilitation and EAP.	1	1	1	1	0	1	1	0	0	1	1	0	0	0	8	Medium
TCH-6	Develop and implement a strategy to mitigate risk to public and property from beaver dam breaches.	0	1	1	0	0	1	1	1	0	1	0	1	0	0	7	Medium
TCH-7 (carryover)	Integrate the risk assessment and recommendations of the hazard mitigation plan with the comprehensive plan.	1	1	1	1	0	1	1	0	0	1	1	1	0	1	10	High
TCH-8 (carryover)	Purchase/acquire a tub grinder to support debris management after hazard event.	0	1	1	1	0	1	0	0	0	1	1	1	0	0	7	Medium
TCH-9 (carryover)	Provide residents with information listing steps taken to lessen potential flood damage to reduce the impact	1	1	1	1	0	1	1	0	1	1	0	1	0	0	9	High





Table 9.3-13. Summary of Prioritization of Actions

Mitigation Action / Project Number	Mitigation Action/Initiative	Life Safety	Property Protection	Cost-Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
	of flooding. Information may include brochures, FEMA handouts, posters, pamphlets, note cards and online links.																
TCH-10 (carryover)	Educate specific homeowners who have property in the floodplain areas on carrying NFIP policies.	0	1	1	1	0	1	1	0	0	1	0	1	0	0	7	Medium
TCH-11 (carryover)	Work with Warren County to implement zoning regulations to discourage building new structures in disaster prone areas.	0	1	1	1	0	1	1	1	0	1	1	1	0	0	9	High
TCH-12	Participate in the StormReady program.	1	1	1	1	0	1	1	0	0	1	0	1	0	0	8	Medium
TCH-13 (carryover)	Design a network of citizens that will check in on elderly, functional needs, and low-income individuals during major events.	1	0	1	1	0	1	1	0	1	1	1	1	0	0	9	High
TCH-14 (carryover)	Acquire funding to send a town representative to the 2017 NYS Wildland Fire Suppression Training	1	1	1	1	0	1	0	0	0	1	0	0	0	0	6	Medium
TCH-15 (carryover)	Maintain a current inventory of at-risk buildings and infrastructure and continually update inventory of at-risk structures in each jurisdiction with annual review and revision.	1	1	1	1	0	1	0	0	0	1	1	0	0	0	7	Medium
TCH-16 (carryover)	Provide continuing education and training for local Floodplain Administrator to ensure code enforcement and proper inspections	0	1	1	1	0	1	1	1	0	1	1	1	0	0	9	High

Note: Refer to Section 6, which conveys guidance on prioritizing mitigation actions.





9.3.7 Future Needs To Better Understand Risk/Vulnerability

None at this time.

9.3.8 Hazard Area Extent and Location

Hazard area extent and location maps have been generated for the Town of Chester that illustrate the areas probable to be impacted within the municipality (see Figure 9.3-1 and Figure 9.3-2 below). These maps are based on the best available data at the time of the preparation of this Plan, and are considered to be adequate for planning purposes. Maps have been generated for those hazards (i.e., wildfire and flooding) that can be clearly identified using mapping techniques and technologies, and to which the Town of Chester has significant exposure. These maps also appear in the hazard profiles within Section 5.4, Volume I of this Plan.

9.3.9 Additional Comments

None at this time.



Figure 9.3-1. Town of Chester Landslide Hazard Area Map

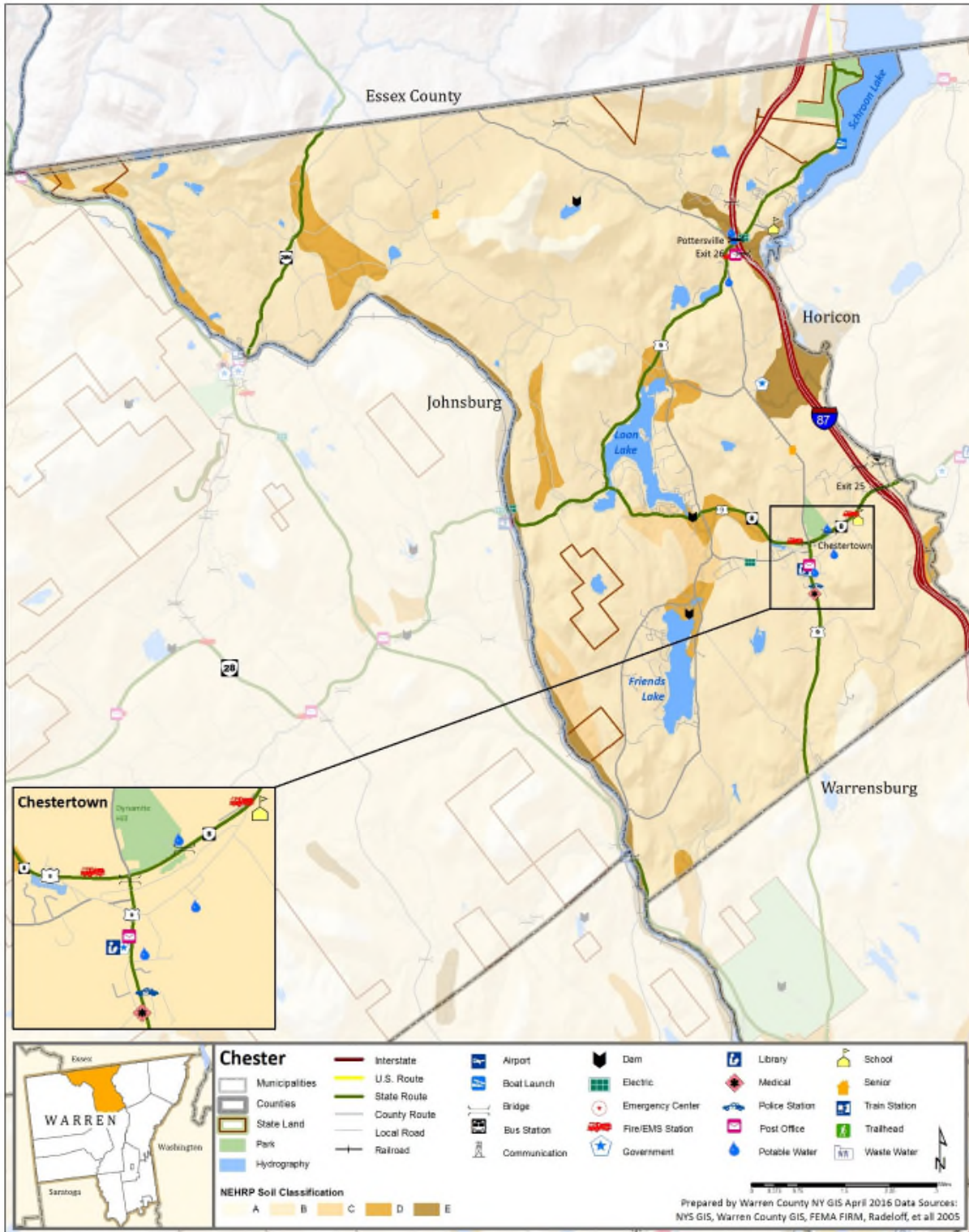
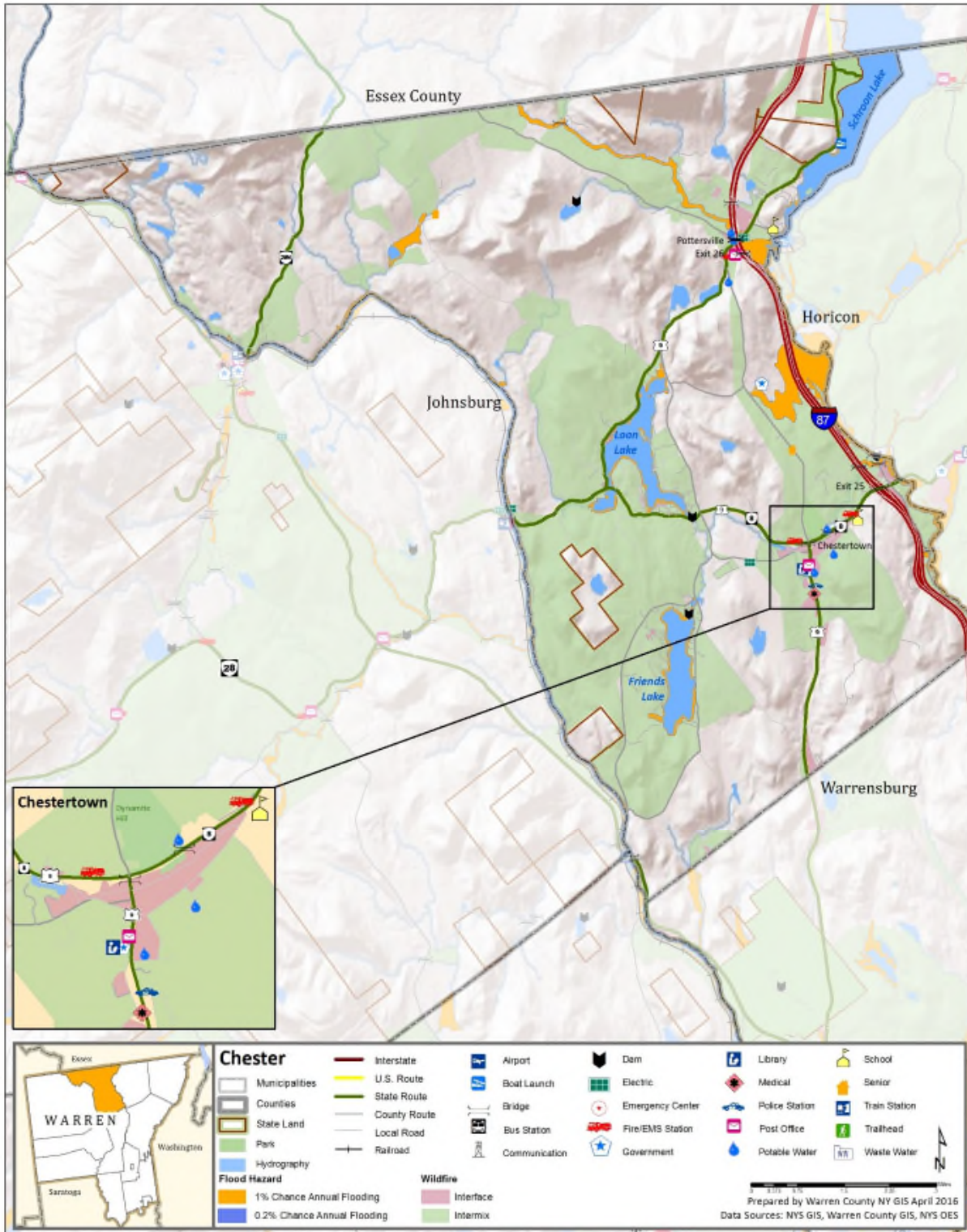




Figure 9.3-2. Town of Chester Flood and Wildfire Hazard Area Extent and Location Map





Name of Jurisdiction:	Town of Chester
Name and Title Completing Worksheet:	Jason Monroe, Highway Superintendent
Action Number:	TCH-2
Mitigation Action/Initiative:	Complete one mile of roadway elevation on Old River Road.

Assessing the Risk	
Hazard(s) addressed:	Severe flooding on Old River Road
Specific problem being mitigated:	Area residents were evacuated in 2011 when rising waters from an ice jam on the Hudson River left over 100 yards of the road impassable. One mile of road elevation is needed at a cost of \$1 million to mitigate the problem.
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	Actions considered include: <ul style="list-style-type: none"> • “No Action” – not acceptable, risk continues • Construct a levy – not a cost effective or technically feasible option • Roadway elevation – best current alternative
Action/Project Intended for Implementation	
Description of Selected Action/Project	Complete one mile of roadway elevation on Old River Road. All mitigation efforts shall be made in consideration of Federal and State directives to mitigate critical infrastructure to address protection to the 500-year flood event or “worst damage scenario”.
Action/Project Category	SIP, NSP
Goals Met	1, 3
Applies to existing and or new development, or not applicable	Existing
Benefits (losses avoided)	Medium-High – residential flooding, and future evacuations
Estimated Cost	\$1 million (High)
Priority*	High
Plan for Implementation	
Responsible Organization	Town DPW, Planning Department
Local Planning Mechanism	Capital Improvement Plans and Budgets
Potential Funding Sources	FEMA (HMGP, FMA, PDM)
Timeline for Completion	Short, DOF
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:



Action Number:

TCH-2

Mitigation Action/Initiative:

Complete one mile of roadway elevation on Old River Road.

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Reduce risk of stranding residents behind flooded impassible roadway
Property Protection	1	Reduce further roadway damage
Cost-Effectiveness	1	Reduce need for multiple repairs and emergency personnel responding to the area
Technical	1	Technically feasible
Political	1	Project has support of Town officials
Legal	1	Town has legal jurisdiction over project area
Fiscal	0	Will need external funding to supplement local funds
Environmental	0	
Social	1	Addresses flood-vulnerable population
Administrative	1	Town has capability to administer the project
Multi-Hazard	0	
Timeline	1	Project could be completed within 5 years, if funding becomes available
Agency Champion	1	Town DPW
Other Community Objectives	0	
Total	11	
Priority (High/Med/Low)	High	



Name of Jurisdiction: Town of Chester
Name and Title Completing Worksheet: Craig Leggett, Supervisor
Action Number: TCH-3
Mitigation Action/Initiative: Acquire funding and install backup generators at critical facilities

Assessing the Risk	
Hazard(s) addressed:	All
Specific problem being mitigated:	No backup power at critical facilities in the town
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	Besides backup generators, there are no other practical, cost-effective alternatives to maintain critical operations at this facility in the event of a power outage.
Action/Project Intended for Implementation	
Description of Selected Action/Project	Acquire funding and install backup generators at critical facilities, including Town Hall Emergency Shelter, Chestertown Hall, Hudson Headwaters, and North Warren Emergency Squad Headquarters (located in Chester, serves Chester and Horicon).
Action/Project Category	SIP
Goals Met	3
Applies to existing and or new development, or not applicable	Existing
Benefits (losses avoided)	Medium
Estimated Cost	Low
Priority*	High
Plan for Implementation	
Responsible Organization	Town Board, Town Planning Department
Local Planning Mechanism	Emergency Management
Potential Funding Sources	FEMA (HMGP, FMA, PDM), NYS DHSES, Local Budget
Timeline for Completion	Short Term
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:



Action Number: TCH-3

Mitigation Action/Initiative: Acquire funding and install backup generators at critical facilities

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	
Property Protection	0	
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	
Fiscal	0	Need grant funding
Environmental	0	
Social	1	
Administrative	1	
Multi-Hazard	1	All hazards
Timeline	1	
Agency Champion	0	
Other Community Objectives	1	
Total	11	
Priority (High/Med/Low)	High	



Name of Jurisdiction:	Town of Chester
Name and Title Completing Worksheet:	Jason Monroe, Highway Superintendent
Action Number:	TCH-4
Mitigation Action/Initiative:	Replace culverts and/or expand culvert capacity

Assessing the Risk	
Hazard(s) addressed:	Flood, severe storm
Specific problem being mitigated:	Insufficient culvert capacity leads to roadway flooding and washout
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	Actions considered include: <ul style="list-style-type: none"> • No action, or replace culvert “in kind” – not acceptable, risk continues • Replace culvert with larger capacity culvert – best current alternative
Action/Project Intended for Implementation	
Description of Selected Action/Project	Replace culverts and/or expand culvert capacity at Stock Farm Road and Wood Wells Road to reduce flooding overflow. Mitigation efforts shall be made in consideration of Federal and State directives to mitigate critical infrastructure to address protection to the 500-year flood event or “worst damage scenario”.
Action/Project Category	SIP
Goals Met	1
Applies to existing and or new development, or not applicable	Existing
Benefits (losses avoided)	Medium – roadway damage and closure
Estimated Cost	Medium-High
Priority*	High
Plan for Implementation	
Responsible Organization	Town Public Works / Highway
Local Planning Mechanism	Capital Improvement Plans and Budgets
Potential Funding Sources	FEMA (HMGP, FMA, PDM), CDBG, NYS DHSES, County, Local Budget
Timeline for Completion	Short
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:



Action Number: TCH-4

Mitigation Action/Initiative: Replace culverts and/or expand culvert capacity

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	0	
Property Protection	1	Reduce further roadway damage and shoulder washout
Cost-Effectiveness	1	Reduce need for multiple repairs
Technical	1	Technically feasible
Political	1	Project has support of Town officials
Legal	1	Town has legal jurisdiction over project area
Fiscal	0	Will need external funding to supplement local funds
Environmental	1	Reduce blockage of waterway
Social	0	
Administrative	1	Town has capability to administer the project
Multi-Hazard	1	Flood and severe storm
Timeline	1	Can be completed within 5 years
Agency Champion	0	
Other Community Objectives	0	
Total	9	
Priority (High/Med/Low)	High	



Name of Jurisdiction: Town of Chester
Name and Title Completing Worksheet: Craig Leggett, Supervisor
Action Number: TCH-5
Mitigation Action/Initiative: Identify funding for Lake Loon dam rehabilitation and EAP.

Assessing the Risk	
Hazard(s) addressed:	Flood, Severe Storms, Earthquake
Specific problem being mitigated:	Lake Loon dam has been identified by the Town and/or regulatory agencies as needing an Emergency Action Plan, and potentially actions to address structural issues. Such activities are beyond the Town's current fiscal capabilities.
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	See above. The Town shall seek fiscal support to develop and EAP and study what may be needed to address structural issues with the dam, then work to implement those projects as funding is secured. Mitigation efforts shall be made in consideration of Federal and State directives to mitigate critical infrastructure to address protection to the 500-year flood event or "worst damage scenario".
Action/Project Intended for Implementation	
Description of Selected Action/Project	Identify funding for Lake Loon dam rehabilitation and EAP.
Action/Project Category	SIP
Goals Met	1, 3
Applies to existing and or new development, or not applicable	Existing
Benefits (losses avoided)	Medium
Estimated Cost	Low
Priority*	Medium
Plan for Implementation	
Responsible Organization	Owned by Loon Lake Park District, managed by Town Board
Local Planning Mechanism	Municipal Budget, Hazard Mitigation
Potential Funding Sources	NYSDEC, Local Budget
Timeline for Completion	Short Term
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:



Action Number: TCH-5
Mitigation Action/Initiative: Identify funding for Lake Loon dam rehabilitation and EAP.

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	
Property Protection	1	
Cost-Effectiveness	1	
Technical	1	
Political	0	
Legal	1	
Fiscal	1	
Environmental	0	
Social	0	
Administrative	1	
Multi-Hazard	1	Flood, Severe Storms, Earthquake
Timeline	0	
Agency Champion	0	
Other Community Objectives	0	
Total	8	
Priority (High/Med/Low)	Medium	



9.4 CITY OF GLENS FALLS

This section presents the jurisdictional annex for the City of Glens Falls.

9.4.1 Hazard Mitigation Plan Point of Contact

The following individuals have been identified as the hazard mitigation plan’s (HMP) primary and alternate points of contact.

Primary Point of Contact	Alternate Point of Contact
James Schrammel, Chief, Fire Department 134 Ridge St. Glens Falls, NY 12801 (518) 761-3822 firechief@cityofglensfalls.com	Steve Gurzler, City Engineer 230 Dix Avenue Glens Falls, NY 12801 (518) 761-3850 engineer@cityofglensfalls.com

9.4.2 Municipal Profile

The City of Glens Falls is located in the southeastern corner of Warren County in the Adirondack foothills. It is bordered by the Town of Queensbury to the north, east and west and the Hudson River and Saratoga County to the south. The City has a total land area of 3.9 square miles of which 3.8 square miles is land and 0.1 square miles is water. Interstate 87, U.S. Route 9, New York Route 32 and New York Route 9L are major transportation routes serving the City.

The City was incorporated in 1908 with a strong mayor charter. The City’s Common Council has six members, five are elected from wards and one is elected at large.

The City owns a large amount of watershed land, protecting the City water supply, within the adjacent Town of Queensbury.

According to the 2010 Census, the community's population was 14,700.

Growth/Development Trends

Table 9.4-1 below summarizes recent residential/commercial development in the City of Glens Falls since 2010 to present and lists any known or anticipated major residential/commercial development and major infrastructure development that has been identified in the next five years within the municipality. Refer to the map in Section 9.4.9 of this annex: Figure 9.4-1 that illustrates landslide hazard areas, and Figure 9.4-2 that illustrates the flood and wildfire hazard areas.

Table 9.4-1. Growth and Development

Property or Development Name	Type (e.g. Res., Comm.)	# of Units / Structures	Location (address and/or Parcel ID)	Known Hazard Zone(s)	Description/Status of Development
Recent Development from 2010 to present					
UA Local 773	Business/Industrial Education	1	37 Luzerne Rd	None Identified	Completed
Glens Falls Parking Garage	5 story parking garage	1	50-54 Park St	None Identified	Completed
21 Bay – Roger Building	3 story mixed commercial / residential	33 apartments / 9 commercial	21 Bay St	None Identified	Completed



Property or Development Name	Type (e.g. Res., Comm.)	# of Units / Structures	Location (address and/or Parcel ID)	Known Hazard Zone(s)	Description/Status of Development
Village Green	Duplexes / 3 story multiple dwelling	114 dwelling units / 41 apartments	1 South Delaware	None Identified	Completed
20 Elm – The Mill	6 story – mixed use commercial / residential	52 apartments	20 Elm St	None Identified	Completed
Warren Square	3 story – mixed commercial / residential	25 apartments / 8 commercial	77-78 Warren Street	None Identified	Completed
Haviland Park	Single family housing	49 Single Family	Along Feeder Canal	None Identified	Under Construction
14 Hudson Av	5 Story mixed commercial / residential	63 apartments / 9 commercial	65-75 Park Street	None Identified	Under Construction
Known or Anticipated Development in the Next Five (5) Years					
Multiple properties	RES	200	Various	None Identified	Conversion
Multiple properties	COMM	10	Various	None Identified	Planned

* Only location-specific hazard zones or vulnerabilities identified.

9.4.3 Natural Hazard Event History Specific to the Municipality

Warren County has a history of natural and non-natural hazard events as detailed in Volume I, Section 5.0 of this Plan. A summary of historical events appears in each hazard profile and includes a chronology of events that have affected the County and its municipalities. For the purpose of this Plan update, events that have occurred in the County from 2010 to present were summarized to indicate the range and impact of hazard events in the community. Information regarding specific damages is included, if available, based on reference material or local sources. This information is presented in Table 9.4-2 below. For details of these and additional events, refer to Volume I, Section 5.0 of this Plan.

Table 9.4-2. Hazard Event History

Dates of Event	Event Type (FEMA Disaster Declaration if applicable)	Warren County Designated?	Summary of Damages/Losses
August 27-29, 2011	Hurricane Irene (DR-4020)	Yes	There was severe wind and flooding damage throughout the County. The City of Glens Falls had sewage backups and overflows.
May 29, 2012	Hail and Wind	N/A	Debris removal occurred in the County as a result of this event. A generator at a fire station, a patrol car, and the canopy of a patrol boat were all damaged. In Glens Falls, massive tree blow downs occurred and cleanup was needed on watershed property.

Notes:

- FEMA Federal Emergency Management Agency
- DR Major Disaster Declaration (FEMA)
- N/A Not applicable

9.4.4 Hazard Vulnerabilities and Ranking





The hazard profiles in Section 5.0 of this Plan convey detailed information regarding each plan participant’s vulnerability to the identified hazards. The following summarizes the hazard vulnerabilities and their ranking in the City of Glens Falls. For additional vulnerability information relevant to this jurisdiction, refer to Section 5.0.

Hazard Risk/Vulnerability Risk Ranking

Table 9.4-3 below summarizes hazard risk/vulnerability rankings of potential hazards for the City of Glens Falls.

Table 9.4-3. Hazard Risk/Vulnerability Risk Ranking

Hazard type	Estimate of Potential Dollar Losses to Structures Vulnerable to the Hazard ^{a, b}	Probability of Occurrence	Risk Ranking Score (Probability x Impact)	Hazard Ranking ^a
Earthquake	100-year MRP: \$80,141.00 500-year MRP: \$7,126,053 2,500-Year MRP: \$56,222,937.00	Occasional	32	High
Flood	RCV Exposed to 1% Annual Chance: \$18,934,062	Frequent	18	Medium
Landslide	Damage estimate not available	Occasional	16	Medium
Infestation	Damage estimate not available	Frequent	24	Medium
Severe Storm	RCV Exposed to 1938 storm-winds: \$1,003,829	Frequent	48	High
Severe Winter Storm	GBS 1% Loss: \$18,669,280 GBS 5% Loss: \$93,346,400	Frequent	51	High
Wildfire	RCV Exposed to Intermix: \$2,792,000 RCV Exposed to Interface: \$1,660,964,000	Frequent	48	High
Cyber Security	Damage estimate not available	Occasional	12	Low
Disease Outbreak	Damage estimate not available	Frequent	27	Medium
Hazardous Material Incidents	Damage estimate not available	Frequent	24	Medium

Notes:

- a. The general building stock valuation is based on the custom inventory generated for the municipality and based on improved value.
 High = Total hazard priority risk ranking score of 31 and above
 Medium = Total hazard priority risk ranking of 20-30+
 Low = Total hazard risk ranking below 20
- b. Loss estimates for the severe storm and severe winter storm hazards are structural values only and do not include the estimated value of contents. The earthquake was evaluated by Census tract. The Census tracts do not exactly align with municipal boundaries; therefore, a total is reported for each Town inclusive of the Villages. Loss estimates for the flood and earthquake hazards represent both structure and contents. Potential flood loss estimates were generated using Hazus-MH 2.2 and digitized FIRM maps from the 1980s and 1990s for the 1-percent annual chance event; NED DEM was used to generate a depth grid. The County’s 2015 Real Property data was used to generate the values for flood and includes structure and contents. For the wildfire hazard, the improved value and estimated contents of buildings located within the identified hazard zones is provided.

GBS General building stock
 MRP Mean return period
 RCV Replacement Cost Value

National Flood Insurance Program (NFIP) Summary

Table 9.4-4 below summarizes NFIP statistics for the City of Glens Falls.





Table 9.4-4. NFIP Summary

Municipality	# Policies (1)	# Claims (Losses) (1)	Total Loss Payments (2)	# Rep. Loss Prop. (1)	# Severe Rep. Loss Prop. (1)	# Policies in 100-year Boundary (3)
City of Glens Falls	8	0	\$0	0	0	1

Source: FEMA Region 2, 2014

- (1) Policies, claims, repetitive loss, and severe repetitive loss statistics are provided by FEMA, are current as of November 30, 2015, and are summarized by community name. Total number of repetitive loss properties includes severe repetitive loss properties. Number of claims represents claims closed by November 30, 2015.
- (2) Total building and content losses from the claims file provided by FEMA Region 2.
- (3) Number of policies inside and outside of flood zones is based on latitude and longitude provided by FEMA Region 2 in the policy file.
- (4) FEMA noted that for a property with more than one entry, more than one policy may have been in force or more than one Geographic Information System (GIS) specification was possible.

Critical Facilities

Table 9.4-5 below identifies critical facilities within the municipality located on parcels that intersect the current regulatory NFIP 1% chance flood boundary (aka: “Special Flood Hazard Area” (SFHA)), however it is recognized that the actual facility structure(s) may lie outside of the SFHA. Please refer to the Flood Hazard Profile (Section 5.4.2) for further details of estimated flood losses throughout the County, as well as the “Other Vulnerabilities Identified” section following.

Table 9.4-5. Potential Flood Losses to Critical Facilities

Municipality	Facility Types in 1% Chance Flood Boundary						
	Boat Facilities	Dam	Electric	Government	Highway Bridge	Rail Facility	Wastewater
City of Glens Falls	0	0	0	0	0	0	1

Source: Warren County Real Property 2015 tax roll; HAZUS-MH 2.2; FEMA 2015

Notes:

- (1) HAZUS-MH 2.2 provides a general indication of the maximum restoration time for 100% operations. Clearly, a great deal of effort is needed to quickly restore essential facilities to full functionality; therefore, this will be an indication of the maximum downtime (HAZUS-MH 2.2 User Manual).
- (2) Some facilities may be within the Digital Flood Insurance Rate Map (DFIRM) flood hazard boundary; however, HAZUS did not calculate potential loss, perhaps because depth of flooding would not cause any damages to these structures according to the depth damage function used in HAZUS for that facility type. Further, HAZUS-MH may estimate potential damage to a facility outside the DFIRM if the model generates a depth grid beyond DFIRM boundaries.

- X Facility located within the DFIRM boundary
 - Not calculated by HAZUS-MH 2.2

Other Vulnerabilities Identified

The municipality has identified the following vulnerabilities within their community:

- Hazardous material transport (rail) associated with Finch Paper (ammonia, sulfur dioxide) is a recognized concern.
- Wastewater Treatment Plant, built in 1985/6, is located in the floodplain. There is only one point of ingress/egress, which can be blocked by rail traffic serving the adjacent Finch Paper facility.



- The following critical facilities in the City lack back-up power:
 - WWTP (however they work off of direct feed from two parts of the grid). As they lower their loading, they will be able to better specify backup power.
 - None of the City district schools have back up power. Abraham Wing does have backup power (separate school district).
 - City Hall
 - They had a funding application in for standby power for their pumping stations – four or five lift stations (Sandy HMGP).
 - Library has partial backup power.
 - The Pines (private nursing home) – existence of back-up power not established.
 - Stichman Towers (senior living) – has an older backup power system, similar to what was recently replaced at Cronin Senior High Rise.
- A number of issues have been identified with the existing NFIP mapping (outdated).
- Low flows are recognized in parts of their fire hydrant systems. This is a public safety issue. More resources (staff and funding) are needed to properly address the problem.
- The Wilke Intake (dam) in Queensbury has a completed engineering inspection/assessment, and needs spillway upgrades.
- Tree limb management on side streets, where the utility companies are not necessarily addressing, is becoming a significant problem.
- Emerald Ash Borer/Asian Longhorn Beetle: Damage to large swaths of trees creates a life-safety concern as well as risk for loss of power. The last storm in 1989 took down many trees resulting in widespread and lengthy power outages.
- Beaver damming and associated flooding concerns on Water Street, Dixon Road and at Butler Pond.
- The City does not have a formal Emergency Operations Center. City Hall lacks backup power. The Library has partial backup power.
- Traffic lights – they do have major issues when they lose power – Old traffic lights could use any standard generator, however newer styles require an inverter type generator.
- Disease – Epidemic: The need to have city staff vaccinated – key staff need to get vaccinated. This is a hazard that should be planned for. There are critical staff beyond what is currently designated for vaccination.

9.4.5 Capability Assessment

This section identifies the following capabilities of the local jurisdiction:

- Planning and regulatory capability
- Administrative and technical capability
- Fiscal capability
- Community classification
- NFIP
- Integration of mitigation planning into existing and future planning mechanisms.



Planning and Regulatory Capability

Table 9.4-6 below summarizes regulatory tools available to the City of Glens Falls.

Table 9.4-6. Planning and Regulatory Tools

Tool / Program (code, ordinance, plan)	Do you have this? (Yes/No) If Yes, date of adoption or update	Authority (local, county, state, federal)	Dept. /Agency Responsible	Code Citation and Comments (Code Chapter, name of plan, explanation of authority, etc.)
Planning Capability				
Master Plan	No	-	-	-
Capital Improvements Plan	No	-	-	-
Floodplain Management / Basin Plan	No	-	-	-
Stormwater Management Plan	Yes	Local	Water and Sewer; Common Council	Combined Sewer Overflow (CSO) Long Term Control Plan (LTCP); 2014 Draft CGF Green Infrastructure Plan
Open Space Plan	No	-	-	-
Stream Corridor Management Plan	No	-	-	-
Watershed Management or Protection Plan	No	-	-	-
Economic Development Plan	No	-	-	-
Comprehensive Emergency Management Plan	No	-	-	Existing plan outdated, inadequate
Emergency Response Plan	No	-	-	Individual plans exist for dams and the water plant
Post-Disaster Recovery Plan	No	-	-	-
Transportation Plan	No	-	-	-
Strategic Recovery Planning Report	No	-	-	-
Other Plans:	Yes	Local	-	2015-2019 City of Glen Falls Consolidated Plan; 2014 Community Development Action Plan
Regulatory Capability				
Building Code	Yes	State, Local	Building & Codes	Chapter 109 (Fire Prevention and Building Construction)
Zoning Ordinance	Yes	Local	Building & Codes	Chapter 220 (Zoning)
Subdivision Ordinance	Yes	Local	Building & Codes	Chapter 191 (Subdivision of Land)
NFIP Flood Damage Prevention Ordinance	Yes	Federal, State, Local	Building & Codes	Chapter 113 (Flood Damage Prevention)
NFIP: Cumulative Substantial Damages	No	-	-	-
NFIP: Freeboard	Yes	State, Local	Building & Codes	State mandated BFE+2 for single and two-family residential construction, BFE+1 for all other construction types
Growth Management Ordinances	No	-	-	-
Site Plan Review Requirements	Yes	Local	Building & Codes	Site Plan Review and Approval §220-27





Tool / Program (code, ordinance, plan)	Do you have this? (Yes/No) If Yes, date of adoption or update	Authority (local, county, state, federal)	Dept. /Agency Responsible	Code Citation and Comments (Code Chapter, name of plan, explanation of authority, etc.)
Stormwater Management Ordinance	Yes	Local	Water and Sewer	Chapter 220 (Zoning)
Municipal Separate Storm Sewer System (MS4)	Yes	Local	Water and Sewer	Chapter 177, Article XIV (Illicit Discharges)
Natural Hazard Ordinance	No	-	-	-
Post-Disaster Recovery Ordinance	No	-	-	-
Real Estate Disclosure Requirement	Yes	State	-	New York State (NYS) mandate, Property Condition Disclosure Act, <i>NY Code</i> – Article 14 §460-467
Other (Special Purpose Ordinances [i.e., sensitive areas, steep slope])	No	-	-	-

Administrative and Technical Capability

Table 9.4-7 below summarizes potential staff and personnel resources available to the City of Glens Falls.

Table 9.4-7. Administrative and Technical Capabilities

Resources	Is this in place? (Yes or No)	Department/ Agency/Position
Administrative Capability		
Planning Board	Yes	Planning Board and Zoning Board of Appeals
Mitigation Planning Committee	No	-
Environmental Board/Commission	No	-
Open Space Board/Committee	No	-
Economic Development Commission/Committee	Yes	Glens Falls Urban Renewal Agency
Maintenance programs to reduce risk	Yes	DPW
Mutual aid agreements	Yes	Fire & EMS
Technical/Staffing Capability		
Planner(s) or engineer(s) with knowledge of land development and land management practices	No	-
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Yes	Code Enforcement Officer City Engineer
Planners or engineers with an understanding of natural hazards	No	-
NFIP Floodplain Administrator (FPA)	Yes	City Building Inspector (Per City Code 113); currently James Buxton, Code Enforcement Officer
Surveyor(s)	No	-
Personnel skilled or trained in GIS and/or Hazards United States (HAZUS) – Multi-Hazards (MH) applications	Yes	Water & Sewer GIS Technician
Scientist familiar with natural hazards	No	-
Emergency Manager	No	-
Grant writer(s)	No	-
Staff with expertise or training in benefit/cost analysis	No	-





Resources	Is this in place? (Yes or No)	Department/ Agency/Position
Professionals trained in conducting damage assessments	No	-

Fiscal Capability

Table 9.4-8 below summarizes financial resources available to the City of Glens Falls.

Table 9.4-8. Fiscal Capabilities

Financial Resources	Accessible or Eligible to Use (Yes/No)
Community Development Block Grants (CDBG, CDBG-DR)	Yes
Capital improvements project funding	Yes
Authority to Levy Taxes for specific purposes	Yes
User fees for water, sewer, gas or electric service	Yes
Impact fees for homebuyers or developers of new development/homes	No
Stormwater utility fee	No
Incur debt through general obligation bonds	Yes
Incur debt through special tax bonds	No
Incur debt through private activity bonds	No
Withhold public expenditures in hazard-prone areas	No
Other federal or state funding programs	Yes
Open Space Acquisition funding programs	No
Other	No

Community Classifications

Table 9.4-9 below summarizes classifications for community program available to the City of Glens Falls.

Table 9.4-9. Community Classifications

Program	Do you have this? (Yes/No)	Classification (if applicable)	Date Classified (if applicable)
Community Rating System (CRS)	NP	N/A	N/A
Building Code Effectiveness Grading Schedule (BCEGS)	No		
Public Protection (ISO Fire Protection Classes 1 to 10)	Yes	4	2/2016
NYSDEC Climate Smart Community	Yes	Passed Climate Smart Communities Pledge	
Storm Ready	NP	N/A	N/A
Firewise	NP	N/A	N/A
Disaster/safety programs in/for schools	No		
Organizations with mitigation focus (advocacy group, non-government)	No		
Public education program/outreach (through website, social media)	No		



Program	Do you have this? (Yes/No)	Classification (if applicable)	Date Classified (if applicable)
Public-Private Partnerships	No		

Note:

- N/A Not applicable
- NP Not participating
- Unavailable

The classifications listed above relate to the community’s ability to provide effective services to lessen its vulnerability to the hazards identified. These classifications can be viewed as a gauge of the community’s capabilities in all phases of emergency management (preparedness, response, recovery and mitigation) and are used as an underwriting parameter for determining the costs of various forms of insurance. The Community Rating System (CRS) class applies to flood insurance, while the Building Code Effectiveness Grading Schedule (BCEGS) and Public Protection classifications apply to standard property insurance. CRS classifications range on a scale of 1 to 10, with class 1 being the best possible classification, and class 10 representing no classification benefit. Firewise classification is higher if the subject property is more than 1000 feet from a creditable fire hydrant and is within 5 road miles of a recognized Fire Station.

Criteria for classification credits are outlined in the following documents:

- The Community Rating System Coordinators Manual
- The Building Code Effectiveness Grading Schedule
- The ISO Mitigation online ISO’s Public Protection website at <https://www.isomitigation.com/program-works/how-the-ppc-program-works.html>
- The National Weather Service Storm Ready website at <http://www.stormready.noaa.gov/index.html>
- The National Firewise Communities website at <http://firewise.org/>

Self-Assessment of Capability

Table 9.4-10 below provides an approximate measure of the City of Glens Falls’ capability to work in a hazard-mitigation capacity and/or effectively implement hazard mitigation strategies to reduce hazard vulnerabilities.

Table 9.4-10. Self-Assessment Capability for the Municipality

Area	Degree of Hazard Mitigation Capability		
	Limited (If limited, what are your obstacles?)*	Moderate	High
Planning and Regulatory Capability	X - Staffing		
Administrative and Technical Capability		X	
Fiscal Capability		X	
Community Political Capability		X	
Community Resiliency Capability		X	
Capability to Integrate Mitigation into Municipal Processes and Activities.	X - Staffing		

National Flood Insurance Program





NFIP Floodplain Administrator (FPA)

Jim Buxton – Building and Codes

Flood Vulnerability Summary

As of November 30, 2015, there are 8 NFIP policies in force within the community, one of which was within the 100-year flood boundary. There are no repetitive loss property and no severe repetitive loss properties in the City of Glens Falls. According to current NFIP statistics at the time of this plan, NFIP policies in the City of Glens Falls insured over \$3.3 million of property with total annual insurance premiums of \$7,707. Since 1978, 0 NFIP claims have been paid.

Resources

The City of Glens Falls floodplain administrator is relatively new to administering the floodplain management program. There are resources available to the administrator to cover state-approved training courses pertaining to floodplain management. The City's part-time building inspector has received floodplain management training.

The City's zoning map includes floodplains along the Hudson River in industrial areas. The flood risk in the City is low and there are no identified barriers to administering the floodplain management program.

Compliance History

The City of Glens Falls is in good standing with the NFIP. The date of the most recent Community Assistance Visit is unknown.

The City intends to continue active participation in the NFIP, and maintain compliance with all requirements of participation. Further, the Town has identified several actions to support both continued and improved participation in the NFIP as identified in Table 9.4-13.

Regulatory

The City of Glens Falls' floodplain management regulations meet Federal and State requirements. The City's site plan review program helps support the floodplain management program.

The City does not participate in the Community Rating System, recognizing its limited policy base.

Integration of Hazard Mitigation into Existing and Future Planning Mechanisms

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, each community was surveyed to obtain a better understanding of their community's progress in plan integration. A summary is provided below. In addition, the community identified specific integration activities that will be incorporated into municipal procedures.

Planning

Green Infrastructure Plan: The City of Glens Falls (CGF) undertook a series of actions, projects and management decisions in 2013 to begin a Green Infrastructure Program. The program is a plan-as-you-do approach to reducing combined sewer overflows and stormwater pollution. The aim is to reduce the volume of stormwater runoff, especially runoff entering the sanitary sewers, using natural features, infiltration and vegetation. A preliminary draft of the plan identifies opportunities to address pollution prevention and natural hazard mitigation pertaining to localized flooding and erosion. (Integration action)



2015-2019 Consolidated Plan: This plan constitutes the Consolidated Strategic plan for the disposition of CDBG entitlement funds from 2015 to 2019, and forms the basis for a whole range of community development efforts that seek to address issues such as

- Housing – affordability, accessibility, housing condition, barriers to affordability
- Public Service – critical services for the elderly, homeless, and urban poor
- Economic Development – job opportunities for low/mod income households
- Infrastructure – deteriorating infrastructure in low/mod income neighborhoods
- Homeless Needs – a strategy for addressing homeless housing needs
- Other Special Needs – identifying and addressing the needs of other at-risk populations

This plan does not currently identify natural hazard mitigation opportunities, however there is a potential to integrate mitigation strategies as appropriate.

Evacuation Planning: The City has evacuation plans established with the senior living and nursing facilities in the City (e.g. Cronin Senior High Rise, Stichman Towers, The Pines).

Regulatory and Enforcement (Ordinances)

Fire Prevention and Building Construction Chapter 109: The building codes are strictly enforced to make new and renovated buildings as prepared as possible for hazard related incidents. The City complies with New York State Uniform Fire Prevention and Building Code (the Uniform Code) and the State Energy Conservation Construction Code (the Energy Code).

Flood Damage Prevention Chapter 113: This article promotes the public health, safety, and general welfare of residents and seeks to minimize public and private losses due to flood conditions and erosion. The chapter regulates development to promote flood resistant structures and controls the alteration of floodplains to prevent increased vulnerability.

Operational and Administration

Climate Change Considerations: City Engineering and Department of Public Works (DPW) are considering climate change in their maintenance and upgrade programs, recognizing the increasing frequency and intensity of storms. As they do new drainage projects, the City is incorporating more conservative designs.

Snow Removal: Public Works is responsible for plowing streets. Major thoroughfares are prioritized. Sand is available for residential use.

Zoning and Planning Boards: The Zoning Board of Appeals hears and decides appeals and requests for variances, and hears and decides on appeals when it is alleged there is an error in any requirement, decision or determination made by the local administrator in the enforcement or administration of the City Code.

The Planning Board consist of seven members, each appointed by the Mayor. The work of the Board is divided into the following areas: City plan and topography; Architectural; Housing and health; Highways and traffic; and Site plan review. It is the duty of the Board to review and approve, approve with modifications or disapprove site plans, and construction design plans.

Building and Codes: The Building and Codes Department is responsible for issuing building permits, conducting code inspections, and coordinating meetings of the Planning Board and Zoning Board of Appeals.



Funding

Operating Budget: The City’s operating budget contains provisions for expected repairs like snow removal and infrastructure repair after a storm or natural disaster. The City also contains funding for community development and special districts.

Education and Outreach

Police Department: The City of Glens Falls Police Department maintains a facebook page.

9.4.6 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and prioritization.

Past Mitigation Initiative Status

Table 9.4-11 below indicates progress on the community’s mitigation strategy identified in the 2011 Plan. Previous actions that are now ongoing programs and capabilities are indicated as such in Table 9.4-11, and also appear under “Capability Assessment” presented previously in this annex. Actions carried forward as part of this plan update are included in the following subsection (in Table 9.4-12) with prioritization.

Table 9.4-11. Past Mitigation Initiative Status

Description	Status	Review Comments
Reconstruct Corinth Road at the Main Street Corridor in the Town of Queensbury and City of Glens Falls. Total reconstruction, upgrade utilities, and widen to 3 lanes.	Completed	Discontinue
Modify zoning practices to align with “FireWise Communities” guidelines to develop best practices.	No progress, not applicable	Discontinue
Educate residents regarding steps to be taken to decrease the impact of natural hazards (including ice storms, wild/forest fires, severe storms, tornado, earth-quakes, and all other natural hazards) by developing, enhancing, and implementing education programs, brochures, school presentations informing groups about ways to reduce risk, and other outreach activities.	Ongoing	Improve public education/understanding of the dam failure inundation zones
Monitor and remove trees/limbs in storm areas that present potential hazards to keep trees from threatening lives, property, and public infrastructure during storm events.	In progress; Continue	Change wording to: Develop and implement a street tree maintenance program.
Obtain funding to purchase generators for municipally-owned critical facilities.	In progress; Continue	Change wording to: Work with facility owners to install or upgrade permanent back-up power at the following critical facilities: <ul style="list-style-type: none"> • WWTP • All City district school • City Hall • Standby power for four or five lift/pumping



Table 9.4-11. Past Mitigation Initiative Status

Description	Status	Review Comments
		stations <ul style="list-style-type: none"> • Library (supplement current partial backup power.) • The Pines (private nursing home) • Stichman Towers (senior living) – replace older backup power system
Coordinate/create mutual aid agreements between emergency services, public works departments, and public utilities to ensure efficient use of resources during and after storm events.	Ongoing, operational	Discontinue – Include as ongoing operational capability.
Develop plans for debris management after hazard events, including severe winter snow/ice events, and other severe storms.	Ongoing, operational	Discontinue – Include as ongoing operational capability.
Design a network of citizens that will check in on elderly, functional needs, and low-income individuals during major events.	No progress, not applicable	Discontinue
Send a city representative to the NYS Wildland Fire Suppression Training.	No progress, not applicable	Discontinue
Provide training for local code enforcement officials to implement building codes that reflect disaster resistant construction for new structures and renovation.	No progress, not applicable	Discontinue
Provide residents with information listing steps taken to lessen potential flood damage to reduce the impact of flooding.	Ongoing, operational	Discontinue – Include as ongoing operational capability.
Educate the community on benefits of carrying NFIP policies and increase knowledge of NFIP services.	Ongoing, operational	Discontinue – Include as ongoing operational capability.
Review and update local plans to integrate goals, objectives, and activities from this HMP which are not found in existing regulatory documents, as appropriate.	In progress; Continue	Change wording to: Integrate natural hazard mitigation strategies, such as property protection measures, into the Community Development program, as appropriate.
Maintain a current inventory of at-risk buildings and infrastructure and continually update inventory of at-risk structures in each jurisdiction.	Ongoing, operational	Discontinue – Include as ongoing operational capability.
Apply for grants to assist with mitigation activities needed to provide a level of protection for critical facilities.	Ongoing, operational	Discontinue – Include as ongoing operational capability.
Provide continuing education and training for local Floodplain Administrator to ensure code enforcement and proper inspections.	Ongoing, operational	Discontinue – Include as ongoing operational capability.



Table 9.4-11. Past Mitigation Initiative Status

Description	Status	Review Comments
Implement zoning regulations to discourage building new structures in disaster prone areas – if such regulations are not already written into City Zoning code or Floodplain Ordinance.	In progress; Continue	Change wording to: Develop guidelines and standards for incorporating likely impacts of climate change into design and maintenance programs.



Completed Mitigation Initiatives not Identified in the Previous Mitigation Strategy

The City of Glen Falls has identified the following mitigation projects/activities that have also been completed but were not identified in the previous mitigation strategy in the 2011 Plan:

- Completed an engineering assessment of the Wilke Intake Queensbury Dam.
- A stormwater management/drainage problem at Kensington Road has been addressed.
- Enhanced catch basin cleaning efforts have been cited as significantly improving local stormwater management issues.
- Sewer separation and green stormwater management has been occurring in the City (South Street, Broad Street, Hudson Avenue).
- As part of the City's Combined Sewer Overflow (CSO) and Municipal Separate Storm Sewer System (MS4) plan, they are currently eliminating the last major section of their combined sewers.
- The City is cutting back brush along roadsides in the watershed to protect the roadways and help them to dry out. They are widening their roads and improving the drainage.

Proposed Hazard Mitigation Initiatives for the Plan Update

The city of Glens Falls participated in a mitigation action workshop in September and was provided the following Federal Emergency Management Agency (FEMA) publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 'Selecting Appropriate Mitigation Measures for Floodprone Structures' (March 2007) and FEMA 'Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards' (January 2013).

Table 9.4-12 summarizes the comprehensive-range of specific mitigation initiatives the municipality would like to pursue in the future to reduce the effects of hazards. Some of these initiatives may be previous actions carried forward for this plan update. Implementation of these initiatives will depend on available funding (grants and local match availability), and some initiatives may be modified or omitted at any time based on occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in Table 9.4-12 to further demonstrate the wide range of activities and mitigation measures selected.

As discussed in Section 6, 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing your actions as 'High', 'Medium', or 'Low.' The table below summarizes the evaluation of each mitigation initiative, listed by Action Number.

Table 9.4-12 summarizes the prioritization of all proposed mitigation initiatives for the Plan update.



Table 9.4-12. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category	CRS Category
CGF-1	Water System Hydraulic Analysis: Perform a dynamic hydraulic analysis to address low flows in the City’s fire water hydrant systems. The analysis would be completed in two parts – first create a model of the system, then identify and implement solutions.	Both	Wildfire	1, 3	Fire Department, Water and Sewer, DPW	High	Medium	Capital Budget, grants	Short	High	SIP	PR, SP
CGF-2	Wilke Intake Spillway Improvements as specified by engineering assessment of the Wilke Intake Queensbury Dam.	Existing	Flood (Dam Failure)	1, 3	Water and Sewer Board, Common Council	High	High	Bond	2017	High	SIP	PR, SP
CGF-3	Work with Finch Paper to: <ul style="list-style-type: none"> Better understand when trains are moving and may block the single WWTP ingress/egress. Install an emergency gate in the fence. 	N/A	HAZ MAT, Severe Storm, Severe Winter Storm	3	DPW, Fire Department, Finch Paper	Medium	Low	Capital Budget, County	Short	Medium	SIP, EAP	SP, ES
CGF-4	Evaluate causes of flooding and possible mitigation solutions in the Bush Street area, where residential building is currently ongoing.	New	Flood	1	DPW, Water and Sewer	Medium	Low	General fund	Short	Medium	LPR	PR
CGF-5	Continue to incorporate green infrastructure design into development and redevelopment projects.	Both	Flood, Severe Storm, Severe Winter Storm	1, 4, 5	DPW, Water and Sewer, Building and Codes	High	Low	Capital Budget, Grants	OG	High	LPR	PR





Table 9.4-12. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category	CRS Category
CGF-6	Integrate natural hazard mitigation strategies, such as property protection measures, into the Community Development program, as appropriate.	N/A	All Hazards	1, 2	Community Development, Common Council	High	Low	General fund	OG	High	LPR	PR
CGF-7	Work with facility owners to install or upgrade permanent back-up power at the following critical facilities: <ul style="list-style-type: none"> • WWTP • All City district school • City Hall • Standby power for four or five lift/pumping stations • Library (supplement current partial backup power.) • The Pines (private nursing home) • Stichman Towers (senior living) – replace older backup power system 											
	See above.	Existing	Severe Storm, Severe Winter Storm	1, 3, 4	DPW, Building and Codes	High	Medium	County, NYDHSES, Grants	Short	High	SIP	ES
CGF-8	Develop and implement a catch basin cleaning program.	N/A	Flood (Stormwater), Haz Mat	1, 3, 5	DPW, Water and Sewer	Medium	Medium	Capital Budget	Short	High	LPR	NR
CGF-9	Improve public education/understanding of the dam failure inundation zones (specifically in Queensbury), where they are looking to do some infill housing (increases risk – and could increase dam hazard ratings).	Both	Flood (Dam Failure)	1, 2, 3, 4	DPW, Community Development, Building and Codes	High	Low	General fund, FEMA grants	Should be completed in 2017	High	EAP	PI
CGF-10	Develop and implement a street tree maintenance program.	N/A	Severe Storm, Severe	1, 3	DPW	Medium	Medium	Capital Budget	Short	Medium	LPR	PR



Table 9.4-12. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category	CRS Category
			Winter Storm									
CGF-11	Develop guidelines and standards for incorporating likely impacts of climate change into design and maintenance programs.	N/A	All Hazards	1, 4, 5	DPW, Community Development, Building and Codes, Common Council	High	Medium	General fund, grants	OG	High	LPR	PR

Notes:

Not all acronyms and abbreviations defined below are included in the table.

*Does this mitigation initiative reduce effects of hazards on new and/or existing buildings and/or infrastructure? Not applicable (N/A) is inserted if this does not apply.

Acronyms and Abbreviations:

- CAV Community Assistance Visit
- CDBG Community Development Block Grant
- GCRS Community Rating System
- DPW Department of Public Works
- FEMA Federal Emergency Management Agency
- FPA Floodplain Administrator
- HMA Hazard Mitigation Assistance
- N/A Not applicable
- NFIP National Flood Insurance Program
- OEM Office of Emergency Management

Potential FEMA HMA Funding Sources:

- FMA Flood Mitigation Assistance Grant Program
- HMGP Hazard Mitigation Grant Program
- PDM Pre-Disaster Mitigation Grant Program
- RFC Repetitive Flood Claims Grant Program (discontinued)
- SRL Severe Repetitive Loss Grant Program (discontinued)

Timeline:

- Short 1 to 5 years
- Long Term 5 years or greater
- OG On-going program
- DOF Depending on funding

Costs:

Where actual project costs have been reasonably estimated:

- Low < \$10,000
- Medium \$10,000 to \$100,000
- High > \$100,000

Where actual project costs cannot reasonably be established at this time:

- Low Possible to fund under existing budget. Project is part of, or can be part of, an existing ongoing program.
- Medium Could budget for under existing work plan, but would require a

Benefits:

Where possible, an estimate of project benefits (per FEMA's benefit calculation methodology) has been evaluated against the project costs, and is presented as:

- Low < \$10,000
- Medium \$10,000 to \$100,000
- High > \$100,000

Where numerical project benefits cannot reasonably be established at this time:

- Low Long-term benefits of the project are difficult to quantify in the short term.
- Medium Project will have a long-term impact on reduction of risk exposure to life





Costs:

reapportionment of the budget or a budget amendment, or cost of the project would have to be spread over multiple years.

High Would require an increase in revenue via an alternative source (i.e., bonds, grants, fee increases) to implement. Existing funding levels are not adequate to cover costs of the proposed project.

Benefits:

and property, or project will provide an immediate reduction in risk exposure to property.

High Project will have an immediate impact on reduction of risk exposure to life and property.

Mitigation Category:

- Local Plans and Regulations (LPR) – Actions that include government authorities, policies, or codes that influence the way land and buildings are developed and built.
- Structure and Infrastructure Project (SIP) – Actions that involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures, as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce impacts of hazards.
- Natural Systems Protection (NSP) – Actions that minimize damage and losses, and also preserve or restore the functions of natural systems.
- Education and Awareness Programs (EAP) – Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities

CRS Category:

- Preventative Measures (PR) – Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and stormwater management regulations.
- Property Protection (PP) – Actions include public activities to reduce hazard losses or 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.
- Public Information (PI) – 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 educational programs for school-age children and adults.
- Natural Resource Protection (NR) – 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.
- Structural Flood Control Projects (SP) – Actions that involve construction of structures to reduce impacts of a hazard. Such structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.
- Emergency Services (ES) – Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and protection of essential facilities



Table 9.4-13. Summary of Prioritization of Actions

Mitigation Action/Project Number	Mitigation Action/Initiative	Life Safety	Property Protection	Cost-Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency	Champlain Other	Community	Total	High / Medium / Low
CGF-1	Water System Hydraulic Analysis: Perform a dynamic hydraulic analysis to address low flows in the City's fire water hydrant systems. The analysis would be completed in two parts – first create a model of the system, then identify and implement solutions.	1	1	1	1	0	1	1	0	0	1	0	1	1	0	0	9	High
CGF-2	Wilke Intake Spillway Improvements as specified by engineering assessment of the Wilke Intake Queensbury Dam.	1	1	1	1	0	1	0	0	0	1	1	1	0	0	0	8	High
CGF-3	Work with Finch Paper to: <ul style="list-style-type: none"> Better understand when trains are moving and may block the single WWTP ingress/egress. Install an emergency gate in the fence. 	1	0	1	1	0	1	0	0	0	1	1	1	0	0	0	7	Medium
CGF-4	Evaluate causes of flooding and possible mitigation solutions in the Bush Street area, where residential building is currently ongoing.	0	1	1	1	0	0	0	0	0	1	0	1	0	0	0	5	Medium
CGF-5	Continue to incorporate green infrastructure design into development and redevelopment projects.	0	1	1	1	1	1	1	1	0	1	1	0	0	1	0	10	High
CGF-6	Integrate natural hazard mitigation strategies, such as property protection measures, into the Community Development program, as appropriate.	0	1	1	1	0	1	1	1	0	1	1	0	1	0	0	9	High
CGF-7	Work with facility owners to install or upgrade permanent back-up power at the following critical facilities: <ul style="list-style-type: none"> WWTP All City district school City Hall Standby power for four or five lift/pumping stations Library (supplement current partial backup power.) The Pines (private nursing home) Stichman Towers (senior living) – replace older backup power system 	1	0	1	1	1	1	0	0	1	1	0	1	1	0	0	9	High
CGF-8	Develop and implement a catch basin cleaning program.	0	1	1	1	0	1	1	1	0	1	0	1	0	0	0	8	High





Table 9.4-13. Summary of Prioritization of Actions

Mitigation Action/Project Number	Mitigation Action/Initiative	Life Safety	Property Protection	Cost-Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency	Champlain Other	Community	Total	High / Medium / Low
CGF-9	Improve public education/ understanding of the dam failure inundation zones (specifically in Queensbury), where they are looking to do some infill housing (increases risk – and could increase dam hazard ratings).	1	1	1	1	1	1	1	0	1	1	1	1	0	0	0	11	High
CGF-10	Develop and implement a street tree maintenance program.	1	1	1	1	0	0	1	0	0	1	0	1	0	0	0	7	Medium
CGF-11	Develop guidelines and standards for incorporating likely impacts of climate change into design and maintenance programs.	0	1	1	1	1	1	1	0	0	1	1	0	0	0	0	8	High

Note: Refer to Section 6, which conveys guidance on prioritizing mitigation actions.



9.4.7 Future Needs To Better Understand Risk/Vulnerability

None at this time.

9.4.8 Hazard Area Extent and Location

Hazard area extent and location maps have been generated for the City of Glens Falls that illustrate the areas probable to be impacted within the municipality (see Figure 9.4-1 and Figure 9.4-2 below). These maps are based on the best available data at the time of the preparation of this Plan, and are considered to be adequate for planning purposes. Maps have been generated for those hazards (i.e., wildfire and flooding) that can be clearly identified using mapping techniques and technologies, and to which the City of Glens Falls has significant exposure. These maps also appear in the hazard profiles within Section 5.4, Volume I of this Plan.

9.4.9 Additional Comments

None at this time.



Figure 9.4-1. City of Glens Falls Flood and Wildfire Hazard Area Extent and Location Map

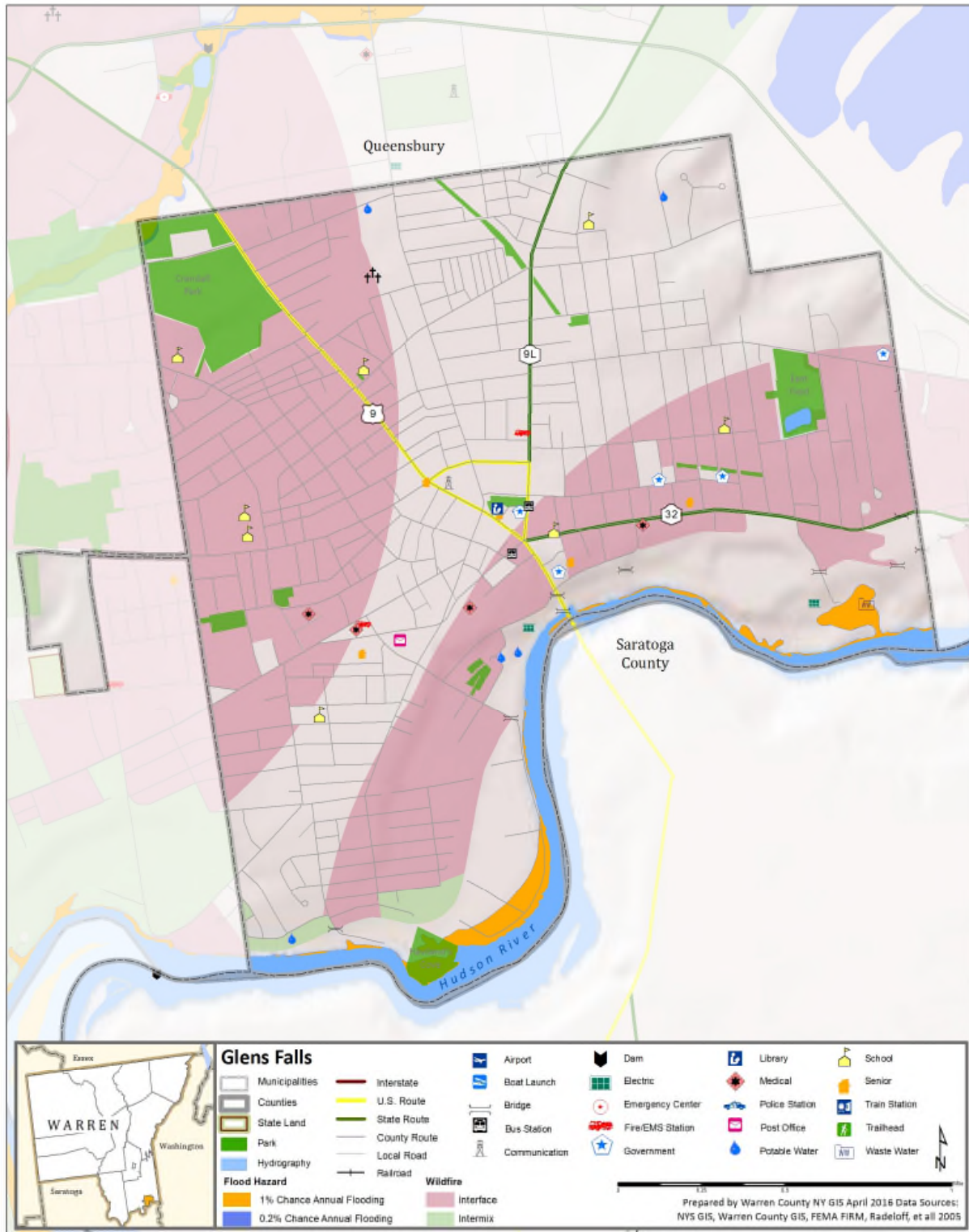
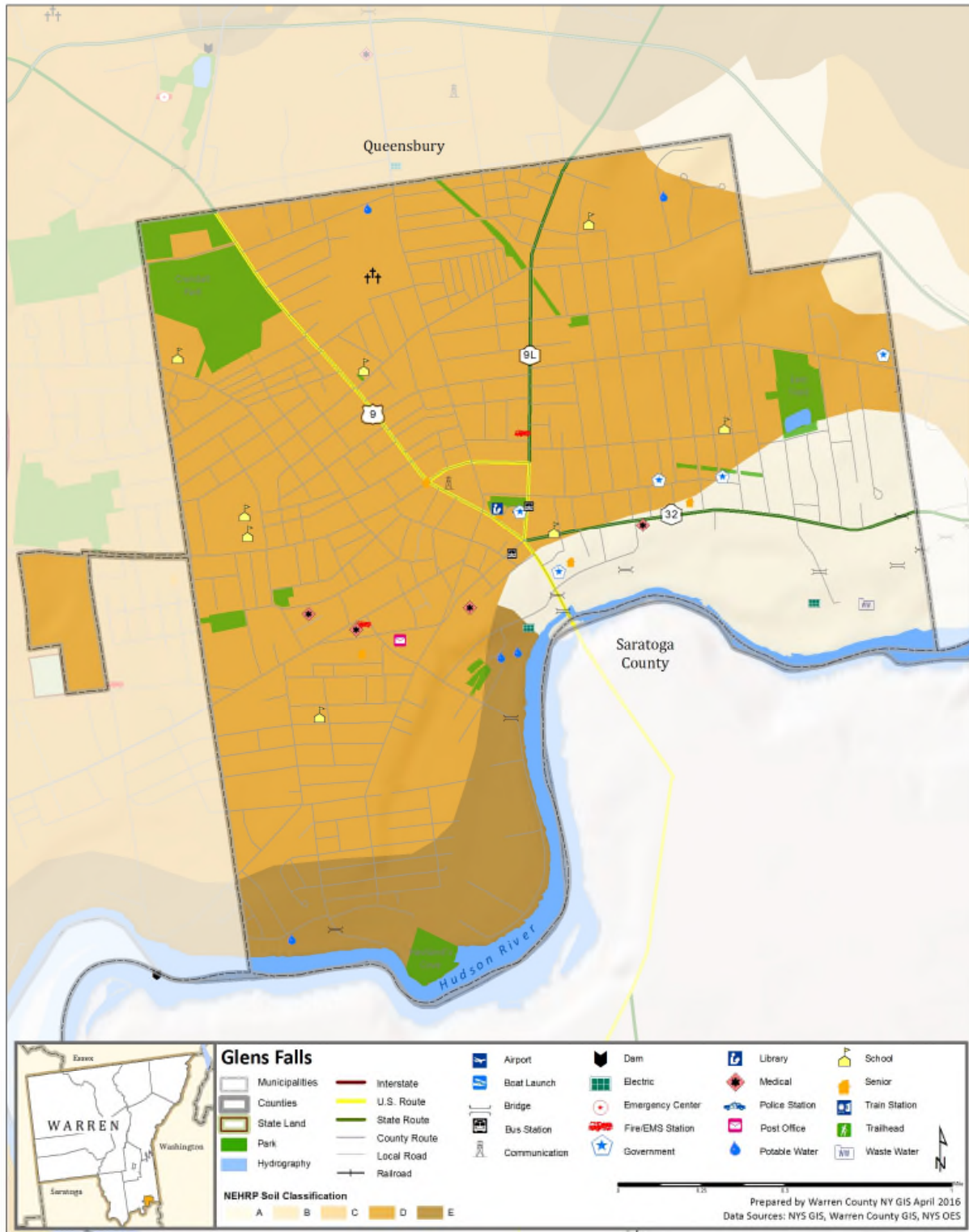




Figure 9.4-2. City of Glens Falls Landslide Hazard Area Map





Name of Jurisdiction: City of Glens Falls
Name and Title Completing Worksheet: Steve Gurzler, City Engineer
Action Number: CGF-1
Mitigation Action/Initiative: Water System Hydraulic Analysis

Assessing the Risk	
Hazard(s) addressed:	Wildfire
Specific problem being mitigated:	Need an analysis to address low flows in the City's fire hydrant system
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	This initiative is specifically designed to analyze various alternatives to address the stated problem.
Action/Project Intended for Implementation	
Description of Selected Action/Project	Perform a dynamic hydraulic analysis to address low flows in the City's fire water hydrant systems. The analysis would be completed in two parts – first create a model of the system, then identify and implement solutions.
Action/Project Category	SIP
Goals Met	1, 3
Applies to existing and or new development, or not applicable	New and Existing
Benefits (losses avoided)	High
Estimated Cost	Medium
Priority*	High
Plan for Implementation	
Responsible Organization	Fire Department, Water and Sewer, DPW
Local Planning Mechanism	Capital Improvement, Hazard Mitigation
Potential Funding Sources	Capital Budget, grants
Timeline for Completion	Short Term
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:



Action Number:

CGF-1

Mitigation Action/Initiative:

Water System Hydraulic Analysis

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	
Property Protection	1	
Cost-Effectiveness	1	
Technical	1	
Political	0	
Legal	1	
Fiscal	1	Use capital budget or grant funding
Environmental	0	
Social	0	
Administrative	1	
Multi-Hazard	0	Wildfire
Timeline	1	
Agency Champion	1	
Other Community Objectives	0	
Total	9	
Priority (High/Med/Low)	High	



Name of Jurisdiction: City of Glens Falls
Name and Title Completing Worksheet: Steve Gurzler, City Engineer
Action Number: CGF-3
Mitigation Action Name: Install an emergency gate in the fence at WWTP

Assessing the Risk	
Hazard(s) addressed:	Flooding
Specific problem being mitigated:	WWTP only has a single ingress/egress, which is frequently blocked by passing trains
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	Better understand when trains are moving and may block the single WWTP ingress/egress.
Action/Project Intended for Implementation	
Description of Selected Action/Project	Install an emergency gate in the fence.
Mitigation Action Type	SIP, EAP
Goals Met	Goal 3: Provide for Emergency Services
Applies to existing and or new development, or not applicable	N/A
Benefits (losses avoided)	Medium – eliminates the risk of blocked access to WWTP
Estimated Cost	Low
Priority*	Medium
Plan for Implementation	
Responsible Organization	DPW, Fire Department, Finch Paper
Local Planning Mechanism	Local Comprehensive Emergency Management Plan
Potential Funding Sources	Operating Budget, County
Timeline for Completion	Short
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:



Action Number:

CGF-3

Mitigation Action Name:

Install an emergency gate in the fence at WWTP

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Ensure continuous service/operation of critical facility.
Property Protection	0	
Cost-Effectiveness	1	Installing an additional gate in perimeter fence is low cost compared to benefit of providing continued WWT service.
Technical	1	Project is technically feasible.
Political	0	
Legal	1	City has legal authority to complete the project.
Fiscal	0	Outside funding may be required.
Environmental	0	No environmental impacts.
Social	0	No social impacts.
Administrative	1	The city has administrative capability to complete project.
Multi-Hazard	1	HAZ MAT, Utility Failure
Timeline	1	Could be completed in less than 5 years
Agency Champion	0	
Other Community Objectives	0	
Total	7	
Priority (High, Medium, Low)	Medium	



Name of Jurisdiction: City of Glens Falls
Name and Title Completing Worksheet: Steve Gurzler, City Engineer
Action Number: CGF-2
Mitigation Action Name: Wilke Intake Spillway Improvements as specified by engineering assessment of the Wilke Intake Queensbury Dam.

Assessing the Risk	
Hazard(s) addressed:	Flood (Dam Failure), Severe Storm
Specific problem being mitigated:	The Wilke Intake (dam) in Queensbury needs spillway upgrades.
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	See engineering assessment report.
Action/Project Intended for Implementation	
Description of Selected Action/Project	Upgrade spillway as indicated in engineering report. Mitigation efforts shall be made in consideration of Federal and State directives to mitigate critical infrastructure to address protection to the 500-year flood event or “worst damage scenario”.
Mitigation Action Type	SIP
Goals Met	Goal 1: Protect Life and Property Goal 3: Provide for Emergency Services
Applies to existing and or new development, or not applicable	Existing
Benefits (losses avoided)	High – eliminates the risk of dam failure
Estimated Cost	High
Priority*	High
Plan for Implementation	
Responsible Organization	Water and Sewer Board, Common Council
Local Planning Mechanism	Emergency Action Plan, Comprehensive Emergency Management Plan
Potential Funding Sources	Bond
Timeline for Completion	Short - 2017
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:



Action Number:

CGF-2

Mitigation Action Name:

Wilke Intake Spillway Improvements as specified by engineering assessment of the Wilke Intake Queensbury Dam.

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Minimize risk of injury from dam failure
Property Protection	1	Minimize risk of dam failure and associated property damage
Cost-Effectiveness	1	Upgrading spillway is low cost compared to benefit of reducing risk of complete dam failure
Technical	1	Project is technically feasible.
Political	0	
Legal	1	City has legal authority to complete the project.
Fiscal	0	Outside funding may be required.
Environmental	0	No environmental impacts.
Social	0	No social impacts.
Administrative	1	The city has administrative capability to complete project.
Multi-Hazard	1	Flood (Dam Failure), Severe Storm
Timeline	1	Could be completed in less than 5 years
Agency Champion	0	
Other Community Objectives	0	
Total	8	
Priority (High, Medium, Low)	High	



Name of Jurisdiction:	City of Glens Falls
Name and Title Completing Worksheet:	Steve Gurzler, City Engineer
Action Number:	CGF-7
Mitigation Action/Initiative:	Install or upgrade permanent back up power at critical facilities

Assessing the Risk	
Hazard(s) addressed:	Severe Storm, Severe Winter Storm
Specific problem being mitigated:	Need for backup power at critical facilities in the City
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	The City has identify no practical or cost-effectives alternatives to the installation of backup power at critical facilities to address prolonged power outages.
Action/Project Intended for Implementation	
Description of Selected Action/Project	<p>Work with facility owners to install or upgrade permanent back-up power at the following critical facilities:</p> <ul style="list-style-type: none"> • WWTP • All City district school • City Hall • Standby power for four or five lift/pumping stations • Library (supplement current partial backup power.) • The Pines (private nursing home) • Stichman Towers (senior living) – replace older backup power system
Action/Project Category	SIP
Goals Met	1, 3, 4
Applies to existing and or new development, or not applicable	Existing
Benefits (losses avoided)	High
Estimated Cost	Medium
Priority*	High
Plan for Implementation	
Responsible Organization	DPW, Building and Codes
Local Planning Mechanism	Hazard Mitigation, Emergency Management
Potential Funding Sources	County, NYSDHSES, Grants
Timeline for Completion	Short Term
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:



Action Number:

CGF-7

Mitigation Action/Initiative:

Install or upgrade permanent back up power at critical facilities

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	
Property Protection	0	
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	
Fiscal	0	Need grant funding
Environmental	0	
Social	1	
Administrative	1	
Multi-Hazard	0	Severe Storm, Severe Winter Storm
Timeline	1	
Agency Champion	1	
Other Community Objectives	0	
Total	9	
Priority (High/Med/Low)	High	



9.5 Town of Hague

This section presents the jurisdictional annex for the Town of Hague.

9.5.1 Hazard Mitigation Plan Point of Contact

The following individuals have been identified as the hazard mitigation plan’s (HMP) primary and alternate points of contact.

Primary Point of Contact	Alternate Point of Contact
Cathy Clark, Zoning Enforcement Officer 9793 Graphite Mountain Road P.O. Box 509 Hague, NY 12836 (518) 543-6161 x14 zoning@townofhague.org	Edna Frasier, Supervisor 9793 Graphite Mountain Road P.O. Box 509 Hague, NY 12836 (518) 543-6161 x12 supervisor@townofhague.org

9.5.2 Municipal Profile

The Town of Hague is located on Lake George in northeastern Warren County. The Town is bordered on the east by Washington County and on the north by Essex County. The Town has a total land area of 79.6 square miles of which 64.0 square miles is land and 15.6 square miles is water. The Town includes one hamlet, Hague, and three neighborhoods: Graphite, Sabbath Day Point, and Silver Bay.

According to the 2010 Census, the community's population was 699. Town government is run by the Town Board as the executive, administrative and legislative body of the town. Though the supervisor presides at Town Board meetings and may be assigned certain powers of administration and supervision, it is the Board as a whole that is responsible for running the Town.

Growth/Development Trends

The Town of Hague did not note any recent residential/commercial development since 2010 or any major residential or commercial development, or major infrastructure development planned for the next five years in the municipality.

9.5.3 Natural Hazard Event History Specific to the Municipality

Warren County has a history of natural and non-natural hazard events as detailed in Volume I, Section 5.0 of this plan. A summary of historical events appears in each hazard profile, and includes a chronology of events that have affected the County and its municipalities. For the purpose of this Plan update, events that have occurred in the County from 2010 to present were summarized to indicate the range and impact of hazard events in the community. Information regarding specific damages is included, if available, based on reference material or local sources. This information is presented in Table 9.5-1 below. For details of these and additional events, refer to Volume I, Section 5.0 of this Plan.

Table 9.5-1. Hazard Event History

Dates of Event	Event Type (FEMA Disaster Declaration if applicable)	County Designated?	Summary of Damages/Losses
April 27-28, 2011	Severe Storms, Flooding, Tornadoes and	Yes	Flooding occurred along the Hudson River in Warren County from North River southward to the Saratoga County line. Numerous reports of flooding. The County had approximately \$676,000 in





Dates of Event	Event Type (FEMA Disaster Declaration if applicable)	County Designated?	Summary of Damages/Losses
	Straight-Line Winds (DR-1993)		damages. Nearly two-thirds of the County was damaged. No specific damages were reported in the Town of Hague.
May 27 – June 2, 2011	Flooding	N/A	Flooding occurred in the County and there was severe damage along a thin line through the County (Stony Creek, Thurman, Warrensburg, Horicon and Bolton) that resulted in \$13.125 million in damages. No specific damages were reported in the Town of Hague.
August 27-29, 2011	Hurricane Irene (DR-4020)	Yes	Evacuation and sheltering for at least one family was required. Loss of services included road closure, utility outages, emergency pumping and tree removal. Road and bridge damage occurred on Yaw Road and a section of New Hague Road was lost. Debris and removal was needed from culverts and roads town-wide. Beach restoration was needed. Public assistance was requested in the amount of \$146,638.83. Hague Volunteer Fire Department and Town of Hague Highway Department spent staff time on emergency services and/or clean up.
October 29, 2012	Hurricane Sandy (EM-3351)	Yes	The Town of Hague suffered major damage including one and one half miles of power lines were downed, boat and house damage resulting from high wind and one tree was lost.

Notes:

- EM Emergency Declaration (FEMA)
- FEMA Federal Emergency Management Agency
- DR Major Disaster Declaration (FEMA)
- N/A Not applicable

9.5.4 Hazard Vulnerabilities and Ranking

The hazard profiles in Section 5.0 of this Plan convey detailed information regarding each plan participant’s vulnerability to the identified hazards. The following summarizes the hazard vulnerabilities and their ranking in the Town of Hague. For additional vulnerability information relevant to this jurisdiction, refer to Section 5.0.

Hazard Risk/Vulnerability Risk Ranking

Table 9.5-2 below summarizes the hazard risk/vulnerability rankings of potential hazards for the Town of Hague.

Table 9.5-2. Hazard Risk/Vulnerability Risk Ranking

Hazard type	Estimate of Potential Dollar Losses to Structures Vulnerable to the Hazard ^{a, b}	Probability of Occurrence	Risk Ranking Score (Probability x Impact)	Hazard Ranking ^a
Earthquake	100-year MRP: \$30,511.00 500-year MRP: \$2,889,908 2,500-Year MRP: \$22,563,207.00	Occasional	12	Low
Flood	RCV Exposed to 1% Annual Chance: \$6,321,928	Frequent	18	Medium
Landslide	Damage estimate not available	Frequent	33	High
Infestation	Damage estimate not available	Frequent	24	Medium
Severe Storm	RCV Exposed to 1938 storm-winds: \$222,965	Frequent	48	High
Severe Winter Storm	GBS 1% Loss: \$2,580,800 GBS 5% Loss: \$12,904,000	Frequent	51	High





Hazard type	Estimate of Potential Dollar Losses to Structures Vulnerable to the Hazard ^{a, b}	Probability of Occurrence	Risk Ranking Score (Probability x Impact)	Hazard Ranking ^a
Wildfire	RCV Exposed to Intermix: \$245,399,000 RCV Exposed to Interface: \$41,838,000	Frequent	48	High
Cyber Security	Damage estimate not available	Occasional	12	Low
Disease Outbreak	Damage estimate not available	Frequent	27	Medium
Hazardous Material Incidents	Damage estimate not available	Frequent	24	Medium

Notes:

- a. The general building stock valuation is based on the custom inventory generated for the municipality and based on improved value.
High = Total hazard priority risk ranking score of 31 and above
Medium = Total hazard priority risk ranking of 20-30+
Low = Total hazard risk ranking below 20
- b. Loss estimates for the severe storm and severe winter storm hazards are structural values only and do not include the estimated value of contents. The earthquake was evaluated by Census tract. The Census tracts do not exactly align with municipal boundaries; therefore, a total is reported for each Town inclusive of the Villages. Loss estimates for the flood and earthquake hazards represent both structure and contents. Potential flood loss estimates were generated using Hazus-MH 2.2 and digitized FIRM maps from the 1980s and 1990s for the 1-percent annual chance event; NED DEM was used to generate a depth grid. The County's 2015 Real Property data was used to generate the values for flood and includes structure and contents. For the wildfire hazard, the improved value and estimated contents of buildings located within the identified hazard zones is provided.

GBS General building stock
MRP Mean return period
RCV Replacement Cost Value

National Flood Insurance Program (NFIP) Summary

Table 9.5-3 below summarizes NFIP statistics for the Town of Hague.

Table 9.5-3. NFIP Summary

Municipality	# Policies (1)	# Claims (Losses) (1)	Total Loss Payments (2)	# Rep. Loss Prop. (1)	# Severe Rep. Loss Prop. (1)	# Policies in 100-year Boundary (3)
Town of Hague	15	1	\$8,021	0	0	5

Source: FEMA Region 2, 2014

Notes:

- (1) Policies, claims, repetitive loss, and severe repetitive loss statistics are provided by FEMA, are current as of November 30, 2015, and are summarized by community name. Total number of repetitive loss properties includes severe repetitive loss properties. Number of claims represents claims closed by November 30, 2015.
- (2) Total building and content losses from the claims file provided by FEMA Region 2.
- (3) Number of policies inside and outside of flood zones is based on latitude and longitude provided by FEMA Region 2 in the policy file.
- (4) FEMA noted that for a property with more than one entry, more than one policy may have been in force or more than one Geographic Information System (GIS) specification was possible.

Critical Facilities

Table 9.5-4 below identifies critical facilities within the municipality located on parcels that intersect the current regulatory NFIP 1% chance flood boundary (aka: “Special Flood Hazard Area” (SFHA)), however it is recognized that the actual facility structure(s) may lie outside of the SFHA. Please refer to the Flood Hazard Profile (Section 5.4.2) for further details of estimated flood losses throughout the County, as well as the “Other Vulnerabilities Identified” section following.





Table 9.5-4. Potential Flood Losses to Critical Facilities

Municipality	Facility Types in 1% Chance Flood Boundary						
	Boat Facilities	Dam	Electric	Government	Highway Bridge	Rail Facility	Wastewater
Town of Hague	1	0	0	0	2	0	0

Source: Warren County Real Property 2015 tax roll; HAZUS-MH 2.2; FEMA 2015

Notes:

- (1) HAZUS-MH 2.2 provides a general indication of the maximum restoration time for 100% operations. Clearly, a great deal of effort is needed to quickly restore essential facilities to full functionality; therefore, this will be an indication of the maximum downtime (HAZUS-MH 2.2 User Manual).
- (2) Some facilities may be within the Digital Flood Insurance Rate Map (DFIRM) flood hazard boundary; however, HAZUS did not calculate potential loss, perhaps because depth of flooding would not cause any damages to these structures according to the depth damage function used in HAZUS for that facility type. Further, HAZUS-MH may estimate potential damage to a facility outside the DFIRM if the model generates a depth grid beyond DFIRM boundaries.

Other Vulnerabilities Identified

The municipality has identified the following vulnerabilities within their community:

- Backups of debris along streams at culverts and bridges.
- Undermining of roads due to erosion along road beds.

9.5.5 Capability Assessment

This section identifies the following capabilities of the local jurisdiction:

- Planning and regulatory capability
- Administrative and technical capability
- Fiscal capability
- Community classification
- NFIP
- Integration of mitigation planning into existing and future planning mechanisms.

Planning and Regulatory Capability

Table 9.5-5 below summarizes regulatory tools available to the Town of Hague.

Table 9.5-5. Planning and Regulatory Tools

Tool / Program (code, ordinance, plan)	Do you have this? (Yes/No) If Yes, date of adoption or update	Authority (local, county, state, federal)	Dept. /Agency Responsible	Code Citation and Comments (Code Chapter, name of plan, explanation of authority, etc.)
Planning Capability				
Comprehensive Plan	Yes	Local	Town Council, Planning Board	Land Use Plan (Comprehensive Plan) Adopted 2003
Capital Improvements Plan	No	-	-	-
Floodplain Management / Basin Plan	Yes	Local	Zoning office	160-49





Tool / Program (code, ordinance, plan)	Do you have this? (Yes/No) If Yes, date of adoption or update	Authority (local, county, state, federal)	Dept. /Agency Responsible	Code Citation and Comments (Code Chapter, name of plan, explanation of authority, etc.)
Stormwater Management Plan	Yes	Lake George Park Commission	Lake George Park Commission & Warren County Soil and Water	6 NYCRR 645 & 646
Open Space Plan	Yes	Town	Zoning	150-12
Stream Corridor Management Plan	No	-	-	-
Watershed Management or Protection Plan	Yes	Regional	Lake George Park Commission (LGPC)	Regional Watershed Plan Governing Tree-Cutting And Stream Corridor Protection, Article 43- 0112 (5) of the Environmental Conservation Law
Economic Development Plan	Yes	Adirondack Park Agency only	Economic Development	-
Comprehensive Emergency Management Plan	Yes	Town of Hague	Supervisor's office	Adopted 1998 - last update 2013
Emergency Response Plan	Yes	Local	Supervisor's office	Town of Hague – Supervisor's office; County – Emergency services office
Post-Disaster Recovery Plan	No	-	-	-
Transportation Plan	No	-	-	-
Strategic Recovery Planning Report	No	-	-	-
Other Plans:	No	-	-	-
Regulatory Capability				
Building Code	Yes	State	Warren Co.	Chapter 73 (Building Construction)
Zoning Ordinance	Yes	Local	Zoning Enforcement Officer	Chapter 160 (Zoning)
Subdivision Ordinance	Yes	Local	Zoning Enforcement Officer	Chapter 150 (Subdivision of Land)
NFIP Flood Damage Prevention Ordinance	Yes	Federal, State, Local	Zoning Enforcement Officer	Chapter 99 (Flood Damage)
NFIP: Cumulative Substantial Damages	No	-	-	-
NFIP: Freeboard	Yes	State, Local	Zoning Enforcement Officer	State mandated BFE+2 for single and two-family residential construction, BFE+1 for all other construction types
Growth Management Ordinances	No	-	-	-
Site Plan Review Requirements	Yes	Local	Zoning Enforcement Officer	Article VI of the Zoning Code
Stormwater Management Ordinance	Yes	Regional	Lake George Park	6 NYCRR 645 & 646



Tool / Program (code, ordinance, plan)	Do you have this? (Yes/No) If Yes, date of adoption or update	Authority (local, county, state, federal)	Dept. /Agency Responsible	Code Citation and Comments (Code Chapter, name of plan, explanation of authority, etc.)
			Commission (LGPC)	Environmental Conservation Law Sections 43-0107 (8)&(32), 43-0115 (3), and 43-0117 (4), Navigation Law Section 44-a (not subdivided)
Municipal Separate Storm Sewer System (MS4)	N/A	-	-	No storm conveyance system, only closed sewer
Natural Hazard Ordinance	No	-	-	-
Post-Disaster Recovery Ordinance	No	-	-	-
Real Estate Disclosure Requirement	Yes	State	-	New York State (NYS) mandate, Property Condition Disclosure Act, <i>NY Code</i> – Article 14 §460-467
Other (Special Purpose Ordinances [i.e., sensitive areas, steep slope])	Yes	Local Adirondack Park Agency (APA) Town	-	Wetlands (Chapter 66); Sewer Chapter 132

Administrative and Technical Capability

Table 9.5-6 below summarizes potential staff and personnel resources available to the Town of Hague.

Table 9.5-6. Administrative and Technical Capabilities

Resources	Is this in place? (Yes or No)	Department/ Agency/Position
Administrative Capability		
Planning Board	Yes	Town Planning Board
Mitigation Planning Committee	No	-
Environmental Board/Commission	No	-
Open Space Board/Committee	No	Planning Board for Subdivisions, only
Economic Development Commission/Committee	No	APA only
Maintenance programs to reduce risk	No	-
Mutual aid agreements	Yes	Fire Department & Warren County
Technical/Staffing Capability		
Planner(s) or engineer(s) with knowledge of land development and land management practices	No	Can be hired on a case by case basis
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	No	-
Planners or engineers with an understanding of natural hazards	No	-
NFIP Floodplain Administrator (FPA)	Yes	Zoning Enforcement Officer
Surveyor(s)	No	Can be hired on a case by case basis
Personnel skilled or trained in GIS and/or Hazards United States (HAZUS) – Multi-Hazards (MH) applications	Yes	Zoning Enforcement Officer
Scientist familiar with natural hazards	No	-
Emergency Manager	No	Warren County Emergency Management





Resources	Is this in place? (Yes or No)	Department/ Agency/Position
Grant writer(s)	No	Can be hired on a case by case basis
Staff with expertise or training in benefit/cost analysis	No	-
Professionals trained in conducting damage assessments	No	Can be hired on a case by case basis

Fiscal Capability

Table 9.5-7 below summarizes financial resources available to the Town of Hague.

Table 9.5-7. Fiscal Capabilities

Financial Resources	Accessible or Eligible to Use (Yes/No)
Community Development Block Grants (CDBG, CDBG-DR)	Yes
Capital improvements project funding	Yes -Town Board
Authority to Levy Taxes for specific purposes	Yes
User fees for water, sewer, gas or electric service	Yes, sewer
Impact fees for homebuyers or developers of new development/homes	No
Stormwater utility fee	No
Incur debt through general obligation bonds	No
Incur debt through special tax bonds	Yes
Incur debt through private activity bonds	No
Withhold public expenditures in hazard-prone areas	No
Other federal or state funding programs	Yes
Open Space Acquisition funding programs	No
Other	No

Community Classifications

Table 9.5-8 below summarizes classifications for community program available to the Town of Hague.

Table 9.5-8. Community Classifications

Program	Do you have this? (Yes/No)	Classification (if applicable)	Date Classified (if applicable)
Community Rating System (CRS)	NP	N/A	N/A
Building Code Effectiveness Grading Schedule (BCEGS)	NP	N/A	N/A
Public Protection (ISO Fire Protection Classes 1 to 10)	TBD	-	-
Storm Ready	TBD	-	-
Firewise	NP	N/A	N/A
Disaster/safety programs in/for schools	N/A	N/A	N/A
Organizations with mitigation focus (advocacy group, non-government)	NP	N/A	N/A
Public education program/outreach (through website, social media)	NP	N/A	N/A



Program	Do you have this? (Yes/No)	Classification (if applicable)	Date Classified (if applicable)
Public-Private Partnerships	N/A	N/A	N/A

Note:

- N/A Not applicable
- NP Not participating
- Unavailable
- TBD To be determined.

The classifications listed above relate to the community’s ability to provide effective services to lessen its vulnerability to the hazards identified. These classifications can be viewed as a gauge of the community’s capabilities in all phases of emergency management (preparedness, response, recovery and mitigation) and are used as an underwriting parameter for determining the costs of various forms of insurance. The Community Rating System (CRS) class applies to flood insurance, while the Building Code Effectiveness Grading Schedule (BCEGS) and Public Protection classifications apply to standard property insurance. CRS classifications range on a scale of 1 to 10, with class 1 being the best possible classification, and class 10 representing no classification benefit. Firewise classification is higher if the subject property is more than 1000 feet from a creditable fire hydrant and is within 5 road miles of a recognized Fire Station.

Criteria for classification credits are outlined in the following documents:

- The Community Rating System Coordinators Manual
- The Building Code Effectiveness Grading Schedule
- The ISO Mitigation online ISO’s Public Protection website at <https://www.isomitigation.com/program-works/how-the-ppc-program-works.html>
- The National Weather Service Storm Ready website at <http://www.stormready.noaa.gov/index.html>
- The National Firewise Communities website at <http://firewise.org/>

Self-Assessment of Capability

Table 9.5-9 below provides an approximate measure of the Town of Hague’s capability to work in a hazard-mitigation capacity and/or effectively implement hazard mitigation strategies to reduce hazard vulnerabilities.

Table 9.5-9. Self-Assessment Capability for the Municipality

Area	Degree of Hazard Mitigation Capability		
	Limited (If limited, what are your obstacles?)*	Moderate	High
Planning and Regulatory Capability	X- limited staff		X – In flood zones
Administrative and Technical Capability	X- limited staff		
Fiscal Capability		X	
Community Political Capability	X		
Community Resiliency Capability			X
Capability to Integrate Mitigation into Municipal Processes and Activities.	X- limited staff		





National Flood Insurance Program

NFIP Floodplain Administrator (FPA)

Catherine Clark – Zoning Enforcement Officer, Planning and Zoning Department

Flood Vulnerability Summary

As of November 30, 2015, 15 policies were in force, five of which were within the 100-year flood boundary. There are no repetitive loss property and no severe repetitive loss properties in the Town of Hague. Since 1978, one claim has been paid totaling \$8,021. According to current NFIP statistics at the time of this Plan, NFIP policies in the Town of Hague insured over \$2.9 million of property with total annual insurance premiums of \$15,941.

Available mapping identifies flood zones as well as flood fringe zones. During Hurricane Floyd there was an unknown amount of private property damage, but most damage was structural as a result of downed trees and boat damage due to high winds. Power was lost for 7-10 days.

Resources

The floodplain administrator assumes responsibility for all aspects of the floodplain management program including permit review, record-keeping, GIS, floodplain outreach, some inspections and some identifications. She is a certified floodplain manager, but would be open to attending continuing education sessions.

Minimal education and outreach is provided to the community regarding flood hazards/risks.

Most flood-related damage that has occurred in the community resulted from a stream blockage that was not in mapped flood zones.

Compliance History

The Town of Hague is currently in good standing in the NFIP. The most recent Community Assistance Visit was in 2000 or 2001.

The Town intends to continue active participation in the NFIP, and maintain compliance with all requirements of participation. Further, the Town has identified several actions to support both continued and improved participation in the NFIP as identified in Table 9.5-13.

Regulatory

The Town's floodplain management regulations currently meet New York State (NYS) and FEMA standards. Structures in the community that are forty feet or greater in height are reviewed by the APA.

The Town does not participate in the Community Rating System due to a limited policy base, and does not foresee participating in the near future.

Integration of Hazard Mitigation into Existing and Future Planning Mechanisms

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, each community was surveyed to obtain a better understanding of their community's progress in plan integration. A summary is provided below. In addition, the community identified specific integration activities that will be incorporated into municipal procedures.



Planning

Land Use Plan: The Town of Hague comprehensive plan does not currently refer to the hazard mitigation plan or incorporate considerations for areas of natural hazard risk, however will be adding risk assessments and recommendations to the Comprehensive Plan in spring of 2017.

Stormwater Planning: Stormwater planning is required for newer developments.

Watershed Management Plan: The Lake George Park Commission (LGPC) administers a Regional Watershed Plan, recorded as Article 43- 0112 (5) of the Environmental Conservation Law.

Regulatory and Enforcement (Ordinances)

Flood Damage Protection Ordinance: Setback requirements are required for new developments.

Operational and Administration

Planning Board: The purpose of the Planning Board is to: assure that the development within the Town is consistent with the Land Use Plan (Comprehensive Plan); conduct site plan reviews as required by the Town Zoning and Codes, review subdivision requests as required by the Town Subdivision Code; and make recommendations to the Zoning Board of Appeals when requested as part of the variance appeal process. The planning board utilizes NFIP and NYS building codes to help guide its decisions.

Zoning Enforcement Officer: The Zoning Enforcement Officer performs the following functions in the Town of Hague:

- Issues permits for land use, zoning, septic, subdivision and variance.
- Provides technical assistance to the Planning Board, the Zoning Board of Appeals and the Local Board of Health.
- Provides the point of contact to report alleged zoning or sanitary violations.
- Administers the Town Junk Law.
- Administers the Flood Hazard Zoning District (Flood Plain.)
- Town Sanitary Codes

The local Floodplain Administrator receives continuing education and training to ensure code enforcement and proper inspections.

Stormwater Management: Joe Thoin, Lake George Park Commission (LGPC).

As part of its regular, ongoing operations, the Town of Hague performs annual cleaning of culverts, and monitors and removes tree limbs to protect public and private property.

Technical Capabilities: Substantial damage estimates and benefit-cost analysis support may be available through Warren County. Town staff would benefit from additional training in risk reduction.

Mitigation Implementation: The Highway Department performs annual culvert cleanouts. The Town Board, Planning Board, and Zoning Enforcement Officer implement zoning regulations to discourage building new structures in disaster prone areas.

Funding

Highway Department: Some monies are budgeted for mitigation-related projects.





Education and Outreach

Hague Fire Department: Conduct Fire Safety training & is a Red Cross Emergency Shelter in the event of a disaster or long term power outage.

Hague Town Board: The Town Board and County Office of Emergency Services provide residents undertaking construction projects with information listing steps taken to lessen potential flood damage to reduce the impact of flooding. In addition, the Town cooperates with local insurance carriers to educate the community on benefits of carrying NFIP policies and increase knowledge of NFIP services.

9.5.6 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and prioritization.

Past Mitigation Initiative Status

Table 9.5-10 below indicates progress on the community’s mitigation strategy identified in the 2011 Plan. Previous actions that are now ongoing programs and capabilities are indicated as such in Table 9.5-10, and also appear under “Capability Assessment” presented previously in this annex. Actions carried forward as part of this plan update are included in the following subsection (in Table 9.5-11) with prioritization.

Table 9.5-10. Past Mitigation Initiative Status

Description	Status	Review Comments
Educate residents regarding steps to be taken to decrease the impact of natural hazards (including ice storms, wild/forest fires, severe storms, tornado, earth-quakes, and all other natural hazards) by developing, enhancing, and implementing education programs, brochures, school presentations informing groups about ways to reduce risk, and other outreach activities.	No progress	Town Board, Superintendent of school districts, County Office of Emergency Services
Monitor and remove trees/limbs in storm areas that present potential hazards to keep trees from threatening lives, property, and public infrastructure during storm events.	Completed annually on town roads by Town DPW. Completed as needed by the County on County roads and the State on State roads.	Ongoing operational capability.
Obtain funding to purchase generators for municipally-owned critical facilities.	Complete – Town Board and County Office of Emergency Services	The Town Hall, the Town Shed, The Sewer Plant, Fire Dept., & Silver Bay Assn. (Who also open their doors and rooms during long term power outages and disasters.)
Coordinate/create mutual aid agreements between emergency services, public works departments, and public utilities to ensure efficient use of resources during and after storm events.	Town Board – Town DPW, Fire Department, & Warren Co. soil and Water	Ongoing operational capability.
Develop plans for debris management after hazard events, including severe winter snow/ice events, and other severe storms.	Complete – Town DPW, Warren Co. DPW, & NYSDOT	Ongoing operational capability.
Design a network of citizens that will check in on elderly, functional needs, and low- income individuals during major events.	Active - Care Coordinator, Bertha Dunsmore	Town Board, Health Advisory Committee. Ongoing operational capability.
Send a town representative to the NYS Wildland Fire Suppression Training.	Fire Department, annually	Ongoing operational capability.





Table 9.5-10. Past Mitigation Initiative Status

Description	Status	Review Comments
Provide training for local code enforcement officials to implement building codes that reflect disaster resistant construction for new structures and renovation.	Complete	Training provided on flood zone construction. Ongoing operational capability.
Provide residents with information listing steps taken to lessen potential flood damage to reduce the impact of flooding.	Ongoing	Information provided by the Town Board and County Office of Emergency Services during construction periods. Ongoing operational capability.
Educate the community on benefits of carrying NFIP policies and increase knowledge of NFIP services.	Ongoing	Information provided by the Town Floodplain Administrator and by private insurance carriers during construction periods. Ongoing operational capability.
Review and update local plans to integrate goals, objectives, and activities from this HMP which are not found in existing regulatory documents, as appropriate.	No progress	Integrate the risk assessment and recommendations of the hazard mitigation plan into the Town’s comprehensive plan.
Maintain a current inventory of at-risk buildings and infrastructure and continually update inventory of at-risk structures in each jurisdiction.	Currently the Town only inventories properties located within the Flood and Flood Fringe Zones	Most recent damages were not contained around these areas, but were located along stream and brook corridors, during a 100 yr. event.
Apply for grants to assist with mitigation activities needed to provide a level of protection for critical facilities.	No progress	Continue – see THG-3.
Provide continuing education and training for local Floodplain Administrator to ensure code enforcement and proper inspections.	Complete	Ongoing operational capability.
Implement zoning regulations to discourage building new structures in disaster prone areas – if such regulations are not already written into Town Zoning code or Floodplain	Complete	Ongoing operational capability.
Install two sedimentation ponds along Hague Brook to collect sediment.	Complete	Sedimentation ponds were installed along Hague Brook to collect sediment.
Hague Books banks shoring.	Complete	Hague Books banks were shored up with rock bed to prevent erosion of its banks.

Completed Mitigation Initiatives not Identified in the Previous Mitigation Strategy

All mitigation projects/activities completed by the Town of Hague were identified in the previous mitigation strategy in the 2011 Plan.

Proposed Hazard Mitigation Initiatives for the Plan Update

The Town of Hague participated in a mitigation action workshop in September and was provided the following Federal Emergency Management Agency (FEMA) publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 ‘Selecting Appropriate Mitigation Measures for Floodprone Structures’ (March 2007) and FEMA ‘Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards’ (January 2013).

Table 9.5-11 summarizes the comprehensive-range of specific mitigation initiatives the Town of Hague would like to pursue in the future to reduce the effects of hazards. Some of these initiatives may be previous actions carried forward for this Plan update. Implementation of these initiatives will depend on available funding (grants and local match availability), and some initiatives may be modified or omitted at any time based on occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and





the six CRS mitigation action categories are listed in Table 9.5-11 to further demonstrate the wide range of activities and mitigation measures selected.

As discussed in Section 6, 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing your actions as 'High', 'Medium', or 'Low.' The table below summarizes the evaluation of each mitigation initiative, listed by Action Number.

Table 9.5-11 summarizes the prioritization of all proposed mitigation initiatives for the Plan update.



Table 9.5-11. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category	CRS Category
THG-1	Integrate the risk assessment and recommendations of the hazard mitigation plan into the Town's Land Use Plan (Comprehensive Plan).	N/A	All Hazards	1	Town Council, Planning Board	High	Low	Local Budget	Short-Term (Spring 2017)	Medium	LPR	PR
THG-2	Arrange for additional training for relevant staff on hazard risk reduction.	N/A	All Hazards	3	Town Supervisor; County Emergency Services	High	Low	Local Budget, NYS DHSES, County	Short-Term	High	EAP	PI, ES
THG-3	Implement measures to ensure all critical facilities in the floodplain (both in 1% and 0.2% flood zones) are protected to the 500-year flood (0.2 percent annual chance flood) level.	Existing	Flood, Severe Storm	1, 3	Town Public Works, Planning Board	High	High	FEMA (HMGP, FMA, PDM), CDBG, NYS DHSES, County	Short-Term	Medium	SIP	SP, PP
THG-7	Educate residents regarding options for mitigating their properties from natural hazards using various outreach techniques including informational mailers, brochures, school presentations, and other outreach activities.	N/A	All Hazards	1, 2	Town Supervisor; County Emergency Services	Medium	Low	Local Budget, NYS DHSES, County	Short-Term	High	EAP	PI
THG-8	Update current inventory of at-risk buildings and infrastructure to include at-risk structures outside of the flood and flood-fringe zones, including those located along stream and brook corridors, impacted during a 100 yr. event.	Existing	Flood, Severe Storm	3	Town Board, Superintendent of school districts, County Office of Emergency Services	High	Medium	Local Budget, NYS DHSES, County	Short-Term	Low	LPR	PR
THG-9	Boat Launch Culvert pipe replacement											
	See action worksheet	Existing	Flooding	1, 3	Town of Hague, Army Corp of Engineering, & NYSDEC	High	Medium	Possible Grants: Waterfront Revitalization Grants,	Short term	High	SIP	PP SP





Table 9.5-11. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category	CRS Category
								Revolving fund grant.				
THG-10	Semi-annual inspection of all streams and brooks for Beaver dams and any tree that presents a hazard of falling into the stream											
	See Action Worksheet	Existing	Flooding	1, 3	Town of Hague Highway Department & NYSDEC; Warren County soil & Water	High	Low	Grant funding with local cost share	Short term	High	LPR NSP	PR NR
THG-11	Rain gardens - Erosion and Stormwater prevention											
	See Action Worksheet	Both	Flooding, Severe Storm	1, 3	Town of Hague, ZEO	Medium	Low	Grant funding with local cost share	Short term	Medium	SIP NSP	PR PP NR
THG-12	Install catch basins along state roads.											
	See Action Worksheet	N/A	Flooding, Severe Storms	1, 3	NYSDOT & Town of Hague	High	High	Grant funding & NYS funds	Long term	Medium	SIP NSP	PR NR
THG-13	Vegetation removal from brook beds at the intersection of all bridges, Town, County, & NYS											
	See Action Worksheet	Existing	Flooding and Ice Jams	1, 3	Town of Hague Highway Department, Warren County soil & Water	High - Bridge and culvert reconstruction	Low	Grant funding with local cost share	Short term	High	SIP	PR SP

Notes:

Not all acronyms and abbreviations defined below are included in the table.

*Does this mitigation initiative reduce effects of hazards on new and/or existing buildings and/or infrastructure? Not applicable (N/A) is inserted if this does not apply.

Acronyms and Abbreviations:

CAV Community Assistance Visit
 CDBG Community Development Block Grant
 GCRS Community Rating System
 DPW Department of Public Works
 FEMA Federal Emergency Management Agency
 FPA Floodplain Administrator

Potential FEMA HMA Funding Sources:

FMA Flood Mitigation Assistance Grant Program
 HMGP Hazard Mitigation Grant Program
 PDM Pre-Disaster Mitigation Grant Program
 RFC Repetitive Flood Claims Grant Program (discontinued)
 SRL Severe Repetitive Loss Grant Program (discontinued)

Timeline:

Short 1 to 5 years
 Long Term 5 years or greater
 OG On-going program
 DOF Depending on funding





Acronyms and Abbreviations:

HMA	Hazard Mitigation Assistance
N/A	Not applicable
NFIP	National Flood Insurance Program
OEM	Office of Emergency Management

Potential FEMA HMA Funding Sources:

Timeline:

Costs:

Where actual project costs have been reasonably estimated:

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

Where actual project costs cannot reasonably be established at this time:

Low	Possible to fund under existing budget. Project is part of, or can be part of, an existing ongoing program.
Medium	Could budget for under existing work plan, but would require a reapportionment of the budget or a budget amendment, or cost of the project would have to be spread over multiple years.
High	Would require an increase in revenue via an alternative source (i.e., bonds, grants, fee increases) to implement. Existing funding levels are not adequate to cover costs of the proposed project.

Benefits:

Where possible, an estimate of project benefits (per FEMA's benefit calculation methodology) has been evaluated against the project costs, and is presented as:

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

Where numerical project benefits cannot reasonably be established at this time:

Low	Long-term benefits of the project are difficult to quantify in the short term.
Medium	Project will have a long-term impact on reduction of risk exposure to life and property, or project will provide an immediate reduction in risk exposure to property.
High	Project will have an immediate impact on reduction of risk exposure to life and property.

Mitigation Category:

- Local Plans and Regulations (LPR) – Actions that include government authorities, policies, or codes that influence the way land and buildings are developed and built.
- Structure and Infrastructure Project (SIP) – Actions that involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures, as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce impacts of hazards.
- Natural Systems Protection (NSP) – Actions that minimize damage and losses, and also preserve or restore the functions of natural systems.
- Education and Awareness Programs (EAP) – Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities

CRS Category:

- Preventative Measures (PR) – Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and stormwater management regulations.
- Property Protection (PP) – Actions include public activities to reduce hazard losses or 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.
- Public Information (PI) – 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 educational programs for school-age children and adults.
- Natural Resource Protection (NR) – 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.
- Structural Flood Control Projects (SP) – Actions that involve construction of structures to reduce impacts of a hazard. Such structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.
- Emergency Services (ES) – Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and protection of essential facilities





Table 9.5-12. Summary of Prioritization of Actions

Mitigation Action/Project Number	Mitigation Action/Initiative	Life Safety	Property Protection	Cost-Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community	Total	High / Medium / Low
THG-1	Integrate the risk assessment and recommendations of the hazard mitigation plan into the Town's Land Use Plan (Comprehensive Plan).	1	0	1	0	0	1	1	0	1	1	0	1	0	1	8	Medium
THG-2	Arrange for additional training for relevant staff on hazard risk reduction.	1	1	1	1	1	1	1	0	1	-1	1	1	1	1	11	High
THG-3	Implement measures to ensure all critical facilities in the floodplain (both in 1% and 0.2% flood zones) are protected to the 500-year flood (0.2 percent annual chance flood) level.	1	1	0	0	0	1	0	1	1	-1	1	0	0	1	6	Medium
THG-7	Educate residents regarding options for mitigating their properties from natural hazards using various outreach techniques including informational mailers, brochures, school presentations, and other outreach activities.	1	1	1	1	1	1	1	1	1	0	1	1	1	1	12	High
THG-8	Update current inventory of at-risk buildings and infrastructure to include at-risk structures outside of the flood and flood-fringe zones, including those located along stream and brook corridors, impacted during a 100 yr. event.	1	1	-1	1	-1	-1	-1	-1	-1	-1	1	-1	-1	-1	-6	Low
THG-9	Boat Launch Culvert pipe replacement	1	1	0	1	1	1	1	1	1	1	1	1	1	0	12	High
THG-10	Semi-annual inspection of all streams and brooks for Beaver dams and any tree that presents a hazard of falling into the stream	1	1	1	1	0	1	1	1	1	1	1	1	0	0	11	High
THG-11	Rain gardens - Erosion and Stormwater prevention	0	1	1	1	1	1	1	1	0	1	1	1	0	1	12	Medium
THG-12	Install catch basins along state roads.	1	1	0	1	1	-1	-1	1	1	-1	1	0	1	0	5	Medium





Table 9.5-12. Summary of Prioritization of Actions

Mitigation Action/Project Number	Mitigation Action/Initiative	Life Safety	Property Protection	Cost-Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community	Total	High / Medium / Low
THG-13	Vegetation removal from brook beds at the intersection of all bridges, Town, County, & NYS	1	1	1	1	1	0	1	1	1	1	1	1	0	0	11	High

Note: Refer to Section 6, which conveys guidance on prioritizing mitigation actions.



9.5.7 Future Needs To Better Understand Risk/Vulnerability

None at this time.

9.5.8 Hazard Area Extent and Location

Hazard area extent and location maps have been generated for the Town of Hague that illustrate the areas probable to be impacted within the municipality (see Figure 9.5-1 and Figure 9.5-2 below). These maps are based on the best available data at the time of the preparation of this plan, and are considered to be adequate for planning purposes. Maps have been generated for those hazards (i.e., wildfire and flooding) that can be clearly identified using mapping techniques and technologies, and to which the Town of Hague has significant exposure. These maps also appear in the hazard profiles within Section 5.4, Volume I of this Plan.

9.5.9 Additional Comments

None at this time.



Figure 9.5-1. Town of Hague Landslide Hazard Area Map

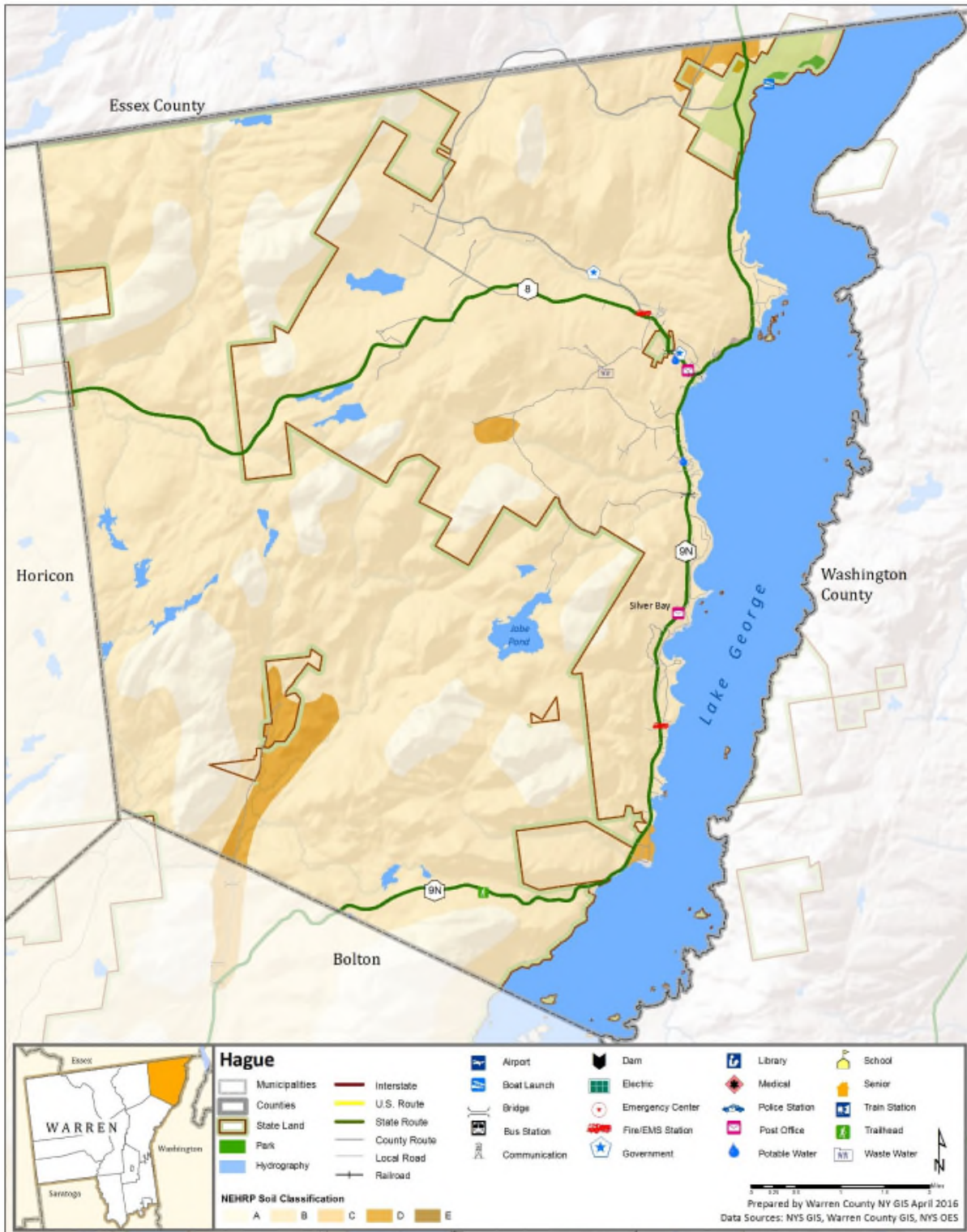
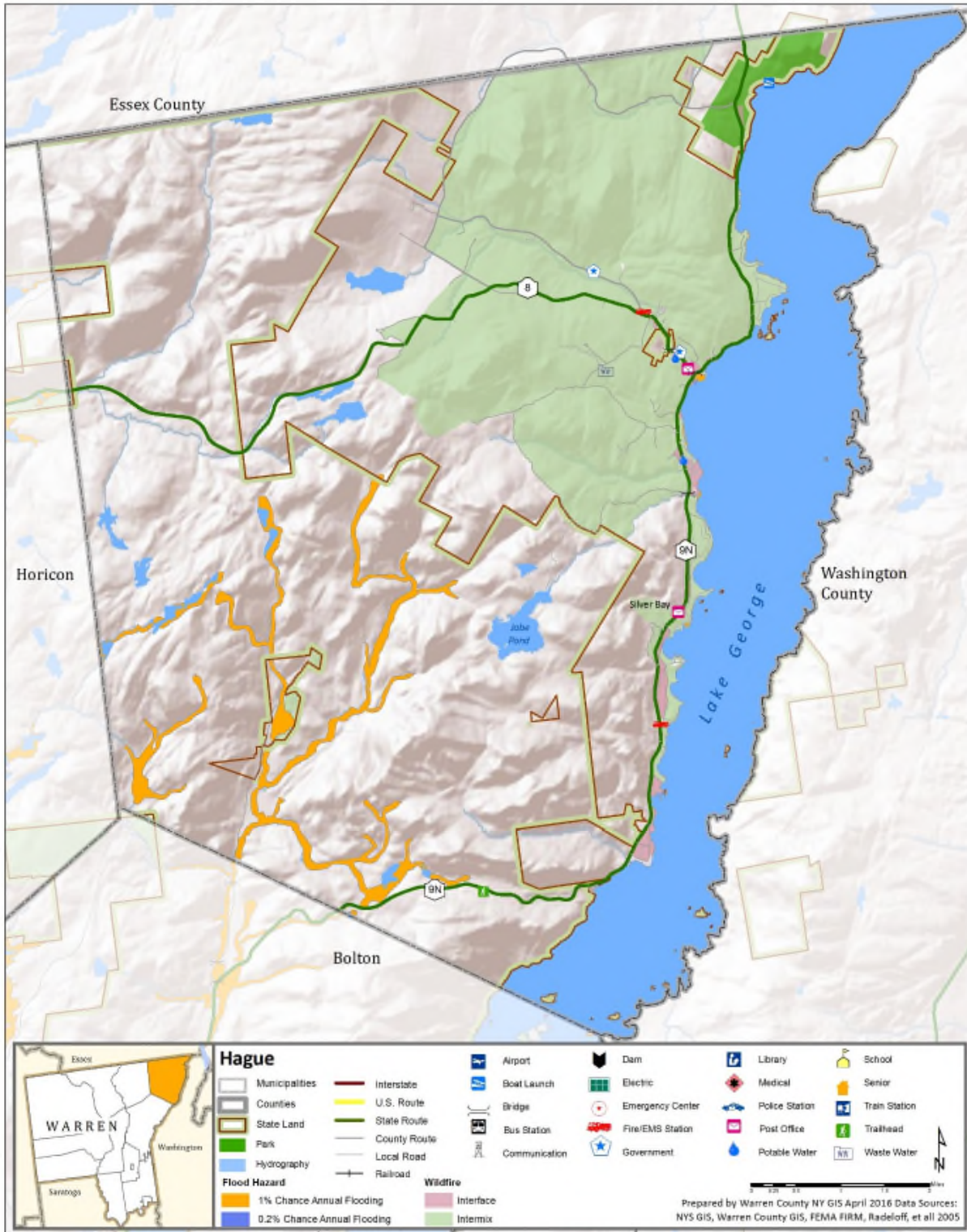




Figure 9.5-2. Town of Hague Flood and Wildfire Hazard Area Extent and Location Map





Name of Jurisdiction: Town of Hague
Name and Title Completing Worksheet: Cathy Clark, Zoning Enforcement Officer
Action Number: THG-3
Mitigation Action/Initiative: Critical facilities in floodplain

Assessing the Risk	
Hazard(s) addressed:	Flood, Severe Storm
Specific problem being mitigated:	Critical facilities located in the floodplain are prone to flood damages
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	Currently identified critical facilities in the floodplain are limited to one boat facility, and two road bridge, however these facilities are not considered to be in need of mitigation. The intent of this initiative is towards any future critical facilities, however with the exception of transportation infrastructure, it is unlikely that other types of critical facilities would be located in a flood hazard zone.
Action/Project Intended for Implementation	
Description of Selected Action/Project	Implement measures to ensure all critical facilities in the floodplain (both in 1% and 0.2% flood zones) are protected to the 500-year flood (0.2 percent annual chance flood) level.
Action/Project Category	SIP
Goals Met	1, 3
Applies to existing and or new development, or not applicable	Existing
Benefits (losses avoided)	High
Estimated Cost	High
Priority*	Medium
Plan for Implementation	
Responsible Organization	Town Public Works, Planning Board
Local Planning Mechanism	Hazard Mitigation
Potential Funding Sources	FEMA (HMGP, FMA, PDM), CDBG, NYS DHSES, County
Timeline for Completion	Short Term
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:



Action Number: THG-3
Mitigation Action/Initiative: Critical facilities in floodplain

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	
Property Protection	1	
Cost-Effectiveness	0	
Technical	0	
Political	0	
Legal	1	
Fiscal	0	Need to seek grant funding
Environmental	1	
Social	1	
Administrative	-1	
Multi-Hazard	1	Flood, Severe Storm
Timeline	0	
Agency Champion	0	
Other Community Objectives	1	
Total	6	
Priority (High/Med/Low)	Medium	



Name of Jurisdiction:	Town of Hague
Name and Title Completing Worksheet:	Catherine Clark, ZEO
Action Number:	THG-9
Mitigation Action/Initiative:	Boat Launch Culvert pipe replacement

Assessing the Risk	
Hazard(s) addressed:	Flooding
Specific problem being mitigated:	The metal culvert outlet in our Town Boat Launch is deteriorating to the point that it may collapse. The outlet drains the waters from three perennial streams which merge into a sedimentation pond and is piped underground approximately 500 yard to the west of the outlet.
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	<ol style="list-style-type: none"> 1. Boat Launch Culvert pipe replacement 2. If the outlet collapses the waters will back up to the nearest culvert and flood NYS Rte. 9N and neighboring properties.
Action/Project Intended for Implementation	
Description of Selected Action/Project	Boat Launch Culvert pipe replacement
Action/Project Category	Structure and Infrastructure Project (SIP)
Goals Met	Prevent flooding of State highway and private properties
Applies to existing and or new development, or not applicable	Existing
Benefits (losses avoided)	High - If the outlet collapses the waters will back up to the nearest culvert and flood NYS Rte. 9N and neighboring properties.
Estimated Cost	Medium
Priority*	High
Plan for Implementation	
Responsible Organization	Town of Hague
Local Planning Mechanism	Town of Hague, Army Corp of Engineering, & NYSDEC
Potential Funding Sources	Possible Grants: Waterfront Revitalization Grants, Revolving fund grant.
Timeline for Completion	Short
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Spring 2016 Progress on Action/Project: Internal pipe was inspected and found to be in good shape. Outlet of pipe to be repaired.



Action Number: THG-9
Mitigation Action/Initiative: Boat Launch Culvert pipe replacement

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	If outlet is not replaced, the threat of flooding could happen without notice, posing imminent danger to travelers on NYS Rte. 9N.
Property Protection	1	Very Significant
Cost-Effectiveness	0	unknown
Technical	1	While engineering and many permits will be necessary to implement this project the benefits will outweigh the cost.
Political	1	yes
Legal	1	Jurisdiction for this project will fall on the Town of Hague, NYSDEC, Army Corp of Engineering, and may include the Adirondack Park Agency.
Fiscal	1	Partially, but grants should be explored for this project.
Environmental	1	yes
Social	1	no
Administrative	1	Partially, but outside help will be required.
Multi-Hazard	1	Road closures and private property damage.
Timeline	1	Yes, with proper funding
Agency Champion	1	Town & Lake organizations
Other Community Objectives	1	
Total	13	
Priority (High/Med/Low)	High	



Name of Jurisdiction:	Town of Hague
Name and Title Completing Worksheet:	Catherine Clark, ZEO
Action Number:	THG-10
Mitigation Action/Initiative:	Semi-annual inspection of all streams and brooks for Beaver dams and any tree that presents a hazard of falling into the stream.

Assessing the Risk	
Hazard(s) addressed:	Flooding
Specific problem being mitigated:	Beaver dams present a potential for creating flooding hazards when broken. Also, at risk trees create an erosion problem when the root system breaks from the stream bank and the fallen trees have the potential of blocking culverts and bridges during storm events.
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	<ol style="list-style-type: none"> 1. Inspect all brooks and streams semi-annually 2. Obtain permits from NYSDEC or Army Corp where required.
Action/Project Intended for Implementation	
Description of Selected Action/Project	Inspect all brooks and streams semi-annually Obtain permits from NYSDEC or Army Corp where required. Remove vegetation and beaver dams where needed. If Beaver dams are an on-going problem at certain locations apply for a permit from the DEC for the relocation of the beavers.
Action/Project Category	Local Plans and Regulations (LPR) Natural Systems Protection (NSP)
Goals Met	Goal 1: Protect Life and Property Goal 3: Provide for Emergency Services
Applies to existing and or new development, or not applicable	Existing
Benefits (losses avoided)	To keep streams and brooks free of debris which may create blockages at bridges and culverts. To keep sediment from creating deltas in the lake.
Estimated Cost	Low - Permits, evaluation and Town Highway Department salary
Priority*	High
Plan for Implementation	
Responsible Organization	Town of Hague Highway Department & NYSDEC
Local Planning Mechanism	Town & Warren County soil & Water
Potential Funding Sources	Grant funding with local cost share
Timeline for Completion	Short
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Fall 2016 Progress on Action/Project: The Town Board asked for assistance of our residents and hunters to report any tree found in waterways to the Highway Dep't. Several trees have since been removed.



Action Number:

THG-10

Mitigation Action/Initiative:

Semi-annual inspection of all streams and brooks for Beaver dams and any tree that presents a hazard of falling into the stream.

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	It will prevent damming of streams and will stabilize the banks of the brooks (by keeping the root system of diseased trees in place on steep banks.)
Property Protection	1	Flooding and blocking of culverts and bridges can be mitigated.
Cost-Effectiveness	1	Yes
Technical	1	The Town would have to work with NYSDEC for removal of vegetation on State Lands and Property owners for private lands.
Political	0	
Legal	1	With the cooperation of the NYSDEC
Fiscal	1	Probably not
Environmental	1	Yes
Social	1	No
Administrative	1	The Town staff could implements this project, but could also enlist the aid of Warren County soil & Water as well as the DEC.
Multi-Hazard	1	Flooding and blocking of culverts and bridges can be mitigated.
Timeline	1	Yes
Agency Champion	0	
Other Community Objectives	1	
Total	12	
Priority (High/Med/Low)	High	



Name of Jurisdiction:	Town of Hague
Name and Title Completing Worksheet:	Catherine Clark, ZEO
Action Number:	THG-11
Mitigation Action/Initiative:	Rain Gardens

Assessing the Risk	
Hazard(s) addressed:	Erosion and Stormwater prevention; Flooding, Severe Storm
Specific problem being mitigated:	Stormwater runoff from Town municipal buildings.
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	Inspect all municipal buildings from run-off issues and install rain gardens where needed to capture excessive run-off from buildings and parking lots.
Action/Project Intended for Implementation	
Description of Selected Action/Project	Inspect all municipal buildings from run-off issues and install rain gardens where needed to capture excessive run-off from buildings and parking lots.
Action/Project Category	Structure and Infrastructure Project (SIP) Natural Systems Protection (NSP)
Goals Met	Goal 1: Protect Life and Property Goal 3: Provide for Emergency Services
Applies to existing and or new development, or not applicable	Existing
Benefits (losses avoided)	Medium - To retain and drain all stormwater runoff from municipal buildings.
Estimated Cost	Low - Town Highway Department & ZEO
Priority*	High
Plan for Implementation	
Responsible Organization	Town of Hague
Local Planning Mechanism	ZEO
Potential Funding Sources	Grant funding with local cost share
Timeline for Completion	Short
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Summer 2016 Progress on Action/Project: Highway Dep't. installed a rain garden/retention area for their building and parking lot.



Action Number: THG-11
Mitigation Action/Initiative: Rain gardens

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	0	None
Property Protection	1	It will keep stormwater from backing up into foundation level of our building and prevent erosion.
Cost-Effectiveness	1	Yes
Technical	1	Yes
Political	1	Stormwater protections to lands are highly encourage by Local and State agencies such as the Fund for Lake George, Warren County soil & Water, The Lake George Park Commission and Local resident groups.
Legal	1	Yes
Fiscal	1	Yes
Environmental	1	Yes. It will keep stormwater from backing up into foundation level of our building and prevent erosion.
Social	1	No
Administrative	1	Yes
Multi-Hazard	1	Yes. It will keep stormwater from backing up into foundation level of our building and prevent erosion.
Timeline	1	Yes
Agency Champion	1	Yes
Other Community Objectives	1	Environmental Quality
Total	12	
Priority (High/Med/Low)	Med.	



Name of Jurisdiction:	Town of Hague
Name and Title Completing Worksheet:	Catherine Clark, ZEO
Action Number:	THG-12
Mitigation Action/Initiative:	Install catch basins along state roads.

Assessing the Risk	
Hazard(s) addressed:	Sedimentation entering into our streams and Lake George; Flooding, Severe Storms
Specific problem being mitigated:	Storm drains without catch basins along State roads.
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	NYSDOT will not add catch basins or enlarge existing catch basins along the Rte. 9N and Rte. 8 corridor due to funding issues.
Action/Project Intended for Implementation	
Description of Selected Action/Project	Petition New York State to find grants or funding to make these necessary improvements.
Action/Project Category	Current
Goals Met	Goal 1: Protect Life and Property Goal 3: Provide for Emergency Services
Applies to existing and or new development, or not applicable	N/A
Benefits (losses avoided)	Even with the installation of sedimentation ponds along Hague Brook most of the sand and salt applied to the above listed roads in the winter months go directly into our water ways and end up in Lake George creating deltas and greatly adds to the saltation of the lake (which is a AAA special water body and is classified as potable.) Deltas at the mouths of our brooks are blocking and /or rerouting the flow from the brooks thus creating a potential flooding hazard.
Estimated Cost	High
Priority*	Medium
Plan for Implementation	
Responsible Organization	NYSDOT & Town of Hague
Local Planning Mechanism	NYSDOT
Potential Funding Sources	Grant funding & NYS funds
Timeline for Completion	Long term
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project: No action to date due to lack of funding in NYSDOT budget.



Action Number: THG-12
Mitigation Action/Initiative: Install catch basins along state roads.

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Many of our lake front property owners get their drinking water from the lake. Reducing the saltation of the lake will improve the health of the lake.
Property Protection	1	Delta along mouth of brooks reduces property values and also create a flooding possibility if the mouth of the brook is totally blocked.
Cost-Effectiveness	0	It would if the State would fund the projects.
Technical	1	yes
Political	1	The State of the Lake is a hot button item of our community as well as the whole Lake George Park basin. Protecting sand and salt from entering our water bodies have been key items of group discussion throughout all of lake George agency agenda for the past four years.
Legal	-1	No. Only the State has control over State Highways.
Fiscal	-1	It would have to be funded by NYSDOT budget item and/or Grants.
Environmental	1	Yes. If catch basins were to be added to all of the States culvert pipes there would be a huge impact environmentally to the health of our streams and lakes.
Social	1	no
Administrative	-1	No State engineers would be required.
Multi-Hazard	1	Yes. It would reduce flood risks to property owners, improve the quality of potable drinking water, and improve the State of our streams.
Timeline	0	Only if funds are found that would allow the State to undertake the project.
Agency Champion	1	Yes. The Lake George Planning Commission, Lake George Association, the Local Water Quality Review Committee, the Lake George Waterkeeper and the Town of Hague.
Other Community Objectives	1	Stormwater Management
Total	6	
Priority (High/Med/Low)	MED	



Name of Jurisdiction:	Town of Hague
Name and Title Completing Worksheet:	Catherine Clark, ZEO
Action Number:	THG-13
Mitigation Action/Initiative:	Vegetation removal from brook beds at the intersection of all bridges, Town, County, & NYS

Assessing the Risk	
Hazard(s) addressed:	Flooding and Ice Jams
Specific problem being mitigated:	During storm events fallen trees and ice blocks have the potential to get hung up in the excess vegetation which is growing in the brook beds upland of the bridges.
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	<ol style="list-style-type: none"> 1. Inspect all brook beds at bridges intersection annually 2. Obtain permits from NYSDEC or Army Corp where required.
Action/Project Intended for Implementation	
Description of Selected Action/Project	Inspect all brook beds at bridges intersection annually Obtain permits from NYSDEC or Army Corp where required. Remove vegetation where needed.
Action/Project Category	Current
Goals Met	Goal 1: Protect Life and Property Goal 3: Provide for Emergency Services
Applies to existing and or new development, or not applicable	Existing
Benefits (losses avoided)	Bridge and culvert reconstruction
Estimated Cost	Low - Permit, evaluation and Town Highway Department salary Under
Priority*	High
Plan for Implementation	
Responsible Organization	Town of Hague Highway Department
Local Planning Mechanism	Warren County soil & Water
Potential Funding Sources	Grant funding with local cost share
Timeline for Completion	Short
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: 2016 Progress on Action/Project: Progress ongoing.



Action Number: THG-13
Mitigation Action/Initiative: Vegetation removal from brook beds at the intersection of all bridges, Town, County, & NYS

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	
Property Protection	1	Risk of fallen trees getting stuck parallel to bridges will be reduced.
Cost-Effectiveness	1	After necessary permits are awarded our Town Highway crew can perform work.
Technical	1	yes
Political	1	
Legal	0	NYSDEC control the bed of brooks. Permit will need to be applied for and grant for work to be completed.
Fiscal	1	yes
Environmental	1	yes
Social	1	no
Administrative	1	yes
Multi-Hazard	1	Yes. Ice jams that have broken the stream/bridge during winter warming and rain events. Ice that has been dislodges from frozen brooks have hit the bridge and has blocked crucial intersection was well as caused damage to roads.
Timeline	1	Yes, if permits are granted.
Agency Champion	1	
Other Community Objectives	1	
Total	13	
Priority (High/Med/Low)	High	



9.6 Town of Horicon

This section presents the jurisdictional annex for the Town of Horicon.

9.6.1 Hazard Mitigation Plan Point of Contact

The following individuals have been identified as the hazard mitigation plan’s (HMP) primary and alternate points of contact.

Primary Point of Contact	Alternate Point of Contact
Matthew J. Simpson, Supervisor P.O. Box 90 Brant Lake, NY 12815-0090 (518) 494-3647 supervisor@horiconny.gov	Dawn Higgins, Secretary P.O. Box 90 Brant Lake, NY 12815-0090 (518) 494-3647 dhiggins@horiconny.gov

9.6.2 Municipal Profile

The Town of Horicon is in the Adirondack Park on Warren County’s northern border. Horicon is bordered by the Towns of Schroon to the north, Hague to the east, Bolton to the south, and Chester to the west. It is part of the Glens Falls Metropolitan Statistical Area. The Town has a total land area of 71.8 square miles of which 66.1 square miles is land and 5.7 square miles is water. The Town includes six hamlets: Adirondack, Brant Lake, Pottersville, Schroon Lake, South Horicon, and Starbuckville. Brant Lake is located in the central portion of the Town and Schroon Lake is located partly in the northwest part of Town. The major through fare within the town is NYS Route 8.

According to the 2010 Census, the community's population was 1,389. The Town is governed by a Town Board consisting of four councilmembers and the Town Supervisor.

Growth/Development Trends

The Town of Horicon did not note any recent residential/commercial development since 2010 or any major residential or commercial development, or major infrastructure development planned for the next five years in the municipality.

9.6.3 Natural Hazard Event History Specific to the Municipality

Warren County has a history of natural and non-natural hazard events as detailed in Volume I, Section 5.0 of this Plan. A summary of historical events appears in each hazard profile, and includes a chronology of events that have affected the County and its municipalities. For the purpose of this Plan update, events that have occurred in the County from 2010 to present were summarized to indicate the range and impact of hazard events in the community. Information regarding specific damages is included, if available, based on reference material or local sources. This information is presented in Table 9.6-1 below. For details of these and additional events, refer to Volume I, Section 5.0 of this Plan.

Table 9.6-1. Hazard Event History

Dates of Event	Event Type (FEMA Disaster Declaration if applicable)	Warren County Designated?	Summary of Damages/Losses
April 27-28, 2011	Severe Storms, Flooding,	Yes	Horicon experienced power outages. Road surfaces were damaged. Culverts and ditches needed to be cleaned of debris.





Dates of Event	Event Type (FEMA Disaster Declaration if applicable)	Warren County Designated?	Summary of Damages/Losses
	Tornadoes and Straight-Line Winds (DR-1993)		Trees came down across roads. No public assistance was requested. \$94,000 in cleanup costs.
May 27 – June 2, 2011	Flooding “Memorial Day Storm”	N/A	Road surfaces were damaged. Culverts and ditches were blocked and debris removal was needed. Trees came down across roads. No public assistance was requested. \$50,000 in cleanup costs.
August 27-29, 2011	Hurricane Irene (DR-4020)	Yes	Utilities were out in Horicon for several days. Several roads were damaged. Culverts throughout town needed to be cleaned of debris including ditches. Trees came down across roads. No public assistance was requested. Approximately \$100,000 in cleanup costs.
June 28, 2013	Severe Storms and Flooding (DR-4129)	Yes	Roads surfaces were damaged. Culverts damaged town wide. Trees came down across roads. No public assistance was requested. \$103,000 in cleanup costs.

Notes:

- EM Emergency Declaration (FEMA)
- FEMA Federal Emergency Management Agency
- DR Major Disaster Declaration (FEMA)
- N/A Not applicable

9.6.4 Hazard Vulnerabilities and Ranking

The hazard profiles in Section 5.0 of this Plan convey detailed information regarding each plan participant’s vulnerability to the identified hazards. The following summarizes the hazard vulnerabilities and their ranking in the Town of Horicon. For additional vulnerability information relevant to this jurisdiction, refer to Section 5.0.

Hazard Risk/Vulnerability Risk Ranking

Table 9.6-2 below summarizes hazard risk/vulnerability rankings of potential hazards for the Town of Horicon.

Table 9.6-2. Hazard Risk/Vulnerability Risk Ranking

Hazard type	Estimate of Potential Dollar Losses to Structures Vulnerable to the Hazard ^{a, b}	Probability of Occurrence	Risk Ranking Score (Probability x Impact)	Hazard Ranking ^a
Earthquake	100-year MRP: \$30,511.00 500-year MRP: \$2,889,908 2,500-Year MRP: \$22,563,207.00	Occasional	12	Low
Flood	RCV Exposed to 1% Annual Chance: \$23,768,292	Frequent	18	Medium
Landslide	Damage estimate not available	Occasional	16	Medium
Infestation	Damage estimate not available	Frequent	24	Medium
Severe Storm	RCV Exposed to 1938 storm-winds: \$429,354	Frequent	48	High
Severe Winter Storm	GBS 1% Loss: \$3,863,330 GBS 5% Loss: \$19,316,650	Frequent	51	High
Wildfire	RCV Exposed to Intermix: \$409,303,000	Frequent	48	High





Hazard type	Estimate of Potential Dollar Losses to Structures Vulnerable to the Hazard ^{a, b}	Probability of Occurrence	Risk Ranking Score (Probability x Impact)	Hazard Ranking ^a
	RCV Exposed to Interface: \$55,375,000			
Cyber Security	Damage estimate not available	Occasional	12	Low
Disease Outbreak	Damage estimate not available	Frequent	27	Medium
Hazardous Material Incidents	Damage estimate not available	Frequent	24	Medium

Notes:

- a. The general building stock valuation is based on the custom inventory generated for the municipality and based on improved value.
 High = Total hazard priority risk ranking score of 31 and above
 Medium = Total hazard priority risk ranking of 20-30+
 Low = Total hazard risk ranking below 20
- b. Loss estimates for the severe storm and severe winter storm hazards are structural values only and do not include the estimated value of contents. The earthquake was evaluated by Census tract. The Census tracts do not exactly align with municipal boundaries; therefore, a total is reported for each Town inclusive of the Villages. Loss estimates for the flood and earthquake hazards represent both structure and contents. Potential flood loss estimates were generated using Hazus-MH 2.2 and digitized FIRM maps from the 1980s and 1990s for the 1-percent annual chance event; NED DEM was used to generate a depth grid. The County's 2015 Real Property data was used to generate the values for flood and includes structure and contents. For the wildfire hazard, the improved value and estimated contents of buildings located within the identified hazard zones is provided.

GBS General building stock
 MRP Mean return period
 RCV Replacement Cost Value

National Flood Insurance Program (NFIP) Summary

Table 9.6-3 below summarizes NFIP statistics for the Town of Horicon.

Table 9.6-3. NFIP Summary

Municipality	# Policies (1)	# Claims (Losses) (1)	Total Loss Payments (2)	# Rep. Loss Prop. (1)	# Severe Rep. Loss Prop. (1)	# Policies in 100-year Boundary (3)
Town of Horicon	16	6	\$104,432	0	0	8

Source: FEMA, 2015

Notes:

- (1) Policies, claims, repetitive loss, and severe repetitive loss statistics are provided by FEMA, are current as of November 30, 2015, and are summarized by community name. Total number of repetitive loss properties includes severe repetitive loss properties. Number of claims represents claims closed by November 30, 2015.
- (2) Total building and content losses from the claims file provided by FEMA Region 2.
- (3) Number of policies inside and outside of flood zones is based on latitude and longitude provided by FEMA Region 2 in the policy file.
- (4) FEMA noted that for a property with more than one entry, more than one policy may have been in force or more than one Geographic Information System (GIS) specification was possible.

Critical Facilities

Table 9.6-4 below identifies critical facilities within the municipality located on parcels that intersect the current regulatory NFIP 1% chance flood boundary (aka: "Special Flood Hazard Area" (SFHA)), however it is recognized that the actual facility structure(s) may lie outside of the SFHA. Please refer to the Flood Hazard Profile (Section 5.4.2) for further details of estimated flood losses throughout the County, as well as the "Other Vulnerabilities Identified" section following.





Table 9.6-4. Potential Flood Losses to Critical Facilities

Municipality	Facility Types in 1% Chance Flood Boundary						
	Boat Facilities	Dam	Electric	Government	Highway Bridge	Rail Facility	Wastewater
Horicon	1	3	0	3	3	0	0

Source: Warren County Real Property 2015 tax roll; HAZUS-MH 2.2; FEMA 2015

Notes:

- (1) HAZUS-MH 2.2 provides a general indication of the maximum restoration time for 100% operations. Clearly, a great deal of effort is needed to quickly restore essential facilities to full functionality; therefore, this will be an indication of the maximum downtime (HAZUS-MH 2.2 User Manual).
- (2) Some facilities may be within the Digital Flood Insurance Rate Map (DFIRM) flood hazard boundary; however, HAZUS did not calculate potential loss, perhaps because depth of flooding would not cause any damages to these structures according to the depth damage function used in HAZUS for that facility type. Further, HAZUS-MH may estimate potential damage to a facility outside the DFIRM if the model generates a depth grid beyond DFIRM boundaries.

X Facility located within the DFIRM boundary
 - Not calculated by HAZUS-MH 2.2

Other Vulnerabilities Identified

The municipality has identified the following vulnerabilities within their community:

- Alder Brook Road – Road elevation and two culverts needed at an estimated cost of \$200,000. The town looked into applying for HMGP funding to replace culverts, but did not have enough data for the BCA. Bedrock underlays the site, which poses engineering challenges and increases the cost of the project. Currently this project is stalled due to lack of funding.
- Upper Brant Lake Dam – Town owned dam with history of flooding. Recently reclassified as a Moderate Hazard Dam.
- Riding High Road – Originates in Bolton, but comes into Horicon. Bolton’s end floods. They want to put in a bridge here. Inadequate roads and bridges here is a safety concern – results in a 5 mile detour.

9.6.5 Capability Assessment

This section identifies the following capabilities of the local jurisdiction:

- Planning and regulatory capability
- Administrative and technical capability
- Fiscal capability
- Community classification
- NFIP
- Integration of mitigation planning into existing and future planning mechanisms.

Planning and Regulatory Capability

Table 9.6-5 below summarizes regulatory tools available to the Town of Horicon.

Table 9.6-5. Planning and Regulatory Tools

Tool / Program (code, ordinance, plan)	Do you have this? (Yes/No) If Yes, date of adoption or update	Authority (local, county, state, federal)	Dept. /Agency Responsible	Code Citation and Comments (Code Chapter, name of plan, explanation of authority, etc.)
Planning Capability				
Master Plan	Yes, 07/2010	Local	Comprehensive Plan Steering Committee	Town of Horicon Comprehensive Plan
Capital Improvements Plan	No	-	-	-
Floodplain Management / Basin Plan	No	-	-	-
Stormwater Management Plan	No	-	-	-
Open Space Plan	No	-	-	-
Stream Corridor Management Plan	No	-	-	-
Watershed Management or Protection Plan	No	-	-	-
Economic Development Plan	Yes	Local	Comprehensive Plan Steering Committee	The fourth component of the Comprehensive Plan is the "Town of Horicon Community Development Strategic Plan".
Comprehensive Emergency Management Plan	Yes, 01/2014	-	-	-
Emergency Response Plan	Yes	County	WCOES	
Post-Disaster Recovery Plan	No	-	-	-
Transportation Plan	No	-	-	-
Strategic Recovery Planning Report	No	-	-	-
Other Plans:		-	-	-
Regulatory Capability				
Building Code	Yes	County	Warren County Fire Prevention and Building Code Enforcement	-

Tool / Program (code, ordinance, plan)	Do you have this? (Yes/No) If Yes, date of adoption or update	Authority (local, county, state, federal)	Dept. /Agency Responsible	Code Citation and Comments (Code Chapter, name of plan, explanation of authority, etc.)
			Department	
Zoning Ordinance	Yes, 11/2002	Local	Zoning Administrator	-
Subdivision Ordinance	Yes, 05/1963	Local	Planning Board	-
NFIP Flood Damage Prevention Ordinance	Yes	Federal, State, Local	Zoning Administrator	-
NFIP: Cumulative Substantial Damages	No	-	-	
NFIP: Freeboard	Yes	State, Local	-	State mandated BFE+2 for single and two-family residential construction, BFE+1 for all other construction types
Growth Management Ordinances	No	-	-	-
Site Plan Review Requirements	Yes	Local	Planning	Zoning Ordinance
Stormwater Management Ordinance	No	-	-	-
Municipal Separate Storm Sewer System (MS4)	No	-	-	-
Natural Hazard Ordinance	No	-	-	-
Post-Disaster Recovery Ordinance	No	-	-	-
Real Estate Disclosure Requirement	Yes	State	-	New York State (NYS) mandate, Property Condition Disclosure Act, <i>NY Code</i> – Article 14 §460-467
Other (Special Purpose Ordinances [i.e., sensitive areas, steep slope])	No	-	-	-

Administrative and Technical Capability

Table 9.6-6 below summarizes potential staff and personnel resources available to the Town of Horicon.

Table 9.6-6. Administrative and Technical Capabilities

Resources	Is this in place? (Yes or No)	Department/ Agency/Position
Administrative Capability		
Planning Board	Yes	Planning Board
Mitigation Planning Committee	No	-
Environmental Board/Commission	No	-
Open Space Board/Committee	No	-
Economic Development Commission/Committee	No	-
Maintenance programs to reduce risk	No	-
Mutual aid agreements	Yes	Fire Departments/Chestertown
Technical/Staffing Capability		
Planner(s) or engineer(s) with knowledge of land development and land management practices	No	-
Engineer(s) or professional(s) trained in construction	No	-



Resources	Is this in place? (Yes or No)	Department/ Agency/Position
practices related to buildings and/or infrastructure		
Planners or engineers with an understanding of natural hazards	No	-
NFIP Floodplain Administrator (FPA)	Yes	Zoning Administrator
Surveyor(s)	Yes	Private Contractor
Personnel skilled or trained in GIS and/or Hazards United States (HAZUS) – Multi-Hazards (MH) applications	No	-
Scientist familiar with natural hazards	No	-
Emergency Manager	No	-
Grant writer(s)	No	-
Staff with expertise or training in benefit/cost analysis	No	-
Professionals trained in conducting damage assessments	No	-

Fiscal Capability

Table 9.6-7 below summarizes financial resources available to the Town of Horicon.

Table 9.6-7. Fiscal Capabilities

Financial Resources	Accessible or Eligible to Use (Yes/No)
Community Development Block Grants (CDBG, CDBG-DR)	Yes
Capital improvements project funding	Yes
Authority to Levy Taxes for specific purposes	Yes
User fees for water, sewer, gas or electric service	No
Impact fees for homebuyers or developers of new development/homes	No
Stormwater utility fee	No
Incur debt through general obligation bonds	Yes
Incur debt through special tax bonds	Yes
Incur debt through private activity bonds	No
Withhold public expenditures in hazard-prone areas	No
Other federal or state funding programs	Yes
Open Space Acquisition funding programs	Yes
Other	No

Community Classifications

Table 9.6-8 below summarizes classifications for community program available to the Town of Horicon.

Table 9.6-8. Community Classifications

Program	Do you have this? (Yes/No)	Classification (if applicable)	Date Classified (if applicable)
Community Rating System (CRS)	NP	N/A	N/A
Building Code Effectiveness Grading Schedule	NP	-	-



Program	Do you have this? (Yes/No)	Classification (if applicable)	Date Classified (if applicable)
(BCEGS)			
Public Protection (ISO Fire Protection Classes 1 to 10)	NP	-	-
Storm Ready	NP	N/A	N/A
Disaster/safety programs in/for schools	NP	N/A	N/A
Organizations with mitigation focus (advocacy group, non-government)	NP	-	-
Public education program/outreach (through website, social media)	Yes	-	-
Public-Private Partnerships	Yes	-	-
Disaster/safety programs in/for schools	NP	-	-

Note:

- N/A Not applicable
- NP Not participating
- Unavailable

The classifications listed above relate to the community’s ability to provide effective services to lessen its vulnerability to the hazards identified. These classifications can be viewed as a gauge of the community’s capabilities in all phases of emergency management (preparedness, response, recovery and mitigation) and are used as an underwriting parameter for determining the costs of various forms of insurance. The Community Rating System (CRS) class applies to flood insurance, while the Building Code Effectiveness Grading Schedule (BCEGS) and Public Protection classifications apply to standard property insurance. CRS classifications range on a scale of 1 to 10, with class 1 being the best possible classification, and class 10 representing no classification benefit. Firewise classification is higher if the subject property is more than 1000 feet from a creditable fire hydrant and is within 5 road miles of a recognized Fire Station.

Criteria for classification credits are outlined in the following documents:

- The Community Rating System Coordinators Manual
- The Building Code Effectiveness Grading Schedule
- The ISO Mitigation online ISO’s Public Protection website at <https://www.isomitigation.com/ppc/>
- The National Weather Service Storm Ready website at <http://www.stormready.noaa.gov/index.html>
- The National Firewise Communities website at <http://firewise.org/>

Self-Assessment of Capability

Table 9.6-9 below provides an approximate measure of the Town of Horicon’s capability to work in a hazard-mitigation capacity and/or effectively implement hazard mitigation strategies to reduce hazard vulnerabilities.

Table 9.6-9. Self-Assessment Capability for the Municipality

Area	Degree of Hazard Mitigation Capability		
	Limited (If limited, what are your obstacles?)*	Moderate	High
Planning and Regulatory Capability		X	
Administrative and Technical Capability	X – lack of training		
Fiscal Capability		X	



Area	Degree of Hazard Mitigation Capability		
	Limited (If limited, what are your obstacles?)*	Moderate	High
Community Political Capability		X	
Community Resiliency Capability	X		
Capability to Integrate Mitigation into Municipal Processes and Activities.		X	

National Flood Insurance Program

NFIP Floodplain Administrator (FPA)

James Steen – Zoning Administrator

Flood Vulnerability Summary

As of November 30, 2015, 16 policies were in force, eight of which were within the 100-year flood boundary. Since 1978, 6 claims have been paid totaling \$104,431. There are no Repetitive Loss or Severe Repetitive Loss properties in the Town of Horicon. According to current NFIP statistics at the time of this Plan, NFIP policies in the Town of Horicon insured over \$3.2 million of property with total annual insurance premiums of \$18,256.

Horicon does not maintain a list of properties that have been flood damaged. No damaged structures were reported to the zoning office during any of the major recent storm events. The Town does not make substantial damage estimates. There is currently no process in place to determine if property owners are interested in mitigation such as elevation or acquisition.

Resources

The Flood Damage Prevention Ordinance (FDPO) identifies the Zoning Administrator as the NFIP Floodplain Administrator. The floodplain administrator is the sole person assuming responsibilities for floodplain administration and would benefit from training. At this time the FPA has not been trained and just became aware of his responsibilities. There currently is no active floodplain management program, however the Town’s goal is to provide training to the FPA. There are currently no flood related education and outreach programs in place.

Compliance History

The Town is in good standing with the National Flood Insurance Program, but the FPA is unsure if there has ever been a Community Assistance Visit.

The Town intends to continue active participation in the NFIP, and maintain compliance with all requirements of participation. Further, the Town has identified several actions to support both continued and improved participation in the NFIP as identified in Table 9.6-13.

Regulatory

The Town of Horicon’s floodplain regulations meet the minimum State and FEMA requirements. Planning Board conditional use approval required to build in the floodplain.

The Town does not currently participate in the Community Rating System.

Integration of Hazard Mitigation into Existing and Future Planning Mechanisms



For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, each community was surveyed to obtain a better understanding of their community's progress in plan integration. A summary is provided below. In addition, the community identified specific integration activities that will be incorporated into municipal procedures.

Planning

Comprehensive Plan: The comprehensive land use plan is intended to serve as a guide for future growth and development in the Town of Horicon. It describes the environmental resources of the town, examines current land use patterns, analyses growth trends, discusses future needs, and sets forth policies designed to insure that growth will occur in an orderly manner that will be in the best interests of the health, safety and general welfare of existing and future residents. The Plan refers to the FEMA flood hazard maps. It does not explicitly refer to the hazard mitigation plan.

Community Development Plan: The Community development plan focuses upon issues of economic development, the provision of low-income housing, recreational facilities, development infrastructure, and community facilities. It also addresses hamlet revitalization and preservation initiatives. It complements, and interrelates with the Comprehensive Plan.

The Town is not an MS4 community.

Continuity of Operations Plan: The Town has a COOP/COG that will serve to protect local government and operations from natural hazard disruptions. The Town has mutual aid agreements in place with Warren County and area responders to ensure efficient use of resources during and after storm events.

Emergency Management Plan: The Town has an Emergency Management Plan that does not refer to the hazard mitigation plan.

The Town does not have a recovery plan in place.

Regulatory and Enforcement (Ordinances)

Zoning: The municipal zoning and subdivision regulations consider natural hazard risk. The Zoning Administrator administers and enforces the provisions of the Zoning and Project Review or Zoning Law (Ordinance) and provides technical assistance to the local review boards (Planning Board and Zoning Board of Appeals in reviewing applications for development such as Subdivision, Conditional Uses, and Variance requests from the Zoning Law. The Zoning Administrator issues Zoning Compliance Certificates (Land Use Permits) for new construction and Sewage (septic) Disposal Permits.

Planning Board and Zoning Board of Appeals: The municipal zoning regulations give the Boards discretion on a case by case basis to require hazard mitigation as a condition of approval, if it is determined that it is appropriate.

Operational and Administration

Highway Department: The role of the Highway Superintendent is to effectively manage the Highway Department's assets in personnel and equipment, to provide for adequate vehicular and pedestrian safety in maintaining the approximately 52 miles of paved roads located in the Town of Horicon.

The key activities of importance for the Highway Department are integrated with hazard mitigation planning:

- snow plowing and sanding
- road re-surfacing and grading
- pruning and removal of trees along town highway roads that represent a threat to safety
- installing and repairing culverts
- digging and maintaining ditches
- removal of debris in ditches and on town roads caused by weather-related events
- providing for proper channeling of road and storm water runoff.

The Highway Department develops and maintains plans for debris management after hazard events, and regularly clears debris and snow/ice after severe events.

The Highway Superintendent, Paul Smith, performs the stormwater management function on Horicon.

The Town does not have staff that has experience with benefit-cost analysis or in preparing grant applications for mitigation projects.

Substantial Damage: Substantial damage estimates can be performed by Town staff.

Training and Capability Building: Town staff receives training to support natural hazard risk reduction. Additional training on stormwater management would be welcome. Staff participates in groups and associations that support natural hazard risk reduction.

Other Programs: The highway dept. will maintain the right of ways but sometimes contracts with a private contractor as necessary for vegetative management.

Funding

Budget: The municipal budget does not include line items for mitigation projects or activities. The Town does not have a capital improvement budget.

No grant funds for mitigation have been awarded to the community. There are no other known mechanisms for supporting hazard mitigation projects (fund balance).

Education and Outreach

No public outreach mechanisms or programs are in place to inform citizens on natural hazards. Resources for establishing a program would be useful.

9.6.6 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and prioritization.

Past Mitigation Initiative Status

Table 9.6-10 below indicates progress on the community's mitigation strategy identified in the 2011 Plan. Previous actions that are now ongoing programs and capabilities are indicated as such in Table 9.6-10, and also appear under "Capability Assessment" presented previously in this annex. Actions carried forward as part of this plan update are included in the following subsection (in Table 9.6-11) with prioritization.

Table 9.6-10. Past Mitigation Initiative Status

Description	Status	Review Comments
Elevate or reroute roadways and bridges to avoid flooding. Specific locations include: <ul style="list-style-type: none"> - Burnt Hill Road - Hayesburg Road - Glendale Road/Bridge (County-owned bridge) 	In progress (approximately 33% complete)	<ul style="list-style-type: none"> - Burnt Hill Road – there was a beaver dam and culvert, flooded properties, replaced culvert – no issues since. - Hayesburg Road – failed culvert, replaced. Bridge on Hayesburg has been replaced and upgraded. <p>Include in 2016 HMP</p>
Educate residents regarding steps to be taken to decrease the impact of natural hazards (including ice storms, wild/forest fires, severe storms, tornado, earth-quakes, and all other natural hazards) by developing, enhancing, and implementing education programs, brochures, school presentations informing groups about ways to reduce risk, and other outreach activities.	No progress	<p>No funding available. Next step would be to hold a public meeting.</p> <p>Include in the 2016 HMP.</p>
Monitor and remove trees/limbs in storm areas that present potential hazards to keep trees from threatening lives, property, and public infrastructure during storm events.	In progress (50% complete)	<p>This initiative is completed as time permits. Next step is to continue to work with the Highway Department.</p> <p>Include in the 2016 HMP. Seek additional funding as available.</p>
Obtain funding to purchase generators for municipally-owned critical facilities.	Complete	<p>Town owned facilities all have generators.</p> <p>Discontinue.</p>
Coordinate/create mutual aid agreements between emergency services, public works departments, and public utilities to ensure efficient use of resources during and after storm events.	In progress (50% complete)	<p>Agreements are in place with Warren County and area responders.</p> <p>Include in the 2016 HMP as ongoing operational capability.</p>
Develop plans for debris management after hazard events, including severe winter snow/ice events, and other severe storms.	Complete	<p>Highway Department regularly clears debris and snow/ice after severe events.</p> <p>Discontinue.</p>
Design a network of citizens that will check in on elderly, functional needs, and low- income individuals during major events.	No progress	<p>Has not been acted on.</p> <p>Include in the 2016 HMP.</p>
Send a town representative to the NYS Wildland Fire Suppression Training.	No progress	<p>Funding has impeded completion.</p> <p>Include in the 2016 HMP.</p>
Provide training for local code enforcement officials to implement building codes that reflect disaster resistant construction for new structures and renovation.	No progress	<p>The Town does not approve or disapprove building permits. Warren County administers this program.</p> <p>Discontinue.</p>
Provide residents with information listing steps taken to lessen potential flood damage to reduce the impact of flooding.	No progress	<p>Town does not have appropriate information.</p> <p>Include in the 2016 HMP – see THO-4.</p>
Educate the community on benefits of carrying NFIP policies and increase knowledge of NFIP services.	No progress	<p>There is no allotment in the budget for this initiative. Most people only purchase flood insurance when required by lending agencies due to the high cost.</p> <p>Discontinue</p>
Review and update local plans to integrate goals, objectives, and activities from this HMP which	Complete	Floodplain regulations are already in place.

Table 9.6-10. Past Mitigation Initiative Status

Description	Status	Review Comments
are not found in existing regulatory documents, as appropriate.		Discontinue
Maintain a current inventory of at-risk buildings and infrastructure and continually update inventory of at-risk structures in each jurisdiction.	No progress	The Town does not have a building inspector. Town staff is not trained in this field. Discontinue
Apply for grants to assist with mitigation activities needed to provide a level of protection for critical facilities.	No progress	The Town has not been made aware of available grants. Include in the 2016 HMP.
Provide continuing education and training for local Floodplain Administrator to ensure code enforcement and proper inspections.	No progress	The new Supervisor just learned of this this plan. Include in the 2016 HMP.
Implement zoning regulations to discourage building new structures in disaster prone areas – if such regulations are not already written into Town Zoning code or Floodplain Ordinance.	N/A	Already in place. Moved to ongoing operational capability.

Completed Mitigation Initiatives not Identified in the Previous Mitigation Strategy

The Town of Horicon has identified the following mitigation projects/activities that have also been completed but were not identified in the previous mitigation strategy in the 2011 Plan:

- Burnt Pond Rd. culvert replaced 2013.
- Replaced culvert on Grassville Rd. 2014.
- Hayesburg culvert replaced 2014.
- Pease Hill Road has been a problem area. It needed a bigger culvert, but bedrock here is a problem. Site constraints held up a project in this area, but the work was completed in recent years.
- Harris Road washed out in the past. Town and County worked to stabilize ditches, hydro seeded banks and ditches, and improved culverts. No problems there now.
- Granger Road –Culvert replacement with larger culvert is in progress.

In addition, the Town noted that Warren County will be improving the Upper Brant Lake Dam in 2016.

Proposed Hazard Mitigation Initiatives for the Plan Update

The Town of Horicon participated in a mitigation action workshop in September and was provided the following Federal Emergency Management Agency (FEMA) publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 ‘Selecting Appropriate Mitigation Measures for Floodprone Structures’ (March 2007) and FEMA ‘Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards’ (January 2013).

Table 9.6-11 summarizes the comprehensive-range of specific mitigation initiatives the Town of Horicon would like to pursue in the future to reduce the effects of hazards. Some of these initiatives may be previous actions carried forward for this plan update. Implementation of these initiatives will depend on available funding (grants and local match availability), and some initiatives may be modified or omitted at any time based on occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in Table 9.6-11 to further demonstrate the wide range of activities and mitigation measures selected.

As discussed in Section 6, 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing your actions as ‘High’, ‘Medium’, or ‘Low.’ The table below summarizes the evaluation of each mitigation initiative, listed by Action Number.

Table 9.6-12 summarizes the prioritization of all proposed mitigation initiatives for the Plan update.

Table 9.6-11. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category	CRS Category
THO-1	Secure funding and complete culvert replacement and road elevation for Alder Brook Road. All mitigation efforts shall be made in consideration of Federal and State directives to mitigate critical infrastructure to address protection to the 500-year flood event or “worst damage scenario”.	Both	Flood, Severe Storm	1, 3	Town Supervisor, Highway Department, SWCD	Medium	\$200,000 (High)	FEMA (HMGP, FMA, PDM), CDBG, NYS DHSES, County, Local Budget	DOF	Medium	SIP	NR
THO-2	Install lake level control system and other surface improvements at Upper Brant Lake Dam. All mitigation efforts shall be made in consideration of Federal and State directives to mitigate critical infrastructure to address protection to the 500-year flood event or “worst damage scenario”.	Both	Dam Failure, Flood, Severe Storm	1, 3, 4, 5	Town Supervisor, Highway Department, SWCD	Medium	\$150,000 (High)	FEMA (HMGP, FMA, PDM), CDBG, Smart Growth Grant, Local Budget	Short	High	SIP	NR
THO-3	Integrate the risk assessment and recommendations of the hazard mitigation plan into the comprehensive plan and community development plan.	Both	All Hazards	1	Planning Board	Low-Medium	Low	PDM, Town Staff/ Operating Budget	Short	Medium	LPR	PR
THO-4 (carryover)	Educate residents at a public meeting regarding steps to be taken to decrease the impact of natural hazards by developing, enhancing, and disseminating educational material informing groups about ways to reduce risk.	N/A	All Hazards	2	Town Supervisor, Planning Board, school districts; County Office of Emergency Services	Low-Medium	Low	Local Budget	OG	High	EAP	PI
THO-5 (carryover)	Work with the Highway Department to monitor and remove trees/limbs in storm areas that present potential	N/A	Severe Storm, Severe Winter	1, 3	Town DPW, Highway Department	Low	Low	Local; HMGP, PDM	OG	Medium	LPR	PR



Table 9.6-11. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category	CRS Category
	hazards to keep trees from threatening lives, property, and public infrastructure during storm events. Seek additional funding as available.		Storm									
THO-6 (carryover)	Design a network of citizens that will check in on elderly, functional needs, and low-income individuals during major events.	Existing	All Hazards	3	Planning Board, Town Supervisor	High	Low	Operating budget, State/County Grants	Short	High	EAP	ES
THO-7 (carryover)	Provide continuing education and training for local Floodplain Administrator to ensure code enforcement and proper inspections.	N/A	Flood	3	Town Supervisor, Planning Board	Low	Low	Local Budget	Short	Medium	EAP	PR, ES

Notes:

Not all acronyms and abbreviations defined below are included in the table.

*Does this mitigation initiative reduce effects of hazards on new and/or existing buildings and/or infrastructure? Not applicable (N/A) is inserted if this does not apply.

Acronyms and Abbreviations:

CAV Community Assistance Visit
 CDBG Community Development Block Grant
 GCRS Community Rating System
 DPW Department of Public Works
 FEMA Federal Emergency Management Agency
 FPA Floodplain Administrator
 HMA Hazard Mitigation Assistance
 N/A Not applicable
 NFIP National Flood Insurance Program
 OEM Office of Emergency Management

Potential FEMA HMA Funding Sources:

FMA Flood Mitigation Assistance Grant Program
 HMGP Hazard Mitigation Grant Program
 PDM Pre-Disaster Mitigation Grant Program
 RFC Repetitive Flood Claims Grant Program (discontinued)
 SRL Severe Repetitive Loss Grant Program (discontinued)

Timeline:

Short 1 to 5 years
 Long Term 5 years or greater
 OG On-going program
 DOF Depending on funding

Costs:

Where actual project costs have been reasonably estimated:

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

Benefits:

Where possible, an estimate of project benefits (per FEMA's benefit calculation methodology) has been evaluated against the project costs, and is presented as:

Low < \$10,000
 Medium \$10,000 to \$100,000



Costs:

Where actual project costs cannot reasonably be established at this time:

- Low** Possible to fund under existing budget. Project is part of, or can be part of, an existing ongoing program.
- Medium** Could budget for under existing work plan, but would require a reappropriation of the budget or a budget amendment, or cost of the project would have to be spread over multiple years.
- High** Would require an increase in revenue via an alternative source (i.e., bonds, grants, fee increases) to implement. Existing funding levels are not adequate to cover costs of the proposed project.

Benefits:

High > \$100,000

Where numerical project benefits cannot reasonably be established at this time:

- Low** Long-term benefits of the project are difficult to quantify in the short term.
- Medium** Project will have a long-term impact on reduction of risk exposure to life and property, or project will provide an immediate reduction in risk exposure to property.
- High** Project will have an immediate impact on reduction of risk exposure to life and property.

Mitigation Category:

- *Local Plans and Regulations (LPR)* – Actions that include government authorities, policies, or codes that influence the way land and buildings are developed and built.
- *Structure and Infrastructure Project (SIP)* – Actions that involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures, as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce impacts of hazards.
- *Natural Systems Protection (NSP)* – Actions that minimize damage and losses, and also preserve or restore the functions of natural systems.
- *Education and Awareness Programs (EAP)* – Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities

CRS Category:

- *Preventative Measures (PR)* – Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and stormwater management regulations.
- *Property Protection (PP)* – Actions include public activities to reduce hazard losses or 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.
- *Public Information (PI)* – 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 educational programs for school-age children and adults.
- *Natural Resource Protection (NR)* – 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.
- *Structural Flood Control Projects (SP)* – Actions that involve construction of structures to reduce impacts of a hazard. Such structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.
- *Emergency Services (ES)* – Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and protection of essential facilities



Table 9.6-12. Summary of Prioritization of Actions

Mitigation Action/Project Number	Mitigation Action/Initiative	Life Safety	Property Protection	Cost-Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
THO-1	Secure funding and complete culvert replacement and road elevation for Alder Brook Road.	1	1	0	1	0	1	0	1	0	1	1	0	0	0	6	Medium
THO-2	Install lake level control system and other surface improvements at Upper Brant Lake Dam	1	1	0	1	0	1	0	1	0	1	0	0	0	0	6	Medium
THO-3	Integrate the risk assessment and recommendations of the hazard mitigation plan into the comprehensive plan and community development plan.	0	1	1	1	0	1	1	0	0	1	1	0	0	0	7	Medium
THO-4	Educate residents at a public meeting regarding steps to be taken to decrease the impact of natural hazards by developing, enhancing, and disseminating educational material informing groups about ways to reduce risk.	1	0	1	1	1	0	1	0	1	0	1	0	0	1	8	High
THO-5	Work with the Highway Department to monitor and remove trees/limbs in storm areas that present potential hazards to keep trees from threatening lives, property, and public	1	0	1	1	0	1	0	0	0	1	0	0	0	1	6	Medium



Table 9.6-12. Summary of Prioritization of Actions

Mitigation Action/Project Number	Mitigation Action/Initiative	Life Safety	Property Protection	Cost-Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
	infrastructure during storm events. Seek additional funding as available.																
THO-6	Design a network of citizens that will check in on elderly, functional needs, and low-income individuals during major events.	1	0	1	1	0	1	1	0	0	1	1	1	0	0	8	High
THO-7	Provide continuing education and training for local Floodplain Administrator to ensure code enforcement and proper inspections.	0	0	1	1	0	1	1	0	0	1	0	1	0	0	6	Medium

Note: Refer to Section 6, which conveys guidance on prioritizing mitigation actions.



9.6.7 Future Needs To Better Understand Risk/Vulnerability

None at this time.

9.6.8 Hazard Area Extent and Location

Hazard area extent and location maps have been generated for the Town of Horicon that illustrate the areas probable to be impacted within the municipality (see Figure 9.6-1 and Figure 9.6-2 below). These maps are based on the best available data at the time of the preparation of this Plan, and are considered to be adequate for planning purposes. Maps have been generated for those hazards (i.e., wildfire and flooding) that can be clearly identified using mapping techniques and technologies, and to which the Town of Horicon has significant exposure. These maps also appear in the hazard profiles within Section 5.4, Volume I of this Plan.

9.6.9 Additional Comments

None at this time.

Figure 9.6-1. Town of Horicon Flood and Wildfire Hazard Area Extent and Location Map

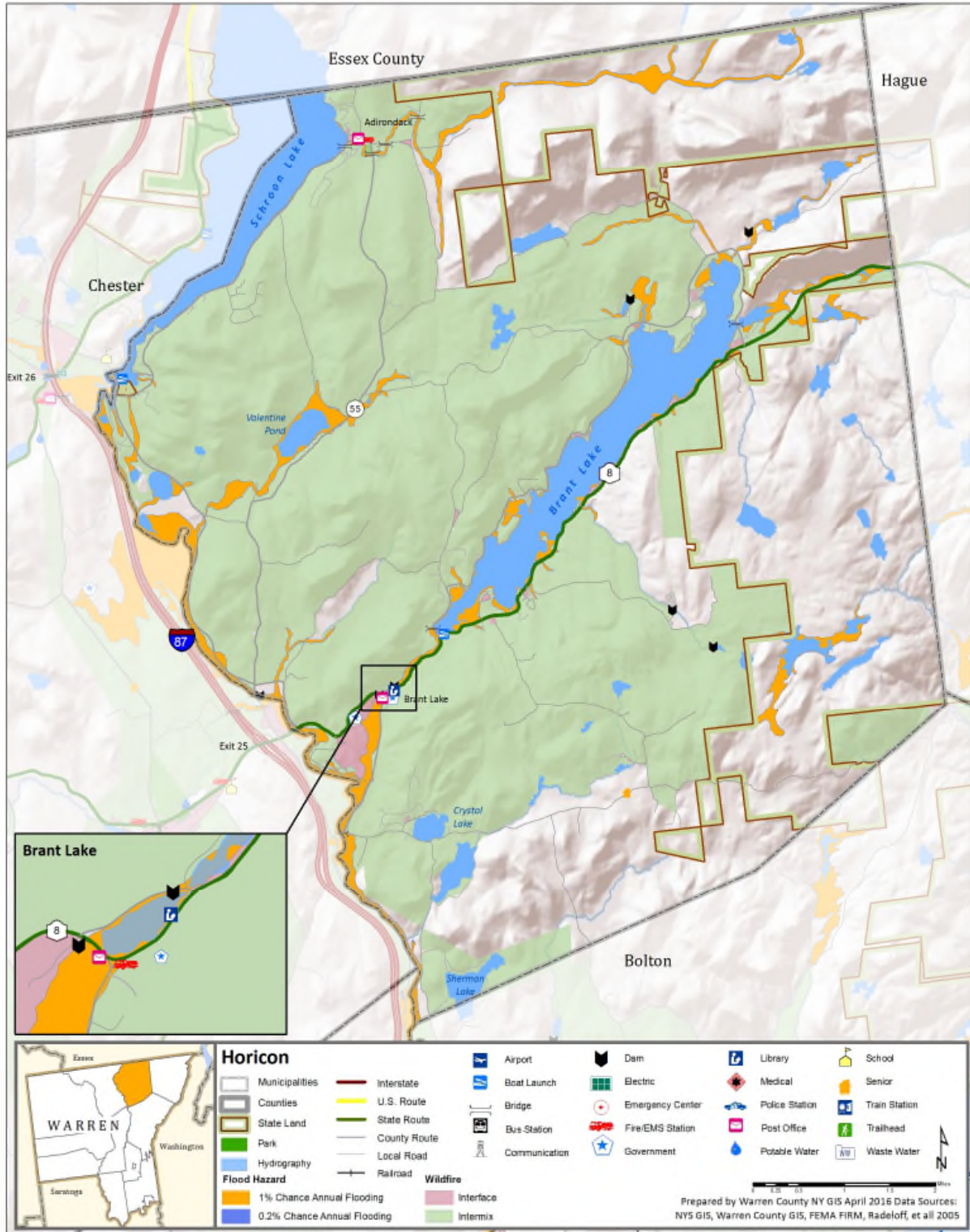
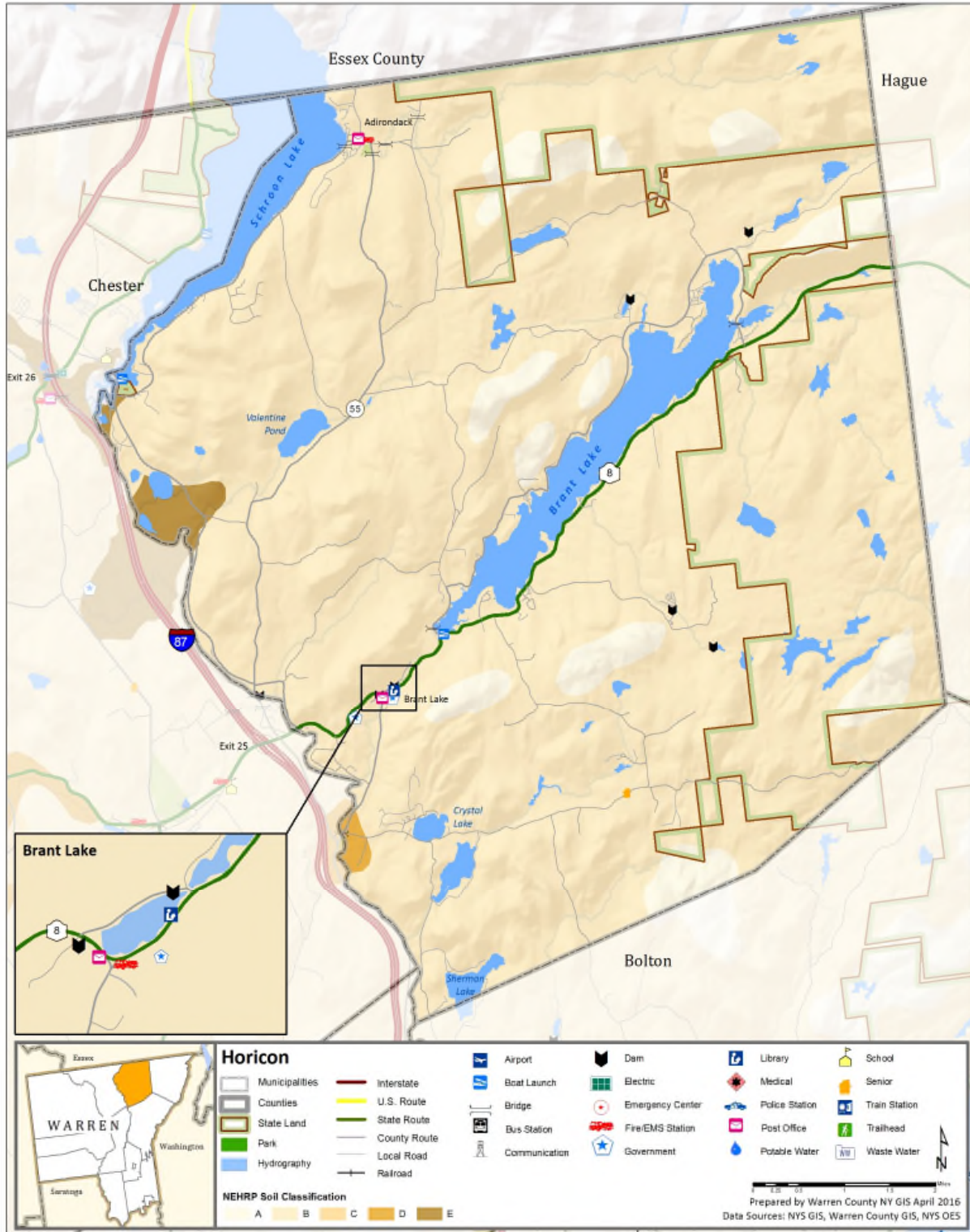


Figure 9.6-2. Town of Horicon Landslide Hazard Area Map



9.6.10 Action Worksheets

Name of Jurisdiction:	Town of Horicon
Name and Title Completing Worksheet:	Matthew J. Simpson, Supervisor
Action Number:	THO-1
Mitigation Action/Initiative:	Secure funding and complete culvert replacement and road elevation for Alder Brook Road

Assessing the Risk	
Hazard(s) addressed:	Flood, Severe Storm
Specific problem being mitigated:	Needs a bigger culvert and road elevation, but there are site constraints. Bedrock underlays the site, which poses engineering challenges and increases the cost of the project. Currently this project is stalled due to lack of funding.
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	The town looked into applying for HMGP funding to replace culverts, but did not have enough data for the BCA.
Action/Project Intended for Implementation	
Description of Selected Action/Project	Road elevation and two culverts needed at an estimated cost of \$200,000. All mitigation efforts shall be made in consideration of Federal and State directives to mitigate critical infrastructure to address protection to the 500-year flood event or "worst damage scenario".
Action/Project Category	SIP
Goals Met	1, 3
Applies to existing and or new development, or not applicable	N/A
Benefits (losses avoided)	Road closures and bank washout.
Estimated Cost	\$200,000 (High)
Priority*	Medium
Plan for Implementation	
Responsible Organization	Town Supervisor, Highway Department, SWCD
Local Planning Mechanism	Capital Improvement Program
Potential Funding Sources	FEMA (HMGP, FMA, PDM), CDBG, NYS DHSES, County, Local Budget
Timeline for Completion	DOF
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:

Action Number: THO-1
Mitigation Action/Initiative: Secure funding and complete culvert replacement and road elevation for Alder Brook Road

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Secure roadway from potential collapse due to washout
Property Protection	1	Secure roadway from potential collapse due to washout
Cost-Effectiveness	0	
Technical	0	Site constraints present engineering difficulties.
Political	0	
Legal	1	The Town has legal jurisdiction over the project area.
Fiscal	0	Project would need additional outside funding.
Environmental	1	Reduce roadway flooding and surface pollutants entering waterway.
Social	0	
Administrative	1	Town has administrative capabilities to implement this project.
Multi-Hazard	1	Flood, Severe Storm
Timeline	0	Unknown, depending on funding
Agency Champion	1	Town Supervisor and County Soil and Water support this project.
Other Community Objectives	0	
Total	7	
Priority (High/Med/Low)	Medium	

Name of Jurisdiction:	Town of Horicon
Name and Title Completing Worksheet:	Matthew J. Simpson, Supervisor
Action Number:	THO-2
Mitigation Action/Initiative:	Install lake level control system and other surface improvements at Upper Brant Lake Dam

Assessing the Risk	
Hazard(s) addressed:	Dam Failure, Flood, Severe Storm
Specific problem being mitigated:	Recently classified as a Moderate Hazard Dam by NYS DEC. History of overtopping and flood damages.
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	Actions considered include: <ul style="list-style-type: none"> • Replace dam – cost prohibitive and unnecessary • Install a control system; perform surface and bank restoration – chosen alternative
Action/Project Intended for Implementation	
Description of Selected Action/Project	Install a control system for the lake level using a rubber inflatable bladder system which can be deflated quickly and easily to prevent upstream flooding. The Town will also perform some surface and bank restoration. All mitigation efforts shall be made in consideration of Federal and State directives to mitigate critical infrastructure to address protection to the 500-year flood event or “worst damage scenario”.
Action/Project Category	SIP
Goals Met	1, 3, 4, 5
Applies to existing and or new development, or not applicable	Both
Benefits (losses avoided)	Medium – flood damage and potential future dam failure
Estimated Cost	\$150,000 (High)
Priority*	High
Plan for Implementation	
Responsible Organization	Town Supervisor, Highway Department, SWCD
Local Planning Mechanism	Capital Improvement Program
Potential Funding Sources	FEMA (HMGP, FMA, PDM), CDBG, Smart Growth Grant, Local Budget
Timeline for Completion	Short
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:



Action Number: THO-2
Mitigation Action/Initiative: Install lake level control system and other surface improvements at Upper Brant Lake Dam

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Secure dam from potential collapse due to overtopping
Property Protection	1	Secure dam from potential collapse due to overtopping
Cost-Effectiveness	1	Bladder system and related improvements is less expensive than full replacement.
Technical	1	Project is technically feasible.
Political	0	
Legal	1	The Town has legal jurisdiction over the project area.
Fiscal	0	Project would need additional outside funding.
Environmental	0	
Social	0	
Administrative	1	Town has administrative capabilities to implement this project.
Multi-Hazard	1	Flood, Severe Storm, Dam Failure
Timeline	1	Project will be completed within 5 years
Agency Champion	1	Town Supervisor and County Soil and Water support this project.
Other Community Objectives	0	
Total	9	
Priority (High/Med/Low)	High	



9.7 Town of Johnsburg

This section presents the jurisdictional annex for the Town of Johnsburg.

9.7.1 Hazard Mitigation Plan Point of Contact

The following individuals have been identified as the hazard mitigation plan's (HMP) primary and alternate points of contact.

Primary Point of Contact	Alternate Point of Contact
Ron Vaneslow, Supervisor 219 Main Street North Creek, NY 12853 (518) 251-2421 supervisor@johnsburgny.com	Dan Hitchcock, Highway Department Superintendent 88 Ski Bowl Road North Creek, NY 12853 518-251-2113 johnsburghwy1@frontiernet.net
2 nd Alternate Point of Contact	
Joann Morehouse, Deputy Town Clerk 219 Main Street North Creek, NY 12853 (518) 251-2421	

9.7.2 Municipal Profile

The Town of Johnsburg is in the northwest corner of Warren County. It is part of the Glens Falls Metropolitan Statistical Area. The Town borders Hamilton County on the north and west and the Hudson River on the east. The Town includes seven hamlets: Bakers Mills, Garnet Lake, Johnsburg, North Creek, Riparius, Sodom and Wevertown. Bodies of water include the Hudson River and Garnet Lake. U.S. Route 8 passes through the Town. According to the 2010 Census, the community's population was 2,395.

Growth/Development Trends

Table 9.7-1 below summarizes recent residential/commercial development in the Town of Johnsburg since 2010 and lists any known or anticipated major residential/commercial development and major infrastructure development that has been identified in the next five years within the municipality. Refer to the maps following Section 9.7.9 of this annex: Figure 9.7-1 that illustrates landslide hazard areas, and Figure 9.7-2 that illustrates the flood and wildfire hazard areas.

Table 9.7-1. Growth and Development

Property or Development Name	Type (e.g. Res., Comm.)	# of Units / Structures	Location (address and/or Parcel ID)	Known Hazard Zone(s)	Description/Status of Development
Recent Development from 2010 to present					
Ski Bowl Park – Front Street Mountain Development	Residential	100 plus	Adjacent to North Creek ski Bowl Park Route 28	None identified	Developing every year at Ski Bowl Park. Approved in 2006. Phased development
Top Ridge	Residential	64 units	Claude Straight Rd. North reek	None identified	Continuous build out
Known or Anticipated Development in the Next Five (5) Years					
Stewart's – new store	Commercial	1	Rte. 28 North Creek	None identified	Doubling the size of existing store
Ski Bowl Park –	Residential	100+	Ski Bowl Rd North	None	Slowly building since



Property or Development Name	Type (e.g. Res., Comm.)	# of Units / Structures	Location (address and/or Parcel ID)	Known Hazard Zone(s)	Description/Status of Development
Front Street Property	and Commercial		Creek	identified	2006
Top Ridge	Residential	64	Claude Straight Rd. North Creek	None identified	Building since 2010

Note: Only location-specific hazard zones or vulnerabilities are identified

9.7.3 Natural Hazard Event History Specific to the Municipality

Warren County has a history of natural and non-natural hazard events as detailed in Volume I, Section 5.0 of this Plan. A summary of historical events appears in each hazard profile, and includes a chronology of events that have affected the County and its municipalities. For the purpose of this Plan update, events that have occurred in the County from 2010 to present were summarized to indicate the range and impact of hazard events in the community. Information regarding specific damages is included, if available, based on reference material or local sources. This information is presented in Table 9.7-2 below. For details of these and additional events, refer to Volume I, Section 5.0 of this Plan.

Table 9.7-2. Hazard Event History

Dates of Event	Event Type (FEMA Disaster Declaration if applicable)	Warren County Designated?	Summary of Damages/Losses
March 23, 2010	Severe Storms and Flooding (DR-1899)	Yes	Flooding from a severe rain storm caused damage to many roads in the northern portion of the County.
April 27-28, 2011	Severe Storms, Flooding, Tornadoes and Straight-Line Winds (DR-1993)	Yes	Flooding occurred along the Hudson River in Warren County from North River southward to the Saratoga County line. Numerous reports of flooding. The County had approximately \$676,000 in damages. Nearly two-thirds of the County was damaged.
October 29, 2012	Hurricane Sandy (EM-3351)	Yes	Heavy rain fell throughout the County
June 28, 2013	Severe Storms and Flooding (DR-4129)	Yes	Flooding was very severe in Johnsburg.
May 13-22, 2014	Flooding	N/A	One culvert washed out as a result of this flooding event.
July 8, 2014	Thunderstorms and Tornado (F0) (DR-4180)	No	F0 tornado occurred in North Creek Tree damage in North Creek Damage in ski Bowl Park. \$12,273.42 damages covered by insurance

Notes:

- EM Emergency Declaration (FEMA)
- FEMA Federal Emergency Management Agency
- DR Major Disaster Declaration (FEMA)
- N/A Not applicable

9.7.4 Hazard Vulnerabilities and Ranking

The hazard profiles in Section 5.0 of this Plan convey detailed information regarding each plan participant’s vulnerability to the identified hazards. The following summarizes the hazard vulnerabilities and their ranking in the Town of Johnsburg. For additional vulnerability information relevant to this jurisdiction, refer to Section 5.0.





Hazard Risk/Vulnerability Risk Ranking

Table 9.7-3 below summarizes hazard risk/vulnerability rankings of potential hazards for the Town of Johnsburg.

Table 9.7-3. Hazard Risk/Vulnerability Risk Ranking

Hazard type	Estimate of Potential Dollar Losses to Structures Vulnerable to the Hazard ^{a, b}	Probability of Occurrence	Risk Ranking Score (Probability x Impact)	Hazard Ranking ^a
Earthquake	100-year MRP: \$27,972.00 500-year MRP: \$2,421,568 2,500-Year MRP: \$20,186,533.00	Occasional	12	Low
Flood	RCV Exposed to 1% Annual Chance: \$16,254,734	Frequent	18	Medium
Landslide	Damage estimate not available	Frequent	27	Medium
Infestation	Damage estimate not available	Frequent	24	Medium
Severe Storm	RCV Exposed to 1938 storm-winds: \$33,985	Frequent	48	High
Severe Winter Storm	GBS 1% Loss: \$3,498,070 GBS 5% Loss: \$17,490,350	Frequent	51	High
Wildfire	RCV Exposed to Intermix: \$249,218,000 RCV Exposed to Interface: \$120,674,000	Frequent	42	High
Cyber Security	Damage estimate not available	Occasional	12	Low
Disease Outbreak	Damage estimate not available	Frequent	27	Medium
Hazardous Material Incidents	Damage estimate not available	Frequent	24	Medium

Notes:

- The general building stock valuation is based on the custom inventory generated for the municipality and based on improved value.
High = Total hazard priority risk ranking score of 31 and above
Medium = Total hazard priority risk ranking of 20-30+
Low = Total hazard risk ranking below 20
- Loss estimates for the severe storm and severe winter storm hazards are structural values only and do not include the estimated value of contents. The earthquake was evaluated by Census tract. The Census tracts do not exactly align with municipal boundaries; therefore, a total is reported for each Town inclusive of the Villages. Loss estimates for the flood and earthquake hazards represent both structure and contents. Potential flood loss estimates were generated using Hazus-MH 2.2 and digitized FIRM maps from the 1980s and 1990s for the 1-percent annual chance event; NED DEM was used to generate a depth grid. The County's 2015 Real Property data was used to generate the values for flood and includes structure and contents. For the wildfire hazard, the improved value and estimated contents of buildings located within the identified hazard zones is provided.

GBS General building stock
MRP Mean return period
RCV Replacement Cost Value

National Flood Insurance Program (NFIP) Summary

Table 9.7-4 summarizes NFIP statistics for the Town of Johnsburg.

Table 9.7-4. NFIP Summary

Municipality	# Policies (1)	# Claims (Losses) (1)	Total Loss Payments (2)	# Rep. Loss Prop. (1)	# Severe Rep. Loss Prop. (1)	# Policies in 100-year Boundary (3)
Town of Johnsburg	11	3	\$56,870	0	0	6

Source: FEMA, 2015

Notes:





- (1) Policies, claims, repetitive loss, and severe repetitive loss statistics are provided by FEMA, are current as of November 30, 2015, and are summarized by community name. Total number of repetitive loss properties includes severe repetitive loss properties. Number of claims represents claims closed by November 30, 2015.
- (2) Total building and content losses from the claims file provided by FEMA Region 2.
- (3) Number of policies inside and outside of flood zones is based on latitude and longitude provided by FEMA Region 2 in the policy file.
- (4) FEMA noted that for a property with more than one entry, more than one policy may have been in force or more than one Geographic Information System (GIS) specification was possible.

Critical Facilities

Table 9.7-5 below identifies critical facilities within the municipality located on parcels that intersect the current regulatory NFIP 1% chance flood boundary (aka: “Special Flood Hazard Area” (SFHA)), however it is recognized that the actual facility structure(s) may lie outside of the SFHA. Please refer to the Flood Hazard Profile (Section 5.4.2) for further details of estimated flood losses throughout the County, as well as the “Other Vulnerabilities Identified” section following.

Table 9.7-5. Potential Flood Losses to Critical Facilities

Municipality	Facility Types in 1% Chance Flood Boundary						
	Boat Facilities	Dam	Electric	Government	Highway Bridge	Rail Facility	Wastewater
Town of Johnsburg	2	2	0	1	22	0	0

Source: Warren County Real Property 2015 tax roll; HAZUS-MH 2.2; FEMA 2015

Notes:

- (1) HAZUS-MH 2.2 provides a general indication of the maximum restoration time for 100% operations. Clearly, a great deal of effort is needed to quickly restore essential facilities to full functionality; therefore, this will be an indication of the maximum downtime (HAZUS-MH 2.2 User Manual).
- (2) Some facilities may be within the Digital Flood Insurance Rate Map (DFIRM) flood hazard boundary; however, HAZUS did not calculate potential loss, perhaps because depth of flooding would not cause any damages to these structures according to the depth damage function used in HAZUS for that facility type. Further, HAZUS-MH may estimate potential damage to a facility outside the DFIRM if the model generates a depth grid beyond DFIRM boundaries.

X Facility located within the DFIRM boundary

- Not calculated by HAZUS-MH 2.2

** To Be Determined

Other Vulnerabilities Identified

The municipality has identified the following vulnerabilities within their community:

- Culvert failure and roadway flooding/washout
 - Glen Creek road is vulnerable to flooding and has some culverts that are having issues – one 9' squash culvert is being engineered to be repaired in summer 2016.
 - Barton’s Mines Road was impacted from a 2011 storm, and is currently being repaired. Just got a permit to put in a large culvert, but this area is susceptible to flooding near the bridge.
 - Rogers Road is vulnerable to flooding.
 - Riverside Station and River Road are vulnerable to flooding/washout, and need ongoing monitoring.



- Chatiemac Road had \$100,000 of damage. The Town continues to put in more culverts here and hasn't lost anything since.
- Austin Pond Road has been rebuilt twice after failures. One section of Austin Pd. Rd was a little too low and was prone to flooding from the pond. There is a huge beaver dam at the outlet of the pond and during heavy rains the road was subject to minor flooding. That portion of the roadbed has been elevated.
- Property flooding
 - House in Wevertown washed out in 2011, and has flooded three times.
 - One home off Barton's Mine road got flooded all the way around.
- Low-lying bridges – two replaced in 2015, though there are still a number that need to be repaired or replaced.
 - Harvey Road Bridge has bad abutments. The Town has been working on trying to get a grant for repair, and was awarded \$230,000 in Consolidated Local Street and Highway Improvement Program (CHIPS) money, but this has to cover paving as well.
 - Garnet Lake Road Bridge has rotted out steel I-Beams, but there is no place to put a temporary bridge.
 - Harrington Road Bridge washed out due to a beaver dam. The same event took out railroad tracks roughly two miles away, off Riverside Station Road in Riparius.
- Ice jams are a problem in areas along the river.
 - Riverside Station at Rt. 8 under the bridge.
 - Portion of River Road is a sharp corner where ice jams up....this floods Chestertown's River Road.
 - One ice jam took out the road in Chestertown along the river.
- Steep slopes – The Town has roughly 60 miles of dirt roads that are steep, trying to put in deeper ditches and crown them more.
 - Landslides and debris slides are a big problem along 13th Lake Road, which is partly a County road.
- Forest Fires
 - Higher terrain near Warrensburg is susceptible. There was a fire on Crane Mountain in 2002.
- Beaver Dams
 - The biggest problem areas are along Coulter Road. Other vulnerable locations include Edwards Hill Road, Harrington Road, and Washer Hill Road.
- Back-up power needs
 - The Water Department has a generator.



- The town has a few emergency shelters equipped with back-up power, including the shelter at the North Creek fire house, which has a generator. The NCOC is a designated shelter with a generator, as is the new JEMS building on Peaceful Valley Rd.
- The town is in the process of installing two smaller boilers and a new generator at the highway garage.
- Town Hall is equipped with a small generator which is adequate.
- The school does not have a backup generator.
- Gore Mountain is on a separate electrical trunk, but this is not on the list of shelters.
- Hudson Headwaters Health Center, attached to the Nursing Home – Adirondack Tri-County Rehab and Nursing Center – this has a generator.
- Senior Living facility across the street from Town Hall has backup power.

There are at least three private dams in Johnsburg at Windover, Antler Lake, and Garnet Lake. Each dam has an emergency action plan in place, which are on file at the Supervisor’s office.

9.7.5 Capability Assessment

This section identifies the following capabilities of the local jurisdiction:

- Planning and regulatory capability
- Administrative and technical capability
- Fiscal capability
- Community classification
- NFIP
- Integration of mitigation planning into existing and future planning mechanisms.

Planning and Regulatory Capability

Table 9.7-6 below summarizes regulatory tools available to the Town of Johnsburg.

Table 9.7-6. Planning and Regulatory Tools

Tool / Program (code, ordinance, plan)	Do you have this? (Yes/No) If Yes, date of adoption or update	Authority (local, county, state, federal)	Dept. /Agency Responsible	Code Citation and Comments (Code Chapter, name of plan, explanation of authority, etc.)
Planning Capability				
Master Plan	Yes, 07/2005	Local	Planning and Zoning	Town of Johnsburg Comprehensive Plan
Capital Improvements Plan	No	-	-	-
Floodplain Management / Basin Plan	Yes	Local	Town	-
Stormwater Management Plan	Yes	Local	Town	Highway Department
Open Space Plan	Yes	Local	Town	Planning Board
Stream Corridor Management Plan	Yes	State	Adirondack Park Agency (APA)	-
Watershed Management or	Yes	Federal	-	-



Tool / Program (code, ordinance, plan)	Do you have this? (Yes/No) If Yes, date of adoption or update	Authority (local, county, state, federal)	Dept. /Agency Responsible	Code Citation and Comments (Code Chapter, name of plan, explanation of authority, etc.)
Protection Plan				
Economic Development Plan	No	-	-	-
Comprehensive Emergency Management Plan	Yes	County	Warren County Office of Emergency Services (OES)	-
Emergency Response Plan	Yes	County	Johnsburg Emergency Squad	Johnsburg utilizes the Warren County Comprehensive EMP
Post-Disaster Recovery Plan	No	-	-	-
Transportation Plan	No	-	-	-
Strategic Recovery Planning Report	No	-	-	-
Other Plans:	No	-	-	-
Regulatory Capability				
Building Code	Yes	State & Local	Buildings Department	All applicants for a building permit must be issued a Site Plan Compliance letter by the Town Zoning Enforcement Officer before the County will issue Certificate of Occupancy.
Zoning Ordinance	Yes	Local	Zoning Enforcement Officer	Local Law #1-2008 Amend Zoning Law
Subdivision Ordinance	Yes	Local	Zoning Enforcement Officer	Local Law #2-2007 Subdivision
NFIP Flood Damage Prevention Ordinance	Yes	Federal, State, Local	Zoning Enforcement Officer	Town of Johnsburg Flood Damage Protection Law, adopted 1987
NFIP: Cumulative Substantial Damages	No	-	-	-
NFIP: Freeboard	Yes	State, Local	-	State mandated BFE+2 for single and two-family residential construction, BFE+1 for all other construction types
Growth Management Ordinances	Yes	State	APA	
Site Plan Review Requirements	Yes	Local	Planning Board	Part of Land Use Planning Fee Structures
Stormwater Management Ordinance	Yes	Local	Zoning Enforcement Officer	-
Municipal Separate Storm Sewer System (MS4)	No	-	-	-
Natural Hazard Ordinance	No	-	-	-
Post-Disaster Recovery Ordinance	No	-	-	-
Real Estate Disclosure Requirement	Yes	State	-	New York State (NYS) mandate, Property Condition Disclosure Act, NY



Tool / Program (code, ordinance, plan)	Do you have this? (Yes/No) If Yes, date of adoption or update	Authority (local, county, state, federal)	Dept. /Agency Responsible	Code Citation and Comments (Code Chapter, name of plan, explanation of authority, etc.)
				Code – Article 14 §460-467
Other (Special Purpose Ordinances [i.e., sensitive areas, steep slope])	Yes	State	APA	-

Administrative and Technical Capability

Table 9.7-7 below summarizes potential staff and personnel resources available to the Town of Johnsbury.

Table 9.7-7. Administrative and Technical Capabilities

Resources	Is this in place? (Yes or No)	Department/ Agency/Position
Administrative Capability		
Planning Board	Yes	Planning Board and Zoning Board of Appeals
Mitigation Planning Committee	No	-
Environmental Board/Commission	No	-
Open Space Board/Committee	No	-
Economic Development Commission/Committee	No	-
Maintenance programs to reduce risk	No	-
Mutual aid agreements	Yes	Local Fire Departments and EMS response
Technical/Staffing Capability		
Planner(s) or engineer(s) with knowledge of land development and land management practices	Yes	APA and Clough Harbor Assoc., as needed on a contractual basis
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Yes	APA and Clough Harbor Assoc., as needed on a contractual basis
Planners or engineers with an understanding of natural hazards	Yes	Zoning Enforcement Officer; APA and Clough Harbor Assoc., as needed on a contractual basis
NFIP Floodplain Administrator (FPA)	Yes	Zoning Enforcement Officer
Surveyor(s)	No	-
Personnel skilled or trained in GIS and/or Hazards United States (HAZUS) – Multi-Hazards (MH) applications	No	-
Scientist familiar with natural hazards	No	-
Emergency Manager	No	-
Grant writer(s)	No	-
Staff with expertise or training in benefit/cost analysis	No	-
Professionals trained in conducting damage assessments	No	-

Fiscal Capability

Table 9.7-8 below summarizes financial resources available to the Town of Johnsbury.





Table 9.7-8. Fiscal Capabilities

Financial Resources	Accessible or Eligible to Use (Yes/No)
Community Development Block Grants (CDBG, CDBG-DR)	Yes
Capital improvements project funding	No
Authority to Levy Taxes for specific purposes	Yes
User fees for water, sewer, gas or electric service	Yes
Impact fees for homebuyers or developers of new development/homes	No
Stormwater utility fee	No
Incur debt through general obligation bonds	Yes
Incur debt through special tax bonds	Yes
Incur debt through private activity bonds	No
Withhold public expenditures in hazard-prone areas	Yes
Other federal or state funding programs	Yes
Open Space Acquisition funding programs	Yes
Other	No

Community Classifications

Table 9.7-9 below summarizes classifications for community program available to the Town of Johnsburg.

Table 9.7-9. Community Classifications

Program	Do you have this? (Yes/No)	Classification (if applicable)	Date Classified (if applicable)
Community Rating System (CRS)	No	N/A	N/A
Building Code Effectiveness Grading Schedule (BCEGS)	No	N/A	N/A
Public Protection (ISO Fire Protection Classes 1 to 10)	Yes	N/A	N/A
Storm Ready	Yes	N/A	N/A
Firewise	Yes	N/A	N/A
Disaster/safety programs in/for schools	Yes	N/A	N/A
Organizations with mitigation focus (advocacy group, non-government)	No	N/A	N/A
Public education program/outreach (through website, social media)	TBD	N/A	N/A
Public-Private Partnerships	TBD	N/A	N/A

Note:

- N/A Not applicable
- NP Not participating
- TBD To be determined
- Unavailable

The classifications listed above relate to the community’s ability to provide effective services to lessen its vulnerability to the hazards identified. These classifications can be viewed as a gauge of the community’s capabilities in all phases of emergency management (preparedness, response, recovery and mitigation) and are used as an underwriting parameter for determining the costs of various forms of insurance. The Community





Rating System (CRS) class applies to flood insurance, while the Building Code Effectiveness Grading Schedule (BCEGS) and Public Protection classifications apply to standard property insurance. CRS classifications range on a scale of 1 to 10, with class 1 being the best possible classification, and class 10 representing no classification benefit. Firewise classification is higher if the subject property is more than 1000 feet from a creditable fire hydrant and is within 5 road miles of a recognized Fire Station.

Criteria for classification credits are outlined in the following documents:

- The Community Rating System Coordinators Manual
- The Building Code Effectiveness Grading Schedule
- The ISO Mitigation online ISO’s Public Protection website at <https://www.isomitigation.com/program-works/how-the-ppc-program-works.html>
- The National Weather Service Storm Ready website at <http://www.stormready.noaa.gov/index.html>
- The National Firewise Communities website at <http://firewise.org/>

Self-Assessment of Capability

Table 9.7-10 below provides an approximate measure of the Town of Johnsbury’s capability to work in a hazard-mitigation capacity and/or effectively implement hazard mitigation strategies to reduce hazard vulnerabilities.

Table 9.7-10. Self-Assessment Capability for the Municipality

Area	Degree of Hazard Mitigation Capability		
	Limited (If limited, what are your obstacles?)*	Moderate	High
Planning and Regulatory Capability	X		
Administrative and Technical Capability	X		
Fiscal Capability	X		
Community Political Capability			X
Community Resiliency Capability		X	
Capability to Integrate Mitigation into Municipal Processes and Activities.		X	

National Flood Insurance Program

NFIP Floodplain Administrator (FPA)

Danae Tucker, Zoning Enforcement Officer

Flood Vulnerability Summary

As of November 30, 2015, 11 policies were in force, six of which were within the 100-year flood boundary. Since 1978, 3 claims have been paid totaling \$56,869. There are no repetitive loss property and no severe repetitive loss properties in the Town of Johnsbury. According to current NFIP statistics at the time of this Plan, NFIP policies in the Town of Johnsbury insured over \$2.2 million of property with total annual insurance premiums of \$ 6,006.

The majority of flood damage from storms in the past 5 years affected roads and bridges. The Town maintains a list of damaged properties, but no property owners have expressed interest (thus far) in mitigation. Currently, the Town is not aware of any property owners interested in mitigation (elevation or acquisition), or if any are





currently in the process of mitigation. Private flood insurance is the most likely funding source for any ongoing mitigation on private properties.

The Town FPA makes Substantial Damage estimates in conjunction with FEMA for publicly owned infrastructure.

Resources

The Town FPA is the sole person assuming the responsibilities of floodplain administration. The FPA reviews and inspects all zoning applications, but does not provide any education or outreach to the community regarding flood hazards/risk, and flood risk reduction.

Barriers to running an effective floodplain management program in the community include lack of funding and availability. The FPA feels adequately supported in fulfilling the responsibilities of the municipal floodplain administrator, but there exists a serious lack of funding and availability of appropriate training. The FPA would attend continuing education and/or certification training on floodplain management if it were offered in the County.

Compliance History

The town is in good standing in the NFIP, but is unaware of when the most recent Community Assistance Visit occurred.

The Town intends to continue active participation in the NFIP, and maintain compliance with all requirements of participation. Further, the Town has identified several actions to support both continued and improved participation in the NFIP as identified in Table 9.7-13.

Regulatory

The Town's floodplain management regulations/ordinances meet the FEMA and State minimum requirements.

The Town maintains other local ordinances, plans or programs (e.g. site plan review) that support floodplain management and meeting the NFIP requirements. For instance, the planning and zoning board considers efforts to reduce flood risk when reviewing development applications.

The community has not considered joining the Community Rating System (CRS) program to reduce flood insurance premiums for their insured, but would consider attending a seminar if they were offered locally.

Integration of Hazard Mitigation into Existing and Future Planning Mechanisms

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, each community was surveyed to obtain a better understanding of their community's progress in plan integration. A summary is provided below. In addition, the community identified specific integration activities that will be incorporated into municipal procedures.

Planning

Comprehensive Plan: The Town comprehensive plan discussed elements relevant to hazard mitigation including flood hazard areas and steep slopes, but does not explicitly refer to a local or Countywide Hazard Mitigation Plan.



Comprehensive Emergency Management Plan: Johnsburg utilizes the Warren County Comprehensive Emergency Management Plan.

Regulatory and Enforcement (Ordinances)

Zoning Ordinance: Johnsburg municipal zoning and subdivision regulations, and/or site plan review process, consider natural hazard risk including the presence of floodplains, steep slopes, and sensitive habitat areas. In addition, the Town's zoning and subdivision regulations and site plan review process requires developers to take additional actions to mitigate natural hazard risk with activities such as stormwater detention, creating easements in areas/zones of hazard risk, etc.

The Planning Board and Zoning Enforcement Officer reference available old floodplain maps to guide their decisions with respect to natural hazard risk management. The town also utilizes Clough Harbor and Associates for advice on major planning decisions.

Town of Johnsburg Flood Damage Protection Law: This article promotes the public health, safety, and general welfare of residents and seeks to minimize public and private losses due to flood conditions and erosion. The chapter regulates development to promote flood resistant structures and controls the alteration of floodplains to prevent increased vulnerability. The ordinance meets, but does not exceed, the minimum Federal and State NFIP regulatory requirements

Operational and Administration

Johnsburg has a planning board that enforces local development and the regulations in the local land use plan. The Johnsburg Planning Board also performs the Stormwater Management functions in the community.

The Zoning Enforcement Officer is responsible for reviewing all development permits and site plan applications, and also performs the NFIP Floodplain Management functions in the community.

Town staff participate in other groups and committees that support natural hazard risk reduction and build hazard management capabilities, including Warren County Soil and Water Conservation District (SWCD).

Town staff would benefit from additional training and/or certification in preparing grant applications for mitigation projects and natural hazard risk reduction with respect to natural hazard risk management.

Funding

Operating Budget: The Town's operating budget contains minimal provisions for expected repairs like snow removal and infrastructure repair after a storm or natural disaster, but includes no line items specifically for mitigation projects/activities. There are no capital improvement funds for any budget lines.

The Highway Department is currently working with the Town Board to set one up a capital improvement fund for bridges to increase the \$20,000.00 per year allotment for bridge work which is insufficient for the department needs. In one recent year, three town bridges were red flagged, with repair costs estimated at more than \$750,000.

Education and Outreach

The Town utilizes a bulletin board in the Town Hall as a public outreach mechanism to inform citizens on natural hazards (e.g. safe use of generators, emergency preparedness, and flood hazard information).

The Town recognizes that holding regular public information sessions would promote further public outreach and education in your community with respect to natural hazard risk management.



9.7.6 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and prioritization.

Past Mitigation Initiative Status

Table 9.7-11 below indicates progress on the community’s mitigation strategy identified in the 2011 Plan. Previous actions that are now ongoing programs and capabilities are indicated as such in Table 9.7-11, and also appear under “Capability Assessment” presented previously in this annex. Actions carried forward as part of this plan update are included in the following subsection (in Table 9.7-12) with prioritization.

Table 9.7-11. Past Mitigation Initiative Status

Description	Status	Review Comments
Maintain cleared areas around roadways (obstructions of groundwater, infestation), including: - areas around Riverside Station Road, River Road	Ongoing	One of Riverside Station track that washed out a road. Continue - Crown Riverside Station road to prevent debris buildup and ice formation.
Elevate or reroute roadways and bridges to avoid flooding. Specific locations include: - Barney Hill Road Baker’s Mills area (Town of Johnsbury)	Ongoing	These areas washes out frequently. Efforts are made yearly to work on culverts but keep washing out. Continue - Repair or retrofit low-lying bridges on Garnett Lake Road and Harvey Road.
Develop plans for debris management after hazard events, including severe winter snow/ice events, and other severe storms.	Ongoing	Operational
Monitor and remove trees/limbs in storm areas that present potential hazards to keep trees from threatening lives, property, and public infrastructure during storm events.	Ongoing	Operational
Coordinate/create mutual aid agreements between emergency services, public works departments, and public utilities to ensure efficient use of resources during and after storm events.	Ongoing	Operational
Obtain funding to purchase generators for municipally-owned critical facilities.	Continue	Backup power for the school
Apply for grants to assist with mitigation activities needed to provide a level of protection for critical facilities.	Ongoing	Operational - Notify and provide needed support to the facility managers/operators of those critical facilities located in the floodplain and evaluate the facility’s flood vulnerability and identify feasible mitigation options. Efforts to mitigate critical facilities shall recognize Federal and State directives for protection to the 500-year flood level or “worst case scenario”.
Maintain a current inventory of at-risk buildings and infrastructure and continually update inventory of at-risk structures in each jurisdiction.	Ongoing	Operational



Table 9.7-11. Past Mitigation Initiative Status

Description	Status	Review Comments
Provide continuing education and training for local Floodplain Administrator to ensure code enforcement and proper inspections.	Ongoing	Continue action as - Provide annual education and training for local Floodplain Administrator to ensure code enforcement and proper inspections.
Send a town representative to the NYS Wildland Fire Suppression Training.	Discontinue	Not applicable to Town.
Provide training for local code enforcement officials to implement building codes that reflect disaster resistant construction for new structures and renovation.	Ongoing	Continue action as - Provide annual education and training for local Floodplain Administrator to ensure code enforcement and proper inspections.
Provide residents with information listing steps taken to lessen potential flood damage to reduce the impact of flooding.	Complete – ongoing operational capability	Working with Warren County Soil and Water, the town was able to persuade property owners to build a causeway in their private pond, which now prevents waters back to Sodom Rd. from washing out during every large rain storm. Also educating the public on damage from beaver dams – the highway department was able to allow trappers to remove beaver dams from Crane Mt. Road, Cleveland Rd, and Coulter Rd. that now prevents flood damage.
Educate the community on benefits of carrying NFIP policies and increase knowledge of NFIP services.	Ongoing	Continue as - Conduct education and outreach to residents and business owners to inform them if their properties are in known hazard areas, and actions they can take to protect those properties.
Design a network of citizens that will check in on elderly, functional needs, and low- income individuals during major events.	Discontinue	Not applicable to Town.
Educate residents regarding steps to be taken to decrease the impact of natural hazards (including ice storms, wild/forest fires, severe storms, tornado, earth-quakes, and all other natural hazards) by developing, enhancing, and implementing education programs, brochures, school presentations informing groups about ways to reduce risk, and other outreach activities.	Complete – ongoing operational capability	Working with Warren County Soil and Water, the town was able to persuade property owners to build a causeway in their private pond, which now prevents waters back to Sodom Rd. from washing out during every large rain storm.
Review and update local plans to integrate goals, objectives, and activities from this HMP which are not found in existing regulatory documents, as appropriate.	Ongoing	Continue as - Integrate the risk assessment and recommendations of the hazard mitigation plan into the comprehensive plan.
Implement zoning regulations to discourage building new structures in disaster prone areas – if such regulations are not already written into Town Zoning code or Floodplain Ordinance.	Complete – ongoing operational capability	Discontinue



Completed Mitigation Initiatives not Identified in the Previous Mitigation Strategy

The Town of Johnsborg has identified the following mitigation projects/activities that have also been completed but were not identified in the previous mitigation strategy in the 2011 Plan:

- Highway department installed a temporary bridge on Garnet Lake Road.
- Replaced Armstrong Rd Bridge and installed a new culvert that took out sharp turn.
- Replaced Harrington Road bridge over Mill Creek
- Barton's Mines Rd
 - Installed 900 linear feet of stone retainer wall to prevent future washouts.
 - Installed a 17' structural box culvert to prevent wash outs from an improper sized culvert.
 - Realigned Balm of Gilead Brook near the intersection of Hayes Rd. to properly align with large culvert.
 - Also installed stone retainer wall to prevent Brook from overflowing stream and washing out the road in that location.
- Rogers Rd.
 - Built a large stone abutment and installed a causeway to try and prevent Balm of Gilead Brook from washing out area in the future. This is the 3rd time we have repaired this area. FEMA will not allow for a bridge to be built, however there was a bridge there at one time.
- Crosby Rd. – Installed 70' stone retainer wall to prevent future road erosion.
- Waddell Rd. – Replaced undersized bridge with a structural box culvert.
- New improved Town website
- New eWaste Collection Container at transfer station

Proposed Hazard Mitigation Initiatives for the Plan Update

The Town of Johnsborg participated in a mitigation action workshop in September and was provided the following Federal Emergency Management Agency (FEMA) publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 'Selecting Appropriate Mitigation Measures for Floodprone Structures' (March 2007) and FEMA 'Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards' (January 2013).

Table 9.7-12 summarizes the comprehensive-range of specific mitigation initiatives the Town of Johnsborg would like to pursue in the future to reduce the effects of hazards. Some of these initiatives may be previous actions carried forward for this plan update. Implementation of these initiatives will depend on available funding (grants and local match availability), and some initiatives may be modified or omitted at any time based on occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in Table 9.7-12 to further demonstrate the wide range of activities and mitigation measures selected.

As discussed in Section 6, 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing your actions as 'High', 'Medium', or 'Low.' The table below summarizes the evaluation of each mitigation initiative, listed by Action Number.

Table 9.7-12 summarizes the prioritization of all proposed mitigation initiatives for the Plan update.



Table 9.7-12. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category	CRS Category
JB-1 (carryover)	Integrate the risk assessment and recommendations of the hazard mitigation plan into the comprehensive plan.	Both	All hazards	1	Planning Board	Low-Medium	Low	PDM, Town Staff/ Operating Budget	Short	Medium	LPR	PR
JB-2	Repair or retrofit low-lying bridges on Garnett Lake Road and Harvey Road. SEE ACTION WORKSHEET	Existing	Severe storm, flood	1, 3	Town Board; Highway Dept.	High	High	CHIPS, Local budget, NYS DHSES, County	Short, DOF	High	SIP	PP
JB-3	Crown Riverside Station road to prevent debris buildup and ice formation. SEE ACTION WORKSHEET	Existing	Flood – stormwater, severe storm	1, 3	Town DPW, Planning Department	Medium-High	\$1 Million (High)	HMGP, FMA, PDM	DOF	Medium	SIP, NSP	NR, SP
JB-4	Notify and provide needed support to the facility managers/operators of those critical facilities located in the floodplain and evaluate the facility’s flood vulnerability and identify feasible mitigation options. Working from available data on critical facilities in the floodplain, the Town shall provide direct outreach to facility managers/operators of their vulnerability, and work to develop needed data to support vulnerability assessments performed by the County. Facility owners/operators shall be advised of opportunities to insure and mitigate their flood risks, and the Town shall assist (non-financial) with securing mitigation grant funding as available and appropriate.											
	Efforts to mitigate critical facilities shall recognize Federal and State directives for protection to the 500-year flood level or “worst case scenario”.											
	See above.	Existing	Flood, severe storm	1, 3	Johnsburg Public Works, Planning Board	High	High	FEMA (HMGP, FMA, PDM), CDBG, NYS DHSES, County	Short-Term	High	EAP	SP, PP
JB-5	Provide annual education and training for local Floodplain Administrator to ensure code enforcement and proper inspections.	N/A	Flood	2, 3	Town Board	Medium	Low	N/A	OG	High	EAP	PR
JB-6	Develop and implement a strategy to mitigate risk to public and property from beaver dam breaches along Coulter Road.	Both	Flood	1, 3	Planning Department, NYS DEC, Private property owners	Low	Low	FMA, HMGP, PDM	DOF	Low	LPR, NSP	PR, NR
JB-7 (carryover)	Conduct education and outreach to residents and business owners to inform	Existing	Earthquake, flood, infestation,	1, 3, 4	Town Clerk	High	Low	Operating budget	OG	High	EAP	PI





Table 9.7-12. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category	CRS Category
	them if their properties are in known hazard areas, and actions they can take to protect those properties.		landslide, wildfire, hazmat									
JB-8	Purchase and install backup power generators for municipally-owned critical facilities, including Johnsburg Central School.	Existing	Earthquake, flood, severe storm, severe winter storm	1, 3, 4	Johnsburg Public Works, Central School District	High	Medium	HMGP, FMA, PDM, CDBG, NYS DHSES, County	Short	High	SIP	ES

Notes:

Not all acronyms and abbreviations defined below are included in the table.

*Does this mitigation initiative reduce effects of hazards on new and/or existing buildings and/or infrastructure? Not applicable (N/A) is inserted if this does not apply.

Acronyms and Abbreviations:

- CAV Community Assistance Visit
- CDBG Community Development Block Grant
- GCRS Community Rating System
- DPW Department of Public Works
- FEMA Federal Emergency Management Agency
- FPA Floodplain Administrator
- HMA Hazard Mitigation Assistance
- N/A Not applicable
- NFIP National Flood Insurance Program
- OEM Office of Emergency Management

Potential FEMA HMA Funding Sources:

- FMA Flood Mitigation Assistance Grant Program
- HMGP Hazard Mitigation Grant Program
- PDM Pre-Disaster Mitigation Grant Program
- RFC Repetitive Flood Claims Grant Program (discontinued)
- SRL Severe Repetitive Loss Grant Program (discontinued)

Timeline:

- Short 1 to 5 years
- Long Term 5 years or greater
- OG On-going program
- DOF Depending on funding

Costs:

Where actual project costs have been reasonably estimated:

- Low < \$10,000
- Medium \$10,000 to \$100,000
- High > \$100,000

Where actual project costs cannot reasonably be established at this time:

- Low Possible to fund under existing budget. Project is part of, or can be part of, an existing ongoing program.

Benefits:

Where possible, an estimate of project benefits (per FEMA's benefit calculation methodology) has been evaluated against the project costs, and is presented as:

- Low < \$10,000
- Medium \$10,000 to \$100,000
- High > \$100,000

Where numerical project benefits cannot reasonably be established at this time:

- Low Long-term benefits of the project are difficult to quantify in the short term.





Costs:

Medium Could budget for under existing work plan, but would require a reapportionment of the budget or a budget amendment, or cost of the project would have to be spread over multiple years.

High Would require an increase in revenue via an alternative source (i.e., bonds, grants, fee increases) to implement. Existing funding levels are not adequate to cover costs of the proposed project.

Benefits:

Medium Project will have a long-term impact on reduction of risk exposure to life and property, or project will provide an immediate reduction in risk exposure to property.

High Project will have an immediate impact on reduction of risk exposure to life and property.

Mitigation Category:

- **Local Plans and Regulations (LPR)** – Actions that include government authorities, policies, or codes that influence the way land and buildings are developed and built.
- **Structure and Infrastructure Project (SIP)** – Actions that involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures, as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce impacts of hazards.
- **Natural Systems Protection (NSP)** – Actions that minimize damage and losses, and also preserve or restore the functions of natural systems.
- **Education and Awareness Programs (EAP)** – Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities

CRS Category:

- **Preventative Measures (PR)** – Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and stormwater management regulations.
- **Property Protection (PP)** – Actions include public activities to reduce hazard losses or 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.
- **Public Information (PI)** – 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 educational programs for school-age children and adults.
- **Natural Resource Protection (NR)** – 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.
- **Structural Flood Control Projects (SP)** – Actions that involve construction of structures to reduce impacts of a hazard. Such structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.
- **Emergency Services (ES)** – Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and protection of essential facilities



Table 9.7-13. Summary of Prioritization of Actions

Mitigation Action/Project Number	Mitigation Action/Initiative	Life Safety	Property Protection	Cost-Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
JB-1	Integrate the risk assessment and recommendations of the hazard mitigation plan into the comprehensive plan.	0	1	1	1	0	1	1	0	0	1	1	0	0	0	7	Medium
JB-2	Repair or retrofit low-lying bridges on Garnett Lake Road and Harvey Road.	1	1	0	1	0	1	0	1	0	1	1	0	0	0	7	Medium
JB-3	Crown Riverside Station road to prevent debris buildup and ice formation.	1	1	0	1	0	1	0	1	0	1	1	0	0	0	7	Medium
JB-4	Notify and provide needed support to the facility managers/operators of those critical facilities located in the floodplain and evaluate the facility's flood vulnerability and identify feasible mitigation options. Efforts to mitigate critical facilities shall recognize Federal and State directives for protection to the 500-year flood level or "worst case scenario".	1	1	1	0	1	1	-1	1	1	1	1	1	0	1	10	High
JB-5	Provide annual education and training for local Floodplain Administrator to ensure code enforcement and proper inspections.	0	0	1	1	0	1	1	0	0	1	0	1	0	0	6	Medium
JB-6	Develop and implement a strategy to mitigate risk to public and property	0	0	1	0	0	0	0	0	0	0	0	0	1	1	3	Low





Table 9.7-13. Summary of Prioritization of Actions

Mitigation Action/Project Number	Mitigation Action/Initiative	Life Safety	Property Protection	Cost-Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
	from beaver dam breaches along Coulter Road.																
JB-7	Conduct education and outreach to residents and business owners to inform them if their properties are in known hazard areas, and actions they can take to protect those properties.	1	1	1	1	1	1	1	0	1	-1	1	1	1	1	11	High
JB-8	Purchase and install backup power generators for municipally-owned critical facilities, including Johnsburg Central School.	1	0	1	1	1	1	0	0	1	1	1	0	0	0	8	High

Note: Refer to Section 6, which conveys guidance on prioritizing mitigation actions.



9.7.7 Future Needs To Better Understand Risk/Vulnerability

None at this time.

9.7.8 Hazard Area Extent and Location

Hazard area extent and location maps have been generated for the Town of Johnsburg that illustrate the areas probable to be impacted within the municipality (see Figure 9.7-1 and Figure 9.7-2 below). These maps are based on the best available data at the time of the preparation of this Plan, and are considered to be adequate for planning purposes. Maps have been generated for those hazards (i.e., wildfire and flooding) that can be clearly identified using mapping techniques and technologies, and to which the Town of Johnsburg has significant exposure. These maps also appear in the hazard profiles within Section 5.4, Volume I of this Plan.

9.7.9 Additional Comments

None at this time.



Figure 9.7-1. Town of Johnsburg Flood and Wildfire Hazard Area Extent and Location Map

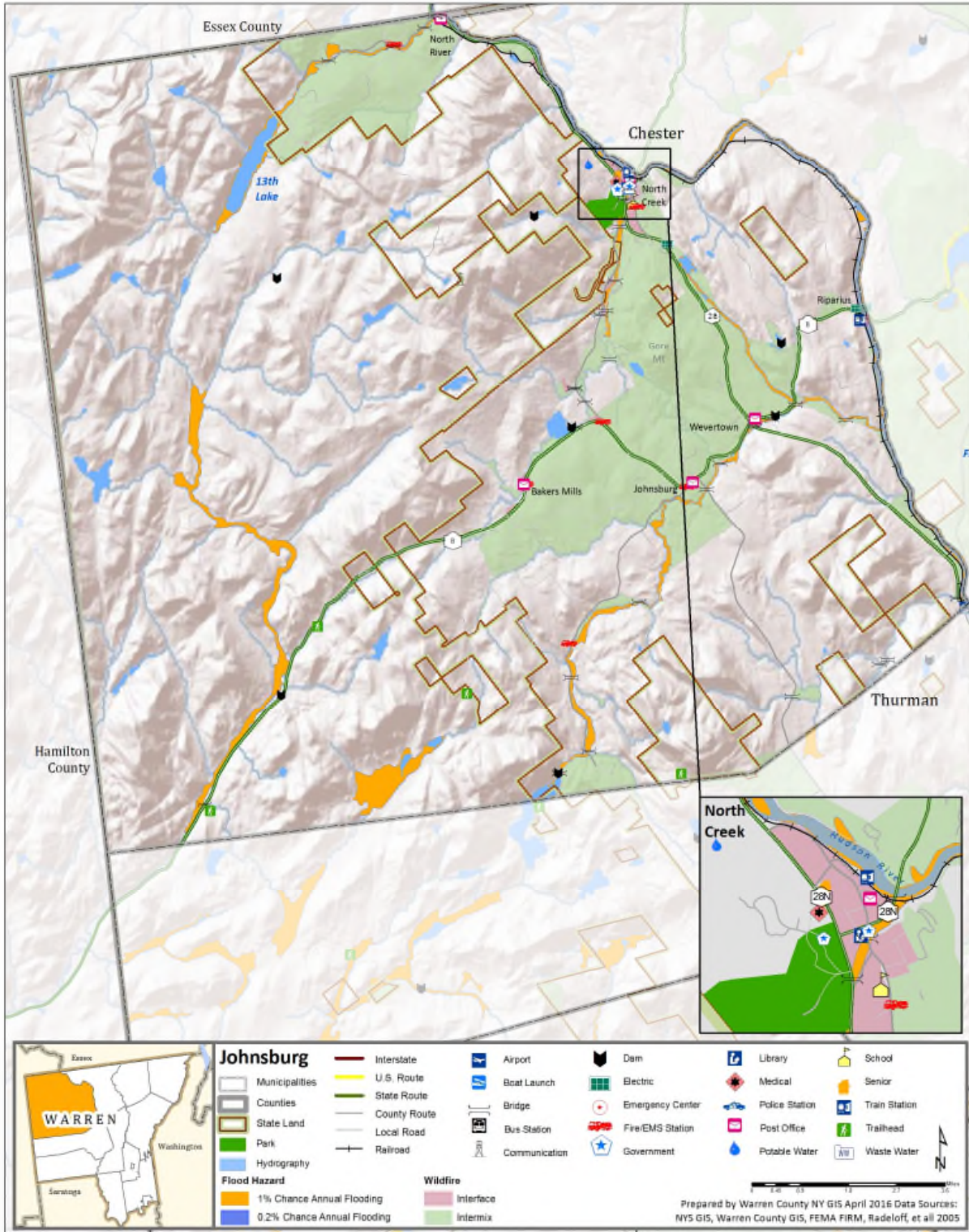
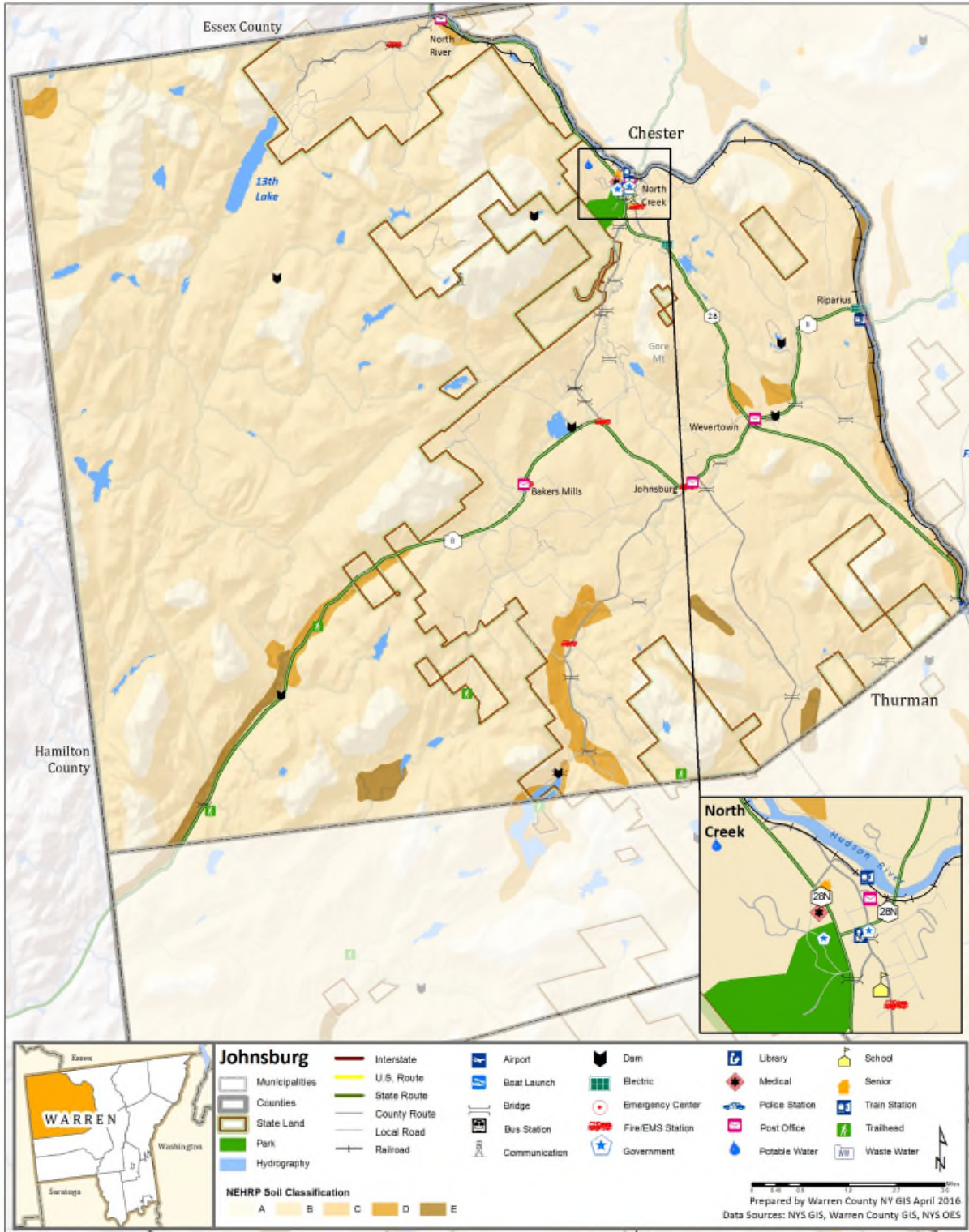




Figure 9.7-2. Town of Johnsburg Landslide Hazard Area Map





Name of Jurisdiction:	Town of Johnsburg
Name and Title Completing Worksheet:	Dan Hitchcock, Highway Department Superintendent
Action Number:	JB-2
Mitigation Action Name:	Repair or retrofit low-lying bridges on Garnett Lake Road and Harvey Road.

Assessing the Risk	
Hazard(s) addressed:	Severe Storm, Flooding
Specific problem being mitigated:	Harvey Road Bridge has bad abutments. Garnett Lake Road Bridge has rotted out steel I-Beams
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	The Town has been working on trying to get a grant for the Harvey Road Bridge repair, and was awarded \$230,000 in CHIPS money, but this has to cover paving as well. A temporary bridge was considered for Garnett Lake Road Bridge, but there is no place to put it.
Action/Project Intended for Implementation	
Description of Selected Action/Project	Repair Harvey Road Bridge, including repaving, and replace the Garnett Lake Road Bridge. All mitigation efforts shall be made in consideration of Federal and State directives to mitigate critical infrastructure to address protection to the 500-year flood event or “worst damage scenario”.
Mitigation Action Type	SIP
Goals Met	1, 3
Applies to existing and or new development, or not applicable	Existing
Benefits (losses avoided)	High – risk of bridge failure
Estimated Cost	High
Priority*	High
Plan for Implementation	
Responsible Organization	Town Board; Highway Dept.
Local Planning Mechanism	Capital Improvements Budget
Potential Funding Sources	CHIPS, Local budget, NYS DHSES, County
Timeline for Completion	Short
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:



Action Number:

JB-2

Mitigation Action Name:

Repair or retrofit low-lying bridges on Garnett Lake Road and Harvey Road.

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Reduce the risk of bridge collapse
Property Protection	1	Reduce the risk of bridge collapse
Cost-Effectiveness	0	High Cost, High Benefit
Technical	1	This project is technically feasible.
Political	0	
Legal	1	The Town has legal jurisdiction over the bridges.
Fiscal	0	Outside funding may be necessary to complete the work.
Environmental	1	Reduce the risk of continued erosion and bank failure surrounding bridge abutments.
Social	0	
Administrative	1	The Town has the administrative capabilities to manage the project.
Multi-Hazard	1	The project addresses the Severe Storm and Flood hazards.
Timeline	0	Depends on funding
Agency Champion	0	
Other Community Objectives	0	
Total	7	
Priority (Tier I, II or III)	Medium	



Name of Jurisdiction:	Town of Johnsburg
Name and Title Completing Worksheet:	Dan Hitchcock, Highway Department Superintendent
Action Number:	JB-3
Mitigation Action Name:	Crown Riverside Station road

Assessing the Risk	
Hazard(s) addressed:	Flooding
Specific problem being mitigated:	Icing is a problem on Riverside Station Road, particularly in the area of Rt. 28.
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	The only practical and cost-effective solution to address this problem is through on-going drainage improvements and proper crowning of the road.
Action/Project Intended for Implementation	
Description of Selected Action/Project	Crown Riverside Station road to improve drainage and prevent ice formation. All mitigation efforts shall be made in consideration of Federal and State directives to mitigate critical infrastructure to address protection to the 500-year flood event or “worst damage scenario”.
Mitigation Action Type	SIP, NSP
Goals Met	1, 3
Applies to existing and or new development, or not applicable	Existing
Benefits (losses avoided)	Reduced risk of roadway icing; improved drainage and reduced damage to roadway, shoulders and culverts.
Estimated Cost	\$1 Million (High)
Priority*	Medium
Plan for Implementation	
Responsible Organization	Town DPW, Planning Department
Local Planning Mechanism	DPW
Potential Funding Sources	HMGP, FMA, PDM
Timeline for Completion	DOF
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:



Action Number:

JB-3

Mitigation Action Name:

Crown Riverside Station Road

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Reduce the risk of icing and possible accidents.
Property Protection	1	Reduce the risk of icing which may lead to roadway failure.
Cost-Effectiveness	0	High Cost, Medium-High Benefit
Technical	1	This project is technically feasible.
Political	0	
Legal	1	The Town has legal jurisdiction over the segment of roadway in question.
Fiscal	0	Outside funding may be necessary to complete the work.
Environmental	1	May reduce the risk of erosion and bank failure.
Social	0	
Administrative	1	The Town has the administrative capabilities to manage the project.
Multi-Hazard	1	The project addresses the Severe Storm and Flood hazards.
Timeline	0	Depends on funding
Agency Champion	0	
Other Community Objectives	0	
Total	7	
Priority	Medium	



Name of Jurisdiction:	Town of Johnsburg
Name and Title Completing Worksheet:	Dan Hitchcock, Highway Department Superintendent
Action Number:	JB-8
Mitigation Action/Initiative:	Purchase and install backup power generators for municipally-owned critical facilities

Assessing the Risk	
Hazard(s) addressed:	Earthquake, flood, severe storm, severe winter storm
Specific problem being mitigated:	Lack of backup power at municipal-owned critical facilities
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	There are no feasible or cost-effective alternatives to the installation or back-up power to maintain critical facilities during power outages. Tree-trimming is an on-going effort throughout the County. Alternatives such as burying all power lines, secondary grid feeds and "micro-grids" are cost-prohibitive and outside the capabilities of the Town.
Action/Project Intended for Implementation	
Description of Selected Action/Project	Purchase and install backup power generators for municipally-owned critical facilities, including Johnsburg Central School.
Action/Project Category	SIP
Goals Met	1, 3, 4
Applies to existing and or new development, or not applicable	Existing
Benefits (losses avoided)	High
Estimated Cost	Medium
Priority*	High
Plan for Implementation	
Responsible Organization	Johnsburg Public Works, Central School District
Local Planning Mechanism	Emergency Management, Hazard Mitigation
Potential Funding Sources	HMGP, FMA, PDM, CDBG, NYS DHSES, County
Timeline for Completion	Short Term
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:



Action Number:

JB-8

Mitigation Action/Initiative:

Purchase and install backup power generators for municipally-owned critical facilities

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	
Property Protection	0	
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	
Fiscal	0	Need to seek grant funding
Environmental	0	
Social	1	
Administrative	1	
Multi-Hazard	1	Earthquake, flood, severe storm, severe winter storm
Timeline	0	
Agency Champion	0	
Other Community Objectives	0	
Total	8	
Priority (High/Med/Low)	High	



9.8 Town of Lake George

This section presents the jurisdictional annex for the Town of Lake George.

9.8.1 Hazard Mitigation Plan Point of Contact

The following individuals have been identified as the hazard mitigation plan's (HMP) primary and alternate points of contact.

Primary Point of Contact	Alternate Point of Contact
Dan Barusch, Director of Planning and Zoning 20 Old Post Road Lake George, NY 12845 (518) 668-5131 Ext.311 dbarusch@lakegeorgetown.org	Dennis Dickinson, Supervisor 20 Old Post Road Lake George, NY 12845 (518) 668-5722 x1 supervisor@lakegeorgetown.org

9.8.2 Municipal Profile

The Town of Lake George is in southeastern Warren County proximate to the southwestern shore of Lake George. The Town has a land area of 32.7 square miles of which 30.2 square miles is land and 2.5 square miles is water. There are three hamlets located in the Town: Big Hollow, Crosbyside and Diamond Point. The Town also included Bloody Pond located in the south part of town. Interstate 87 passes through the town.

According to the 2010 Census, the community's population was 3,515.

Growth/Development Trends

The Town of Lake George noted that there has not been any large-scale commercial development in Town for a while. Most large-scale developments are residential subdivisions. The most recent infrastructure project (since 2010), aside from the Beach Road project, was the Route 9 Gateway project.

Table 9.8-1 summarizes recent residential/commercial development in the Town of Lake George since 2010 and lists any known or anticipated major residential/commercial development and major infrastructure development that has been identified in the next five years within the municipality. Refer to the maps following Section 9.8.9 of this annex: Figure 9.8-1 that illustrates landslide hazard areas, and Figure 9.8-2 that illustrates the flood and wildfire hazard areas.

Table 9.8-1. Growth and Development

Property or Development Name	Type (e.g. Res., Comm.)	# of Units / Structures	Location (address and/or Parcel ID)	Known Hazard Zone(s)	Description/Status of Development
Recent Development from 2010 to present					
Diamond Lookout Subdivision	Residential	14-15	Watershed Drive	None	Construction finished on two lots. Other lots pending purchase / site plan review
Lochlea Subdivision	Residential	9-11	Lochlea Lane	None	4-5 existing cabins, with 5-6 structures built / planned since 2010. Located along English Brook (Town / Village)



Property or Development Name	Type (e.g. Res., Comm.)	# of Units / Structures	Location (address and/or Parcel ID)	Known Hazard Zone(s)	Description/Status of Development
Known or Anticipated Development in the Next Five (5) Years					
Route 9 Gateway Project	Infrastructure	N/A	Route 9N from Exit 21 to Village	None	Construction started in 4/16 and last until early 2017
Konci Terrace Subdivision	Residential	10-20	Konci Terrace	None	Pending purchase of lots and individual site plan review
Route 9N Subdivision	Residential	34-38	Route 9N near Exit 21	None	Pending purchase of lots and individual site plan review
BBD Subdivision	Residential	24-26	Bloody Pond Rd.	None	Pending purchase of units and potential site plan review
Cohold LLC Subdivision	Residential	19-20	Bloody Pond Rd.	None	Pending purchase of units and potential site plan review
Mountains Edge Subdivision	Residential	16-18	Huna Way	None	Pending purchase of lots and individual site plan review

Note: Only location-specific hazard zones or vulnerabilities are identified

9.8.3 Natural Hazard Event History Specific to the Municipality

Warren County has a history of natural and non-natural hazard events as detailed in Volume I, Section 5.0 of this Plan. A summary of historical events appears in each hazard profile, and includes a chronology of events that have affected the County and its municipalities. For the purpose of this Plan update, events that have occurred in the County from 2010 to present were summarized to indicate the range and impact of hazard events in the community. Information regarding specific damages is included, if available, based on reference material or local sources. This information is presented in Table 9.8-2 below. For details of these and additional events, refer to Volume I, Section 5.0 of this Plan.

Table 9.8-2. Hazard Event History

Dates of Event	Event Type (FEMA Disaster Declaration if applicable)	Warren County Designated?	Summary of Damages/Losses
March 23, 2010	Severe Storms and Flooding (DR-1899)	Yes	Flooding from a severe rain storm caused some damage to several local roads in the Town, additional manpower hours were needed for cleanup.
March 10-14, 2011	Ice Jam	N/A	Additional manpower hours were needed from the Highway Department for plowing and salting of roads. Several car accidents occurred in Town.
April 27-28, 2011	Severe Storms, Flooding, Tornadoes and Straight-Line Winds (DR-1993)	Yes	Flooding occurred along the Hudson River in Warren County from North River southward to the Saratoga County line. Numerous reports of flooding throughout the Town of Lake George occurred on properties along the Lake and proximate to the Schroon River.
May 27 – June 2, 2011	Flooding “Memorial Day Storm”	N/A	Minimal flooding occurred in the Town, unaware of any specific damages.
August 27-29, 2011	Hurricane Irene (DR-4020)	Yes	There was severe wind and flooding damage throughout the County.





Dates of Event	Event Type (FEMA Disaster Declaration if applicable)	Warren County Designated?	Summary of Damages/Losses
			English Brook Foot Bridge that connects the Lochlea development in the Town of Lake George washed away during the storm.
May 29, 2012	Hail and Wind	N/A	Additional manpower needed for debris removal occurring throughout the Town as a result of this event.
October 29, 2012	Hurricane Sandy (EM-3351)	Yes	Heavy rainfall throughout the Town, although not much damage was incurred within the Town.
June 28, 2013	Severe Storms and Flooding (DR-4129)	Yes	Minimal flooding occurred in the Town, unaware of any specific damages.
July 8, 2014	Thunderstorms and Tornado (F0) (DR-4180)	No	Heavy rainfall throughout the Town. Additional manpower needed for debris removal occurring throughout the Town as a result of this event.

Notes:

- EM Emergency Declaration (FEMA)
- FEMA Federal Emergency Management Agency
- DR Major Disaster Declaration (FEMA)
- N/A Not applicable

9.8.4 Hazard Vulnerabilities and Ranking

The hazard profiles in Section 5.0 of this Plan convey detailed information regarding each plan participant’s vulnerability to the identified hazards. The following summarizes the hazard vulnerabilities and their ranking in the Town of Lake George. For additional vulnerability information relevant to this jurisdiction, refer to Section 5.0.

Hazard Risk/Vulnerability Risk Ranking

Table 9.8-3 below summarizes hazard risk/vulnerability rankings of potential hazards for the Town of Lake George.

Table 9.8-3. Hazard Risk/Vulnerability Risk Ranking

Hazard type	Estimate of Potential Dollar Losses to Structures Vulnerable to the Hazard ^{a, b}	Probability of Occurrence	Risk Ranking Score (Probability x Impact)	Hazard Ranking ^a
Earthquake	100-year MRP: \$29,277.00 500-year MRP: \$2,659,712 2,500-Year MRP: \$21,251,565.00	Occasional	12	Low
Flood	RCV Exposed to 1% Annual Chance: \$1,375,354	Frequent	18	Medium
Landslide	Damage estimate not available	Occasional	16	Medium
Infestation	Damage estimate not available	Frequent	24	Medium
Severe Storm	RCV Exposed to 1938 storm-winds: \$356,068	Frequent	48	High
Severe Winter Storm	GBS 1% Loss: \$4,599,120 GBS 5% Loss: \$22,995,600	Frequent	51	High
Wildfire	RCV Exposed to Intermix: \$421,075,000 RCV Exposed to Interface: \$231,290,000	Frequent	48	High
Cyber Security	Damage estimate not available	Occasional	12	Low





Hazard type	Estimate of Potential Dollar Losses to Structures Vulnerable to the Hazard ^{a, b}	Probability of Occurrence	Risk Ranking Score (Probability x Impact)	Hazard Ranking ^a
Disease Outbreak	Damage estimate not available	Frequent	27	Medium
Hazardous Material Incidents	Damage estimate not available	Frequent	24	Medium

Notes:

a. The general building stock valuation is based on the custom inventory generated for the municipality and based on improved value.

High = Total hazard priority risk ranking score of 31 and above

Medium = Total hazard priority risk ranking of 20-30+

Low = Total hazard risk ranking below 20

b. Loss estimates for the severe storm and severe winter storm hazards are structural values only and do not include the estimated value of contents. The earthquake was evaluated by Census tract. The Census tracts do not exactly align with municipal boundaries; therefore, a total is reported for each Town inclusive of the Villages. Loss estimates for the flood and earthquake hazards represent both structure and contents. Potential flood loss estimates were generated using Hazus-MH 2.2 and digitized FIRM maps from the 1980s and 1990s for the 1-percent annual chance event; NED DEM was used to generate a depth grid. The County's 2015 Real Property data was used to generate the values for flood and includes structure and contents. For the wildfire hazard, the improved value and estimated contents of buildings located within the identified hazard zones is provided.

GBS General building stock

MRP Mean return period

RCV Replacement Cost Value

National Flood Insurance Program (NFIP) Summary

Table 9.8-4 below summarizes NFIP statistics for the Town of Lake George.

Table 9.8-4. NFIP Summary

Municipality	# Policies (1)	# Claims (Losses) (1)	Total Loss Payments (2)	# Rep. Loss Prop. (1)	# Severe Rep. Loss Prop. (1)	# Policies in 100-year Boundary (3)
Town of Lake George	8	6	\$54,723	0	0	2

Source: FEMA, 2014

Notes:

- (1) Policies, claims, repetitive loss, and severe repetitive loss statistics are provided by FEMA, are current as of November 30, 2015, and are summarized by community name. Total number of repetitive loss properties includes severe repetitive loss properties. Number of claims represents claims closed by November 30, 2015.
- (2) Total building and content losses from the claims file provided by FEMA Region 2.
- (3) Number of policies inside and outside of flood zones is based on latitude and longitude provided by FEMA Region 2 in the policy file.
- (4) FEMA noted that for a property with more than one entry, more than one policy may have been in force or more than one Geographic Information System (GIS) specification was possible.

Critical Facilities

Table 9.8-5 below identifies critical facilities within the municipality located on parcels that intersect the current regulatory NFIP 1% chance flood boundary (aka: "Special Flood Hazard Area" (SFHA)), however it is recognized that the actual facility structure(s) may lie outside of the SFHA. Please refer to the Flood Hazard Profile (Section 5.4.2) for further details of estimated flood losses throughout the County, as well as the "Other Vulnerabilities Identified" section following.



Table 9.8-5. Potential Flood Losses to Critical Facilities

Municipality	Facility Types in 1% Chance Flood Boundary						
	Boat Facilities	Dam	Electric	Government	Highway Bridge	Rail Facility	Wastewater
Lake George	1	0	0	0	0	0	0

Source: Warren County Real Property 2015 tax roll; HAZUS-MH 2.2; FEMA 2015

Notes:

- (1) HAZUS-MH 2.2 provides a general indication of the maximum restoration time for 100% operations. Clearly, a great deal of effort is needed to quickly restore essential facilities to full functionality; therefore, this will be an indication of the maximum downtime (HAZUS-MH 2.2 User Manual).
- (2) Some facilities may be within the Digital Flood Insurance Rate Map (DFIRM) flood hazard boundary; however, HAZUS did not calculate potential loss, perhaps because depth of flooding would not cause any damages to these structures according to the depth damage function used in HAZUS for that facility type. Further, HAZUS-MH may estimate potential damage to a facility outside the DFIRM if the model generates a depth grid beyond DFIRM boundaries.

Other Vulnerabilities Identified

The municipality has identified the following vulnerabilities within their community:

- English Brook Bridge along Lakeshore Drive/SR 9N, half in the Town and half in the Village of Lake George, has flooded out before and could benefit from elevation. The adjacent footbridge located in Lochlea was washed out in 2011 during Hurricane Irene and was rebuilt in-kind (not mitigated).
- Various issues with runoff and stormwater around roadways, including:
 - Lakeshore Dr. – Routine flooding at English brook crossing, and along other areas east of sloped residential neighborhoods, such as the Lake View Estates.
 - Rt. 9L – large events bring massive amounts of runoff and ponding in certain residential areas (Beatty Road, Cedar Lane, Lake Street, Newton Street), degrading streets and contributing to runoff into the Lake.
 - Swale Maintenance on Stone Schoolhouse road – The steep slope of this road makes it difficult to capture and slow surface water runoff, which flows down onto Lakeshore Drive and then into the lake. There are some swales/ditches on side of the roads, but they need better maintenance.
 - Middle Road - Runs across Lake View Brook sub-watershed. Lake View Estates sub-watershed is identified as one of the problematic contributors to runoff in the Town, as there are slopes varying from 5-20% and an unclassified stream / brook that runs down the area into the Lake (near the Tahoe Resort). Storm culverts at the Tahoe have washed out several times causing heavy sedimentation and the formation of a delta in the lake. Middle Road has four stream crossings, paved gutters, and paved turnouts to the brook making it a high priority area for stormwater runoff.

These issues are documented in the 7-2014 *Lake View Estates Watershed Assessment*, prepared by Warren County Soil and Water Conservation District.



- Michelli Drive and Front Street – Stormwater flow from this area on the east side of Lake George becomes very heavy during major events, rushing over Route 9L, then into private residential areas along Front Street and into the lake. The Town encourages homeowners to do stormwater control measures, but can only make recommendations. NYS DOT installed a culvert to take water from Michelli Rd. under Route 9L to a ponding area/drainage basin on other side, but the basin is not being properly maintained and frequently overflows. The ditch can only be accessed by private roads, and gets clogged with trash and debris.
 - Michelli Drive is a Town of Lake George road approximately 3/8 of a mile long, with two short cul-de-sacs off of it. It is located off of NYS Route 9L at the southeastern tip of Lake George, approximately one quarter mile north of Beach Road. Stormwater is captured on Michelli Drive and conveyed to a drainage ditch on the north side of Michelli, which flows into a culvert under Route 9L.
 - Front Street is a small street located between NYS Route 9L and the lake itself, downhill of Michelli Drive. Over the past few years, numerous landowners in the Front Street area have noted frequent and sometimes significant stormwater runoff problems on their properties. It is the contention of the affected downhill landowners that uncontrolled runoff from Michelli Drive, Route 9L, and Usher Park is the problem which exhibits itself on their properties. However, most of the older (pre-1980) houses in this neighborhood are lacking any onsite stormwater management systems such as dry wells, infiltration trenches or swales, water gardens, etc. As such, and in a densely developed and sloping neighborhood like Front Street, stormwater primarily runs off of properties and onto the properties of their topographically lower neighbor.

These issues are documented in the 8-12-05 *Michelli Drive and Front Street Neighborhood Drainage Report*, prepared by Warren County Soil and Water Conservation District.

- Prospect Mountain – Runoff comes down mountain and creates flood problems in residential areas. The Town has limited capabilities for improvement or maintenance because the flooding source is on state-owned lands.
- Big Hollow Road – Flooding sometimes occurs where the road crosses English Brook, to the east of I-87 and to the west of Route 9.
- Beaver Damming
 - Route 9 between Warrensburg and Lake George;
 - Truesdale Hill Road;
 - Other critical transportation infrastructure down through the Big Hollow area and into the Village.
- Schroon River floodplain: Flood prone areas in the Town’s AE Flood Zones (along Schroon River) have little to no flood control measures. Many properties in the northern part of the town bordering Warrensburg are routinely flooded from the Schroon River. Lake George Escapes, a 175 acre campground, falls almost entirely within the floodplain. The campground mostly consists of passive camp sites, but does include some offices, cabins, and a maintenance building. Potential to mitigate flood damage by elevating or flood-proofing office and maintenance building.



9.8.5 Capability Assessment

This section identifies the following capabilities of the local jurisdiction:

- Planning and regulatory capability
- Administrative and technical capability
- Fiscal capability
- Community classification
- NFIP
- Integration of mitigation planning into existing and future planning mechanisms.

Planning and Regulatory Capability

Table 9.8-6 below summarizes regulatory tools available to the Town of Lake George.

Table 9.8-6. Planning and Regulatory Tools

Tool / Program (code, ordinance, plan)	Do you have this? (Yes/No) If Yes, date of adoption or update	Authority (local, county, state, federal)	Dept. /Agency Responsible	Code Citation and Comments (Code Chapter, name of plan, explanation of authority, etc.)
Planning Capability				
Master Plan	Yes, Updated 2015	Local	Town of Lake George Planning and Zoning Office; Comprehensive Plan Committee	Town of Lake George Comprehensive Plan (Adopted 2016)
Capital Improvements Plan	No	-	-	-
Floodplain Management / Basin Plan	No	-	-	-
Stormwater Management Plan	Yes, Updated 2015	Local	Town of Lake George Planning and Zoning Office	Town of Lake George Stormwater Management Program (SWMP) Plan (Adopted October 2015)
Open Space Plan	No	-	-	-
Stream Corridor Management Plan	Yes, Updated 2001	State, Regional	NYS DOS; Lake George Watershed Coalition	“Lake George – Planning for the Future” (Not formerly adopted by Lake George)
Watershed Management or Protection Plan	Yes, Updated 2001	State, Regional	NYS DOS; Lake George Watershed Coalition	“Lake George – Planning for the Future” (Not formerly adopted by Lake George)
Economic Development Plan	No	-	-	-
Comprehensive Emergency Management Plan	Yes, Updated 2015	County	Warren County Office of Emergency Services	Warren County Comprehensive Emergency Management Plan (Adopted October 2015)
Emergency Response Plan	Yes, Updated 2015	County	Warren County Office of Emergency Services	Warren County Comprehensive Emergency Management Plan (Section 3) (Adopted October 2015)



Tool / Program (code, ordinance, plan)	Do you have this? (Yes/No) If Yes, date of adoption or update	Authority (local, county, state, federal)	Dept. /Agency Responsible	Code Citation and Comments (Code Chapter, name of plan, explanation of authority, etc.)
Post-Disaster Recovery Plan	Yes, Updated 2015	County	Warren County Office of Emergency Services	Warren County Comprehensive Emergency Management Plan (Section 4) (Adopted October 2015)
Transportation Plan	Yes, Updated 2013	Regional	Adirondack-Glens Falls Transportation Council	Adirondack-Glens Falls Transportation Council Long Range Plan Update: 2035; Adirondack-Glens Falls Transportation Council 2014-2018 Transportation Improvement Program (None formerly adopted by Lake George)
Strategic Recovery Planning Report	No	-	-	-
Other Plans:	Yes, 2008	County	Warren County Soil and Water Conservation District	English Brook Watershed Assessment (2008); East Brook Watershed Assessment (2008); LG Basin Reservoir and Sediment Basin Cleanout Program (2005); (None formerly adopted by Lake George)
Regulatory Capability				
Building Code	Yes, Updated 2007	County, Local	Town of Lake George Planning and Zoning Office; Warren County Fire Prevention and Building Codes	Warren County Code Chapter 150 (State Uniform Fire Prevention and Building Code) – Warren County Local Law 12-2007; Town of Lake George Code Chapter 80 (Fire prevention and building construction) – Originally adopted 1984
Zoning Ordinance	Yes, Updated 2003, 2016	Local	Town of Lake George Planning and Zoning Office	Town of Lake George Chapter 175 (Zoning) – Originally adopted 1978; recently updated in 2016
Subdivision Ordinance	Yes, Updated 1994	Local	Town of Lake George Planning and Zoning Office	Town of Lake George Chapter 150 (Subdivision of Land) – Originally adopted 1978
NFIP Flood Damage Prevention Ordinance	Yes, Updated 1996	Local	Town of Lake George Planning and Zoning Office	NFIP mandated - Town of Lake George Code Chapter 83 (Flood Damage Prevention) – Originally adopted 1994
NFIP: Cumulative Substantial Damages	No	-	-	-
NFIP: Freeboard	Yes	State, Local	NYS DEC; Town of Lake George Planning and Zoning Office	State mandated – Base Flood Elevation +2’ for single and two-family residential construction, Base Flood Elevation +1’ for all other construction types
Growth Management Ordinances	No	-	-	-
Site Plan Review Requirements	Yes, Updated 2003	Local	Town of Lake George Planning and	Town of Lake George Chapter 175 (Zoning), Article VI (Site Plan Review) – Originally adopted 1978



Tool / Program (code, ordinance, plan)	Do you have this? (Yes/No) If Yes, date of adoption or update	Authority (local, county, state, federal)	Dept. /Agency Responsible	Code Citation and Comments (Code Chapter, name of plan, explanation of authority, etc.)
			Zoning Office; Planning Board	
Stormwater Management Ordinance	Yes, Updated 2003, 2016	Local	Town of Lake George Planning and Zoning Office; Stormwater Officer	Updated 2016 as Chapter 148 - Stormwater management and Erosion and Sediment Control
Municipal Separate Storm Sewer System (MS4)	Yes, Updated 2015	State, Regional, Local	NYS DEC; Lake Champlain-Lake George Regional Planning Board; Town of Lake George Planning and Zoning Office	Town of Lake George MS4 (started 1/1/2015); Town of Lake George Stormwater Management Program (SWMP) Plan (Adopted October 2015)
Natural Hazard Ordinance	Yes, Updated 2012	State	NYS DHSES	NYS Executive Law Article 2-B
Post-Disaster Recovery Ordinance	Yes, Updated 2012	State	NYS DHSES	NYS Executive Law Article 2-B
Real Estate Disclosure Requirement	Yes, Updated 2015	State	NYS DOS	New York State (NYS) mandate, Property Condition Disclosure Act, NY Code – Article 14 §460-467
Other (Special Purpose Ordinances [i.e., sensitive areas, steep slope])	Yes, 2009	Regional	Lake George Park Commission	Draft Stream Corridor Management Regulations for the Lake George Park

Administrative and Technical Capability

Table 9.8-7 below summarizes potential staff and personnel resources available to the Town of Lake George.

Table 9.8-7. Administrative and Technical Capabilities

Resources	Is this in place? (Yes or No)	Department/ Agency/Position
Administrative Capability		
Planning Board	Yes	Town of Lake George Planning Board and Zoning Board of Appeals
Mitigation Planning Committee	No	-
Environmental Board/Commission	Yes	“Go Green Committee”, Town of Lake George Consolidated Board of Health
Open Space Board/Committee	No	-
Economic Development Commission/Committee	No	-
Maintenance programs to reduce risk	No	-
Mutual aid agreements	Yes	Lake George Volunteer Fire Department Mutual Aid Plan; Lake George EMS Mutual Aid (not sure if it is in writing, but think it’s county wide)



Resources	Is this in place? (Yes or No)	Department/ Agency/Position
Technical/Staffing Capability		
Planner(s) or engineer(s) with knowledge of land development and land management practices	Yes	Town of Lake George Planning and Zoning Office; Director of Planning and Zoning; Code Enforcement Officer
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Yes	Town of Lake George Town Engineer - Private (Chazen Companies)
Planners or engineers with an understanding of natural hazards	Yes	Town of Lake George Planning and Zoning Office; Director of Planning and Zoning
NFIP Floodplain Administrator (FPA)	Yes	Town of Lake George Planning and Zoning Office; Director of Planning and Zoning
Surveyor(s)	No	-
Personnel skilled or trained in GIS and/or Hazards United States (HAZUS) – Multi-Hazards (MH) applications	Yes (GIS)	Town of Lake George Planning and Zoning Office; Director of Planning and Zoning
Scientist familiar with natural hazards	No	-
Emergency Manager	Yes	Town Supervisor
Grant writer(s)	No	-
Staff with expertise or training in benefit/cost analysis	Yes	Town of Lake George Comptroller
Professionals trained in conducting damage assessments	Yes	Most of the Highway Department is “unofficially trained through experience”

Fiscal Capability

Table 9.8-8 below summarizes financial resources available to the Town of Lake George.

Table 9.8-8. Fiscal Capabilities

Financial Resources	Accessible or Eligible to Use (Yes/No)
Community Development Block Grants (CDBG, CDBG-DR)	No
Capital improvements project funding	No
Authority to Levy Taxes for specific purposes	Yes – Eligible at budget time
User fees for water, sewer, gas or electric service	Yes – Eligible at budget time
Impact fees for homebuyers or developers of new development/homes	No
Stormwater utility fee	No
Incur debt through general obligation bonds	Yes - Eligible
Incur debt through special tax bonds	No
Incur debt through private activity bonds	No
Withhold public expenditures in hazard-prone areas	No
Other federal or state funding programs	No – Only accessible if applied for and awarded
Open Space Acquisition funding programs	No – Only accessible if applied for and awarded
Other	No

Community Classifications

Table 9.8-9 below summarizes classifications for community program available to the Town of Lake George.





Table 9.8-9. Community Classifications

Program	Do you have this? (Yes/No)	Classification (if applicable)	Date Classified (if applicable)
Community Rating System (CRS)	NP	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	NP (would be County)	-	-
Public Protection (ISO Fire Protection Classes 1 to 10)	NP (would be County)	-	-
NYSDEC Climate Smart Community	Yes	Passed Climate Smart Communities Pledge	2016
Storm Ready	NP	-	-
Firewise	NP	-	-
Disaster/safety programs in/for schools	Yes	N/A	N/A
Organizations with mitigation focus (advocacy group, non-government)	No	-	-
Public education program/outreach (through website, social media)	Yes	N/A	N/A
Public-Private Partnerships	No	-	-

Note:

- N/A Not applicable
- NP Not participating
- Unavailable

The classifications listed above relate to the community’s ability to provide effective services to lessen its vulnerability to the hazards identified. These classifications can be viewed as a gauge of the community’s capabilities in all phases of emergency management (preparedness, response, recovery and mitigation) and are used as an underwriting parameter for determining the costs of various forms of insurance. The Community Rating System (CRS) class applies to flood insurance, while the Building Code Effectiveness Grading Schedule (BCEGS) and Public Protection classifications apply to standard property insurance. CRS classifications range on a scale of 1 to 10, with class 1 being the best possible classification, and class 10 representing no classification benefit. Firewise classification is higher if the subject property is more than 1000 feet from a creditable fire hydrant and is within 5 road miles of a recognized Fire Station.

Criteria for classification credits are outlined in the following documents:

- The Community Rating System Coordinators Manual
- The Building Code Effectiveness Grading Schedule
- The ISO Mitigation online ISO’s Public Protection website at <https://www.isomitigation.com/program-works/how-the-ppc-program-works.html>
- The National Weather Service Storm Ready website at <http://www.stormready.noaa.gov/index.html>
- The National Firewise Communities website at <http://firewise.org/>

Self-Assessment of Capability

Table 9.8-10 below provides an approximate measure of the Town of Lake George’s capability to work in a hazard-mitigation capacity and/or effectively implement hazard mitigation strategies to reduce hazard vulnerabilities.





Table 9.8-10. Self-Assessment Capability for the Municipality

Area	Degree of Hazard Mitigation Capability		
	Limited (If limited, what are your obstacles?)*	Moderate	High
Planning and Regulatory Capability			X
Administrative and Technical Capability			X
Fiscal Capability	X (Limited Staff; Local Funding Limited)		
Community Political Capability		X	
Community Resiliency Capability		X	
Capability to Integrate Mitigation into Municipal Processes and Activities.		X	

National Flood Insurance Program

NFIP Floodplain Administrator (FPA)

Dan Barusch, Director of Planning and Zoning, Zoning Office

Flood Vulnerability Summary

As of November 30, 2015, 8 policies were in force, two of which are within the 100-year flood boundary. Since 1978, 6 claims have been paid within the Town, totaling \$54,722. There are no repetitive loss properties and no severe repetitive loss properties in the Town of Lake George. According to current NFIP statistics at the time of this Plan, NFIP policies in the Town of Lake George insured \$2.2 million of property with total annual insurance premiums of \$3,415.

The Town maintains a list of properties that have been flood damaged. That list does not identify property owners interested in mitigation, although the FPA thinks that is a good idea. The FPA does not believe that the Town identifies property owners’ interests in mitigation or whether or not they are in the process of mitigation. The FPA speculates that any mitigation activities would be at the cost of the property owner or through the use /purchase of flood insurance. There are only a small amount of parcels in flood zones, and they should all have flood insurance.

The Town does not have a staff person who is authorized to make substantial damage estimates.

Resources

The Town FPA is the sole person assuming the FPA responsibilities. The zoning office includes permit review and requirements for every parcel within the floodplain; zoning staff conduct routine inspections on properties within the floodplain (specifically in the Schroon River Floodplain); assist with damage assessments conducted by Lake George Department of Public Works / Highways when damages are recorded; and have recently started educating specific applicants that may lie within / near floodplains within Lake George.

The Town FPA only provides outreach and education to potential applicants of permits who fall within / near the floodplain boundaries, although the Town is interested in having a presentation for the public on the topic of floods / flash floods / flood hazards / flood risk reduction.

Aside from the potential for minimal public interaction, no there are not any barriers to running an effective floodplain management program in the Town. The Town FPA feels adequately supported and trained, although





he would be interested in additional FPA training if it was available in the area. The FPA is attending FPA training in 10/2015, and would be interested in additional FPA certification training if it was available in the area.

Compliance History

The community is in good-standing with NFIP. There are no outstanding compliance issues that the FPA is aware of. The most recent compliance audit [e.g. Community Assistance Visit (CAV)] was completed in July / August 2015.

The Town intends to continue active participation in the NFIP, and maintain compliance with all requirements of participation. Further, the Town has identified several actions to support both continued and improved participation in the NFIP as identified in Table 9.8-13.

Regulatory

The Town's Flood Damage Prevention Ordinance, Chapter 83 of the Town Code, meets or exceeds the FEMA and State minimum requirements for qualification and participation in the NFIP.

In addition, Any applications that go through the Planning and Zoning Office, including Area/Use variances, Site Plan Reviews, and Land Use and Development permits, are all considered for flood permit review (only deemed necessary if the parcel falls within the floodplain boundaries).

Other plans or programs that support floodplain management include our stormwater management program plan, our stormwater regulations located in Town Code Chapter 148, Stormwater Management and Erosion and Sediment Control, which include strict stormwater mitigation measures and standards for all projects located within the town. Consistently the Town Planning Board requires stormwater control measures for projects in order to help reduce flood risk and control stormwater runoff.

It has not been discussed whether or not the Town would be interested in joining the CRS program to reduce flood insurance premiums, and due to the low number of parcels located in the floodplains, the FPA does not believe the Town would be interested. However, the FPA would attend a CRS seminar to learn about the program if it was offered locally.

Integration of Hazard Mitigation into Existing and Future Planning Mechanisms

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, each community was surveyed to obtain a better understanding of their community's progress in plan integration. A summary is provided below. In addition, the community identified specific integration activities that will be incorporated into municipal procedures.

Planning

Comprehensive Plan: The comprehensive plan addresses mitigation related issues including wetlands and floodplains and locating suitable lands for development. The Town has a comprehensive plan, and completed an update to the comprehensive plan in 2015. The update does not particularly address natural hazards but it discusses natural environments, and could be amended to include more considerations such as flooding, winter events, topography, etc. The Comprehensive Plan does not refer to a local or Countywide HMP, due to the fact that consideration on natural hazards is scarce. As stated before, future amendments to the plan could include mention of the 2015 WC HMP and include recommendations.



Stormwater Management Plan: The Town is an MS4 jurisdiction and has a formal Stormwater Management Plan (adopted in October 2015). The plan does not specify projects and initiatives to reduce stormwater runoff and otherwise mitigate stormwater flooding, but I believe it could be amended to include potential projects and or actions to take to reduce stormwater.

Watershed or Stream Corridor Management Plan: “Lake George – Planning for the Future” (2001) – Gives recommendations on mitigating hazards associated with stream and wetland management.

Planner: The Town’s Director of Planning and Zoning (Dan Barusch) acts as a municipal planner, and has considerable knowledge of natural hazards. His other roles include stormwater management officer and floodplain administrator.

Emergency Management Coordinator: The Town adopted the 2015 Warren County Comprehensive Emergency Management Plan (CEMP) in October 2015. The Plan refers to the 2011 Warren County HMP and mentions the update to the HMP. The CEMP covers post-disaster recovery and includes a few risk-reduction policies and mitigation activities.

Regulatory and Enforcement (Ordinances)

Zoning: The Town’s municipal zoning and subdivision regulations, and/or site plan review process, consider natural hazard risk (e.g. the presence of floodplains, steep slopes, etc.) to a certain degree – any applications that go through the Planning and Zoning Office, including Area/Use variances, Site Plan Reviews, and Land Use and Development permits, are all considered for flood permit review (only deemed necessary if the parcel falls within the floodplain boundaries) and look at locations of steep slopes and locations of wetlands and streams.

The only information provided to the Planning Board and zoning board of appeals (ZBA) are what is included in the applications on specific agendas, which includes proximity to a floodplain, whether or not a floodplain permit was needed/issued, proximity to steep slopes and the presence of wetlands. The FPA does not believe any additional information would assist in this process, due to the small amount of parcels that lie within the floodplain.

The Town has both a Planning Board and a ZBA, although their functions with respect to managing natural hazard risk are minimal, as that job lies with the County Hazard Mitigation Coordinator. Their functions do include relation to regulations at various levels (although not specific to hazard regulations) and plans identified at the local, county and state level.

Stormwater: The Town’s stormwater regulations located in Town Code Chapter 148, Stormwater Management and Erosion and Sediment Control, include strict stormwater mitigation measures and standards for all projects located within the town. Additionally our site plan review process requires either minor or major stormwater plans for almost all projects. Consistently the Town Planning Board requires stormwater control measures for projects in order to help reduce flood risk and control stormwater runoff. These regulations do not really look at the risks of underground utilities, easements in high risk areas, etc.

Flood Damage Prevention Ordinance: Chapter 83 of the Town Code meets or exceeds the FEMA and State minimum requirements for qualification and participation in the NFIP.

Operational and Administration

The Town has a Go Green Committee and a Consolidated Board of Health that serve environmental functions, although not specific to natural hazard risks. The Town is also interested in getting a Town representative on the Warren County Local Emergency Planning Committee.



Stormwater: The Director of Planning and Zoning (Dan Barusch) acts as one of two stormwater management officers, along with the Superintendent of Highways / Director of Public Works (Dan Davis).

NFIP and Flood Damage Reduction: The Director of Planning and Zoning (Dan Barusch) acts as the floodplain administrator. Town Comptroller has experience with some Benefit-Cost Analysis. The Town does have staff that have experience in preparing grant applications, however none of them are for hazard mitigation projects, due to the low frequency of natural hazards that affect the Town.

While there is no regularly scheduled training or continuing professional education which supports natural hazard risk reduction, some planning/zoning department and highway department staff members will periodically attend FEMA and other planning related conferences and seminars. Overall risk hazard assessment training would benefit the staff of the Town, specifically the Director of Planning and Zoning (Dan Barusch) and the Superintendent of Highways / Director of Public Works (Dan Davis). Natural hazard preparation and recovery would also be beneficial training topics for the Town staff.

Tree Maintenance: The Town regularly monitors and removes trees/limbs on public property in storm areas that present potential hazards to keep trees from threatening lives, property, and public infrastructure during storm events.

Emergency Sheltering: The Lake George Elementary School is a designated shelter with cooking facilities. The facility has a mobile backup generator which provides limited emergency electric service. The generator system is mainly designed to keep the heat on and refrigeration running. Strategic planning for the entire school district is currently in progress, and will identify projects or programs that will reduce the facility's vulnerability to damages and losses.

Funding

Staff: There are no staff members at the Town that have job descriptions that specifically include identifying and/or implementing mitigation projects/actions or other efforts to reduce natural hazard risk. When the HMP update is finished, the Director of Planning and Zoning (Dan Barusch) and the Superintendent of Highways / Director of Public Works (Dan Davis) will most likely work together to implement some of the recommendations in an effort to reduce natural hazard risk to the Town. Aside from the Town's participation in the Municipal Separate Storm Sewer System (MS4) Program and the Town's participation in this HMP update, no staff members are participating in organizations that support natural hazard risk reduction, although we are interested in getting a Town representative on the Warren County Local Emergency Planning Committee.

Municipal/operating budget: The Town municipal/operating budget does not specifically include line items for mitigation projects/activities, aside from stormwater runoff mitigation.

Capital Improvements Budget: There is no Capital Improvements Budget for the Town, and there are no budgeted items for mitigation-related projects, aside from stormwater runoff mitigation projects.

Mitigation Grants: The Town has not pursued or been awarded grant funds for mitigation-related projects, although there have been some recent grants given to the Town for stormwater runoff mitigation such as a New York State Department of Environmental Conservation (NYS DEC) Water Quality Improvement Project (WQIP) grant for the MS4 which is for \$80,000 and has a 25% local match (only receiving \$60,000 from DEC), primarily covered by in-kind services.

Education and Outreach

The Town uses social media for natural hazard public outreach. There are also public service announcements regarding impending natural hazards, and the Village visitor center typically has some flyers on flooding





potential from stormwater runoff accumulation (and possibly for ice storms and safety on the lake once it is frozen). Potential public presentations on natural hazards and risk to communities would be a beneficial form of outreach / education, although it is unclear how many people would participate. The American Planning Association has limited risk hazard mitigation materials available to the public or online.

9.8.6 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and prioritization.

Past Mitigation Initiative Status

Table 9.8-11 below indicates progress on the community’s mitigation strategy identified in the 2011 Plan. Previous actions that are now ongoing programs and capabilities are indicated as such in Table 9.8-11, and also appear under “Capability Assessment” presented previously in this annex. Actions carried forward as part of this plan update are included in the following subsection (in Table 9.8-12) with prioritization.

Table 9.8-11. Past Mitigation Initiative Status

Description	Status	Review Comments
Reconstruct Beach Road in the Town and Village of Lake George. Reconstruction, utility and drainage upgrade and multi-modal safety improvements.	Completed	Barton and Loguidice. Entire Beach road done in 2012/13. Discontinue due to completion of action.
Maintain cleared areas around roadways (obstructions of groundwater, infestation), including: <ul style="list-style-type: none"> • Areas around Truesdale Hill Road • Prospect Mountain • Sewell Street area 	In Progress	<ul style="list-style-type: none"> • Sewell Street done – Village – catch basins and channeling to mitigate problem. Discontinue Sewell Street action, due to completion. • Truesdale Hill Road – Actually affects the County road at Diamond Point Road. Beaver damming is really the issue here. • Prospect Mountain – State-owned area and massive parking lot. NYS DOT needs to install stormwater controls here. Include the action, but for same and new locations in need of it (Rt. 9L, Flat Rock Rd., Front St., Lakeshore Dr.). Develop new action for LG & State to maintain cleared areas at Prospect Mountain.
Educate residents regarding steps to be taken to decrease the impact of natural hazards (including ice storms, wild/forest fires, severe storms, tornado, earth-quakes, and all other natural hazards) by developing, enhancing, and implementing education programs, brochures, school presentations informing groups about ways to reduce risk, and other outreach activities.	Limited manpower has been an obstacle and minimal funding for hazard-related activities, and has delayed any educational outreach. Unclear whether or not the County office of Emergency Services or the School Districts have instituted educational outreach regarding natural hazards.	Add Lake George Planning department to the responsible parties. Include in 2015 HMP
Monitor and remove trees/limbs in storm areas that present potential hazards to keep trees from threatening lives, property, and public infrastructure during storm events.	100% Complete. Removal of trees on public property that were in sensitive areas has been completed. Local budget funding	Discontinue due to completion of action. Include monitoring of trees as an ongoing operational capability.



Table 9.8-11. Past Mitigation Initiative Status

Description	Status	Review Comments
Obtain funding to purchase generators for municipally-owned critical facilities.	No funding has been obtained which is a major obstacle, and no staff (at the Town) has been put on this task.	No critical facilities in need of back-up power have been identified. Discontinue.
Coordinate/create mutual aid agreements between emergency services, public works departments, and public utilities to ensure efficient use of resources during and after storm events.	30% Complete. Mutual Aid agreements exist and/or have been put in place for emergency services (Fire, EMS) for LG, surrounding municipalities and Warren County. No funding required. No progress on MAA's for DPW – has not been discussed or followed up on.	Create mutual aid agreements between public works departments. Discontinue MAA's for utilities, as not many are public, and ones that are already work together. Include in 2015 HMP
Develop plans for debris management after hazard events, including severe winter snow/ice events, and other severe storms.	20% Complete. The Town has adopted the Warren County CEMP and plans to use the Debris Management annex as a guide for this, although no progress has been made on developing a Town-specific plan due to limited resources. No funding expended (staff time).	Develop a Debris Management Plan specifically for TOLG. Include in 2015 HMP
Design a network of citizens that will check in on elderly, functional needs, and low-income individuals during major events.	Limited manpower has been an obstacle and minimal funding for actions like this have ever been allocated. This would be purely a "citizen's action group" and not funded or required by the Town.	Don't think this is something that will be accomplished, even if the Town had the manpower. Not applicable - discontinue
Send a town representative to the NYS Wildland Fire Suppression Training.	The Town staff is unaware if the LGVFD had sent a representative to the NYS Wildland Fire Suppression Training. Town staff did not have a representative at the training due to limited manpower.	Fire Protection and Suppression is handled by Lake George Volunteer Fire and Warren County. Send a LGVFD representative to NYS Wildland Fire Supp. Training. Include in 2015 HMP
Provide training for local code enforcement officials to implement building codes that reflect disaster resistant construction for new structures and renovation.	Town code enforcement official does not enforce the County building codes.	Building Codes and Inspections thereof are maintained / conducted by the County not the Town Code Officer. Discontinue
Provide residents with information listing steps taken to lessen potential flood damage to reduce the impact of flooding.	30% Complete. The Town has floodplain development permits within the Planning and Zoning Office and the office provides residents within flood-prone areas with examples of flood mitigation techniques. No funding expended (staff time).	Define what information would be helpful in the action (i.e., brochures, FEMA handouts, online links, etc.). Include in 2015 HMP
Educate the community on benefits of carrying NFIP policies and increase knowledge of NFIP services.	30% Complete. The Town has floodplain development permits and inquires whether or not homeowners in the flood-prone areas carry floodplain insurance. No funding expended (staff time).	Educate Specific homeowners who have property in the floodplain areas on carrying NFIP policies. Include in 2015 HMP
Review and update local plans to integrate goals, objectives, and activities from this HMP which are not found in existing regulatory documents, as appropriate.	Limited manpower has been an obstacle for this action. A review of local plans will be done in the next year in anticipation of including new HMP objectives and goals into these plans, as appropriate.	Potentially detail which types of plans (comprehensive plans, Stormwater plans, etc.). Include in 2015 HMP – combined with initiative to integrate the risk assessment and recommendations of the hazard mitigation plan in the comprehensive plan.
Maintain a current inventory of at-risk buildings and infrastructure and continually	40% Complete. An inventory of private properties and buildings within the Town's flood-prone areas	Work with Warren County to continue inventory development of at-risk public buildings and infrastructure in the Town annually.



Table 9.8-11. Past Mitigation Initiative Status

Description	Status	Review Comments
update inventory of at-risk structures in each jurisdiction.	has been completed. No funding expended (staff time). Continue an inventory to detail at-risk infrastructure and public structures.	Include in 2015 HMP
Apply for grants to assist with mitigation activities needed to provide a level of protection for critical facilities.	Limited manpower has been an obstacle for this action, as has willingness to apply for grants (federal and/or state).	Add LG Planning department to responsible parties, as Town Board does not do the grant applications. Include in 2015 HMP
Provide continuing education and training for local Floodplain Administrator to ensure code enforcement and proper inspections.	50% Complete. The Local FPA has attended training (held by NYS DEC), although it was not provided by the Town. Limited manpower and financial resources are obstacles that will not allow the Town to host this training. No funds expended (staff time).	Send a town representative to the local (county) and/or state FPA training. Add Planning department to responsible parties. Include in 2015 HMP
Implement zoning regulations to discourage building new structures in disaster prone areas – if such regulations are not already written into Town Zoning code or Floodplain Ordinance.	Limited manpower and willingness to amend zoning regulations have been major obstacles for this action. Town already has a Floodplain Ordinance (Ch. 83 – Flood Damage Prevention).	Zoning amendments face fierce backlash in the Town. Property rights will be “diminished” if people are discouraged from building on their properties if they are located in disaster prone areas. Discontinue

Completed Mitigation Initiatives not Identified in the Previous Mitigation Strategy

The Town of Lake George has identified the following mitigation projects/activities that have also been completed but were not identified in the previous mitigation strategy in the 2011 Plan:

- Big Hollow Dam – Installed a pipe and valve through the dam to lower the level. Dam failure risk has been essentially eliminated. The Town maintains the area by periodic dredging.
- Currently updating FIRM for Warren County to assess all properties within floodplain. This project is led by FEMA / DEC, with assistance from Warren County and local municipalities as needed. The last FIRM update was 20 years ago or more.
- Currently updating Flood Insurance Study for Warren County. This project is led by Warren County SWCD, with assistance from local municipalities and/or consultant.
- The County is considering developing annexes in the Warren County CEMP for each Warren County jurisdiction. This effort is led by Warren County OES, with assistance from local municipalities and/or consultant.
- DOT installed a culvert to take water from Michelli Road under Route 9L to a drainage basin on other side.
- Stormwater controls have been installed at Usher Park, on the east side of the lake (drywells and a trench drain) with the help of the Lake George Association.
- Dry wells have been installed along Lake View Circle to deal with some of the runoff in the Lake View sub watershed.

Proposed Hazard Mitigation Initiatives for the Plan Update

The Town of Lake George participated in a mitigation action workshop in September 2015 and was provided the following Federal Emergency Management Agency (FEMA) publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 ‘Selecting Appropriate Mitigation Measures for Floodprone Structures’ (March 2007) and FEMA ‘Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards’ (January 2013).





Table 9.8-12 summarizes the comprehensive-range of specific mitigation initiatives the Town of Lake George would like to pursue in the future to reduce the effects of hazards. Some of these initiatives may be previous actions carried forward for this plan update. Implementation of these initiatives will depend on available funding (grants and local match availability), and some initiatives may be modified or omitted at any time based on occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in Table 9.8-12 to further demonstrate the wide range of activities and mitigation measures selected.

As discussed in Section 6, 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing your actions as ‘High’, ‘Medium’, or ‘Low.’ The table below summarizes the evaluation of each mitigation initiative, listed by Action Number.

Table 9.8-13 summarizes prioritization of all proposed mitigation initiatives for the Plan update.



Table 9.8-12. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category	CRS Category
TLG-1	Review and update local comprehensive and stormwater plans to integrate the risk assessment, goals, objectives, activities, and recommendations of the hazard mitigation plan which are not found in existing regulatory documents.	Both	All Hazards	1	Town Board, Planning Department	Low-Medium	Low	Local Budget	Short	Medium	LPR	PR
TLG-2	Participate in the StormReady program.	Both	Flood, Severe Storm	1, 2	Town Board, Planning Department	Medium	Low	Local Budget	Short	Medium	LPR	PR
TLG-3	Develop and implement a plan to collaborate with State and private property owners to reduce risks from beaver dams in areas including Truesdale Hill Road.	Both	Flood	1, 3	Planning Department, NYS DEC, Private property owners	Low	Low	FMA, HMGP, PDM	DOF	Low	LPR, NSP	PR, NR
TLG-4	Maintain cleared areas around roadways (obstructions of groundwater, infestation), including: <ul style="list-style-type: none"> Rt. 9L Flat Rock Rd. Front St. Lakeshore Dr. Prospect Mountain 	Both	Flood	1, 3	Town DPW	Medium-High	Low-Medium	Local Budget	OG	High	LPR, NSP	PR
TLG-5	Educate residents regarding steps to be taken to decrease the impact of natural hazards (including ice storms, wild/forest fires, severe storms, tornado, earth-quakes, and all other natural hazards)	N/A	All Hazards	2	Town Board; Superintendent; Planning Department; school districts; County Office of Emergency Services	Low-Medium	Low	Local Budget	OG	Medium	EAP	PI





Table 9.8-12. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category	CRS Category
	by developing, enhancing, and implementing education programs, brochures, school presentations informing groups about ways to reduce risk, and other outreach activities.											
TLG-6	Coordinate/create mutual aid agreements public works departments to ensure efficient use of resources during and after storm events.	N/A	All Hazards	3	Town DPW	Medium	Medium	Local; HMGP, PDM	OG	Medium	LPR	PR
TLG-7	Agreement between the Town and NYS DEC for cleaning and maintaining properties and roadways on state and private owned lands, including Prospect Mountain and Battlefield Park grounds.	N/A	Flood	1, 3	Town Board, Planning Department, NYS DEC	Low	Low	Local; HMGP, PDM	OG	Low	LPR	PR
TLG-8	Develop a Debris Management Plan specifically for the Town of Lake George.	N/A	Flood, Wind, Winter Storm	3	Town DPW, Planning Department	Medium	Medium	HMGP, FMA, PDM	Long	Medium	LPR, NSP	PR, NR
TLG-9	Develop a Town of Lake George Flood Management Plan.	Both	Flood	3	Planning Department	High	Medium	Local; HMGP, FMA, PDM	DOF	High	LPR	PR
TLG-10	Send a LGVFD representative to NYS Wildland Fire Supp. Training.	N/A	Wildfire	3	Fire Department, Town Supervisor	Low	Low	Local Budget	Short	Low	EAP	ES
TLG-11	Provide residents with information listing steps taken to lessen potential flood damage to reduce the impact of flooding.	Existing	Flood	1, 2	Town Board, County Office of Emergency Services	Low-Medium	Low	Local Budget	OG	Medium	EAP	PI, ES





Table 9.8-12. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category	CRS Category
	Information may include brochures, FEMA handouts, and online links.											
TLG-12	Educate specific homeowners who have property in the floodplain areas on carrying NFIP policies.	Existing	Flood	2	Town Floodplain Administrator	Low-Medium	Low	Local Budget	OG	Medium	EAP	PI
TLG-13	Continue an annual inventory to detail at-risk infrastructure and public structures in the Town of Lake George.	Existing	All Hazards	3	Planning Department, Building Inspector, Warren County	Low	Low	Local Budget	OG	Low	LPR, EAP	PR, ES
TLG-14	Support the mitigation of vulnerable structures via retrofit (e.g. elevation, flood-proofing) or acquisition/relocation to protect structures from future damage, with critical facilities and repetitive loss properties as a priority when applicable. Town support shall include direct outreach to flood-prone property owners, specifically critical facility owners/operators and those identified by FEMA as RL/SRL or otherwise identified as flood-prone, and working with interested and voluntary property owners to mitigate their properties based on available funding from FEMA and local (property owner) match availability.											
	Efforts to mitigate critical facilities shall recognize Federal and State directives for protection to the 500-year flood level or “worst case scenario”.											
	See above.	Existing	All Hazards	3	Town Board, Town Planning Department	Medium	Low	Local Budget	Short	Medium	EAP, SIP	PR, ES
TLG-15	Send a town representative to the local (County) and/or State FPA training.	N/A	Flood	3	Town Board, Town Planning Department	Low	Low	Local Budget	Short	Low	EAP	PR, ES
TLG-16	Develop engineering assessment of sub-watersheds in town. Assess all areas of town with issues of stormwater runoff. Could be annexes to Flood Management Plan (TLG-9)	Both	Flood, Stormwater	1, 3	Planning Department, Town Engineer	Medium-High	Medium	Local; HMGP, FMA, PDM	DOF	High	NSP	PR, NR
TLG-17	Encourage flood mitigation at Lake George Escapes Campground, including potentially elevating or	Existing	Flood	1	Town Floodplain Manager, Planning Department	Low-Medium	Low-Medium	HMGP, FMA, PDM	DOF	Low	SIP	PP





Table 9.8-12. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category	CRS Category
	flood-proofing office and maintenance buildings.											
	Lake Shore Drive roadside stormwater conveyance improvements.											
TLG-18	See Action Worksheet	Existing	Flood – Stormwater	1	Town DPW, Planning Department	Medium-High	Medium	HMGP, FMA, PDM	DOF	Medium	SIP, NSP	NR, SP
	Lake View Circle Drive and Pine Lane Intersection stormwater improvements.											
TLG-19	See Action Worksheet	Existing	Flood – Stormwater	1	Town DPW, Planning Department	Medium-High	Medium	HMGP, FMA, PDM	DOF	Medium	SIP, NSP	NR, SP
	Middle Road South of Sherrick Drive stormwater improvements.											
TLG-20	See Action Worksheet	Existing	Flood – Stormwater	1	Town DPW, Planning Department	Medium-High	Medium	HMGP, FMA, PDM	DOF	Medium	SIP, NSP	NR, SP
	Middle Road South of Carefree Lane stormwater improvements.											
TLG-21	See Action Worksheet	Existing	Flood – Stormwater	1	Town DPW, Planning Department	Medium-High	Medium	HMGP, FMA, PDM	DOF	Medium	SIP, NSP	NR, SP
	Michelli Drive stormwater improvements.											
TLG-22	See Action Worksheet	Existing	Flood – Stormwater	1	Town DPW, Planning Department	Medium-High	Medium	HMGP, FMA, PDM	DOF	Medium	SIP, NSP	NR, SP
TLG-23	Continue to review and evaluate additional projects from sub-watershed report (Antler Ave & Lake View Circle Dr. intersection; Lake View Brook outlet; Carefree Lane) for further action.	Existing	Flood – Stormwater	1	Town DPW, Planning Department	Medium-High	Medium	HMGP, FMA, PDM	DOF	Medium	LPR, NSP	NR, PR
TLG-24	Middle Road North of Carefree Lane – Install a roadside buffer along the stream banks a 200' section of the brook that flows alongside Middle Road between two stream crossings. Project would increase water quality in	Existing	Flood – Stormwater	1	Town DPW, Planning Department	Medium-High	Medium	HMGP, FMA, PDM	DOF	Medium	SIP, NSP	NR, SP





Table 9.8-12. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category	CRS Category
	this stretch of brook flowing very close and parallel to Middle Road.											
TLG-25	Complete Municipal Stormwater Retrofit Recommendations not already included in this HMP as presented in the 2014 Lake View Watershed Report.	Existing	Flood – Stormwater	1	Town DPW, Planning Department	Medium-High	Medium	HMGP, FMA, PDM	DOF	High	SIP, NSP	NR, SP
TLG-26	Provide municipal support as needed and appropriate to the following NYS DOT project: DOT is planning Bridge corrective maintenance at two locations along NYS Route 9 over English Brook, within Town of Lake George during Fall 2017. The project proposes to add scour material to prevent continued erosion and protect the structures.	Existing	Flood – Stormwater	1	Town DPW, Planning Department – supporting NYS DOT project	Medium-High	Medium	Local Budget to support NYS DOT funded effort	Fall 2017	High	SIP	SP

Notes:

Not all acronyms and abbreviations defined below are included in the table.

*Does this mitigation initiative reduce effects of hazards on new and/or existing buildings and/or infrastructure? Not applicable (N/A) is inserted if this does not apply.

Acronyms and Abbreviations:

CAV Community Assistance Visit
 CDBG Community Development Block Grant
 GCRS Community Rating System
 DPW Department of Public Works
 FEMA Federal Emergency Management Agency

Potential FEMA HMA Funding Sources:

FMA Flood Mitigation Assistance Grant Program
 HMGP Hazard Mitigation Grant Program
 PDM Pre-Disaster Mitigation Grant Program
 RFC Repetitive Flood Claims Grant Program (discontinued)
 SRL Severe Repetitive Loss Grant Program (discontinued)

Timeline:

Short 1 to 5 years
 Long Term 5 years or greater
 OG On-going program
 DOF Depending on funding





Acronyms and Abbreviations:

FPA	Floodplain Administrator
HMA	Hazard Mitigation Assistance
N/A	Not applicable
NFIP	National Flood Insurance Program
OEM	Office of Emergency Management

Potential FEMA HMA Funding Sources:

Timeline:

Costs:

Where actual project costs have been reasonably estimated:

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

Where actual project costs cannot reasonably be established at this time:

Low	Possible to fund under existing budget. Project is part of, or can be part of, an existing ongoing program.
Medium	Could budget for under existing work plan, but would require a reapportionment of the budget or a budget amendment, or cost of the project would have to be spread over multiple years.
High	Would require an increase in revenue via an alternative source (i.e., bonds, grants, fee increases) to implement. Existing funding levels are not adequate to cover costs of the proposed project.

Benefits:

Where possible, an estimate of project benefits (per FEMA's benefit calculation methodology) has been evaluated against the project costs, and is presented as:

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

Where numerical project benefits cannot reasonably be established at this time:

Low	Long-term benefits of the project are difficult to quantify in the short term.
Medium	Project will have a long-term impact on reduction of risk exposure to life and property, or project will provide an immediate reduction in risk exposure to property.
High	Project will have an immediate impact on reduction of risk exposure to life and property.

Mitigation Category:

- Local Plans and Regulations (LPR) – Actions that include government authorities, policies, or codes that influence the way land and buildings are developed and built.
- Structure and Infrastructure Project (SIP) – Actions that involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures, as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce impacts of hazards.
- Natural Systems Protection (NSP) – Actions that minimize damage and losses, and also preserve or restore the functions of natural systems.
- Education and Awareness Programs (EAP) – Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities

CRS Category:

- Preventative Measures (PR) – Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and stormwater management regulations.
- Property Protection (PP) – Actions include public activities to reduce hazard losses or 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.
- Public Information (PI) – 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 educational programs for school-age children and adults.
- Natural Resource Protection (NR) – 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.
- Structural Flood Control Projects (SP) – Actions that involve construction of structures to reduce impacts of a hazard. Such structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.





- *Emergency Services (ES) – Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and protection of essential facilities*



Table 9.8-13. Summary of Prioritization of Actions

Mitigation Action/Project Number	Mitigation Action/Initiative	Life Safety	Property	Cost-Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency	Other	Total	High / Medium / Low
TLG-1	Review and update local comprehensive and stormwater plans to integrate the risk assessment, goals, objectives, activities, and recommendations of the hazard mitigation plan which are not found in existing regulatory documents.	0	0	1	1	-1	1	0	0	0	1	1	1	1	1	7	Medium
TLG-2	Participate in the StormReady program.	1	0	0	1	1	0	1	0	0	1	1	1	0	0	7	Medium
TLG-3	Develop and implement a plan to collaborate with State and private property owners to reduce risks from beaver dams in areas including Truesdale Hill Road.	0	0	1	0	0	0	0	0	0	0	0	0	1	1	3	Low
TLG-4	Maintain cleared areas around roadways (obstructions of groundwater, infestation), including: <ul style="list-style-type: none"> Rt. 9L Flat Rock Rd. Front St. Lakeshore Dr. Prospect Mountain 	1	1	0	1	1	0	-1	1	1	1	1	1	1	1	11	High
TLG-5	Educate residents regarding steps to be taken to decrease the impact of natural hazards (including ice storms, wild/forest fires, severe storms, tornado, earth-quakes, and all other natural hazards) by developing, enhancing, and implementing education programs, brochures, school presentations informing groups about ways to reduce risk, and other outreach activities.	1	0	1	1	1	0	1	0	1	0	1	0	0	1	8	Medium
TLG-6	Coordinate/create mutual aid agreements public works departments to ensure efficient use of resources during and after storm events.	0	0	1	1	1	1	0	0	0	1	1	0	1	1	8	Medium
TLG-7	Agreement between the Town and NYS DEC for cleaning and maintaining properties and roadways on state and private owned lands, including Prospect Mountain and Battlefield Park grounds.	0	0	0	0	1	1	0	0	0	1	0	0	0	1	4	Low
TLG-8	Develop a Debris Management Plan specifically for the Town of Lake George.	0	1	0	1	1	1	-1	1	0	1	1	0	0	1	7	Medium
TLG-9	Develop a Town of Lake George Flood Management Plan.	1	-1	0	1	1	1	0	1	1	1	0	1	1	1	10	High





Table 9.8-13. Summary of Prioritization of Actions

Mitigation Action/Project Number	Mitigation Action/Initiative	Life Safety	Property	Cost-Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Collaboration	Other Community	Total	High / Medium / Low
TLG-10	Send a LGVFD representative to NYS Wildland Fire Supp. Training.	0	0	1	1	0	0	0	0	0	1	0	1	0	0	4	Low
TLG-11	Provide residents with information listing steps taken to lessen potential flood damage to reduce the impact of flooding. Information may include brochures, FEMA handouts, and online links.	0	0	1	1	1	0	1	0	1	0	1	0	0	1	7	Medium
TLG-12	Educate specific homeowners who have property in the floodplain areas on carrying NFIP policies.	1	1	0	0	0	0	0	1	0	1	0	1	0	1	6	Medium
TLG-13	Continue an annual inventory to detail at-risk infrastructure and public structures in the Town of Lake George.	0	0	1	1	0	0	0	0	0	1	0	0	0	1	4	Low
TLG-14	Support the mitigation of vulnerable critical facilities, and private and public property.	0	0	1	1	1	0	0	0	0	1	1	-1	0	1	5	Medium
TLG-15	Send a town representative to the local (County) and/or State FPA training.	0	0	1	1	0	0	0	0	0	1	0	1	0	0	4	Low
TLG-16	Develop engineering assessment of subwatersheds in town. Assess all areas of town with issues of flooding, stormwater issues, etc.	1	1	0	1	1	0	0	1	0	1	1	1	1	1	10	High
TLG-17	Encourage flood mitigation at Lake George Escapes Campground, including potentially elevating or flood-proofing office and maintenance buildings.	1	1	-1	0	0	0	0	1	0	0	0	0	0	0	2	Low
TLG-18	Lake Shore Drive roadside stormwater conveyance improvements.	1	1	0	1	1	0	0	1	1	0	0	1	1	1	9	Medium
TLG-19	Lake View Circle Drive and Pine Lane Intersection stormwater improvements.	1	1	0	1	1	0	0	1	1	0	0	1	1	1	9	Medium
TLG-20	Middle Road South of Sherrick Drive stormwater improvements.	1	1	0	1	1	0	0	1	1	0	0	1	1	1	9	Medium
TLG-21	Middle Road South of Carefree Lane stormwater improvements.	1	1	0	1	1	0	0	1	1	0	0	1	1	1	9	Medium
TLG-22	Michelli Drive stormwater improvements.	1	1	0	1	1	0	0	1	1	0	0	1	1	1	9	Medium
TLG-23	Additional projects from sub-watershed report (Antler Ave & Lake View Circle Dr. intersection; Lake View Brook outlet; Carefree Lane)	1	1	0	1	1	0	0	1	1	0	0	1	1	1	9	Medium
TLG-24	Middle Road North of Carefree Lane – Install a roadside buffer along the stream banks a 200' section of the brook that flows alongside Middle Road between two stream crossings. Project would	1	1	0	1	1	0	0	1	1	0	0	1	1	1	9	Medium





Table 9.8-13. Summary of Prioritization of Actions

Mitigation Action/Project Number	Mitigation Action/Initiative	Life Safety	Property	Cost-Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency	Other	Total	High / Medium / Low
	increase water quality in this stretch of brook flowing very close and parallel to Middle Road.																
TLG-25	Complete Municipal Stormwater Retrofit Recommendations not already included in this HMP as presented in the 2014 Lake View Watershed Report.	1	1	0	1	1	0	0	1	1	1	0	1	1	1	10	High
TLG-25	Provide municipal support as needed and appropriate to the following NYS DOT project: DOT is planning Bridge corrective maintenance at two locations along NYS Route 9 over English Brook.	1	1	1	1	1	0	1	1	1	1	0	1	1	1	12	High

Note: Refer to Section 6, which conveys guidance on prioritizing mitigation actions.



9.8.7 Future Needs To Better Understand Risk/Vulnerability

None at this time.

9.8.8 Hazard Area Extent and Location

Hazard area extent and location maps have been generated for the Town of Lake George that illustrate the areas probable to be impacted within the municipality (see Figure 9.8-1 and Figure 9.8-2 below). These maps are based on the best available data at the time of the preparation of this Plan, and are considered to be adequate for planning purposes. Maps have been generated for those hazards (i.e., landslide, wildfire and flooding) that can be clearly identified using mapping techniques and technologies, and to which the Town of Lake George has significant exposure. These maps also appear in the hazard profiles within Section 5.4, Volume I of this Plan.

9.8.9 Additional Comments

None at this time.



Figure 9.8-1. Town of Lake George Landslide Hazard Area Map

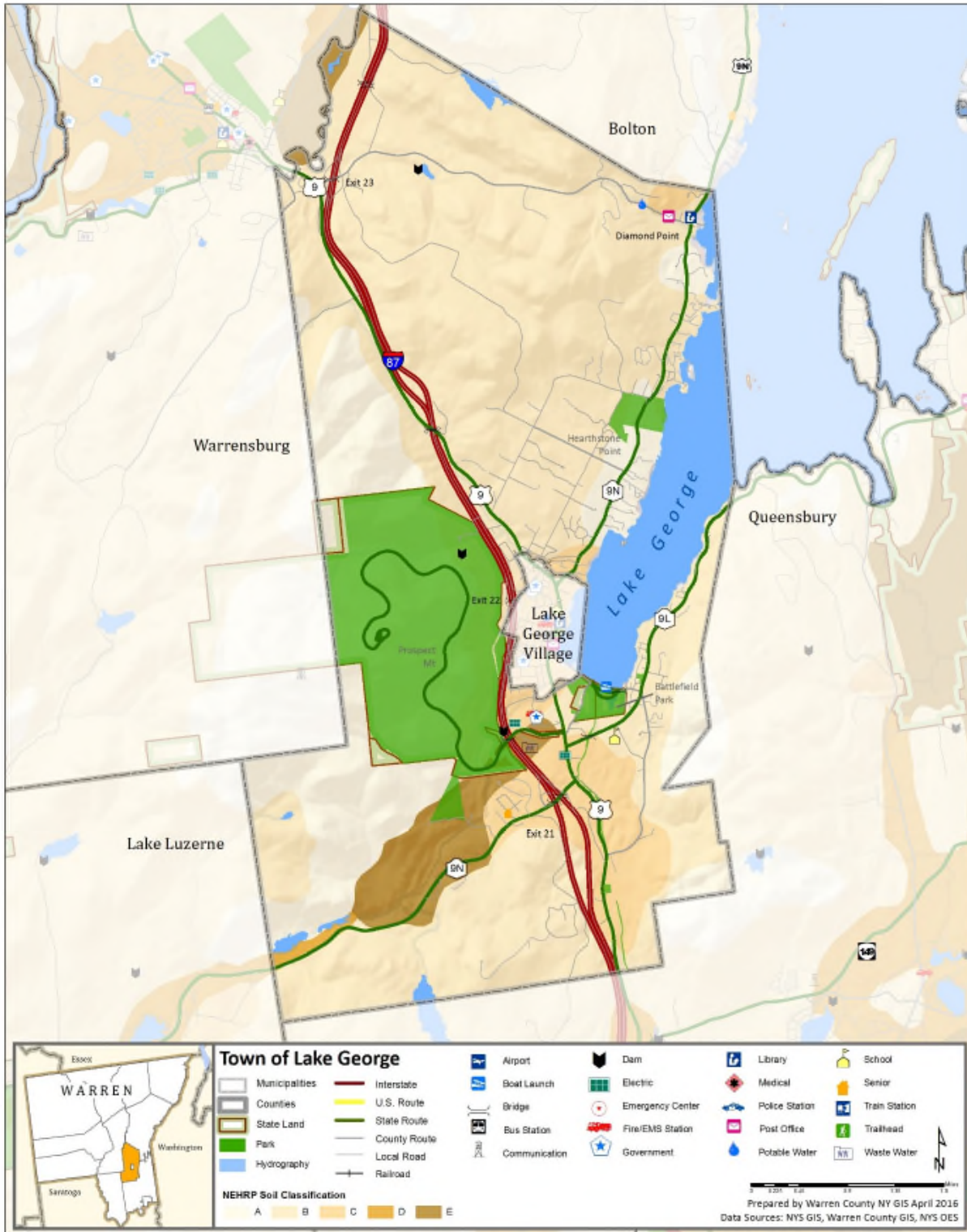
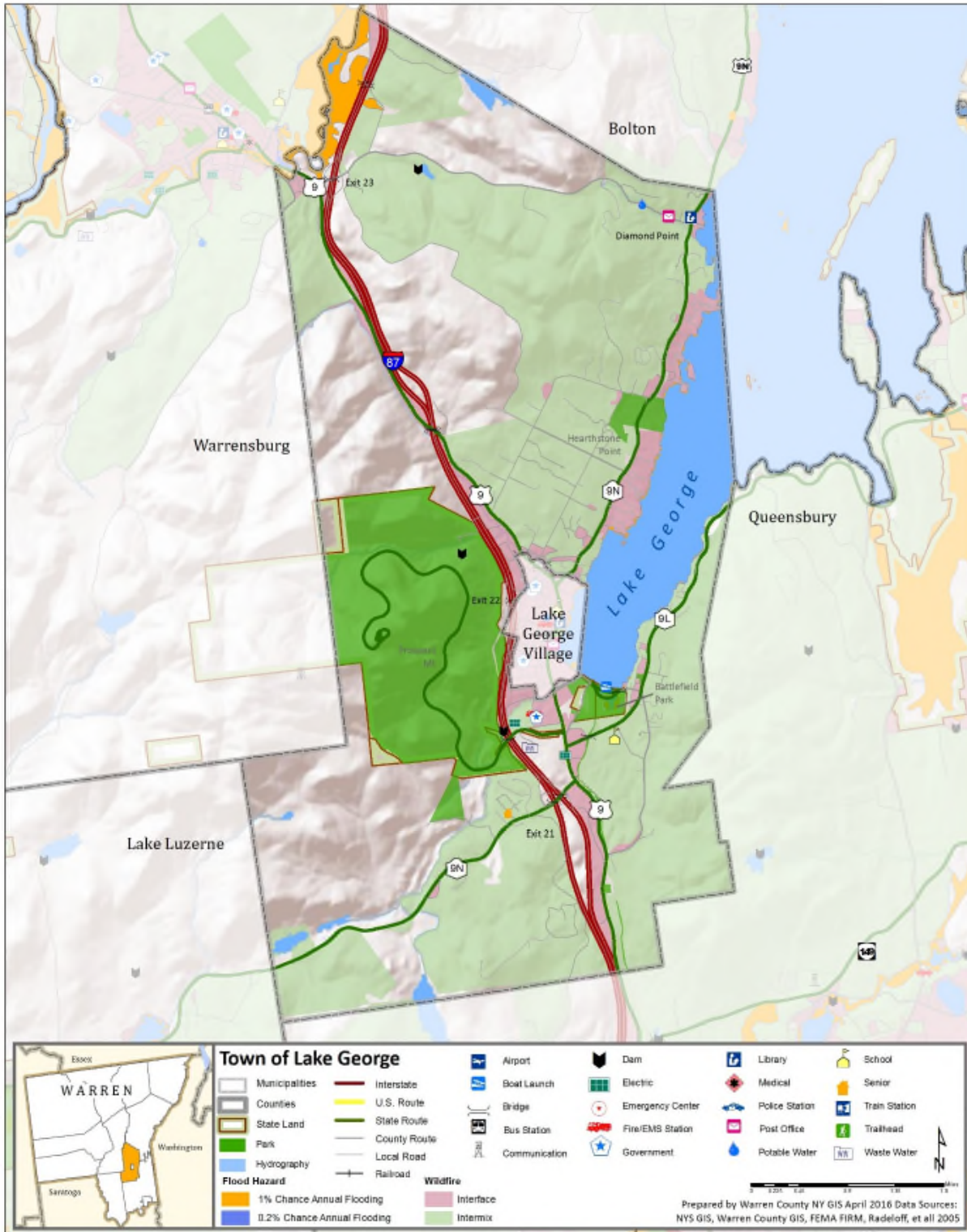




Figure 9.8-2. Town of Lake George Hazard Area Extent and Location Map 2





Name of Jurisdiction: Town of Lake George
Name and Title Completing Worksheet: Dan Barusch, Director of Planning and Zoning
Action Number: TLG-18
Mitigation Action Name: Lake Shore Drive roadside stormwater conveyance improvements.

Assessing the Risk	
Hazard(s) addressed:	<p>Flooding – Stormwater Retrofit The Lake View Brook outlet to Lake George is located 615 feet southeast of the intersection of Lake Shore Drive and Hill Drive. The brook meets Lake Shore Drive 430' south of Hill Drive. On the west side of Lake Shore Drive, the brook is channelized by rock walls and receives stormwater runoff from approximately 600' of road conveyed through paved gutters. The roadside runoff is received from both the north and south sections of Lake Shore Drive. The road crossing is a 40" diameter concrete culvert. At the brook outlet in Lake George, a delta is forming due to a combination of natural processes, stormwater runoff and erosion throughout the watershed.</p>
Specific problem being mitigated:	To reduce roadway flooding and pollutants and siltation at the Lake View Brook Outlet.
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	Stormwater retrofits to assist in capturing and infiltrating stormwater runoff from Lake Shore Drive are going to need additional research due to the numerous site constraints in this area. A few of the site constraints include high groundwater, bedrock and utilities.
Action/Project Intended for Implementation	
Description of Selected Action/Project	A feasible retrofit in this area may certainly be an improvement to the roadside stormwater conveyance. The paved gutters may be improved to vegetated swales with check dams which will increase stormwater infiltration, take up nutrients through vegetation and reduce sediment inputs from de-icing materials to the brook. Check dams come in many varieties ranging from fractured rock piles formed to the swale, to silt socks filled with partially composted woods chips.
Mitigation Action Type	SIP, NSP
Goals Met	Goal 1: Protect Life and Property - Introduce mitigation activities that will make homes, businesses and critical facilities more hazard resistant - Implement mitigation activities encouraging protection of the environment
Applies to existing and or new development, or not applicable	Existing
Benefits (losses avoided)	Improve stormwater quality in Lake View Estates Watershed
Estimated Cost	Medium
Priority*	Medium
Plan for Implementation	



Responsible Organization	Town DPW, Planning Department
Local Planning Mechanism	
Potential Funding Sources	HMGP, FMA, PDM
Timeline for Completion	DOF
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:



Action Number:

TLG-18

Mitigation Action Name:

Lake Shore Drive roadside stormwater conveyance improvements.

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Will provide additional safety from flooding for persons living within the area.
Property Protection	1	Will provide additional property protection from stormwater runoff.
Cost-Effectiveness	0	Projects will most likely not be cost-effective and will require funding.
Technical	1	Planned technical project to be completed by the Highway Department.
Political	1	This area has been a hot topic of concern for stormwater. Political importance.
Legal	0	No legal credence.
Fiscal	0	No fiscal credence.
Environmental	1	Project should enhance environment through treatment / catching stormwater.
Social	1	Project will alleviate concern of residents in the area and comfort Town staff.
Administrative	0	No administrative credence, project will probably be carried out by other entity.
Multi-Hazard	0	Project would only address stormwater runoff / flooding.
Timeline	1	Should be a short time frame, but this is dependent on funding.
Agency Champion	1	Town could be champion of the project, which is an area in need of retrofits which they have been supporting for years.
Other Community Objectives	1	Again, this project satisfies other community objectives in stream protection and treating runoff before it hits the Lake.
Total	9	
Priority (High, Medium, Low)	Medium	



Name of Jurisdiction:	Town of Lake George
Name and Title Completing Worksheet:	Dan Barusch, Director of Planning and Zoning
Action Number:	TLG-19
Mitigation Action Name:	Lake View Circle Drive and Pine Lane Intersection stormwater improvements.

Assessing the Risk	
Hazard(s) addressed:	Flooding – Stormwater Retrofit
Specific problem being mitigated:	Reduce stormwater runoff and sediment being conveyed to the brook.
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	The Town has conducted various studies of stormwater and flooding problems within the Town, each considering various alternatives as documented within associated reports (e.g. Sub-Watershed Report) which are available for review. This project has been identified as the preferred solution for this specific problem area.
Action/Project Intended for Implementation	
Description of Selected Action/Project	<p>At the intersection there is a brook crossing through a 36" HDPE culvert, two drop inlets to the east on Lakeview Circle and one drop inlet south of the intersection on Pine Lane (see Appendix 8 map). This intersection also receives 360' of roadside drainage conveyed through paved gutters from the west portion on Lake View Circle Drive. Depending on groundwater and other site constraints, the following actions are recommended:</p> <ul style="list-style-type: none"> - Replace the two drop inlets on Lakeview Circle with drywells will decrease the amount of stormwater runoff and sediment being conveyed to the brook. - Install a drywell or catch basin on the southwest corner of the intersection and convey to a bioretention basin in a forested area of the southeast portion to reduce stormwater inputs. The bioretention area will also need a protected outlet for larger rain events and if the catch basin were to overflow it would continue on its current conveyance path to the Pine Lane culvert. - Install a stone lined infiltration basin to assist in breaking up stormwater velocity and collecting sediment. - Replace the paved ditch with a vegetated swale in the southwest portion of the intersection that already has a natural shape flowing to the culvert on Pine Lane. The turnout to the vegetated swale will need a protected inlet to break up stormwater velocity from the paved gutter.
Mitigation Action Type	SIP, NSP
Goals Met	Goal 1: Protect Life and Property <ul style="list-style-type: none"> - Introduce mitigation activities that will make homes, businesses and critical facilities more hazard resistant - Implement mitigation activities encouraging protection of the environment
Applies to existing and or new development, or not applicable	Existing
Benefits (losses avoided)	Reduce stormwater runoff and sediment being conveyed to the brook.



Estimated Cost	Medium
Priority*	Medium
Plan for Implementation	
Responsible Organization	Town DPW, Planning Department
Local Planning Mechanism	Stormwater management plans capital improvement plans and budgets
Potential Funding Sources	HMGP, FMA, PDM
Timeline for Completion	DOF
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:



Action Number:

TLG-19

Mitigation Action Name:

Lake View Circle Drive and Pine Lane Intersection stormwater improvements.

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Will provide additional safety from flooding for persons living within the area.
Property Protection	1	Will provide additional property protection from stormwater runoff.
Cost-Effectiveness	0	Projects will most likely not be cost-effective and will require funding.
Technical	1	Planned technical project to be completed by the Highway Department.
Political	1	This area has been a hot topic of concern for stormwater. Political importance.
Legal	0	No legal credence.
Fiscal	0	No fiscal credence.
Environmental	1	Project should enhance environment through treatment / catching stormwater.
Social	1	Project will alleviate concern of residents in the area and comfort Town staff.
Administrative	0	No administrative credence, project will probably be carried out by other entity.
Multi-Hazard	0	Project would only address stormwater runoff / flooding.
Timeline	1	Should be a short time frame, but this is dependent on funding.
Agency Champion	1	Town could be champion of the project, which is an area in need of retrofits which they have been supporting for years.
Other Community Objectives	1	Again, this project satisfies other community objectives in stream protection and treating runoff before it hits the Lake.
Total	9	
Priority (High, Medium, Low)	Medium	



Name of Jurisdiction: Town of Lake George
Name and Title Completing Worksheet: Dan Barusch, Director of Planning and Zoning
Action Number: TLG-20
Mitigation Action Name: Middle Road South of Sherrick Drive

Assessing the Risk	
Hazard(s) addressed:	Flooding – Stormwater Retrofit
Specific problem being mitigated:	A significant amount of stormwater runoff is conveyed 330' south of Sherrick Drive to where Lake View Brook crosses Middle Road. The 36" corrugated metal culvert has a paved gutter that outfalls directly to the brook on each side of Middle Road at the inlet and outlet of the culvert. High groundwater in this location will require surface stormwater treatment.
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	The Town has conducted various studies of stormwater and flooding problems within the Town, each considering various alternatives as documented within associated reports (e.g. Sub-Watershed Report) which are available for review. This project has been identified as the preferred solution for this specific problem area.
Action/Project Intended for Implementation	
Description of Selected Action/Project	<p>The following actions are recommended:</p> <ul style="list-style-type: none"> - Replace the turnout with a vegetated buffer and install vegetated swales to convey stormwater to the already established turnouts south of the culvert on Middle Road to benefit water quality and quantity in this location. - Evaluate the swales and conveyance south of the culvert for the increased stormwater volume flowing past the brook. - Potential to install a short section of paved gutter for conveyance over the culvert and past the brook due to shallow depth of road over the culvert and limited soil depth for a vegetated swale in this area. - In the first turnout south of the culvert, create rock protected inlets and outlets to prevent erosion in these locations. - A general recommendation in this area and throughout the watershed is stream buffers. A stream buffer can be as simple as not mowing and allowing woody vegetation to reestablish providing stream bank stabilization and stream cover. Stream cover provides shade for the stream keeping waters cool and buffers also break up stormwater from flowing directly to the stream and allowing for infiltration. For aesthetics, stream buffers may be planted with New York native flowering shrubs providing landowners with aesthetically pleasing and functional landscaping.
Mitigation Action Type	SIP, NSP
Goals Met	<p>Goal 1: Protect Life and Property</p> <ul style="list-style-type: none"> - Introduce mitigation activities that will make homes, businesses and critical facilities more hazard resistant - Implement mitigation activities encouraging protection of the environment



Applies to existing and or new development, or not applicable	Existing
Benefits (losses avoided)	Benefit water quality and quantity in this location, prevent erosion, reduce stormwater flooding
Estimated Cost	Medium
Priority*	Medium
Plan for Implementation	
Responsible Organization	Town DPW, Planning Department
Local Planning Mechanism	Stormwater management plans capital improvement plans and budgets
Potential Funding Sources	HMGP, FMA, PDM
Timeline for Completion	DOF
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:



Action Number:

TLG-20

Mitigation Action Name:

Middle Road South of Sherrick Drive

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Will provide additional safety from flooding for persons living within the area.
Property Protection	1	Will provide additional property protection from stormwater runoff.
Cost-Effectiveness	0	Projects will most likely not be cost-effective and will require funding.
Technical	1	Planned technical project to be completed by the Highway Department.
Political	1	This area has been a hot topic of concern for stormwater. Political importance.
Legal	0	No legal credence.
Fiscal	0	No fiscal credence.
Environmental	1	Project should enhance environment through treatment / catching stormwater.
Social	1	Project will alleviate concern of residents in the area and comfort Town staff.
Administrative	0	No administrative credence, project will probably be carried out by other entity.
Multi-Hazard	0	Project would only address stormwater runoff / flooding.
Timeline	1	Should be a short time frame, but this is dependent on funding.
Agency Champion	1	Town could be champion of the project, which is an area in need of retrofits which they have been supporting for years.
Other Community Objectives	1	Again, this project satisfies other community objectives in stream protection and treating runoff before it hits the Lake.
Total	9	
Priority (High, Medium, Low)	Medium	



Name of Jurisdiction: Town of Lake George
Name and Title Completing Worksheet: Dan Barusch, Director of Planning and Zoning
Action Number: TLG-21
Mitigation Action Name: Middle Road South of Carefree Lane stormwater improvements.

Assessing the Risk	
Hazard(s) addressed:	Flooding – Stormwater Retrofit
Specific problem being mitigated:	Stormwater flowing south down Middle Road, currently leading to one single end of pipe solution.
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	The Town has conducted various studies of stormwater and flooding problems within the Town, each considering various alternatives as documented within associated reports (e.g. Sub-Watershed Report) which are available for review. This project has been identified as the preferred solution for this specific problem area.
Action/Project Intended for Implementation	
Description of Selected Action/Project	Approximately 85' south of Carefree Lane there is another stream crossing Middle Road. The following actions are recommended: <ul style="list-style-type: none"> - Conduct additional evaluation of the paved turnouts at the stream crossing to determine an alternative path for the stormwater other than a direct outfall to the brook. - Evaluate the paved gutters north of the culvert as vegetated swales with rock check dams. - With the establishment and maintenance of vegetated swales, utilize the District's hydroseeding program for vegetating swales to prevent erosion.
Mitigation Action Type	SIP, NSP
Goals Met	Goal 1: Protect Life and Property <ul style="list-style-type: none"> - Introduce mitigation activities that will make homes, businesses and critical facilities more hazard resistant - Implement mitigation activities encouraging protection of the environment
Applies to existing and or new development, or not applicable	Existing
Benefits (losses avoided)	Prevent erosion, reduce sedimentation in the stream, and reduce stormwater backups and flooding.
Estimated Cost	Medium
Priority*	Medium
Plan for Implementation	
Responsible Organization	Town DPW, Planning Department
Local Planning Mechanism	Stormwater management plans capital improvement plans and budgets
Potential Funding Sources	HMGP, FMA, PDM



Timeline for Completion	DOF
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:



Action Number:

TLG-21

Mitigation Action Name:

Middle Road South of Carefree Lane stormwater improvements.

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Will provide additional safety from flooding for persons living within the area.
Property Protection	1	Will provide additional property protection from stormwater runoff.
Cost-Effectiveness	0	Projects will most likely not be cost-effective and will require funding.
Technical	1	Planned technical project to be completed by the Highway Department.
Political	1	This area has been a hot topic of concern for stormwater. Political importance.
Legal	0	No legal credence.
Fiscal	0	No fiscal credence.
Environmental	1	Project should enhance environment through treatment / catching stormwater.
Social	1	Project will alleviate concern of residents in the area and comfort Town staff.
Administrative	0	No administrative credence, project will probably be carried out by other entity.
Multi-Hazard	0	Project would only address stormwater runoff / flooding.
Timeline	1	Should be a short time frame, but this is dependent on funding.
Agency Champion	1	Town could be champion of the project, which is an area in need of retrofits which they have been supporting for years.
Other Community Objectives	1	Again, this project satisfies other community objectives in stream protection and treating runoff before it hits the Lake.
Total	9	
Priority (High, Medium, Low)	II	



Name of Jurisdiction: Town of Lake George
Name and Title Completing Worksheet: Dan Barusch, Director of Planning and Zoning
Action Number: TLG-22
Mitigation Action Name: Michelli Drive stormwater improvements.

Assessing the Risk	
Hazard(s) addressed:	Flooding – Stormwater Retrofit
Specific problem being mitigated:	High volume of stormwater flow over Michelli Drive affecting homeowners on Front Street.
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	The Town has conducted various studies of stormwater and flooding problems within the Town, each considering various alternatives as documented within associated reports (e.g. Sub-Watershed Report) which are available for review. This project has been identified as the preferred solution for this specific problem area.
Action/Project Intended for Implementation	
Description of Selected Action/Project	The following actions are recommended: <ul style="list-style-type: none"> - Install stormwater infiltration structures on Michelli Drive at two locations on Michelli Drive, one at the end of Short Street, and one in between Hune Way and Route 9L. Depending upon the depth of water table in those locations, it is recommended that two eight-foot diameter, four foot high drywells (stacked), be installed. These structures (including the stone surrounding them) have the capacity to store and infiltrate approximately 600 cubic feet of water, thus alleviating some of the volume which affects the Front Street properties. - Clean and line with stone a section of road ditch between Short Street and Hune Way to minimize erosion and downstream sedimentation.
Mitigation Action Type	SIP, NSP
Goals Met	Goal 1: Protect Life and Property <ul style="list-style-type: none"> - Introduce mitigation activities that will make homes, businesses and critical facilities more hazard resistant - Implement mitigation activities encouraging protection of the environment
Applies to existing and or new development, or not applicable	Existing
Benefits (losses avoided)	Alleviate some of the flood volume affecting Front Street properties; minimize erosion and downstream sedimentation.
Estimated Cost	Medium
Priority*	Medium
Plan for Implementation	
Responsible Organization	Town DPW, Planning Department
Local Planning Mechanism	Stormwater management plans capital improvement plans and budgets



Potential Funding Sources	HMGP, FMA, PDM
Timeline for Completion	DOF
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:



Action Number: Flooding – Stormwater Retrofit
Mitigation Action Name: High volume of stormwater flow over Michelli Drive affecting homeowners on Front Street.

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Will provide additional safety from flooding for persons living within the area.
Property Protection	1	Will provide additional property protection from stormwater runoff.
Cost-Effectiveness	0	Projects will most likely not be cost-effective and will require funding.
Technical	1	Planned technical project to be completed by the Highway Department.
Political	1	This area has been a hot topic of concern for stormwater. Political importance.
Legal	0	No legal credence.
Fiscal	0	No fiscal credence.
Environmental	1	Project should enhance environment through treatment / catching stormwater.
Social	1	Project will alleviate concern of residents in the area and comfort Town staff.
Administrative	0	No administrative credence, project will probably be carried out by other entity.
Multi-Hazard	0	Project would only address stormwater runoff / flooding.
Timeline	1	Should be a short time frame, but this is dependent on funding.
Agency Champion	1	Town could be champion of the project, which is an area in need of retrofits which they have been supporting for years.
Other Community Objectives	1	Again, this project satisfies other community objectives in stream protection and treating runoff before it hits the Lake.
Total	9	
Priority (High, Medium, Low)	Medium	



Name of Jurisdiction: Town of Lake George
Name and Title Completing Worksheet: Dan Barusch, Director of Planning and Zoning
Action Number: TLG-24
Mitigation Action/Initiative: Middle Road North of Carefree Lane

Assessing the Risk	
Hazard(s) addressed:	Flood
Specific problem being mitigated:	Roadways flood due to lack of roadside buffer along the stream banks
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	The identified project is the only feasible and cost-effective alternative to address the problem.
Action/Project Intended for Implementation	
Description of Selected Action/Project	Install a roadside buffer along the stream banks a 200' section of the brook that flows alongside Middle Road between two stream crossings. Project would increase water quality in this stretch of brook flowing very close and parallel to Middle Road.
Action/Project Category	SIP, NSP
Goals Met	1
Applies to existing and or new development, or not applicable	Existing
Benefits (losses avoided)	Medium-High
Estimated Cost	Medium
Priority*	Medium
Plan for Implementation	
Responsible Organization	Town DPW, Planning Department
Local Planning Mechanism	Hazard Mitigation
Potential Funding Sources	HMGP, FMA, PDM
Timeline for Completion	DOF
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:



Action Number: TLG-24
Mitigation Action/Initiative: Middle Road North of Carefree Lane

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	
Property Protection	1	Reduce flood damage to roadway
Cost-Effectiveness	0	
Technical	1	
Political	1	
Legal	0	
Fiscal	0	
Environmental	1	Project would increase water quality
Social	1	
Administrative	0	
Multi-Hazard	0	Flood
Timeline	1	
Agency Champion	1	
Other Community Objectives	1	
Total	9	
Priority (High/Med/Low)	Medium	



Name of Jurisdiction: Town of Lake George
Name and Title Completing Worksheet: Dan Barusch, Director of Planning and Zoning
Action Number: TLG-25
Mitigation Action/Initiative: Complete Municipal Stormwater Retrofit Recommendations

Assessing the Risk	
Hazard(s) addressed:	Flood
Specific problem being mitigated:	Need to complete municipal stormwater retrofit recommendations
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	Please refer to the 2014 Lake View Watershed Report for a discussion of alternatives considered.
Action/Project Intended for Implementation	
Description of Selected Action/Project	Complete Municipal Stormwater Retrofit Recommendations not already included in this HMP as presented in the 2014 Lake View Watershed Report.
Action/Project Category	SIP, NSP
Goals Met	1
Applies to existing and or new development, or not applicable	Existing
Benefits (losses avoided)	Medium-High
Estimated Cost	Medium
Priority*	Low
Plan for Implementation	
Responsible Organization	Town DPW, Planning
Local Planning Mechanism	Hazard Mitigation, Stormwater
Potential Funding Sources	HMGP, FMA, PDM
Timeline for Completion	DOF
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:



Action Number:

TLG-25

Mitigation Action/Initiative:

Complete Municipal Stormwater Retrofit Recommendations

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	
Property Protection	1	
Cost-Effectiveness	0	
Technical	1	
Political	1	
Legal	0	
Fiscal	0	Need to seek grant funding
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	0	Flood
Timeline	1	
Agency Champion	1	
Other Community Objectives	1	
Total	10	
Priority (High/Med/Low)	High	



9.9 Village of Lake George

This section presents the jurisdictional annex for the Village of Lake George.

9.9.1 Hazard Mitigation Plan Point of Contact

The following individuals have been identified as the hazard mitigation plan's (HMP) primary and alternate points of contact.

Primary Point of Contact	Alternate Point of Contact
Robert M. Blais, Mayor P.O. Box 791 Village of Lake George, New York 12845 (518) 668-5771 x25 lgvmayor@nycap.rr.com	David Harrington, Superintendent of Public Works P.O. Box 791 Village of Lake George, New York 12845 (518) 668-5771 x29 lgwtp@hotmail.com

9.9.2 Municipal Profile

The Village of Lake George is a village in the Town of Lake George in Warren County. It is situated on the shores of Lake George. The Village has a total area of 0.6 square miles all of which is land. According to the 2010 Census, the community's population was 906.

Growth/Development Trends

The Village of Lake George did not note any recent residential/commercial development since 2010 or any major residential or commercial development, or major infrastructure development planned for the next five years in the municipality. As the Village is fully built-out, some redevelopment of existing areas does occur.

9.9.3 Natural Hazard Event History Specific to the Municipality

Warren County has a history of natural and non-natural hazard events as detailed in Volume I, Section 5.0 of this Plan. A summary of historical events appears in each hazard profile, and includes a chronology of events that have affected the County and its municipalities. For the purpose of this Plan update, events that have occurred in the County from 2010 to present were summarized to indicate the range and impact of hazard events in the community. Information regarding specific damages is included, if available, based on reference material or local sources. This information is presented in Table 9.9-1 below. For details of these and additional events, refer to Volume I, Section 5.0 of this Plan.

Table 9.9-1. Hazard Event History

Dates of Event	Event Type (FEMA Disaster Declaration if applicable)	Warren County Designated?	Summary of Damages/Losses
August 27-29, 2011	Hurricane Irene (DR-4020)	Yes	There was severe wind and flooding damage throughout the County. In the Village of Lake George, Dieskau Street was closed. Other infrastructure damage included a lost culvert on Bradley Street, road loss on Dieskau Street, and the loss of 6 public docks. The Sewell Street Pump Station lost power. Private boats and docks were grounded. The Village conducted clean-up and debris removal. Public assistance was requested.

Notes:

FEMA Federal Emergency Management Agency
 DR Major Disaster Declaration (FEMA)
 N/A Not applicable





9.9.4 Hazard Vulnerabilities and Ranking

The hazard profiles in Section 5.0 of this Plan convey detailed information regarding each plan participant’s vulnerability to the identified hazards. The following summarizes the hazard vulnerabilities and their ranking in the Village of Lake George. For additional vulnerability information relevant to this jurisdiction, refer to Section 5.0.

Hazard Risk/Vulnerability Risk Ranking

Table 9.9-2 below summarizes hazard risk/vulnerability rankings of potential hazards for the Village of Lake George.

Table 9.9-2. Hazard Risk/Vulnerability Risk Ranking

Hazard type	Estimate of Potential Dollar Losses to Structures Vulnerable to the Hazard ^{a, b}	Probability of Occurrence	Risk Ranking Score (Probability x Impact)	Hazard Ranking ^a
Earthquake	100-year MRP: \$0.00 500-year MRP: \$0 2,500-Year MRP: \$0.00	Occasional	12	Low
Flood	RCV Exposed to 1% Annual Chance: \$5,837,503	Frequent	18	Medium
Landslide	Damage estimate not available	Occasional	16	Medium
Infestation	Damage estimate not available	Frequent	24	Medium
Severe Storm	RCV Exposed to 1938 storm-winds: \$75,368	Frequent	48	High
Severe Winter Storm	GBS 1% Loss: \$2,377,880 GBS 5% Loss: \$11,889,400	Frequent	51	High
Wildfire	RCV Exposed to Intermix: \$0 RCV Exposed to Interface: \$384,848,000	Frequent	24	Medium
Cyber Security	Damage estimate not available	Occasional	12	Low
Disease Outbreak	Damage estimate not available	Frequent	27	Medium
Hazardous Material Incidents	Damage estimate not available	Frequent	24	Medium

Notes:

- a. The general building stock valuation is based on the custom inventory generated for the municipality and based on improved value.
High = Total hazard priority risk ranking score of 31 and above
Medium = Total hazard priority risk ranking of 20-30+
Low = Total hazard risk ranking below 20
- b. Loss estimates for the severe storm and severe winter storm hazards are structural values only and do not include the estimated value of contents. The earthquake was evaluated by Census tract. The Census tracts do not exactly align with municipal boundaries; therefore, a total is reported for each Town inclusive of the Villages. Loss estimates for the flood and earthquake hazards represent both structure and contents. Potential flood loss estimates were generated using Hazus-MH 2.2 and digitized FIRM maps from the 1980s and 1990s for the 1-percent annual chance event; NED DEM was used to generate a depth grid. The County’s 2015 Real Property data was used to generate the values for flood and includes structure and contents. For the wildfire hazard, the improved value and estimated contents of buildings located within the identified hazard zones is provided.

GBS General building stock
MRP Mean return period
RCV Replacement Cost Value

National Flood Insurance Program (NFIP) Summary

Table 9.9-3 below summarizes NFIP statistics for the Village of Lake George.





Table 9.9-3. NFIP Summary

Municipality	# Policies (1)	# Claims (Losses) (1)	Total Loss Payments (2)	# Rep. Loss Prop. (1)	# Severe Rep. Loss Prop. (1)	# Policies in 100-year Boundary (3)
Village of Lake George	6	4	\$97,902	0	0	1

Source: FEMA, 2014

Notes:

- (1) Policies, claims, repetitive loss, and severe repetitive loss statistics are provided by FEMA, are current as of November 30, 2015, and are summarized by community name. Total number of repetitive loss properties includes severe repetitive loss properties. Number of claims represents claims closed by November 30, 2014.
- (2) Total building and content losses from the claims file provided by FEMA Region 2.
- (3) Number of policies inside and outside of flood zones is based on latitude and longitude provided by FEMA Region 2 in the policy file.
- (4) FEMA noted that for a property with more than one entry, more than one policy may have been in force or more than one Geographic Information System (GIS) specification was possible.

Critical Facilities

Table 9.9-4 below identifies critical facilities within the municipality located on parcels that intersect the current regulatory NFIP 1% chance flood boundary (aka: “Special Flood Hazard Area” (SFHA)), however it is recognized that the actual facility structure(s) may lie outside of the SFHA. Please refer to the Flood Hazard Profile (Section 5.4.2) for further details of estimated flood losses throughout the County, as well as the “Other Vulnerabilities Identified” section following.

Table 9.9-4. Potential Flood Losses to Critical Facilities

Municipality	Facility Types in 1% Chance Flood Boundary						
	Boat Facilities	Dam	Electric	Government	Highway Bridge	Rail Facility	Wastewater
Village of Lake George	0	0	0	0	0	0	0

Source: Warren County Real Property 2015 tax roll; HAZUS-MH 2.2; FEMA 2015

Notes:

- (1) HAZUS-MH 2.2 provides a general indication of the maximum restoration time for 100% operations. Clearly, a great deal of effort is needed to quickly restore essential facilities to full functionality; therefore, this will be an indication of the maximum downtime (HAZUS-MH 2.2 User Manual).
- (2) Some facilities may be within the Digital Flood Insurance Rate Map (DFIRM) flood hazard boundary; however, HAZUS did not calculate potential loss, perhaps because depth of flooding would not cause any damages to these structures according to the depth damage function used in HAZUS for that facility type. Further, HAZUS-MH may estimate potential damage to a facility outside the DFIRM if the model generates a depth grid beyond DFIRM boundaries.

Other Vulnerabilities Identified

The municipality has identified the following vulnerabilities within their community:

- Motel 6 at 99 Canada Street has been impacted by repetitive flooding, however was not identified as an NFIP RL/SRL property in FEMA provided data (see above Table 9.9-3).
- Three major streams flow down from Prospect Mountain into the Village. Interstate 87 crosses over these streams through culverts. Continued upstream development has not been met with upgrades to the water and stormwater management systems, resulting in serious localized flooding problems.



- I-87 Exit 22 – Lack of maintenance on work NYS DOT s a decade ago. Stormwater collection and drainage on Prospect Mountain Highway is also an issue due to lack of maintenance. The Village will continue to talk to the State about looking at the drainage problems associated with their infrastructure.
- Lack of State maintenance and debris clearing at culverts. The Village will continue to petition NYS DOT to heighten maintenance.
- Village has historically worked with Warren County and private contractors to mitigate certain areas, mitigating with the installation of larger culverts and drywells, which has gone a long way to address localized flood issues. However, problems persist on State and private property. Specifically, the Village lacks the resources to mitigate the problems on Route 9 where the major problems are.

Beaver Damming

- Beaver damming is seen as a problem, such as an estimated 600-acre beaver dam impounded area and private property in Somerville. The potential impact area would include Route 9 between Warrensburg and Lake George, and other critical transportation infrastructure down through the Big Hollow area and into the Village.
- There is one very large impoundment in the Town of Chester which has the potential to impact three major roads and presents a clear life-safety risk. Private property owners here are not cooperative.
- The County staff continues to monitor some 11-12 dams and good relationships with the private property owners. The Village will continue to improve dialogue and collaboration with private property owners to address the problem.
- Beaver Dam blowout occurred in 2012 or 2013 on Easter Sunday on Northway (I-87) in the Dixon Hill area. The blowout took out/closed several roads in this area.

Sheltering: The Town/Village use the Fire Station as a central point for emergency service personnel to assemble to address emergencies/disasters. As such, it is not considered adequate for sheltering of the general public. The Town/Village believes the Elementary School and High School should be better equipped and designated for public sheltering. Both have backup power. The Town/Village should work towards establishing this as a formal agreement.

Lower Wastewater Pump Station – With the construction of the new million dollar Beach Road reconstruction, this has become more flood vulnerable. NYS DEC has elevated the road in front of the pump station and now stormwater has no place to go. Culverts here need to be lowered to move the water away from the pump station.

Diamond Point Road – Potable Water facility here could use dedicated back-up power.

Pump Station on Bradley Street – This facility was flooded during Hurricane Irene which took out the electrical and pump. Similar damages occurred at this pump station during several other storms, and two separate loss events losses were estimated at \$8,000-10,000, each. A mitigation project to get it elevated would be expensive (~500k).

Old-growth timber (tall, especially pine, on lake side – Trinity Rock Road, Black Rock Road on lakeside) in back of power-line rights-of-way – vulnerable to falling and taking out power lines and blocking the road.





9.9.5 Capability Assessment

This section identifies the following capabilities of the local jurisdiction:

- Planning and regulatory capability
- Administrative and technical capability
- Fiscal capability
- Community classification
- NFIP
- Integration of mitigation planning into existing and future planning mechanisms.

Planning and Regulatory Capability

Table 9.9-5 below summarizes regulatory tools available to the Village of Lake George.

Table 9.9-5. Planning and Regulatory Tools

Tool / Program (code, ordinance, plan)	Do you have this? (Yes/No) If Yes, date of adoption or update	Authority (local, county, state, federal)	Dept. /Agency Responsible	Code Citation and Comments (Code Chapter, name of plan, explanation of authority, etc.)
Planning Capability				
Master Plan	Yes	Local		
Capital Improvements Plan	No	-	-	-
Floodplain Management / Basin Plan	No	-	-	-
Stormwater Management Plan	Yes, April 2014	Local	Village of Lake George Department of Public Works	Village of Lake George Stormwater Management Program Plan
Open Space Plan	No	-	-	-
Stream Corridor Management Plan	Yes	Local	Lake George Park Commission	-
Watershed Management or Protection Plan	Yes	Local	Lake George Park Commission	-
Economic Development Plan	Yes	County	Warren County	WCEDC
Comprehensive Emergency Management Plan	Yes	County	-	-
Emergency Response Plan	Yes	County	-	-
Post-Disaster Recovery Plan	No	-	-	-
Transportation Plan	No	-	-	-
Strategic Recovery Planning Report	No	-	-	-
Other Plans:				
Regulatory Capability				
Building Code	Yes	State, Local		NYS Building Code, Chapter 78 (Building Construction)
Zoning Ordinance	Yes	Local	Planning	Chapter 220 (Zoning)



Tool / Program (code, ordinance, plan)	Do you have this? (Yes/No) If Yes, date of adoption or update	Authority (local, county, state, federal)	Dept. /Agency Responsible	Code Citation and Comments (Code Chapter, name of plan, explanation of authority, etc.)
			Board	
Subdivision Ordinance	Yes	Local	Planning Board	§220-10 (Subdivision)
NFIP Flood Damage Prevention Ordinance	Yes	Federal, State, Local		Chapter 114 (Flood Damage Prevention)
NFIP: Cumulative Substantial Damages	No	-	-	-
NFIP: Freeboard	Yes	State, Local	-	State mandated BFE+2 for single and two-family residential construction, BFE+1 for all other construction types
Growth Management Ordinances	No	-	-	
Site Plan Review Requirements	Yes	Local	-	Chapter 220, Article VII (Site Plan Review)
Stormwater Management Ordinance	Yes	Local	Village of Lake George Department of Public Works	Chapter 220, Article IX (Stormwater Management Regulations)
Municipal Separate Storm Sewer System (MS4)	Yes, 2013	Local	Village of Lake George Department of Public Works	-
Natural Hazard Ordinance	No	-	-	-
Post-Disaster Recovery Ordinance	No	-	-	-
Real Estate Disclosure Requirement	Yes	State	-	New York State (NYS) mandate, Property Condition Disclosure Act, <i>NY Code</i> – Article 14 §460-467
Other (Special Purpose Ordinances [i.e., sensitive areas, steep slope])	Yes	Local	-	Chapter 174 (Snow Removal and Emergency Conditions)

Administrative and Technical Capability

Table 9.9-6 below summarizes potential staff and personnel resources available to the Village of Lake George.

Table 9.9-6. Administrative and Technical Capabilities

Resources	Is this in place? (Yes or No)	Department/ Agency/Position
Administrative Capability		
Planning Board	Yes	Planning Board and Zoning Board of Appeals
Mitigation Planning Committee	No	-
Environmental Board/Commission	No	-
Open Space Board/Committee	No	-
Economic Development Commission/Committee	No	-
Maintenance programs to reduce risk	No	-





Resources	Is this in place? (Yes or No)	Department/ Agency/Position
Mutual aid agreements	Yes	
Technical/Staffing Capability		
Planner(s) or engineer(s) with knowledge of land development and land management practices	No	-
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Yes	Consultant engineer used as needed.
Planners or engineers with an understanding of natural hazards	Yes	Consultant engineer used as needed.
NFIP Floodplain Administrator (FPA)	Yes	Building and Zoning Administrator
Surveyor(s)	No	-
Personnel skilled or trained in GIS and/or Hazards United States (HAZUS) – Multi-Hazards (MH) applications	No	-
Scientist familiar with natural hazards	No	-
Emergency Manager	No	-
Grant writer(s)	Yes	Consultants used as applicable.
Staff with expertise or training in benefit/cost analysis	No	-
Professionals trained in conducting damage assessments	No	-

Fiscal Capability

Table 9.9-7 below summarizes financial resources available to the Village of Lake George.

Table 9.9-7. Fiscal Capabilities

Financial Resources	Accessible or Eligible to Use (Yes/No)
Community Development Block Grants (CDBG, CDBG-DR)	No
Capital improvements project funding	Yes
Authority to Levy Taxes for specific purposes	Yes
User fees for water, sewer, gas or electric service	Yes
Impact fees for homebuyers or developers of new development/homes	No
Stormwater utility fee	No
Incur debt through general obligation bonds	Yes
Incur debt through special tax bonds	No
Incur debt through private activity bonds	No
Withhold public expenditures in hazard-prone areas	No
Other federal or state funding programs	No
Open Space Acquisition funding programs	No
Other	

Community Classifications

Table 9.9-8 below summarizes classifications for community program available to the Village of Lake George.





Table 9.9-8. Community Classifications

Program	Do you have this? (Yes/No)	Classification (if applicable)	Date Classified (if applicable)
Community Rating System (CRS)	No	N/A	N/A
Building Code Effectiveness Grading Schedule (BCEGS)	No	N/A	N/A
Public Protection (ISO Fire Protection Classes 1 to 10)	Yes	4	9/1/2014
NYSDEC Climate Smart Community	Yes	Passed Climate Smart Communities Pledge	
Storm Ready	NP	N/A	N/A
Firewise	NP	N/A	N/A
Disaster/safety programs in/for schools	Yes	N/A	N/A
Organizations with mitigation focus (advocacy group, non-government)	No	N/A	N/A
Public education program/outreach (through website, social media)	Yes	N/A	N/A
Public-Private Partnerships	No	N/A	N/A

Note:

- N/A Not applicable
- NP Not participating
- Unavailable

The classifications listed above relate to the community’s ability to provide effective services to lessen its vulnerability to the hazards identified. These classifications can be viewed as a gauge of the community’s capabilities in all phases of emergency management (preparedness, response, recovery and mitigation) and are used as an underwriting parameter for determining the costs of various forms of insurance. The Community Rating System (CRS) class applies to flood insurance, while the Building Code Effectiveness Grading Schedule (BCEGS) and Public Protection classifications apply to standard property insurance. CRS classifications range on a scale of 1 to 10, with class 1 being the best possible classification, and class 10 representing no classification benefit. Firewise classification is higher if the subject property is more than 1000 feet from a creditable fire hydrant and is within 5 road miles of a recognized Fire Station.

Criteria for classification credits are outlined in the following documents:

- The Community Rating System Coordinators Manual
- The Building Code Effectiveness Grading Schedule
- The ISO Mitigation online ISO’s Public Protection website at <https://www.isomitigation.com/program-works/how-the-ppc-program-works.html>
- The National Weather Service Storm Ready website at <http://www.stormready.noaa.gov/index.html>
- The National Firewise Communities website at <http://firewise.org/>

Self-Assessment of Capability

Table 9.9-9 below provides an approximate measure of the Village of Lake George’s capability to work in a hazard-mitigation capacity and/or effectively implement hazard mitigation strategies to reduce hazard vulnerabilities.





Table 9.9-9. Self-Assessment Capability for the Municipality

Area	Degree of Hazard Mitigation Capability		
	Limited (If limited, what are your obstacles?)*	Moderate	High
Planning and Regulatory Capability	X - Staffing		
Administrative and Technical Capability	X - Staffing		
Fiscal Capability		X	
Community Political Capability			X
Community Resiliency Capability			X
Capability to Integrate Mitigation into Municipal Processes and Activities.			X

National Flood Insurance Program

NFIP Floodplain Administrator (FPA)

Douglas Frost – Code Enforcement Officer

Flood Vulnerability Summary

As of November 30, 2014, 6 policies were in force, one of which was within the 100-year flood boundary. Since 1978, 4 claims have been paid within the Village, totaling \$97,902. There are no repetitive loss property and no severe repetitive loss properties in the Village of Lake George. According to current NFIP statistics at the time of this Plan, NFIP policies in the Village of Lake George insured over \$1.9 million of property with total annual insurance premiums of \$7,494.

The Village does not maintain a list of properties that have been flood damaged, however the Village FPA noted residential damage has occurred outside of the Village. Motel #6 has also been flooded during past events. The Village does not have a staff person who is authorized to make substantial damage estimates.

The FPA is not aware of any property owners interested in mitigation or in the process of mitigation.

Resources

The Village Code Enforcement Officer is the FPA, responsible for enforcing the codes, regulations, and local laws of the Village of Lake George. He administers and enforces the zoning regulations. He assists applicants, inspect sites, reviews building applications, and investigates complaints. (Note: According to Chapter 114-10 of the Village Code, the Building and Zoning Administrator is the local floodplain administrator.)

The FPA currently provides minimal education or outreach to the community regarding flood hazard/risk.

Barriers to running an effective floodplain management program in the Village include the fact that the Village is 100% developed, and not much flooding occurs within the Village boundaries. The FPA would be interested in additional FPA certification training if it was available in the area.

Compliance History

The Village is in good standing in the NFIP, and the floodplain administrator is unaware of when the most recent Community Assistance Visit (CAV) was completed.





The Village intends to continue active participation in the NFIP, and maintain compliance with all requirements of participation. Further, the Village has identified several actions to support both continued and improved participation in the NFIP as identified in Table 9.9-13.

Regulatory

Chapter 114 of the Village Code meets or exceeds the FEMA and State minimum requirements for qualification and participation in the NFIP.

Integration of Hazard Mitigation into Existing and Future Planning Mechanisms

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, each community was surveyed to obtain a better understanding of their community's progress in plan integration. A summary is provided below. In addition, the community identified specific integration activities that will be incorporated into municipal procedures.

Planning

Planning Board: The Planning Board reviews those applications for projects in the Village for which the Village Code requires review.

Transportation: The Village DPW has a representative sitting on the Adirondack Glens Falls Transportation Council.

Regulatory and Enforcement (Ordinances)

Code Enforcement: The Code Enforcement Officer is responsible for enforcing the codes, regulations, and local laws of the Village of Lake George. He administers and enforces the zoning regulations. He assists applicants, inspect sites, reviews building applications, and investigates complaints.

Zoning: The Village has both a Planning Board and a Zoning Board of Adjustment (ZBA). Their functions include relation to regulations at various levels (although not specific to hazard regulations) and plans identified at the local, county and state level.

Stormwater: The Village's stormwater regulations located in Village Code Chapter 220: Zoning, and are documented in the Stormwater Management Program Plan.

Flood Damage Prevention Ordinance: Chapter 114 of the Village Code meets or exceeds the FEMA and State minimum requirements for qualification and participation in the NFIP.

Operational and Administration

Stormwater: The Department of Public Works administers the stormwater management office program.

NFIP and Flood Damage Reduction: Douglas Frost, the Village Code Enforcement Officer, acts as the floodplain administrator.

Tree Management: Town and Village have tree management programs to supplement the efforts of the utilities. Village Department of Public Works (DPW) monitors trees and trims as needed, and performs a village cleanup twice a year. This is ongoing capability.



Funding

Municipal/operating budget: The Village municipal/operating budget specifically includes line items for mitigation projects/activities related to stormwater mitigation.

Capital Improvements Budget: The Village Capital Improvements Budget includes budgeted items for mitigation projects related to stormwater drainage, sewer and water facilities, fire department, and schools.

Mitigation Grants: The Village has been awarded multiple stormwater improvement grants.

Education and Outreach

The Village website is available for public outreach to inform citizens of natural hazards.

The Village works with a contractor to develop their MS4 outreach program, which does include work on erosion controls and proper organic debris management. Public education will be a big effort in 2015-2016, supported through the Village website.

The Village relies on the County OES active Facebook page, which has pretty good coverage, and can be used to support local outreach and education. Spring and fall are targeted times for public outreach.

9.9.6 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and prioritization.

Past Mitigation Initiative Status

Table 9.9-10 below indicates progress on the community’s mitigation strategy identified in the 2011 Plan. Previous actions that are now ongoing programs and capabilities are indicated as such in Table 9.9-10, and also appear under “Capability Assessment” presented previously in this annex. Actions carried forward as part of this plan update are included in the following subsection (in Table 9.9-11) with prioritization.

Table 9.9-10. Past Mitigation Initiative Status

Description	Status	Review Comments
Reconstruct Beach Road in the Town and Village of Lake George. Reconstruction, utility and drainage upgrade and multi-modal safety improvements.	Completed. Beach Road is a County road.	While this project was completed, this has led to stormwater flood impacts to the wastewater pump station.
Educate residents regarding steps to be taken to decrease the impact of natural hazards (including ice storms, wild/forest fires, severe storms, tornado, earth-quakes, and all other natural hazards) by developing, enhancing, and implementing education programs, brochures, school presentations informing groups about ways to reduce risk, and other outreach activities.	In Progress, Ongoing	New Action Wording: Expand Village website to include links to information on natural hazard and risk management.
Monitor and remove trees/limbs in storm areas that present potential hazards to keep trees from threatening lives, property, and public infrastructure during storm events.	Ongoing; Discontinue	Town and Village have tree management programs to supplement the efforts of the utilities. Include in 2016 HMP as ongoing operational capability.
Obtain funding to purchase generators for	Discontinue	This is a Town facility – not in the Village.



Table 9.9-10. Past Mitigation Initiative Status

Description	Status	Review Comments
municipally-owned critical facilities.		
Coordinate/create mutual aid agreements between emergency services, public works departments, and public utilities to ensure efficient use of resources during and after storm events.	No longer applicable - Discontinue	Fire Department has agreements with other departments, but the Village doesn't have a need for agreements with private utilities, etc.
Develop plans for debris management after hazard events, including severe winter snow/ice events, and other severe storms.	No longer applicable - Discontinue	Village DPW monitors trees and trims as needed, and performs a village cleanup twice a year. This is ongoing capability.
Design a network of citizens that will check in on elderly, functional needs, and low- income individuals during major events.	No progress – continue as new action	There are a few senior living facilities in the Village. New action: look into backup power needs for senior housing facilities, including Hunter's Run.
Send a village representative to the NYS Wildland Fire Suppression Training.	Not applicable to Village Staff - discontinue	Unaware if FD would be interested.
Provide training for local code enforcement officials to implement building codes that reflect disaster resistant construction for new structures and renovation.	Ongoing capability; Discontinue	Village CEO does attend training.
Provide residents with information listing steps taken to lessen potential flood damage to reduce the impact of flooding.	Ongoing capability; Discontinue	Village has a lot of brochures at village hall.
Educate the community on benefits of carrying NFIP policies and increase knowledge of NFIP services.	Ongoing capability; Discontinue	Include in 2016 HMP as ongoing operational capability.
Review and update local plans to integrate goals, objectives, and activities from this HMP which are not found in existing regulatory documents, as appropriate.	Continue	Zoning and Planning Board could review existing plans to reflect data given to them from the HMP.
Maintain a current inventory of at-risk buildings and infrastructure and continually update inventory of at-risk structures in each jurisdiction.	No progress, not applicable - Discontinue	N/A
Apply for grants to assist with mitigation activities needed to provide a level of protection for critical facilities.	Ongoing; Discontinue	Include in 2016 HMP as ongoing operational capability.
Provide continuing education and training for local Floodplain Administrator to ensure code enforcement and proper inspections.	Ongoing capability; Discontinue	Village CEO does attend training.
Implement zoning regulations to discourage building new structures in disaster prone areas – if such regulations are not already written into Village Zoning code or Floodplain Ordinance.	Discontinue	Village is built-out – no longer applicable. See new action VLG-11.



Completed Mitigation Initiatives not Identified in the Previous Mitigation Strategy

The Village of Lake George has identified the following mitigation projects/activities that have also been completed but were not identified in the previous mitigation strategy in the 2011 Plan:

- Sewell Street Flood Mitigation – Installed catch basins and channeling to mitigate local flood problem in this area.
- Public Outreach and Education – The Town/Village works with a contractor to develop their MS4 outreach program, which does include work on erosion controls and proper organic debris management. Public education will be a big effort this year. They use their website to support this.
- The County has a good, active Facebook page (OES) Facebook page, which has pretty good coverage, and can be used to support local outreach and education. Spring and Fall are targeted times for public outreach.
- Town and Village have tree management programs to supplement the efforts of the utilities.
- Soule Street Stormwater Improvements: The Village received funding from the Park Commission to complete a project designed by SWCD. Now complete, the project has addressed the largest amount of the problem.
- Drainage improvements at Prospect Brook: This work completed according to a capital improvements plan and budget.
- All Village operational facilities are equipped with back-up power generators.

Proposed Hazard Mitigation Initiatives for the Plan Update

The Village of Lake George participated in a mitigation action workshop in September 2015 and was provided the following Federal Emergency Management Agency (FEMA) publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 ‘Selecting Appropriate Mitigation Measures for Floodprone Structures’ (March 2007) and FEMA ‘Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards’ (January 2013).

Table 9.9-11 summarizes the comprehensive-range of specific mitigation initiatives the Village would like to pursue in the future to reduce the effects of hazards. Some of these initiatives may be previous actions carried forward for this plan update. Implementation of these initiatives will depend on available funding (grants and local match availability), and some initiatives may be modified or omitted at any time based on occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in Table 9.9-11 to further demonstrate the wide range of activities and mitigation measures selected.

As discussed in Section 6, 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing your actions as ‘High’, ‘Medium’, or ‘Low.’ The table below summarizes the evaluation of each mitigation initiative, listed by Action Number.

Table 9.9-12 summarizes prioritization of all proposed mitigation initiatives for the Plan update.



Table 9.9-11. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category	CRS Category
VLG-1	Work with property owners to mitigate flood risk to repetitively damaged properties, including providing non-financial assistance to property owner to secure mitigation funding as available, at property owner request.	Existing	Flood	1, 2	Village and WCSWD	low	low	Village or WCESD Staff/ Operating Budget	Short	Low	EAP	PR, PI
VLG-2	Provide direct outreach to Motel 6 property owner to consider structural and non-structural mitigation measures to reduce repetitive flooding to roughly 12 units on lower level. Provide non-financial assistance to property owner to secure mitigation funding as available, at property owner request.	Existing	Flood	1	Village and WCWSD	low	low	Village or WCESD Staff/ Operating Budget	Short	Medium	LPR	PR
VLG-3	Develop and implement a plan to collaborate with private property owners to reduce risks from beaver dams.	Existing	Flood	1, 2	Village	low	low	Village Staff/ Operating Budget	Short	Low	LPR, NSP	PR, NR
VLG-4	Identify opportunities to incorporate hazard mitigation strategies into the stormwater management program.	Both	Flood, Stormwater	1, 3	Village DPW Supt.	low	low	Village Staff/ Operating Budget	Short	High	LPR	ES, NR
VLG-5	Participate in the development and implementation of a County-wide Debris Management Plan – on County’s five-year plan.	N/A	All Hazards	1, 3	Village DPW Supt	low	low	Village Staff/ Operating Budget	Short	Low	LPR	ES
VLG-6	Provide training for Village staff with respect to ice storm risk management.	N/A	Ice, Winter Storm	3	Village DPW Supt.	low	low	Grants	Short	High	EAP	ES
VLG-7	Expand Village website to include links to information on natural hazard and risk	N/A	All Hazards	2	Village DPW Supt.	low	low	Village Staff/ Operating	Short	Medium	EAP	PI





Table 9.9-11. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category	CRS Category
	management.							Budget				
VLG-8	Establish a formal agreement with the Elementary School and High School to designate those facilities as emergency shelters.	N/A	All Hazards	3	Mayor	low	low	Village Staff/ Operating Budget	Short	Medium	LPR	ES
VLG-9	Look into backup power needs for senior housing facilities, including Hunter's Run.	Existing	All Hazards	3	Village Trustees	low	low	Village Staff/ Operating Budget	Short	Medium	EAP	ES
VLG-10	Bradley Street Pump Station Elevation	Existing	Flood	1	Water Dept.	high	~500k	FMA, HMGP, PDM	DOF	Medium	SIP	PP
VLG-11	Review and update local plans to integrate goals, objectives, and activities from this HMP which are not found in existing regulatory documents, as appropriate.	Both	All Hazards	1	Planning Board	low	low	PDM, Village Staff/ Operating Budget	Short	Low	LPR	PR

Notes:

Not all acronyms and abbreviations defined below are included in the table.

*Does this mitigation initiative reduce effects of hazards on new and/or existing buildings and/or infrastructure? Not applicable (N/A) is inserted if this does not apply.

Acronyms and Abbreviations:

CAV Community Assistance Visit
 CDBG Community Development Block Grant
 GCRS Community Rating System
 DPW Department of Public Works
 FEMA Federal Emergency Management Agency
 FPA Floodplain Administrator
 HMA Hazard Mitigation Assistance
 N/A Not applicable
 NFIP National Flood Insurance Program
 OEM Office of Emergency Management

Potential FEMA HMA Funding Sources:

FMA Flood Mitigation Assistance Grant Program
 HMGP Hazard Mitigation Grant Program
 PDM Pre-Disaster Mitigation Grant Program
 RFC Repetitive Flood Claims Grant Program (discontinued)
 SRL Severe Repetitive Loss Grant Program (discontinued)

Timeline:

Short 1 to 5 years
 Long Term 5 years or greater
 OG On-going program
 DOF Depending on funding

Costs:

Where actual project costs have been reasonably estimated:

Benefits:

Where possible, an estimate of project benefits (per FEMA's benefit calculation methodology)





Costs:

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

Where actual project costs cannot reasonably be established at this time:

Low Possible to fund under existing budget. Project is part of, or can be part of, an existing ongoing program.
Medium Could budget for under existing work plan, but would require a reapportionment of the budget or a budget amendment, or cost of the project would have to be spread over multiple years.
High Would require an increase in revenue via an alternative source (i.e., bonds, grants, fee increases) to implement. Existing funding levels are not adequate to cover costs of the proposed project.

Mitigation Category:

- Local Plans and Regulations (LPR) – Actions that include government authorities, policies, or codes that influence the way land and buildings are developed and built.
- Structure and Infrastructure Project (SIP) – Actions that involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures, as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce impacts of hazards.
- Natural Systems Protection (NSP) – Actions that minimize damage and losses, and also preserve or restore the functions of natural systems.
- Education and Awareness Programs (EAP) – Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities

CRS Category:

- Preventative Measures (PR) – Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and stormwater management regulations.
- Property Protection (PP) – Actions include public activities to reduce hazard losses or 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.
- Public Information (PI) – 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 educational programs for school-age children and adults.
- Natural Resource Protection (NR) – 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.
- Structural Flood Control Projects (SP) – Actions that involve construction of structures to reduce impacts of a hazard. Such structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.
- Emergency Services (ES) – Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and protection of essential facilities

Benefits:

has been evaluated against the project costs, and is presented as:

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

Where numerical project benefits cannot reasonably be established at this time:

Low Long-term benefits of the project are difficult to quantify in the short term.
Medium Project will have a long-term impact on reduction of risk exposure to life and property, or project will provide an immediate reduction in risk exposure to property.
High Project will have an immediate impact on reduction of risk exposure to life and property.



Table 9.9-12. Summary of Prioritization of Actions

Mitigation Action/Project Number	Mitigation Action/Initiative	Life Safety	Property Protection	Cost-Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
VLG-1	Work with property owners to mitigate flood risk to repetitively damaged properties.	0	1	1	0	0	1	0	1	0	0	1	-1	-1	-1	2	Low
VLG-2	Encourage Hotel #6 property owner to consider structural and non-structural mitigation measures to reduce repetitive flooding to roughly 12 units on lower level.	1	1	1	0	1	1	1	1	0	0	1	-1	-1	-1	5	Medium
VLG-3	Develop and implement a plan to collaborate with private property owners to reduce risks from beaver dams.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Low
VLG-4	Identify opportunities to incorporate hazard mitigation strategies into the stormwater management program.	1	1	1	1	1	1	1	1	1	1	1	1	0	0	12	High
VLG-5	Participate in the development and implementation of a County-wide Debris Management Plan – on County’s five-year plan.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Low
VLG-6	Provide training for Village staff with respect to ice storm risk management.	1	1	1	1	1	1	1	1	0	0	0	1	0	0	9	High
VLG-7	Expand Village website to include links to information on natural hazard and risk management.	1	1	0	0	1	1	0	0	0	0	0	0	0	0	4	Medium





Table 9.9-12. Summary of Prioritization of Actions

Mitigation Action/Project Number	Mitigation Action/Initiative	Life Safety	Property Protection	Cost-Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
VLG-8	Establish a formal agreement with the Elementary School and High School to designate those facilities as emergency shelters.	1	1	0	0	1	0	0	0	0	0	1	0	0	0	4	Medium
VLG-9	Look into backup power needs for senior housing facilities, including Hunter's Run.	1	1	0	0	1	0	0	0	1	0	1	0	0	0	5	Medium
VLG-10	Bradley Street Pump Station Elevation	1	1	-1	1	1	0	0	0	1	0	0	-1	0	0	5	Medium
VLG-11	Review and update local plans to integrate goals, objectives, and activities from this HMP which are not found in existing regulatory documents, as appropriate.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Low

Note: Refer to Section 6, which conveys guidance on prioritizing mitigation actions.



9.9.7 Future Needs To Better Understand Risk/Vulnerability

None at this time.

9.9.8 Hazard Area Extent and Location

Hazard area extent and location maps have been generated for the Village of Lake George that illustrate the areas probable to be impacted within the municipality (see Figure 9.9-1 and Figure 9.9-2 below). These maps are based on the best available data at the time of the preparation of this Plan, and are considered to be adequate for planning purposes. Maps have been generated for those hazards (i.e., landslide, wildfire and flooding) that can be clearly identified using mapping techniques and technologies, and to which the Village of Lake George has significant exposure. These maps also appear in the hazard profiles within Section 5.4, Volume I of this Plan.

9.9.9 Additional Comments

None at this time.



Figure 9.9-1. Village of Lake George Landslide Hazard Area Map

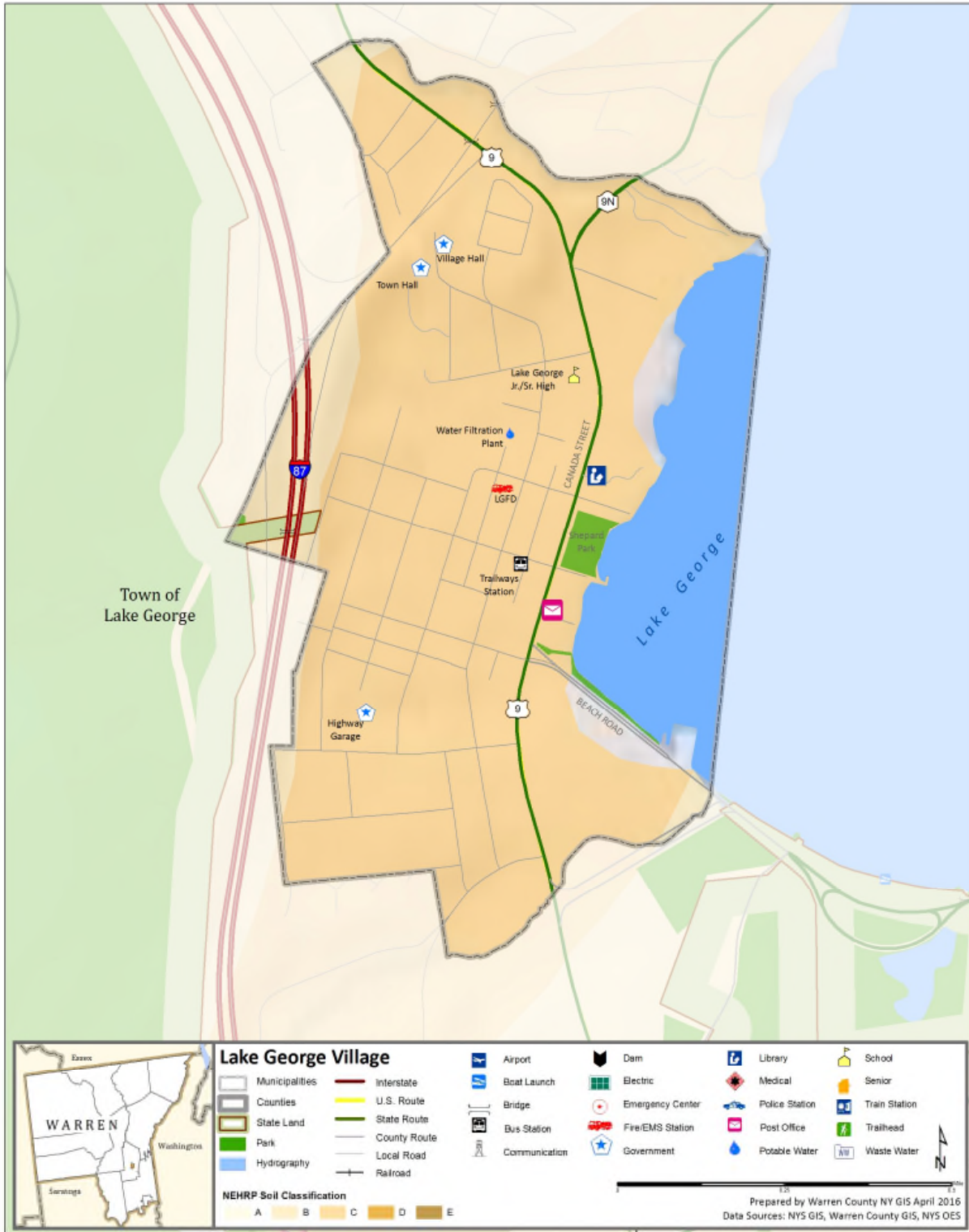
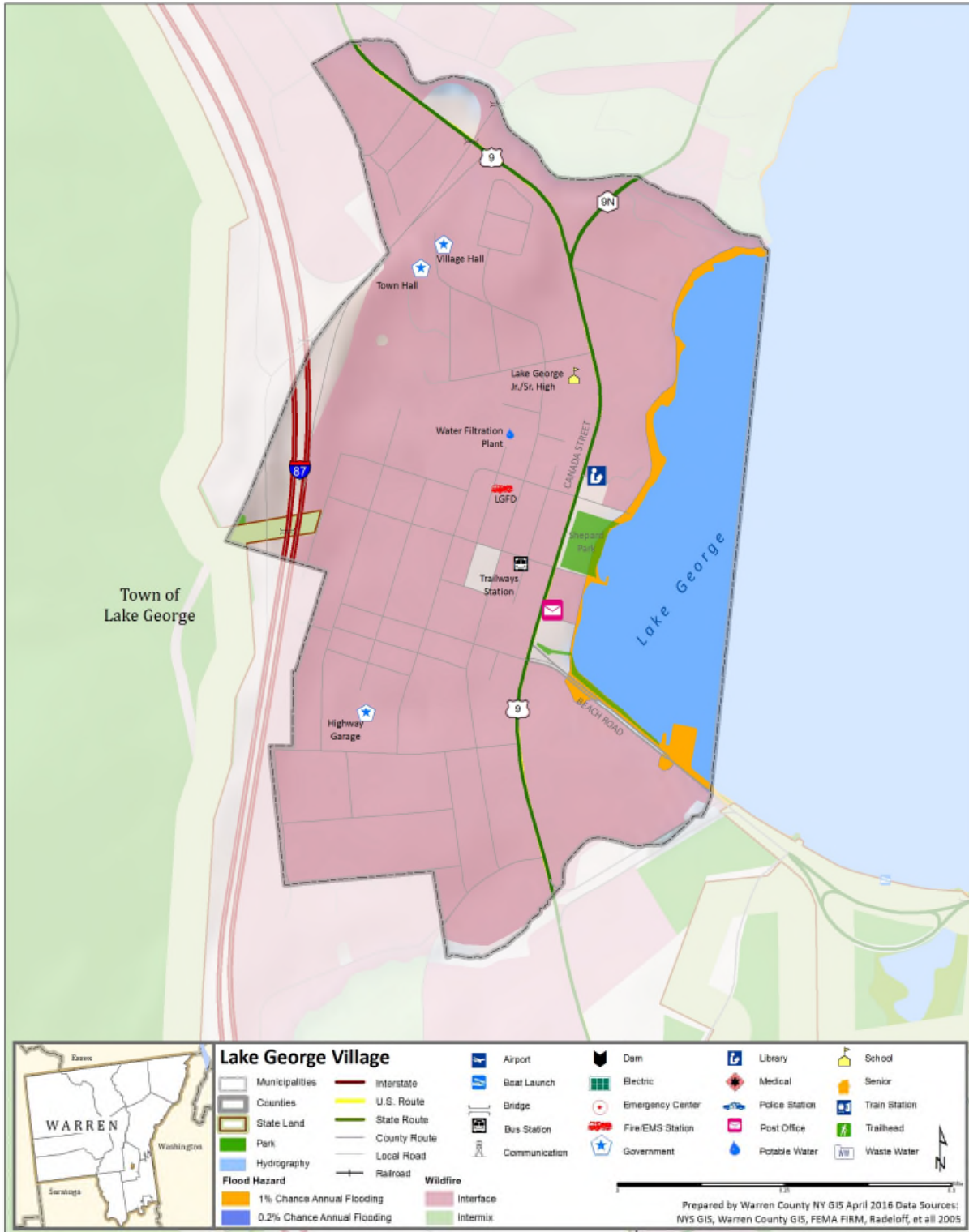




Figure 9.9-2. Village of Lake George Flood and Wildfire Hazard Area Extent and Location Map





Name of Jurisdiction: Village of Lake George
Name and Title Completing Worksheet: David Harrington, Code Enforcement Officer
Action Number: VLG-2
Mitigation Action/Initiative: Motel 6 Flood Mitigation Outreach and Support

Assessing the Risk	
Hazard(s) addressed:	Flood
Specific problem being mitigated:	<p>Motel 6 at 99 Canada Street has been impacted by repetitive flooding, however was not identified as an NFIP RL/SRL property in FEMA provided data (see above Table 9.9-3).</p> <p>Three major streams flow down from Prospect Mountain into the Village. Interstate 87 crosses over these streams through culverts. Continued upstream development has not been met with upgrades to the water and stormwater management systems, resulting in serious localized flooding problems.</p> <p>I-87 Exit 22 – Lack of maintenance on work NYS DOT s a decade ago. Stormwater collection and drainage on Prospect Mountain Highway is also an issue due to lack of maintenance. The Village will continue to talk to the State about looking at the drainage problems associated with their infrastructure.</p> <p>Lack of State maintenance and debris clearing at culverts. The Village will continue to petition NYS DOT to heighten maintenance.</p> <p>Village has historically worked with Warren County and private contractors to mitigate certain areas, mitigating with the installation of larger culverts and drywells, which has gone a long way to address localized flood issues. However, problems persist on State and private property. Specifically, the Village lacks the resources to mitigate the problems on Route 9 where the major problems are.</p>
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	See discussion above regarding the sources of the problem and efforts to address other than resorting to direct property mitigation.
Action/Project Intended for Implementation	
Description of Selected Action/Project	Provide direct outreach to Motel 6 property owner to consider structural and non-structural mitigation measures to reduce repetitive flooding to roughly 12 units on lower level. Provide non-financial assistance to property owner to secure mitigation funding as available, at property owner request.
Action/Project Category	LRP (SIP – if mitigation funding can be secured)
Goals Met	1
Applies to existing and or new development, or not applicable	Existing
Benefits (losses avoided)	Low
Estimated Cost	Low
Priority*	Medium
Plan for Implementation	
Responsible Organization	Village and WCSWD



Local Planning Mechanism	Hazard Mitigation
Potential Funding Sources	Village or WCESD Staff / Operating Budget
Timeline for Completion	Short term
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:



Action Number:

VLG-2

Mitigation Action/Initiative:

Motel 6 Flood Mitigation Outreach and Support

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	0	
Property Protection	1	May mitigate a property subject to repetitive flood damage
Cost-Effectiveness	1	Outreach and potential mitigation grant support is assumed to be cost-effective
Technical	-1	Grant application support may be beyond the Village's technical capabilities
Political	1	
Legal	1	
Fiscal	0	Grant application may require contract support
Environmental	0	
Social	1	
Administrative	1	Village administration capabilities suitable
Multi-Hazard	0	Limited to flood
Timeline	1	
Agency Champion	1	
Other Community Objectives	1	Support of local businesses and economy
Total	8	
Priority (High/Med/Low)	Medium	



Name of Jurisdiction: Village of Lake George
Name and Title Completing Worksheet: David Harrington, Code Enforcement Officer
Action Number: VLG-9
Mitigation Action/Initiative: Backup power for senior housing facilities

Assessing the Risk	
Hazard(s) addressed:	All
Specific problem being mitigated:	Lack of backup power at the senior housing facilities in the Village
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	The Village can identify no other practical or cost-effective alternatives to protect the function of these critical facilities in the event of a power outage.
Action/Project Intended for Implementation	
Description of Selected Action/Project	Look into backup power needs for senior housing facilities, including Hunter's Run.
Action/Project Category	SIP
Goals Met	3
Applies to existing and or new development, or not applicable	Existing
Benefits (losses avoided)	Low
Estimated Cost	Low
Priority*	Medium
Plan for Implementation	
Responsible Organization	Village Trustees
Local Planning Mechanism	Hazard Mitigation
Potential Funding Sources	Village Staff/Operating Budget
Timeline for Completion	Short term
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:



Action Number:

VLG-9

Mitigation Action/Initiative:

Backup power for senior housing facilities

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	
Property Protection	1	Allows facilities to function during power outages
Cost-Effectiveness	0	
Technical	0	
Political	1	
Legal	0	
Fiscal	0	
Environmental	0	
Social	1	
Administrative	0	
Multi-Hazard	1	All hazards
Timeline	0	
Agency Champion	0	
Other Community Objectives	0	
Total	5	
Priority (High/Med/Low)	Medium	



Name of Jurisdiction: Village of Lake George
Name and Title Completing Worksheet: David Harrington Superintendent of Public Works
Action Number: VLG-10
Mitigation Action Name: Bradley Street Pump Station Elevation

Assessing the Risk	
Hazard(s) addressed:	Flooding
Specific problem being mitigated:	Pump station floods
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	Construct a new pump station above ground in a different location – not cost-effective
Action/Project Intended for Implementation	
Description of Selected Action/Project	Elevate existing pump station
Mitigation Action Type	SIP
Goals Met	Goal 1: Protect Life and Property <ul style="list-style-type: none"> Introduce mitigation activities that will make homes, businesses and critical facilities more hazard resistant Implement mitigation activities encouraging protection of the environment
Applies to existing and or new development, or not applicable	N/A
Benefits (losses avoided)	Lessen chance of flooding
Estimated Cost	~ 500K
Priority*	Medium
Plan for Implementation	
Responsible Organization	Village of Lake George
Local Planning Mechanism	Engineers and village staff
Potential Funding Sources	FMA, HMGP, PDM
Timeline for Completion	DOF
Reporting on Progress	
Date of Status Report/ Report of Progress	Date:12/18/15 Progress on Action/Project:



Action Number: VLG-10
Mitigation Action Name: Bradley Street Pump Station

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Provide constant water pressure
Property Protection	1	Protect customers' infrastructure
Cost-Effectiveness	-1	Cost is high to elevate pump station
Technical	1	Technically feasible
Political	1	Less complaints when pump station is inoperable
Legal	0	No existing legal concerns with pump station current location
Fiscal	-1	High project cost is prohibitive
Environmental	0	No environmental concerns with existing location
Social	1	Less complaints when pump station is inoperable
Administrative	0	Little to no administration concerns
Multi-Hazard	0	No multi hazard – only addressed flood hazard
Timeline	1	With funding, project could be completed quickly
Agency Champion	0	
Other Community Objectives	0	
Total	5	
Priority (Low, High)	Medium, Medium	



9.10 Town of Lake Luzerne

This section presents the jurisdictional annex for the Town of Lake Luzerne.

9.10.1 Hazard Mitigation Plan Point of Contact

The following individuals have been identified as the hazard mitigation plan's (HMP) primary and alternate points of contact.

Primary Point of Contact	Alternate Point of Contact
Allen Saheim, Zoning Officer and Floodplain Administrator 539 Lake Ave, PO Box 370 Lake Luzerne, NY 12846 Work# (518) 696-2711 x4 Cell#(518) 338-6121 Lakeluzerne41@roadrunner.com	Eugene Merlino, Supervisor Town of Lake Luzerne 539 Lake Ave. PO Box 370 Lake Luzerne, NY 12846 Work# (518) 696-2711 x3 Cell# (518) 361-2404 supervisorlakeluzerne@hotmail.com

9.10.2 Municipal Profile

The Town of Lake Luzerne is within the Adirondack Park in southern Warren County. It is part of the Glens Falls Metropolitan Statistical Area. The Town has a total land area of 54.1 square miles of which 52.6 square miles are land and 1.4 square miles is water. The Town is bordered by Saratoga County on the south and west, the Town of Warrensburg on the north, and the Town of Queensbury and the Town of Lake George on the west. There are six hamlets in the Town: Bearstown, Danielstown, Fourth Lake, Hartman, Lake Luzerne and Lake Vanare. Town government is run by the Town Board as the executive, administrative and legislative body of the Town. The Town Supervisor presides over Town Board meetings and may be assigned certain powers of administration and supervision.

According to the 2010 Census, the community's population was 3,347. The Town has a public water supply and is part of the Haddon/Luzerne School District.

Growth/Development Trends

Table 9.10-1 below summarizes recent residential/commercial development in the Town of Lake Luzerne since 2010, and lists any known or anticipated major residential/commercial development and major infrastructure development that has been identified in the next five years within the municipality. Refer to the maps following Section 9.10.9 of this annex: Figure 9.10-1 that illustrates landslide hazard areas, and Figure 9.10-2 that illustrates the flood and wildfire hazard areas.

Table 9.10-1. Growth and Development

Property or Development Name	Type (e.g. Res., Comm.)	# of Units / Structures	Location (address and/or Parcel ID)	Known Hazard Zone(s)	Description/Status of Development
Recent Development from 2010 to present					
East River Estates	Residential	9 Single Family	East River Drive	Possibly Flood (inadequate mapping)	Development in progress
Known or Anticipated Development in the Next Five (5) Years					
None Identified					

Note: Only location-specific hazard zones or vulnerabilities are identified

9.10.3 Natural Hazard Event History Specific to the Municipality





Warren County has a history of natural and non-natural hazard events as detailed in Volume I, Section 5.0 of this Plan. A summary of historical events appears in each hazard profile, and includes a chronology of events that have affected the County and its municipalities. For the purpose of this Plan update, events that have occurred in the County from 2010 to present were summarized to indicate the range and impact of hazard events in the community. Information regarding specific damages is included, if available, based on reference material or local sources. This information is presented in Table 9.10-2 below. For details of these and additional events, refer to Volume I, Section 5.0 of this Plan.

Table 9.10-2. Hazard Event History

Dates of Event	Event Type (FEMA Disaster Declaration if applicable)	Warren County Designated?	Comments
April 27-28, 2011	Severe Storms, Flooding, Tornadoes and Straight-Line Winds (DR-1993)	Yes	Small scale evacuations from homes along Hudson River, from 44 River Rd., south to the Lake Luzerne Corinth Bridge. No sheltering, no injuries reported and no Lake Luzerne deaths attributed to this event. Several private residential homes had severe flood damage. Portion of River Rd, Wall St. Pleasant View and Terrace Dr. closed until flood waters receded, and each of those roads required minor repairs. Highway and Parks crews worked overtime to clear debris and to make roads passable.
August 27-29, 2011	Hurricane Irene (DR-4020)	Yes	Limited evacuations along Hudson River south to the Lake Luzerne/ Corinth Bridge. No injuries or deaths were reported for this event in the Town of Lake Luzerne. Several residences were damaged, and several property owners requested assistance through FEMA. Potash Road Bridge washed out and led to the closure of Potash Road, as it was impassable to any vehicle traffic. Highway and Parks departments had overtime to assist with evacuations, debris cleanup and road repair. Utility outages were also reported.

Notes:

FEMA Federal Emergency Management Agency
 DR Major Disaster Declaration (FEMA)

9.10.4 Hazard Vulnerabilities and Ranking

The hazard profiles in Section 5.0 of this Plan convey detailed information regarding each plan participant’s vulnerability to the identified hazards. The following summarizes the hazard vulnerabilities and their ranking in the Town of Lake Luzerne. For additional vulnerability information relevant to this jurisdiction, refer to Section 5.0.

Hazard Risk/Vulnerability Risk Ranking

Table 9.10-3 below summarizes hazard risk/vulnerability rankings of potential hazards for the Town of Lake Luzerne.





Table 9.10-3. Hazard Risk/Vulnerability Risk Ranking

Hazard type	Estimate of Potential Dollar Losses to Structures Vulnerable to the Hazard ^{a, b}	Probability of Occurrence	Risk Ranking Score (Probability x Impact)	Hazard Ranking ^a
Earthquake	100-year MRP: \$94,218.00 500-year MRP: \$1,545,487 2,500-Year MRP: \$12,279,456.00	Occasional	32	High
Flood	RCV Exposed to 1% Annual Chance: \$29,000,180	Frequent	27	Medium
Landslide	Damage estimate not available	Occasional	12	Low
Infestation	Damage estimate not available	Frequent	24	Medium
Severe Storm	RCV Exposed to 1938 storm-winds: \$359,799	Frequent	48	High
Severe Winter Storm	GBS 1% Loss: \$4,770,640 GBS 5% Loss: \$23,853,200	Frequent	51	High
Wildfire	RCV Exposed to Intermix: \$381,903,000 RCV Exposed to Interface: \$229,985,000	Frequent	42	High
Cyber Security	Damage estimate not available	Occasional	12	Low
Disease Outbreak	Damage estimate not available	Frequent	27	Medium
Hazardous Material Incidents	Damage estimate not available	Frequent	24	Medium

Notes:

- a. The general building stock valuation is based on the custom inventory generated for the municipality and based on improved value.
High = Total hazard priority risk ranking score of 31 and above
Medium = Total hazard priority risk ranking of 20-30+
Low = Total hazard risk ranking below 20
- b. Loss estimates for the severe storm and severe winter storm hazards are structural values only and do not include the estimated value of contents. The earthquake was evaluated by Census tract. The Census tracts do not exactly align with municipal boundaries; therefore, a total is reported for each Town inclusive of the Villages. Loss estimates for the flood and earthquake hazards represent both structure and contents. Potential flood loss estimates were generated using Hazus-MH 2.2 and digitized FIRM maps from the 1980s and 1990s for the 1-percent annual chance event; NED DEM was used to generate a depth grid. The County's 2015 Real Property data was used to generate the values for flood and includes structure and contents. For the wildfire hazard, the improved value and estimated contents of buildings located within the identified hazard zones is provided.

GBS General building stock
MRP Mean return period
RCV Replacement Cost Value

National Flood Insurance Program (NFIP) Summary

Table 9.10-4 table below summarizes the NFIP statistics for the Town of Lake Luzerne.

Table 9.10-4. NFIP Summary

Municipality	# Policies (1)	# Claims (Losses) (1)	Total Loss Payments (2)	# Rep. Loss Prop. (1)	# Severe Rep. Loss Prop. (1)	# Policies in 100-year Boundary (3)
Town of Lake Luzerne	49	18	\$786,405	0	0	35

Source: FEMA, 2014

Notes:

- (1) Policies, claims, repetitive loss, and severe repetitive loss statistics are provided by FEMA, are current as of November 30, 2015, and are summarized by community name. Total number of repetitive loss properties includes severe repetitive loss properties. Number of claims represents claims closed by November 30, 2015.
- (2) Total building and content losses from the claims file provided by FEMA Region 2.
- (3) Number of policies inside and outside of flood zones is based on latitude and longitude provided by FEMA Region 2 in the policy file.





(4) FEMA noted that for a property with more than one entry, more than one policy may have been in force or more than one Geographic Information System (GIS) specification was possible.

Critical Facilities

Table 9.10-5 below identifies critical facilities within the municipality located on parcels that intersect the current regulatory NFIP 1% chance flood boundary (aka: "Special Flood Hazard Area" (SFHA)), however it is recognized that the actual facility structure(s) may lie outside of the SFHA. Please refer to the Flood Hazard Profile (Section 5.4.2) for further details of estimated flood losses throughout the County, as well as the "Other Vulnerabilities Identified" section following.

Table 9.10-5. Potential Flood Losses to Critical Facilities

Table with 8 columns: Municipality, Boat Facilities, Dam, Electric, Government, Highway Bridge, Rail Facility, Wastewater. Row for Town of Lake Luzerne shows counts: 2, 3, 0, 0, 6, 0, 0.

Source: Warren County Real Property 2015 tax roll; HAZUS-MH 2.2; FEMA 2015

Notes:

- (1) HAZUS-MH 2.2 provides a general indication of the maximum restoration time for 100% operations. Clearly, a great deal of effort is needed to quickly restore essential facilities to full functionality; therefore, this will be an indication of the maximum downtime (HAZUS-MH 2.2 User Manual).
(2) Some facilities may be within the Digital Flood Insurance Rate Map (DFIRM) flood hazard boundary; however, HAZUS did not calculate potential loss, perhaps because depth of flooding would not cause any damages to these structures according to the depth damage function used in HAZUS for that facility type. Further, HAZUS-MH may estimate potential damage to a facility outside the DFIRM if the model generates a depth grid beyond DFIRM boundaries.

Other Vulnerabilities Identified

The municipality has identified the following vulnerabilities within their community:

- Beaver problem and frequent flooding on Towner Road.
Reed Park Road Bridge – Needs to be replaced and elevated. The bridge is currently vulnerable to flooding and beaver damming.
Bear Town Road needs a culvert replacement.
Fire House on Lake Avenue – very close to floodplain, nearly flooded in 2011.
Lake Avenue – All properties along Lake Avenue are vulnerable to flooding, as evidenced in Irene (2011).
Pot Ash Road – Irene and Sandy caused complete washout and destroyed the bridge. (It has since been replaced.)
(Luzerne) Senior living – State Operated facility off of Fenway, off Stuart Avenue. Houses vulnerable population.
Hall Hill Road – Storm water issue, needs rip-rap or seeded mats to stabilize slope





- East River Drive (County road) – Erosion issues, sinking along river
- Runoff from Hadley Luzerne Central School bus garage and athletic field caused flooding to a residence on Ramsey Road. The Town is talking with the school maintenance supervisor to help keep runoff on school property.

9.10.5 Capability Assessment

This section identifies the following capabilities of the local jurisdiction:

- Planning and regulatory capability
- Administrative and technical capability
- Fiscal capability
- Community classification
- NFIP
- Integration of mitigation planning into existing and future planning mechanisms.

Planning and Regulatory Capability

Table 9.10-6 below summarizes regulatory tools available to the Town of Lake Luzerne.

Table 9.10-6. Planning and Regulatory Tools

Tool / Program (code, ordinance, plan)	Do you have this? (Yes/No) If Yes, date of adoption or update	Authority (local, county, state, federal)	Dept. /Agency Responsible	Code Citation and Comments (Code Chapter, name of plan, explanation of authority, etc.)
Planning Capability				
Master Plan	Yes/4-2010	Local	Planning Dept	Waterfront Revitalization Strategy & Comprehensive Plan
Capital Improvements Plan	No	-	-	-
Floodplain Management / Basin Plan	Yes/1-1987	Local	Zoning Office	Flood Damage Prevention
Storm Water Management Plan	Yes/4-1998	Local	Zoning Dept	Subdivision Regulations
Open Space Plan	Yes/4-2010	Local	Zoning Dept	Zoning Ordinance
Stream Corridor Management Plan	No	-	-	-
Watershed Management or Protection Plan	No	-	-	-
Economic Development Plan	Yes/4-2010	Local	Planning Dept	Waterfront Revitalization Strategy & Comprehensive Plan
Comprehensive Emergency Management Plan	No	-	-	-
Emergency Response Plan	No	-	-	-
Post-Disaster Recovery Plan	No	-	-	-
Transportation Plan	No	-	-	-
Strategic Recovery Planning Report	No	-	-	-
Other Plans:	N/A	-	-	-
Regulatory Capability				
Building Code	N/A	-	County Building Codes	-
Zoning Ordinance	Yes/9-2010	Local/State	Zoning Dept.	Zoning Ordinance
Subdivision Ordinance	Yes/4-1998	Local	Zoning/Planning Board	Subdivision Regulations
NFIP Flood Damage Prevention Ordinance	Yes	Federal, Local	Zoning/Planning	Flood Damage Prevention

Tool / Program (code, ordinance, plan)	Do you have this? (Yes/No) If Yes, date of adoption or update	Authority (local, county, state, federal)	Dept. /Agency Responsible	Code Citation and Comments (Code Chapter, name of plan, explanation of authority, etc.)
NFIP: Cumulative Substantial Damages	No	-	-	-
NFIP: Freeboard	Yes	State, Local	-	State mandated BFE+2 for single and two-family residential construction, BFE+1 for all other construction types
Growth Management Ordinances	No	-	-	-
Site Plan Review Requirements	Yes/9-2010	Local/State	Planning Board	Zoning Ordinance
Stormwater Management Ordinance	Yes/9-2010	Local/State	Planning Board	Zoning Ordinance
Municipal Separate Storm Sewer System (MS4)	No	-	-	-
Natural Hazard Ordinance	No	-	-	-
Post-Disaster Recovery Ordinance	No	-	-	-
Real Estate Disclosure Requirement	Yes	State	-	New York State (NYS) mandate, Property Condition Disclosure Act, <i>NY Code – Article 14 §460-467</i>
Other (Special Purpose Ordinances [i.e., sensitive areas, steep slope])	No	-	-	-

Administrative and Technical Capability

Table 9.10-7 below summarizes potential staff and personnel resources available to the Town of Lake Luzerne.

Table 9.10-7. Administrative and Technical Capabilities

Resources	Is this in place? (Yes or No)	Department/ Agency/Position
Administrative Capability		
Planning Board	Yes	Appointed by Town Board
Mitigation Planning Committee	No	-
Environmental Board/Commission	No	-
Open Space Board/Committee	No	-
Economic Development Commission/Committee	No	-
Maintenance programs to reduce risk	No	-
Mutual aid agreements	Yes	DPW/EMS
Technical/Staffing Capability		
Planner(s) or engineer(s) with knowledge of land development and land management practices	Yes	Use Chazen Engineering, as needed
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Yes	Town uses Warren County Building Code and Fire Prevention Office
Planners or engineers with an understanding of natural hazards	Yes	Use Chazen Engineering as needed
NFIP Floodplain Administrator (FPA)	Yes	Zoning Dept/Floodplain Administrator

Resources	Is this in place? (Yes or No)	Department/ Agency/Position
Surveyor(s)	Yes	Use local surveyors as needed
Personnel skilled or trained in GIS and/or Hazards United States (HAZUS) – Multi-Hazards (MH) applications	Yes	Use County GIS Staffer
Scientist familiar with natural hazards	Yes	Chazen Engineering Firm
Emergency Manager	Yes	Town Supervisor/DPW Superintendent
Grant writer(s)	Yes	Use County Office
Staff with expertise or training in benefit/cost analysis	No	-
Professionals trained in conducting damage assessments	No	-

Fiscal Capability

Table 9.10-8 below summarizes financial resources available to the Town of Lake Luzerne.

Table 9.10-8. Fiscal Capabilities

Financial Resources	Accessible or Eligible to Use (Yes/No)
Community Development Block Grants (CDBG, CDBG-DR)	Yes
Capital improvements project funding	Yes
Authority to Levy Taxes for specific purposes	Yes
User fees for water, sewer, gas or electric service	Yes/ Water Only
Impact fees for homebuyers or developers of new development/homes	Yes
Stormwater utility fee	No
Incur debt through general obligation bonds	Yes
Incur debt through special tax bonds	Yes
Incur debt through private activity bonds	Yes
Withhold public expenditures in hazard-prone areas	No
Other federal or state funding programs	Yes/Used FEMA Grant to replace bridge
Open Space Acquisition funding programs	No
Other	-

Community Classifications

Table 9.10-9 below summarizes classifications for community program available to the Town of Lake Luzerne.

Table 9.10-9. Community Classifications

Program	Do you have this? (Yes/No)	Classification (if applicable)	Date Classified (if applicable)
Community Rating System (CRS)	NP	N/A	N/A
Building Code Effectiveness Grading Schedule (BCEGS)	NP	N/A	N/A
Public Protection (ISO Fire Protection Classes 1 to 10)	NP	N/A	N/A
Storm Ready	NP	N/A	N/A

Program	Do you have this? (Yes/No)	Classification (if applicable)	Date Classified (if applicable)
Firewise	NP	N/A	N/A
Disaster/safety programs in/for schools	Yes	-	Community Center is Shelter for schools
Organizations with mitigation focus (advocacy group, non-government)	N/A	-	-
Public education program/outreach (through website, social media)	TBD	-	-
Public-Private Partnerships	N/A	-	-

Note:

- N/A Not applicable
- NP Not participating
- Unavailable

The classifications listed above relate to the community’s ability to provide effective services to lessen its vulnerability to the hazards identified. These classifications can be viewed as a gauge of the community’s capabilities in all phases of emergency management (preparedness, response, recovery and mitigation) and are used as an underwriting parameter for determining the costs of various forms of insurance. The Community Rating System (CRS) class applies to flood insurance, while the Building Code Effectiveness Grading Schedule (BCEGS) and Public Protection classifications apply to standard property insurance. CRS classifications range on a scale of 1 to 10, with class 1 being the best possible classification, and class 10 representing no classification benefit. Firewise classification is higher if the subject property is more than 1000 feet from a creditable fire hydrant and is within 5 road miles of a recognized Fire Station.

Criteria for classification credits are outlined in the following documents:

- The Community Rating System Coordinators Manual
- The Building Code Effectiveness Grading Schedule
- The ISO Mitigation online ISO’s Public Protection website at <https://www.isomitigation.com/program-works/how-the-ppc-program-works.html>
- The National Weather Service Storm Ready website at <http://www.stormready.noaa.gov/index.html>
- The National Firewise Communities website at <http://firewise.org/>

Self-Assessment of Capability

Table 9.10-10 below provides an approximate measure of the Town of Lake Luzerne’s capability to work in a hazard-mitigation capacity and/or effectively implement hazard mitigation strategies to reduce hazard vulnerabilities.

Table 9.10-10. Self-Assessment Capability for the Municipality

Area	Degree of Hazard Mitigation Capability		
	Limited (If limited, what are your obstacles?)*	Moderate	High
Planning and Regulatory Capability		X	
Administrative and Technical Capability		X	
Fiscal Capability			X
Community Political Capability			X



Area	Degree of Hazard Mitigation Capability		
	Limited (If limited, what are your obstacles?)*	Moderate	High
Community Resiliency Capability			X
Capability to Integrate Mitigation into Municipal Processes and Activities.		X	

National Flood Insurance Program

NFIP Floodplain Administrator (FPA)

Allen Saheim - Zoning Officer/ Floodplain manager

Flood Vulnerability Summary

As of November 30, 2015, 49 policies were in force, 35 of which were within the 100-year flood boundary. Since 1978, 18 claims have been paid within the Town, totaling \$786,405. There are no repetitive loss property and no severe repetitive loss properties in the Town of Lake Luzerne. According to current NFIP statistics at the time of this Plan, NFIP policies in the Town of Lake Luzerne insured over \$8.5 million of property with total annual insurance premiums of \$48,316.

The floodplain administrator has compiled a list of property owners along the Hudson River & downstream from the two town-owned dams.

All flood damaged structures in Lake Luzerne have been residential properties. The Town does not make substantial damage estimates.

No property owners have come to the town asking to be elevated or acquired.

FEMA grants were made available to home owners whose primary residence was damaged by Hurricane Irene. Many homeowners had private flood insurance.

Resources

Allen Saheim is the floodplain administrator. All development within the flood zone is brought before the Planning Board of Lake Luzerne. The floodplain administrator is adequately supported in his role, but would be open to additional training if available.

All flood zone building applications are reviewed to ensure adherence to the towns adopted Flood Damage Local Law # 1 of 1987. The town keeps records of elevation certificates. The flood zone administrator assists the applicants with the application processes.

Town staff went door to door to properties along the Hudson River and handed out information and provided a computer link address so that residents could monitor the elevation of flood waters along the Hudson River (Hadley & North Creek monitoring stations).

Compliance History

The community is in good standing with FEMA and the NFIP. The most recent Community Assistance Visit has not occurred in the previous 11 years.

The Town intends to continue active participation in the NFIP, and maintain compliance with all requirements of participation. Further, the Town has identified several actions to support both continued and improved participation in the NFIP as identified in Table 9.10-13.

Regulatory

Floodplain management regulations exceed the minimum. The Planning and Zoning Boards are required to mitigate future damage with regards to floods.

The Town does not currently participate in the CRS program, but would attend a seminar if offered locally.

Integration of Hazard Mitigation into Existing and Future Planning Mechanisms

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, each community was surveyed to obtain a better understanding of their community's progress in plan integration. A summary is provided below. In addition, the community identified specific integration activities that will be incorporated into municipal procedures.

Planning

Master Planning: The Comprehensive Plan was completed in April 2010. The town has designated flood zone areas. Development within the flood zone requires site plan approval from the Lake Luzerne Planning Board. The plan does not refer to the Hazard Mitigation Plan (integration action). The Mater Plan also includes redevelopment, growth, economic development, open space, watershed management, amd local waterfront revitalization elements. The purpose of the Comprehensive Plan includes:

- Maintaining and protecting Lake Luzerne's natural resources and encourage their care and planned use as a focal point of the community.
- Preserving the delicate water resources while maintaining the availability of the Hudson River, lakes and other waterways for recreation.
- Fostering an economic base focused on a combination of small-scale niche tourism, year-round services, and appropriately-scaled local businesses.
- Restoring, improving, and developing the "historic hamlet of Lake Luzerne" as the cultural and social focal point for the community.
- Balancing open space preservation with future development.
- Continuing to meet the needs of a diverse and growing year-round population including housing, social interaction, and recreational resources.

Stormwater Management: Lake Luzerne is not a MS4 regulated community. Storm water management requirements are in the Subdivision Regulations of Lake Luzerne adopted April 1998. Requirements on page 58 of the Town of Lake Luzerne" Subdivision Regulations" adopted April 1998.

Continuity of Operations Planning: The Town does not have a formal COOP/COG, Lake Luzerne's department heads work well together, small towns government/department heads are multi-functional, have town cell phones and are in 24/7 contact with each other.

Post Disaster Recovery: The town does not have a post-disaster recovery plan, however the Town has recovered from past natural disasters well. All town employees are multi-taskers.

Regulatory and Enforcement (Ordinances)

Planning Board: The Town Planning Board reviews all development with respect to flood zones. The towns Subdivision Regulations require elevations be shown on all Major Subdivision applications i.e. (5 or more building lots). The Planning Board has a diverse background in engineering, architecture and reviews all development with in food zones. The Planning Board also reviews all site plan and subdivision applications and take topography and storm water retention into account. The towns Zoning Office provides the planning Board & Zoning Board members with information on all applications. If the towns planning & Zoning boards require additional information the Town has an engineering firm at their disposal.

Flood Damage Prevention: The town discourages development within the flood zones. The town has implemented a local law or a second level of scrutiny for development in flood zones. The towns Flood Zone local law requires all development within the flood zone to be 2 feet above flood zone elevation.

The town's newest development has all utilities underground, also storm water runoff is also reviewed and mitigated on the developments site.

Operational and Administration

Planning Capabilities: The Town does not have a municipal planner on staff, however, the town has an engineering firm on retainer to assist the towns planning board in natural hazard risk reduction.

Planning and Zoning Boards: Lake Luzerne has a Planning Board and Zoning Board of Appeals. The boards take all related natural hazard regulations be it local, state or federal rules. The Planning board does not approve subdivision maps within the Adirondack Park without getting an approval from the Adirondack Park Agency (APA).

Town Board: The Town board of Lake Luzerne assists in managing natural hazard risk.

Stormwater Management: Stormwater Management functions are performed by Chazen Engineering when requested by the Lake Luzerne Town, Planning and Zoning Boards. All wastewater in the Town is managed via septic.

Technical Support: The Town would contract with Chazen Engineering or with an appropriate firm to conduct benefit-cost analysis. The Town would contract with Chazen Engineering or with an appropriate firm to conduct substantial damage estimates. The Town would use the county's planning office to assist with preparing grant applications for mitigation projects. The Town, with assistance from Warren County Emergency Preparedness personnel, are currently working on Emergency Action Plans for the town owned dams.

Natural Hazard Risk Reduction Training: The Town's personnel receive appropriate safety training through the Warren County safety office. The Town has a natural hazard exercise will all key personnel

Other Hazard Management Programs: The Town's Departments of Public Works and Parks & Recreation department is constantly working on vegetation control and road repair/replacement.

Mitigation in Job Responsibilities: The Highway Superintendent job description includes identifying and implementing mitigation projects and actions.

Backup Power: Both of the state owned assisted living residential facilities has backup propane generators. Both of these residences are also supplied with municipal water. The Town water supply building has its own stand-alone backup diesel generator so residents that are connected to the water system will have a potable water

supply in case of a power failure. The Town Hall, which is also the command and control/emergency shelter, is connected to the water system and is equipped with a propane generator for backup power.

Funding

General Fund: The general fund could be used if needed for mitigation projects/activities.

Emergency Fund: The town has an emergency fund and can be used if needed.

Education and Outreach

Flood Warning: The Town’s website has a link to the “Advanced Hydrologic Prediction Service” which shows the stage in feet of water at the Hadley measuring station. When the water level is at ‘Action Level” homeowners below the gage would prepare for a possible flood. Also local news/weather stations are a good source for citizens in regards to natural hazards.

Opportunities: More natural hazard exercises and practice related to emergency action plans would promote further public outreach and education (integration action).

9.10.6 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and prioritization.

Past Mitigation Initiative Status

Table 9.10-11 below indicates progress on the community’s mitigation strategy identified in the 2011 Plan. Previous actions that are now ongoing programs and capabilities are indicated as such in Table 9.10-11, and also appear under “Capability Assessment” presented previously in this annex. Actions carried forward as part of this plan update are included in the following subsection (in Table 9.10-12) with prioritization.

Table 9.10-11. Past Mitigation Initiative Status

Description	Status	Review Comments
Educate residents regarding steps to be taken to decrease the impact of natural hazards (including ice storms, wild/forest fires, severe storms, tornado, earth-quakes, and all other natural hazards) by developing, enhancing, and implementing education programs, brochures, school presentations informing groups about ways to reduce risk, and other outreach activities.	In progress	<ol style="list-style-type: none"> 50% Complete Town website has link to Hudson River flood monitoring stations Include in 2016 HMP as ongoing operational capability
Monitor and remove trees/limbs in storm areas that present potential hazards to keep trees from threatening lives, property, and public infrastructure during storm events.	In progress	<ol style="list-style-type: none"> Vegetation control along roadways is constantly being done. This will never be completed National Grid contracts with companies to remove limbs etc. along power lines. Include in 2016 HMP as ongoing operational capability
Obtain funding to purchase generators for municipally-owned critical facilities.	Complete	<ol style="list-style-type: none"> All critical buildings have backup generators Discontinue because project has been completed.



Table 9.10-11. Past Mitigation Initiative Status

Description	Status	Review Comments
Coordinate/create mutual aid agreements between emergency services, public works departments, and public utilities to ensure efficient use of resources during and after storm events.	In progress	<ol style="list-style-type: none"> 1. Town DPW and County DPW work together when situations warrant. 2. Include in 2016 HMP as ongoing operational capability
Develop plans for debris management after hazard events, including severe winter snow/ice events, and other severe storms.	No progress	<ol style="list-style-type: none"> 1. The town has an account it can draw upon to assist in after hazard events for debris removal, overtime for employees or payment to contractors. 2. Include in 2016 HMP as ongoing operational capability
Design a network of citizens that will check in on elderly, functional needs, and low- income individuals during major events.	No progress	<ol style="list-style-type: none"> 1. Obtain a list of elderly meals on wheels recipients. 2. Obtain a list of senior star recipients from the assessor 3. Include in 2016 HMP
Send a town representative to the NYS Wildland Fire Suppression Training.	No progress	<ol style="list-style-type: none"> 1. Some town employees are members of the local volunteer fire department. 2. Include in 2016 HMP
Provide training for local code enforcement officials to implement building codes that reflect disaster resistant construction for new structures and renovation.	In progress	<ol style="list-style-type: none"> 1. Town uses Warren County Building Code and Fire Prevention Office. 2. Include in 2016 HMP - Flood Administrator will ask the Town Board for approval to update "Flood Damage Prevention Local Law # 1 of 1987
Provide residents with information listing steps taken to lessen potential flood damage to reduce the impact of flooding.	In progress	<ol style="list-style-type: none"> 1. Town has a local law listing the requirements for building in the flood zone. 2. Include in 2016 HMP
Educate the community on benefits of carrying NFIP policies and increase knowledge of NFIP services.	In progress	<ol style="list-style-type: none"> 1. All construction is approved by the Planning Board for flood zone development. County Building Codes inspects new buildings for adherence to flood mitigation requirements. 2. Include in 2016 HMP - Flood Administrator will ask the Town Board for approval to update "Flood Damage Prevention Local Law # 1 of 1987
Review and update local plans to integrate goals, objectives, and activities from this HMP which are not found in existing regulatory documents, as appropriate.	In progress	<ol style="list-style-type: none"> 1. Town regulations should always be as up to date as possible. 2. Include in 2016 HMP as ongoing operational capability
Maintain a current inventory of at-risk buildings and infrastructure and continually update inventory of at-risk structures in each jurisdiction.	In progress	<ol style="list-style-type: none"> 1. The town can get lists of at risk properties that are in the flood zones from the assessor. 2. Repairing the Hidden Valley Rd. Bridge 3. Repair of the Historical Smoke Stack 4. Include in 2016 HMP
Apply for grants to assist with mitigation activities needed to provide a level of protection for critical facilities.	No progress	<ol style="list-style-type: none"> 1. The town applies for grants when needed. 2. Include in 2016 HMP as ongoing operational capability

Table 9.10-11. Past Mitigation Initiative Status

Description	Status	Review Comments
Provide continuing education and training for local Floodplain Administrator to ensure code enforcement and proper inspections.	Complete	<ol style="list-style-type: none"> 1. The county building code office does all construction inspections 2. Floodplain administrator attends local training whenever possible. 3. Include in 2016 HMP as ongoing operational capability
Implement zoning regulations to discourage building new structures in disaster prone areas – if such regulations are not already written into Town Zoning code or Floodplain Ordinance.	Complete	<ol style="list-style-type: none"> 1. The town discourages development within the flood zones. The town has implemented a local law or a second level of scrutiny for development in flood zones. 2. Include in 2016 HMP as ongoing operational capability. Involve the assessor - ask for assessment relief (unimproved private properties get a lower assessment if property owners agree to not develop in flood prone areas)

Completed Mitigation Initiatives not Identified in the Previous Mitigation Strategy

The Town of Lake Luzerne has identified the following mitigation projects/activities that have also been completed but were not identified in the previous mitigation strategy in the 2011 Plan:

- Several private properties have been elevated on Davern Drive and on Pleasant View Drive, a couple of homes (former seasonal cabins) have been elevated.
- The Town Hall serves local sheltering needs, and is equipped with a propane generator for backup power.
- Hidden Valley Rd. Bridge being replaced/repared 3-17-2016
- Potash Rd. Bridge was demolished by “Sandy.” Damaged structure was removed and rebuilt. The new bridge reopened in 2014 (roughly \$500,000).
- The Town recently received New York State licensing to build a new Mill St. senior facility off of White Street.

Proposed Hazard Mitigation Initiatives for the Plan Update

The Town of Lake Luzerne participated in a mitigation action workshop in September 2015 and was provided the following Federal Emergency Management Agency (FEMA) publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 ‘Selecting Appropriate Mitigation Measures for Floodprone Structures’ (March 2007) and FEMA ‘Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards’ (January 2013).

Table 9.10-12 summarizes the comprehensive-range of specific mitigation initiatives the Town of Lake Luzerne would like to pursue in the future to reduce the effects of hazards. Some of these initiatives may be previous actions carried forward for this plan update. Implementation of these initiatives will depend on available funding (grants and local match availability), and some initiatives may be modified or omitted at any time based on occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in Table 9.10-12 to further demonstrate the wide range of activities and mitigation measures selected.

As discussed in Section 6, 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing your actions as ‘High’, ‘Medium’, or ‘Low.’ The table below summarizes the evaluation of each mitigation initiative, listed by Action Number.

Table 9.10-13 summarizes prioritization of all proposed mitigation initiatives for the Plan update.

Table 9.10-12. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category	CRS Category
TLL-1	Integrate the risk assessment and recommendations of the HMP into the Town Master plan.	N/A	All Hazards	2	Town Board	Tool for DPW Superintendent	\$10,000	Town Budget	2 years	Medium	LPR	PR
TLL-2	Increase personnel capabilities, knowledge and preparedness level by increasing number of natural hazard exercises.	N/A	All Hazards	2, 3	Town DPW/Town Board	Known responsibilities prior to an event	\$10,000	Town Budget	3 years	Medium	EAP	ES
TLL-3	Consider Participation in the CRS program.	N/A	Flood	1, 2	Town Board	Medium	Medium	Town Budget	1 year	Medium	LPR	PR
TLL-4	Prepare a Natural Resource Inventory for Lake Luzerne to provide the community with information needed to make decisions about the protection of critical resources and changes to municipal laws.	N/A	All Hazards	1, 2	Lake Luzerne Town Board	Lessen the loss of critical resources	\$1,000	Zoning Budget	1 year	Low	EAP	NR
TLL-5	Mitigate Bear Town Road by upgrading the existing culvert and elevating the roadway.	Existing	Flood	1	Town DPW	Lessen chance of road closure due to flooding	\$50,000	DPW Annual Budget	5 years	Medium	SIP	SP
TLL-6 (carryover)	Compile and maintain lists of elderly, functional needs, and low- income individuals of concern during major events. - Obtain a list of elderly meals on wheels recipients. - Obtain a list of senior star recipients from the assessor	Existing	All Hazards	1, 3	Town Board, Health Advisory Committee	Protect vulnerable populations	Low	Town Budget	Short-Term	High	LPR	ES
TLL-7 (carryover)	Update "Flood Damage Prevention Local Law # 1 of 1987, and consider including a provision to	Both	Flood	3	Town Board, Code Officer, FPA	High	Medium	Town Budget County,	Short-Term	High	LPREAP	PR

Table 9.10-12. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category	CRS Category
	ask for assessment relief (unimproved private properties get a lower assessment) if property owners agree to not develop in flood prone areas							State Grants				
TLL-8 (carryover)	Provide residents with information listing steps taken to lessen potential flood damage to reduce the impact and on the benefits of carrying flood insurance through NFIP.	N/A	Flood	1, 2	Town Board, County Office of Emergency Services, Town Floodplain Administrator	Medium	Low	Town Budget, County, State	Short-Term	Medium	EAP	PI
TLL-9	Support the mitigation of vulnerable structures via retrofit (e.g. elevation, flood-proofing) or acquisition/relocation to protect structures from future damage, with critical facilities and repetitive loss properties as a priority when applicable. Town support shall include direct outreach to flood-prone property owners, specifically critical facility owners/operators and those identified by FEMA as RL/SRL or otherwise identified as flood-prone, and working with interested and voluntary property owners to mitigate their properties based on available funding from FEMA and local (property owner) match availability.											
	Efforts to mitigate critical facilities shall recognize Federal and State directives for protection to the 500-year flood level or “worst case scenario”.											
	See above	Existing	All Hazards	1, 3	Town Board	High	Low – Staff Time	Local Budget for outreach and general support	Short	High	EAP, SIP	PR, ES
TLL-10	Replace and elevate Reed Park Road Bridge	Existing	Flood	1, 3	Town DPW	Lessen chance of road closure due to flooding	Medium-High	DPW Annual Budget	DOF	Medium	SIP	SP
TLL-11	Evaluate ways to mitigate flooding to the 500-year event level at Lake Avenue Firehouse. Implement best mitigation alternative(s) as funding is secured.	Existing	All Hazards	1, 3	Town Fire Department, DPW	High	Medium	FEMA (HMGP, FMA, PDM), CDBG, NYS DHSES, County	DOF	Medium	LPR, SIP	PR



Table 9.10-12. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category	CRS Category
TLL-12	Stabilize Slope on Hall Hill Road	N/A	Land subsidence, flooding, severe storm	1	Town DPW, WCSW	Lessen chance of road failure due to flooding	Medium	DPW Annual Budget	DOF	Medium	SIP	SP
TLL-13	Develop and implement a plan to collaborate with State and private property owners to reduce risks from beaver dams in areas including Towner Road and Reed Park Road.	Both	Flood	1, 3	Planning Department, NYS DEC, Private property owners	Low	Low	FMA, HMGP, PDM	DOF	Low	LPR, NSP	PR, NR

Notes:

Not all acronyms and abbreviations defined below are included in the table.

*Does this mitigation initiative reduce effects of hazards on new and/or existing buildings and/or infrastructure? Not applicable (N/A) is inserted if this does not apply.

Acronyms and Abbreviations:

- CAV Community Assistance Visit
- CDBG Community Development Block Grant
- GCRS Community Rating System
- DPW Department of Public Works
- FEMA Federal Emergency Management Agency
- FPA Floodplain Administrator
- HMA Hazard Mitigation Assistance
- N/A Not applicable
- NFIP National Flood Insurance Program
- OEM Office of Emergency Management

Potential FEMA HMA Funding Sources:

- FMA Flood Mitigation Assistance Grant Program
- HMGP Hazard Mitigation Grant Program
- PDM Pre-Disaster Mitigation Grant Program
- RFC Repetitive Flood Claims Grant Program (discontinued)
- SRL Severe Repetitive Loss Grant Program (discontinued)

Timeline:

- Short 1 to 5 years
- Long Term 5 years or greater
- OG On-going program
- DOF Depending on funding

Costs:

Where actual project costs have been reasonably estimated:

- Low < \$10,000
- Medium \$10,000 to \$100,000
- High > \$100,000

Where actual project costs cannot reasonably be established at this time:

Benefits:

Where possible, an estimate of project benefits (per FEMA's benefit calculation methodology) has been evaluated against the project costs, and is presented as:

- Low < \$10,000
- Medium \$10,000 to \$100,000
- High > \$100,000



Costs:

- Low* Possible to fund under existing budget. Project is part of, or can be part of, an existing ongoing program.
- Medium* Could budget for under existing work plan, but would require a reapportionment of the budget or a budget amendment, or cost of the project would have to be spread over multiple years.
- High* Would require an increase in revenue via an alternative source (i.e., bonds, grants, fee increases) to implement. Existing funding levels are not adequate to cover costs of the proposed project.

Benefits:

- Where numerical project benefits cannot reasonably be established at this time:
- Low* Long-term benefits of the project are difficult to quantify in the short term.
- Medium* Project will have a long-term impact on reduction of risk exposure to life and property, or project will provide an immediate reduction in risk exposure to property.
- High* Project will have an immediate impact on reduction of risk exposure to life and property.

Mitigation Category:

- *Local Plans and Regulations (LPR)* – Actions that include government authorities, policies, or codes that influence the way land and buildings are developed and built.
- *Structure and Infrastructure Project (SIP)* – Actions that involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures, as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce impacts of hazards.
- *Natural Systems Protection (NSP)* – Actions that minimize damage and losses, and also preserve or restore the functions of natural systems.
- *Education and Awareness Programs (EAP)* – Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities

CRS Category:

- *Preventative Measures (PR)* – Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and stormwater management regulations.
- *Property Protection (PP)* – Actions include public activities to reduce hazard losses or 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.
- *Public Information (PI)* – 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 educational programs for school-age children and adults.
- *Natural Resource Protection (NR)* – 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.
- *Structural Flood Control Projects (SP)* – Actions that involve construction of structures to reduce impacts of a hazard. Such structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.
- *Emergency Services (ES)* – Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and protection of essential facilities

Table 9.10-13. Summary of Prioritization of Actions

Mitigation Action/Project Number	Mitigation Action/Initiative	Life Safety	Property Protection	Cost-Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community	Total	High / Medium / Low
TLL-1	Integrate the risk assessment and recommendations of the HMP into the Town Master plan.	0	1	1	1	0	1	1	0	0	1	1	1	0	0	8	Medium
TLL-2	Increase personnel capabilities, knowledge and preparedness level by increasing number of natural hazard exercises.	1	1	1	1	0	1	0	0	0	1	1	1	0	0	8	Medium
TLL-3	Consider Participation in the CRS program.	0	1	1	1	0	1	0	1	0	0	0	0	0	1	6	Medium
TLL-4	Prepare a Natural Resource Inventory for Lake Luzerne to provide the community with information needed to make decisions about the protection of critical resources and changes to municipal laws.	0	0	1	0	0	1	1	1	0	0	1	1	0	0	6	Low
TLL-5	Mitigate Beartown Road by upgrading the existing culvert and elevating the roadway.	1	1	1	1	0	0	0	0	0	1	1	1	0	0	7	Medium
TLL-6	Compile and maintain lists of elderly, functional needs, and low-income individuals of concern during major events. - Obtain a list of elderly meals on wheels recipients. - Obtain a list of senior star recipients from the assessor	1	0	1	1	0	1	1	0	1	1	1	1	0	0	9	High

Table 9.10-13. Summary of Prioritization of Actions

Mitigation Action/Project Number	Mitigation Action/Initiative	Life Safety	Property Protection	Cost-Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community	Total	High / Medium / Low
TLL-7	Update "Flood Damage Prevention Local Law # 1 of 1987, and consider including a provision to ask for assessment relief (unimproved private properties get a lower assessment) if property owners agree to not develop in flood prone areas	1	1	1	1	0	1	0	1	0	1	0	1	0	1	9	High
TLL-8	Provide residents with information listing steps taken to lessen potential flood damage to reduce the impact and on the benefits of carrying flood insurance through NFIP.	0	1	1	1	0	1	1	0	0	1	0	1	0	0	7	Medium
TLL-9	Support the mitigation of vulnerable critical facilities, and private and public property.	1	1	1	1	0	1	1	0	1	1	1	1	0	0	10	High
TLL-10	Replace and elevate Reed Park Road Bridge	1	1	1	1	0	1	0	0	0	1	1	0	0	0	7	Medium
TLL-11	Evaluate ways to mitigate Flooding at Lake Avenue Firehouse	1	1	1	0	0	1	0	0	1	1	0	0	0	1	7	Medium

Table 9.10-13. Summary of Prioritization of Actions

Mitigation Action/Project Number	Mitigation Action/Initiative	Life Safety	Property Protection	Cost-Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community	Total	High / Medium / Low
TLL-12	Stabilize Slope on Hall Hill Road	1	1	1	1	0	1	1	0	0	1	1	0	0	0	8	Medium
TLL-13	Develop and implement a plan to collaborate with State and private property owners to reduce risks from beaver dams in areas including Towner Road and Reed Park Road.	0	0	1	0	0	0	0	0	0	0	0	0	1	1	3	Low

Note: Refer to Section 6, which conveys guidance on prioritizing mitigation actions.



9.10.7 Future Needs To Better Understand Risk/Vulnerability

None at this time.

9.10.8 Hazard Area Extent and Location

Hazard area extent and location maps have been generated for the Town of Lake Luzerne that illustrate the areas probable to be impacted within the municipality (see Figure 9.10-1 and Figure 9.10-2 below). These maps are based on the best available data at the time of the preparation of this Plan, and are considered to be adequate for planning purposes. Maps have been generated for those hazards (i.e., landslide, wildfire and flooding) that can be clearly identified using mapping techniques and technologies, and to which the Town of Lake Luzerne has significant exposure. These maps also appear in the hazard profiles within Section 5.4, Volume I of this Plan.

9.10.9 Additional Comments

None at this time.

Figure 9.10-1. Town of Lake Luzerne Landslide Hazard Area Map

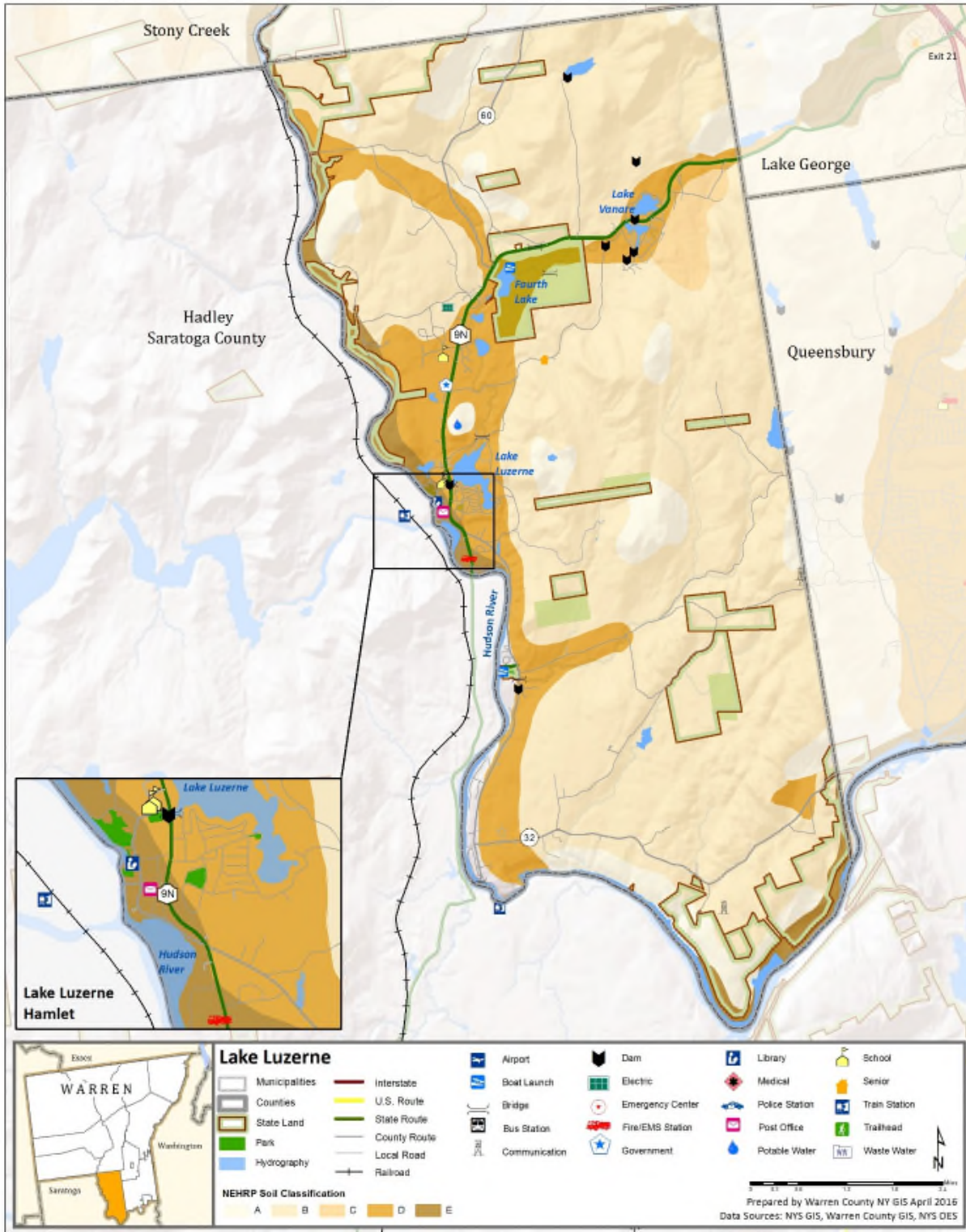
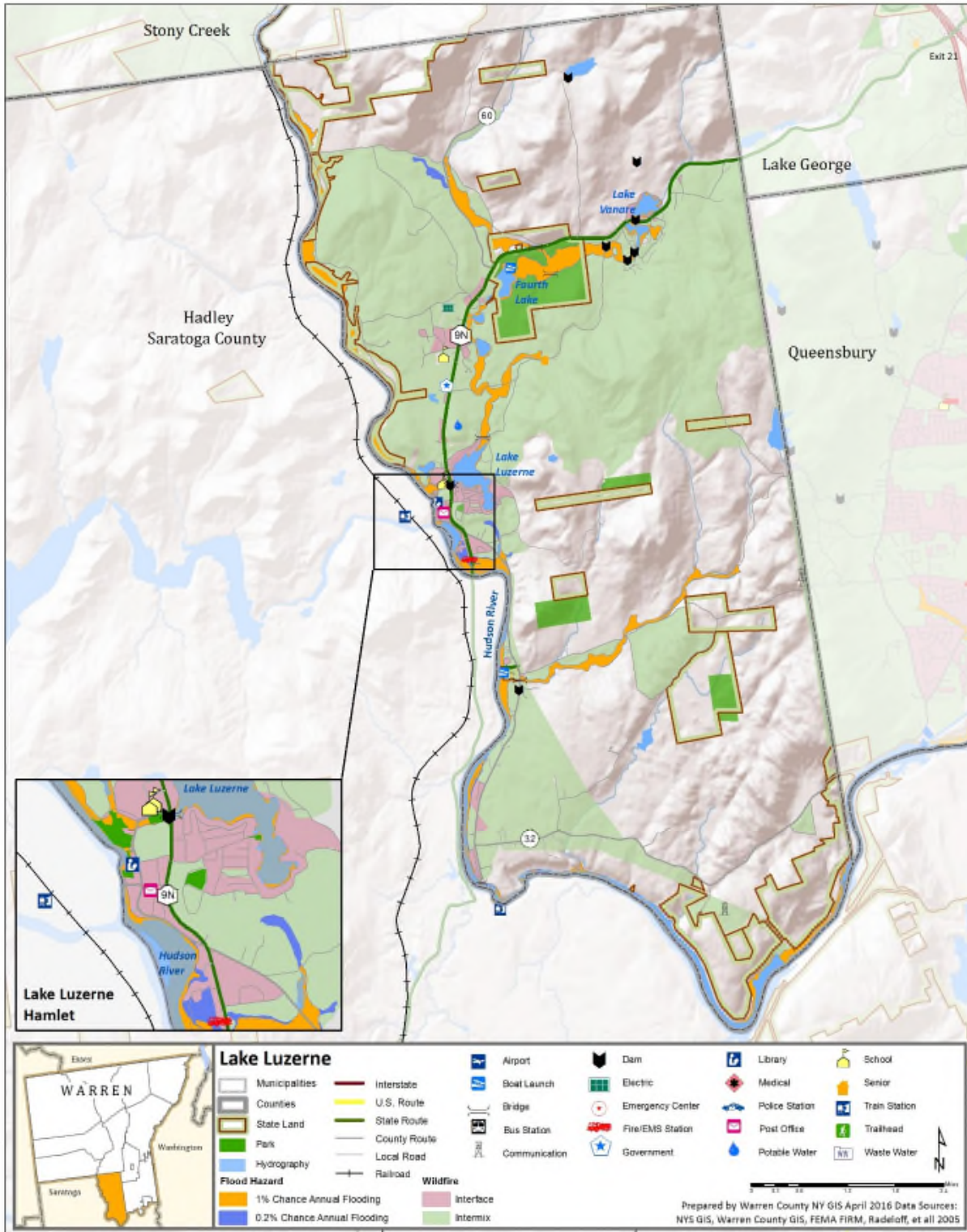


Figure 9.10-2. Town of Lake Luzerne Flood and Wildfire Hazard Area Extent and Location Map



9.10.10 Action Worksheets

Name of Jurisdiction:	Town of Lake Luzerne
Name and Title Completing Worksheet:	Eugene Merlino, Supervisor Town of Lake Luzerne
Action Number:	TLL-5
Mitigation Action/Initiative:	Bear Town Road improvements

Assessing the Risk	
Hazard(s) addressed:	Flooding, Severe Weather
Specific problem being mitigated:	Bear Town Road needs a culvert replacement.
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	Replace/improve culvert and elevate roadway is the only practical alternative.
Action/Project Intended for Implementation	
Description of Selected Action/Project	Mitigate flooding at Beartown Road by upgrading the existing culvert and elevating the roadway, recognizing Federal and State directives for protection to the 500-year flood level or “worst case scenario”.
Action/Project Category	SIP
Goals Met	1
Applies to existing and or new development, or not applicable	Existing
Benefits (losses avoided)	Lessen chance of road closure due to flooding
Estimated Cost	\$50,000 (Medium)
Priority*	Medium
Plan for Implementation	
Responsible Organization	Town DPW
Local Planning Mechanism	Capital improvement plan and budgets
Potential Funding Sources	DPW Annual Budget
Timeline for Completion	5 years
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:



Action Number: TLL-5
Mitigation Action/Initiative: Bear Town Road Improvements

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Will provide additional safety from flooding for persons living within the area.
Property Protection	1	Will protect roadway from future damage or collapse.
Cost-Effectiveness	1	
Technical	1	Project is technically feasible.
Political	0	
Legal	0	
Fiscal	0	Outside funding may be required.
Environmental	0	No environmental impact.
Social	0	No social impact.
Administrative	1	Town has administrative capability to manage the project.
Multi-Hazard	1	Project would address flooding and severe storm hazard.
Timeline	1	Should be a short time frame, but this is dependent on funding.
Agency Champion	0	
Other Community Objectives	0	
Total	7	
Priority (High/Med/Low)	Medium	

Name of Jurisdiction: Town of Lake Luzerne
Name and Title Completing Worksheet: Eugene Merlino, Supervisor Town of Lake Luzerne
Action Number: TLL-10
Mitigation Action/Initiative: Replace and Elevate Reed Park Road Bridge

Assessing the Risk	
Hazard(s) addressed:	Flooding
Specific problem being mitigated:	The bridge is currently vulnerable to flooding and beaver damming.
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	The replacement and elevation of the bridge is the only practical alternative.
Action/Project Intended for Implementation	
Description of Selected Action/Project	Replace and elevate Reed Park Road Bridge. All mitigation efforts shall be made in consideration of Federal and State directives to mitigate critical infrastructure to address protection to the 500-year flood event or “worst damage scenario”.
Action/Project Category	SIP
Goals Met	1, 3
Applies to existing and or new development, or not applicable	Existing
Benefits (losses avoided)	Lessen chance of road closure due to flooding
Estimated Cost	Medium-High
Priority*	Medium
Plan for Implementation	
Responsible Organization	Town DPW
Local Planning Mechanism	DPW
Potential Funding Sources	DPW Annual Budget
Timeline for Completion	DOF
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:

Action Number: TLL-10
Mitigation Action/Initiative: Replace and Elevate Reed Park Road Bridge

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Will provide additional safety from flooding for persons living within the area.
Property Protection	1	Will protect roadway from future damage or collapse.
Cost-Effectiveness	1	
Technical	1	Project is technically feasible.
Political	0	
Legal	1	Town has legal jurisdiction over roadway.
Fiscal	0	Outside funding may be required.
Environmental	0	No environmental impact.
Social	0	No social impact.
Administrative	1	Town has administrative capability to manage the project.
Multi-Hazard	1	Project would address flooding and severe storm hazard.
Timeline	0	DOF
Agency Champion	0	
Other Community Objectives	0	
Total	7	
Priority (High/Med/Low)	Medium	

Name of Jurisdiction: Town of Lake Luzerne
Name and Title Completing Worksheet: Eugene Merlino, Supervisor Town of Lake Luzerne
Action Number: TLL-11
Mitigation Action/Initiative: Lake Avenue Firehouse – Flood Mitigation Study

Assessing the Risk	
Hazard(s) addressed:	Flood
Specific problem being mitigated:	Lake Avenue firehouse, a municipal Critical Facility, is known to be vulnerable to flooding.
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	Possible mitigation alternatives have not been properly evaluated. This project is to conduct the alternatives analysis so that the best project can be identified for subsequent implementation.
Action/Project Intended for Implementation	
Description of Selected Action/Project	Evaluate ways to mitigate flooding to the 500-year event level at Lake Avenue Firehouse. Implement best mitigation alternative(s) as funding is secured.
Action/Project Category	LPR, SIP
Goals Met	1, 3
Applies to existing and or new development, or not applicable	Existing
Benefits (losses avoided)	High – Reduced flood vulnerability to a municipal critical facility
Estimated Cost	Medium (for alternatives analysis)
Priority*	Medium
Plan for Implementation	
Responsible Organization	Town Fire Department, DPW
Local Planning Mechanism	Municipal Capital Plan; Emergency Management Plan
Potential Funding Sources	FEMA (HMGP, FMA, PDM), CDBG, NYS DHSES, County
Timeline for Completion	Study – Short Term, DOF
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:

Action Number: TLL-11
Mitigation Action/Initiative: Lake Avenue Firehouse – Flood Mitigation Study

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Protects a municipal Critical Facility serving life-safety interests.
Property Protection	1	Protects a municipal Critical Facility.
Cost-Effectiveness	0	Study needed to determine cost-effectiveness
Technical	0	Town will need engineering consultant support for study.
Political	1	
Legal	1	Town has legal jurisdiction to conduct study.
Fiscal	0	Outside funding may be required.
Environmental	0	Environmental impacts not yet determined.
Social	1	Project should benefit all populations.
Administrative	1	Town has administrative capability to manage the project.
Multi-Hazard	1	Project would address flooding and severe storm hazard.
Timeline	0	DOF
Agency Champion	0	
Other Community Objectives	0	
Total	7	
Priority (High/Med/Low)	Medium	

Name of Jurisdiction: Town of Lake Luzerne
Name and Title Completing Worksheet: Eugene Merlino, Supervisor Town of Lake Luzerne
Action Number: TLL-12
Mitigation Action/Initiative: Stabilize Slope on Hall Hill Road

Assessing the Risk	
Hazard(s) addressed:	Land subsidence, flooding, severe storm
Specific problem being mitigated:	Storm water issue, needs rip-rap or seeded mats to stabilize slope
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	1. Harden slope
	2. Install rip-rap
	3. Install seeded mats
Action/Project Intended for Implementation	
Description of Selected Action/Project	Install rip-rap or seeded mats to stabilize slope
Action/Project Category	SIP
Goals Met	1
Applies to existing and or new development, or not applicable	N/A
Benefits (losses avoided)	Lessen chance of road failure due to flooding
Estimated Cost	Medium
Priority*	Medium
Plan for Implementation	
Responsible Organization	Town DPW, WCSW
Local Planning Mechanism	Stormwater Management Plan, Capital Improvement Plan and Budget
Potential Funding Sources	DPW Annual Budget, County
Timeline for Completion	DOF
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:

Action Number: TLL-12
Mitigation Action/Initiative: Stabilize Slope on Hall Hill Road

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Will maintain safety of roadway.
Property Protection	1	Will protect roadway from future damage or collapse.
Cost-Effectiveness	1	
Technical	1	Project is technically feasible.
Political	0	
Legal	1	Town has legal jurisdiction over roadway.
Fiscal	1	Project can be completed within existing funding streams.
Environmental	0	No environmental impact.
Social	0	No social impact.
Administrative	1	Town has administrative capability to manage the project.
Multi-Hazard	1	Project would address land subsidence, flooding and severe storm hazard.
Timeline	0	DOF
Agency Champion	0	
Other Community Objectives	0	
Total	8	
Priority (High/Med/Low)	Medium	



9.11 TOWN OF QUEENSBURY

This section presents the jurisdictional annex for the Town of Queensbury.

9.11.1 Hazard Mitigation Plan Point of Contact

The following individuals have been identified as the hazard mitigation plan's (HMP) primary and alternate points of contact.

Primary Point of Contact	Alternate Point of Contact
John Strough, Town Supervisor 742 Bay Road Queensbury, NY 12804 (518) 761-8229 qbysupervisor@queensbury.net	Craig Brown, Planning/Community Development Director 742 Bay Road Queensbury, NY 12804 (518) 761-8220 daveh@queensbury.net

9.11.2 Municipal Profile

The Town of Queensbury is in the southeastern corner of Warren County. It has a total land area of 64.81 square miles of which 63.01 square miles is land and 1.80 square miles is water. The Town is bordered to the west by the Town of Lake Luzerne, to its east by Washington County, to its north by Lake George, and to its south by the City of Glens Falls and the Hudson River. Queensbury is a town of the first class and is governed by a town board consisting of four councilmembers and a town supervisor. The town includes 16 hamlets and one census-designated place including: Brayton, East Lake George, French Mountain, Glen Lake, Glens Falls North, Harrisena, Kattskill Bay, Lake Sunnyside, Oneida Corners, Paradise Beach, Queensbury, West Glens Falls, Jenkinsville, South Queensbury, Top O'the World and West Mountain. In addition to portions of Lake George, the Town includes Glen Lake and Lake Sunnyside.

According to the 2010 Census, the community's population was 27,901.

Growth/Development Trends

Table 9.11-1 summarizes recent residential/commercial development in the Town of Queensbury since 2010, and lists any known or anticipated major residential/commercial development and major infrastructure development that has been identified in the next five years within the municipality. Refer to the maps following Section 9.11.9 of this annex: Figure 9.11-1 that illustrates landslide hazard areas, and Figure 9.11-2 that illustrates the flood and wildfire hazard areas.

Table 9.11-1. Growth and Development

Property or Development Name	Type (e.g. Res., Comm.)	# of Units / Structures	Location (address and/or Parcel ID)	Known Hazard Zone(s)	Description/Status of Development
Recent Development from 2010 to present					
Homestead Village MHC	Commercial	29/29	Luzerne Road	None	Complete
Forest Park MHC	Commercial	18/18	Pitcher Road	None	Complete
Hiland Crossings	Residential	35/35	Meldon Circle	None	Complete
Haviland Rd. Sub.	Residential	15/15	Pollazzo, Beekman, Bogart	None	Complete





Section 9.11: Town of Queensbury

Property or Development Name	Type (e.g. Res., Comm.)	# of Units / Structures	Location (address and/or Parcel ID)	Known Hazard Zone(s)	Description/Status of Development
Cottage Hill Project	Commercial	148/25	Gentry Hill, Gentry Hill No., Gentry Hill East	None	Currently there are five buildings constructed with a total of 34 living units occupied for cottage hill.
Village @ Sweet Road	Residential	6/6	Devin Court	None	Complete
N/A	Residential	13/13	Geneva Drive	None	Complete
Leuci Subdivision	Residential	7/7	Elk Ridge Drive	None	Complete
Ridgewood Homes	Residential	4/4	Ridgewood Court	None	Complete
Bayberry Place Apts.	Commercial	36/5	Willowbrook Road	None	Complete
N/A	Residential	14/7	DePalo Drive	None	Complete
Luzerne Rd. Sub.	Residential	11/11	Charlton Lane	None	Complete
Sutton Place Sub	Residential	4/4	Essex Court	None	Complete
Queensbury Village	Residential	7/7	Petrie Lane	None	Complete
Pointe West	Residential	9/9	Caitlin Drive	None	Complete
Westbrook I	Commercial	60/1	W. Mountain Rd.	None	Complete
Westbrook II	Commercial	35/1	W. Mountain Rd.	None	Complete
West Mountain Rd. Sub.	Residential	7/7	Apres Cir., Alessia Dr.	None	Complete
Barringer Heights	Residential	8/8	Richmond Hill Drive	None	Complete
Dodge Watkins & Larry Clute	Residential	2/2	Old Forge Road	None	Complete
Pine Ridge Estates	Residential	1/1	Westberry Way, Woodshire Court	None	Complete
Stonehurst	Residential	3/3	Stonehurst Drive, Thistlewood Drive	None	Complete
N/A	Residential	2/2	Holly Lane	None	Complete
N/A	Residential	3/3	Harris Street	None	Complete
N/A	Residential	2/2	Rainbow Trail	None	Complete
N/A	Residential	11/11	Luzerne Road	None	Complete
N/A	Residential	5/5	Howard Street	None	Complete
N/A	Residential	3/3	State Route 149	None	Complete
N/A	Residential	3/3	Birdsall Road	None	Complete





Property or Development Name	Type (e.g. Res., Comm.)	# of Units / Structures	Location (address and/or Parcel ID)	Known Hazard Zone(s)	Description/Status of Development
N/A	Residential	5/5	Sherman Avenue	None	Complete
N/A	Residential	2/1	Clendon Brook Drive	None	Complete
N/A	Residential	4/4	Garner Street	None	Complete
N/A	Residential	2/1	Queensbury Avenue	None	Complete
N/A	Residential	3/3	Dixon Road	None	Complete
N/A	Residential	3/3	Montray Road	None	Complete
N/A	Residential	3/3	Lockhart Mountain Road	None	Complete
N/A	Residential	113	Various	None	Complete
Known or Anticipated Development in the Next Five (5) Years					
Cottage Hill Project	Commercial	148/25	Gentry Hill, Gentry Hill No., Gentry Hill East	None	Currently there are five buildings constructed. Additional 20 units planned.

Note: Only location-specific hazard zones or vulnerabilities are identified

9.11.3 Natural Hazard Event History Specific to the Municipality

Warren County has a history of natural and non-natural hazard events as detailed in Volume I, Section 5.0 of this Plan. A summary of historical events appears in each hazard profile, and includes a chronology of events that have affected the County and its municipalities. For the purpose of this Plan update, events that have occurred in the County from 2010 to present were summarized to indicate the range and impact of hazard events in the community. Information regarding specific damages is included, if available, based on reference material or local sources. This information is presented in Table 9.11-2 below. For details of these and additional events, refer to Volume I, Section 5.0 of this Plan.

Table 9.11-2. Hazard Event History

Dates of Event	Event Type (FEMA Disaster Declaration if applicable)	Warren County Designated?	Summary of Damages/Losses
May 27 – June 2, 2011	Flooding “Memorial Day Storm”	N/A	Flooding occurred in the County and there was severe damage along a thin line through the County (Stony Creek, Thurman, Warrensburg, Horicon and Bolton) that resulted in \$13.125 million in damages. Town of Queensbury Highway Department loaned an assortment of trucks and manpower.
August 27-29, 2011	Hurricane Irene (DR-4020)	Yes	There was severe wind and flooding damage throughout the County. The Town of Queensbury Highway Department provided tree clean up a week after event.
October 29, 2012	Hurricane Sandy (EM-3351)	Yes	Heavy rain fell throughout the County The Town of Queensbury Highway Department provided tree clean up during the week and after, with a focus on Assembly Pt. A culvert blew out on Thunderbird Lane and was later replaced.

Notes:





FEMA Federal Emergency Management Agency
 DR Major Disaster Declaration (FEMA)
 N/A Not applicable

9.11.4 Hazard Vulnerabilities and Ranking

The hazard profiles in Section 5.0 of this Plan convey detailed information regarding each plan participant’s vulnerability to the identified hazards. The following summarizes the hazard vulnerabilities and their ranking in the Town of Queensbury. For additional vulnerability information relevant to this jurisdiction, refer to Section 5.0.

Hazard Risk/Vulnerability Risk Ranking

Table 9.11-3 below summarizes hazard risk/vulnerability rankings of potential hazards for the Town of Queensbury.

Table 9.11-3. Hazard Risk/Vulnerability Risk Ranking

Hazard type	Estimate of Potential Dollar Losses to Structures Vulnerable to the Hazard ^{a, b}	Probability of Occurrence	Risk Ranking Score (Probability x Impact)	Hazard Ranking ^a
Earthquake	100-year MRP: \$770,680.00 500-year MRP: \$12,521,301 2,500-Year MRP: \$98,420,339.00	Occasional	32	High
Flood	RCV Exposed to 1% Annual Chance: \$76,086,432	Frequent	18	Medium
Landslide	Damage estimate not available	Occasional	12	Low
Infestation	Damage estimate not available	Frequent	24	Medium
Severe Storm	RCV Exposed to 1938 storm-winds: \$2,605,680	Frequent	48	High
Severe Winter Storm	GBS 1% Loss: \$36,021,390 GBS 5% Loss: \$180,106,950	Frequent	51	High
Wildfire	RCV Exposed to Intermix: \$1,657,654,000 RCV Exposed to Interface: \$2,924,084,000	Frequent	42	High
Cyber Security	Damage estimate not available	Occasional	12	Low
Disease Outbreak	Damage estimate not available	Frequent	27	Medium
Hazardous Material Incidents	Damage estimate not available	Frequent	24	Medium

Notes:

- a. The general building stock valuation is based on the custom inventory generated for the municipality and based on improved value.
 High = Total hazard priority risk ranking score of 31 and above
 Medium = Total hazard priority risk ranking of 20-30+
 Low = Total hazard risk ranking below 20
- b. Loss estimates for the severe storm and severe winter storm hazards are structural values only and do not include the estimated value of contents. The earthquake was evaluated by Census tract. The Census tracts do not exactly align with municipal boundaries; therefore, a total is reported for each Town inclusive of the Villages. Loss estimates for the flood and earthquake hazards represent both structure and contents. Potential flood loss estimates were generated using Hazus-MH 2.2 and digitized FIRM maps from the 1980s and 1990s for the 1-percent annual chance event; NED DEM was used to generate a depth grid. The County’s 2015 Real Property data was used to generate the values for flood and includes structure and contents. For the wildfire hazard, the improved value and estimated contents of buildings located within the identified hazard zones is provided.

GBS General building stock
 MRP Mean return period
 RCV Replacement Cost Value





National Flood Insurance Program (NFIP) Summary

Table 9.11-4 summarizes NFIP statistics for the Town of Queensbury.

Table 9.11-4. NFIP Summary

Municipality	# Policies (1)	# Claims (Losses) (1)	Total Loss Payments (2)	# Rep. Loss Prop. (1)	# Severe Rep. Loss Prop. (1)	# Policies in 100-year Boundary (3)
Town of Queensbury	76	42	\$1,159,853	0	0	29

Source: FEMA, 2014

Notes:

- (1) Policies, claims, repetitive loss, and severe repetitive loss statistics are provided by FEMA, are current as of November 30, 2015, and are summarized by community name. Total number of repetitive loss properties includes severe repetitive loss properties. Number of claims represents claims closed by November 30, 2014.
- (2) Total building and content losses from the claims file provided by FEMA Region 2.
- (3) Number of policies inside and outside of flood zones is based on latitude and longitude provided by FEMA Region 2 in the policy file.
- (4) FEMA noted that for a property with more than one entry, more than one policy may have been in force or more than one Geographic Information System (GIS) specification was possible.

Critical Facilities

Table 9.11-5 below identifies critical facilities within the municipality located on parcels that intersect the current regulatory NFIP 1% chance flood boundary (aka: “Special Flood Hazard Area” (SFHA)), however it is recognized that the actual facility structure(s) may lie outside of the SFHA. Please refer to the Flood Hazard Profile (Section 5.4.2) for further details of estimated flood losses throughout the County, as well as the “Other Vulnerabilities Identified” section following.

Table 9.11-5. Potential Flood Losses to Critical Facilities

Municipality	Facility Types in 1% Chance Flood Boundary						
	Boat Facilities	Dam	Electric	Government	Highway Bridge	Rail Facility	Wastewater
Town of Queensbury	0	3	0	0	6	0	0

Source: Warren County Real Property 2015 tax roll; HAZUS-MH 2.2; FEMA 2015

Notes:

- (1) HAZUS-MH 2.2 provides a general indication of the maximum restoration time for 100% operations. Clearly, a great deal of effort is needed to quickly restore essential facilities to full functionality; therefore, this will be an indication of the maximum downtime (HAZUS-MH 2.2 User Manual).
- (2) Some facilities may be within the Digital Flood Insurance Rate Map (DFIRM) flood hazard boundary; however, HAZUS did not calculate potential loss, perhaps because depth of flooding would not cause any damages to these structures according to the depth damage function used in HAZUS for that facility type. Further, HAZUS-MH may estimate potential damage to a facility outside the DFIRM if the model generates a depth grid beyond DFIRM boundaries.

Other Vulnerabilities Identified

The municipality has identified the following vulnerabilities within their community:

- Bad steep roads – the area below Dixon Dam is a major concern and should be a priority for improvement.
- Dams up on the mountain are a significant concern, specifically:
 - Wilke





- Keenan
- Butler (could impact ~55 homes)

9.11.5 Capability Assessment

This section identifies the following capabilities of the local jurisdiction:

- Planning and regulatory capability
- Administrative and technical capability
- Fiscal capability
- Community classification
- NFIP
- Integration of mitigation planning into existing and future planning mechanisms.

Planning and Regulatory Capability

Table 9.11-6 below summarizes regulatory tools available to the Town of Queensbury.

Table 9.11-6. Planning and Regulatory Tools

Tool / Program (code, ordinance, plan)	Do you have this? (Yes/No) If Yes, date of adoption or update	Authority (local, county, state, federal)	Dept. /Agency Responsible	Code Citation and Comments (Code Chapter, name of plan, explanation of authority, etc.)
Planning Capability				
Master Plan	Yes, 2007	Local	Planning	2007 Comprehensive Land Use Plan
Capital Improvements Plan	Yes	Local	Town Board	Annual budget
Floodplain Management / Basin Plan	Yes	Local	Building and Codes, Zoning	Chapter 91 Flood Damage prevention
Stormwater Management Plan	No	-	-	-
Open Space Plan	Yes, 2003	Local	Planning and Development	Adopted July 7, 2003
Stream Corridor Management Plan	No	-	-	-
Watershed Management or Protection Plan	No	-	-	-
Economic Development Plan	Document prepared but not adopted	Local	Planning and Development	Queensbury South Vision Plan 2014
Comprehensive Emergency Management Plan	Yes	Local, County, State	Town Supervisor, Emergency Management Coordinator	Town of Queensbury Comprehensive Emergency Management Plan, 11/2014
Emergency Response Plan	Yes	Local	Town Supervisor, Emergency Management Coordinator	Comprehensive Emergency Response Plan, 11/2014
Post-Disaster Recovery Plan	Yes	Local	Town Supervisor, Emergency Management Coordinator	Included in Town of Queensbury Comprehensive Emergency Management Plan
Transportation Plan	No	-	-	-
Strategic Recovery Planning Report	Yes	Local	Town Supervisor, Emergency Management	Included in Town of Queensbury Comprehensive Emergency





Tool / Program (code, ordinance, plan)	Do you have this? (Yes/No) If Yes, date of adoption or update	Authority (local, county, state, federal)	Dept. /Agency Responsible	Code Citation and Comments (Code Chapter, name of plan, explanation of authority, etc.)
			Coordinator -	Management Plan
Other Plans:	No	-	-	-
Regulatory Capability				
Building Code	Yes	State	Code Compliance Officer, Fire Marshal	NYS Building Code
Zoning Ordinance	Yes	Local, State	Code Compliance Officer, Fire Marshal	Code of Town of Queensbury, Chapter 179
Subdivision Ordinance	Yes	Local, State	Code Compliance Officer, Fire Marshal	Code of Town of Queensbury, Chapter A183
NFIP Flood Damage Prevention Ordinance	Yes	Local, State, Federal	Dave Hatin, Director of Building and Codes	Code of Town of Queensbury, Chapter 91
NFIP: Cumulative Substantial Damages	No	-	-	-
NFIP: Freeboard	Yes	State, Local	-	State mandated BFE+2 for single and two-family residential construction, BFE+1 for all other construction types
Growth Management Ordinances	Yes	-local	Town Board –report	Growth Report prepare in 2004? Not adopted
Site Plan Review Requirements	Yes	Local	Planning Board, Zoning Board of Appeals	Code of Town of Queensbury, Chapter 179
Stormwater Management Ordinance	Yes	Local	Warren County Soil and Water Conservation District, Town Code Compliance Officer	Code of Town of Queensbury, Chapter 179
Municipal Separate Storm Sewer System (MS4)	Yes	-	-	Code of Town of Queensbury, Chapter 147
Natural Hazard Ordinance	No	-	-	-
Post-Disaster Recovery Ordinance	No	-	-	-
Real Estate Disclosure Requirement	Yes	State	-	New York State (NYS) mandate, Property Condition Disclosure Act, <i>NY Code</i> – Article 14 §460-467
Other (Special Purpose Ordinances [i.e., sensitive areas, steep slope])	Yes	-	-	Code of Town of Queensbury, Chapter 94: Freshwater Wetlands

Administrative and Technical Capability

Table 9.11-7 below summarizes potential staff and personnel resources available to the Town of Queensbury.

Table 9.11-7. Administrative and Technical Capabilities

Resources	Is this in place? (Yes or No)	Department/ Agency/Position
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Resources	Is this in place? (Yes or No)	Department/ Agency/Position
Administrative Capability		
Planning Board	Yes	Planning Board and Zoning Board of Appeals
Mitigation Planning Committee	Yes	Emergency Management Planning Committee
Environmental Board/Commission	No	
Open Space Board/Committee	No	
Economic Development Commission/Committee	Yes	Housing and Community Development; Chamber of Commerce
Maintenance programs to reduce risk	Yes	Tree Trimming
Mutual aid agreements	Yes	DPW
Technical/Staffing Capability		
Planner(s) or engineer(s) with knowledge of land development and land management practices	Yes	Queensbury Planning Office
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Yes	Fire Marshal
Planners or engineers with an understanding of natural hazards	Yes	Queensbury Planning Office
NFIP Floodplain Administrator (FPA)	Yes	Director of Building and Codes Enforcement
Surveyor(s)	No	-
Personnel skilled or trained in GIS and/or Hazards United States (HAZUS) – Multi-Hazards (MH) applications	Yes	Queensbury Planning Office
Scientist familiar with natural hazards	No	-
Emergency Manager	Yes	Town Supervisor
Grant writer(s)	Yes	Contracts with Chazen and Shelter Planning (Consultant support)
Staff with expertise or training in benefit/cost analysis	Yes	Chazen (Consultant support), Town Supervisor, Safety Officer
Professionals trained in conducting damage assessments	Yes	Town Supervisor, Safety Officer

Fiscal Capability

Table 9.11-8 below summarizes financial resources available to the Town of Queensbury.

Table 9.11-8. Fiscal Capabilities

Financial Resources	Accessible or Eligible to Use (Yes/No)
Community Development Block Grants (CDBG, CDBG-DR)	Yes
Capital improvements project funding	Yes
Authority to Levy Taxes for specific purposes	Yes
User fees for water, sewer, gas or electric service	Yes
Impact fees for homebuyers or developers of new development/homes	Yes, Recreation Fee
Stormwater utility fee	No
Incur debt through general obligation bonds	Yes
Incur debt through special tax bonds	No
Incur debt through private activity bonds	No
Withhold public expenditures in hazard-prone areas	No





Financial Resources	Accessible or Eligible to Use (Yes/No)
Other federal or state funding programs	EPF, LWRP, DOT, FHW, BOA, HOME
Open Space Acquisition funding programs	Private - Queensbury Land Conservancy
Other	Adirondack Regional Council –Queensbury is one partner

Community Classifications

Table 9.11-9 below summarizes classifications for community program available to the Town of Queensbury.

Table 9.11-9. Community Classifications

Program	Do you have this? (Yes/No)	Classification (if applicable)	Date Classified (if applicable)
Community Rating System (CRS)	NP	N/A	N/A
Building Code Effectiveness Grading Schedule (BCEGS)	No	-	-
Public Protection (ISO Fire Protection Classes 1 to 10)	Yes	N/A	N/A
Storm Ready	NP	N/A	N/A
Firewise	NP	N/A	N/A
Disaster/safety programs in/for schools	Yes	N/A	N/A
Organizations with mitigation focus (advocacy group, non-government)	Yes –Fire/EMS	N/A	N/A
Public education program/outreach (through website, social media)	/National Grid (ICS) incident Command System training/Warren County	N/A	N/A
Public-Private Partnerships	Yes –Fire/EMS	N/A	N/A

Note:

- N/A Not applicable
- NP Not participating
- Unavailable

The classifications listed above relate to the community’s ability to provide effective services to lessen its vulnerability to the hazards identified. These classifications can be viewed as a gauge of the community’s capabilities in all phases of emergency management (preparedness, response, recovery and mitigation) and are used as an underwriting parameter for determining the costs of various forms of insurance. The Community Rating System (CRS) class applies to flood insurance, while the Building Code Effectiveness Grading Schedule (BCEGS) and Public Protection classifications apply to standard property insurance. CRS classifications range on a scale of 1 to 10, with class 1 being the best possible classification, and class 10 representing no classification benefit. Firewise classification is higher if the subject property is more than 1000 feet from a creditable fire hydrant and is within 5 road miles of a recognized Fire Station.

Criteria for classification credits are outlined in the following documents:

- The Community Rating System Coordinators Manual
- The Building Code Effectiveness Grading Schedule
- The ISO Mitigation online ISO’s Public Protection website at <https://www.isomitigation.com/program-works/how-the-ppc-program-works.html>





- The National Weather Service Storm Ready website at <http://www.stormready.noaa.gov/index.html>
- The National Firewise Communities website at <http://firewise.org/>

Self-Assessment of Capability

Table 9.11-10 below provides an approximate measure of the Town of Queensbury’s capability to work in a hazard-mitigation capacity and/or effectively implement hazard mitigation strategies to reduce hazard vulnerabilities.

Table 9.11-10. Self-Assessment Capability for the Municipality

Area	Degree of Hazard Mitigation Capability		
	Limited (If limited, what are your obstacles?)*	Moderate	High
Planning and Regulatory Capability			X
Administrative and Technical Capability			X
Fiscal Capability	X (State-imposed tax cap)		
Community Political Capability		X	
Community Resiliency Capability		X	
Capability to Integrate Mitigation into Municipal Processes and Activities.		X	

National Flood Insurance Program

NFIP Floodplain Administrator (FPA)

Dave Hatin – Building and Codes Director

Flood Vulnerability Summary

As of November 30, 2014, 76 policies were in force, 29 of which were within the 100-year flood boundary in the Town of Queensbury. Since 1978, 32 claims have been paid within the Town, totaling \$1.16 million. There are no repetitive loss property and no severe repetitive loss properties. According to current NFIP statistics at the time of this Plan, NFIP policies in the in the Town of Queensbury insured over \$17.9 million of property with total annual insurance premiums of \$86,934.

The Town of Queensbury does not maintain lists of properties that have been flood damaged. No known structures were damaged during Floyd, Irene, Sandy or other recent events. No known properties are interested in mitigating their properties to reduce flood risk.

Resources

The Flood Damage Prevention Ordinance (FDPO) identifies the Director of the Building and Codes Enforcement as the NFIP Floodplain Administrator. The floodplain administrator is the sole person assuming responsibilities for floodplain administration including, permit review, inspections, record keeping and GIS. The floodplain administrator is currently adequately trained for floodplain management responsibilities, although additional training would be welcome.

Currently, there are no programs providing education and outreach to the community regarding flood hazards.





Compliance History

The Town of Queensbury is currently in good-standing in the NFIP. The most recent Community Assistance Visit was in 2012.

The Town intends to continue active participation in the NFIP, and maintain compliance with all requirements of participation. Further, the Town has identified several actions to support both continued and improved participation in the NFIP as identified in Table 9.11-13.

Regulatory

The Town of Queensbury's floodplain regulations meet the minimum State and FEMA requirements.

The Town does not currently participate in the Community Rating System.

Integration of Hazard Mitigation into Existing and Future Planning Mechanisms

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, each community was surveyed to obtain a better understanding of their community's progress in plan integration. A summary is provided below. In addition, the community identified specific integration activities that will be incorporated into municipal procedures.

Land Use Planning: The Town of Queensbury has a Planning Board that has been established to review site plan and subdivision applications and make recommendations to the Queensbury Town Board regarding matters, which will contribute to the planning and development of the Town of Queensbury as it deems desirable. The Zoning Board of Appeals is a seven member Board appointed by the Town Board that reviews and grants variances from the Zoning Ordinance.

Town of Queensbury Master Plan: The Town of Queensbury has a master plan, *2007 Comprehensive Land Use Plan*, adopted on August 6, 2007. Although the plan does not directly reference the County-wide hazard mitigation plan or directly address areas of natural hazard risk, it does include elements that address utilizing natural features as an organizing theme for development, protecting open spaces and view sheds, and restricting development from steep slopes.

Stormwater Regulations: The Town of Queensbury is a Municipal Separate Storm Sewer System (MS4) regulated Community. The Town Code includes specific stormwater regulations, but does not have a stormwater master plan.

Comprehensive Emergency Management Plan: The objectives of the Town of Queensbury's Comprehensive Emergency Management Plan include:

- A. To identify, assess and prioritize vulnerabilities to emergencies or disasters and the resources available to prevent or mitigate, respond to, and recover from them.
- B. To outline short, medium, and long range measures to improve the Town's capability to manage hazards.
- C. To provide that the Town government, in concert with the County government, will take appropriate actions to prevent or mitigate the effects of hazards and be prepared to respond to and recover from them when an emergency or disaster occurs.
- D. To provide for the efficient utilization of all available resources during an emergency.



- E. To provide for the effective utilization and coordination of County, State, and Federal programs to assist disaster victims, and to prioritize the response to the needs of the elderly, disabled, low income, and other groups which may be inordinately affected

The plan incorporates by reference the County-wide Hazard Mitigation Plan.

Other Plans: The Town of Queensbury has an open space plan that was adopted on July 7, 2003. The “Queensbury South Vision Plan 2014,” a local waterfront revitalization plan was prepared, but not adopted.

Regulatory and Enforcement (Ordinances)

Zoning Code and Subdivision regulations: The municipal zoning and subdivision regulations, Chapter 178, 179 and A183 of the Town code, consider risk from and mitigation of natural hazards. Steep slopes, wetlands, lakes and other water resources are identified via existing GIS resources. Municipal zoning code requires developers to mitigate natural hazard risk in the form of stormwater regulations

Building Codes: The Fire Marshal’s Office locally administers the NYS Fire and through plan review and annual and periodic inspection.

Flood Damage Prevention Chapter 91: Code of Town of Queensbury, Chapter 91 contains the Floodplain Damage Prevention regulations. It is the purpose of this chapter is to promote the public health, safety and general welfare and to minimize public and private losses due to flood conditions in specific areas by provisions designed to:

- A. Regulate uses which are dangerous to health, safety and property due to water or erosion hazards, or which result in damaging increases in erosion or in flood heights or velocities.
- B. Require that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction.
- C. Control the alteration of natural floodplains, stream channels and natural protective barriers which are involved in the accommodation of floodwaters.
- D. Control filling, grading, dredging and other development which may increase erosion or flood damages.
- E. Regulate the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards to other lands.
- F. Qualify and maintain for participation in the National Flood Insurance Program.

Operational and Administration

Town Planning and Zoning Board: Both boards review and make decisions as outlined in the Town Code as they are required.

Safety Committee: The Town of Queensbury Safety Committee has functions related to managing risk from natural hazards.

Stormwater Management: Stormwater management is performed via a partnership with Warren County Soil and Water Conservation District, Town Code Compliance Officer.

Floodplain Administrator: The NFIP Floodplain Management functions are performed by the Director of Building and Codes.

Hazard Mitigation Capability Building: Representatives from Warren County Soil and Water, Fire Marshal, Director of Building and Codes participate in groups that support natural hazard risk reduction. The Town of





Queensbury has five fire companies. Queensbury Central Fire Department has a well-constructed building with a backup generator to run 95% of the facility. All of the key elements will work on backup power, such as lights, heat, kitchen, and fuel pumps.

Town staff, including code enforcement officer, code compliance officer, and other field positions, are trained in natural hazard risk reduction as needed. Staff in building codes, fire marshal, and community development departments would benefit from additional training and/or certification with respect to natural hazard risk management.

Funding

The Town has a Capital Improvements Budget, this includes a budget for mitigation-related projects (e.g. improved stormwater management/drainage, hardening of critical facilities and infrastructure). The budget has line items for emergency operations. The highway department also has a set aside line item for mitigation. Fire companies also have budget line items for emergency operations.

The 2% tax cap limits the amount of money the Town can budget for mitigation activities.

Education and Outreach

The Town recently upgraded its website so that departments can now upgrade their individual pages.

The Queensbury Fire Marshal and Deputy Fire Marshal, while not formally affiliated with the Town’s five volunteer fire companies, regularly communicate, share information and technical assistance with the fire companies. The Fire Marshal also leads fire prevention education of local school children.

9.11.6 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and prioritization.

Past Mitigation Initiative Status

Table 9.11-11 below indicates progress on the community’s mitigation strategy identified in the 2011 Plan. Previous actions that are now ongoing programs and capabilities are indicated as such in Table 9.11-11, and also appear under “Capability Assessment” presented previously in this annex. Actions carried forward as part of this plan update are included in the following subsection (in Table 9.11-12) with prioritization.

Table 9.11-11. Past Mitigation Initiative Status

Description	Status	Review Comments
Reconstruct Corinth Road at the Main Street Corridor in the Town of Queensbury and City of Glens Falls. Total reconstruction, upgrade utilities, and widen to 3 lanes.	Completed in 2013	Completed - discontinue
Modify zoning practices to align with “FireWise Communities” guidelines to develop a Best Practices.	Ongoing operational capability.	The town enacts zoning regulations for individual homes that specify such things as setbacks and general lot locations, and clearly defines in the zoning code what constitutes unbuildable land.
Educate residents regarding steps to be taken to decrease the impact of natural hazards (including ice storms, wild/forest fires, severe storms, tornado, earth-quakes, and all other natural hazards) by developing, enhancing, and implementing education programs,	Continue	Educate residents regarding steps to be taken to decrease the impact of natural hazards (including ice storms, wild/forest fires, severe storms, tornado, earth-quakes, and all other natural hazards) by developing, enhancing, and implementing education programs, brochures,





Table 9.11-11. Past Mitigation Initiative Status

Description	Status	Review Comments
brochures, school presentations informing groups about ways to reduce risk, and other outreach activities.		school presentations informing groups about ways to reduce risk, and other outreach activities.
Monitor and remove trees/limbs in storm areas that present potential hazards to keep trees from threatening lives, property, and public infrastructure during storm events.	Continue	New wording - Work with NIMO to further develop and confirm tree removal responsibilities.
Obtain funding to purchase generators for municipally-owned critical facilities.	Continue	New wording - Obtain funding to purchase generators for municipally-owned critical facilities, including backup power for Mountain Lakes EMS
Coordinate/create mutual aid agreements between emergency services, public works departments, and public utilities to ensure efficient use of resources during and after storm events.	Ongoing operational capability.	The Town Board has always maintained strong shared services.
Develop plans for debris management after hazard events, including severe winter snow/ice events, and other severe storms.	Ongoing operational capability.	The County has a five year plan to have a FEMA approved disaster plan, so that when they have to do debris management they will be eligible for reimbursement – including white goods.
Design a network of citizens that will check in on elderly, functional needs, and low- income individuals during major events.	Ongoing operational capability.	Town Board, Health Advisory Committee
Send a town representative to the NYS Wildland Fire Suppression Training.	Continue	New wording - Identify training opportunities for relevant staff (building code enforcement, fire marshal and community development) to better understand and identify opportunities for natural hazard risk reduction.
Provide training for local code enforcement officials to implement building codes that reflect disaster resistant construction for new structures and renovation.	Continue	New wording - Identify training opportunities for relevant staff (building code enforcement, fire marshal and community development) to better understand and identify opportunities for natural hazard risk reduction.
Provide residents with information listing steps taken to lessen potential flood damage to reduce the impact of flooding.	Continue	
Educate the community on benefits of carrying NFIP policies and increase knowledge of NFIP services.	Continue	
Review and update local plans to integrate goals, objectives, and activities from this HMP which are not found in existing regulatory documents, as appropriate.	Continue	New wording - Integrate the risk assessment and recommendations of the hazard mitigation plan into the Town Comprehensive Plan.
Maintain a current inventory of at-risk buildings and infrastructure and continually update inventory of at-risk structures in each jurisdiction.	Continue	
Apply for grants to assist with mitigation activities needed to provide a level of protection for critical facilities.	Ongoing operational capability.	Town Board, Planning and Zoning Board
Provide continuing education and training for local Floodplain Administrator to ensure code enforcement and proper inspections.	Continue	New wording - Identify training opportunities for relevant staff (building code enforcement, fire marshal and community development) to better understand and identify opportunities for natural hazard risk reduction.
Implement zoning regulations to discourage building new structures in disaster prone areas – if such regulations are not already written	Ongoing operational capability.	



Table 9.11-11. Past Mitigation Initiative Status

Description	Status	Review Comments
into Town Zoning code or Floodplain Ordinance.		

Completed Mitigation Initiatives not Identified in the Previous Mitigation Strategy

The Town of Queensbury has identified the following mitigation projects/activities that have also been completed but were not identified in the previous mitigation strategy in the 2011 Plan:

- Bridge Road Bridge – replacement on Halfway Brook elevated
- Halfway Brook - Amount of stormwater has been reduced through land use practices
- Homer Avenue Flooding – Culvert Upgraded, significantly reduced flooding here

Proposed Hazard Mitigation Initiatives for the Plan Update

The Town of Queensbury participated in a mitigation action workshop in September and was provided the following Federal Emergency Management Agency (FEMA) publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 ‘Selecting Appropriate Mitigation Measures for Floodprone Structures’ (March 2007) and FEMA ‘Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards’ (January 2013).

Table 9.11-12 summarizes the comprehensive-range of specific mitigation initiatives the Town of Queensbury would like to pursue in the future to reduce the effects of hazards. Some of these initiatives may be previous actions carried forward for this plan update. Implementation of these initiatives will depend on available funding (grants and local match availability), and some initiatives may be modified or omitted at any time based on occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in Table 9.11-12 to further demonstrate the wide range of activities and mitigation measures selected.

As discussed in Section 6, 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing your actions as ‘High’, ‘Medium’, or ‘Low.’ The table below summarizes the evaluation of each mitigation initiative, listed by Action Number.

Table 9.11-13 summarizes prioritization of all proposed mitigation initiatives for the Plan update.



Table 9.11-12. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category	CRS Category
TQB-1	Participate in the Community Rating System	N/A	Flood, severe storm	1, 2, 3, 4	Town of Queensbury	High	Medium	County Budget, Municipal Budget	Ongoing	Medium	LPR	PR
TQB-2 (carryover)	Integrate the risk assessment and recommendations of the hazard mitigation plan into the Town Comprehensive Plan.	Both	All hazards	1, 4, 5	Town Board, Planning Department	Low-Medium	Low	Local Budget	Short	Medium	LPR	PR
TQB-3	Develop a Continuity of Government Plan.	N/A	All hazards	3	Fire Marshal, Town Board	High	Low/Medium	FEMA (HMGP, FMA, PDM), CDBG, NYS DHSES, County, Town	Short-Term	Medium	LPR	ES, PR
TQB-4 (carryover)	Identify training opportunities for relevant staff (building code enforcement, fire marshal and community development) to better understand and identify opportunities for natural hazard risk reduction.	N/A	All hazards	1, 2, 3, 4	County, Town	Medium	Low – Staff Time	FEMA (HMGP, FMA, PDM), CDBG, NYS DHSES, County	Ongoing	High	EAP	PI
TQB-5	Train staff in benefit cost analysis and in preparing grant applications for mitigation projects.	N/A	All hazards	1, 2, 3, 4	County, Town	Medium	Low – Staff Time	FEMA (HMGP, FMA, PDM), CDBG, NYS DHSES, County	Ongoing	High	EAP	PI





Table 9.11-12. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category	CRS Category
TQB-6	Work with National Grid to further develop and confirm tree removal responsibilities.	N/A	Severe storm, severe winter storm	1, 3	Town DPW, Highway Department	Low	Low	Local; HMGP, PDM	OG	Medium	LPR	PR
TQB-7	Obtain funding to purchase generators for municipally-owned critical facilities, including backup power for Mountain Lakes EMS	Existing	Severe storm (utility failure)	1, 3	DPW	High	Medium-High	Funded in annual budget, FEMA HMA grants	Short Term	High	SIP	ES, PP
TQB-8	Diesel Bypass Pump - Queensbury Wastewater Department: A trash diesel pump to bypass sanitary sewer flow at our sewer pump stations in case of a lightning strike that damages electrical equipment such as our backup generator.											
	See above	Existing	Severe storm (utility failure)	1, 3, 5	DPW	High	High	Local; HMGP, PDM	Short-Term	High	SIP	PP, PR
TQB-9	Work with the County on a coordinated dam Safety program.	Existing	Flood	1, 2, 3	DPW	low	low	Town Staff/ Operating Budget	Short-Term	Low	LPR	PR
TQB-10	Conduct GIS mapping of all culverts, including details on culvert size, age, construction type, etc.	Existing	Flood, utility failure	3, 4	Planning Office, DPW, Contractor (Larger repairs)	Medium	Medium	General Fund	Short-Term then ongoing	High	LPR, EAP	PR
TQB-11 (carryover)	Educate residents regarding steps to be taken to decrease the impact of natural hazards (including ice storms, wild/forest fires, severe storms, tornado, earth-quakes, and all other natural hazards) by developing, enhancing, and implementing education programs, brochures, school presentations informing groups about ways to reduce risk, and other outreach activities.	Existing	Earthquake, flood, infestation, landslide, wildfire, hazmat	1, 2	Town Board; Superintendent of school districts; County Office of Emergency Services	High	Low	Operating budget	OG	High	EAP	PI
TQB-12 (carryover)	Provide residents with information listing steps taken to lessen potential flood	Existing	Flood	1, 2	Town Board, County/local	High	Low	Town Staff/ Operating Budget	Short-Term	Medium	EAP	PI





Table 9.11-12. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category	CRS Category
	damage to reduce the impact of flooding.				DPW							
TQB-13 (carryover)	Educate the community on benefits of carrying NFIP policies and increase knowledge of NFIP services.	Existing	Flood, severe storm	1, 2	Town Floodplain Administrator	High	Low	Town Staff/ Operating Budget	Short-Term	Medium	EAP	PI
TQB-14 (carryover)	Maintain a current inventory of at-risk buildings and infrastructure and continually update inventory of at-risk structures.	Existing	All hazards	1, 3	Town Board, County Office of Emergency Services	High	Medium	Town and County Staff/ Operating Budget	Ongoing	Medium	LPR	PR, PI, ES

Notes:

Not all acronyms and abbreviations defined below are included in the table.

*Does this mitigation initiative reduce effects of hazards on new and/or existing buildings and/or infrastructure? Not applicable (N/A) is inserted if this does not apply.

Acronyms and Abbreviations:

CAV Community Assistance Visit
 CDBG Community Development Block Grant
 GCRS Community Rating System
 DPW Department of Public Works
 FEMA Federal Emergency Management Agency
 FPA Floodplain Administrator
 HMA Hazard Mitigation Assistance
 N/A Not applicable
 NFIP National Flood Insurance Program
 OEM Office of Emergency Management

Potential FEMA HMA Funding Sources:

FMA Flood Mitigation Assistance Grant Program
 HMGP Hazard Mitigation Grant Program
 PDM Pre-Disaster Mitigation Grant Program
 RFC Repetitive Flood Claims Grant Program (discontinued)
 SRL Severe Repetitive Loss Grant Program (discontinued)

Timeline:

Short 1 to 5 years
 Long Term 5 years or greater
 OG On-going program
 DOF Depending on funding

Costs:

Where actual project costs have been reasonably estimated:

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

Where actual project costs cannot reasonably be established at this time:

Low Possible to fund under existing budget. Project is part of, or can be part of, an existing ongoing program.

Benefits:

Where possible, an estimate of project benefits (per FEMA's benefit calculation methodology) has been evaluated against the project costs, and is presented as:

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

Where numerical project benefits cannot reasonably be established at this time:

Low Long-term benefits of the project are difficult to quantify in the short term.





Costs:

Medium Could budget for under existing work plan, but would require a reapportionment of the budget or a budget amendment, or cost of the project would have to be spread over multiple years.

High Would require an increase in revenue via an alternative source (i.e., bonds, grants, fee increases) to implement. Existing funding levels are not adequate to cover costs of the proposed project.

Benefits:

Medium Project will have a long-term impact on reduction of risk exposure to life and property, or project will provide an immediate reduction in risk exposure to property.

High Project will have an immediate impact on reduction of risk exposure to life and property.

Mitigation Category:

- **Local Plans and Regulations (LPR)** – Actions that include government authorities, policies, or codes that influence the way land and buildings are developed and built.
- **Structure and Infrastructure Project (SIP)** – Actions that involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures, as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce impacts of hazards.
- **Natural Systems Protection (NSP)** – Actions that minimize damage and losses, and also preserve or restore the functions of natural systems.
- **Education and Awareness Programs (EAP)** – Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities

CRS Category:

- **Preventative Measures (PR)** – Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and stormwater management regulations.
- **Property Protection (PP)** – Actions include public activities to reduce hazard losses or 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.
- **Public Information (PI)** – 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 educational programs for school-age children and adults.
- **Natural Resource Protection (NR)** – 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.
- **Structural Flood Control Projects (SP)** – Actions that involve construction of structures to reduce impacts of a hazard. Such structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.
- **Emergency Services (ES)** – Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and protection of essential facilities



Table 9.11-13. Summary of Prioritization of Actions

Mitigation Action/Project Number	Mitigation Action/Initiative	Life Safety	Property Protection	Cost-Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
TQB-1	Participate in the Community Rating System	1	1	0	0	1	0	0	1	0	0	1	1	1	0	7	Medium
TQB-2	Integrate the risk assessment and recommendations of the hazard mitigation plan into the Town Comprehensive Plan.	0	0	1	1	-1	1	0	0	0	1	1	1	1	1	7	Medium
TQB-3	Develop a Continuity of Government Plan.	1	0	1	1	1	1	-1	0	1	-1	1	1	1	1	8	Medium
TQB-4	Identify training opportunities for relevant staff (building code enforcement, fire marshal and community development) to better understand and identify opportunities for natural hazard risk reduction.	1	1	1	1	0	0	1	0	1	1	1	0	0	1	9	High
TQB-5	Train staff in benefit cost analysis and in preparing grant applications for mitigation projects.	1	1	1	1	0	0	1	0	1	1	1	0	0	1	9	High
TQB-6	Work with National Grid to further develop and confirm tree removal	0	0	1	1	1	1	0	0	0	1	1	0	1	1	8	Medium





Table 9.11-13. Summary of Prioritization of Actions

Mitigation Action/Project Number	Mitigation Action/Initiative	Life Safety	Property Protection	Cost-Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
	responsibilities.																
TQB-7	Obtain funding to purchase generators for municipally-owned critical facilities, including backup power for Mountain Lakes EMS	0	1	1	1	1	1	-1	1	1	1	1	1	1	1	11	High
TQB-8	Diesel Bypass Pump - Queensbury Wastewater Department: A trash diesel pump to bypass sanitary sewer flow at our sewer pump stations in case of a lightning strike that damages electrical equipment such as our backup generator.	0	1	1	1	0	1	-1	1	0	1	1	1	1	0	9	High
TQB-9	Work with the County on a coordinated dam Safety program.	1	1	0	1	0	1	0	1	0	1	0	0	0	0	6	Medium
TQB-10	Conduct GIS mapping of all culverts, including details on culvert size, age, construction type, etc.	1	1	1	1	1	1	1	1	0	0	1	1	1	0	11	High
TQB-11	Educate residents regarding steps to be	1	0	1	1	1	0	1	0	1	0	1	0	0	1	8	Medium





Table 9.11-13. Summary of Prioritization of Actions

Mitigation Action/Project Number	Mitigation Action/Initiative	Life Safety	Property Protection	Cost-Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
	taken to decrease the impact of natural hazards (including ice storms, wild/forest fires, severe storms, tornado, earthquakes, and all other natural hazards) by developing, enhancing, and implementing education programs, brochures, school presentations informing groups about ways to reduce risk, and other outreach activities.																
TQB-12	Provide residents with information listing steps taken to lessen potential flood damage to reduce the impact of flooding.	0	1	1	1	0	0	1	0	0	1	0	1	1	0	7	Medium
TQB-13	Educate the community on benefits of carrying NFIP policies and increase knowledge of NFIP services.	0	0	1	1	0	0	1	0	0	1	0	1	1	0	6	Medium
TQB-14	Maintain a current inventory of at-risk buildings and infrastructure and continually update inventory of at-risk	1	1	1	1	0	1	0	0	1	1	1	0	0	0	8	Medium





Table 9.11-13. Summary of Prioritization of Actions

Mitigation Action/Project Number	Mitigation Action/Initiative	Life Safety	Property Protection	Cost-Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
	structures in each jurisdiction.																

Note: Refer to Section 6, which conveys guidance on prioritizing mitigation actions.



9.11.7 Future Needs To Better Understand Risk/Vulnerability

None at this time.

9.11.8 Hazard Area Extent and Location

Hazard area extent and location maps have been generated for the Town of Queensbury that illustrate the areas probable to be impacted within the municipality (see Figure 9.11-1 and Figure 9.11-2 below). These maps are based on the best available data at the time of the preparation of this Plan, and are considered to be adequate for planning purposes. Maps have been generated for those hazards (i.e., landslide, wildfire and flooding) that can be clearly identified using mapping techniques and technologies, and to which the Town of Queensbury has significant exposure. These maps also appear in the hazard profiles within Section 5.4, Volume I of this Plan.

9.11.9 Additional Comments

None at this time.



Figure 9.11-1. Town of Queensbury Landslide Hazard Area Map

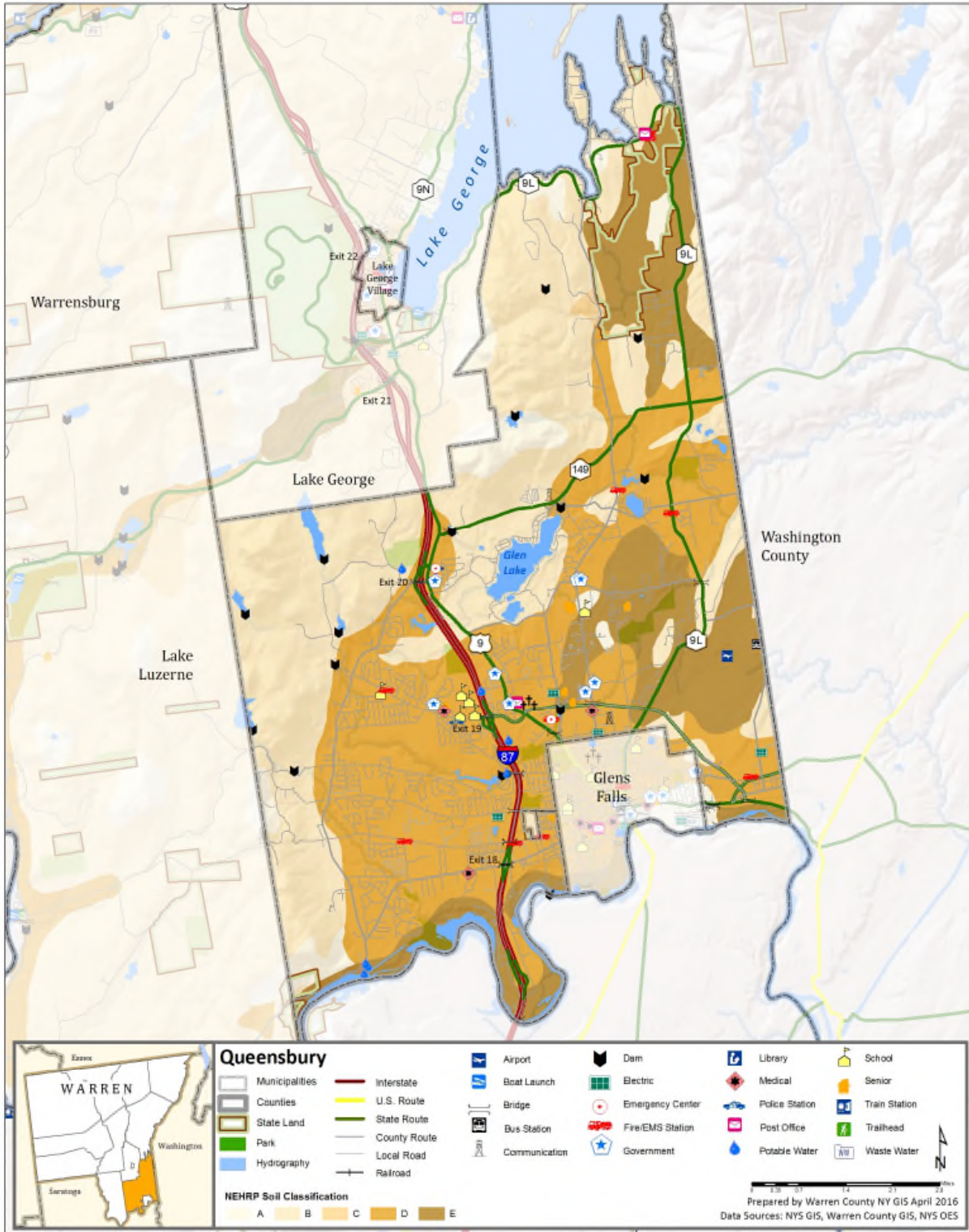
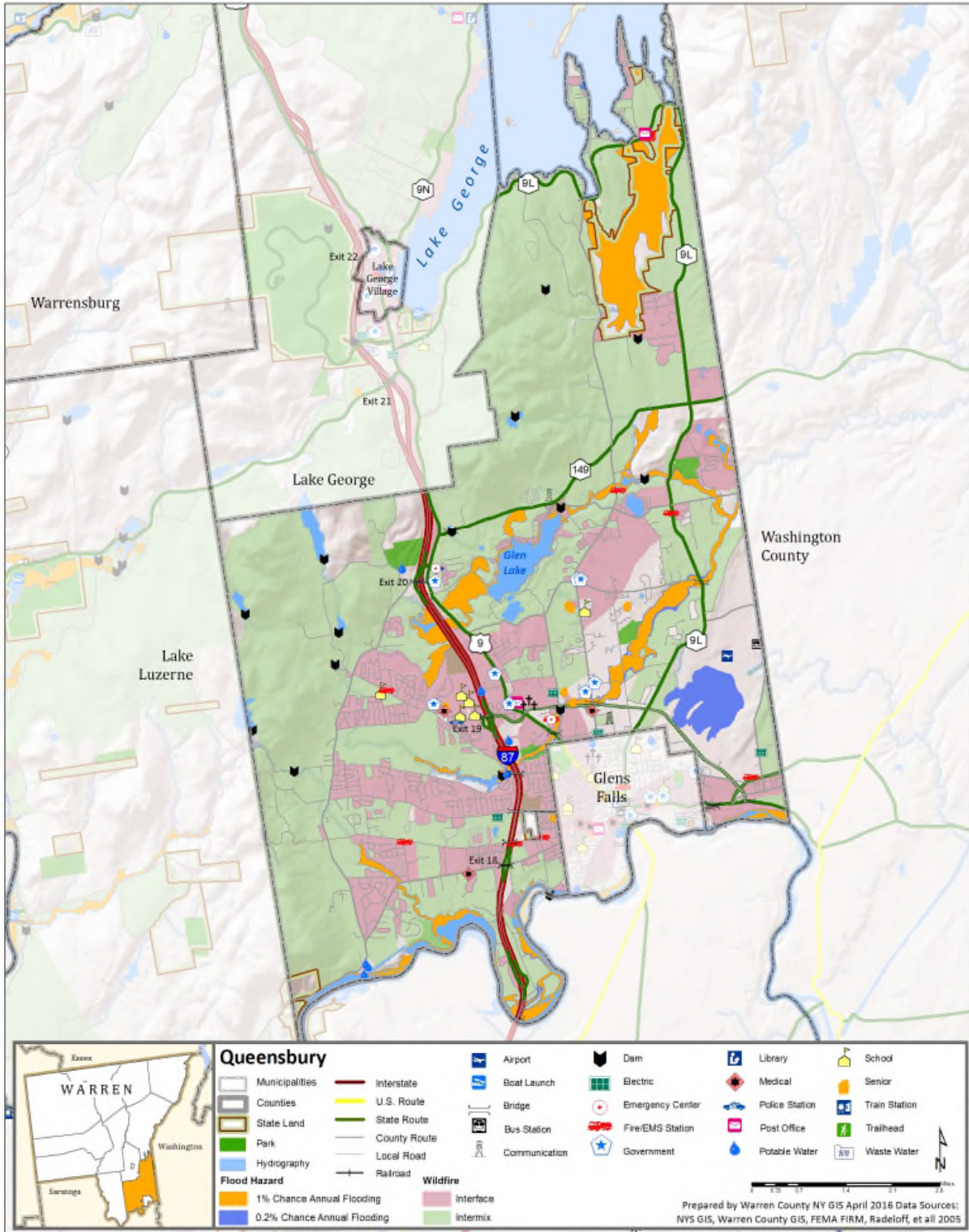




Figure 9.11-2. Town of Queensbury Flood and Wildfire Hazard Area Extent and Location Map





Name of Jurisdiction: Town of Queensbury
Name and Title Completing Worksheet: Craig Brown, Planning/Community Development Director
Action Number: TQB-7
Mitigation Action/Initiative: Purchase generators for municipally-owned critical facilities

Assessing the Risk	
Hazard(s) addressed:	Severe Storm
Specific problem being mitigated:	Lack of backup power at critical facilities
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	Other than installing on-site backup power, there are no practical, cost-effective alternatives to preserve critical facility operations in the Town in the event of prolonged power outages.
Action/Project Intended for Implementation	
Description of Selected Action/Project	Obtain funding to purchase generators for municipally-owned critical facilities, including backup power for Mountain Lakes EMS
Action/Project Category	SIP
Goals Met	1, 3
Applies to existing and or new development, or not applicable	Existing
Benefits (losses avoided)	High
Estimated Cost	Medium-High
Priority*	High
Plan for Implementation	
Responsible Organization	DPW
Local Planning Mechanism	Emergency Management, Hazard Mitigation
Potential Funding Sources	Annual budget, FEMA, HMA grants
Timeline for Completion	Short Term
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:



Action Number:

TQB-7

Mitigation Action/Initiative:

Purchase generators for municipally-owned critical facilities

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	0	
Property Protection	1	
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	
Fiscal	-1	
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	
Timeline	1	
Agency Champion	1	
Other Community Objectives	1	
Total	11	
Priority (High/Med/Low)	High	



Name of Jurisdiction: Town of Queensbury
Name and Title Completing Worksheet: Craig Brown, Planning/Community Development Director
Action Number: TQB-8
Mitigation Action Name: Diesel Bypass Pump - Queensbury Wastewater Department

Assessing the Risk	
Hazard(s) addressed:	Severe storm (utility failure)
Specific problem being mitigated:	Sewer pump stations do not currently have redundant backup equipment, increasing possibility for service interruptions during hazard events.
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	The Town has identified no other feasible or cost-effective alternatives to the selected project (diesel powered bypass pump).
Action/Project Intended for Implementation	
Description of Selected Action/Project	Install a trash diesel pump to bypass sanitary sewer flow at our sewer pump stations in case of a lightning strike that damages electrical equipment such as our backup generator.
Mitigation Action Type	SIP
Goals Met	1, 3, 5
Applies to existing and or new development, or not applicable	Existing
Benefits (losses avoided)	High
Estimated Cost	High
Priority*	High
Plan for Implementation	
Responsible Organization	Queensbury Wastewater Department
Local Planning Mechanism	DPW projects
Potential Funding Sources	Local; HMGP, PDM
Timeline for Completion	Short Term
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:



Action Number:

TQB-8

Mitigation Action Name:

Diesel Bypass Pump - Queensbury Wastewater Department

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Reduce risk of possible secondary public health incidents from service interruptions.
Property Protection	1	Reduce risk of property damage to pump station.
Cost-Effectiveness	1	Most cost-effective project option.
Technical	1	Project is technically feasible.
Political	0	
Legal	1	Town has jurisdiction over the pump stations.
Fiscal	-1	Requires external funding.
Environmental	1	Reduces risk of sewage overflow.
Social	0	
Administrative	1	Town has administrative capabilities to manage the project.
Multi-Hazard	1	All hazards
Timeline	1	Short-Term
Agency Champion	1	DPW
Other Community Objectives	0	
Total	9	
Priority (High, Medium, Low)	Medium	



9.12 TOWN OF STONY CREEK

This section presents the jurisdictional annex for the Town of Stony Creek.

9.12.1 Hazard Mitigation Plan Point of Contact

The following individuals have been identified as the hazard mitigation plan’s (HMP) primary and alternate points of contact.

Primary Point of Contact	Alternate Point of Contact
Frank E. Thomas, Supervisor 52 Hadley Road P.O. Box 96 Stony Creek, NY 12878 (518) 696-3575 x 302 tscsupvr@frontier.com	Neil Bradley, Highway Superintendent 52 Hadley Road P.O. Box 96 Stony Creek, NY 12878 (518) 955-0714 tscsupvr@frontier.com

9.12.2 Municipal Profile

The Town of Stony Creek is in the south-western corner of Warren County, in the southeast section of the Adirondack State Park. It is bordered by Warrensburg, Thurman, Hadley, Day and Wells. According to the U.S. Census, the population of the Town of Stony Creek is 767. The entire Town is within the Adirondack Park (Town of Stony Creek website).

The town is served by the Warrensburg and Lake Luzerne School Districts.

Growth/Development Trends

Table 9.12-1 below summarizes residential/commercial development in the Town of Stony Creek since 2010 and lists any known or anticipated major residential/commercial development and major infrastructure development slated for the next 5 years within the municipality. Town representatives noted that there has been minimal residential development in the past 5 years. Refer to the maps following Section 9.12.9 of this annex: Figure 9-12-1 that illustrates landslide hazard areas, and Figure 9-12-2 that illustrates the flood and wildfire hazard areas.

Table 9.12-1. Growth and Development

Property or Development Name	Type (e.g. Res., Comm.)	# of Units / Structures	Location (address and/or Parcel ID)	Known Hazard Zone(s)	Description/Status of Development
Recent Development from 2010 to present					
Single	Residential	10	Various	None identified	Complete
Known or Anticipated Development in the Next Five (5) Years					
None anticipated					

Note: Only location-specific hazard zones or vulnerabilities are identified

9.12.3 Natural Hazard Event History Specific to the Municipality

Warren County has a history of natural and non-natural hazard events as detailed in Volume I, Section 5.0 of this Plan. A summary of historical events appears in each hazard profile, and includes a chronology of events that have affected the County and its municipalities. For the purpose of this Plan update, events that have





occurred in the County from 2010 to present were summarized to indicate the range and impact of hazard events in the community. Information regarding specific damages is included, if available, based on reference material or local sources. This information is presented in Table 9.12-2 below. For details of these and additional events, refer to Volume I, Section 5.0 of this Plan.

Table 9.12-2. Hazard Event History

Dates of Event	Event Type (FEMA Disaster Declaration if applicable)	Warren County Designated?	Summary of Damages/Losses
April 27-28, 2011	Severe Storms, Flooding, Tornadoes and Straight-Line Winds (DR-1993)	Yes	Flooding occurred along the Hudson River in Warren County from North River southward to the Saratoga County line. The Town of Stony Creek reported instances of damage on private property. 20 rooms were destroyed at the Thousand Acres Ranch.
May 27 – June 2, 2011	Flooding “Memorial Day Storm”	N/A	Flooding occurred in the County and there was severe damage along a thin line through the County (Stony Creek, Thurman, Warrensburg, Horicon and Bolton) that resulted in \$13.125 million in damages. Extensive flood damage to transportation infrastructure occurred throughout the Town of Stony Creek. The Town Park was also flooded. Flooding and damages were exacerbated by beaver dams that were washed out during the storm flow.
August 27-29, 2011	Hurricane Irene (DR-4020)	Yes	There was severe wind and flooding damage throughout the County and in the Town of Stony Creek. \$270,000 FEMA and NYS funds were distributed to the town as a result of the damage.
October 29, 2012	Hurricane Sandy (EM-3351)	Yes	Heavy rain fell throughout the County. Minor washouts occurred along road shoulders in the Town of Stony Creek.

Notes:

- EM Emergency Declaration (FEMA)
- FEMA Federal Emergency Management Agency
- DR Major Disaster Declaration (FEMA)
- N/A Not applicable

9.12.4 Hazard Vulnerabilities and Ranking

The hazard profiles in Section 5.0 of this Plan convey detailed information regarding each plan participant’s vulnerability to the identified hazards. The following summarizes the hazard vulnerabilities and their ranking in the Town of Stony Creek. For additional vulnerability information relevant to this jurisdiction, refer to Section 5.0.

Hazard Risk/Vulnerability Risk Ranking

Table 9.12-3 below summarizes hazard risk/vulnerability rankings of potential hazards for the Town of Stony Creek.

Table 9.12-3. Hazard Risk/Vulnerability Risk Ranking

Hazard type	Estimate of Potential Dollar Losses to Structures Vulnerable to the Hazard ^{a, b}	Probability of Occurrence	Risk Ranking Score (Probability x Impact)	Hazard Ranking ^a
Earthquake	100-year MRP: \$68,745.00	Occasional	12	Low





Hazard type	Estimate of Potential Dollar Losses to Structures Vulnerable to the Hazard ^{a, b}	Probability of Occurrence	Risk Ranking Score (Probability x Impact)	Hazard Ranking ^a
	500-year MRP: \$1,319,145 2,500-Year MRP: \$10,933,884.00			
Flood	RCV Exposed to 1% Annual Chance: \$1,828,467	Frequent	18	Medium
Landslide	Damage estimate not available	Occasional	12	Low
Infestation	Damage estimate not available	Frequent	24	Medium
Severe Storm	RCV Exposed to 1938 storm-winds: \$30,608	Frequent	48	High
Severe Winter Storm	GBS 1% Loss: \$931,490 GBS 5% Loss: \$4,657,450	Frequent	51	High
Wildfire	RCV Exposed to Intermix: \$88,929,000 RCV Exposed to Interface: \$1,818,000	Frequent	42	High
Cyber Security	Damage estimate not available	Occasional	12	Low
Disease Outbreak	Damage estimate not available	Frequent	27	Medium
Hazardous Material Incidents	Damage estimate not available	Frequent	24	Medium

Notes:

- a. The general building stock valuation is based on the custom inventory generated for the municipality and based on improved value.
High = Total hazard priority risk ranking score of 31 and above
Medium = Total hazard priority risk ranking of 20-30+
Low = Total hazard risk ranking below 20
- b. Loss estimates for the severe storm and severe winter storm hazards are structural values only and do not include the estimated value of contents. The earthquake was evaluated by Census tract. The Census tracts do not exactly align with municipal boundaries; therefore, a total is reported for each Town inclusive of the Villages. Loss estimates for the flood and earthquake hazards represent both structure and contents. Potential flood loss estimates were generated using Hazus-MH 2.2 and digitized FIRM maps from the 1980s and 1990s for the 1-percent annual chance event; NED DEM was used to generate a depth grid. The County's 2015 Real Property data was used to generate the values for flood and includes structure and contents. For the wildfire hazard, the improved value and estimated contents of buildings located within the identified hazard zones is provided.

GBS General building stock
MRP Mean return period
RCV Replacement Cost Value

National Flood Insurance Program (NFIP) Summary

Table 9.12-4 below summarizes NFIP statistics for the Town of Stony Creek.

Table 9.12-4. NFIP Summary

Municipality	# Policies (1)	# Claims (Losses) (1)	Total Loss Payments (2)	# Rep. Loss Prop. (1)	# Severe Rep. Loss Prop. (1)	# Policies in 100-year Boundary (3)
Town of Stony Creek	2	1	\$2,355	0	0	1

Source: FEMA, 2014

Notes:

- (1) Policies, claims, repetitive loss, and severe repetitive loss statistics are provided by FEMA, are current as of November 30, 2015, and are summarized by community name. Total number of repetitive loss properties includes severe repetitive loss properties. Number of claims represents claims closed by November 30, 2015.
- (2) Total building and content losses from the claims file provided by FEMA Region 2.
- (3) Number of policies inside and outside of flood zones is based on latitude and longitude provided by FEMA Region 2 in the policy file.
- (4) FEMA noted that for a property with more than one entry, more than one policy may have been in force or more than one Geographic Information System (GIS) specification was possible.





Critical Facilities

Table 9.12-5 below identifies critical facilities within the municipality located on parcels that intersect the current regulatory NFIP 1% chance flood boundary (aka: “Special Flood Hazard Area” (SFHA)), however it is recognized that the actual facility structure(s) may lie outside of the SFHA. Please refer to the Flood Hazard Profile (Section 5.4.2) for further details of estimated flood losses throughout the County, as well as the “Other Vulnerabilities Identified” section following.

Table 9.12-5. Potential Flood Losses to Critical Facilities

Municipality	Facility Types in 1% Chance Flood Boundary						
	Boat Facilities	Dam	Electric	Government	Highway Bridge	Rail Facility	Wastewater
Town of Stony Creek	0	1	0	0	6	0	0

Source: Warren County Real Property 2015 tax roll; HAZUS-MH 2.2; FEMA 2015

Notes:

- (1) HAZUS-MH 2.2 provides a general indication of the maximum restoration time for 100% operations. Clearly, a great deal of effort is needed to quickly restore essential facilities to full functionality; therefore, this will be an indication of the maximum downtime (HAZUS-MH 2.2 User Manual).
- (2) Some facilities may be within the Digital Flood Insurance Rate Map (DFIRM) flood hazard boundary; however, HAZUS did not calculate potential loss, perhaps because depth of flooding would not cause any damages to these structures according to the depth damage function used in HAZUS for that facility type. Further, HAZUS-MH may estimate potential damage to a facility outside the DFIRM if the model generates a depth grid beyond DFIRM boundaries.

Other Vulnerabilities Identified

The municipality has identified the following vulnerabilities within their community:

- Hildebrandt Road – Vulnerable to creek flooding, and in need of bottomless culvert upgrade.
- Fodder Road – There are numerous 6’-8’ culverts along Fodder Road. Nonetheless, the system gets overwhelmed in large storms, leading to roadway flooding.
- Van Auken Road bridge/culvert – Streambank erosion here is impacting the roadway needs. Culvert upgrades are needed.
- States Road East bridge/culvert – This area has insufficient culvert capacity for existing volumes. Some culvert upgrades were completed here, but the area still needs greater capacity.
- Louis Waite Road and bridge/culvert – Box culvert here needs to be significantly upsized.
- Roaring Branch Road – Stream bank erosion affecting private property. Some stabilization efforts have been made, but additional work is needed.
- Beaver dams continue to be a great concern to the Town, particularly on private property.
- Town Park flooded during May 2011 event.
- DPW facility at 48 Hadley Road needs designated backup power.
- Library on Harrisburg Road (in the hamlet) has experienced basement flooding.





- Private property on Murray Road flooded during May 2011 event.
- Thousand Acres Ranch Resort (Warrensburg Road) flooded out – lost quite a few lodging units in the May 2011 event.

9.12.5 Capability Assessment

This section identifies the following capabilities of the local jurisdiction:

- Planning and regulatory capability
- Administrative and technical capability
- Fiscal capability
- Community classification
- NFIP
- Integration of mitigation planning into existing and future planning mechanisms.

Planning and Regulatory Capability

Table 9.12-6 below summarizes regulatory tools available to the Town of Stony Creek.

Table 9.12-6. Planning and Regulatory Tools

Tool / Program (code, ordinance, plan)	Do you have this? (Yes/No) If Yes, date of adoption or update	Authority (local, county, state, federal)	Dept. /Agency Responsible	Code Citation and Comments (Code Chapter, name of plan, explanation of authority, etc.)
Planning Capability				
Master Plan	Yes	State	APA	http://apa.ny.gov/
Capital Improvements Plan	No	-	-	-
Floodplain Management / Basin Plan	No	-	-	-
Stormwater Management Plan	No	-	-	In process as part of an Upper Hudson River Initiative partnership
Open Space Plan	No	-	-	-
Stream Corridor Management Plan	No	-	-	-
Watershed Management or Protection Plan	No	-	-	-
Economic Development Plan	No	-	-	-
Comprehensive Emergency Management Plan	Yes	County/Town	OES/Town Supervisor	2006, will be updated in next 1-2 years
Emergency Response Plan	Yes	County/Town	OES/Town Supervisor	In County plan
Post-Disaster Recovery Plan	No	-	-	-
Transportation Plan	No	-	-	-
Strategic Recovery Planning Report	No	-	-	-
Other Plans:	No	-	-	-
Regulatory Capability				
Building Code	Yes	County	Fire Prevention and Building Codes	Town Local Law – county agreement
Zoning Ordinance	Yes	State	APA	Adirondack Park Agency and NYC DEC
Subdivision Ordinance	Yes	State	APA	-
NFIP Flood Damage Prevention	Yes	Town	Town Supervisor	Local Law #1 of 1996

Tool / Program (code, ordinance, plan)	Do you have this? (Yes/No) If Yes, date of adoption or update	Authority (local, county, state, federal)	Dept. /Agency Responsible	Code Citation and Comments (Code Chapter, name of plan, explanation of authority, etc.)
Ordinance				
NFIP: Cumulative Substantial Damages	No	-	-	-
NFIP: Freeboard	Yes	State, Local	NYSDOS/Warren County Fire Prevention Building and Codes	State-mandated BFE+2 for single and two-family residential construction, BFE+1 for all other construction types
Growth Management Ordinances	No	-	-	-
Site Plan Review Requirements	No	-	-	-
Stormwater Management Ordinance	No	-	-	-
Municipal Separate Storm Sewer System (MS4)	NA	-	-	-
Natural Hazard Ordinance	No	-	-	-
Post-Disaster Recovery Ordinance	No	-	-	-
Real Estate Disclosure Requirement	Yes	State	-	New York State (NYS) mandate, Property Condition Disclosure Act, <i>NY Code</i> – Article 14 §460-467
Other (Special Purpose Ordinances [i.e., sensitive areas, steep slope])	No	-	-	-

Administrative and Technical Capability

Table 9.12-7 below summarizes potential staff and personnel resources available to the Town of Stony Creek.

Table 9.12-7. Administrative and Technical Capabilities

Resources	Is this in place? (Yes or No)	Department/ Agency/Position
Administrative Capability		
Planning Board	No	APA, Town Board Committee
Mitigation Planning Committee	No	-
Environmental Board/Commission	No	-
Open Space Board/Committee	No	-
Economic Development Commission/Committee	No	Town Board Committee
Maintenance programs to reduce risk	Yes	Buildings and Transfer Center Committee - Council C. Thomas & J. Thomas: 2 Highway Garages Park Garage, Town Hall, Transfer Facility Culvert and ditch maintenance, trees and limbs, utilities upkeep
Mutual aid agreements	Yes	EMS with Luzerne and Warrensburg, Fire Dept – Luzerne, Thurman and Warrensburg
Technical/Staffing Capability		
Planner(s) or engineer(s) with knowledge of land development and land management practices	Yes	APA, private contractors



Resources	Is this in place? (Yes or No)	Department/ Agency/Position
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Yes	Warren County Fire Prevention and Building Codes, Private contractors
Planners or engineers with an understanding of natural hazards	No	APA, private contractors
NFIP Floodplain Administrator (FPA)	Yes	Town Supervisor
Surveyor(s)	Yes	Private contractors
Personnel skilled or trained in GIS and/or Hazards United States (HAZUS) – Multi-Hazards (MH) applications	Yes	Warren County Planning Department
Scientist familiar with natural hazards	No	
Emergency Manager	Yes	Town Supervisor, Highway Superintendent, Fire Chief
Grant writer(s)	No	-
Staff with expertise or training in benefit/cost analysis	No	-
Professionals trained in conducting damage assessments	No	-

Fiscal Capability

Table 9.12-8 below summarizes financial resources available to the Town of Stony Creek.

Table 9.12-8. Fiscal Capabilities

Financial Resources	Accessible or Eligible to Use (Yes/No)
Community Development Block Grants (CDBG, CDBG-DR)	No
Capital improvements project funding	Yes – Annual budget
Authority to Levy Taxes for specific purposes	Yes
User fees for water, sewer, gas or electric service	No
Impact fees for homebuyers or developers of new development/homes	No
Stormwater utility fee	No
Incur debt through general obligation bonds	Yes
Incur debt through special tax bonds	Unknown.
Incur debt through private activity bonds	No
Withhold public expenditures in hazard-prone areas	Yes
Other federal or state funding programs	Yes
Open Space Acquisition funding programs	Yes
Other	-

Community Classifications

Table 9.12-9 below summarizes classifications for community program available to the Town of Stony Creek.

Table 9.12-9. Community Classifications

Program	Do you have this? (Yes/No)	Classification (if applicable)	Date Classified (if applicable)



Program	Do you have this? (Yes/No)	Classification (if applicable)	Date Classified (if applicable)
Community Rating System (CRS)	NP	N/A	N/A
Building Code Effectiveness Grading Schedule (BCEGS)	No	-	-
Public Protection (ISO Fire Protection Classes 1 to 10)	Yes	-	-
Storm Ready	NP	N/A	N/A
Firewise	NP	N/A	N/A
Disaster/safety programs in/for schools	No	-	-
Organizations with mitigation focus (advocacy group, non-government)	No	-	-
Public education program/outreach (through website, social media)	Yes	N/A	N/A
Public-Private Partnerships	No	-	-

Note:

- N/A Not applicable
- NP Not participating
- Unavailable

The classifications listed above relate to the community’s ability to provide effective services to lessen its vulnerability to the hazards identified. These classifications can be viewed as a gauge of the community’s capabilities in all phases of emergency management (preparedness, response, recovery and mitigation) and are used as an underwriting parameter for determining the costs of various forms of insurance. The Community Rating System (CRS) class applies to flood insurance, while the Building Code Effectiveness Grading Schedule (BCEGS) and Public Protection classifications apply to standard property insurance. CRS classifications range on a scale of 1 to 10, with class 1 being the best possible classification, and class 10 representing no classification benefit. Firewise classification is higher if the subject property is more than 1000 feet from a creditable fire hydrant and is within 5 road miles of a recognized Fire Station.

Criteria for classification credits are outlined in the following documents:

- The Community Rating System Coordinators Manual
- The Building Code Effectiveness Grading Schedule
- The ISO Mitigation online ISO’s Public Protection website at <https://www.isomitigation.com/program-works/how-the-ppc-program-works.html>
- The National Weather Service Storm Ready website at <http://www.stormready.noaa.gov/index.html>
- The National Firewise Communities website at <http://firewise.org/>

Self-Assessment of Capability

Table 9.12-10 below provides an approximate measure of the Town of Stony Creek’s capability to work in a hazard-mitigation capacity and/or effectively implement hazard mitigation strategies to reduce hazard vulnerabilities.



Table 9.12-10. Self-Assessment Capability for the Municipality

Area	Degree of Hazard Mitigation Capability		
	Limited (If limited, what are your obstacles?)*	Moderate	High
Planning and Regulatory Capability		X	
Administrative and Technical Capability		X	
Fiscal Capability	X – funding		
Community Political Capability			X
Community Resiliency Capability			X
Capability to Integrate Mitigation into Municipal Processes and Activities.			X

National Flood Insurance Program

NFIP Floodplain Administrator (FPA)

Frank E. Thomas – Town Supervisor

Flood Vulnerability Summary

Flood damages in the past 5 years have impacted town roads, the Town library, and private residences. As of June 30, 2015, there are no Repetitive Loss or Severe Repetitive Loss properties in the community.

Resources

The Town FPA is the sole person assuming responsibilities of floodplain administration. The Town FPA performs basic NFIP administration in the Town, and conducts education and outreach with regards to printed materials and notice of local training opportunities. Pamphlets on natural hazards are available at the Town Hall. The Adirondack Park Agency (APA) also provides support.

The Town FPA noted barriers to running an effective floodplain management program in the Town of Stony Creek, including a small staff and lack of public education for understanding community benefit. The FPA does not feel adequately supported and trained to fulfill the responsibilities of municipal Floodplain Administrator, and expressed interest in attending continuing education and/or certification training on floodplain management if offered in the County.

Compliance History

As of November 30, 2015, 2 policies were in force in the Town of Stony Creek, one of which was within the 100-year flood boundary. Since 1978, one claim has been paid within the Town, totaling \$2,355. There are no repetitive loss property and no severe repetitive loss properties in the Town.

The Town intends to continue active participation in the NFIP, and maintain compliance with all requirements of participation. Further, the Town has identified several actions to support both continued and improved participation in the NFIP as identified in Table 9.12-13.

Regulatory

The Town’s Flood Damage Prevention Ordinance (FDPO) appears in Local Law #1 of 1996 enacted by the town board on April 15, 1996. A hard copy of the ordinance is available for review from the Town Clerk.



Floodplain management regulations and ordinances meet FEMA and New York State (NYS) minimum requirements, and do not exceed these requirements.

The Town of Stony Creek does not have any other local ordinances, plans, and programs that specifically support floodplain management. However, the Town falls within the jurisdiction of the APA, which does regulate development within park boundaries.

The Town of Stony Creek does not participate in the CRS program, but would consider entry if deemed appropriate. The Town FPA would be happy to attend an informative seminar if offered.

Integration of Hazard Mitigation into Existing and Future Planning Mechanisms

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into day-to-day local government operations. As part of this planning effort, each community was surveyed to obtain a better understanding of the community's progress in plan integration. A summary is provided below. In addition, the community identified specific integration activities to be incorporated into municipal procedures.

Planning

Land Use Planning: The Town of Stony Creek is situated entirely within the Adirondack Park. Land use planning and regulation in the Town is with the Adirondack Park Association (<http://apa.ny.gov/>) and the New York State Department of Environmental Conservation (NYS DEC).

The APA reviews all applications for development in the Town of Stony Creek and considers natural hazard risk areas in their review. Many development activities require additional levels of environmental review, specifically NYS State Environment Quality Review (SEQR) and Federal National Environmental Protection Act (NEPA) requirements. .

Regulatory and Enforcement (Ordinances)

Burning Permits: Stony Creek and Thurman issue burning permits to control wildfire risk.

Flood Damage Prevention Ordinance: This ordinance promotes the public health, safety, and general welfare of residents and seeks to minimize public and private losses due to flood conditions and erosion. It regulates development to promote flood resistant structures and controls the alteration of floodplains to prevent increased vulnerability.

Zoning Code: The Town abides by NYS DEC regulations, as well as the APA land classification system, which is available for review at the Town Hall. The Adirondack Park Agency administers the Adirondack Park Agency Act (Executive Law, article 27), the Freshwater Wetlands Act (Environmental Conservation Law, article 24) within the Adirondack Park and, for private lands within the Adirondack Park, the Wild Scenic and Recreational Rivers System Act (Environmental Conservation Law, article 15, title 27).

Operational and Administration

Operating Budget: The Town's operating budget contains provisions for street maintenance, capital improvements, and expected repairs like snow removal and brush removal after a storm or natural disaster.

Other Funding Sources: New York State Department of Transportation (NYSDOT) and NYSDEC are potential funding resources for operational activities in the Town of Stony Creek.

Education and Outreach

Town staff attend trainings and classes sponsored by Warren County Soil and Water Conservation District (SWCD) and Warren County Office of Emergency Services (OES), or by state and federal agencies, as able and in order to meet all professional requirements.

The Town is currently building a public safety webpage for resident use and benefit.

9.12.6 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and prioritization.

Past Mitigation Initiative Status

Table 9.12-11 below indicates progress on the community’s mitigation strategy identified in the 2011 Plan. Previous actions that are now ongoing programs and capabilities are indicated as such in Table 9.12-11, and also appear under “Capability Assessment” presented previously in this annex. Actions carried forward as part of this plan update are included in the following subsection (in Table 9.12-12) with prioritization.

Table 9.12-11. Past Mitigation Initiative Status

Description	Status	Review Comments
Replace the Tannery Road Bridge over Stony Creek in the Town of Stony Creek	Completed (est. 2008)	County project.
Replace the Grist Mill Road Bridge over Stony Creek in the Town of Stony Creek	Completed (est. 2008)	County project
Educate residents regarding steps to be taken to decrease the impact of natural hazards (including ice storms, wild/forest fires, severe storms, tornado, earth-quakes, and all other natural hazards) by developing, enhancing, and implementing education programs, brochures, school presentations informing groups about ways to reduce risk, and other outreach activities.	Ongoing - Operational Capability	Through WC OES and SWCD. Town advertises training and educational events. Stream simulation table is utilized at the yearly Stony Creek Mountain Days (public event).
Monitor and remove trees/limbs in storm areas that present potential hazards to keep trees from threatening lives, property, and public infrastructure during storm events.	Ongoing - Operational Capability	As needed and requested.
Obtain funding to purchase generators for municipally-owned critical facilities.	Incomplete Town Hall has backup power	Carry this initiative forward. Obtain funding to purchase designated backup power generator for DPW facility at 48 Hadley Road.
Coordinate/create mutual aid agreements between emergency services, public works departments, and public utilities to ensure efficient use of resources during and after storm events.	Ongoing - Operational Capability	Fire and EMS agreements (Towns)
Develop plans for debris management after hazard events, including severe winter	Incomplete	Carry this initiative forward.



Table 9.12-11. Past Mitigation Initiative Status

Description	Status	Review Comments
snow/ice events, and other severe storms.		
Design a network of citizens that will check in on elderly, functional needs, and low- income individuals during major events.	Ongoing - Operational Capability	Fire department and Town works with WC Public Health through their special needs registry.
Send a town representative to the NYS Wildland Fire Suppression Training.	Incomplete	Carry this initiative forward.
Provide training for local code enforcement officials to implement building codes that reflect disaster resistant construction for new structures and renovation.	Not Applicable	County handles code enforcement
Provide residents with information listing steps taken to lessen potential flood damage to reduce the impact of flooding.	Incomplete	Carry initiate forward – E/O Educate the community on steps taken to lessen potential flood damage to reduce the impact of flooding, and on the benefits of carrying NFIP policies.
Educate the community on benefits of carrying NFIP policies and increase knowledge of NFIP services.	Ongoing	Local law in place, would like more information for residents.
Review and update local plans to integrate goals, objectives, and activities from this HMP which are not found in existing regulatory documents, as appropriate.	Ongoing	Review and update local comprehensive emergency plan to integrate education and outreach goals, objectives, and activities from this HMP.
Maintain a current inventory of at-risk buildings and infrastructure and continually update inventory of at-risk structures in each jurisdiction.	Incomplete	Carry initiate forward
Apply for grants to assist with mitigation activities needed to provide a level of protection for critical facilities.	Not applicable	Critical facilities have generators and are not in flood zones.
Provide continuing education and training for local Floodplain Administrator to ensure code enforcement and proper inspections.	Incomplete	Carry initiative forward, Supervisor is very interested in training opportunities
Implement zoning regulations to discourage building new structures in disaster prone areas – if such regulations are not already written into Town Zoning code or Floodplain Ordinance.	Ongoing - Operational Capability	APA regulations

Completed Mitigation Initiatives not Identified in the Previous Mitigation Strategy

The Town of Stony Creek has identified the following mitigation projects/activities that have also been completed but were not identified in the previous mitigation strategy in the 2011 Plan:

- Fire Department installed backup power 2-3 years prior to publishing this Plan update.

Proposed Hazard Mitigation Initiatives for the Plan Update

The Town of Stony Creek participated in a mitigation action workshop in September 2015 and was provided the following Federal Emergency Management Agency (FEMA) publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 ‘Selecting Appropriate Mitigation Measures for Floodprone Structures’ (March 2007) and FEMA ‘Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards’ (January 2013).

Table 9.12-12 summarizes the comprehensive-range of specific mitigation initiatives the Town of Stony Creek would like to pursue in the future to reduce the effects of hazards. Some of these initiatives may be previous actions carried forward for this plan update. Implementation of these initiatives will depend on available funding (grants and local match availability), and some initiatives may be modified or omitted at any time based on occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in Table 9.12-12 to further demonstrate the wide range of activities and mitigation measures selected.

As discussed in Section 6, 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing your actions as ‘High’, ‘Medium’, or ‘Low.’ The table below summarizes the evaluation of each mitigation initiative, listed by Action Number.

Table 9.12-12 summarizes prioritization of all proposed mitigation initiatives for the Plan update.

Table 9.12-12. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category	CRS Category
TSC-1	Upgrade undersized culverts on Hildebrandt Road, Fodder Road, Van Auken Road, States Road Est, Louis Waite Road, and Roaring Branch Road.	Existing	Flood, Severe Storm	1, 3	Town Highway Department	High	Medium	Local; HMGP, FMA, PDM	Short Term	High	SIP	PP, SP
TSC-2	Develop a partnership between public and private partners to monitor and address risk from beaver dams.	Both	Flood	1, 2, 3	Supervisor, Town Highway Department	Medium	Low	Local Budget, County OEM	Short Term	Low	LPR, EAP	PR
TSC-3	Integrate green infrastructure projects such as a bioswale in the town park.	N/A	Flood, Severe Storm	1, 2	Town Council, Supervisor	Medium	Medium	Local Budget, Grants	Short Term	High	NSP	PR, NR
TSC-4	Roaring Branch Road Stream Bank Stabilization – Stream bank erosion affecting private property. Some stabilization efforts have been made, but additional work is needed.	Existing	Flood, Severe Storm	1, 3, 5	Town Highway Department	Medium	Medium	Local; HMGP, FMA, PDM	Short Term	Medium	SIP	NR
TSC-5 (carryover)	Obtain funding to purchase designated backup power generators for municipally-owned critical facilities, including the DPW facility at 48 Hadley Road.	Existing	All Hazards	1, 3	Town Highway Department	High	Medium	Local; HMGP, PDM	Short Term	High	SIP	ES
TSC-6 (carryover)	Develop plans for debris management after hazard events, including severe winter snow/ice events, and other severe storms.	N/A	Earthquake, Flood, Landslide, Infestation, Severe Storm, Severe Winter Storm, Wildfire, Hazardous Material Incidents	3, 4	Town Highway Department	Medium	Low	Local; HMGP	Short Term	High	LPR, EAP	PR, ES
TSC-7 (carryover)	Educate the community on steps taken to lessen potential	Both	Flood, Severe	1, 2	Town Supervisor,	High	Low	Local, County	Short Term	High	EAP	PR, PI



Table 9.12-12. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category	CRS Category
	flood damage to reduce the impact of flooding, and on the benefits of carrying NFIP policies.		Storms		Warren County OES							
TSC-8	Review and update local comprehensive emergency plan to integrate education and outreach goals, objectives, and activities from this HMP.	N/A	All Hazards	2, 3	Town Supervisor	Medium	Low	Local, County	Short Term	High	LRP EAP	PR ES
TSC-9 (carryover)	Maintain a current inventory of at-risk buildings and infrastructure and continually update inventory of at-risk structures in each jurisdiction.	Existing	Earthquake, Flood, Landslide, Severe Storm, Severe Winter Storm, Wildfire, Hazardous Material Incidents	3, 4	Town Highway Department, APA	Medium	Low	Local; HMGP, PDM	Long Term	High	PR	PP ES
TSC-10 (carryover)	Provide continuing education and training for local Floodplain Administrator to ensure code enforcement and proper inspections.	Both	Flood, Severe Storm	1, 2	Town Supervisor/ FPA	High	Low	Local, County; HMGP, PDM	Short Term	High	EAP	PI NR ES
TSC-11 (carryover)	Send a town representative to the NYS Wildland Fire Suppression Training.	N/A	Wildfire	3, 4	Fire Marshal	High	Low	Local, County, PDM	Short Term	High	EAP	PI NR ES

Notes:

Not all acronyms and abbreviations defined below are included in the table.

*Does this mitigation initiative reduce effects of hazards on new and/or existing buildings and/or infrastructure? Not applicable (N/A) is inserted if this does not apply.

Acronyms and Abbreviations:

CAV Community Assistance Visit
 CDBG Community Development Block Grant
 GCRS Community Rating System
 DPW Department of Public Works

Potential FEMA HMA Funding Sources:

FMA Flood Mitigation Assistance Grant Program
 HMGP Hazard Mitigation Grant Program
 PDM Pre-Disaster Mitigation Grant Program
 RFC Repetitive Flood Claims Grant Program (discontinued)

Timeline:

Short 1 to 5 years
 Long Term 5 years or greater
 OG On-going program
 DOF Depending on funding



Acronyms and Abbreviations:

FEMA	Federal Emergency Management Agency
FPA	Floodplain Administrator
HMA	Hazard Mitigation Assistance
N/A	Not applicable
NFIP	National Flood Insurance Program
OEM	Office of Emergency Management

Potential FEMA HMA Funding Sources:

SRL	Severe Repetitive Loss Grant Program (discontinued)
-----	---

Timeline:

Costs:

Where actual project costs have been reasonably estimated:

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

Where actual project costs cannot reasonably be established at this time:

Low	Possible to fund under existing budget. Project is part of, or can be part of, an existing ongoing program.
Medium	Could budget for under existing work plan, but would require a reapportionment of the budget or a budget amendment, or cost of the project would have to be spread over multiple years.
High	Would require an increase in revenue via an alternative source (i.e., bonds, grants, fee increases) to implement. Existing funding levels are not adequate to cover costs of the proposed project.

Benefits:

Where possible, an estimate of project benefits (per FEMA's benefit calculation methodology) has been evaluated against the project costs, and is presented as:

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

Where numerical project benefits cannot reasonably be established at this time:

Low	Long-term benefits of the project are difficult to quantify in the short term.
Medium	Project will have a long-term impact on reduction of risk exposure to life and property, or project will provide an immediate reduction in risk exposure to property.
High	Project will have an immediate impact on reduction of risk exposure to life and property.

Mitigation Category:

- Local Plans and Regulations (LPR) – Actions that include government authorities, policies, or codes that influence the way land and buildings are developed and built.
- Structure and Infrastructure Project (SIP) – Actions that involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures, as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce impacts of hazards.
- Natural Systems Protection (NSP) – Actions that minimize damage and losses, and also preserve or restore the functions of natural systems.
- Education and Awareness Programs (EAP) – Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities

CRS Category:

- Preventative Measures (PR) – Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and stormwater management regulations.
- Property Protection (PP) – Actions include public activities to reduce hazard losses or 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.
- Public Information (PI) – 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 educational programs for school-age children and adults.
- Natural Resource Protection (NR) – 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.
- Structural Flood Control Projects (SP) – Actions that involve construction of structures to reduce impacts of a hazard. Such structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.



- *Emergency Services (ES) – Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and protection of essential facilities*

Table 9.12-13. Summary of Prioritization of Actions

Mitigation Action/Project Number	Mitigation Action/Initiative	Life Safety	Property Protection	Cost-Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
TSC-1	Upgrade undersized culverts on Hildebrandt Road, Fodder Road, Van Auken Road, States Road Est, Louis Waite Road, and Roaring Branch Road.	0	1	1	1	1	1	0	1	0	1	0	0	0	0	7	H
TSC-2	Develop a partnership between public and private partners to monitor and address risk from beaver dams.	1	1	1	1	-1	-1	1	0	0	0	1	-1	-1	0	2	L
TSC-3	Integrate green infrastructure projects such as a bioswale in the town park.	1	0	0	1	0	1	1	1	0	1	0	-1	0	1	4	H
TSC-4	Roaring Branch Road Stream Bank Stabilization – Stream bank erosion affecting private property. Some stabilization efforts have been made, but additional work is needed.	0	1	1	1	0	0	-1	1	0	1	0	-1	0	1	4	M
TSC-5	Obtain funding to purchase generators for municipally-owned critical facilities. DPW facility at 48 Hadley Road needs designated backup power.	1	1	1	1	1	1	0	0	-1	1	1	1	0	0	8	H
TSC-6	Develop plans for debris management after hazard events, including severe winter snow/ice events, and other severe storms.	0	1	1	1	0	1	1	1	0	1	1	0	0	0	8	H

Table 9.12-13. Summary of Prioritization of Actions

Mitigation Action/Project Number	Mitigation Action/Initiative	Life Safety	Property Protection	Cost-Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
TSC-7	Educate the community on steps taken to lessen potential flood damage to reduce the impact of flooding, and on the benefits of carrying NFIP policies.	0	1	1	1	0	0	1	0	0	1	1	1	0	0	7	H
TSC-8	Review and update local comprehensive emergency plan to integrate education and outreach goals, objectives, and activities from this HMP.	1	0	1	1	0	1	1	0	1	1	1	1	0	0	9	H
TSC-9	Maintain a current inventory of at-risk buildings and infrastructure and continually update inventory of at-risk structures in each jurisdiction.	0	1	1	1	0	0	1	0	0	1	1	1	0	0	7	H
TSC-10	Provide continuing education and training for local Floodplain Administrator to ensure code enforcement and proper inspections.	0	1	1	1	0	1	1	1	0	1	1	1	1	0	10	H
TSC-11	Send a town representative to the NYS Wildland Fire Suppression Training.	1	1	1	1	1	1	0	0	0	1	0	1	0	0	8	H

Note: Refer to Section 6, which conveys guidance on prioritizing mitigation actions.

9.12.7 Future Needs To Better Understand Risk/Vulnerability

None at this time.

9.12.8 Hazard Area Extent and Location

Hazard area extent and location maps have been generated for the Town of Stony Creek that illustrate the areas probable to be impacted within the municipality (see Figure 9.12-1 and Figure 9.12-2 below). These maps are based on the best available data at the time of the preparation of this Plan, and are considered to be adequate for planning purposes. Maps have been generated for those hazards (i.e., wildfire and flooding) that can be clearly identified using mapping techniques and technologies, and to which the Town of Stony Creek has significant exposure. These maps also appear in the hazard profiles within Section 5.4, Volume I of this Plan.

9.12.9 Additional Comments

None at this time.

Figure 9.12-1. Town of Stony Creek Landslide Hazard Area Map

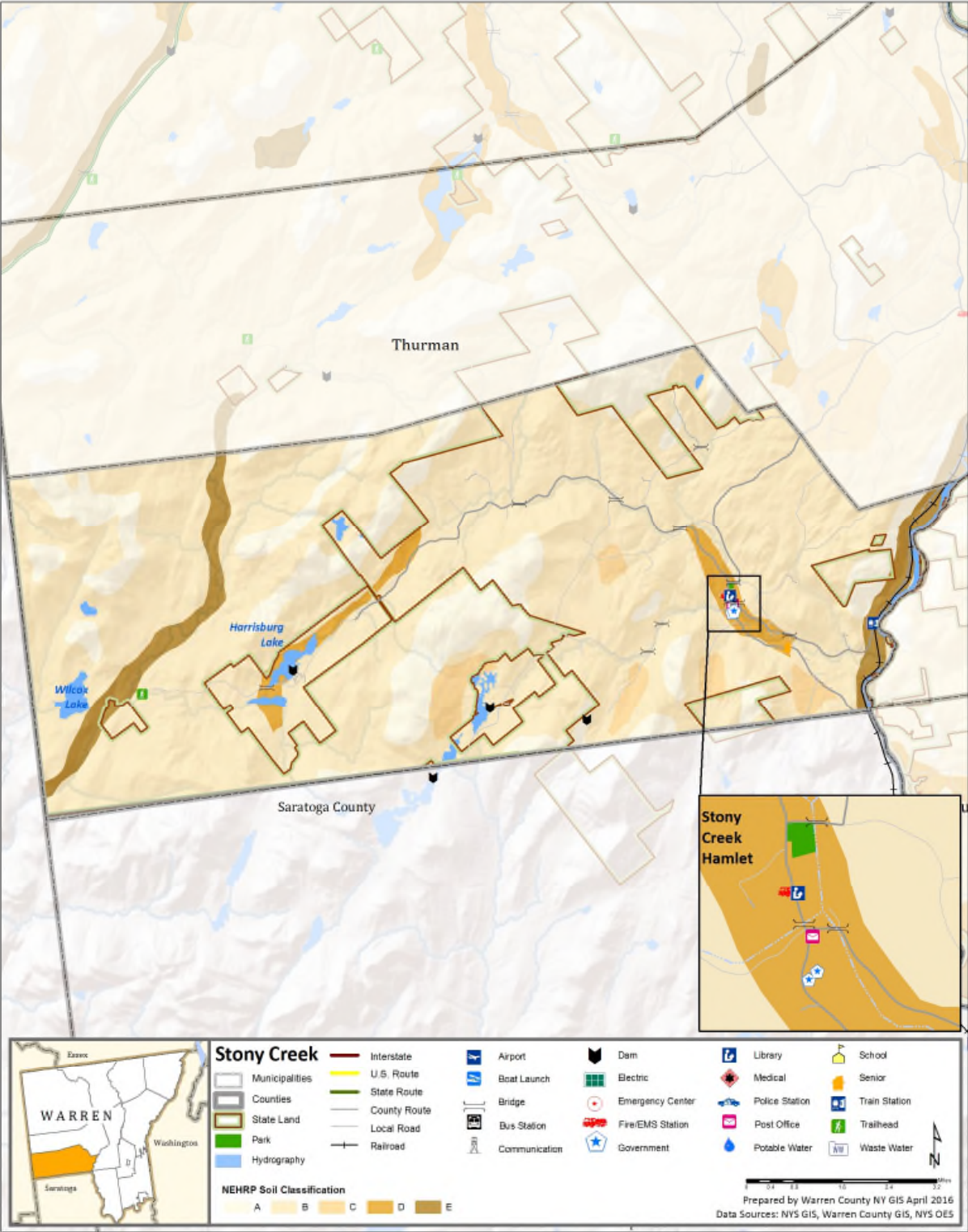
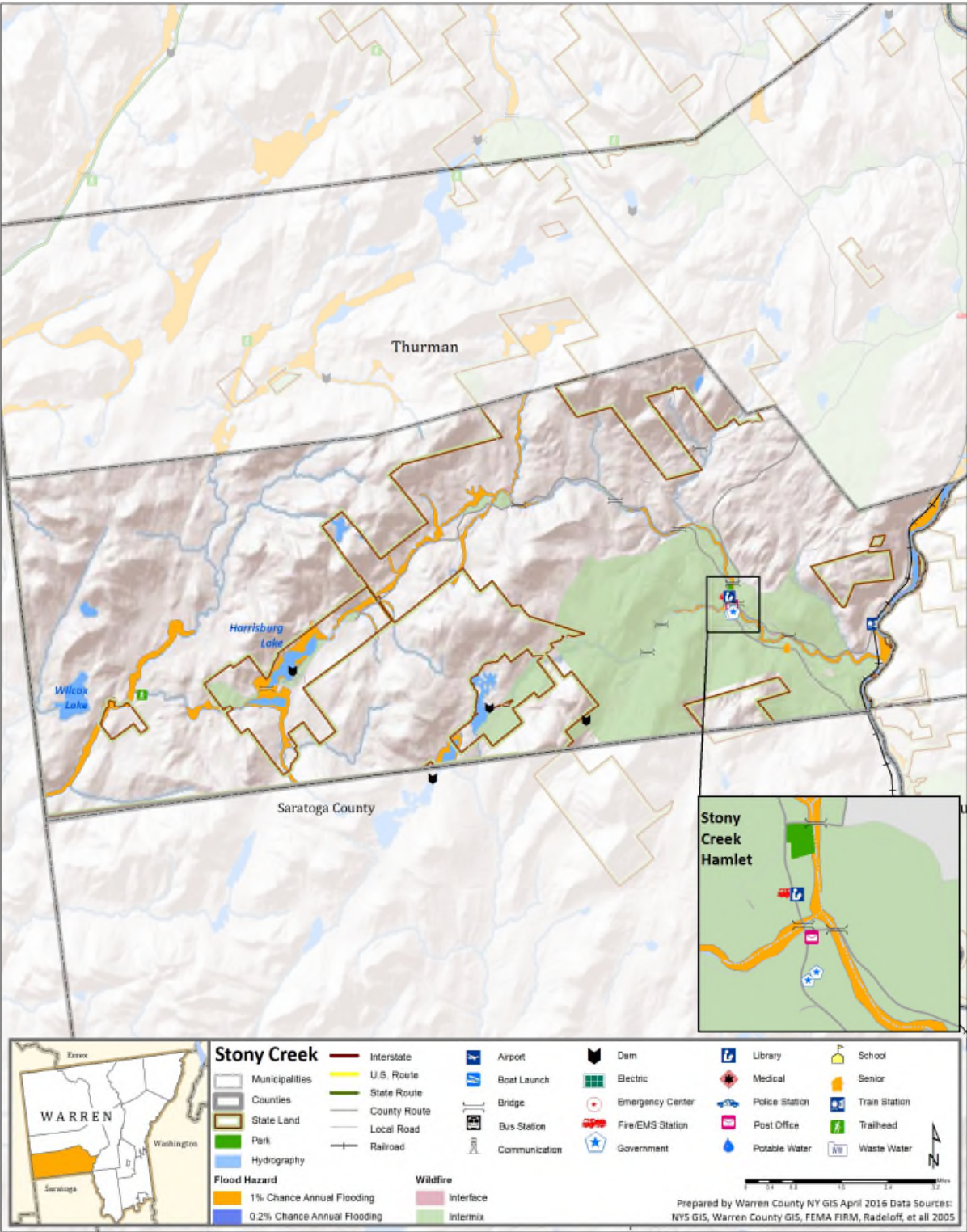


Figure 9.12-2. Town of Stony Creek Flood and Wildfire Hazard Area Extent and Location Map



Name of Jurisdiction:	Town of Stony Creek
Name and Title Completing Worksheet:	Neil Bradley, Highway Superintendent
Action Number:	TSC-1
Mitigation Action Name:	Upgrade undersized culverts on Hildebrandt Road, Fodder Road, Van Auken Road, States Road Est, Louis Waite Road, and Roaring Branch Road.

Assessing the Risk	
Hazard(s) addressed:	Flood
Specific problem being mitigated:	Undersized culverts on Hildebrandt Road, Fodder Road, Van Auken Road, States Road Est, Louis Waite Road, and Roaring Branch Road
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	The Town has identified no other feasible or cost-effective alternatives to address these problem areas. General stormwater management programs may help incrementally to lessen the problems, but will not be sufficient.
Action/Project Intended for Implementation	
Description of Selected Action/Project	Upgrade undersized culverts on Hildebrandt Road, Fodder Road, Van Auken Road, States Road Est, Louis Waite Road, and Roaring Branch Road. All mitigation efforts shall be made in consideration of Federal and State directives to mitigate critical infrastructure to address protection to the 500-year flood event or “worst damage scenario”.
Mitigation Action Type	SIP
Goals Met	1, 3
Applies to existing and or new development, or not applicable	Existing
Benefits (losses avoided)	Road washout, roadway closure
Estimated Cost	Medium
Priority*	High
Plan for Implementation	
Responsible Organization	Town Highway Department
Local Planning Mechanism	APA
Potential Funding Sources	Local; HMGP, FMA, PDM
Timeline for Completion	Short Term
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:



Action Number: TSC-1
Mitigation Action Name: Upgrade undersized culverts on Hildebrandt Road, Fodder Road, Van Auken Road, States Road Est, Louis Waite Road, and Roaring Branch Road.

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	0	
Property Protection	1	Reduce further roadway damage and shoulder washout
Cost-Effectiveness	1	Reduce need for multiple repairs
Technical	1	Technically feasible
Political	1	Project has support of Town officials
Legal	1	Town has legal jurisdiction over project area
Fiscal	0	Will need external funding to supplement local funds
Environmental	1	Reduce blockage of waterway
Social	0	
Administrative	1	Town has capability to administer the project
Multi-Hazard	0	
Timeline	0	
Agency Champion	0	
Other Community Objectives	0	
Total	7	
Priority (High, Medium, Low)	High	

Name of Jurisdiction: Town of Stony Creek
Name and Title Completing Worksheet: Neil Bradley, Highway Superintendent
Action Number: TSC-4
Mitigation Action/Initiative: Roaring Branch Road Stream Bank Stabilization

Assessing the Risk	
Hazard(s) addressed:	Flood, Severe Storm
Specific problem being mitigated:	Stream bank erosion along the roadway has impacted private properties
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	The Town has been addressing this problem area for several years. Stream bank stabilization has been identified as the only practical and cost-effective solution to protect local infrastructure (roads) and adjoining private properties.
Action/Project Intended for Implementation	
Description of Selected Action/Project	Stream bank erosion affecting private property. Some stabilization efforts have been made, but additional work is needed. These mitigation efforts shall be made in consideration of Federal and State directives to mitigate critical infrastructure to address protection to the 500-year flood event or “worst damage scenario”.
Action/Project Category	SIP
Goals Met	1, 3, 5
Applies to existing and or new development, or not applicable	Existing
Benefits (losses avoided)	Medium
Estimated Cost	Medium
Priority*	Medium
Plan for Implementation	
Responsible Organization	Town Highway Department
Local Planning Mechanism	Hazard Mitigation
Potential Funding Sources	Local Budget, HMGP
Timeline for Completion	Short Term
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:



Action Number: TSC-4
Mitigation Action/Initiative: Roaring Branch Road Stream Bank Stabilization

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	0	
Property Protection	1	Protect properties from erosion
Cost-Effectiveness	1	
Technical	1	
Political	0	
Legal	0	
Fiscal	-1	Need grant funding or incorporate into municipal budget
Environmental	1	
Social	0	
Administrative	1	
Multi-Hazard	0	
Timeline	-1	
Agency Champion	0	
Other Community Objectives	1	
Total	4	
Priority (High/Med/Low)	Medium	

Name of Jurisdiction:	Town of Stony Creek
Name and Title Completing Worksheet:	Neil Bradley, Highway Superintendent
Action Number:	TSC-5
Mitigation Action/Initiative:	Obtain funding to purchase generators for municipally-owned critical facilities

Assessing the Risk	
Hazard(s) addressed:	All hazards
Specific problem being mitigated:	Lack of backup power at critical facilities
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	The Town can identify no other feasible or cost-effective solutions to maintaining the function of municipal critical facilities during extended power outages other than the installation of stand-alone backup power.
Action/Project Intended for Implementation	
Description of Selected Action/Project	Obtain funding to purchase designated backup power generators for municipally-owned critical facilities, including the DPW facility at 48 Hadley Road.
Action/Project Category	SIP
Goals Met	1, 3
Applies to existing and or new development, or not applicable	Existing
Benefits (losses avoided)	High
Estimated Cost	Medium
Priority*	High
Plan for Implementation	
Responsible Organization	Town Highway Department
Local Planning Mechanism	Hazard Mitigation
Potential Funding Sources	Local Budget, HMGP, PDM
Timeline for Completion	Short Term
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:



Action Number: TSC-5
Mitigation Action/Initiative: Obtain funding to purchase generators for municipally-owned critical facilities

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	
Property Protection	1	Allow critical facilities to operate during power outages
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	
Fiscal	0	
Environmental	0	
Social	-1	
Administrative	1	
Multi-Hazard	1	All hazards
Timeline	1	
Agency Champion	0	
Other Community Objectives	0	
Total	8	
Priority (High/Med/Low)	High	



9.13 Town of Thurman

This section presents the jurisdictional annex for the Town of Thurman.

9.13.1 Hazard Mitigation Plan Point of Contact

The following individuals have been identified as the hazard mitigation plan's (HMP) primary and alternate points of contact.

Primary Point of Contact	Alternate Point of Contact
Evelyn Wood, Town Supervisor P.O. Box 29, 311 Athol Road Athol, New York 12810 (518) 623-9649 thurmansupervisor@verizon.net	Pat Wood, Highway Superintendent P.O. Box 29, 311 Athol Road Athol, New York 12810 (518) 623-9614 highwaydept@yahoo.com

9.13.1 Municipal Profile

The Town of Thurman is in the western portion of Warren County. The Town is bordered on the east by the Hudson River and on the west by Hamilton County. It has a total land area of 92.8 square miles of which 91.3 square miles is land and 1.5 square miles is water. The Town of Thurman includes the hamlets of Thurman (location of Town Hall) and Chestertown. Garnet Lake is located within the Town. According to the 2010 Census, the community's population was 1,219.

The Town of Thurman is served by the Warrensburg School District. Residents are on private well and septic systems. Electricity is provided exclusively overhead by National Grid.

Growth/Development Trends

The Town of Thurman did not note any recent residential/commercial development since 2010 or any major residential or commercial development, or major infrastructure development planned for the next five years in the municipality.

9.13.2 Natural Hazard Event History Specific to the Municipality

Warren County has a history of natural and non-natural hazard events as detailed in Volume I, Section 5.0 of this Plan. A summary of historical events appears in each hazard profile, and includes a chronology of events that have affected the County and its municipalities. For the purpose of this Plan update, events that have occurred in the County from 2010 to present were summarized to indicate the range and impact of hazard events in the community. Information regarding specific damages is included, if available, based on reference material or local sources. This information is presented in Table 9.13-1 below. For details of these and additional events, refer to Volume I, Section 5.0 of this Plan.

Table 9.13-1. Hazard Event History

Dates of Event	Event Type (FEMA Disaster Declaration if applicable)	Warren County Designated?	Summary of Damages/Losses
March 23, 2010	Severe Storms and Flooding (DR-1899)	Yes	Flooding from a severe rain storm caused damage to many roads.
April 27-28, 2011	Severe Storms, Flooding,	Yes	Flooding occurred along the Hudson River in Thurman from the Glen to Stony Creek border. Roads were closed and damaged.



Dates of Event	Event Type (FEMA Disaster Declaration if applicable)	Warren County Designated?	Summary of Damages/Losses
	Tornadoes and Straight-Line Winds (DR-1993)		
May 27 – June 2, 2011	Flooding “Memorial Day Storm”	N/A	Flooding occurred in the County and there was severe damage along a thin line through the County (Stony Creek, Thurman, Warrensburg, Horicon and Bolton) that resulted in \$13.125 million in damages. The Town of Thurman experienced extensive flood damage to transportation infrastructure throughout Town, including Combs Road Bridge which was washed out. A private dam on Cameron Road (County Route 418) / Cameron Dam/No. 9 Brook failed, destroying a flash board and damaging a dry hydrant.
May 29, 2012	Hail and Wind	N/A	Debris removal occurred. Some homes & cars were damaged.
October 29, 2012	Hurricane Sandy (EM-3351)	Yes	Heavy rain and high winds caused damages and power outages.
April 14, 2014	Flooding	N/A	Flooding on some roads.
May 13-22, 2014	Flooding	N/A	One culvert washed out as a result of this flooding event.
July 8, 2014	Thunderstorms and Tornado (F0) (DR-4180)	No	High winds, heavy winds and thunderstorms throughout the town knocked limbs and trees down.

Notes:

- EM Emergency Declaration (FEMA)
- FEMA Federal Emergency Management Agency
- DR Major Disaster Declaration (FEMA)
- N/A Not applicable

9.13.3 Hazard Vulnerabilities and Ranking

The hazard profiles in Section 5.0 of this Plan convey detailed information regarding each plan participant’s vulnerability to the identified hazards. The following summarizes the hazard vulnerabilities and their ranking in the Town of Thurman. For additional vulnerability information relevant to this jurisdiction, refer to Section 5.0.

Hazard Risk/Vulnerability Risk Ranking

Table 9.13-2 below summarizes hazard risk/vulnerability rankings of potential hazards for the Town of Thurman.

Table 9.13-2. Hazard Risk/Vulnerability Risk Ranking

Hazard type	Estimate of Potential Dollar Losses to Structures Vulnerable to the Hazard ^{a, b}	Probability of Occurrence	Risk Ranking Score (Probability x Impact)	Hazard Ranking ^a
Earthquake	100-year MRP: \$68,745.00 500-year MRP: \$1,319,145 2,500-Year MRP: \$10,933,884.00	Occasional	16	Medium
Flood	RCV Exposed to 1% Annual Chance: \$945,932	Frequent	27	Medium
Landslide	Damage estimate not available	Frequent	27	Medium
Infestation	Damage estimate not available	Frequent	24	Medium



Hazard type	Estimate of Potential Dollar Losses to Structures Vulnerable to the Hazard ^{a, b}	Probability of Occurrence	Risk Ranking Score (Probability x Impact)	Hazard Ranking ^a
Severe Storm	RCV Exposed to 1938 storm-winds: \$33,193	Frequent	48	High
Severe Winter Storm	GBS 1% Loss: \$1,872,980 GBS 5% Loss: \$9,364,900	Frequent	51	High
Wildfire	RCV Exposed to Intermix: \$82,078,000 RCV Exposed to Interface: \$525,000	Frequent	42	High
Cyber Security	Damage estimate not available	Occasional	12	Low
Disease Outbreak	Damage estimate not available	Frequent	27	Medium
Hazardous Material Incidents	Damage estimate not available	Frequent	24	Medium

Notes:

- a. The general building stock valuation is based on the custom inventory generated for the municipality and based on improved value.
High = Total hazard priority risk ranking score of 31 and above
Medium = Total hazard priority risk ranking of 20-30+
Low = Total hazard risk ranking below 20
- b. Loss estimates for the severe storm and severe winter storm hazards are structural values only and do not include the estimated value of contents. The earthquake was evaluated by Census tract. The Census tracts do not exactly align with municipal boundaries; therefore, a total is reported for each Town inclusive of the Villages. Loss estimates for the flood and earthquake hazards represent both structure and contents. Potential flood loss estimates were generated using Hazus-MH 2.2 and digitized FIRM maps from the 1980s and 1990s for the 1-percent annual chance event; NED DEM was used to generate a depth grid. The County's 2015 Real Property data was used to generate the values for flood and includes structure and contents. For the wildfire hazard, the improved value and estimated contents of buildings located within the identified hazard zones is provided.

GBS General building stock
MRP Mean return period
RCV Replacement Cost Value

National Flood Insurance Program (NFIP) Summary

Table 9.13-3 summarizes NFIP statistics for the Town of Thurman.

Table 9.13-3. NFIP Summary

Municipality	# Policies (1)	# Claims (Losses) (1)	Total Loss Payments (2)	# Rep. Loss Prop. (1)	# Severe Rep. Loss Prop. (1)	# Policies in 100-year Boundary (3)
Town of Thurman	2	4	\$85,530	0	0	2

Source: FEMA, 2014

Notes:

- (1) Policies, claims, repetitive loss, and severe repetitive loss statistics are provided by FEMA, are current as of November 30, 2015, and are summarized by community name. Total number of repetitive loss properties includes severe repetitive loss properties. Number of claims represents claims closed by November 30, 2015.
- (2) Total building and content losses from the claims file provided by FEMA Region 2.
- (3) Number of policies inside and outside of flood zones is based on latitude and longitude provided by FEMA Region 2 in the policy file.
- (4) FEMA noted that for a property with more than one entry, more than one policy may have been in force or more than one Geographic Information System (GIS) specification was possible.

Critical Facilities

Table 9.13-4 below identifies critical facilities within the municipality located on parcels that intersect the current regulatory NFIP 1% chance flood boundary (aka: “Special Flood Hazard Area” (SFHA)), however it is recognized that the actual facility structure(s) may lie outside of the SFHA. Please refer to the Flood Hazard Profile (Section 5.4.2) for further details of estimated flood losses throughout the County, as well as the “Other Vulnerabilities Identified” section following.





Table 9.13-4. Potential Flood Losses to Critical Facilities

Municipality	Facility Types in 1% Chance Flood Boundary						
	Boat Facilities	Dam	Electric	Government	Highway Bridge	Rail Facility	Wastewater
Town of Thurman	0	1	0	0	2	0	0

Source: Warren County Real Property 2015 tax roll; HAZUS-MH 2.2; FEMA 2015

Notes:

- (1) HAZUS-MH 2.2 provides a general indication of the maximum restoration time for 100% operations. Clearly, a great deal of effort is needed to quickly restore essential facilities to full functionality; therefore, this will be an indication of the maximum downtime (HAZUS-MH 2.2 User Manual).
- (2) Some facilities may be within the Digital Flood Insurance Rate Map (DFIRM) flood hazard boundary; however, HAZUS did not calculate potential loss, perhaps because depth of flooding would not cause any damages to these structures according to the depth damage function used in HAZUS for that facility type. Further, HAZUS-MH may estimate potential damage to a facility outside the DFIRM if the model generates a depth grid beyond DFIRM boundaries.

Other Vulnerabilities Identified

The Town of Thurman generally considers itself to have a low structural flood risk, though some issues persist. The municipality has identified the following vulnerabilities within their community:

- Drainage Issues / Flooding
 - Wolf Pond Road has drainage/flooding issues that can be addressed with the installation of a bottomless culvert.
 - Dippikill Road near Parker Cross Road (Patterson Brook) – This segment of roadway washed out in May 2011 “Memorial Day Storm”. Needs bridge replacement/bottomless culvert.
 - Combs Road Bridge – Washed out in May 2011 “Memorial Day Storm”. Needs bridge replacement/bottomless culvert.
 - Athol Road near Cameron Road: Flood/severe storms/ice jams. Town Hall has a history of basement flooding during heavy precipitation events, snowmelt events. The basement of the Town Hall houses the Food Pantry along with all Town Records. Records should be scanned and maintained electronically to reduce risk of losing records during a flood. The Town Court is also located in Town Hall. Furthermore, the Town Hall acts as an emergency shelter if necessary, even though it is not officially designated as an emergency shelter. The building has a full kitchen, but no shower facilities.
 - Town Hall has a history of basement flooding during heavy precipitation events, snowmelt events. The basement of the Town Hall houses the Food Pantry along with all Town Records.
- Ice Jams and Beaver Dams
 - River Road at Huber Road: Flood/ice jams. This area of roadway has some low sections that are vulnerable to flooding, icing and ice-jamming. There have been numerous instances of significant ice jams, some of which led to road closures in the spring of 2014.



- Barton Road near Mountain Road – Flood/severe storms/ice jams. Road washout from mountain stream in May 2011 event.
- Barton Road near Don Potter Road: Flood/severe storms/ice jams/beaver dams. Water on road from beaver dams during high precipitation events impacts road. Impacted during May 2011 event.
- Erosion
 - Combs Road – Failure here in 2013 led to the currently ongoing NYSDOT slope stabilization project.
 - Bowen Hill Road at George’s Knoll: Flood/severe storms/ice jams. Ditch erosion and sedimentation, road base and surface impacted (May 2011). Culvert improvements have been completed here. The town has placed a number of small (12-18” diameter) road culverts under Bowen Hill Road to reduce water volume at any given outlet. Project performed, but may need additional work to fully address.
 - Garnet Lake Road/Little Pond at Henry Wescott Road: Flood/severe storms/ice jams. Ditch erosion and sedimentation, road base and surface impacted (May 2011). Culvert improvements have been completed here, but additional work may be needed to fully address the issue.
 - Ski Hi Road at Clarence Russell Road: Flood/severe storms/ice jams. Road erosion and ditch sedimentation, flooding and debris on road (May 2011).
- Cameron Road (County Route 418) / Cameron Dam/No. 9 Brook: Dam Failure. A private dam was impacted from severe storms – flash board destroyed, dry hydrant damaged (May 2011). Flashboards replaced and dry hydrant repaired. Project performed, but may need additional work to fully address.
- Passenger (tourist) railway along County Route 418/River Road (entire length): Concerns about wildfires from train tracks in remote locations. Also concerns about passengers in remote locations if an accident were to occur.
- Utility failure at Bear Pond Road near Mountain Road and in several other areas of town: Verizon-serviced telephone lines do not function during rainfall and snow events.

9.13.4 Capability Assessment

This section identifies the following capabilities of the local jurisdiction:

- Planning and regulatory capability
- Administrative and technical capability
- Fiscal capability
- Community classification
- NFIP
- Integration of mitigation planning into existing and future planning mechanisms.

Planning and Regulatory Capability

Table 9.13-5 below summarizes regulatory tools available to the Town of Thurman.



Table 9.13-5. Planning and Regulatory Tools

Tool / Program (code, ordinance, plan)	Do you have this? (Yes/No) If Yes, date of adoption or update	Authority (local, county, state, federal)	Dept. /Agency Responsible	Code Citation and Comments (Code Chapter, name of plan, explanation of authority, etc.)
Planning Capability				
Master Plan	No	-	-	-
Capital Improvements Plan	No	-	-	-
Floodplain Management / Basin Plan	No	-	-	-
Stormwater Management Plan	No	-	-	-
Open Space Plan	No	-	-	-
Stream Corridor Management Plan	No	-	-	-
Watershed Management or Protection Plan	No	-	-	-
Economic Development Plan	No	-	-	-
Comprehensive Emergency Management Plan	Yes	Local	-	Emergency Action Plan - updated annually.
Emergency Response Plan	Yes	Local	-	Emergency Action Plan - updated annually.
Post-Disaster Recovery Plan	No	-	-	-
Transportation Plan	No	-	-	-
Strategic Recovery Planning Report	No	-	-	-
Other Plans:	No	-	-	-
Regulatory Capability				
Building Code	Yes	County	Warren County Buildings & Codes	NYS Building Code
Zoning Ordinance	Yes	Local	-	Through APA and local zoning
Subdivision Ordinance	Yes	Local	-	Local Law
NFIP Flood Damage Prevention Ordinance	Yes	Federal, State, Local	Town Board	
NFIP: Cumulative Substantial Damages	No	-	-	-
NFIP: Freeboard	Yes	State, Local	-	State mandated BFE+2 for single and two-family residential construction, BFE+1 for all other construction types
Growth Management Ordinances	No	-	-	-
Site Plan Review Requirements	Yes	County	Warren County Buildings & Codes	
Stormwater Management Ordinance	No	-	-	-
Municipal Separate Storm Sewer System (MS4)	No	-	-	-



Tool / Program (code, ordinance, plan)	Do you have this? (Yes/No) If Yes, date of adoption or update	Authority (local, county, state, federal)	Dept. /Agency Responsible	Code Citation and Comments (Code Chapter, name of plan, explanation of authority, etc.)
Natural Hazard Ordinance	No	-	-	-
Post-Disaster Recovery Ordinance	No	-	-	-
Real Estate Disclosure Requirement	Yes	State	-	New York State (NYS) mandate, Property Condition Disclosure Act, <i>NY Code</i> – Article 14 §460-467
Other (Special Purpose Ordinances [i.e., sensitive areas, steep slope])	No	-	-	-

Administrative and Technical Capability

Table 9.13-6 below summarizes potential staff and personnel resources available to the Town of Thurman.

Table 9.13-6. Administrative and Technical Capabilities

Resources	Is this in place? (Yes or No)	Department/ Agency/Position
Administrative Capability		
Planning Board	No	-
Mitigation Planning Committee	No	-
Environmental Board/Commission	No	-
Open Space Board/Committee	No	-
Economic Development Commission/Committee	No	-
Maintenance programs to reduce risk	No	-
Mutual aid agreements	Yes	Shared services agreement with the Town of Stony Creek.
Technical/Staffing Capability		
Planner(s) or engineer(s) with knowledge of land development and land management practices	Yes	Contractor
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Yes	Contractor
Planners or engineers with an understanding of natural hazards	Yes	Contractor
NFIP Floodplain Administrator (FPA)	Yes	Town Board
Surveyor(s)	No	-
Personnel skilled or trained in GIS and/or Hazards United States (HAZUS) – Multi-Hazards (MH) applications	Yes	County Staff
Scientist familiar with natural hazards	No	-
Emergency Manager	Yes	Warren County
Grant writer(s)	No	-
Staff with expertise or training in benefit/cost analysis	No	-
Professionals trained in conducting damage assessments	No	-



Fiscal Capability

Table 9.13-7 below summarizes financial resources available to the Town of Thurman.

Table 9.13-7. Fiscal Capabilities

Financial Resources	Accessible or Eligible to Use (Yes/No)
Community Development Block Grants (CDBG, CDBG-DR)	Yes
Capital improvements project funding	No
Authority to Levy Taxes for specific purposes	Yes
User fees for water, sewer, gas or electric service	No
Impact fees for homebuyers or developers of new development/homes	No
Stormwater utility fee	No
Incur debt through general obligation bonds	Yes
Incur debt through special tax bonds	No
Incur debt through private activity bonds	No
Withhold public expenditures in hazard-prone areas	Yes
Other federal or state funding programs	Yes
Open Space Acquisition funding programs	Yes
Other	No

Community Classifications

Table 9.13-8 below summarizes classifications for community program available to the Town of Thurman.

Table 9.13-8. Community Classifications

Program	Do you have this? (Yes/No)	Classification (if applicable)	Date Classified (if applicable)
Community Rating System (CRS)	NP	N/A	N/A
Building Code Effectiveness Grading Schedule (BCEGS)	No	-	-
Public Protection (ISO Fire Protection Classes 1 to 10)	No	-	-
Storm Ready	No	N/A	N/A
Firewise	No	N/A	N/A
Disaster/safety programs in/for schools	NP	-	-
Organizations with mitigation focus (advocacy group, non-government)	No	-	-
Public education program/outreach (through website, social media)	No	-	-
Public-Private Partnerships	No	-	-

Note:

- N/A Not applicable
- NP Not participating
- Unavailable

The classifications listed above relate to the community’s ability to provide effective services to lessen its vulnerability to the hazards identified. These classifications can be viewed as a gauge of the community’s capabilities in all phases of emergency management (preparedness, response, recovery and mitigation) and are





used as an underwriting parameter for determining the costs of various forms of insurance. The Community Rating System (CRS) class applies to flood insurance, while the Building Code Effectiveness Grading Schedule (BCEGS) and Public Protection classifications apply to standard property insurance. CRS classifications range on a scale of 1 to 10, with class 1 being the best possible classification, and class 10 representing no classification benefit. Firewise classification is higher if the subject property is more than 1000 feet from a creditable fire hydrant and is within 5 road miles of a recognized Fire Station.

Criteria for classification credits are outlined in the following documents:

- The Community Rating System Coordinators Manual
- The Building Code Effectiveness Grading Schedule
- The ISO Mitigation online ISO’s Public Protection website at <https://www.isomitigation.com/program-works/how-the-ppc-program-works.html>
- The National Weather Service Storm Ready website at <http://www.stormready.noaa.gov/index.html>
- The National Firewise Communities website at <http://firewise.org/>

Self-Assessment of Capability

Table 9.13-9 below provides an approximate measure of the Town of Thurman’s capability to work in a hazard-mitigation capacity and/or effectively implement hazard mitigation strategies to reduce hazard vulnerabilities.

Table 9.13-9. Self-Assessment Capability for the Municipality

Area	Degree of Hazard Mitigation Capability		
	Limited (If limited, what are your obstacles?)*	Moderate	High
Planning and Regulatory Capability		X	
Administrative and Technical Capability		X	
Fiscal Capability	X – tax levy cap & tax freeze		
Community Political Capability		X	
Community Resiliency Capability			X
Capability to Integrate Mitigation into Municipal Processes and Activities.		X	

National Flood Insurance Program

NFIP Floodplain Administrator (FPA)

Town Board

Flood Vulnerability Summary

As of November 30, 2015, 2 policies were in force in the Town of Thurman, two of which were within the 100-year flood boundary. Since 1978, 4 claims have been paid within the Town, totaling \$85,530. There are no repetitive loss property and no severe repetitive loss properties in the Town of Thurman. According to current NFIP statistics at the time of this Plan, NFIP policies in the Town of Thurman insured \$665,000 of property with total annual insurance premiums of \$ 1,013.



Compliance History

The community is in good standing with FEMA and the NFIP, however is not aware of the history of Community Assistance Visits.

The Town intends to continue active participation in the NFIP, and maintain compliance with all requirements of participation. Further, the Town has identified several actions to support both continued and improved participation in the NFIP as identified in Table 9.13-13.

Regulatory

The Town of Thurman's floodplain management regulations meet at least the the minimum standards. The Town does not currently participate in the Community Rating System, and realizes that is has a very low policy base to support such a program.

Integration of Hazard Mitigation into Existing and Future Planning Mechanisms

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, each community was surveyed to obtain a better understanding of their community's progress in plan integration. A summary is provided below. In addition, the community identified specific integration activities that will be incorporated into municipal procedures.

Planning

Emergency Action Plan: The Town has and Emergency Action Plan with is updated annually.

Zoning: The Town of Thurman Zoning map was prepared in April 2008 by the Warren County Planning Department.

Debris Management: The Town of Thurman routinely addresses branches and dangerous trees that are not otherwise addressed by the utility company. The Town will coordinate with the County in the development of a county-wide debris management plan (integration action).

Regulatory and Enforcement (Ordinances)

Building Code and Permits: Warren County supports the Town with building code enforcement. The Town of Thurman issues burning permits to control wildfire risk.

Operational and Administration

The Town has a shared services agreement with the Town of Stony Creek.

Funding

The Town adopts an annual budget with line items for highway fund expenses, including capital outlay for bridges and other improvements, snow removal, brush and weeds cleanup, and general repairs; personnel services; contractual economic development, engineering, building, ambulance, and fire services; refuse and garbage services;

The Tentative Budget for 2016 remains below the tax levy cap and tax freeze compliant. Dependency on fund balance to reduce appropriations has been reduced again this year in the general fund. As the levy cap continues to tighten preservation of the fund balance will become more important for future years. If the tax levy cap remains as low as it has been this year it will have significant impacts on future years' budgets.



Education and Outreach

The Town maintains a website that provides residents with preparedness information, and provides residents with information listing steps taken to lessen potential flood damage to reduce the impact of flooding.

Warren County has a special needs registry to check in on elderly, functional needs, and low- income individuals during major events.

9.13.5 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and prioritization.

Past Mitigation Initiative Status

Table 9.13-10 below indicates progress on the community’s mitigation strategy identified in the 2011 Plan. Previous actions that are now ongoing programs and capabilities are indicated as such in Table 9.13-10, and also appear under “Capability Assessment” presented previously in this annex. Actions carried forward as part of this plan update are included in the following subsection (in Table 9.13-11) with prioritization.

Table 9.13-10. Past Mitigation Initiative Status

Description	Status	Review Comments
<p>Elevate or reroute roadways and bridges to avoid flooding. Specific locations include:</p> <ul style="list-style-type: none"> - River Road, Ski Hi Road, West Stony Creek Road (Town of Thurman) <p>River Road has a low point (leads to flooding, icing and ice-jamming in winter) - This section needs to be about 4’ higher than present (see picture)</p>	<p>Ski Hi Road – Complete; installed a bottomless culvert</p> <p>West Stony Creek Road – Complete for now; installed a bottomless culvert</p>	<p>Continue action for River Road.</p>
<p>Replace the Harrington Road Bridge over Mill Creek in the Town of Thurman. Note: This is in the Town of Johnsbury.</p>	<p>Complete</p>	<p>Discontinue - This is the Town of Johnsbury.</p>
<p>Educate residents regarding steps to be taken to decrease the impact of natural hazards (including ice storms, wild/forest fires, severe storms, tornado, earth-quakes, and all other natural hazards) by developing, enhancing, and implementing education programs, brochures, school presentations informing groups about ways to reduce risk, and other outreach activities.</p>	<p>Ongoing/Continuous</p>	<p>Continue</p>
<p>Monitor and remove trees/limbs in storm areas that present potential hazards to keep trees from threatening lives, property, and public infrastructure during storm events.</p>	<p>Ongoing / Continuous</p>	<p>The Town routinely addresses branches and dangerous trees that are not otherwise addressed by the utility company. This action shall be removed from the updated strategy.</p>
<p>Obtain funding to purchase generators for municipally-owned critical facilities.</p>	<p>Complete.</p>	<p>This action shall be removed from the updated strategy.</p>



Table 9.13-10. Past Mitigation Initiative Status

Description	Status	Review Comments
Coordinate/create mutual aid agreements between emergency services, public works departments, and public utilities to ensure efficient use of resources during and after storm events.	Complete / Ongoing	The Town has a shared services agreement with the Town of Stony Creek. The County provides building code enforcement to the Town. This action shall be removed from the updated strategy, and included as an ongoing capability.
Develop plans for debris management after hazard events, including severe winter snow/ice events, and other severe storms.	In progress.	This action is being carried forward in the updated strategy, indicating that the Town will coordinate with the County in the development of a county-wide debris management plan (integration action).
Design a network of citizens that will check in on elderly, functional needs, and low- income individuals during major events.	Complete / Ongoing	This is done through the countywide special needs registry. This action shall be removed from the updated strategy, and included as an ongoing capability.
Send a town representative to the NYS Wildland Fire Suppression Training.	Discontinue.	Appropriate personnel throughout the County are provided this specialized training. This action shall be removed from the updated strategy, and included as an ongoing capability.
Provide training for local code enforcement officials to implement building codes that reflect disaster resistant construction for new structures and renovation.	Discontinue.	This is a County-level initiative, and shall be removed from the updated strategy.
Provide residents with information listing steps taken to lessen potential flood damage to reduce the impact of flooding.	Ongoing / Continuous	This action shall be removed from the updated strategy, and included as an ongoing capability.
Educate the community on benefits of carrying NFIP policies and increase knowledge of NFIP services.	Ongoing/Continuous	This action shall be removed from the updated strategy, and included as an ongoing capability.
Review and update local plans to integrate goals, objectives, and activities from this HMP which are not found in existing regulatory documents, as appropriate.	Ongoing/Periodic	Continue
Maintain a current inventory of at-risk buildings and infrastructure and continually update inventory of at-risk structures in each jurisdiction.	Ongoing/Continuous	This action shall be removed from the updated strategy, and included as an ongoing capability.
Apply for grants to assist with mitigation activities needed to provide a level of protection for critical facilities.	Ongoing	Continue - Have had unsuccessful applications to FEMA
Provide continuing education and training for local Floodplain Administrator to ensure code enforcement and proper inspections.	Ongoing	This action shall be removed from the updated strategy, and included as an ongoing capability.
Implement zoning regulations to discourage building new structures in disaster prone areas – if such regulations are not already written	Ongoing/Incomplete	Continue



Table 9.13-10. Past Mitigation Initiative Status

Description	Status	Review Comments
into Town Zoning code or Floodplain Ordinance.		



Completed Mitigation Initiatives not Identified in the Previous Mitigation Strategy

The Town of Thurman has identified the following mitigation projects/activities that have also been completed but were not identified in the previous mitigation strategy in the 2011 Plan:

- Warren County DPW replaced the Combs Road Bridge, which washed out in May 2011, to act as a bypass for a project on South Johnsbury Road (County Road). This will be a permanent bridge.
- River Road Bridge/Culvert – Replaced: A 22’ bottomless culvert was installed at River Road at Huber Road, a low-lying segment of roadway that has historically been vulnerable to flooding, icing and ice-jamming from Patterson Brook. Since the new culvert has been installed, there has not been any issues with Patterson Brook and flooding in this area.
- Ski Hi Bridge/Culvert – Replaced: A 12-14’ bottomless arch was installed at Ski Hi Road at Clarence Russell Road, where road erosion and ditch sedimentation had been frequent occurrences. There have been no issues at this location since the project was completed.
- The town has placed a number of small (12-18” diameter) road culverts under Bowen Hill Road to reduce water volume at any given outlet.
- Town Hall Flood Mitigation: Utilities in the basement of the Town Hall have been elevated, minimizing the risk of damage from future flooding. SWCD supported the Town with a PDM application for stormwater drainage improvements (diversions, catch basin), but those approaches were not cost-effective. Stormwater and drainage issues on this property also lead to icing on the road.
- Flash board and dry hydrant damaged during the Cameron Road (County Route 418) / Cameron Dam/No. 9 Brook Dam Failure in May 2011 were replaced and repaired, respectively.

Proposed Hazard Mitigation Initiatives for the Plan Update

The Town of Thurman participated in a mitigation action workshop in September and was provided the following Federal Emergency Management Agency (FEMA) publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 ‘Selecting Appropriate Mitigation Measures for Floodprone Structures’ (March 2007) and FEMA ‘Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards’ (January 2013).

Table 9.13-11 summarizes the comprehensive-range of specific mitigation initiatives the Town of Thurman would like to pursue in the future to reduce the effects of hazards. Some of these initiatives may be previous actions carried forward for this plan update. Implementation of these initiatives will depend on available funding (grants and local match availability), and some initiatives may be modified or omitted at any time based on occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in Table 9.13-11 to further demonstrate the wide range of activities and mitigation measures selected.

As discussed in Section 6, 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing your actions as ‘High’, ‘Medium’, or ‘Low.’ The table below summarizes the evaluation of each mitigation initiative, listed by Action Number.

Table 9.13-12 summarizes prioritization of all proposed mitigation initiatives for the Plan update.



Table 9.13-11. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category	CRS Category
TTH-1 (carryover)	Address drainage and flooding issues throughout the town by installing bottomless culverts or other drainage improvements at locations including: <ul style="list-style-type: none"> • Wolf Pond Road • Dippikill Road near Parker Cross Road (Patterson Brook) • River Road at Huber Road • Athol Road near Cameron Road 	N/A	Drainage/flooding	1, 3	Town Board, Highway Department	High	High	Town Budget, as supported by available grants (e.g. NYS)	Long Term - DOF	High	SIP	PP
TTH-2	Address drainage and flooding issues throughout the town by improving upon existing stormwater control measures at the following locations: <ul style="list-style-type: none"> • Bowen Hill Road at George's Knoll • Garnet Lake Road/Little Pond at Henry Wescott Road 	N/A	Drainage/flooding	1, 3	Town Board, Highway Department	High	Medium	Town Budget, as supported by available grants (e.g. NYS)	Long Term - DOF	Medium	SIP	PP
TTH-3 (carryover)	The Town of Thurman will coordinate with the County in the development of a county-wide debris management plan.	N/A	All hazards	3	Town Board, Highway Department	Medium	Low	Existing Budget	Short Term	High	LPR	PR
TTH-4	Stormwater and Flood Mitigation at Athol Road – The mitigation recommendation for this site is the installation of new culverts at two locations. The first site would collect runoff and convey it to the established drainage way on the Town property. That would eliminate flooding issues for one of the Town buildings, the public access points and the private residence. The second portion of this project would be to upsize the existing culvert that currently drains the property and conveys it to Athol Road.	Both	Flooding	1, 3	Town Board, Highway Department	High	Medium	Town Budget, as supported by available grants (e.g. NYS DOT)	Short, DOF	Medium	SIP	PP





Table 9.13-11. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category	CRS Category
TTH-5	Digitize Town Hall Records - Town Hall has a history of basement flooding. Records should be scanned and maintained electronically to reduce risk of losing records during a flood.	Existing	Flood	1, 3	Town Board, Town Clerk	High	Medium	Unknown	Short Term	High	LPR	PR
TTH-6	Educate residents regarding steps to be taken to decrease the impact of natural hazards (including ice storms, wild/forest fires, severe storms, tornado, earth-quakes, and all other natural hazards) by developing, enhancing, and implementing education programs, brochures, school presentations informing groups about ways to reduce risk, and other outreach activities.	N/A	All hazards	2	Town Board, Town Clerk, Thurman Fire Company	Low	Low	Existing Budget	Short Term	High	EAP	PI
TTH-7 (carryover)	Review and update local plans to integrate goals, objectives, and activities from this HMP which are not found in existing regulatory documents, as appropriate.	N/A	All hazards	1	Town Board	Low	Low	Existing Budget	Short Term	High	LPR	PR
TTH-8	Support the mitigation of vulnerable structures via retrofit (e.g. elevation, flood-proofing) or acquisition/relocation to protect structures from future damage, with critical facilities and repetitive loss properties as a priority when applicable. Town support shall include direct outreach to flood-prone property owners, specifically critical facility owners/operators and those identified by FEMA as RL/SRL or otherwise identified as flood-prone, and working with interested and voluntary property owners to mitigate their properties based on available funding from FEMA and local (property owner) match availability.											
	Efforts to mitigate critical facilities shall recognize Federal and State directives for protection to the 500-year flood level or “worst case scenario”.											
	See above.	Existing	All hazards	1, 3	Town Board	Medium	Low	Existing Budget	OG	High	LPR	PR
TTH-9 (carryover)	Implement zoning regulations to discourage building new structures in disaster prone areas.	Both	All hazards	1	Town Board	Medium	Medium	Existing Budget	Short Term	High	LPR	PR





Notes:

Not all acronyms and abbreviations defined below are included in the table.

*Does this mitigation initiative reduce effects of hazards on new and/or existing buildings and/or infrastructure? Not applicable (N/A) is inserted if this does not apply.

Acronyms and Abbreviations:

CAV	Community Assistance Visit
CDBG	Community Development Block Grant
GCRS	Community Rating System
DPW	Department of Public Works
FEMA	Federal Emergency Management Agency
FPA	Floodplain Administrator
HMA	Hazard Mitigation Assistance
N/A	Not applicable
NFIP	National Flood Insurance Program
OEM	Office of Emergency Management

Potential FEMA HMA Funding Sources:

FMA	Flood Mitigation Assistance Grant Program
HMGP	Hazard Mitigation Grant Program
PDM	Pre-Disaster Mitigation Grant Program
RFC	Repetitive Flood Claims Grant Program (discontinued)
SRL	Severe Repetitive Loss Grant Program (discontinued)

Timeline:

Short	1 to 5 years
Long Term	5 years or greater
OG	On-going program
DOF	Depending on funding

Costs:

Where actual project costs have been reasonably estimated:

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

Where actual project costs cannot reasonably be established at this time:

Low	Possible to fund under existing budget. Project is part of, or can be part of, an existing ongoing program.
Medium	Could budget for under existing work plan, but would require a reapportionment of the budget or a budget amendment, or cost of the project would have to be spread over multiple years.
High	Would require an increase in revenue via an alternative source (i.e., bonds, grants, fee increases) to implement. Existing funding levels are not adequate to cover costs of the proposed project.

Benefits:

Where possible, an estimate of project benefits (per FEMA's benefit calculation methodology) has been evaluated against the project costs, and is presented as:

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

Where numerical project benefits cannot reasonably be established at this time:

Low	Long-term benefits of the project are difficult to quantify in the short term.
Medium	Project will have a long-term impact on reduction of risk exposure to life and property, or project will provide an immediate reduction in risk exposure to property.
High	Project will have an immediate impact on reduction of risk exposure to life and property.

Mitigation Category:

- Local Plans and Regulations (LPR) – Actions that include government authorities, policies, or codes that influence the way land and buildings are developed and built.
- Structure and Infrastructure Project (SIP) – Actions that involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures, as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce impacts of hazards.
- Natural Systems Protection (NSP) – Actions that minimize damage and losses, and also preserve or restore the functions of natural systems.
- Education and Awareness Programs (EAP) – Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities

CRS Category:





- *Preventative Measures (PR) – Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and stormwater management regulations.*
- *Property Protection (PP) – Actions include public activities to reduce hazard losses or 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.*
- *Public Information (PI) – 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 educational programs for school-age children and adults.*
- *Natural Resource Protection (NR) – 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.*
- *Structural Flood Control Projects (SP) – Actions that involve construction of structures to reduce impacts of a hazard. Such structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) – Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and protection of essential facilities*



Table 9.13-12. Summary of Prioritization of Actions

Mitigation Action/Project Number	Mitigation Action/Initiative	Life Safety	Property Damage	Cost-Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency/Commission	Other Community	Total	High / Medium / Low
TTH-1	Address drainage and flooding issues throughout the town by installing bottomless culverts or other drainage improvements at locations including: <ul style="list-style-type: none"> • Wolf Pond Road • Dippikill Road near Parker Cross Road (Patterson Brook) • River Road at Huber Road • Athol Road near Cameron Road 	0	1	1	1	0	0	1	1	1	1	0	0	1	1	9	High
TTH-2	Address drainage and flooding issues throughout the town by improving upon existing stormwater control measures at the following locations: <ul style="list-style-type: none"> • Bowen Hill Road at George's Knoll • Garnet Lake Road/Little Pond at Henry Wescott Road 	0	1	1	1	0	0	1	1	1	0	0	0	0	1	7	Medium
TTH-3	The Town of Thurman will coordinate with the County in the development of a county-wide debris management plan.	1	1	1	1	1	0	0	1	0	1	1	1	0	0	9	High
TTH-4	Stormwater and Flood Mitigation at Athol Road – The mitigation recommendation for this site is the installation of new culverts at two locations. The first site would collect runoff and convey it to the established drainage way on the Town property. That would eliminate flooding issues for one of the Town buildings, the public access points and the private residence. The second portion of this project would be to upsize the existing culvert that currently drains the property and conveys it to Athol Road.	0	1	1	1	0	0	0	-1	0	0	1	1	1	0	5	Medium
TTH-5	Digitize Town Hall Records - Town Hall has a history of basement flooding. Records should be scanned and maintained electronically to reduce risk of losing records during a flood.	0	1	1	1	1	1	1	1	0	1	1	1	1	1	12	High
TTH-6	Educate residents regarding steps to be taken to decrease the impact of natural hazards (including ice storms, wild/forest fires, severe storms,	1	1	1	1	1	1	0	0	1	1	1	1	0	1	11	High





Table 9.13-12. Summary of Prioritization of Actions

Mitigation Action/Project Number	Mitigation Action/Initiative	Life Safety	Property Damage	Cost-Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency/Commission	Other Community	Total	High / Medium / Low
	tornado, earth-quakes, and all other natural hazards) by developing, enhancing, and implementing education programs, brochures, school presentations informing groups about ways to reduce risk, and other outreach activities.																
TTH-7	Review and update local plans to integrate goals, objectives, and activities from this HMP which are not found in existing regulatory documents, as appropriate.	1	1	1	1	0	1	0	1	0	1	1	1	0	0	9	High
TTH-8	Support the mitigation of vulnerable critical facilities, and private and public property.	1	1	1	1	1	1	1	0	0	1	1	1	1	1	12	High
TTH-9	Implement zoning regulations to discourage building new structures in disaster prone areas.	1	1	0	1	1	1	0	1	0	1	1	1	0	1	10	High

Note: Refer to Section 6, which conveys guidance on prioritizing mitigation actions.



9.13.6 Future Needs To Better Understand Risk/Vulnerability

None at this time.

9.13.7 Hazard Area Extent and Location

Hazard area extent and location maps have been generated for the Town of Thurman that illustrate the areas probable to be impacted within the municipality (see Figure 9.13-1 and Figure 9.13-2 below). These maps are based on the best available data at the time of the preparation of this Plan, and are considered to be adequate for planning purposes. Maps have been generated for those hazards (i.e., landslide, wildfire and flooding) that can be clearly identified using mapping techniques and technologies, and to which the Town of Thurman has significant exposure. These maps also appear in the hazard profiles within Section 5.4, Volume I of this Plan.

9.13.8 Additional Comments

None at this time.



Figure 9.13-1. Town of Thurman Landslide Hazard Area Map

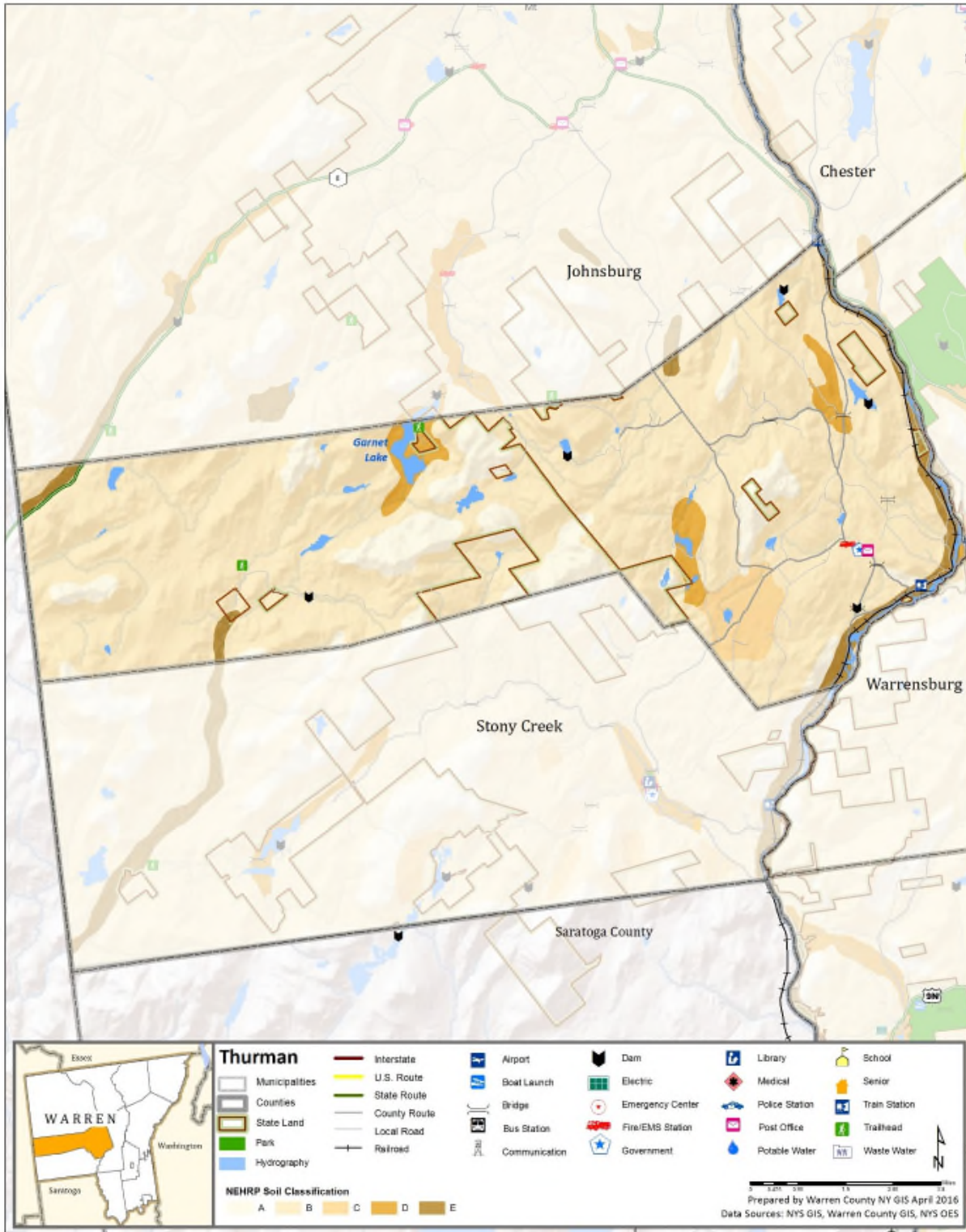
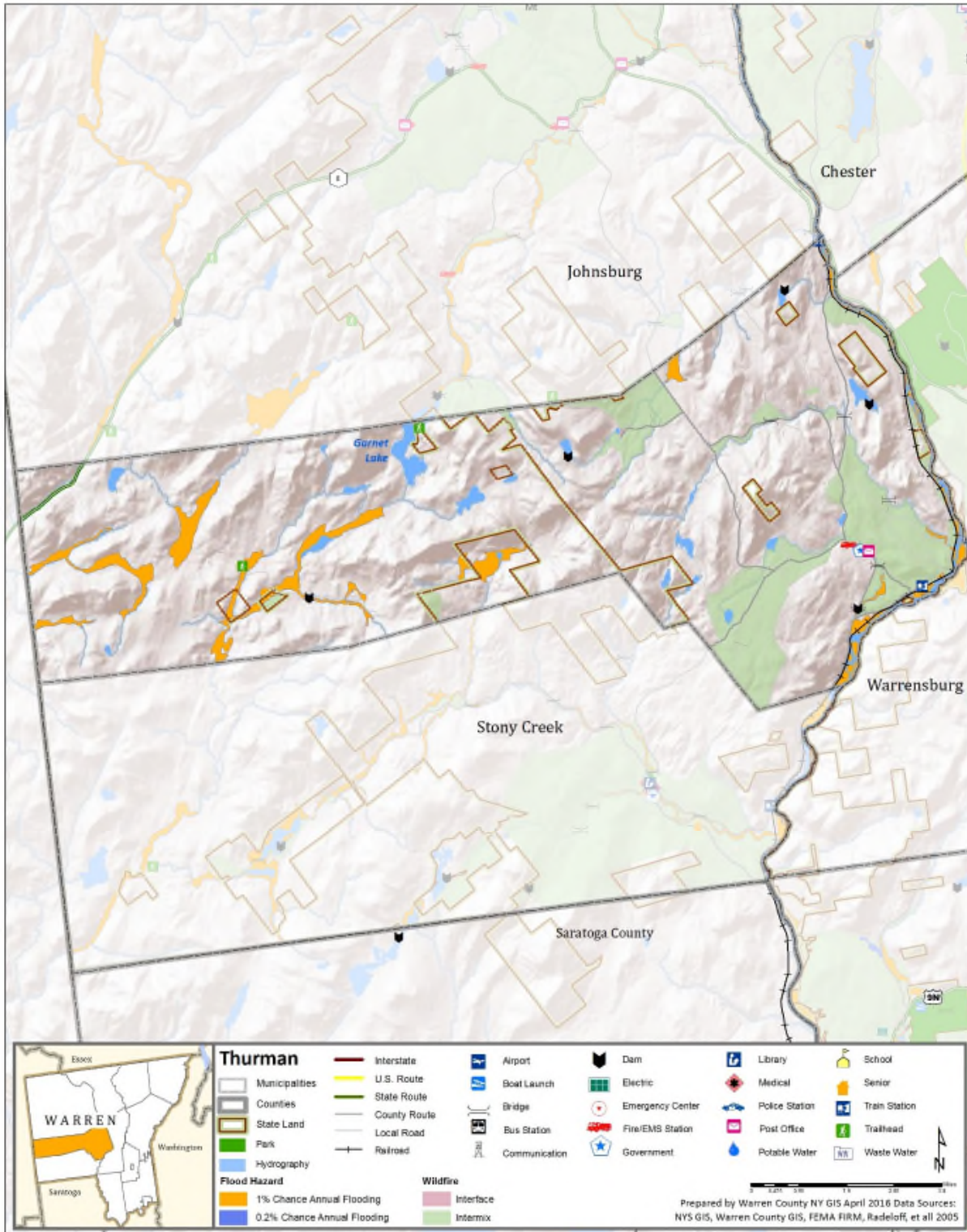




Figure 9.13-2. Town of Thurman Flood and Wildfire Hazard Area Extent and Location Map





Name of Jurisdiction:	Town of Thurman
Name and Title Completing Worksheet:	Pat Wood, Highway Superintendent
Action Number:	TTH-1
Mitigation Action/Initiative:	Address drainage and flooding issues throughout the town

Assessing the Risk	
Hazard(s) addressed:	Flooding
Specific problem being mitigated:	Drainage issues throughout the town due to inadequate culverts, etc. which causes flooding in the municipality
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	The Town Highway Department continues to evaluate flooding and drainage conditions associated with local roadways, and alternative solutions are always considered on a site and project specific basis. For these projects, specific culvert/drainage improvements have been identified.
Action/Project Intended for Implementation	
Description of Selected Action/Project	Address drainage and flooding issues throughout the town by installing bottomless culverts or other drainage improvements at locations including: <ul style="list-style-type: none"> • Wolf Pond Road • Dippikill Road near Parker Cross Road (Patterson Brook) • River Road at Huber Road • Athol Road near Cameron Road <p>All mitigation efforts shall be made in consideration of Federal and State directives to mitigate critical infrastructure to address protection to the 500-year flood event or “worst damage scenario”.</p>
Action/Project Category	SIP
Goals Met	1, 3
Applies to existing and or new development, or not applicable	N/A
Benefits (losses avoided)	High
Estimated Cost	High
Priority*	High
Plan for Implementation	
Responsible Organization	Town Board, Highway Department
Local Planning Mechanism	Hazard Mitigation
Potential Funding Sources	Town Budget, as supported by available grants (e.g. NYS DOT)
Timeline for Completion	Long Term - DOF
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:



Action Number: TTH-1
Mitigation Action/Initiative: Address drainage and flooding issues throughout the town

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	0	
Property Protection	1	Reduce flood damages to roadways and surrounding properties
Cost-Effectiveness	1	
Technical	1	
Political	0	
Legal	0	
Fiscal	1	Need grant funding
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	0	Flooding
Timeline	0	
Agency Champion	1	
Other Community Objectives	1	
Total	9	
Priority (High/Med/Low)	High	



Name of Jurisdiction:	Town of Thurman
Name and Title Completing Worksheet:	Pat Wood, Highway Superintendent
Action Number:	TTH-2
Mitigation Action/Initiative:	Address drainage and flooding issues throughout the town

Assessing the Risk	
Hazard(s) addressed:	Flooding
Specific problem being mitigated:	Drainage issues throughout the town due to inadequate culverts, etc. which causes flooding in the municipality
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	The Town Highway Department continues to evaluate flooding and drainage conditions associated with local roadways, and alternative solutions are always considered on a site and project specific basis. For these projects, specific culvert/drainage improvements have been identified.
Action/Project Intended for Implementation	
Description of Selected Action/Project	Address drainage and flooding issues throughout the town by installing bottomless culverts or other drainage improvements at locations including: <ul style="list-style-type: none"> • Bowen Hill Road at George’s Knoll • Garnet Lake Road/Little Pond at Henry Wescott Road All mitigation efforts shall be made in consideration of Federal and State directives to mitigate critical infrastructure to address protection to the 500-year flood event or “worst damage scenario”.
Action/Project Category	SIP
Goals Met	1, 3
Applies to existing and or new development, or not applicable	N/A
Benefits (losses avoided)	High
Estimated Cost	Medium
Priority*	Medium
Plan for Implementation	
Responsible Organization	Town Board, Highway Department
Local Planning Mechanism	Hazard Mitigation
Potential Funding Sources	Town Budget, as supported by available grants (e.g. NYS DOT)
Timeline for Completion	Long Term - DOF
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:



Action Number: TTH-2

Mitigation Action/Initiative: Address drainage and flooding issues throughout the town

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	0	
Property Protection	1	Reduce flood damages to roadways and surrounding properties
Cost-Effectiveness	1	
Technical	1	
Political	0	
Legal	0	
Fiscal	1	Need grant funding
Environmental	1	
Social	1	
Administrative	0	
Multi-Hazard	0	Flooding
Timeline	0	
Agency Champion	0	
Other Community Objectives	1	
Total	7	
Priority (High/Med/Low)	Medium	



Name of Jurisdiction:	Town of Thurman
Name and Title Completing Worksheet:	Evelyn Wood, Town Of Thurman Supervisor
Action Number:	TTH-4
Mitigation Action Name:	Stormwater and Flood Mitigation at Athol Road

Assessing the Risk	
Hazard(s) addressed:	Flooding
Specific problem being mitigated:	Heavy runoff events frequently flood several municipal buildings causing furnace failures, mold issues, and limits access/use of the property, due to inadequate and failing drainage systems. Flooding occurs not only on municipal property, but runs onto neighboring private property where impacts the structures and property. This water frequently freezes during the late winter/early spring causing icy hazardous situations for employees of the Town and the public. Lack of drainage causes the water to flow into basements, and there is not a viable outlet to convey the pumped water from the site. In addition, this poor drainage causes water to flow onto the adjacent County road causing thick layers of ice, erosion along the road, and heavy sand deposits in the roadway.
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	Utilities in basement of Town Hall have been elevated. SWCD supported the Town with a PDM application for stormwater drainage improvements (diversions, catch basin) solely on the Town Hall property, but was not cost-effective.
Action/Project Intended for Implementation	
Description of Selected Action/Project	The mitigation recommendation for this site is the installation of new culverts at two locations. The first site would collect runoff and convey it to the established drainage way on the Town property. That would eliminate flooding issues for one of the Town buildings, the public access points and the private residence. The second portion of this project would be to upsize the existing culvert that currently drains the property and conveys it to Athol Road. This existing culvert is undersized and past it's design life, and does not function properly. The project will require approximately 300'+/- of culvert, connections, stone, bedding material, stabilization fabric and equipment rental for proper installation. All mitigation efforts shall be made in consideration of Federal and State directives to mitigate critical infrastructure to address protection to the 500-year flood event or "worst damage scenario".
Mitigation Action Type	SIP
Goals Met	1, 3
Applies to existing and or new development, or not applicable	Both
Benefits (losses avoided)	Protect records, ability to use public building in the event of a disaster
Estimated Cost	7,500
Priority*	medium
Plan for Implementation	
Responsible Organization	Town of Thurman
Local Planning Mechanism	Town Board, town employees
Potential Funding Sources	Town Budget, as supported by available grants (e.g. NYS DOT)
Timeline for Completion	Within 2 years



Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:



Action Number: TTH-4

Mitigation Action Name: Stormwater and Flood Mitigation at Athol Road

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	0	No impact on life safety
Property Protection	1	Will protect Town buildings from flooding
Cost-Effectiveness	1	Benefits of flood protection and reducing damages will outweigh costs
Technical	1	Project is technically feasible
Political	0	
Legal	0	
Fiscal	0	
Environmental	-1	May have negative environmental impact
Social	0	
Administrative	0	
Multi-Hazard	1	Flooding and severe weather
Timeline	1	Could be completed within 2 years, DOF
Agency Champion	1	Town Board, Highway Department
Other Community Objectives	0	
Total	5	
Priority (High, Medium, Low)	Medium	



9.14 Town of Warrensburg

This section presents the jurisdictional annex for the Town of Warrensburg.

9.14.1 Hazard Mitigation Plan Point of Contact

The following individuals have been identified as the hazard mitigation plan's (HMP) primary and alternate points of contact.

Primary Point of Contact	Alternate Point of Contact
Edward Pennock, Highway Superintendent 3797 Main Street Warrensburg, NY 12885-1628 518-232-2329 Edward.Pennock@townofwarrensburg.net	Patti Corlew, Zoning Administrator 3797 Main Street Warrensburg, NY 12885-1628 518-623-9214 C Patti.Corlew@TownOfWarrensburg.net

9.14.2 Municipal Profile

The Town of Warrensburg is centrally located in Warren County. The Town has a total land area of 64.8 square miles of which 63.7 square miles is land and 1.1 square miles is water. It is bordered by the Hudson River on the west. U.S. route 9 passes through the Town. The Town contains two hamlets: Riverbank and Warrensburg. According to the 2010 Census, the community's population was 4,094.

The legislative board governing Warrensburg is the Town Board comprised of four councilmembers and the Town Supervisor.

Growth/Development Trends

Table 9.14-1 summarizes recent residential/commercial development in the Town of Warrensburg since 2010 and lists any known or anticipated major residential/commercial development and major infrastructure development that has been identified in the next five years within the municipality. Refer to the maps following Section 9.14.9 of this annex: Figure 9.14-1 that illustrates landslide hazard areas, and Figure 9.14-2 that illustrates the flood and wildfire hazard areas.

Table 9.14-1. Growth and Development

Property or Development Name	Type (e.g. Res., Comm.)	# of Units / Structures	Location (address and/or Parcel ID)	Known Hazard Zone(s)	Description/Status of Development
Recent Development from 2010 to present					
Hudson Headwaters	Health Center	1	3767 Main Street 211.13-4-12	Near floodplain (A6)	Complete
Known or Anticipated Development in the Next Five (5) Years					
Fire House/Community Center	Institutional	2	18 Elm Street 211.13-5-16	Near floodplain (A6)	Planning Phase

Note: Only location-specific hazard zones or vulnerabilities are identified

9.14.3 Natural Hazard Event History Specific to the Municipality

Warren County has a history of natural and non-natural hazard events as detailed in Volume I, Section 5.0 of this Plan. A summary of historical events appears in each hazard profile, and includes a chronology of events that have affected the County and its municipalities. For the purpose of this Plan update, events that have occurred in the County from 2010 to present were summarized to indicate the range and impact of hazard





events in the community. Information regarding specific damages is included, if available, based on reference material or local sources. This information is presented in Table 9.14-2 below. For details of these and additional events, refer to Volume I, Section 5.0 of this Plan.

Table 9.14-2. Hazard Event History

Dates of Event	Event Type (FEMA Disaster Declaration if applicable)	Warren County Designated?	Event and Loss Summary Sheet
March 23, 2010	Severe Storms and Flooding (DR-1899)	Yes	Damage resulted in driving hazards. Heavy rains resulted in widespread flooding at Viele Pond Road (average 20-ft. wide sand and cob rock roadway) for about 800 feet of roadway. Two culverts affected by washout, caused by force of water from Stewart Brook. Many other spots along the road for a total of 1,200 feet of roadway washed out. Average 3-ft. deep washouts. Cost of damage: \$44,368.86
April 27-28, 2011	Severe Storms, Flooding, Tornadoes and Straight-Line Winds (DR-1993)	Yes	Flooding occurred along the Hudson River in Warren County from North River southward to the Saratoga County line. Numerous reports of flooding. The County had approximately \$676,000 in damages. Nearly two-thirds of the County was damaged.
May 27 – June 2, 2011	Flooding	N/A	Flooding occurred in the County and there was severe damage along a thin line through the County (Stony Creek, Thurman, Warrensburg, Horicon and Bolton) that resulted in \$13.125 million in damages.
August 27-29, 2011	Hurricane Irene (DR-4020)	Yes	<p>There was severe wind and flooding damage throughout the County.</p> <ul style="list-style-type: none"> • PW#01418(1) Alden Avenue: Four sections of roadway washed out totaling 29.5 miles. Total Cost: \$102,186.20 • PW#00481 (1) Viele Pond Road: 3.8 miles of gravel and paved roadway washed out. Total Cost: \$66,963.90 • PW#00789 Green Mountain and Rocky Ridge: Green Mansions Road 0.5 mile paved road and Rocky Ridge Road 1.3 mile paved road damages. Total cost: \$25,044.06 • PW#01416 Viele Pond Bridge: Bridge foundation undermined, I-beams and wooden decking damaged. Total Cost: \$23,320.00 • PW#00686(0) Old Route 9: damages to 3 mile paved and unpaved road. Total cost: \$21,618.10 • PW#016371(1) Old Route 9 Culvert: 8' high x 10' long culvert collapsed by heavy sediment. Total Cost: \$28,583.50 • Total Infrastructure Damage Amount: \$267,715.76 • PW#00935 Debris Removal: Trees in roadway, clogged ditches, culverts. 530 CY of raw vegetative debris resulted from event. Total Cost: \$6,927.20

Notes:

- FEMA Federal Emergency Management Agency
- DR Major Disaster Declaration (FEMA)
- N/A Not applicable

9.14.4 Hazard Vulnerabilities and Ranking

The hazard profiles in Section 5.0 of this Plan convey detailed information regarding each plan participant’s vulnerability to the identified hazards. The following summarizes the hazard vulnerabilities and their ranking in the Town of Warrensburg. For additional vulnerability information relevant to this jurisdiction, refer to Section 5.0.

Hazard Risk/Vulnerability Risk Ranking





Table 9.14-3 below summarizes hazard risk/vulnerability rankings of potential hazards for the Town of Warrensburg.

Table 9.14-3. Hazard Risk/Vulnerability Risk Ranking

Hazard type	Estimate of Potential Dollar Losses to Structures Vulnerable to the Hazard ^{a, b}	Probability of Occurrence	Risk Ranking Score (Probability x Impact)	Hazard Ranking ^a
Earthquake	100-year MRP: \$106,882.00 500-year MRP: \$1,822,240 2,500-Year MRP: \$14,748,961.00	Occasional	32	High
Flood	RCV Exposed to 1% Annual Chance: \$20,854,712	Frequent	36	High
Landslide	Damage estimate not available	Frequent	27	Medium
Infestation	Damage estimate not available	Frequent	24	Medium
Severe Storm	RCV Exposed to 1938 storm-winds: \$162,005	Frequent	48	High
Severe Winter Storm	GBS 1% Loss: \$3,997,600 GBS 5% Loss: \$19,988,000	Frequent	51	High
Wildfire	RCV Exposed to Intermix: \$200,130,000 RCV Exposed to Interface: \$387,830,000	Frequent	42	High
Cyber Security	Damage estimate not available	Occasional	12	Low
Disease Outbreak	Damage estimate not available	Frequent	27	Medium
Hazardous Material Incidents	Damage estimate not available	Frequent	24	Medium

Notes:

- a. The general building stock valuation is based on the custom inventory generated for the municipality and based on improved value.
High = Total hazard priority risk ranking score of 31 and above
Medium = Total hazard priority risk ranking of 20-30+
Low = Total hazard risk ranking below 20
- b. Loss estimates for the severe storm and severe winter storm hazards are structural values only and do not include the estimated value of contents. The earthquake was evaluated by Census tract. The Census tracts do not exactly align with municipal boundaries; therefore, a total is reported for each Town inclusive of the Villages. Loss estimates for the flood and earthquake hazards represent both structure and contents. Potential flood loss estimates were generated using Hazus-MH 2.2 and digitized FIRM maps from the 1980s and 1990s for the 1-percent annual chance event; NED DEM was used to generate a depth grid. The County's 2015 Real Property data was used to generate the values for flood and includes structure and contents. For the wildfire hazard, the improved value and estimated contents of buildings located within the identified hazard zones is provided.

GBS General building stock
MRP Mean return period
RCV Replacement Cost Value

National Flood Insurance Program (NFIP) Summary

Table 9.14-4 below summarizes NFIP statistics for the Town of Warrensburg.

Table 9.14-4. NFIP Summary

Municipality	# Policies (1)	# Claims (Losses) (1)	Total Loss Payments (2)	# Rep. Loss Prop. (1)	# Severe Rep. Loss Prop. (1)	# Policies in 100-year Boundary (3)
Town of Warrensburg	21	3	\$11,649	0	0	13

Source: FEMA, 2014

Notes:





- (1) Policies, claims, repetitive loss, and severe repetitive loss statistics are provided by FEMA, are current as of November 30, 2015, and are summarized by community name. Total number of repetitive loss properties includes severe repetitive loss properties. Number of claims represents claims closed by November 30, 2015.
- (2) Total building and content losses from the claims file provided by FEMA Region 2.
- (3) Number of policies inside and outside of flood zones is based on latitude and longitude provided by FEMA Region 2 in the policy file.
- (4) FEMA noted that for a property with more than one entry, more than one policy may have been in force or more than one Geographic Information System (GIS) specification was possible.

Critical Facilities

Table 9.14-5 below identifies critical facilities within the municipality located on parcels that intersect the current regulatory NFIP 1% chance flood boundary (aka: “Special Flood Hazard Area” (SFHA)), however it is recognized that the actual facility structure(s) may lie outside of the SFHA. Please refer to the Flood Hazard Profile (Section 5.4.2) for further details of estimated flood losses throughout the County, as well as the “Other Vulnerabilities Identified” section following.

Table 9.14-5. Potential Flood Losses to Critical Facilities

Municipality	Facility Types in 1% Chance Flood Boundary						
	Boat Facilities	Dam	Electric	Government	Highway Bridge	Rail Facility	Wastewater
Warrensburg	0	1	0	2	7	0	0

Source: Warren County Real Property 2015 tax roll; HAZUS-MH 2.2; FEMA 2015

Notes:

- (1) HAZUS-MH 2.2 provides a general indication of the maximum restoration time for 100% operations. Clearly, a great deal of effort is needed to quickly restore essential facilities to full functionality; therefore, this will be an indication of the maximum downtime (HAZUS-MH 2.2 User Manual).
- (2) Some facilities may be within the Digital Flood Insurance Rate Map (DFIRM) flood hazard boundary; however, HAZUS did not calculate potential loss, perhaps because depth of flooding would not cause any damages to these structures according to the depth damage function used in HAZUS for that facility type. Further, HAZUS-MH may estimate potential damage to a facility outside the DFIRM if the model generates a depth grid beyond DFIRM boundaries.

- X Facility located within the DFIRM boundary
- Not calculated by HAZUS-MH 2.2
- ** To be determined

Other Vulnerabilities Identified

The municipality has identified the following vulnerabilities within their community:

- Cross Roads – culvert here needs to be upsized
- Sweet Road – beaver dam issue – in road to logging company and access to summer camp
- Green Mansions Road – roadway elevation needed
- Forest Lake Road - big culvert here - needs to be elevated
- Public water supply – new well needs backup power. Other two wells have backup power.
- Wastewater Infrastructure – Pump B backup power is mobile
- Swan Street – Elevation and culvert work needed here to address flooding





- Town Hall – used to be a shelter, has no backup power – possible project?
- High School – lacks backup power
- Senior Living/Assisted Living- “Countryside”
- Senior Housing (independent living) – Austin Perry Corners (King St/Adirondack Ave)
- ARC – Sanford Street – Day habilitation center
- CWI – Day habilitation center in River Street Plaza area (state funded)
- Mobile home park – Off main street in flood plain (9 units)
- Mobile home park – Prosser Circle (5 units)
- Schroon River Road – elevation needed in the area of SWCD. Would give access to well #3.
- Warrensburg – Could use a fourth public water well in a different location. The Town has been investigating possible locations.
- Lower River Street – County Road- Continuous water on road, icing issues in the winter. North of the park. Runoff from Harrington Hill.



9.14.5 Capability Assessment

This section identifies the following capabilities of the local jurisdiction:

- Planning and regulatory capability
- Administrative and technical capability
- Fiscal capability
- Community classification
- NFIP
- Integration of mitigation planning into existing and future planning mechanisms.

Planning and Regulatory Capability

Table 9.14-6 below summarizes regulatory tools available to the Town of Warrensburg.

Table 9.14-6. Planning and Regulatory Tools

Tool / Program (code, ordinance, plan)	Do you have this? (Yes/No) If Yes, date of adoption or update	Authority (local, county, state, federal)	Dept. /Agency Responsible	Code Citation and Comments (Code Chapter, name of plan, explanation of authority, etc.)
Planning Capability				
Master Plan	Yes, 03/2012	Local, County	Planning	Town of Warrensburg Comprehensive Plan and Waterfront Revitalization Strategy
Capital Improvements Plan	No	-	-	-
Floodplain Management / Basin Plan	No	-	-	-
Stormwater Management Plan	Yes	County	Warren County Soil and Water, Jim Leibrum	-
Open Space Plan	No	-	-	-
Stream Corridor Management Plan	No	-	-	-
Watershed Management or Protection Plan	No	-	-	-
Economic Development Plan	No	-	-	-
Comprehensive Emergency Management Plan	Yes, 03/2007	Local, County	Planning	Comprehensive Emergency Management Plan 2015 update in process
Emergency Response Plan	No	-	-	-
Post-Disaster Recovery Plan	No	-	-	-
Transportation Plan	No	-	-	-
Strategic Recovery Planning Report	No	-	-	-
Other Plans:	No	-	-	-
Regulatory Capability				
Building Code	Yes	County	Building Codes	NYS Building Code
Zoning Ordinance	Yes, 05/2012	Local	Planning	Code of the Town of Warrensburg, Chapter 211
Subdivision Ordinance	Yes, 02/2013	Local	Planning	Code of the Town of Warrensburg, Chapter 178





Tool / Program (code, ordinance, plan)	Do you have this? (Yes/No) If Yes, date of adoption or update	Authority (local, county, state, federal)	Dept. /Agency Responsible	Code Citation and Comments (Code Chapter, name of plan, explanation of authority, etc.)
NFIP Flood Damage Prevention Ordinance	Yes	Federal, State, Local	Planning/Zoning	Code of the Town of Warrensburg, Chapter 116
NFIP: Cumulative Substantial Damages	No	-	-	-
NFIP: Freeboard	Yes	State, Local	Planning	State mandated BFE+2 for single and two-family residential construction, BFE+1 for all other construction types
Growth Management Ordinances	No	-	-	-
Site Plan Review Requirements	Yes, 05/2012	Local	Planning	Code of the Town of Warrensburg, Chapter 211
Stormwater Management Ordinance	No	-	-	-
Municipal Separate Storm Sewer System (MS4)	No	-	-	-
Natural Hazard Ordinance	No	-	-	-
Post-Disaster Recovery Ordinance	No	-	-	-
Real Estate Disclosure Requirement	Yes	State	-	New York State (NYS) mandate, Property Condition Disclosure Act, <i>NY Code – Article 14 §460-467</i>
Other (Special Purpose Ordinances [i.e., sensitive areas, steep slope])	No	-	-	-

Administrative and Technical Capability

Table 9.14-7 below summarizes potential staff and personnel resources available to the Town of Warrensburg.

Table 9.14-7. Administrative and Technical Capabilities

Resources	Is this in place? (Yes or No)	Department/ Agency/Position
Administrative Capability		
Planning Board	Yes	Planning Board
Mitigation Planning Committee	No	-
Environmental Board/Commission	No	-
Open Space Board/Committee	No	-
Economic Development Commission/Committee	Yes	Economic Development Committee
Maintenance programs to reduce risk	No	-
Mutual aid agreements	Yes	Warrensburg Volunteer Fire Department
Technical/Staffing Capability		
Planner(s) or engineer(s) with knowledge of land development and land management practices	Yes	Cedarwood Engineering
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Yes	Cedarwood Engineering
Planners or engineers with an understanding of natural	Yes	Cedarwood Engineering





Resources	Is this in place? (Yes or No)	Department/ Agency/Position
hazards		
NFIP Floodplain Administrator (FPA)	Yes	Chris Belden, Zoning Administrator
Surveyor(s)	No	-
Personnel skilled or trained in GIS and/or Hazards United States (HAZUS) – Multi-Hazards (MH) applications	Yes	Zoning Administrator, GIS
Scientist familiar with natural hazards	No	-
Emergency Manager	No	-
Grant writer(s)	Yes	Bookkeeper/Grant writer Staff, Patricia Monahan
Staff with expertise or training in benefit/cost analysis	No	-
Professionals trained in conducting damage assessments	No	-

Fiscal Capability

Table 9.14-8 below summarizes financial resources available to the Town of Warrensburg.

Table 9.14-8. Fiscal Capabilities

Financial Resources	Accessible or Eligible to Use (Yes/No)
Community Development Block Grants (CDBG, CDBG-DR)	Yes
Capital improvements project funding	No
Authority to Levy Taxes for specific purposes	No
User fees for water, sewer, gas or electric service	Yes, water/sewer
Impact fees for homebuyers or developers of new development/homes	No
Stormwater utility fee	No
Incur debt through general obligation bonds	No
Incur debt through special tax bonds	No
Incur debt through private activity bonds	No
Withhold public expenditures in hazard-prone areas	No
Other federal or state funding programs	Yes
Open Space Acquisition funding programs	No
Other	No

Community Classifications

Table 9.14-9 below summarizes classifications for community program available to the Town of Warrensburg.

Table 9.14-9. Community Classifications

Program	Do you have this? (Yes/No)	Classification (if applicable)	Date Classified (if applicable)
Community Rating System (CRS)	NP	N/A	N/A
Building Code Effectiveness Grading Schedule (BCEGS)	NP	N/A	N/A
Public Protection (ISO Fire Protection Classes 1 to	NP	N/A	N/A





Program	Do you have this? (Yes/No)	Classification (if applicable)	Date Classified (if applicable)
10)			
Storm Ready	NP	N/A	N/A
Firewise	NP	N/A	N/A
Disaster/safety programs in/for schools	NP	N/A	N/A
Organizations with mitigation focus (advocacy group, non-government)	NP	N/A	N/A
Public education program/outreach (through website, social media)	NP	N/A	N/A
Public-Private Partnerships	NP	N/A	N/A

Note:

- N/A Not applicable
- NP Not participating
- Unavailable

The classifications listed above relate to the community’s ability to provide effective services to lessen its vulnerability to the hazards identified. These classifications can be viewed as a gauge of the community’s capabilities in all phases of emergency management (preparedness, response, recovery and mitigation) and are used as an underwriting parameter for determining the costs of various forms of insurance. The Community Rating System (CRS) class applies to flood insurance, while the Building Code Effectiveness Grading Schedule (BCEGS) and Public Protection classifications apply to standard property insurance. CRS classifications range on a scale of 1 to 10, with class 1 being the best possible classification, and class 10 representing no classification benefit. Firewise classification is higher if the subject property is more than 1000 feet from a creditable fire hydrant and is within 5 road miles of a recognized Fire Station.

Criteria for classification credits are outlined in the following documents:

- The Community Rating System Coordinators Manual
- The Building Code Effectiveness Grading Schedule
- The ISO Mitigation online ISO’s Public Protection website at <https://www.isomitigation.com/ppc/>
- The National Weather Service Storm Ready website at <http://www.stormready.noaa.gov/index.html>
- The National Firewise Communities website at <http://firewise.org/>

Self-Assessment of Capability

Table 9.14-10 below provides an approximate measure of the Town of Warrensburg’s capability to work in a hazard-mitigation capacity and/or effectively implement hazard mitigation strategies to reduce hazard vulnerabilities.

Table 9.14-10. Self-Assessment Capability for the Municipality

Area	Degree of Hazard Mitigation Capability		
	Limited (If limited, what are your obstacles?)*	Moderate	High
Planning and Regulatory Capability		X	
Administrative and Technical Capability		X	
Fiscal Capability		X	
Community Political Capability		X	





Area	Degree of Hazard Mitigation Capability		
	Limited (If limited, what are your obstacles?)*	Moderate	High
Community Resiliency Capability		X	
Capability to Integrate Mitigation into Municipal Processes and Activities.		X	

National Flood Insurance Program

NFIP Floodplain Administrator (FPA)

Chris Belden – Zoning Administrator, Town of Warrensburg Code Enforcement

Flood Vulnerability Summary

As of June 30, 2015 there are 21 policies in force, insuring \$5.1 million of property with total annual insurance premiums of \$27,787. Since 1978, 3 claims have been paid totaling \$11,648. As of November 30, 2014 there are no Repetitive Loss or Severe Repetitive Loss properties in the community.

As of November 30, 2015, 21 policies were in force in the Town of Warrensburg, 13 of which were within the 100-year flood boundary. Since 1978, 3 claims have been paid within the Town, totaling \$11,648. There are no repetitive loss property and no severe repetitive loss properties in the Town of Warrensburg. According to current NFIP statistics at the time of this Plan, NFIP policies in the Town of Warrensburg insured over \$5.6 million of property with total annual insurance premiums of \$30,218.

Resources

The Flood Damage Prevention Ordinance (FDPO) identifies the Zoning Administrator as the NFIP Floodplain Administrator. The floodplain administrator is the sole person assuming responsibilities for floodplain administration within the Town of Warrensburg. Additional training and resources would be a benefit to the administrator.

Code Enforcement provides permit review, GIS, and education-related activities. Education and outreach regarding flood hazards is provided on request.

The Flood Insurance Rate Maps for the Town were produced in 1984 and are unclear due to a lack of parcels and orthoimagery. This presents a barrier to floodplain management activities within the Town.

Compliance History

The Town of Warrensburg is currently in good standing in the NFIP. The date of the most recent Community Assistance Visit is unknown.

Regulatory

The Town of Warrensburg’s floodplain regulations meet the minimum State and FEMA requirements. The Town does not currently participate in the Community Rating System.

The Planning Board acts as the appeals board for floodplain development variances.

Integration of Hazard Mitigation into Existing and Future Planning Mechanisms

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, each community was surveyed to obtain a





better understanding of their community's progress in plan integration. A summary is provided below. In addition, the community identified specific integration activities that will be incorporated into municipal procedures.

Planning

Land Use Planning: The Town of Warrensburg has a Comprehensive Plan and Waterfront Revitalization Strategy. This plan does not include elements addressing areas of natural hazard risk, nor does it refer to the Hazard Mitigation Plan.

Comprehensive Emergency Management Plan: The Comprehensive Emergency Management Plan refers to the hazard mitigation plan.

Regulatory and Enforcement (Ordinances)

Zoning Code and Subdivision Regulations: Municipal zoning and subdivision regulations, Chapters 211 and 178 respectively, consider risk from natural hazards. County GIS data and applicant materials are provided to the Planning Board and Zoning Board to guide decisions regarding risk from natural hazards. Zoning and subdivision regulations do not require developers to take additional actions to mitigate natural hazards. NFIP regulations do not exceed the minimum requirements put forth by the State and FEMA.

Operational and Administration

Planning and Zoning Board: Planning Board performs a review of subdivisions. The Site Plan Zoning Board approves use and area variances.

Stormwater Management: The Town of Warrensburg is not an MS4 regulated community. Stormwater management functions are performed by Warren County Soil and Water.

Technical Resources: Additional training and certification in erosion/sediment control, stormwater management, and floodplain management would be beneficial to Town staff. At least one staffer has experience in preparing grant applications for mitigation projects. The Town does not have an accredited planner on staff but does have a staffer with a background in planning who maintains the Emergency Management Plan.

Funding

Capital Improvement Budget: The Capital Improvement Budget includes budget for mitigation-related projects.

Education and Outreach

Currently no programs are in place.

9.14.6 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and prioritization.

Past Mitigation Initiative Status

Table 9.14-11 below indicates progress on the community's mitigation strategy identified in the 2011 Plan. Previous actions that are now ongoing programs and capabilities are indicated as such in Table 9.14-11, and



also appear under “Capability Assessment” presented previously in this annex. Actions carried forward as part of this plan update are included in the following subsection (in Table 9.14-12) with prioritization.

Table 9.14-11. Past Mitigation Initiative Status

Description	Status	Review Comments
Replace the Middleton Bridge over the Schroon River in the Towns of Bolton and Warrensburg	Complete	This was a County project. Discontinue.
Replace the Woolen Mill Bridge (Milton Street) over the Schroon River in the Town of Warrensburg	Complete	Discontinue due to project completion.
Elevate or reroute roadways and bridges to avoid flooding. Specific locations include: Pack Forest Road Bridge, Alden Avenue Extension (Town of Warrensburg)	Complete	Discontinue due to project completion.
Educate residents regarding steps to be taken to decrease the impact of natural hazards (including ice storms, wild/forest fires, severe storms, tornado, earth-quakes, and all other natural hazards) by developing, enhancing, and implementing education programs, brochures, school presentations informing groups about ways to reduce risk, and other outreach activities.	No Progress	Nothing completed locally by the Town. Include in 2016 HMP
Monitor and remove trees/limbs in storm areas that present potential hazards to keep trees from threatening lives, property, and public infrastructure during storm events.	Complete	Town DPW, Ongoing operational capability. Discontinue.
Obtain funding to purchase generators for municipally-owned critical facilities.	No Progress	Nothing completed locally by the Town, due to lack of funding. Include in 2016 HMP
Coordinate/create mutual aid agreements between emergency services, public works departments, and public utilities to ensure efficient use of resources during and after storm events.	Not complete	Discontinue
Develop plans for debris management after hazard events, including severe winter snow/ice events, and other severe storms.	Unknown progress	Discontinue
Design a network of citizens that will check in on elderly, functional needs, and low- income individuals during major events.	No Progress	No committee has been formed. Discontinue – not appropriate for the Town.
Provide training for local code enforcement officials to implement building codes that reflect disaster resistant construction for new structures and renovation.	Unknown progress	Building Code Enforcement is performed by the County. Discontinue – this action is the responsibility of the County.
Provide residents with information listing steps taken to lessen potential flood damage to reduce the impact of flooding.	No Progress	Operational function of Town FPA/Zoning Administrator. Educational materials not organized or sent out by building department. Continue as new action WT-1.
Educate the community on benefits of carrying NFIP policies and increase knowledge of NFIP services.	No Progress	Ongoing operational function. Discontinue.
Review and update local plans to integrate goals, objectives, and activities from this HMP which are not found in existing regulatory documents, as appropriate.	No Progress	Include in 2016 HMP - Integrate the risk assessment and recommendations of the Hazard Mitigation Plan into the Comprehensive Plan.
Maintain a current inventory of at-risk buildings and infrastructure and continually	No Progress	Include in 2016 HMP



Table 9.14-11. Past Mitigation Initiative Status

Description	Status	Review Comments
update inventory of at-risk structures in each jurisdiction.		
Apply for grants to assist with mitigation activities needed to provide a level of protection for critical facilities.	No Progress	Ongoing operational function as need arises. Discontinue.
Provide continuing education and training for local Floodplain Administrator to ensure code enforcement and proper inspections.	Complete, Ongoing	Completed training in 2015. Consider annual training. Include in 2016 HMP with a focus on annual training.
Implement zoning regulations to discourage building new structures in disaster prone areas – if such regulations are not already written into Town Zoning code or Floodplain Ordinance.	In progress, Ongoing	Disaster-prone areas are considered for Site Plan Review/Subdivision Review. The town updated zoning and subdivision standards in the last 5 years. We also have a separate floodplain development section of our code related to floodplain administration. The Adirondack Park Agency (APA) also has jurisdiction along coastlines (rivers, lakes). Discontinue.

Completed Mitigation Initiatives not Identified in the Previous Mitigation Strategy

The Town of Warrensburg has identified the following mitigation projects/activities that have also been completed but were not identified in the previous mitigation strategy in the 2011 Plan:

- Viele Dam Bridge was replaced

Proposed Hazard Mitigation Initiatives for the Plan Update

The Town of Warrensburg participated in a mitigation action workshop in September 2015 and was provided the following Federal Emergency Management Agency (FEMA) publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 ‘Selecting Appropriate Mitigation Measures for Floodprone Structures’ (March 2007) and FEMA ‘Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards’ (January 2013).

Table 9.14-12 summarizes the comprehensive-range of specific mitigation initiatives the Town of Warrensburg would like to pursue in the future to reduce the effects of hazards. Some of these initiatives may be previous actions carried forward for this plan update. Implementation of these initiatives will depend on available funding (grants and local match availability), and some initiatives may be modified or omitted at any time based on occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in Table 9.14-12 to further demonstrate the wide range of activities and mitigation measures selected.

As discussed in Section 6, 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing your actions as ‘High’, ‘Medium’, or ‘Low.’ The table below summarizes the evaluation of each mitigation initiative, listed by Action Number.

Table 9.14-12 summarizes prioritization of all proposed mitigation initiatives for the Plan update.



Table 9.14-12. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category	CRS Category
WT-1 (carryover)	Educate residents and contractors regarding steps to be taken to decrease the impact of natural hazards (including ice storms, wild/forest fires, severe storms, tornado, earth-quakes, flooding, and all other natural hazards) by developing, enhancing, and implementing education programs, brochures, school presentations informing groups about ways to reduce risk, and other outreach activities.	N/A	All Hazards	2	Town Board; Superintendent of school districts; County Office of Emergency Services; NYSDEC; Highway Dept.	Medium	Low	NYS OEM	Short	Medium	EAP	PI
WT-2	Obtain funding, purchase, and install generators for municipally-owned critical facilities including: - Town Hall - High School	Existing	All Hazards	1, 3	Town Board; County Office of Emergency Services	High	Medium	NYS OEM	Short	High	SIP	ES
WT-3 (carryover)	Maintain a current inventory of at-risk buildings and infrastructure and continually update inventory of at-risk structures in each jurisdiction.	Existing	All Hazards	3	Town Board, Planning Dept.	Low	Low	N/A	OG	Low	LPR	PR
WT-4 (carryover)	Provide annual education and training for local Floodplain Administrator to ensure code enforcement and proper inspections.	N/A	Flood	2, 3	Town Board	Medium	Low	N/A	OG	High	EAP	PR
WT-5	Culvert improvement projects. Upsize Cross Road culvert. Roadway elevation and culvert improvement at Swan Street.	Existing	Severe Storm, Flood	1, 3	Town Board; Highway Dept.	High	Medium	CHIPS	Short	High	SIP	PP
WT-6	Investigate potential locations and install a fourth public water well in the Town of Warrensburg.	New	Multi-hazard	1	Town Board	High	Medium	Town Board	Short	High	SIP	NR



Notes:

Not all acronyms and abbreviations defined below are included in the table.

*Does this mitigation initiative reduce effects of hazards on new and/or existing buildings and/or infrastructure? Not applicable (N/A) is inserted if this does not apply.

Acronyms and Abbreviations:

CAV	Community Assistance Visit
CDBG	Community Development Block Grant
GCRS	Community Rating System
DPW	Department of Public Works
FEMA	Federal Emergency Management Agency
FPA	Floodplain Administrator
HMA	Hazard Mitigation Assistance
N/A	Not applicable
NFIP	National Flood Insurance Program
OEM	Office of Emergency Management

Potential FEMA HMA Funding Sources:

FMA	Flood Mitigation Assistance Grant Program
HMGP	Hazard Mitigation Grant Program
PDM	Pre-Disaster Mitigation Grant Program
RFC	Repetitive Flood Claims Grant Program (discontinued)
SRL	Severe Repetitive Loss Grant Program (discontinued)

Timeline:

Short	1 to 5 years
Long Term	5 years or greater
OG	On-going program
DOF	Depending on funding

Costs:

Where actual project costs have been reasonably estimated:

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

Where actual project costs cannot reasonably be established at this time:

Low	Possible to fund under existing budget. Project is part of, or can be part of, an existing ongoing program.
Medium	Could budget for under existing work plan, but would require a reapportionment of the budget or a budget amendment, or cost of the project would have to be spread over multiple years.
High	Would require an increase in revenue via an alternative source (i.e., bonds, grants, fee increases) to implement. Existing funding levels are not adequate to cover costs of the proposed project.

Benefits:

Where possible, an estimate of project benefits (per FEMA's benefit calculation methodology) has been evaluated against the project costs, and is presented as:

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

Where numerical project benefits cannot reasonably be established at this time:

Low	Long-term benefits of the project are difficult to quantify in the short term.
Medium	Project will have a long-term impact on reduction of risk exposure to life and property, or project will provide an immediate reduction in risk exposure to property.
High	Project will have an immediate impact on reduction of risk exposure to life and property.

Mitigation Category:

- Local Plans and Regulations (LPR) – Actions that include government authorities, policies, or codes that influence the way land and buildings are developed and built.
- Structure and Infrastructure Project (SIP) – Actions that involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures, as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce impacts of hazards.
- Natural Systems Protection (NSP) – Actions that minimize damage and losses, and also preserve or restore the functions of natural systems.
- Education and Awareness Programs (EAP) – Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities

CRS Category:

- Preventative Measures (PR) – Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and stormwater management regulations.





- *Property Protection (PP) – Actions include public activities to reduce hazard losses or 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.*
- *Public Information (PI) – 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 educational programs for school-age children and adults.*
- *Natural Resource Protection (NR) – 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.*
- *Structural Flood Control Projects (SP) – Actions that involve construction of structures to reduce impacts of a hazard. Such structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) – Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and protection of essential facilities*



Table 9.14-13. Summary of Prioritization of Actions

Mitigation Action/Project Number	Mitigation Action/Initiative	Life Safety	Property Protection	Cost-Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
WT-1	Public Education of impacts of natural hazards	1	1		1				1	1		1	1	1		8	Medium
WT-2	Purchase/Install of Generator for municipal critical facilities	1	1	1	1						1	1	1	1		8	High
WT-3	Inventory of at-risk buildings/infrastructure	1	1	1	1				1			1	1	1		8	Low
WT-4	Provide annual training for Floodplain Administrator	1	1		1				1	1			1	1		7	High
WT-5	Culvert/Roadway Improvements	1	1	1	1				1		1	1	1	1		9	High
WT-6	Site and install fourth public water well	1	1	1	1				1	1	1	1	1	1		10	High

Note: Refer to Section 6, which conveys guidance on prioritizing mitigation actions.



9.14.7 Future Needs To Better Understand Risk/Vulnerability

None at this time.

9.14.8 Hazard Area Extent and Location

Hazard area extent and location maps have been generated for the Town of Warrensburg that illustrate the areas probable to be impacted within the municipality (see Figure 9.14-1 and Figure 9.14-2 below). These maps are based on the best available data at the time of the preparation of this Plan, and are considered to be adequate for planning purposes. Maps have been generated for those hazards (i.e., landslide, wildfire and flooding) that can be clearly identified using mapping techniques and technologies, and to which the Town of Warrensburg has significant exposure. These maps also appear in the hazard profiles within Section 5.4, Volume I of this Plan.

9.14.9 Additional Comments

None at this time.



Figure 9.14-1. Town of Warrensburg Landslide Hazard Area Map

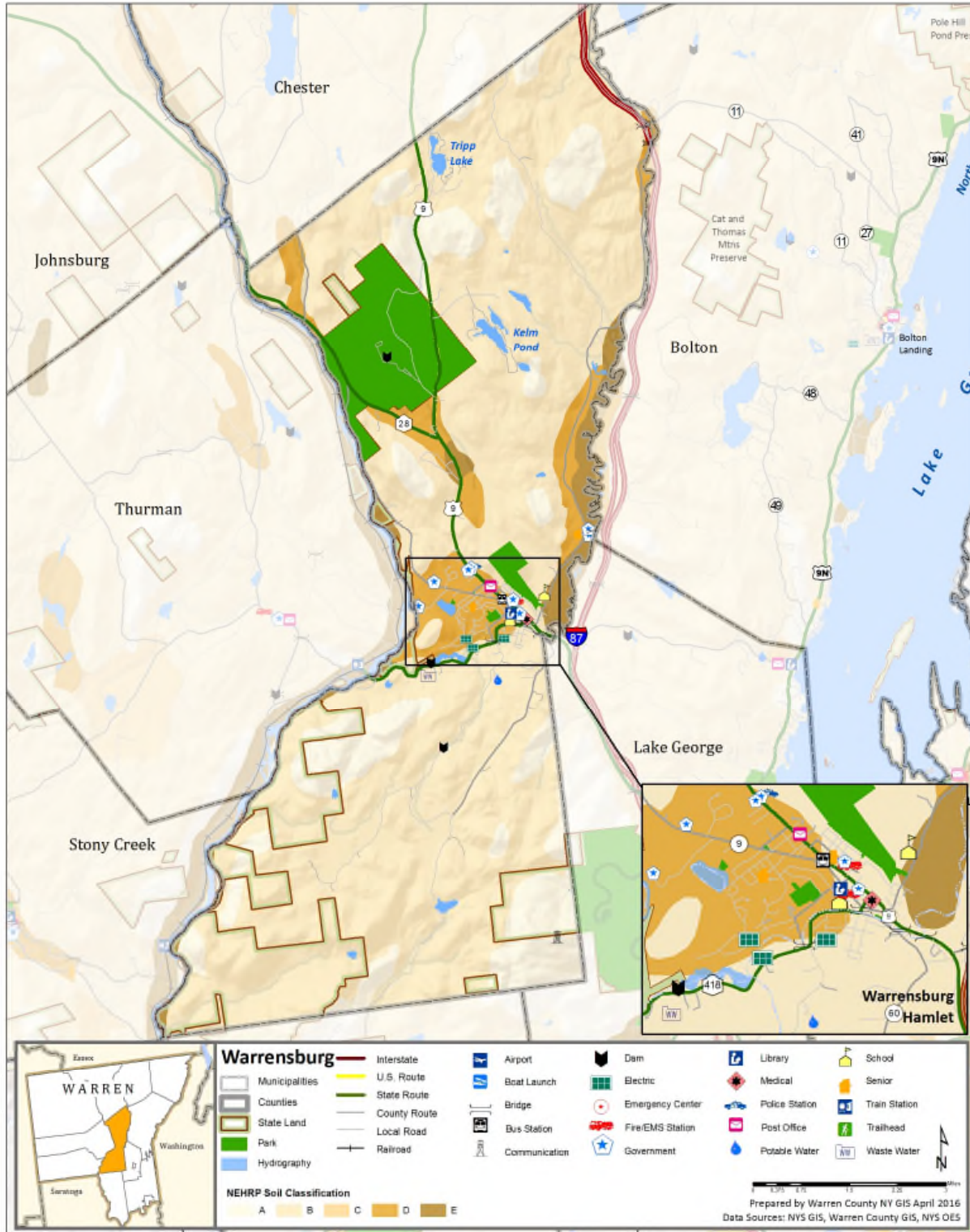
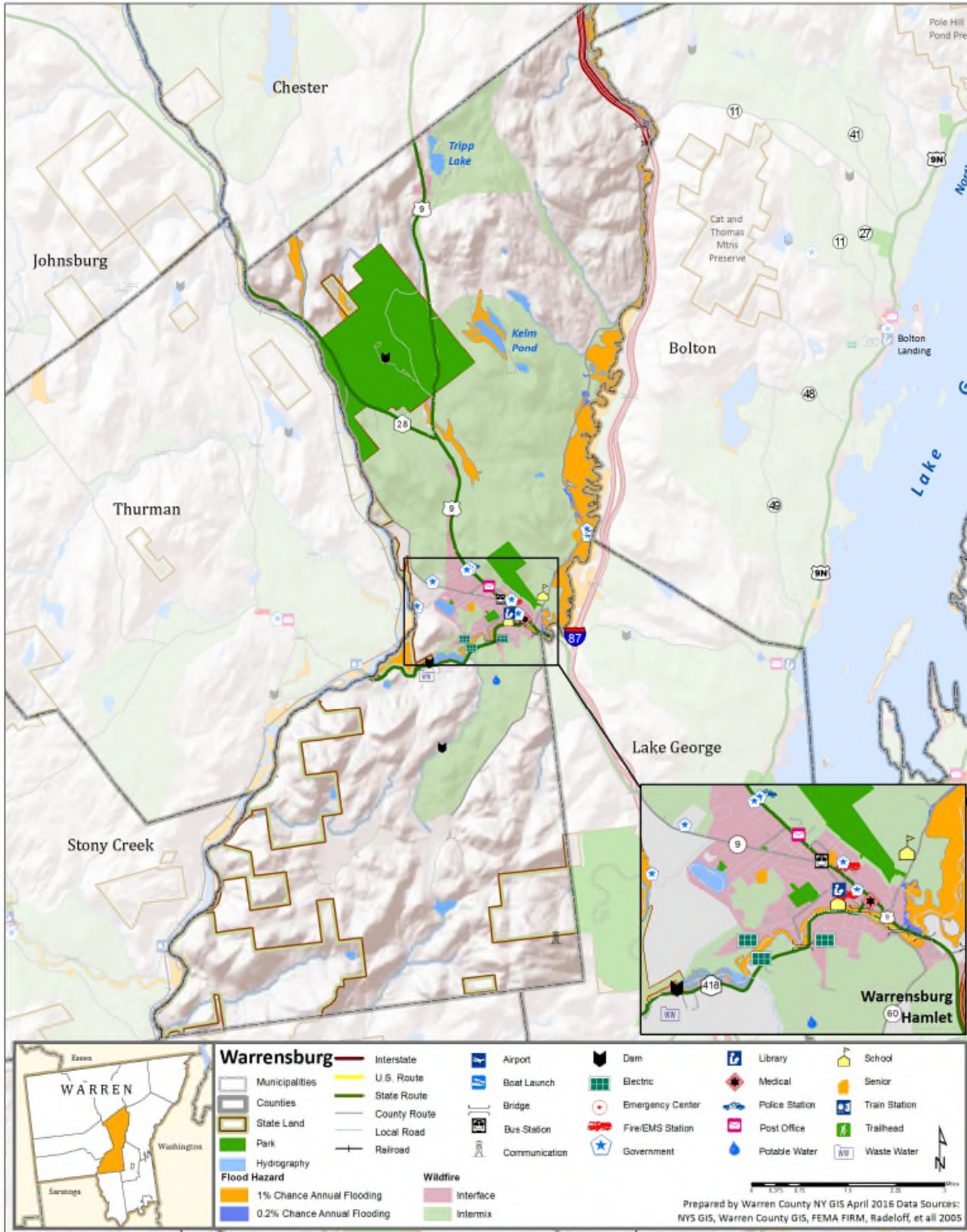




Figure 9.14-2. Town of Warrensburg Flood and Wildfire Hazard Area Extent and Location Map





Name of Jurisdiction:	Town of Warrensburg
Name and Title Completing Worksheet:	Chris Belden, Zoning Administrator
Action Number:	WT-2
Mitigation Action/Initiative:	Purchase/Install of Generator for municipal critical facilities

Assessing the Risk	
Hazard(s) addressed:	All hazards
Specific problem being mitigated:	Power outages at critical facilities
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	Other than installing stand-alone backup power generation, feasible or cost-effective alternatives for serious consideration are limited. Tree-trimming is an on-going effort throughout the County. Alternatives such as burying all power lines, secondary grid feeds and “micro-grids” are cost-prohibitive and outside the capabilities of the Town and facility owners/operators. The purchase of portable standby generators, and installation of generator hookups and transfer switch was considered, but not believed to provide the immediate and sustained protection of stand-alone backup power.
Action/Project Intended for Implementation	
Description of Selected Action/Project	Obtain funding, purchase, and install generators for municipally-owned critical facilities including: - Town Hall - High School
Action/Project Category	SIP
Goals Met	1, 3
Applies to existing and or new development, or not applicable	Existing
Benefits (losses avoided)	High – maintain full functionality of critical facilities and operations during disasters and natural hazard events
Estimated Cost	Medium
Priority*	High
Plan for Implementation	
Responsible Organization	Town Board; County Office of Emergency Services
Local Planning Mechanism	The Warrensburg DPW will administer this project.
Potential Funding Sources	FEMA Hazard Mitigation Assistance (HMA) grant programs, as supported by Town budget
Timeline for Completion	Short
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:



Action Number:

WT-2

Mitigation Action/Initiative:

Purchase/Install of Generator for municipal critical facilities

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Will help these locations operate as emergency shelters.
Property Protection	1	Will maintain critical equipment during power outage, without having to bring in mobile unit.
Cost-Effectiveness	1	Benefits would be high, for a medium cost project.
Technical	1	There are no technical barriers to installing back-up generators at the Town Hall or High School.
Political	0	
Legal	0	The Town has legal authority to implement the project work.
Fiscal	0	The project will be funded under existing program budgets and funding from the County and another source such as grants.
Environmental	0	No environmental impacts anticipated.
Social	0	No social impacts anticipated.
Administrative	1	The Town has the personnel and administrative capabilities to install and maintain the generators.
Multi-Hazard	1	The action addresses all hazards.
Timeline	1	The project can be completed within 5 years.
Agency Champion	1	The Town Board has shown strong support for this project.
Other Community Objectives	0	
Total	8	
Priority (High/Med/Low)	High	



Name of Jurisdiction: Town of Warrensburg
Name and Title Completing Worksheet: Chris Belden, Zoning Administrator
Action Number: WT-5
Mitigation Action/Initiative: Culvert/Roadway Improvements

Assessing the Risk	
Hazard(s) addressed:	Severe Storm, Flooding
Specific problem being mitigated:	Undersized culverts and failing, flood prone roadway segments
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	1. Improve culverts and increase flow capacity. 2. Replace culverts in kind
Action/Project Intended for Implementation	
Description of Selected Action/Project	Upsize Cross Road culvert. Roadway elevation and culvert improvement at Swan Street. All mitigation efforts shall be made in consideration of Federal and State directives to mitigate critical infrastructure to address protection to the 500-year flood event or “worst damage scenario”.
Action/Project Category	SIP
Goals Met	1, 3
Applies to existing and or new development, or not applicable	Existing
Benefits (losses avoided)	High – protect roadway from future flooding and washouts
Estimated Cost	Medium
Priority*	High
Plan for Implementation	
Responsible Organization	Town Board; Highway Dept.
Local Planning Mechanism	The administration of this project will be added to Highway Department’s annual work plan.
Potential Funding Sources	CHIPS – Consolidated Local Street and Highway Improvement Program
Timeline for Completion	Short
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:



Action Number: WT-5
Mitigation Action/Initiative: Culvert/Roadway Improvements

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Reduction in flooding will improve emergency response time and ability of residents to escape dangerous situations.
Property Protection	1	Will protect vehicles and homes of motorists and adjacent landowners.
Cost-Effectiveness	1	Benefits would be high, for a medium cost project.
Technical	1	There are no technical barriers to completing the culvert and roadway improvements.
Political	0	
Legal	0	The Town has legal authority to implement the project work.
Fiscal	0	The project will be funded under existing program budgets and funding from the County and another source such as grants.
Environmental	1	Reducing the possibility of roadway flooding will further prevent soil erosion.
Social	0	No social impacts anticipated.
Administrative	1	The Town has the personnel and administrative capabilities to complete installation/repair and maintain the improvements.
Multi-Hazard	1	The action addresses the severe storm and flood hazards.
Timeline	1	The project can be completed within 5 years.
Agency Champion	1	The DPW has shown strong support for this project.
Other Community Objectives	0	
Total	9	
Priority (High/Med/Low)	High	



Name of Jurisdiction:	Town of Warrensburg
Name and Title Completing Worksheet:	Chris Belden, Zoning Administrator
Action Number:	WT-6
Mitigation Action/Initiative:	Site and install fourth public water well

Assessing the Risk	
Hazard(s) addressed:	Loss of potable water
Specific problem being mitigated:	Adding public water well in different location
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	There are no practical, feasible alternatives to installing an additional well to serve this region that is well-water serviced.
Action/Project Intended for Implementation	
Description of Selected Action/Project	Investigate potential locations and install a fourth public water well in the Town of Warrensburg.
Action/Project Category	SIP
Goals Met	1
Applies to existing and or new development, or not applicable	New
Benefits (losses avoided)	High – avoid total loss of potable public water in the case of failure of other wells
Estimated Cost	Medium
Priority*	High
Plan for Implementation	
Responsible Organization	Town Board, DPW
Local Planning Mechanism	The administration of this project will be add to the Town DPW’s annual work plan.
Potential Funding Sources	Town Board
Timeline for Completion	Short
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:



Action Number:

WT-6

Mitigation Action/Initiative:

Site and install fourth public water well

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	If issues arise with existing 3 wells, fourth would afford greater water security.
Property Protection	1	Access to water is improved.
Cost-Effectiveness	1	Benefits would be high, for a medium cost project.
Technical	1	There are no technical barriers to installing a new well.
Political	0	
Legal	0	The Town has legal authority to implement the project work.
Fiscal	0	The project will be funded under existing Town program budgets and by County or State grants.
Environmental	1	Currently 3 wells are located nearby, if something were to happen town water would be compromised.
Social	1	Providing clean water is necessary.
Administrative	1	The Town has the personnel and administrative capabilities to complete the well installation and maintenance.
Multi-Hazard	1	Area where 3 wells are located could be compromised by many natural or man-made disasters.
Timeline	1	The project can be completed within 5 years.
Agency Champion	1	The DPW has shown strong support for this project.
Other Community Objectives	0	
Total	10	
Priority (High/Med/Low)	High	



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ACRONYMS AND ABBREVIATIONS

This resource identifies the acronyms and abbreviations used in or support the risk assessment document. These are based on documents included in the reference section, with modifications as appropriate to address the Warren County specific identifications and requirements.

ALSFR	Advanced Life Support First Responder
BFE	Base Flood Elevation
BCA	Benefit Cost Analysis
BOCA	Building Officials Code Administration
CDC	Center of Disease Control
CPC	Climate Prediction Center
CFR	Code of Federal Regulations
CRREL	Cold Regions Research and Engineering Laboratory
CRS	Community Rating System
CDMS	Comprehensive Data Management System
CEMP	Comprehensive Emergency Management Program
DI s	Damage Indicators
DOD	Degrees of Damage
DPW	Department of Public Works
DEM	Digital Elevation Model
DFIRMs	Digital Flood Insurance Rate Maps
DR	Major Disaster Declaration (FEMA)
DMA 2000	Disaster Mitigation Act of 2000
EFS	Enhanced Fujita Scale
EM	Emergency Declaration (FEMA)
EMS	Emergency Medical Services
EOC	Emergency Operation Center
EOP	Emergency Operation Plan
FEMA	Federal Emergency Management Agency





FDRA	Fire Danger Rating Area
FD	Fire Department
FPI	Fire Potential Index
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
FM	Fuel Moisture
FMA	Flood Mitigation Assistance Program
FPA	NFIP Floodplain Administrator
GIS	Geographic Information System
HAZUS	Hazards U.S.
HAZUS-MH	Hazards U.S. Multi-Hazard
HAZMAT	Hazardous Materials
HAZNY	Hazards New York
HMGP	Hazard Mitigation Grant Program
HMP	Hazard Mitigation Plan
IT	Information Technology
KBDI	Keetch-Byram Drought Index
LCSN	Lamont-Doherty Cooperative Seismographic Network
LEPC	Local Emergency Planning Committees
LWRP	Local Waterfront Revitalization Program
MRP	Mean Return Period
MSL	Mean Sea Level
Mi	Mile
MGD	Million Gallons per Day
Mph	Miles per Hour
MRCC	Midwest Regional Climate Center
NCDC	National Climate Data Center
NEHRP	National Earthquake Hazard Reduction Program



NFDRS	National Fire Danger Rating System
NFIP	National Flood Insurance Program
NHC	National Hurricane Center
NID	National Inventory of Dams
NIMS	National Incident Management System
NOAA	National Oceanic and Atmospheric Administration
NPDP	National Performance of Dams Program
NSSL	National Severe Storms Library
NWS	National Weather Service
NYGIS	New York Geographic Information System
NYS	New York State
NYSC	New York State Climate Office
NYSDEC	New York State Department of Environmental Conservation
NYSDHSES	New York State Department of Homeland Security & Emergency Services
NYSDOH	New York State Department of Health
NYSDOS	New York State Department of State
NYSDOT	New York State Department of Transportation
NYSERDA	New York State Energy Research and Development Authority
NYSFSMA	New York State Floodplain and Stormwater Managers Association
NYSHMP	New York State Hazard Mitigation Plan
NYSHCR	New York State Homes and Community Renewal
NYS OFP&C	New York State Office of Fire Prevention and Control
N/A	Not Applicable
NA	Not Available
OEM	Office of Emergency Management
ONJSC	Office of the New Jersey State Climatologist
%	Percent
%g	Percent Acceleration Force of Gravity



PD	Police Department
PDM	Pre-Disaster Mitigation Program
PGA	Peak Ground Acceleration
Pop.	Population
RSI	Regional Snowfall Index
RLP	Repetitive Loss of Property
RCV	Replacement Cost Value
Q3	Quality 3
SRL	Severe Repetitive Loss
SPC	Storm Prediction Center
SP	Spectral Acceleration
Sq. Mi.	Square mile
SWOO	Strengths, Weaknesses, Obstacles and Opportunities
SFHA	Special Flood Hazard Area
TBD	To Be Determined
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USDOT	U.S. Department of Transportation
USD	U.S. Dollar
USEPA	U.S. Environmental Protection Agency
USFA	U.S. Fire Administration
USGS	U.S. Geological Survey
VAC	Volunteer Ambulance Corps
WWTP	Wastewater Treatment Plant
WFAS	Wildland Fire Assessment System
WUI	Wildland-Urban Interface
WCT	Wind Chill Temperature Index

Appendix A: Sample Resolution of Plan Adoption

This appendix includes an example resolution to be submitted by Warren County and participating jurisdictions authorizing adoption of the Warren County Hazard Mitigation Plan Update.

RESOLUTION NO. XXXX-XX

**A RESOLUTION OF THE Governing Body OF THE Jurisdiction Name
AUTHORIZING THE ADOPTION OF THE
2016 WARREN COUNTY, NY HAZARD MITIGATION PLAN UPDATE**

WHEREAS, all jurisdictions within Warren County have exposure to natural hazards that increase the risk to life, property, environment, and the County and local economy; and

WHEREAS; pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, The Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre and post disaster hazard mitigation programs; and

WHEREAS; a coalition of Warren County municipalities with like planning objectives has been formed to pool resources and create consistent mitigation strategies within Warren County; and

WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy;

NOW, THEREFORE, BE IT RESOLVED that the **[jurisdiction name]**:

- 1) Adopts in its entirety, the 2016 Warren County Hazard Mitigation Plan Update (the “Plan”) as the jurisdiction’s Natural Hazard Mitigation Plan, and resolves to execute the actions identified in the Plan that pertain to this jurisdiction.
- 2) Will use the adopted and approved portions of the Plan to guide pre- and post-disaster mitigation of the hazards identified.
- 3) Will coordinate the strategies identified in the Plan with other planning programs and mechanisms under its jurisdictional authority.
- 4) Will continue its support of the Mitigation Planning Committee as described within the Plan.
- 5) Will help to promote and support the mitigation successes of all participants in this Plan.
- 6) Will incorporate mitigation planning as an integral component of government and partner operations.
- 7) Will provide an update of the Plan in conjunction with the County no less than every five years.

PASSED AND ADOPTED on this Xst, Xnd, Xrd, Xth day of MONTH, 2016, by the following vote:

AYES:
NOES:
ABSENT:
ABSTAIN:

ATTEST:

Mayor, Town/Village of _____

Clerk, Town/Village of _____

This appendix includes meeting agendas, sign-in sheets and minutes (where applicable and as available) for meetings convened during the development of the 2016 Warren County Hazard Mitigation Plan Update.



WARREN COUNTY HAZARD MITIGATION PLAN
Pre-Project Kick-Off Meeting – Agenda
May 22, 2015



- Introductions

- Project Schedule – *Discrepancy in RFP*
 - Spring 2015 Project Initiation / Contract Executed
 - Conduct formal needs and risk assessment
 - Participating partners conduct HAZNY Assessment
 - Participating partners collect additional data and information
 - Summer 2015 Development of Plan
 - Dec. 1, 2015 NYS DHSES expects Draft*
 - Dec. 1, 2015 Presentation of Draft Plan to the Steering Committee and Planning Partnership
 - Dec. 8, 2015 Steering Committee and Planning Partnership review complete
 - Dec. 16, 2015 Start of the 30-day public comments of Draft Plan
 - Jan. 1, 2016 FEMA expects Draft*
 - January 26, 2016 Presentation of Draft Plan to NYS DHSES
 - March 1, 2016 Revise and finalize Plan to ensure compliance with Federal and State requirements
 - April 1, 2016 Presentation of Final Plan to participating partners
 - May 1, 2016 Presentation of Final Plan to NYS DHSES
 - June 15, 2016 FEMA expects Final*

- Steering Committee – Per RFP, established and convened
 - Office of Emergency Services
 - Warren County Soil and Water Conservation District
 - Planning & Community Development
 - Public Works
 - Information Technology
 - Economic Development
 - Other key stakeholders?

- Meetings to be Established
 - Steering Committee #1
 - Municipal Kick-Off Meeting
 - Local Data Collection Support Meetings

- Municipal Participation –
 - Invitation
 - Letters of Intent to Participate?





WARREN COUNTY HAZARD MITIGATION PLAN UPDATE
SIGN-IN SHEET
TOPIC: Meeting with County Project Management Team
MEETING DATE: May 22, 2015



Name	Title	Agency/Municipality/Department	Phone Number	E-mail
JONATHAN ROSEN	PROJ. MGR.	TETRA TECH, INC.	(973) 630-8042	JONATHAN.ROSEN@TETRA TECH.COM
BRIAN LAFLURE	DIRECTOR	WC OES	518-361-0132	LAFLURE@CO.WARREN.NY.GOV
Amy Hirsch	Emer. Serv. Coord.	WC OES	518-761-6490	hirsch@WarrenCountyny.gov
Jim Lieberman	Board M. Coord.	WC SWCD	518-623-3119	Jim9@nycap.nj.com
Ashley Leemans	cons. intern	WC SWCD	518-623-3119	SWCDintern1@nycap.nj.com



WARREN COUNTY HAZARD MITIGATION PLAN 2015 UPDATE

Municipal Kick-Off Meeting – Agenda

Friday, June 19, 2015



- Welcoming Remarks and Introductions
- Updating the Mitigation Plan – Why?
- Schedule
- Role of the Municipal and County Participants
- Planning Process
 - Organize Resources
 - Re-assess Risk
 - Review and Update HMP
 - Implement Plan and Monitor Progress
- In-Kind Tracking
- Action Items
 - Return Letter of Intent to Participate
 - Confirm Local Floodplain Administrator and Contact Information Today
 - Worksheets – Found on your CD; Complete electronic Word versions and send to Jonathan Raser by the week of July 6, 2015
- Upcoming Mandatory Meetings
 - Municipal Workshops – Spring 2015
 - FEMA Mitigation Strategy Meeting – late Spring/Summer 2015
- Questions and Answers

Project Contacts

Tetra Tech:

Jonathan Raser, CFM
Tetra Tech, Inc.; 1000 The American Road; Morris Plains, NJ 07950
(973) 630-8042
jonathan.raser@tetrattech.com



WARREN COUNTY HAZARD MITIGATION PLAN UPDATE
 Municipal Kick-Off Meetings - June 19, 2015
 Sign-In Sheet



Name	Title	Agency/Municipality	Phone Number	E-mail
Amy Hirsch	Em. Serv. Coord	Warren Co OES	761-6490	hirsch@warrencountyny.gov
Gene Merlino	Supervisor	Lake Luzerne	361-2404	Supervisor@lake.luzerne.ny.gov
Dennis L. Dickinson	Sir	Lake George	796-0400	Dennis.Dickinson@NYCAP.rr.com
Matthew J. Simpson	Supervisor	Horicon	494-3647	supervisor@horiconny.gov
Edna A. Frasier	Supervisor	Hague	543-6161	supervisor@townofhague.org
Bud Taylor	Supervisor	Glen Falls	361-0445	btaylor@roadrunner.com
Ron Chiarof	Supervisor	Albion Falls	791-9836	danjg99@gmail.com
Fred Monro	Supervisor	Chester	796-2415	fmonro2@gmail.com
Kim Conover	Supervisor	Boften	694-2461	Supervisor@Town.Boften.ny.gov
KEVIN B. GERAGHTY	SUPERVISOR	WARRENSBURG	518-623-9511	KEVIN.GERAGHTY@TOWN OF WARRENSBURG.NY.GOV
Cynthia Wood	Supervisor	Thurman	623-9649	thurman@supervisor@verizon.net
Frank Thomas	Supervisor	Stony Creek	696-3575 Ext 302	thomas@supervisor@stonycreek.com
TETA STROUGHT	SUPERVISOR	QUEENSBURY	761-8229	physSupervisor@queensbury.net
SRIAN LAFLURE	DIRECTOR	WC OES	761-6537	SRIAN@WC.OES.NY.GOV
Jim Lieberman	District Manager	WCSWCD	623-3119	jim99@nycap.rr.com
Dean L. Moore	Sr. District Technician	WCSWCD	623-3119	dmoore@nycap.rr.com

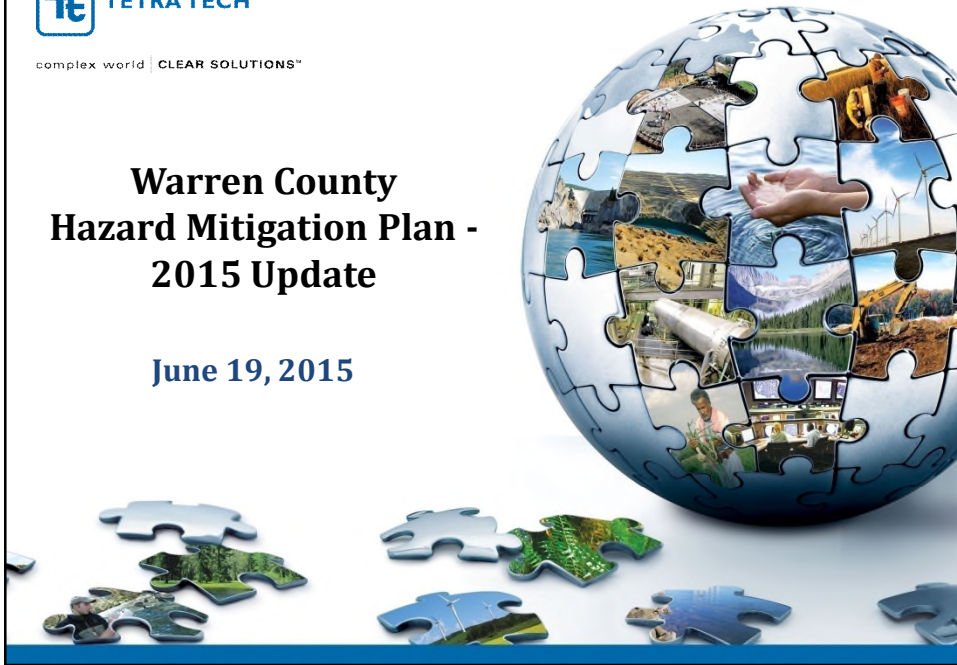




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Warren County Hazard Mitigation Plan - 2015 Update

June 19, 2015



Today's Topics

- Introductions
- Purpose for a Hazard Mitigation Plan
- Updating a Hazard Mitigation Plan
- Schedule
- Participation Expectations
- Planning Process
- Action Items



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Hazard Mitigation

“Mitigation” -

Sustained action taken to reduce or eliminate long-term risk to life and property from a hazard event



“provides the blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and local ability...” (CFR).

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Warren County and DMA 2000

The mitigation plan update will:

- Help the County prepare for and mitigate the effects of disasters.
- Build more resilient communities.
- Continue to allow the county and participating partners to be eligible for pre- and post-disaster recovery and mitigation funding.
 - Public Assistance Funding
 - Post-Disaster Reimbursement for Permanent Work (Categories C-G)
 - Post-Disaster Mitigation for Damaged Structures/Infrastructure (406 Mitigation)
 - Pre-Disaster Mitigation Grant Funding (404 Mitigation)
- Support National Flood Insurance Program (NFIP) compliance and, potentially, policy rate reduction efforts

A **Local Mitigation Plan** demonstrates the jurisdiction's commitment to reducing risk and serves as a guide for decision makers as they commit resources to minimize the effects of natural hazards.

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Requirements for Local Mitigation Plan Updates

- Updated Risk Assessment - a factual basis for activities proposed in the Mitigation Strategy section include:
 - Overview of hazards (type, location, probability)
 - Vulnerability analysis (impact on buildings, infrastructure, economy, development trends)
 - Multiple jurisdictions (specific to each city/town/village)
- Updated Mitigation Strategy – a blueprint for reducing losses identified in the risk assessment
- Include the opportunity for public comment and for relevant agency and stakeholder involvement
- Plan Maintenance and Adoption Processes

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Plan Document

- Volume 1 will contain all information that applies to the whole planning area (county) such as description of the planning process, risk assessment, goals and objectives, County/multi-jurisdictional mitigation strategies and a plan maintenance program.
- Volume 2 will contain those elements that are “jurisdiction specific”. Your community’s chapter. These annexes will meet DMA requirements for each jurisdiction.

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Plan Update Process Steps

- Organize Resources
- Re-Assess the Risk
- Review and Update the Mitigation Plan
- Develop Procedures for Plan Implementation, Monitoring and Update
- NYS DHSES / FEMA Approval
- Adopt the Plan

Engage a Wide Range of "Stakeholders"

- Federal, State, Regional and Local Agencies
- Business and Civic Groups
- Academic Institutions
- Other "local governments"
- The Public



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Organization of the Planning Group

- County Management Team (Soil and Water Conservation District and Office of Emergency Services)
- Contract Consultant (Tetra Tech)
- Steering Committee
- Municipal Planning Partnership
- Stakeholders (e.g. academic, police, fire, health care, business/industry, utilities)
- General Public

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Municipal Planning Partnership

- All municipalities are encouraged to participate to maintain DMA2000 coverage.
- FEMA has greatly expanded their scrutiny of “participation”... Municipalities are required to actively participate.
- All municipalities who wish to join the update process **must formally indicate their intent to participate** with a Letter of Intent to Participate.

Letters of Intent to Participate

Your Letter of Intent to Participate (LOIP) for your community are due ASAP to the County. Copies will be included in the HMP.

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Municipal Participation

- Attend planning partnership meetings/workshops
- Provide data and information in a timely manner
- Support public and stakeholder outreach in your jurisdiction
- Provide outreach and encourage involvement of property owners in floodplains
- Assist with the development of your jurisdictional annex
- Review and provide feedback on Draft and Final Plan documents
- Facilitate the adoption process – Governing Body must pass an Adoption Resolution once the plan is approved by FEMA
- Implement and Maintain the Plan

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Assemble Your Municipal Mitigation Team

*Here is who we suggest you include as part of your
Hazard Mitigation Planning team:*

- Floodplain Administrator
- Building Code Official
- Municipal Engineer
- Land Use Planner
- Municipal Clerk
- Municipal Mayor/Administrator
- Municipal CFO/Fiscal Rep
- Public Works Director
- Police Official
- Fire Official

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Municipal Participation Support

Municipal Involvement will be encouraged and promoted by:


- Three formal municipal planning partnership meetings (Kick-Off Meeting (today), FEMA Mitigation Strategy Workshop, Annex Completion Workshop)
- Data collection and annex tools, templates, surveys
- Local Data Collection Workshops (scheduled week of July 6th)
- Completion of Municipal Annex supports “buy in” and “ownership”
- Planning process execution and municipal training programs designed to build local capability
- Local public outreach including RL/SRL flood structure outreach

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Data Collection Worksheets



WARREN COUNTY HAZARD MITIGATION PLAN UPDATE
Outline of Worksheets on the CD



Please work with your municipal planning team and bring updated versions of worksheets to your local data collection meeting the week of July 6th. Questions? Please contact:
Jonathan Raser
Phone: (973) 630-8042 Email: jonathan.raser@tetrattech.com

#	Worksheet Name	Who is Responsible to Complete and Submit this Worksheet?	Where do you find the requested information?
1	Events/Losses	OEM, Police, Fire, DPW, Engineer	FEMA Project Worksheets (PWs) DPW records, Police response records
2	Capability Assessment	Code Official, Planner, CFO/Fiscal Rep, Clerk	Code Book, e-Code, Municipal ordinances, Master Plan
3	NFIP Floodplain Administrator	Floodplain Administrator	NFIP Records
4	Mitigation Action Progress	HMP Main POC – see "Responsible Party" column in the table provided for guidance	LOIs, NYS DHSES Grants, Capital Improvement records
5	Plan Integration Questionnaire	HMP Main POC	Discuss with Engineer, Clerk, Administrator, Planner, CFO, and Municipal Mayor/Administrator
6	New Development Table	Engineer, Planner, Building Department	Redevelopment Plans, Permits

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Re-Assess the Risk



These are the Five Steps to Assess Risk:

1. Identify Hazards
2. Profile Hazards
3. Inventory Assets
4. Estimate Losses
5. Evaluate Mitigation Options

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Assess the Risk – Hazard of Concern Identification

Hazards of Concern (HOCs)- Those natural hazards that pose significant risk to the Planning Area – and we can address through mitigation rather than only through preparedness, response and recovery.

- Review and update the “hazards of concern” that we will carry through the planning process.
- Our effort should be proportional to the risk the hazards pose.
- Each municipality has differing risk to the HOCs.
- We are generally limiting this plan to natural hazards:
 - Flood (riverine, ice jam, flash, urban/stormwater)
 - Severe Storm (wind, hail, lightning)
 - Severe Winter Weather (heavy snow, blizzard, ice storm)
 - Infestation (e.g. beavers, Emerald Ash Borer)
 - Wildfire
 - Earthquake – could include damage to dams



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Assess the Risk – Hazard Profiling (Worksheet #1 on your CD)

- Hazards are profiled (characterized) according to:
 - Background and local conditions
 - Historic frequency and probability of occurrence
 - Severity
 - Historic losses and impacts
 - Designated hazard areas
- What hazard events have occurred since the 2011 Plan?
- What County and local losses have occurred as a result of these events?



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Worksheet #1 on CD Events and Losses



WARREN COUNTY HAZARD MITIGATION PLAN 2015 UPDATE
Worksheet #1 – Events and Losses



Please work with your municipal planning team and bring updated versions of worksheets to your local data collection meeting the week of July 6th. Questions? Please contact:
Jonathan Raser, CFM
Phone: 973-630-8042 E-mail: jonathan.raser@tetratech.com

Municipality: _____

Who can provide information about events and losses: OEM Coordinator, Police, Fire, DPW, building inspector, municipal engineer. Refer to FEMA Project Worksheets (PWs), DPW records, police response records, etc.

In the table below, please identify events in which your community suffered significant damages/losses and describe these losses (e.g., flooded roads, road closures, DPW/Police overtime, debris management, opened shelter for two days, etc.). Please add other non-declared events that affected your community that are not listed.

Then, please fill out an 'Event and Loss Summary Sheet' for the April 2011 event, May 2011 event, and Hurricane Irene. Feel free to add additional sheets for other major events that impacted your community.

If your community suffered significant damages/losses from this event, indicate "Yes" and complete an Event Loss Summary Sheet.

Date of Event	Event Type (Disaster Declaration if applicable)	Warren County Designate (Y/N)	Did your community suffer losses/losses from this event? (Yes/No - If "yes" please complete an Event Loss Summary Sheet for this event)	Notes on damages within County
March 23, 2010	Severe Storms and Flooding (DR-1899)	Yes		Flooding from a severe rain storm caused damage to many roads in the northern portion of the County.
March 10-14, 2011	Ice Jam	N/A		Several neighborhoods were evacuated as a result of this ice jam.
April 27-28, 2011	Severe Storms, Flooding, Tornadoes and Straight-Line Winds (DR-1993)	Yes	<i>Note: All should fill out an Event Loss Summary sheet for this event.</i>	Flooding occurred along the Hudson River in Warren County from North River southward to the Saratoga County line. Numerous reports of flooding. The County had approximately \$676,000 in damages. Nearly two-thirds of the County was damaged.

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Worksheet #1 on CD Events and Losses (Continued)



WARREN COUNTY HAZARD MITIGATION PLAN 2015 UPDATE
Worksheet #1 – Events and Losses



Event and Loss Summary Sheet
DR-1993 April 27-28, 2011

Event Date and Description (incl. DR# if applicable): _____

Life Safety (evacuation, sheltering, injuries, deaths):

Loss of Service (e.g. road closures, utility outages, commercial closures – include location, time of closure and/or number of affected):

Infrastructure Damage (e.g. roads, bridges, culverts, treatment facilities, lift stations, etc.):

Facility/Structural Damage – Public (e.g. police, school, etc.):

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Assess the Risk – Inventory Assets

What is at risk? People, Property, Economy, Environment

- Population and Demographics – Has this changed since 2011?
- Building Stock (Residential, Commercial, Industrial, Educational, etc.) – Has this changed since 2011?
- Facilities (critical and essential facilities, utilities, transportation features, high-potential loss facilities and user-defined facilities)
 - Police, Fire, Emergency Services
 - Hospitals and Medical Care Facilities
 - Schools and Care Facilities
 - Sheltering Facilities
 - Infrastructure (Transportation Systems, Utilities)



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Assess the Risk – Estimate Losses

- Vulnerability Assessment - What do we predict our suffering to be if we do nothing to mitigate our risk:
 - Given current conditions, which have changed since 2011?
 - Given our improved understanding of risk, and tools to assess that risk, which have changed since 2011?



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Assess the Risk – Evaluate Mitigation Options

➤ Re-evaluate Hazard Mitigation Goals and Objectives

Goals: General guidelines that state what we want to achieve.
Should be consistent with the State goals and other local goals.

Example: “Protect property”

Objectives: Define strategies or implementation steps to attain a stated goal.

Example: “Enact or enforce regulatory measures that ensure new development will not increase flood threats to existing properties”.



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Assess the Risk – Evaluate Mitigation Options

➤ Evaluate Capabilities

What resources do we have at our disposal to Mitigate Risk?

“Proposed mitigation actions will be evaluated against the backdrop of what is feasible in terms of your government’s legal, administrative, fiscal and technical capacities”
(FEMA 386-3)

- Serve to identify legal authority and administrative, technical and fiscal capabilities in the state, county and jurisdictions that will facilitate or hinder hazard mitigation goals and objectives.
- State Capability Assessment is in the State HMP
- Part of this Planning Process is to build County and Local Mitigation Capabilities
- Training, Workshops and Seminars

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Capability Assessments (Worksheet #2 on CD)

Please work with your planning team and bring updated versions of worksheets to your local data collection meeting the week of July 6th.

- Building Code Official
- Municipal Engineer
- Land Use Planner
- Municipal Clerk
- Floodplain Administrator
- CFO/Fiscal Representative

WARREN COUNTY HAZARD MITIGATION PLAN 2015 UPDATE
Worksheet #2 - Municipal Capability Assessment

Please work with your municipal planning team and bring updated versions of worksheets to your local data collection meeting the week of July 6th. Questions? Please contact:
Jonathan Raser
Phone: 973-630-8042 E-mail: jonathan.raser@tetratech.com

Municipality: _____

1. **Planning and Regulatory Capability:** Please indicate whether the following planning or regulatory tools and programs are currently in place or under development for your jurisdiction by placing an "X" in the appropriate box, followed by the date of adoption/update. Then, for each particular item in place, identify the department or agency responsible for its implementation. In addition, indicate the code chapter, and name of plan including any explanation of authority in the right-most column.

Who can assist with completing this table: Municipal Planner, Clerk, Code Official. Refer to your municipal codes and ordinances, Master Plan.

Tool / Program (code, ordinance, plan)	Do you have this? (Yes/No) If yes, date of adoption or update	Authority (local, county, state, federal)	Regg. /Agency Responsible	Code Citation and Comments (Code Chapter, name of plan, explanation of authority, etc.)
Planning Capability				
Master Plan				
Capital Improvements Plan				
Floodplain Management / Main Plan				
Stormwater Management Plan				

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NFIP Compliance

We need the NFIP Floodplain Administrator Involved!

- We need to know specific information about the NFIP program in your community.
- Your NFIP Floodplain Administrator (FPA) MUST be actively involved in the update process.
- NFIP Administrator to work with Tetra Tech to complete **Worksheet #3** (best done in a short interview – live or phone)

WARREN COUNTY HAZARD MITIGATION PLAN UPDATE
Worksheet #3 - NFIP Floodplain Administrator Questionnaire

Please work with your municipal planning team and bring updated versions of worksheets to your local data collection meeting the week of July 6th. Questions? Please contact:
Jonathan Raser, CFM
Phone: (973) 630-8042 Email: jonathan.raser@tetratech.com

Municipality: _____

NFIP Floodplain Administrator Name/Title: _____

Flood Vulnerability Summary

- Does the municipality maintain lists/inventories of properties that have been flood damaged? If so, does this inventory identify property owners who are interested mitigation (e.g. elevation, acquisition)?
- Characterize/quantify the number of structures damaged during Floyd, Irene, Sandy or other events. If possible, can you provide a table of these structures indicating the number of residential / commercial / industrial?
- Do you make Substantial Damage estimates, and how many were declared for Sandy or other events?

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Update, Identification and Analysis of Mitigation Actions

- Mitigation strategies need to be realistic, achievable and action-oriented.
- Will include both regional (county-wide) strategies, as well as jurisdiction-specific.
- For each proposed mitigation strategy, the following will be identified:
 - Implementation timeline
 - Estimated budget
 - Potential funding sources
 - Lead agency or department
 - Supporting agencies
 - Priority
 - For prior/old strategies provide update of status
- Proposed mitigation activities are evaluated using a Cost-Benefit Screening



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Update Progress on 2011 Actions

- Identify progress made on mitigation actions identified in 2011 plan.
- If an action wasn't completed, why not?
- This strategy review process is NOT meant to blame or punish. The answer can reveal things that need to be addressed to allow mitigation to progress, for example:
 - Obstacle: We do not have the technical resources to prepare a grant application.
 - Possible Action: Develop a county-level support team trained in application development.

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Update Progress on 2011 Actions (Worksheet #4 on CD)

Please work with your planning team and bring updated versions of worksheets to your local data collection meeting the week of July 6th.

DUTCHESS COUNTY HAZARD MITIGATION PLAN UPDATE
Worksheet #4 - Mitigation Action Review Worksheet for XXXX

Please complete responses below and send electronic Word version by March 27, 2015 to:
 Jonathan Raser
 Phone: 973-630-8044 E-mail: jonathan.raser@ttratech.com

Who can provide you information about past mitigation actions: See the 'Responsible Party' column in the table below which identifies who put this action in the 2011 HMP (e.g., DPW, Engineer, Code Official, Planner, OEM Coordinator).

Please use the following table to indicate progress and next steps on your community's mitigation strategy identified in the 2010 HMP. Please be as detailed as possible.

2010 Mitigation Action	Responsible Agency	Status (In progress, No progress, Complete)	Describe Status 1. Please describe what was accomplished and indicate % complete. 2. If there was no progress, indicate what obstacles/delays encountered? 3. If there was progress, how/why was the action being hindered (e.g., FEMA HMR grant, local budget)?	Next Step (Include in 2015 HMP or Discontinue)	Describe Next Step 1. If including action in the 2015 HMP, revise/reword to be more specific (as appropriate). 2. If discontinue, explain why.
<i>Example: Elevate Main Street Bridge</i>	DPW	No Progress	1. 80% complete 2. Budget and personnel constraints have restricted this action from moving forward 3. No funding secured	Include in 2015 HMP	1. Elevate Main Street Bridge above the base flood elevation. 2. If you chose "Discontinue," here is an example: <i>The Town does not have the authority to retrofit this bridge; it is owned by the State.</i>
	Choose an item	1. 2. 3.		Choose an item	1. 2.

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New Mitigation Actions for 2015 HMP Update

- Opportunity to add new mitigation actions
- This includes all in-progress grant applications (FEMA or other related grant programs)
- Proposed mitigation actions should address identified vulnerabilities
- FEMA's Mitigation Workshop
– September 2015



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Types of Mitigation Actions

- **Plans and/or Regulations.** Measures such as zoning and building code, ordinances, planning (comprehensive/master plans, stormwater management plans, open space), hazard/risk insurance (e.g. NFIP).
- **Property Protection.** Measures such as acquisition, elevation, relocation, structural retrofits, storm shutters, rebuilding, barriers, floodproofing.
- **Public Education and Outreach.** Measures such as public awareness projects, real estate disclosure, hazard information centers, technical assistance.
- **Natural Resource Protection.** Measures such as erosion and sediment control, stream corridor protection, vegetative management, wetlands preservation.

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Plan Implementation

- Your mitigation strategy section provides a “blueprint” to follow for progressively reducing your community’s natural hazard risk.
- It will include two types of initiatives/projects – those that your community can “self fund”, and those that will require outside (e.g. grant) funding.
- Mitigation grant opportunities open regularly:
 - The annual HMA grant window opens in June of each year (now!).
 - HMGP funding comes in the wake of Declared Disasters in the State.

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Integration with Other Plans and Programs

The Hazard Mitigation Plan should complement and support other Plans and Regulatory Mechanisms

- Emergency Operations Plan (EOP) / Comprehensive Emergency Management Plans (CEMP)
- Master Plans (regional and local) – these plans guide and direct land use and development
- Capital Improvement Plans (some of these projects are grant eligible)
- Higher Regulatory Standards (e.g. increased free-board, cumulative substantial damages)
- Stormwater Management Plans

Plan Integration (Worksheet #5 on your CD)

- For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. We need to gather an understanding of your community's progress in plan integration, as well identify potential integration opportunities that you may pursue in the future.
- Circulate to your "team" to complete. Please expand on your answers when appropriate!

WARREN COUNTY HAZARD MITIGATION PLAN UPDATE Worksheet #5 - Capability Assessment and Plan Integration	
 	
Municipality: _____	
<p>For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. We would like to gather an understanding of your community's progress in plan integration, as well identify potential integration opportunities that your community may pursue in the future.</p> <p>Who can assist with completing this table: The HMP main point of contact should discuss with the Engineer, Clerk, Mayor/Administrator, Planner, CFO</p>	
Applicable Department/Agency	Plan, Program, Mechanism, etc.
Planner (staff or contract); Planning Board; Zoning Board of Adjustments	Planning
	Does your municipality have a Master/Comprehensive Plan (land-use plan), or are you currently working on an update of your Master/Comprehensive Plan?
	If so, does it include, or are you considering, areas of natural hazard risk (e.g. flood-prone areas, steep slopes)?
	Does your Master/Comprehensive plan refer to a local or Countywide Hazard Mitigation Plan?

New Development (Worksheet #6 on your CD)

- Please indicate any major new development since 2011 AND any known or anticipated major new residential/commercial development and major infrastructure development that are identified for the next five (5) years in your municipality.

WARREN COUNTY HAZARD MITIGATION PLAN UPDATE
Worksheet #6 - Potential New Development

Please work with your municipal planning team and bring updated versions of worksheets to your local data collection meeting the week of July 6th. Questions? Please contact:
 Jonathan Raser, EFM
 Phone: 973-630-8042 E-mail: jonathan.raser@tetratech.com

Municipality: _____

Please indicate any recent development within your community from 2010 to present. Additionally, please indicate known or anticipated major residential and/or commercial development and major infrastructure development that are identified for the next five (5) years in your community.

Property or Development Name	Type (e.g. Res., Comm.)	# of Units / Structures	Address and Block/Lot	Known Hazard Zone(s)	Description/Status of Development
Recent Development from 2010 to Present					

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Schedule

- Municipal Kick-Off Meeting: June 19, 2015
- Municipal Data Collection –
Local Support Meetings: Week of July 6-9, 2015
- FEMA Mitigation Workshop: September 2015
- Draft Plan to NYS DHSES: January 1, 2016
- Municipal Annex Completion Workshop: January 2016
- Final Plan to State and FEMA Region II: May 1, 2016
- County and Municipal Plan Adoption: Summer 2016

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Local Data Collection Meetings - July 6-9

Bring your whole local planning team, your draft worksheets, and your questions/concerns

Time	6-Jul	7-Jul	8-Jul	9-Jul	10-Jul
8:30-10:30		Warren County @ SWCD			
11:00 - 1:00	Towns of Stony Creek and Thurman	Towns of Warrenburg and Lake Luzerne	Town and Village of Lake George	Town of Johnsbury	
	Thurman Town Hall	Wsbjg Town Hall	LG Town Hall	Johnsbury Town Hall	
2:00 - 4:00	Town of Bolton	Towns of Horicon/Chester/Hague	Town Queensbury	City of Glens Falls	
	Bolton Town Hall	Horicon Town Hall	Supervisors Conf Room	WWTP	

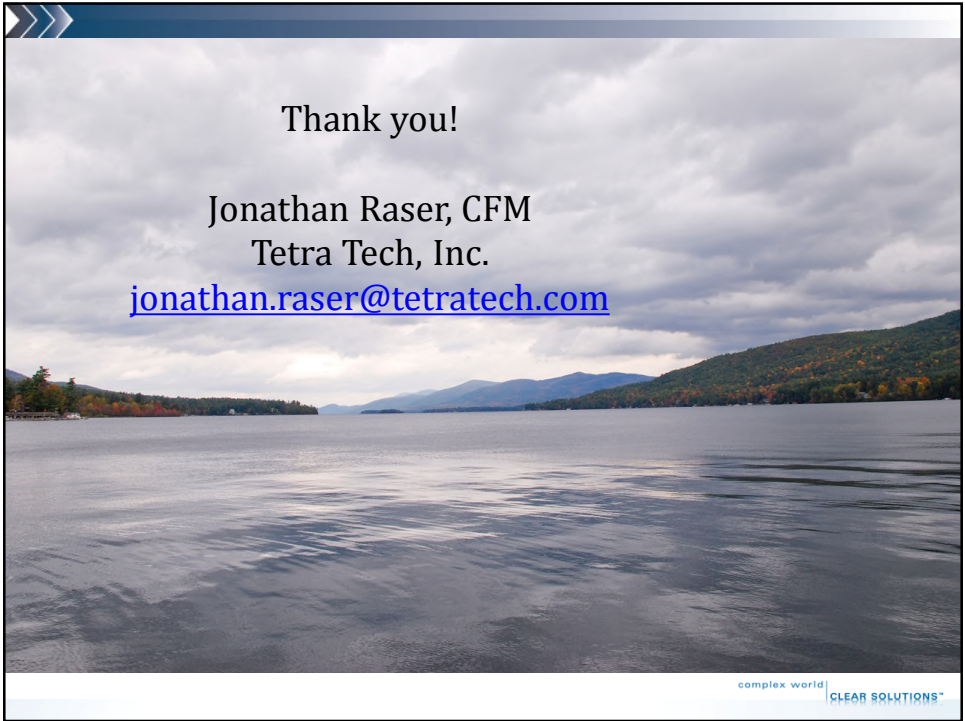
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Worksheets #1 – #6

Please work with your planning team and bring updated versions of worksheets to your local data collection meeting the week of July 6th. All electronic templates are on your CD in the 'Worksheets' folder.

#	Worksheet Name	Who is Responsible to Complete and Submit this Worksheet?	Where do you find the requested information?
1	Events/Losses	OEM, Police, Fire, DPW, Engineer	FEMA Project Worksheets (PWs) DPW records, Police response records
2	Capability Assessment	Code Official, Planner, CFO/Fiscal Rep, Clerk	Code Book, e-Code, Municipal ordinances, Master Plan
3	NFIP Floodplain Administrator	Floodplain Administrator	NFIP Records
4	Mitigation Action Progress	HMP Main POC – see 'Responsible Party' column in the table provided for guidance	LOIs, NYS DHSES Grants, Capital Improvement records
5	Plan Integration Questionnaire	HMP Main POC	Discuss with Engineer, Clerk, Administrator, Planner, CFO, and Municipal Mayor/Administrator
6	New Development Table	Engineer, Planner, Building Department	Redevelopment Plans, Permits

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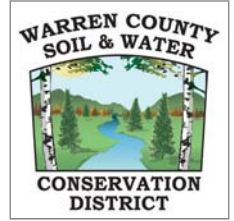
Thank you!

Jonathan Raser, CFM
Tetra Tech, Inc.

jonathan.raser@tetrattech.com



Warren County Multijurisdictional Hazard Mitigation Plan



A Hazard Mitigation meeting has been set for Warren County. The Office of Emergency Services and SWCD will be gathering needed data and information, assist you with completing the project data collection worksheets distributed at the Kick-Off meeting, identifying natural hazard vulnerabilities and mitigation opportunities, and answering any questions you may have about the project.

As will be discussed at the Municipal Kick-Off meeting, municipalities will find that it is most efficient and effective to bring together a group of municipal representatives to provide their insight and perspective on natural hazard risk and mitigation. This local mitigation “team” may include:

- Supervisor and/or Administrator
- NFIP Floodplain Administrator
- Building Code Official
- Municipal Engineer
- Public Works Superintendent
- Land Use Planner
- Police, Fire, EMS Officials
- Municipal Clerk
- Municipal CFO/Fiscal Rep



Invariably we have found that municipalities that take full advantage of these meetings will find the planning process straight-forward, productive and ultimately beneficial to the community.


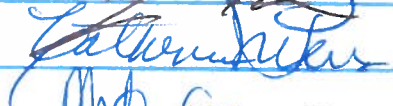
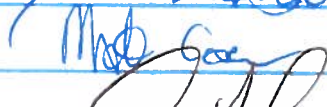
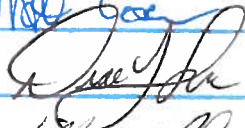




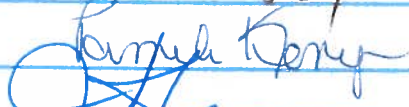

Please contact Jim Lieberum at the Warren County SWCD (518.623.3119) or Amy Hirsch at the Warren County OES (518.761.6240) if you have any questions or would like more information.

Date: July 7, 2015

Time: 8:30 AM to 10:30 AM

Location: Warren County SWCD office

Town of Bolton NMB mtg 7/16/15 2:00-4:00

	<u>Name</u>	<u>Signature</u>	<u>email</u>
1	Jim Lieberman		jim99ca/cap.ri.com
2	Catherine Persons		secretary@town.bolton.ny.us
3	MATT COON		
4	Dean Moore		dmoore123@nycap.ri.com
5	William A Sherman		Highway Superintendent
6	Jim Neumann		Police@town.bolton.ny.us
7	Thomas A French II		TFrench81@town.bolton.ny.us
8	Amy Hirsch		hirsch@warrencounty.ny.gov
9	PAMELA KENYON		planning@town.Bolton.ny.us
	Josanne Cassa		Josannecassa@TETRA TECH.COM

Warren County Hazard Mitigation Meeting
 July 9, 2015 City of Glens Falls 2:00-4:00 PM

	Name	Locality	Email
1	Jim Lieboorn	WCS&D	
2	Amy Hirsch	WCOES	hirsch@warrencounty.ny.gov
3	JUDY VILLA WHITE	CITY HR	personnel@cityofglensfalls.com
4	Devin Fish	City Intern (HR)	
5	Susanne Kosko	CITY CONTROLLER	CONTROLLER@CITYOFGLENSFALLS.COM
6	Michelle Arnold	GFPD	marnold@glensfalls.com
7	Steve Suzzler	GFWD&S DEPT	engineer@cityofglensfalls.com
8	Jonathan Rasch	TERRATECH	
9	JAMES P. SCHNEMMEL	GF FIRE DEPT	JONATHAN.RASCH@TERRATECH.COM
10			FIRECHIEF@CITYOFGLENSFALLS.COM
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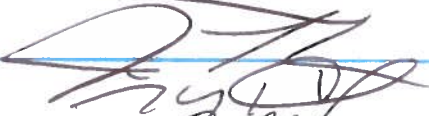
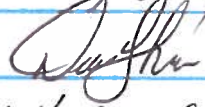
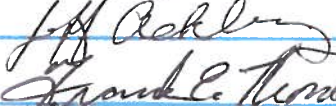
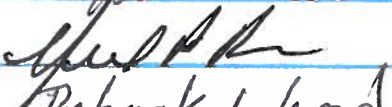
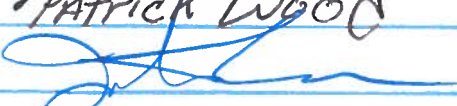



Warren County Hazard Mitigation Meeting
 July 9, 2015 Town of Johnsbury 11:00-1:00 PM

	Name	Locality	Email
1	Dean Moore	WCSWCP	dmoore123@nycap.com
2	Daniel Nitchock	Johnsbury Highway	johnsburyhwy1@frontier.net.net
3	Ron Vanselow	Town Supervisor.	
4	Amy Hirsch	WCOES	hirscham@warrencounty.ny.gov
5	Jonathan Rasse	TEMA TECH	J.NATURALRASSE@TEMA7ECU.COM
6			
7			
8			
9			
10			
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12			
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15			

7-8-15 Town & Village of Lake George HAZMIT Meeting

	Name	Organization	email
1	Shyfrisk	WCOES	hiscad@wvresourceny.gov
2	Dean Moore	WCSWCD	dmoores123@nycap.n.com
3	JONATHAN PATER	TOMATECH	JONATHAN.PATER@TECH.COM
4	Kathy Bozony	TLC	kbozony@lakegeorgetown.org
5	DAVID DAVIS	TLC	
6	David Harrington	VLG	
7	Robert MBSAC	VLG	LOU.MAYOR@VCAF.NC.COM
8	Darlene Gunthe	VLG	lgvclerk@nycap.nycap.com
9			
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Town of Stony Creek + Thurman HMG mtg
July 6 2015 11:00 AM - 1:00 PM

<u>Name</u>	<u>Organization</u>	<u>Signature</u>
1 Jim Lieberman	WC SWCD	
2 Amy Hirsch	WCOES	
3 Dean Moore	WESWCD	
4 Jeff Ackley	Thurman	
5 Frank E. Thomas	Stony Creek	
6 Neil A. ...	Stony Creek	
7 Patrick Wood	THURMAN	
8 TONIA ...	TERRA TEN	

Town of Queensbury NMB meeting
 July 8 2015 2:00 - 4:00 pm C.T. of Qsby

	<u>NAME</u>	<u>Agency</u>	<u>email</u>
1	Jim Lieberum	SWCD	
2	Amy Hirsch	WCOES	nirsch@westernny.gov
3	Ron Montesi	Qby	Ronm@queensbury.net
4	Barbara Tierney	Qby	barbarat@queensbury.net
5	John Stedwell	QBY	jbysupervisor@queensbury.net
6	Laura Moore	QBY	lmoore@queensbury.net
7	MICHAEL PALMER	QBY	FIREMARSHAL@QUEENSBURY.NET
8	David HATIN	QBY	daveh@queensbury.net
9	David DUELL	QBY	daved@queensbury.net
10	Craig Brown	QBY	craigb@queensbury.net
11	Charles Mellon Jr	Bay Ridge Fire	cmellon@gmail.com
12	Victoria LaMarque	QBY	victorial@queensbury.net
13	Christine Hurnyfm	QBY	Chrsh@queensbury.net

Hazard Mitigation Meeting - Town of Chester, Hague and Horicon
 July 7, 2015 Town fo Horicon Office 2:00-4:00

	Name	Locailty	Email
1	Amy Hirsch	UCCES	hirsch@uconn.edu
2	Jim Lieberman	SWCD	jmlieberman@swcd.org
3	Matt Simpson	Town of Horicon	supervisor@horiconwi.gov
4	Walter Tomyns	Town of Chester	zoning@chesterwi.com
5	Jan Vane	Town of Chester	cheat-burg@cheater.com
6	Edna A. Tracie	Town of Hague	supervisor@townofhague.org
7	Cathy Clark ZEG	Town of Hague	zoning@townofhague.org
8	Fred Mowse	Town of Chester	f.mowse2@gmail.com
9	Paul Smith	Town of Horicon	Supr. of Highway
10			
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Warren County Hazard Mitigation Meeting
 July 7, 2015 Warren County SWCD Office 8:30-10:30

	Name	Locality	Email
1	Jim Lieberman	WCSWCD	Jim99@nycap.org
2	Amy Hirsch	WCOES	hirsch@warrencounty-ny.gov
3	Jonathan Rason	TOTRTECH	JONATHAN.RASON@TOTRTECH.COM
4	Kate Mance	A/GFTL	Kmance@agftc.org
5	Dean Moore	WCSWCD	dmoore123@nycap.org
6	George Van Dusen	WCDPW	gVandusen@warrencountydpw.com
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Warrensburg, LL

7-7-15

Name	Organization	email
Dean Moore	wcswd	dmoore123@nycap.org
Amy Hirsch	WCOES	hirsch@warrencounty.ny.gov
Eddie Penrock	T/O Warrensburg	edward.penrock@townofwarrensburg.net
Ron Devel	T/O LK. Luzerne	lakeluzernehighwaydept@lakeluzerne.org
Chip Webster	T/O Warrensburg	chipweb7@attco.com
Chris Belden	T/O Warrensburg	chrisbelden@townofwarrensburg.net
Allen Schein	T/O Lake Luzerne	lakeluzerne4@roadrunner.com
Isiah Ross	TENATECH	Isiah.Ross@TENATECH.COM



WARREN COUNTY HAZARD MITIGATION PLAN
Steering Committee Meeting - Agenda
August 18, 2015



- Review/Finalization of Hazards of Concern
- Review/Update of Goals and Objectives
- Public and Stakeholder Outreach Program
 - Public HMP Website (TT hosting)
 - Review of Citizen and Stakeholder Surveys
 - Outreach program to support traffic to website and surveys
 - Stakeholder surveys (online)) - Develop list of County stakeholders (flood advisory commission, academia, commerce, hospitals, transportation, school districts, fire districts, police, utilities, etc.)
 - Press releases from County in newspapers and social media - Point of Contact for disseminating Public Information (e.g. press releases, surveys, announcements)
- Mitigation Strategy Workshop (FEMA Region II led)
 - Set Date
 - Include NYSDEC participation (Beaver Dams)
 - Mandatory for all participating municipalities
- Risk/Vulnerability Assessment Plan/Progress
- Progress with Municipalities
- County Annex Development





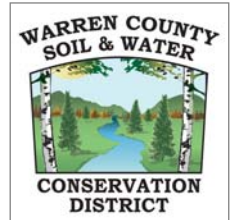
WARREN COUNTY HAZARD MITIGATION PLAN UPDATE
SIGN-IN SHEET
TOPIC: Steering Committee Meeting
MEETING DATE: August 18, 2015



Name	Title	Agency/Municipality/Department	Phone Number	E-mail
JONATHAN ROSER	Planning Consultant	TERRA TECH, INC.	(973) 630-7042	JONATHAN.ROSER@TERRATECH.COM
Cheryl Hirsch	En. Serv. Coord	WC OES	518-761-6490	HIRSCHAC@WARRENCOUNTY.NY.GOV
BRIAN LAFLURK	DIRECTOR WC OES	WC OES	518-761-6537	LAFURK@CO.WARREN.NY.US
Sara Frankenfild	GIS coordinator	WC Planning	518-761-6410	SARA.FRANKENFELD@WARRENCOUNTY.NY.GOV frankenfelds@warrencountyny.gov
Laura Moore	Landuse Planner	CRBT Planning	518 761 8265	LMOORE@QUEENSBURY.NET
Corrina Aldrich	SWCD Dist Man	SWCD	518-692-9940	corrina.aldrich@ny.nacdn.net
Jim Lieberman	HM Coordinator	SWCD	518 623 3119	JIM99CNYCAP.NY.COM



A FEMA Mitigation Strategy Workshop for the Warren County Hazard Mitigation Plan



When: September 22, 2015
Time : 1:00 PM—3:00 PM

Where: WC Sherriff's Training Facility
(off Exit 20 at 1400 State Route 9)

Warren County continues the development of its **Multi-Jurisdictional, Multi-Hazard Mitigation Plan** intended to identify community policies, actions, and tools for implementation over the long term that will result in a reduction of risk and potential for future losses as a result of natural and technological hazards.

As part of the process for developing the Warren County Hazard Mitigation Plan, FEMA representative, Paul Hoole, will be conducting this workshop designed to take the mystery out of mitigation planning. The focus will be on moving from our assessment of risks to the identification of mitigation actions. Mitigation actions are the heart of the Hazard Mitigation Plan.

To expedite completion of the Hazard Mitigation Plan, it is **a requirement that representatives from each municipality** in the County attend this FEMA Mitigation Strategy Workshop.

Mr. Hoole will introduce a common sense approach, along with an easy way to document the thinking behind the mitigation plan, **a FEMA planning requirement**. There will also be ample opportunity to ask questions and engage in discussion, so we urge you to take advantage of this opportunity.

****To register please contact the Warren County Office of Emergency Services at 518.761.6240 by September 17th.

Please contact Jim Lieberum at the Warren County SWCD (518.623.3119) or Amy Hirsch at the Warren County OES (518.761.6240) if you have any questions or would like more information.

Meeting

Location

Date

Initial

Hazard Mitigation Strategy Workshop

Warren County Sheriff's Office

September 22, 2015

Name	Organization	Phone No	
Pat Auer	WC Public Health	761-6571	PA
Bill Sherman	T/O Bolton Highway Dept.	644-9837	
Matt Coon	T/O Bolton Highway Dept.	644-9837	MC
Edna Frasier	Supervisor, T/O Hague	543-6161	EAF
Mike Palmer	T/O Queensbury Fire Marshal	761-8206	
Maryann Huck	T/O Bolton	644-2461	MKH
Mike Colvin	WC IT	761-6407	WC
Dave Harrington	Village of Lake George	796-6543	DH
Chip Webster	T/O Warrensburg	623-9522	CW
Sgt. Mike Webster Dan Hill	WC SO		DH
George Van Duesen	WC DPW	623-4141	GV
Pat Wood	T/O Thurman Highway Dept.	623-9614	PW
Jeff Ackley	T/O Thurman Highway Dept.		
James Schrammel	Chief, GFFD	761-3822	JS
Jim Steen	T/O Horicon	494-4245	JS
Dan Barusch	T/O Lake George	322-5517 668-5721	DB
Ron Vanselow or Dan Hitchcock	T/O Johnsbury	251-2421	
Jeremy Little	T/O Chester	494-7369	
Ronda Rhonda Thomas	T/O Stony Creek	696-3575	RT
Kathy Clark	T/O Hague	543-6223	CC
Emily Slotnick	Tetra Tech	508-287-8665	
Brian LaFlure	WCOES	767-6537	BL
Amy Hirsch	WCOES	761-6490	AH

Gene Merlino	T/O Lake Luzerne	696-2711	
Allen Saheim	T/O Lake Luzerne	696-2711 x 4	AL
Sixa Lieberman	WC	623-3112	SLC
Paul Hoole	FEIMH	518-396-3849	
Chip Webster	T/O WARRENSBURG	623-4136	CW
Jeremy Little	T/O Chester	696 494-7369	W
Emily Sutinick	TETRA TECH, Inc	508.287.8405	ES
Jason Munroe	T/O CHESTER	518-796-7698	
Michael S. Pzet	TOC	518-494-2014	
Ron Vancelow	Johansburg	251-2421	
Sara Frankenfeld	WC Planning	761-6410	SF
Cathy Clark	T/O Hague	543-6161	CC

Edna A. Francis T/O Hague 543-6161 C.C.
Gene Merlino Town of Lake Luzerne 696-2711 ER 3
David Harrington Village of Lake George 796-5543
Laura Moore T/O Queensbury 761 826524



WARREN COUNTY HAZARD MITIGATION PLAN
Steering Committee Meeting - Agenda
February 12, 2016



-
- Finalize Main Plan Sections
 - Section 3, incl. Public and Stakeholder Surveys
 - Section 6
 - Section 4

 - Finalize Hazard Profiles
 - Landslide
 - Infestation
 - Non-Natural Hazards

 - Progress on Municipal Annexes

 - Draft Plan and Public and Stakeholder Outreach
 - Submission to NYS DHSES
 - Notices to Surrounding Counties
 - County-wide announcements
 - Project Website

 - County Annex
 - Complete prior mitigation strategy review
 - Complete draft of updated strategy
 - NYS DHSES Requirements
 - Evacuation and Sheltering Plans/Programs
 - Temporary Housing/Relocation Requirement





WARREN COUNTY HAZARD MITIGATION PLAN UPDATE
SIGN-IN SHEET
TOPIC: Steering Committee Meeting
MEETING DATE: February 12, 2016



Name	Title	Agency/Municipality/Department
Amy Hirsch	Em. Sec. Clerk	Warren Co OES
Jill Lieberman	WC HMG / SWED	Warren Co SWED
Laura Moore	Landuse planner	Queensbury
Bryan LaFlore	DIRECTOR	WARREN CO. OES
Ismael Rasser	Planner	Tetra Tech, Inc.
Sara Frankenfild	GIS Coordinator	WC Planning



WARREN COUNTY HAZARD MITIGATION PLAN
Pre-Project Kick-Off Meeting - Agenda
May 22, 2015



- Information and Data Collection – per the RFP, WC Planning will provide all mapping and spatial analysis
 - Discussion of mapping and spatial analysis (vulnerability assessment)
 - HAZNY vs. HAZUS
 - Planning Department/GIS Point of Contact
 - General Data Wish-List
 - NFIP Data Request
 - Plans and reports (county, regional, local)

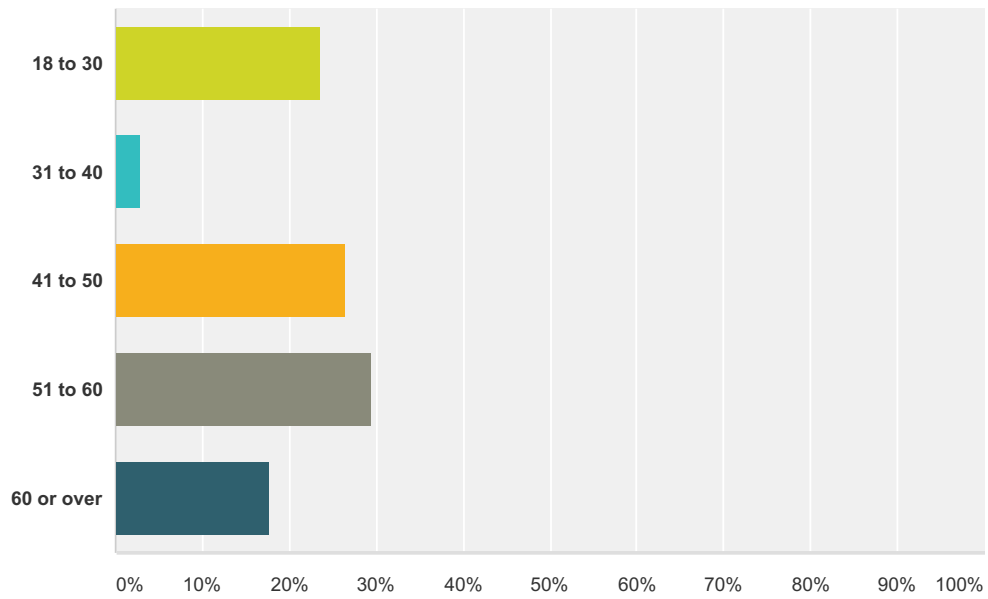
- Public and Stakeholder Outreach
 - Project website - Web Site Point of Contact or Tetra Tech to create a Web Site?
 - Public Survey (online)
 - Stakeholder surveys (online)) - Develop list of County stakeholders (flood advisory commission, academia, commerce, hospitals, transportation, school districts, fire districts, police, utilities, etc.)
 - Press releases from County in newspapers and social media - Point of Contact for disseminating Public Information (e.g. press releases, surveys, announcements)



This appendix provides documentation of public and stakeholder outreach. Stakeholder involvement in this planning process was broad and productive as discussed and further documented in Section 3 (Planning Process). Public and stakeholder input has been incorporated throughout this HMP as appropriate, as identified in Section 3 and the References section, as well as within specific mitigation initiatives identified within the jurisdictional annexes (Section 9).

Q1 Please indicate your age range:

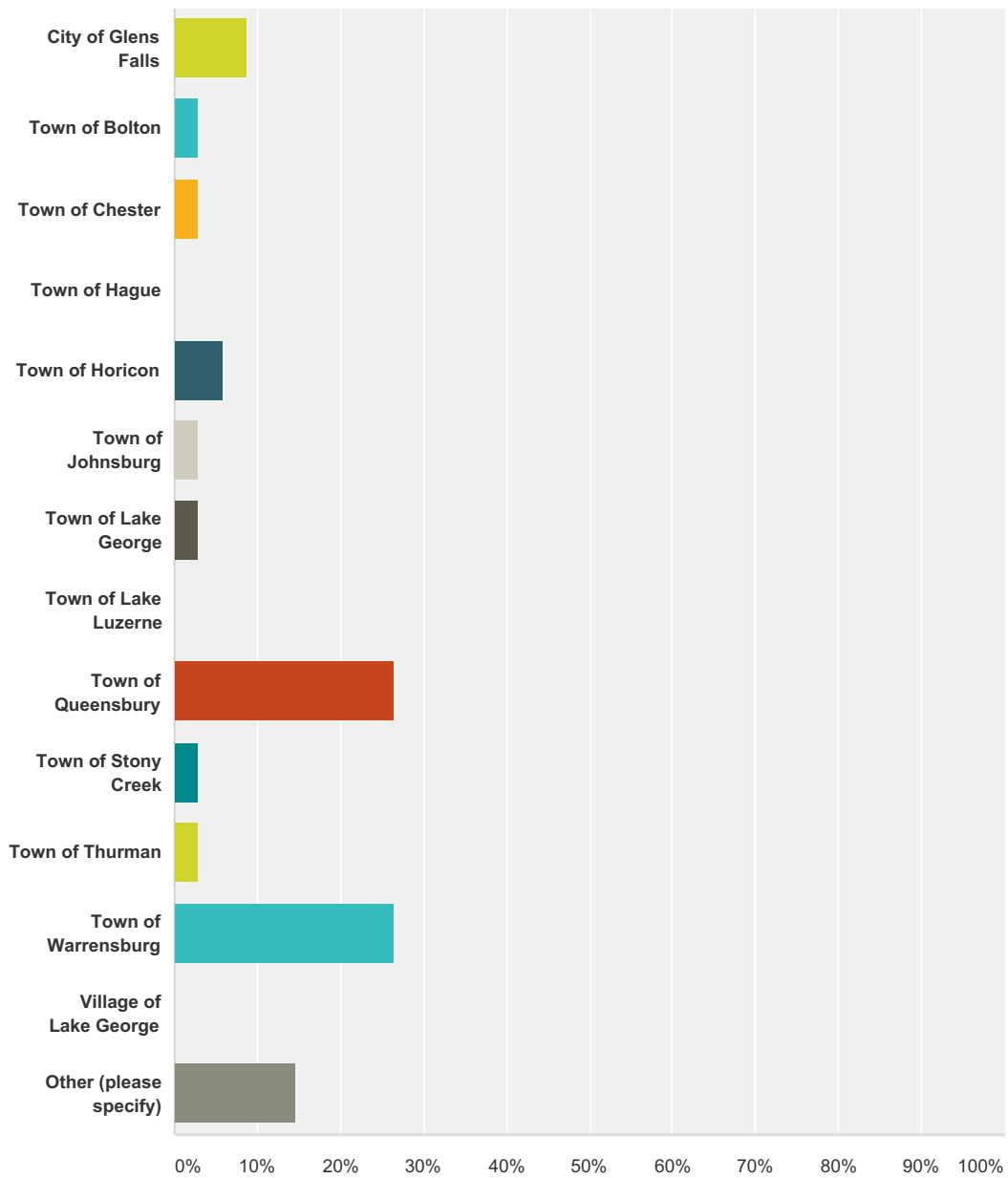
Answered: 34 Skipped: 0



Answer Choices	Responses
18 to 30	23.53% 8
31 to 40	2.94% 1
41 to 50	26.47% 9
51 to 60	29.41% 10
60 or over	17.65% 6
Total	34

Q2 Please indicate in which municipality you live:

Answered: 34 Skipped: 0



Answer Choices	Responses
City of Glens Falls	8.82% 3
Town of Bolton	2.94% 1
Town of Chester	2.94% 1
Town of Hague	0.00% 0
Town of Horicon	5.88% 2

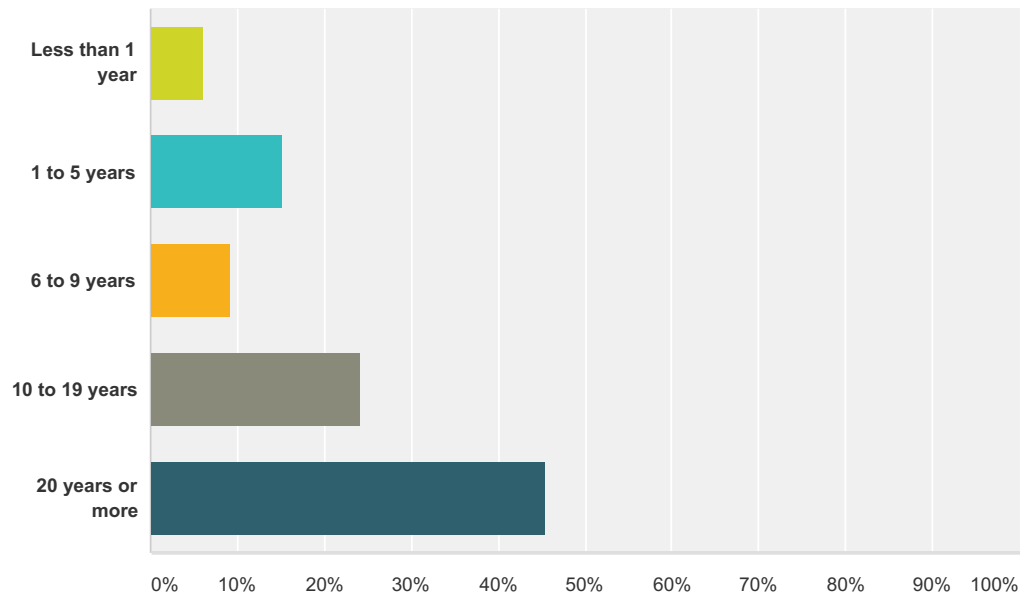
Warren County NY HMP - Citizen Survey

Town of Johnsbury	2.94%	1
Town of Lake George	2.94%	1
Town of Lake Luzerne	0.00%	0
Town of Queensbury	26.47%	9
Town of Stony Creek	2.94%	1
Town of Thurman	2.94%	1
Town of Warrensburg	26.47%	9
Village of Lake George	0.00%	0
Other (please specify)	14.71%	5
Total		34

#	Other (please specify)	Date
1	Hudson Falls, Wsahington County	10/1/2015 7:46 PM
2	Test	9/28/2015 9:53 AM
3	Test	9/28/2015 9:29 AM
4	Test	9/28/2015 9:20 AM
5	This is a test	9/28/2015 9:05 AM

Q3 How long have you lived here?

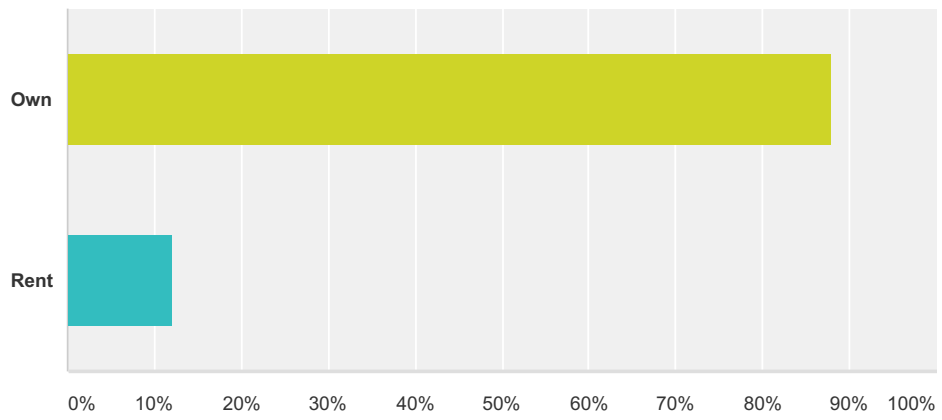
Answered: 33 Skipped: 1



Answer Choices	Responses
Less than 1 year	6.06% 2
1 to 5 years	15.15% 5
6 to 9 years	9.09% 3
10 to 19 years	24.24% 8
20 years or more	45.45% 15
Total	33

Q4 Do you own or rent your place of residence?

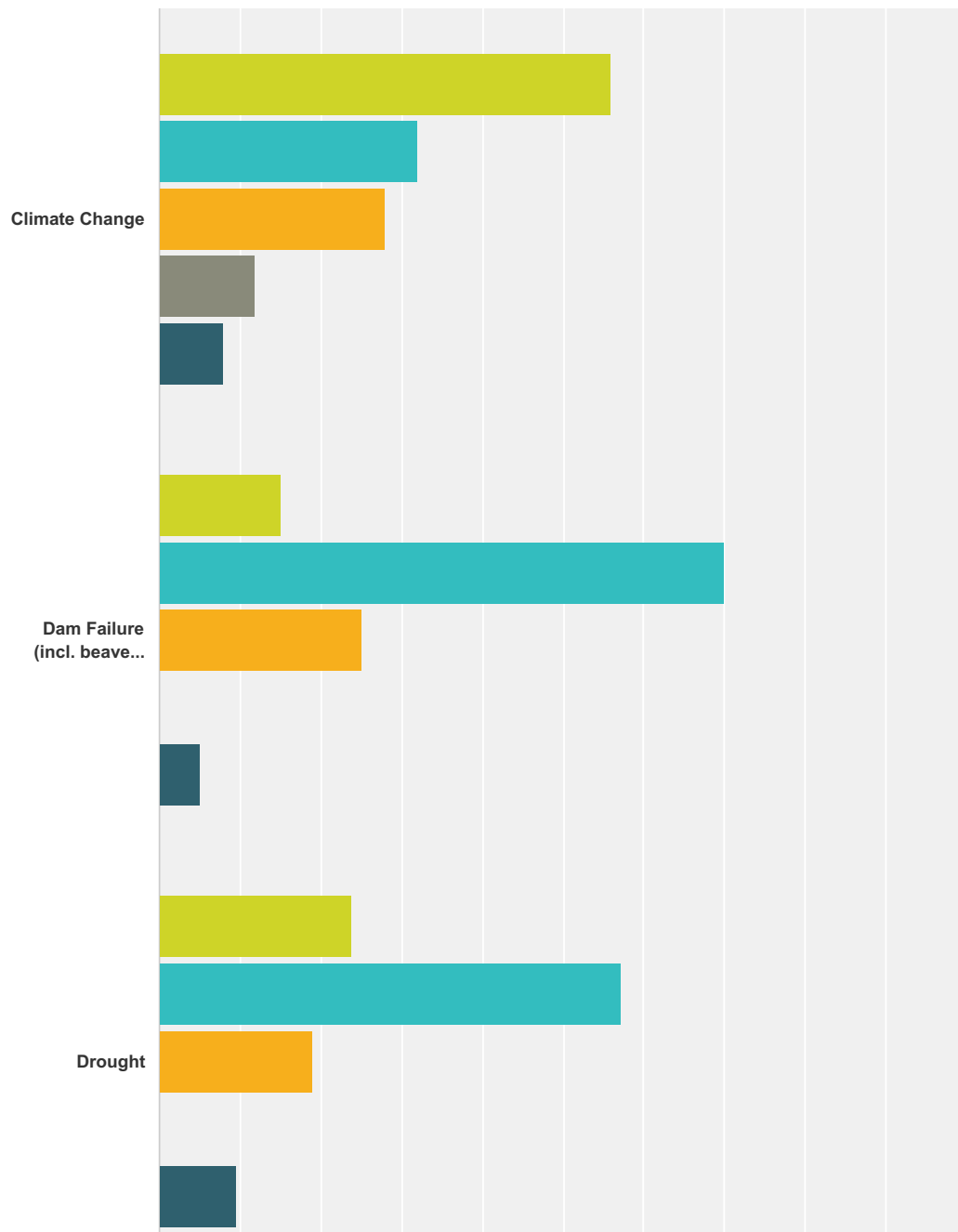
Answered: 33 Skipped: 1



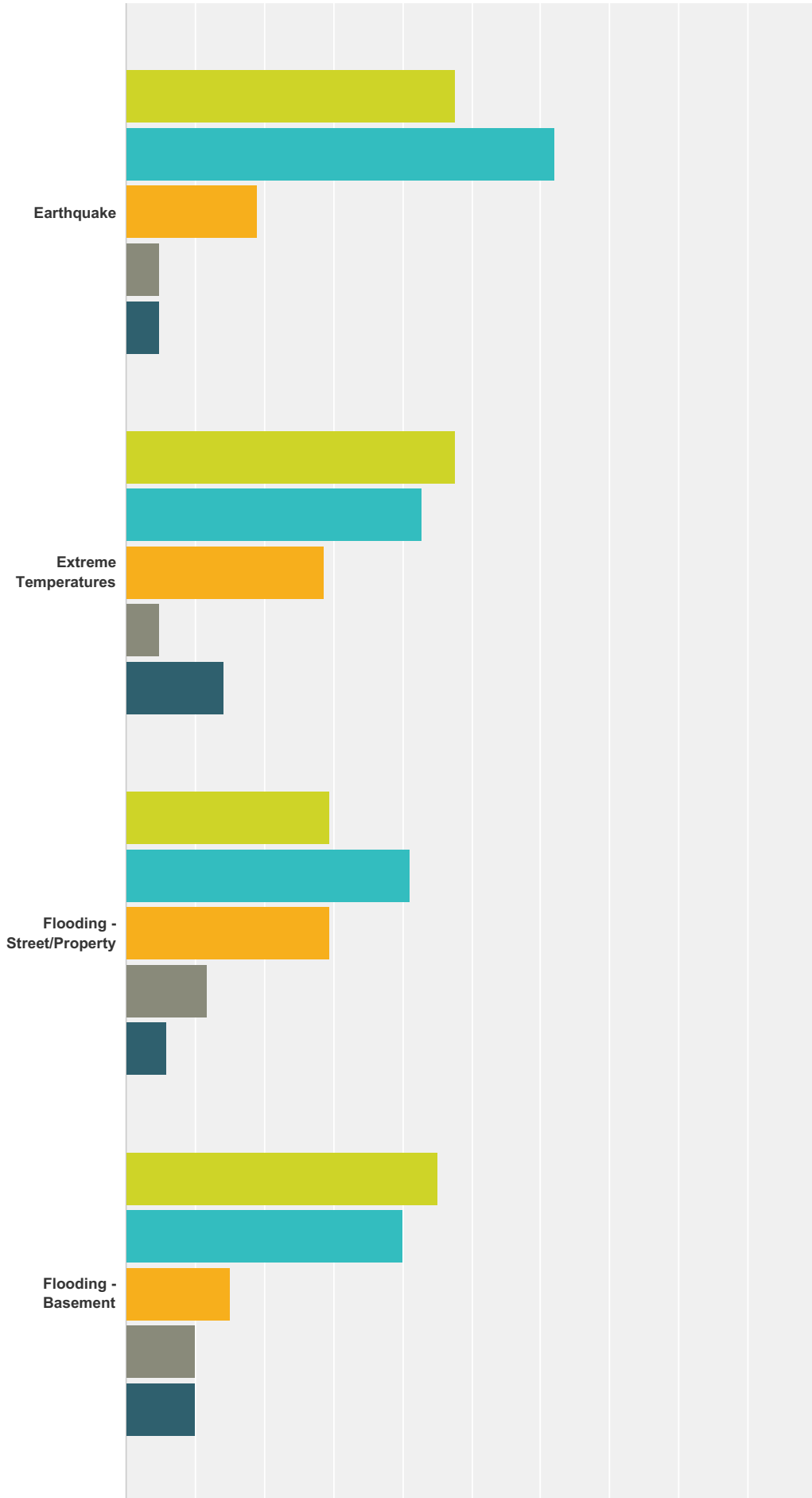
Answer Choices	Responses	
Own	87.88%	29
Rent	12.12%	4
Total		33

Q6 In the past 10 years, which of the following types of hazards/natural disasters have you or someone in your household experienced within Warren County, or sustained damage as a result of, and how concerned are you about the following natural hazards impacting the County? (In the first column indicate if you have experienced the hazard, then indicate your level of concern).

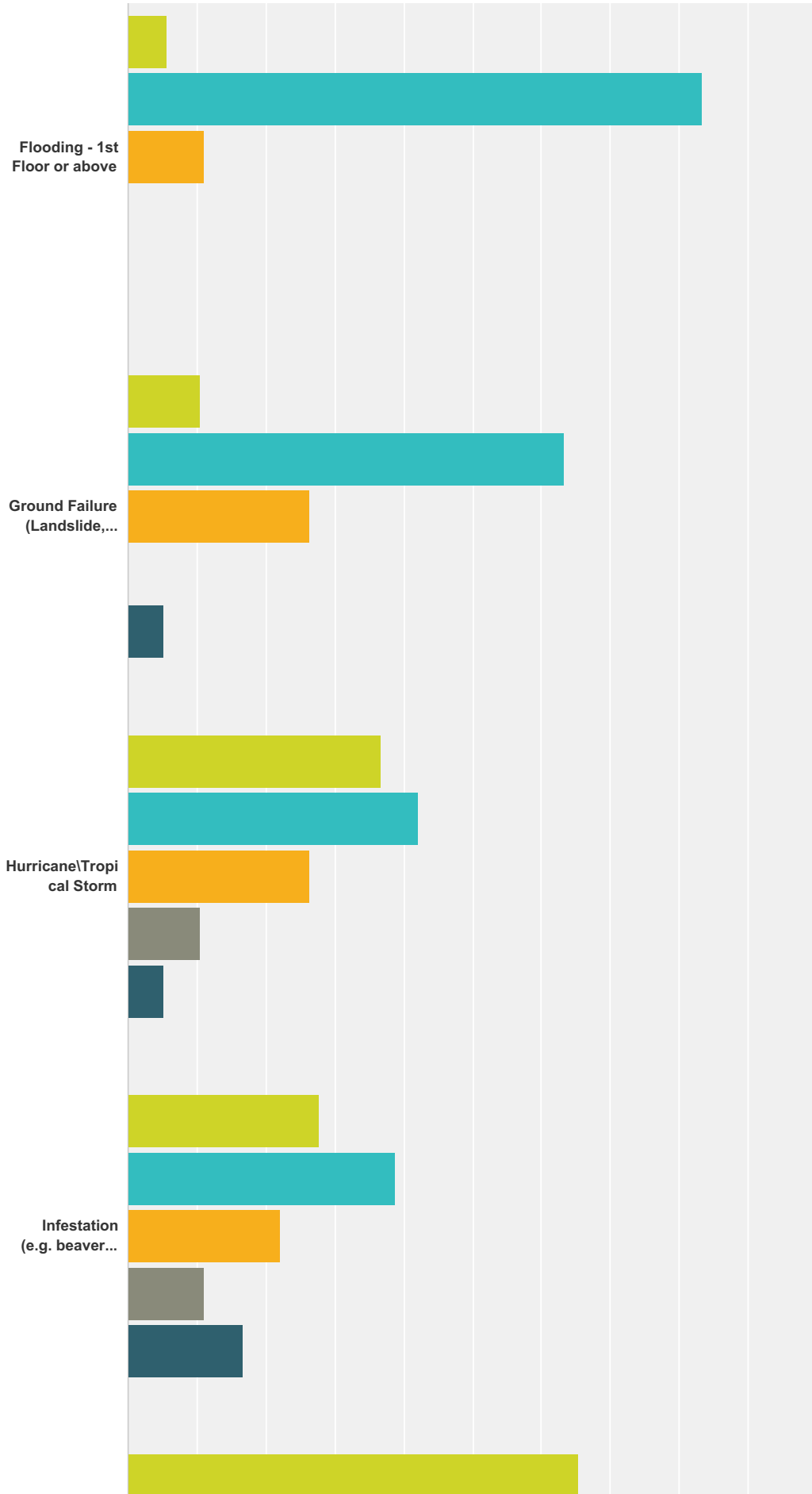
Answered: 28 Skipped: 6



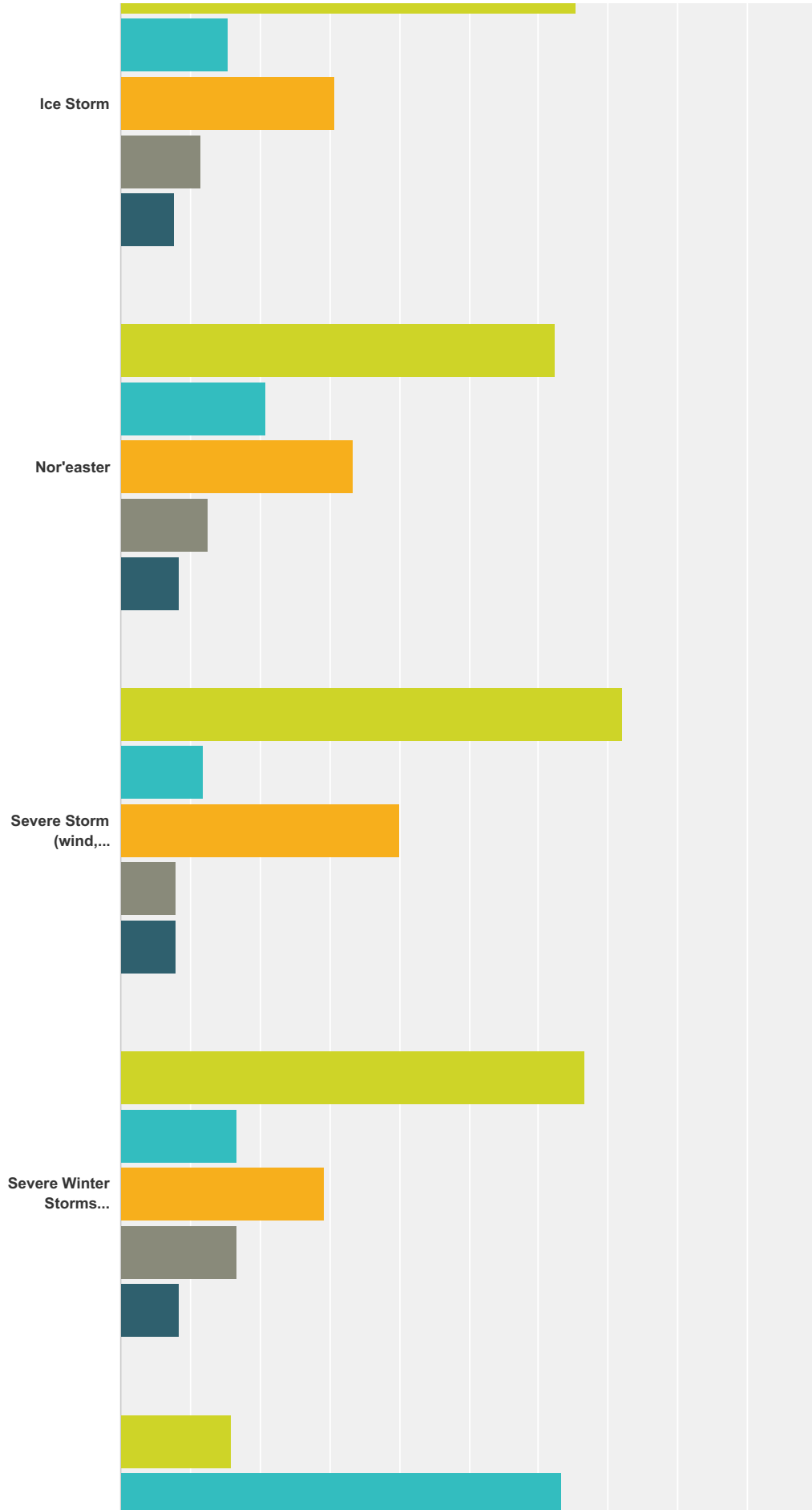
Warren County NY HMP - Citizen Survey



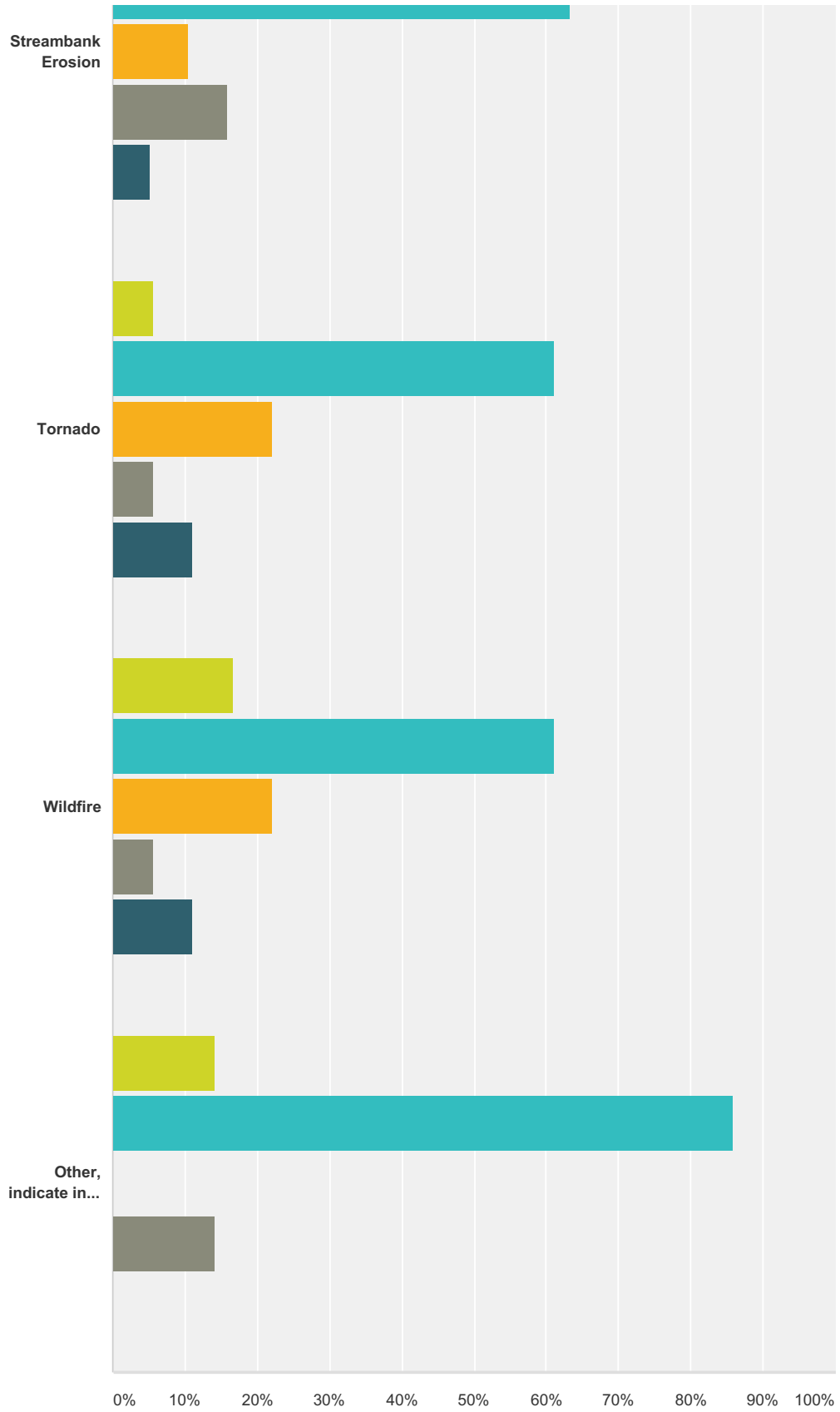
Warren County NY HMP - Citizen Survey



Warren County NY HMP - Citizen Survey



Warren County NY HMP - Citizen Survey



■ Have Experienced
 ■ Not Concerned
 ■ Somewhat Concerned
 ■ Very Concerned
■ Extremely Concerned

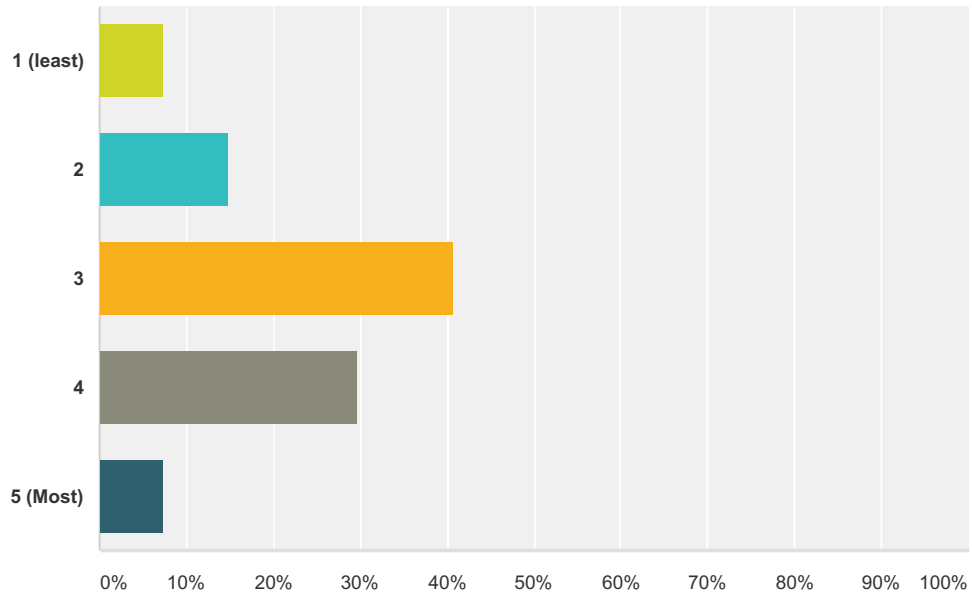
Warren County NY HMP - Citizen Survey

	Have Experienced	Not Concerned	Somewhat Concerned	Very Concerned	Extremely Concerned	Total Respondents
Climate Change	56.00% 14	32.00% 8	28.00% 7	12.00% 3	8.00% 2	25
Dam Failure (incl. beaver dams)	15.00% 3	70.00% 14	25.00% 5	0.00% 0	5.00% 1	20
Drought	23.81% 5	57.14% 12	19.05% 4	0.00% 0	9.52% 2	21
Earthquake	47.62% 10	61.90% 13	19.05% 4	4.76% 1	4.76% 1	21
Extreme Temperatures	47.62% 10	42.86% 9	28.57% 6	4.76% 1	14.29% 3	21
Flooding - Street/Property	29.41% 5	41.18% 7	29.41% 5	11.76% 2	5.88% 1	17
Flooding - Basement	45.00% 9	40.00% 8	15.00% 3	10.00% 2	10.00% 2	20
Flooding - 1st Floor or above	5.56% 1	83.33% 15	11.11% 2	0.00% 0	0.00% 0	18
Ground Failure (Landslide, Sinkholes)	10.53% 2	63.16% 12	26.32% 5	0.00% 0	5.26% 1	19
Hurricane/Tropical Storm	36.84% 7	42.11% 8	26.32% 5	10.53% 2	5.26% 1	19
Infestation (e.g. beavers, Emerald Ash Borer)	27.78% 5	38.89% 7	22.22% 4	11.11% 2	16.67% 3	18
Ice Storm	65.38% 17	15.38% 4	30.77% 8	11.54% 3	7.69% 2	26
Nor'easter	62.50% 15	20.83% 5	33.33% 8	12.50% 3	8.33% 2	24
Severe Storm (wind, lightning, hail)	72.00% 18	12.00% 3	40.00% 10	8.00% 2	8.00% 2	25
Severe Winter Storms (Blizzard, Heavy Snow, Ice)	66.67% 16	16.67% 4	29.17% 7	16.67% 4	8.33% 2	24
Streambank Erosion	15.79% 3	63.16% 12	10.53% 2	15.79% 3	5.26% 1	19
Tornado	5.56% 1	61.11% 11	22.22% 4	5.56% 1	11.11% 2	18
Wildfire	16.67% 3	61.11% 11	22.22% 4	5.56% 1	11.11% 2	18
Other, indicate in comment box below	14.29% 1	85.71% 6	0.00% 0	14.29% 1	0.00% 0	7

#	Other (please specify)	Date
1	Straight Line Winds	10/8/2015 11:08 AM

Q7 Please rank how prepared you feel you and your household are for natural disaster events likely to occur within your municipality. Rank on a scale of 1 to 5, with 5 representing the most prepared.

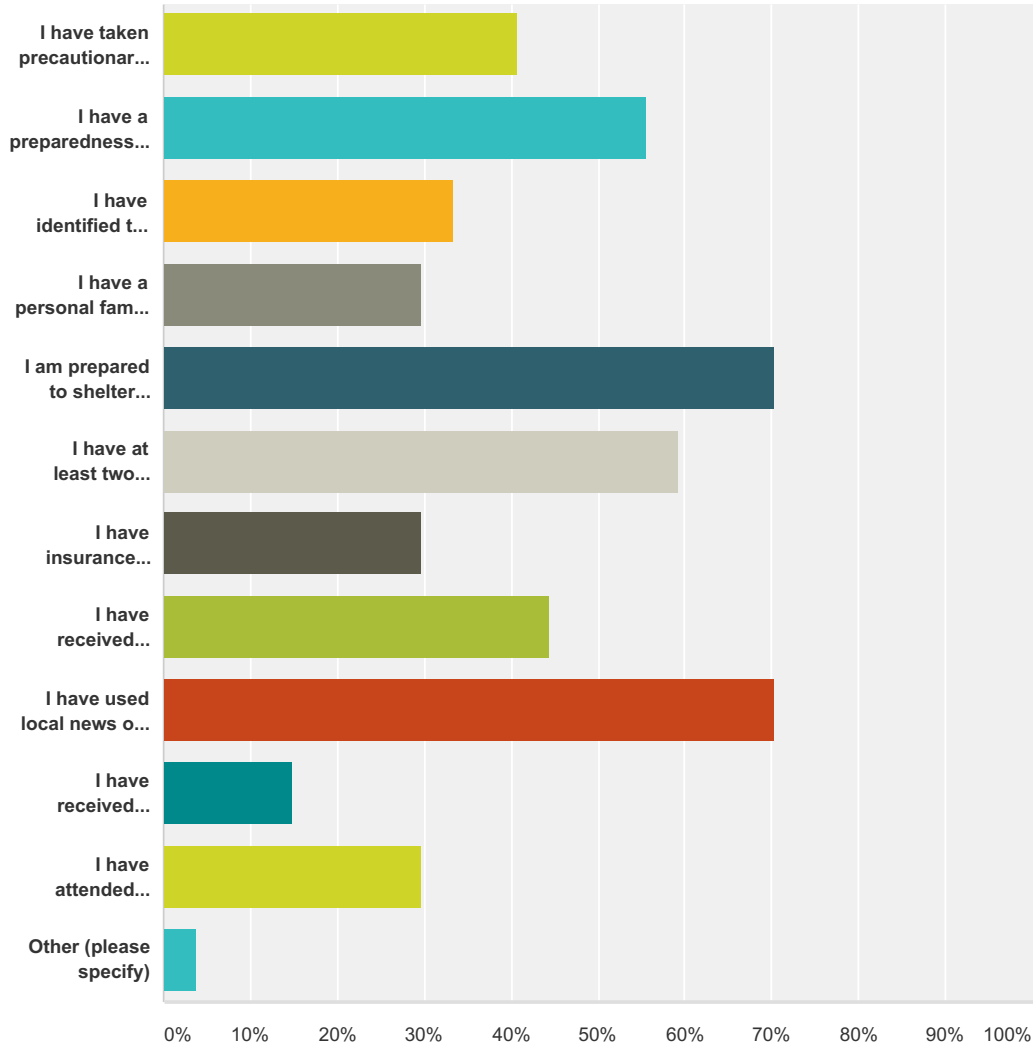
Answered: 27 Skipped: 7



Answer Choices	Responses
1 (least)	7.41% 2
2	14.81% 4
3	40.74% 11
4	29.63% 8
5 (Most)	7.41% 2
Total	27

Q8 In what ways do you believe you are prepared for a natural disaster that may occur within your municipality? (Please check all that apply)

Answered: 27 Skipped: 7



Answer Choices	Responses
I have taken precautionary measures to protect my property though retrofits or when constructed	40.74% 11
I have a preparedness kit consisting of basic supplies and materials for my family and myself	55.56% 15
I have identified the location of the nearest severe weather shelter	33.33% 9
I have a personal family emergency preparedness plan, and have discussed it with my family and others for whom I have responsibility	29.63% 8
I am prepared to shelter in-place if that is the best available option	70.37% 19
I have at least two methods for receiving emergency notifications and for information during severe weather or other potential emergency situations	59.26% 16
I have insurance policies to cover losses from specific risks (e.g. flood insurance)	29.63% 8

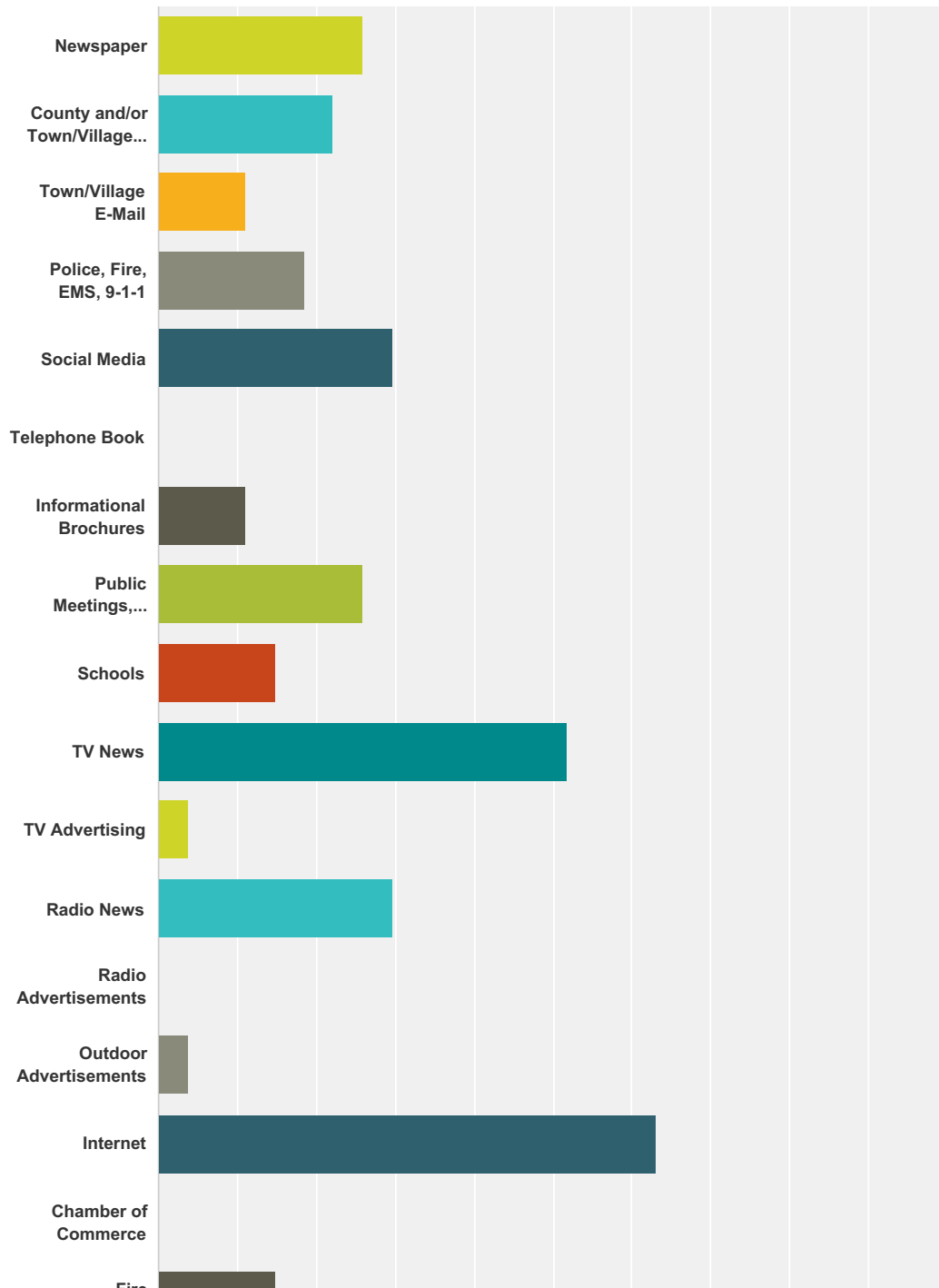
Warren County NY HMP - Citizen Survey

I have received emergency preparedness information from a government source (e.g., federal, state, or local emergency management)	44.44% 12
I have used local news or other media to obtain information	70.37% 19
I have received information from schools and other academic institutions	14.81% 4
I have attended meetings that have dealt with disaster preparedness	29.63% 8
Other (please specify)	3.70% 1
Total Respondents: 27	

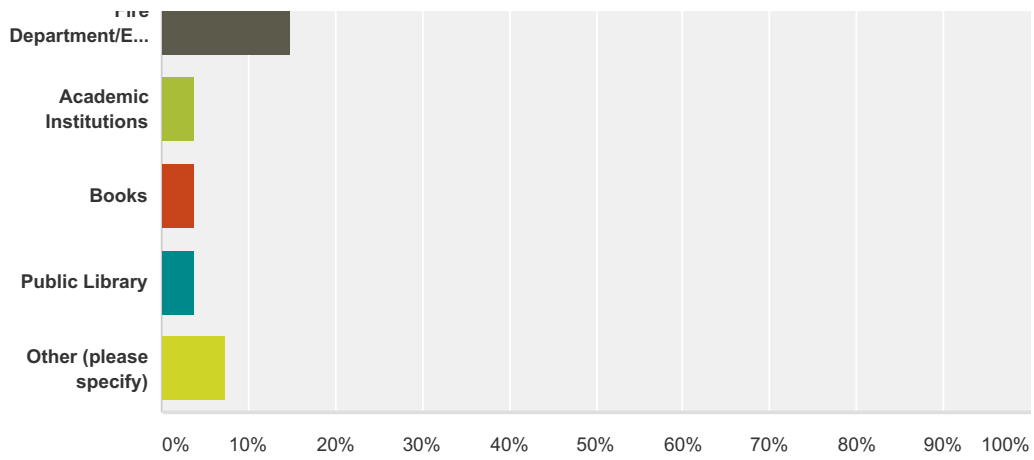
#	Other (please specify)	Date
1	I am a master's student in Resilience and Sustainability	10/1/2015 7:52 PM

Q9 How do you receive your information concerning a natural disaster? Of the information sources below, please identify the top three (3) that are MOST EFFECTIVE in providing you with information to make your home safer and better able to withstand the impact of natural disaster events.

Answered: 27 Skipped: 7



Warren County NY HMP - Citizen Survey



Answer Choices	Responses
Newspaper	25.93% 7
County and/or Town/Village Websites	22.22% 6
Town/Village E-Mail	11.11% 3
Police, Fire, EMS, 9-1-1	18.52% 5
Social Media	29.63% 8
Telephone Book	0.00% 0
Informational Brochures	11.11% 3
Public Meetings, Workshops, or Public Awareness Events	25.93% 7
Schools	14.81% 4
TV News	51.85% 14
TV Advertising	3.70% 1
Radio News	29.63% 8
Radio Advertisements	0.00% 0
Outdoor Advertisements	3.70% 1
Internet	62.96% 17
Chamber of Commerce	0.00% 0
Fire Department/EMS Agency	14.81% 4
Academic Institutions	3.70% 1
Books	3.70% 1
Public Library	3.70% 1
Other (please specify)	7.41% 2
Total Respondents: 27	

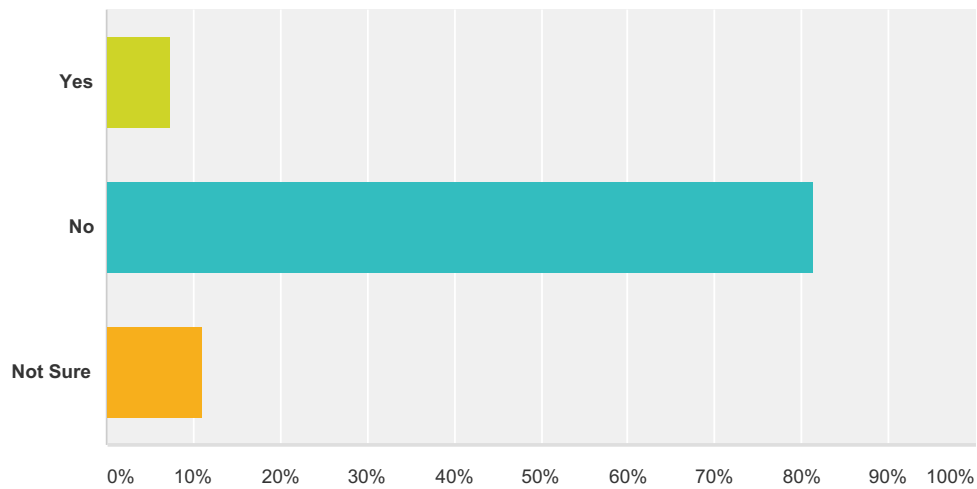
#	Other (please specify)	Date
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Warren County NY HMP - Citizen Survey

1	Warren County Emails	10/19/2015 4:01 PM
2	Weather Alert Radio	10/16/2015 8:43 AM

Q10 To the best of your knowledge is your property located in a designated floodplain? If you do not know, or are not sure, you may check the following online sources: FEMA National Flood Insurance Program site: <https://www.floodsmart.gov> Warren County Community Map application: <http://gis-2.warrencountyny.gov/warrencountygis/> You can also view paper copies of the NFIP Flood Insurance Rate Maps at your Municipal Hall or Warren County Soil and Water Conservation District at 394 Schroon River Road in Warrensburg.

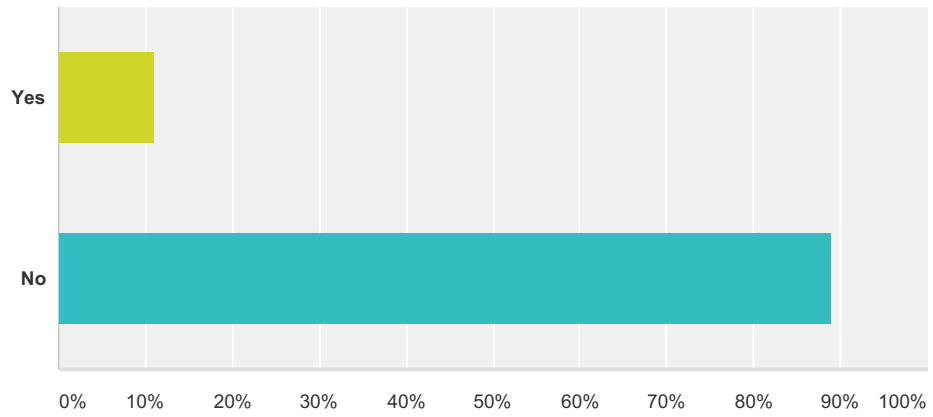
Answered: 27 Skipped: 7



Answer Choices	Responses	
Yes	7.41%	2
No	81.48%	22
Not Sure	11.11%	3
Total		27

Q11 Do you have flood insurance?

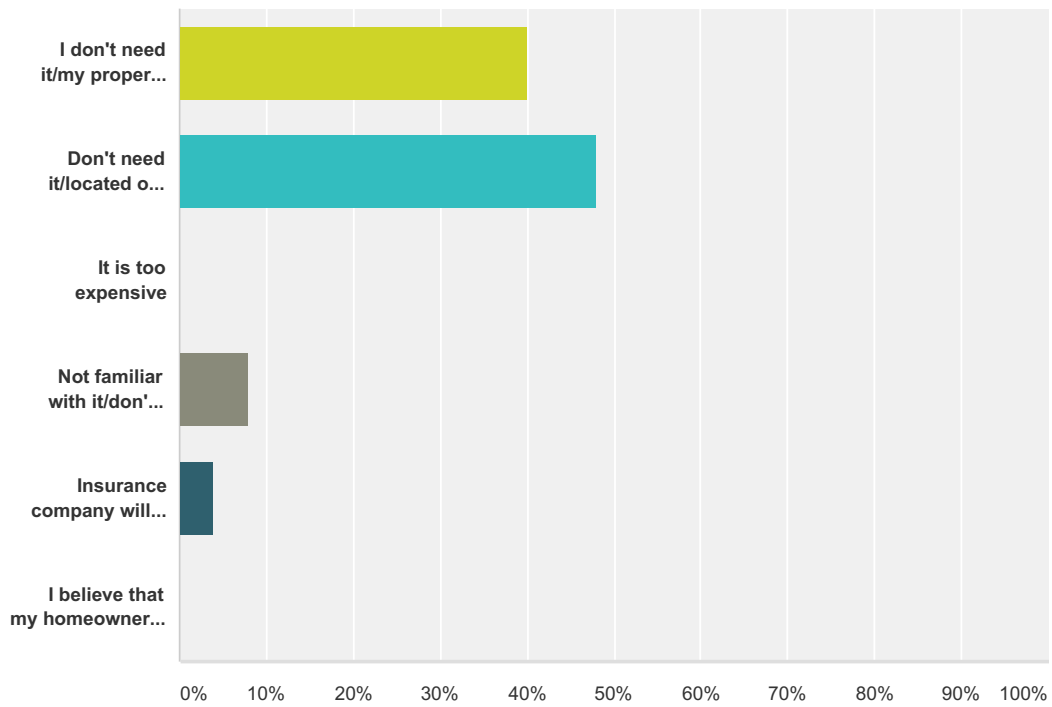
Answered: 27 Skipped: 7



Answer Choices	Responses	
Yes	11.11%	3
No	88.89%	24
Total		27

Q12 If you do NOT have flood insurance, what is the primary reason?

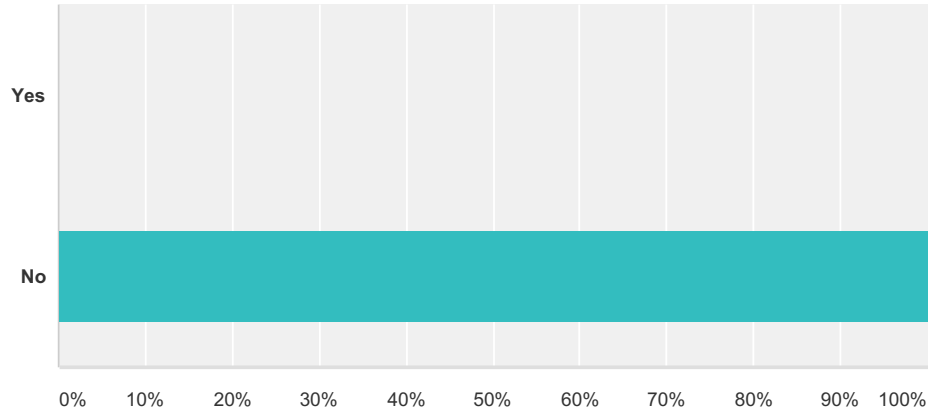
Answered: 25 Skipped: 9



Answer Choices	Responses
I don't need it/my property has never flooded	40.00% 10
Don't need it/located on high ground	48.00% 12
It is too expensive	0.00% 0
Not familiar with it/don't know about it	8.00% 2
Insurance company will not provide	4.00% 1
I believe that my homeowners insurance will cover me	0.00% 0
Total	25

Q13 Do you or did you have problems getting homeowners/renters insurance due to risks from natural hazards?

Answered: 26 Skipped: 8



Answer Choices	Responses	
Yes	0.00%	0
No	100.00%	26
Total		26

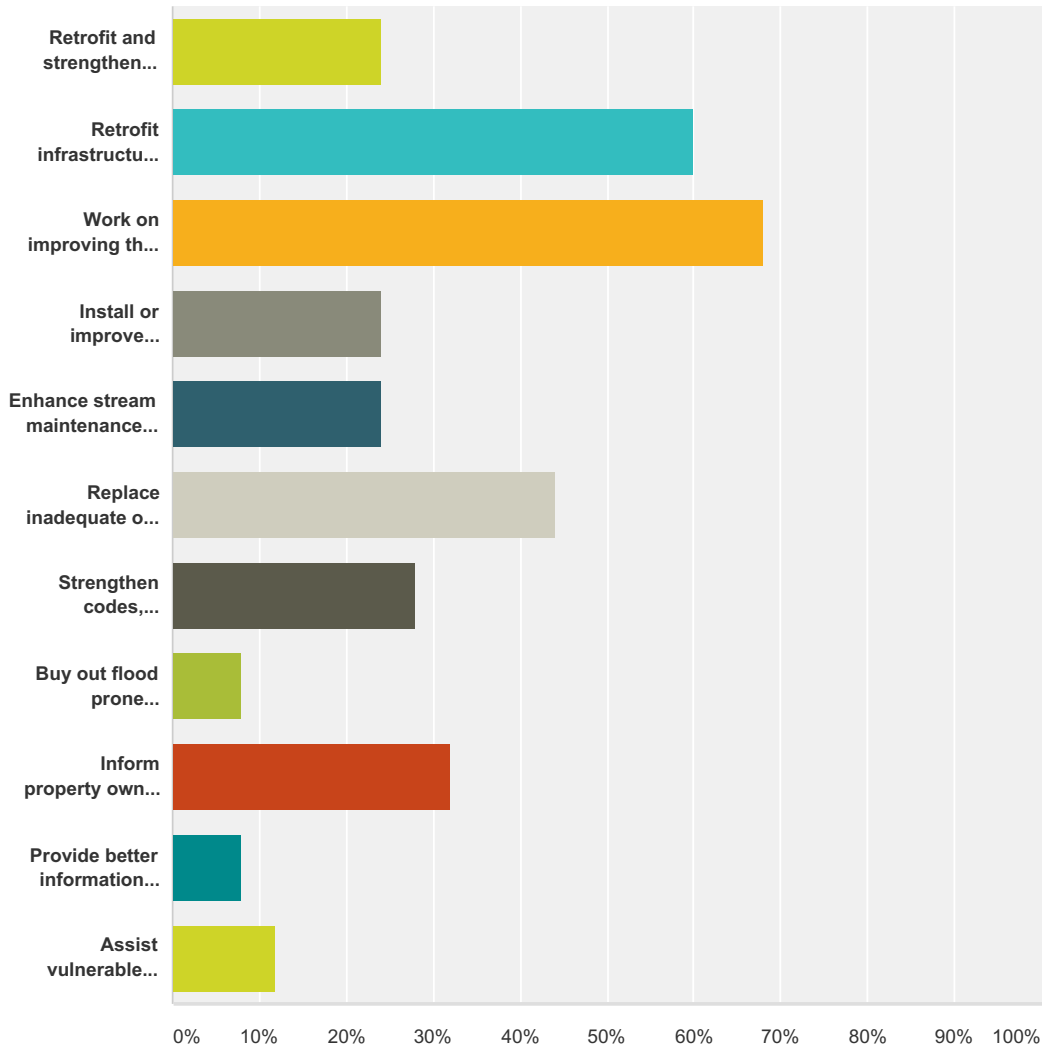
Q14 If you answered "yes" to the previous question, please identify the natural hazard risk that caused you to have problems obtaining homeowners/renters insurance.

Answered: 0 Skipped: 34

#	Responses	Date
	There are no responses.	

Q15 What types of projects do you believe local, county, state or federal government agencies could be doing in order to reduce the damage and disruption of natural disasters in Warren County? Select your top three choices

Answered: 25 Skipped: 9



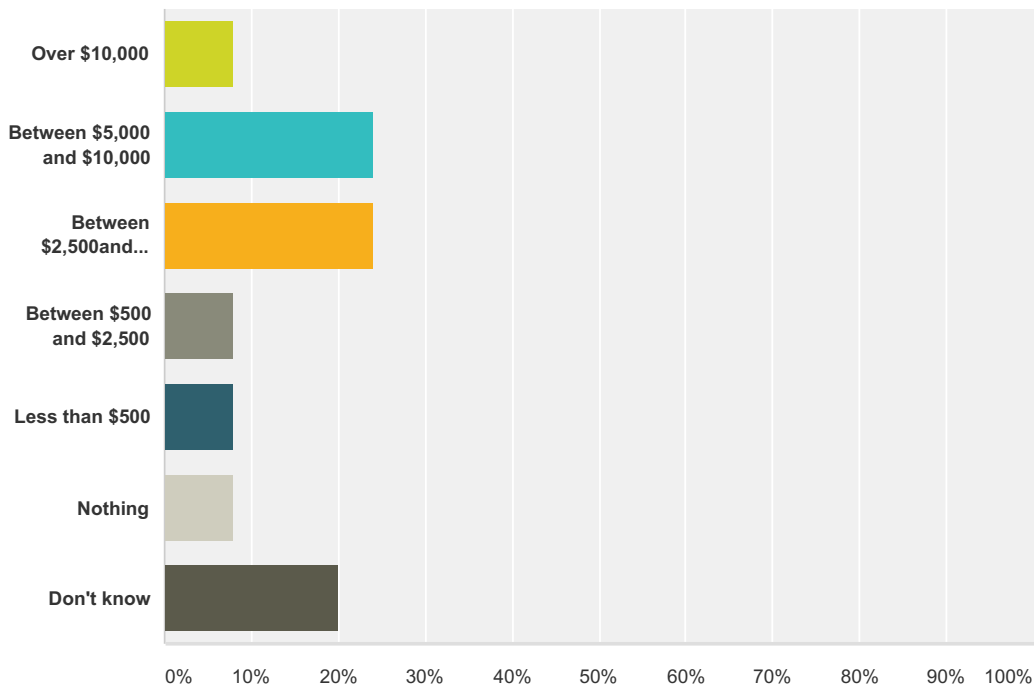
Answer Choices	Responses
Retrofit and strengthen essential facilities such as police, schools, hospitals	24.00% 6
Retrofit infrastructure, such as elevating roadways and improving drainage systems	60.00% 15
Work on improving the damage resistance of utilities (electricity, communications, water/wastewater facilities etc.)	68.00% 17
Install or improve protective structures, such as floodwalls, levees, bulkheads, firebreaks	24.00% 6

Warren County NY HMP - Citizen Survey

Enhance stream maintenance programs/projects	24.00%	6
Replace inadequate or vulnerable bridges and causeways	44.00%	11
Strengthen codes, ordinances and plans to require higher hazard risk management standards and/or provide greater control over development in high hazard areas	28.00%	7
Buy out flood prone properties and maintain as open-space	8.00%	2
Inform property owners of ways they can mitigate damage to their properties	32.00%	8
Provide better information about hazard risks and high-hazard areas	8.00%	2
Assist vulnerable property owners with securing funding to mitigate their properties	12.00%	3
Total Respondents: 25		

Q16 How much money would you be willing to spend on your current home to help protect it from the impacts of potential future natural disasters within our community? Examples are: elevating a flood-prone home; elevating utilities in flood-prone basements; strengthening your roof, siding, doors or windows to withstand high winds; removing threatening trees or branches.

Answered: 25 Skipped: 9



Answer Choices	Responses
Over \$10,000	8.00% 2
Between \$5,000 and \$10,000	24.00% 6
Between \$2,500 and \$5,000	24.00% 6
Between \$500 and \$2,500	8.00% 2
Less than \$500	8.00% 2
Nothing	8.00% 2
Don't know	20.00% 5
Total	25

Q17 If you have already had to spend money to mitigate your property, how much have you spent and on what?

Answered: 9 Skipped: 25

#	Responses	Date
1	\$7000 Solar hot water, bought to reduce cost.... effective during two storms.	10/19/2015 3:32 PM
2	Tree removal \$2700.00	10/16/2015 8:58 AM
3	2500 - drainage	10/16/2015 7:44 AM
4	None	10/15/2015 4:31 PM
5	\$6,000 to install French drain around house to alleviate basement flooding	10/15/2015 2:11 PM
6	Installed metal roofing to better shed snow/ice. Sump pump in basement for occasional water infiltration. Not sure of \$ amounts.	10/8/2015 11:13 AM
7	Installed gutters to move storm water away from the foundation.	10/7/2015 12:00 PM
8	TESTING - NOT A REAL SURVEY RESPONSE	9/28/2015 9:57 AM
9	\$7,000	9/25/2015 9:29 AM

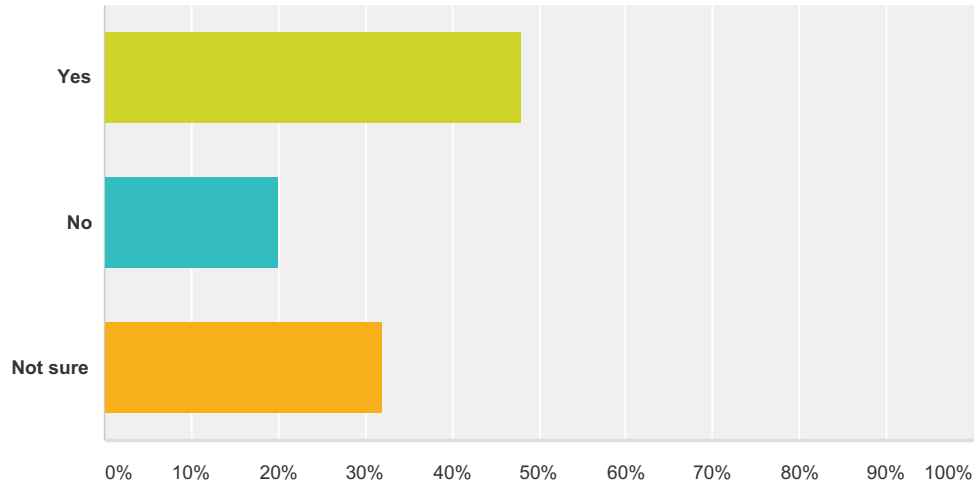
Q18 Which, if any incentives would motivate you to spend money on protecting your home from the possible impacts of a natural disaster? (such as lower interest rates, grant funding, waivers, etc.)

Answered: 12 Skipped: 22

#	Responses	Date
1	Grants	10/16/2015 8:58 AM
2	Grants work for me	10/16/2015 7:44 AM
3	Grant Tax rebate Reduction in insurance premium	10/15/2015 6:40 PM
4	Tax reductions or credits	10/15/2015 5:20 PM
5	Grant funding	10/15/2015 4:31 PM
6	Grant funding for better windows.	10/15/2015 3:02 PM
7	grants funding	10/15/2015 2:11 PM
8	I am more concerned with energy savings than natural disaster mitigation.	10/7/2015 12:00 PM
9	lower rates	10/7/2015 11:54 AM
10	Grant funding or tax incentives	10/1/2015 7:54 PM
11	TESTING - NOT A REAL SURVEY RESPONSE	9/28/2015 9:57 AM
12	Grants	9/25/2015 2:16 PM

Q19 If your property were located in a designated high hazard area (e.g. NFIP flood zone, storm surge zone), or had received repeated damages from a natural disaster event, would you consider a "buyout", "elevation" of the structure, or "relocation"?

Answered: 25 Skipped: 9



Answer Choices	Responses
Yes	48.00% 12
No	20.00% 5
Not sure	32.00% 8
Total	25

Q20 Please list any additional types of projects you believe local, county, state or federal government agencies could be doing in order to reduce the damage and disruption of natural disasters in Warren County?

Answered: 7 Skipped: 27

#	Responses	Date
1	Better standards for wetland and floodplain protection and incentives outside the Adk Park	10/19/2015 4:13 PM
2	Highways and bridges	10/16/2015 8:58 AM
3	Addressing climate change. Provide grand funding to households to prepare their property.	10/15/2015 4:31 PM
4	Update the Grid	10/15/2015 3:02 PM
5	education and code modification	10/7/2015 12:00 PM
6	stormwater managment via green technologies, outreach and education, and hiring community resilience specialists	10/1/2015 7:54 PM
7	TESTING - NOT A REAL SURVEY RESPONSE	9/28/2015 9:57 AM

Warren County NY HMP - Citizen Survey

Q21 Do you have any other comments, questions, or concerns?

Answered: 8 Skipped: 26

#	Responses	Date
1	Thank you for preparing this survey! This will help smaller rural towns that do not have the time or ability to gather this information.	10/19/2015 3:32 PM
2	I believe it is imperative to replace undersized culverts and maintain drainage (including removal of beaver dams) at a higher level. I don't think enough is being done on high risk areas (Thurman Road washouts example) to improve water run off. Culverts need to be maintained and cleaned, ditches cleaned. The reason for all road closings in heavy rains is poor maintenance of drainage, or undersized culverts. Culvert size needs to be at least doubled in most places and even larger in others. Employed by NYSDOT for 30 years	10/16/2015 8:58 AM
3	No.	10/8/2015 11:13 AM
4	I appreciate the foresight of this effort and the opportunity to comment. As a community leader, I support these efforts and will help spread the information to others.	10/7/2015 12:00 PM
5	this is a test survey ONLY	9/28/2015 12:10 PM
6	TESTING - NOT A REAL SURVEY RESPONSE	9/28/2015 9:57 AM
7	Test	9/28/2015 9:54 AM
8	test	9/28/2015 9:29 AM

Q1 Name of your EMS facility:

Answered: 12 Skipped: 0

#	Responses	Date
1	North Warren Emergency Squad	12/9/2015 11:53 AM
2	TEMP	12/9/2015 10:38 AM
3	NWEM	12/2/2015 7:05 PM
4	North Warren Emergency Squad	12/2/2015 6:58 PM
5	North Warren EMS	12/2/2015 6:22 PM
6	North Warren EMS	12/2/2015 6:18 PM
7	North warren EMS	12/2/2015 4:38 PM
8	North Warren EMS	12/2/2015 3:28 PM
9	Mountain Lakes Regional EMS Council	12/2/2015 12:11 PM
10	West Glens Falls	12/2/2015 9:22 AM
11	West Glens Falls EMS	9/24/2015 5:01 PM
12	test	8/25/2015 12:30 PM

Q2 Name of Respondent:

Answered: 10 Skipped: 2

#	Responses	Date
1	Brandon Johnson	12/9/2015 11:53 AM
2	Pete Cafaro	12/2/2015 7:05 PM
3	Cash Jones	12/2/2015 6:58 PM
4	Cynthia Perkins	12/2/2015 6:22 PM
5	Tyler Briscoe	12/2/2015 6:18 PM
6	Ryan wendell	12/2/2015 4:38 PM
7	Jason D. Norton	12/2/2015 3:28 PM
8	Travis Howe	12/2/2015 12:11 PM
9	Mark J. DeSimone	12/2/2015 9:22 AM
10	Dan Albert	9/24/2015 5:01 PM

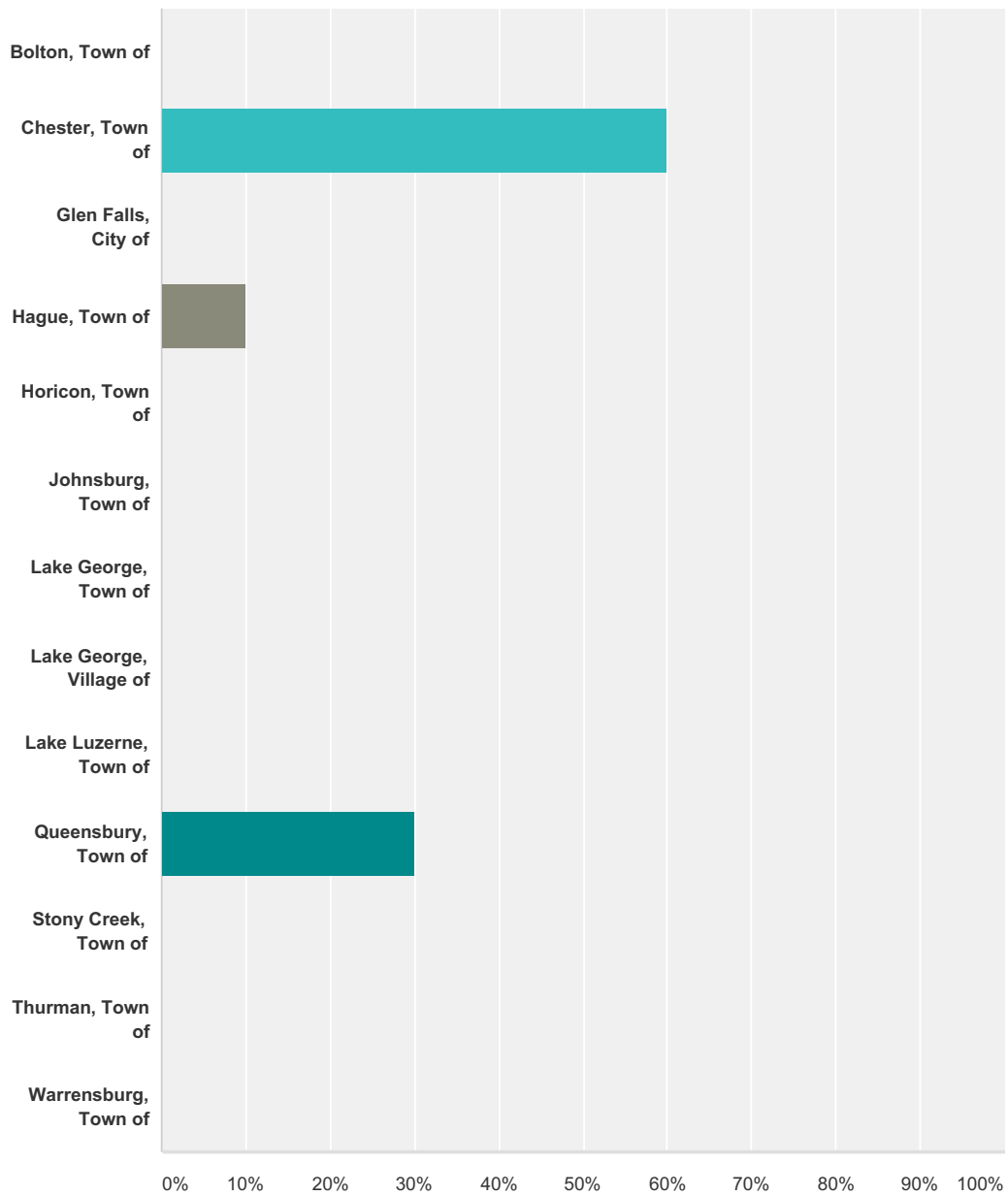
Q3 Contact information (email address or phone number) - optional:

Answered: 7 Skipped: 5

#	Responses	Date
1	cash8187@gmail.com	12/2/2015 6:58 PM
2	croseperk@yahoo.com	12/2/2015 6:22 PM
3	518-586-6175	12/2/2015 4:38 PM
4	nortonjasond@gmail.com 518-795-0404	12/2/2015 3:28 PM
5	thowe@mountainlakesems.org	12/2/2015 12:11 PM
6	medic9152003@yahoo.com	12/2/2015 9:22 AM
7	dannyalbert@yahoo.com	9/24/2015 5:01 PM

Q4 Please identify the location of your facility(ies) and or primary service area:

Answered: 10 Skipped: 2



Answer Choices	Responses
Bolton, Town of	0.00% 0
Chester, Town of	60.00% 6
Glen Falls, City of	0.00% 0
Hague, Town of	10.00% 1
Horicon, Town of	0.00% 0

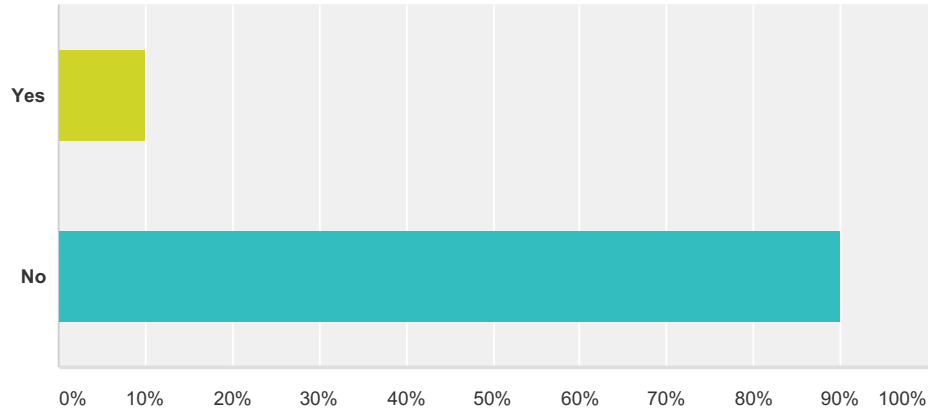
Warren County NY HMP - Emergency Medical Services Survey

Johnsburg, Town of	0.00%	0
Lake George, Town of	0.00%	0
Lake George, Village of	0.00%	0
Lake Luzerne, Town of	0.00%	0
Queensbury, Town of	30.00%	3
Stony Creek, Town of	0.00%	0
Thurman, Town of	0.00%	0
Warrensburg, Town of	0.00%	0
Total		10

#	Other (please specify)	Date
1	And Town of Horicon	12/9/2015 11:53 AM
2	Town of Horicon	12/2/2015 6:22 PM
3	Chestertown, Horicon	12/2/2015 3:28 PM

Q5 Has your EMS facility been impacted by natural hazard events (damaged, closed for extended periods, etc.)?

Answered: 10 Skipped: 2

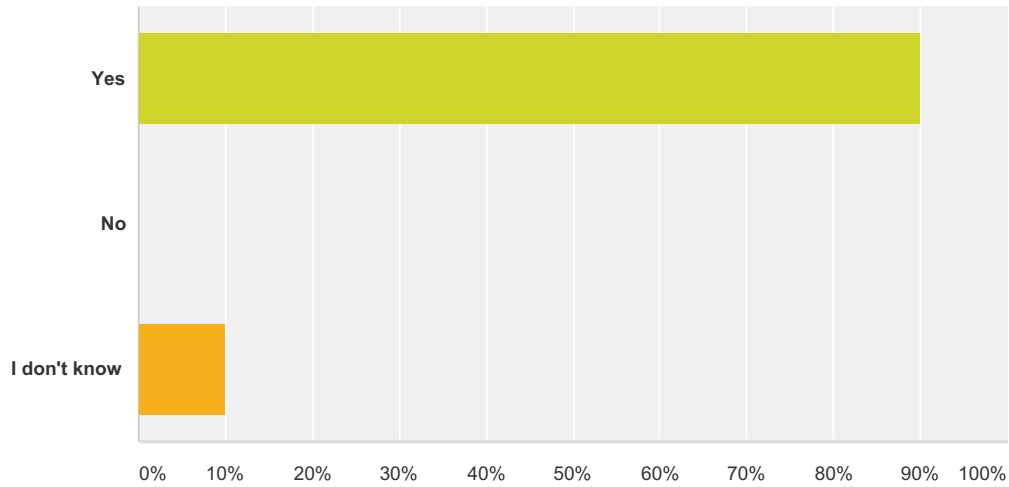


Answer Choices	Responses
Yes	10.00% 1
No	90.00% 9
Total	10

#	If you answered "YES", please identify the events and provide a brief description of the damages or loss of service	Date
1	Trees down, unable to use primary route	12/2/2015 6:22 PM

Q6 Do you think that critical and essential facilities (incl. EMS facilities, hospitals and medical centers) are disaster-resistant (e.g. are properly located and constructed, and have back-up power as appropriate)?

Answered: 10 Skipped: 2

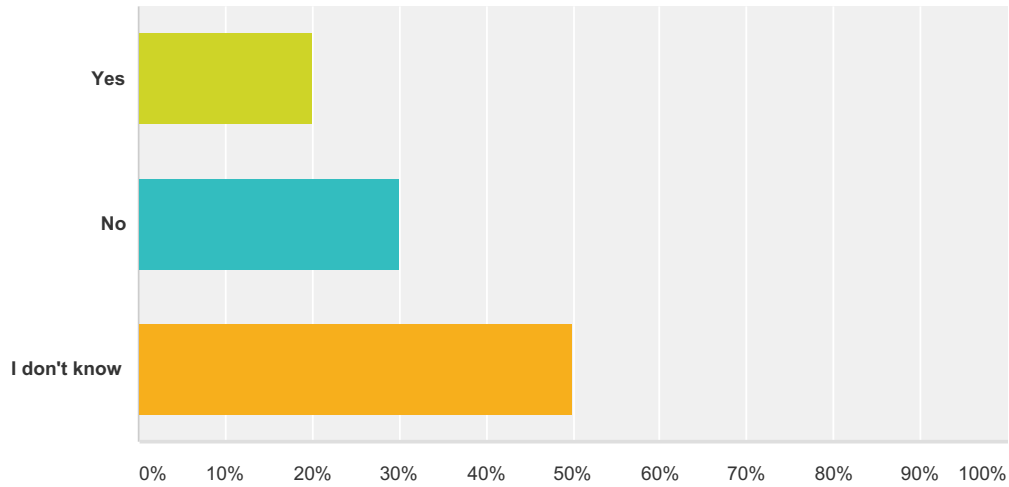


Answer Choices	Responses
Yes	90.00% 9
No	0.00% 0
I don't know	10.00% 1
Total	10

#	Please explain	Date
1	I believe that most facilities in the county are equipped with proper backup power and are constructed well. I can't say that all facilities are properly located.	12/2/2015 3:28 PM
2	The majority of our firehouses and EMS stations have backup power sources but I can't say one way or the other if their locations are resistant to disaster.	12/2/2015 12:11 PM
3	Generator is in place. Currently there are no known structural issues.	9/24/2015 5:01 PM

Q7 Do you think that the transportation infrastructure serving your facilities (e.g. roads and bridges) are properly designed to withstand closures and/or damage due to natural hazards?

Answered: 10 Skipped: 2

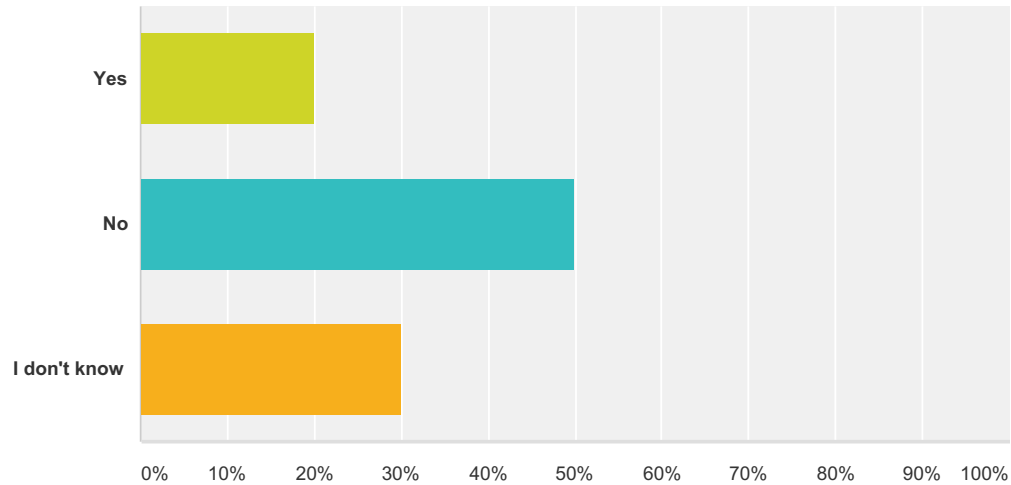


Answer Choices	Responses
Yes	20.00% 2
No	30.00% 3
I don't know	50.00% 5
Total	10

#	Please explain	Date
1	I believe that a good portion of the transportation infrastructure could withstand closures or damage, however only to a certain limit. I can say that there are many that do have foreseeable issues in the future depending on the type of incident.	12/2/2015 3:28 PM
2	An example would be the Town of Thurman infrastructure which suffered washout during recent storms and made for limited access to parts of town. This restricts access for Fire, EMS and LEO's. It is no secret that many of our bridges across the state are aging and susceptible to damage.	12/2/2015 12:11 PM
3	Integrity of the transportation infrastructure would be dependent upon the type and severity of the event. Certain roads and bridges in our district may not be able to withstand severe weather events, such as flooding.	9/24/2015 5:01 PM

Q8 Do you think that the utility infrastructure (specifically electricity and communications) is sufficiently disaster-resistant to support EMS functions during and after natural hazard events?

Answered: 10 Skipped: 2

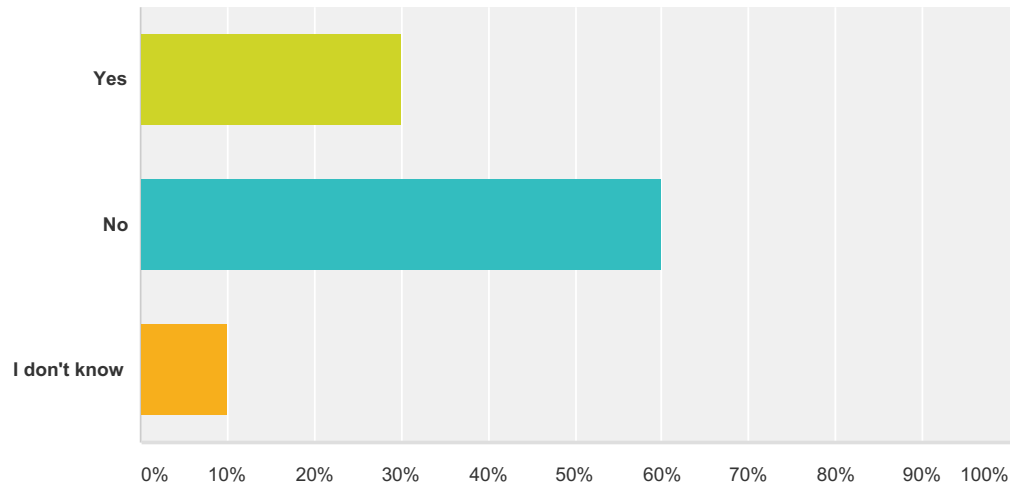


Answer Choices	Responses
Yes	20.00% 2
No	50.00% 5
I don't know	30.00% 3
Total	10

#	Please explain	Date
1	Storm related power and communications outages are frequent due to downed trees.	12/2/2015 7:16 PM
2	I believe that both electricity and communication utilities are not resistant in this area to support EMS functions during disasters. In a number of disasters in the last few years, the systems have been down, and other methods have needed to be utilized.	12/2/2015 3:48 PM
3	Warren County has some gaps in radio communications as it is. We do not have much room for error so to speak. In other words, if we lose a tower or two, we are going to be struggling to communicate effectively.	12/2/2015 12:19 PM
4	back up system	12/2/2015 9:27 AM
5	Electricity and landline phone is questionable depending upon the extend of damage to the infrastructure. There are redundancies in the radio communications systems.	9/24/2015 5:07 PM

Q9 Do you think that local public education and awareness programs are effective at informing the public on what they should do to be prepared for and reduce their personal risk to natural disasters, so as not to increase the need for EMS during hazard events?

Answered: 10 Skipped: 2

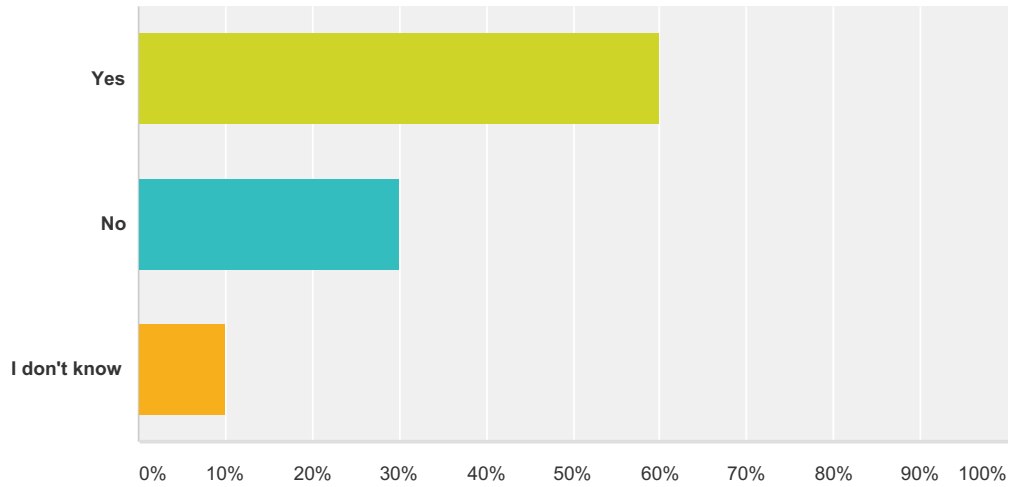


Answer Choices	Responses
Yes	30.00% 3
No	60.00% 6
I don't know	10.00% 1
Total	10

#	Please explain	Date
1	I believe that natural disasters will always increase demand on EMS personnel and facilities and that many families in the area will not be as prepared as we would like. More public education and awareness programs will help, but never be totally effective.	12/2/2015 7:16 PM
2	The public in general has limited knowledge on emergency situations. Additional training and practice of basic response skills could significantly increase a patient's prognosis when in an area of longer EMS response times.	12/2/2015 6:27 PM
3	I believe that public education and awareness are extremely important and key to preparedness. If individuals are informed and prepared, less stress on the current system should be more likely.	12/2/2015 3:48 PM
4	always should have additional fire and ems teams available.	12/2/2015 9:27 AM
5	I don't think people perceive or understand the risk unless they have personally experienced a disaster themselves or through direct friends or family.	9/24/2015 5:07 PM

Q10 Do you think that announcements of road closures and pending road closures are sufficiently accurate and available to support EMS functions during natural hazard events?

Answered: 10 Skipped: 2

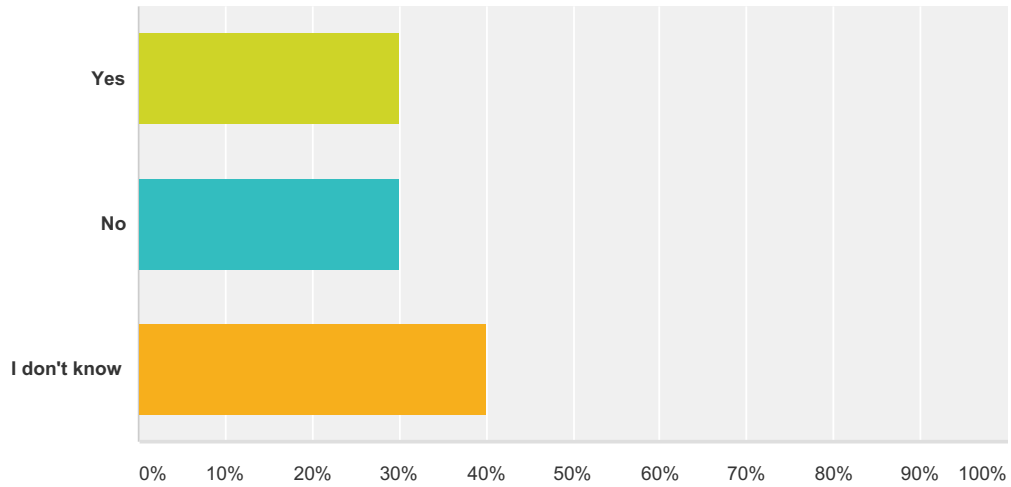


Answer Choices	Responses
Yes	60.00% 6
No	30.00% 3
I don't know	10.00% 1
Total	10

#	Please explain	Date
1	I believe that with the current system in place, that announcements are sufficient. I also believe that with knowledge of the area, and pending road closures, alternate plans can be made.	12/2/2015 3:48 PM
2	does not always happen	12/2/2015 9:27 AM

Q11 Do you think that the public is aware of, understands, and takes advantage of emergency warning and notification systems and services (reverse 911, audible alerts, cell and text services)?

Answered: 10 Skipped: 2

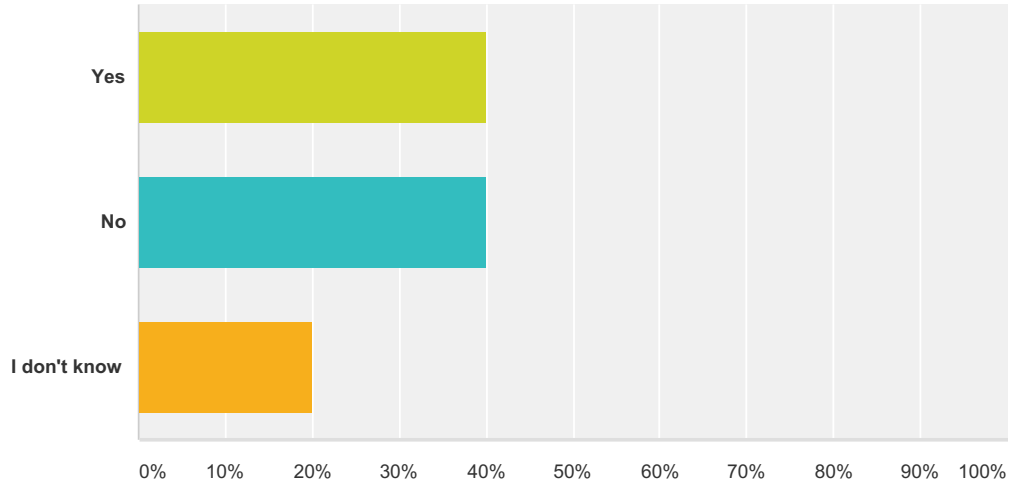


Answer Choices	Responses
Yes	30.00% 3
No	30.00% 3
I don't know	40.00% 4
Total	10

#	Please explain	Date
1	I believe that a good portion of the public is aware, however, many do not take advantage of this service for one reason or another.	12/2/2015 3:48 PM
2	I believe that we need to promote and educate more in this area. There are many folks who have technology specific to their cell phones available to them but they may not know it exists or how to seek / receive information.	12/2/2015 12:19 PM

Q12 Do you think that your EMS company works to inform your constituents of how they can better manage their risk to natural hazards?

Answered: 10 Skipped: 2

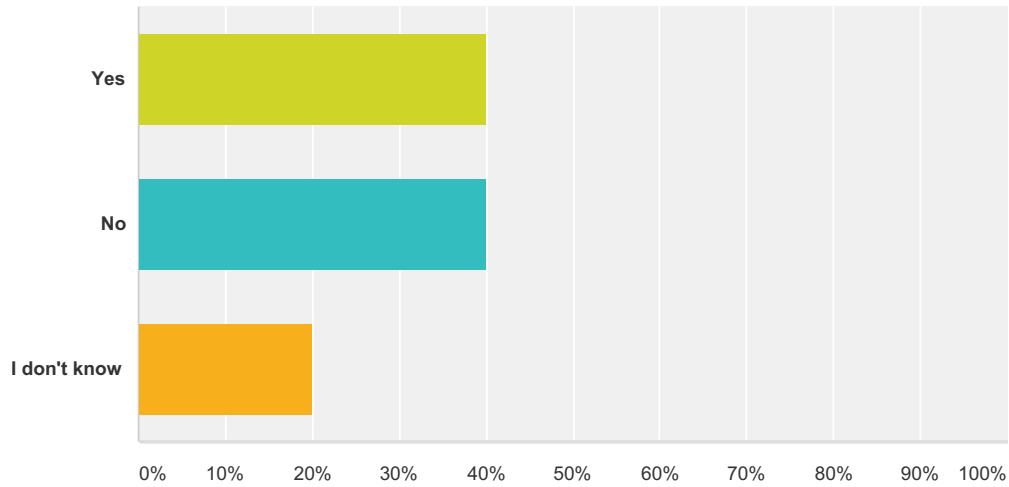


Answer Choices	Responses
Yes	40.00% 4
No	40.00% 4
I don't know	20.00% 2
Total	10

#	Please explain	Date
1	I believe that this is a work in progress in most agencies, and that there has not been a strong concentration in this area. More risk assessments and classes should be offered to help mitigate risk and increase preparedness.	12/2/2015 3:48 PM
2	We could certainly do better in this area. Our office keeps providers and agencies apprised of current forecasts etc. as they are handed to us but we don;t do much in the way of preemptive education.	12/2/2015 12:19 PM

Q13 Do you think that emergency response planning, services, and equipment are adequate to manage and respond properly to natural disasters in your community?

Answered: 10 Skipped: 2

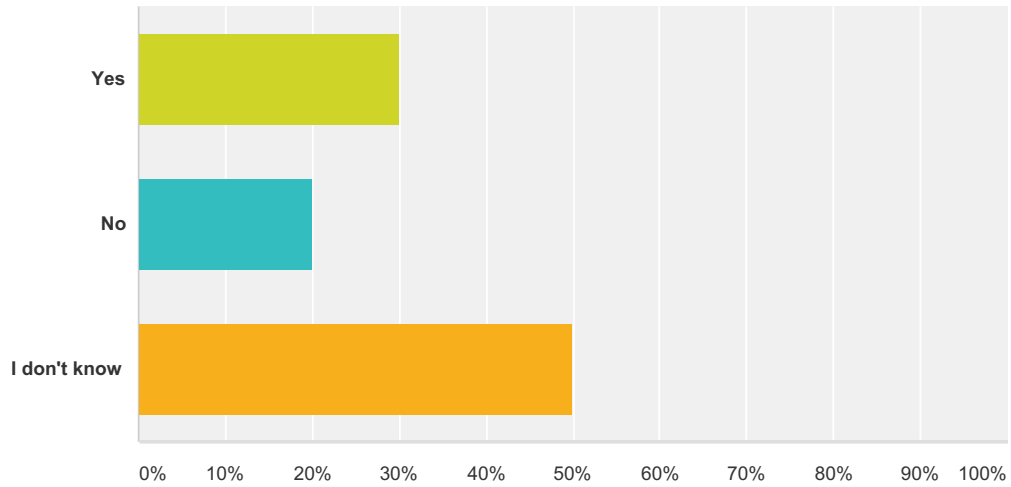


Answer Choices	Responses
Yes	40.00% 4
No	40.00% 4
I don't know	20.00% 2
Total	10

#	Please explain	Date
1	I believe that this is also a work in progress. Many individuals are not really aware of what planning, services, and equipment are at our disposal. The other issue is location of said services and equipment in the county. Evaluation of location to these should be reevaluated.	12/2/2015 3:48 PM
2	Although, the deployment of resources to the northern section of the county could be made easier with additional equipment.	12/2/2015 12:19 PM
3	Not if there are multiple areas effected by a disaster	12/2/2015 9:27 AM
4	I think more can be done to educate agency membership (non-leadership). This is particularly difficult due to high turn-over.	9/24/2015 5:07 PM

Q14 Do you think that local government understands, supports, and possess the resources for natural hazard risk reduction efforts in the community?

Answered: 10 Skipped: 2

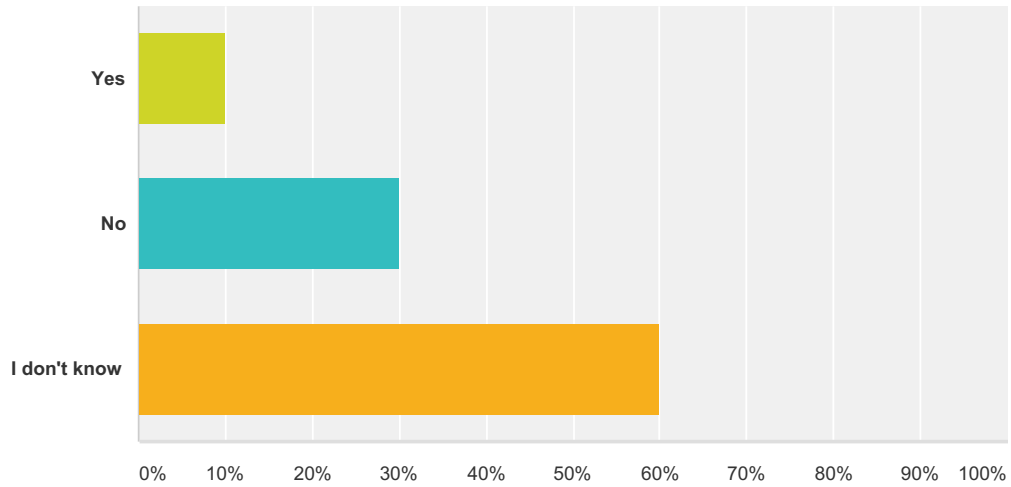


Answer Choices	Responses
Yes	30.00% 3
No	20.00% 2
I don't know	50.00% 5
Total	10

#	Please explain	Date
1	This i can not say yes or no to, as I am not 100% familiar with all current reduction efforts.	12/2/2015 3:48 PM

Q15 Is your organization covered by a Continuity of Operations (COOP) plan? COOP plans examine an organization's ability to perform minimum essential functions during any situation, and support the continuance of organization functions.

Answered: 10 Skipped: 2



Answer Choices	Responses
Yes	10.00% 1
No	30.00% 3
I don't know	60.00% 6
Total	10

#	If "Yes", please explain.	Date
1	I don't believe that this organization is covered by a COOP plan.	12/2/2015 3:48 PM

Q16 Can you identify projects or programs that will reduce your facility's vulnerability to damages and losses, including loss of operation/service, to hazard events?

Answered: 7 Skipped: 5

#	Responses	Date
1	No	12/2/2015 7:18 PM
2	Funding for MCI incident education and training.	12/2/2015 6:28 PM
3	N/a	12/2/2015 4:40 PM
4	I cannot identify any at this time due to lack of knowledge of said projects or programs.	12/2/2015 3:51 PM
5	The availability of generator service at our headquarters.	12/2/2015 12:20 PM
6	n/a	12/2/2015 9:27 AM
7	More could be done to educate how members should prepare themselves and their families for disasters.	9/24/2015 5:08 PM

Q17 Do you have any other comments, questions, or concerns?

Answered: 5 Skipped: 7

#	Responses	Date
1	No	12/2/2015 7:18 PM
2	I feel that smaller municipalities are behind in "hazard awareness and preparedness" , due to lack of funds.	12/2/2015 6:28 PM
3	N/a	12/2/2015 4:40 PM
4	I believe that EMS and county officials coming together and discussing these issues will bring a better understanding of plans and resources, and increase preparedness not only to the EMS field, but to the public as well.	12/2/2015 3:51 PM
5	no	12/2/2015 9:27 AM

Warren County NY HMP - Firefighter Survey

Q1 Name of your fire department or district:

Answered: 17 Skipped: 0

#	Responses	Date
1	Hague Fire Department	12/12/2015 1:30 PM
2	Hague Fire Department	12/10/2015 9:16 PM
3	North River Volunteer Fire Co Inc	12/10/2015 1:05 PM
4	TEMP	12/9/2015 10:37 AM
5	Chestertown	12/5/2015 10:55 PM
6	Bolton	12/3/2015 12:18 AM
7	Bay Ridge Vol. Fire Co., Inc.	12/2/2015 9:09 PM
8	Lake George	12/2/2015 8:24 PM
9	Queensbury Central Fire	12/2/2015 2:14 PM
10	glens falls fire department	12/2/2015 12:11 PM
11	City of Glens Falls	12/2/2015 10:40 AM
12	Minerva Vol. Fire Dept. & Rescue Squad	12/2/2015 10:17 AM
13	City of Glens Falls Fire Department	12/2/2015 10:04 AM
14	South Queensbury Fire	12/2/2015 9:39 AM
15	West Glens Falls Fire Company	12/2/2015 9:17 AM
16	Warren County Emergency Services	9/25/2015 12:57 PM
17	test	8/25/2015 12:29 PM

Warren County NY HMP - Firefighter Survey

Q2 Name of respondent:

Answered: 11 Skipped: 6

#	Responses	Date
1	Michael Cherubini	12/12/2015 1:30 PM
2	Michael Cherubini	12/10/2015 9:16 PM
3	CO Allen	12/10/2015 1:05 PM
4	Charles T Mellon Jr	12/2/2015 9:09 PM
5	Barber, James	12/2/2015 8:24 PM
6	Richard Goedert	12/2/2015 2:14 PM
7	Richard Stafford	12/2/2015 12:11 PM
8	John Paul Jones	12/2/2015 10:04 AM
9	Eric Lettus	12/2/2015 9:39 AM
10	Kelli Anne Kennedy	12/2/2015 9:17 AM
11	Brian LaFlure	9/25/2015 12:57 PM

Warren County NY HMP - Firefighter Survey

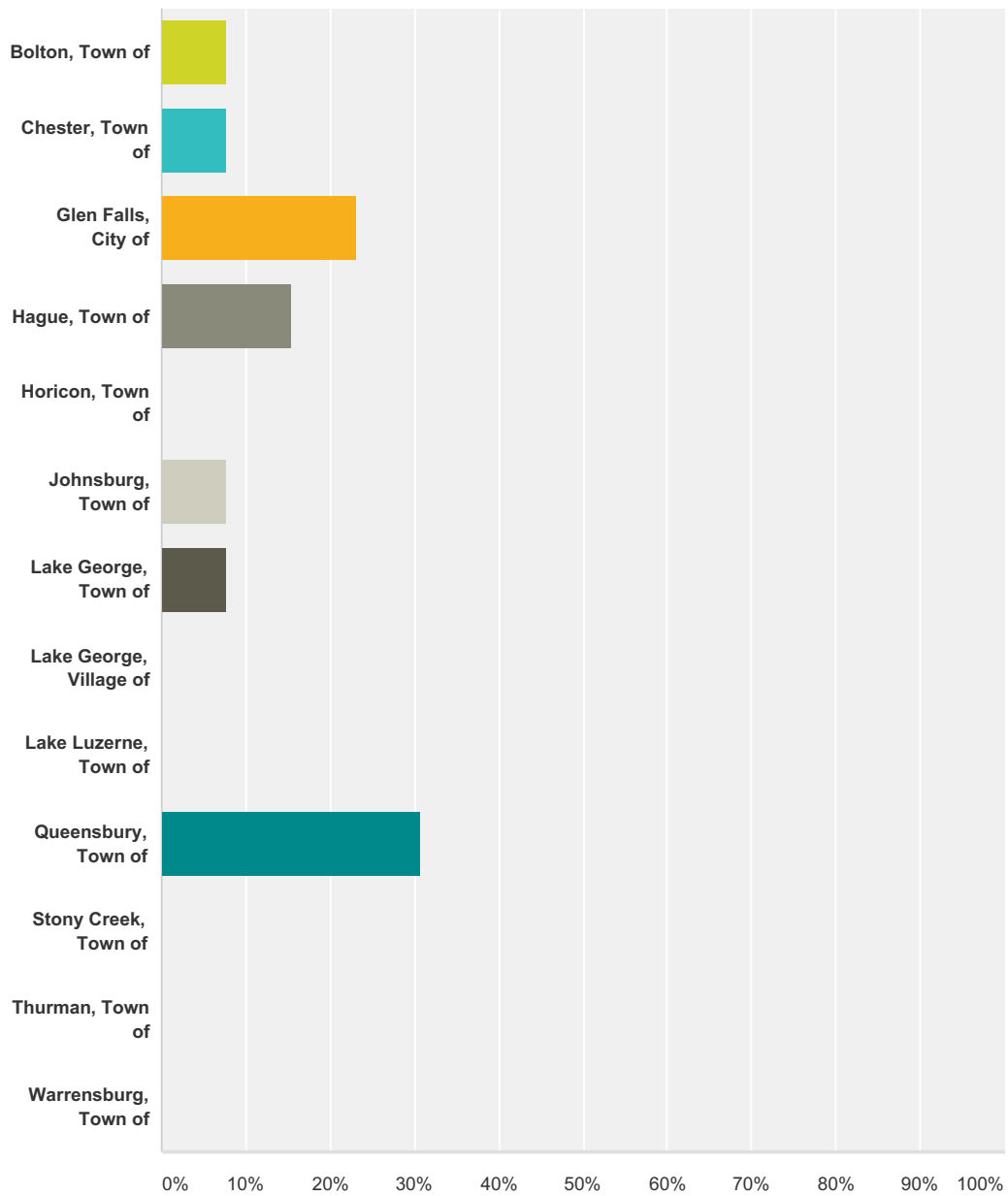
Q3 Contact information (email address or phone number) - optional:

Answered: 10 Skipped: 7

#	Responses	Date
1	mmcherubini@aol.com	12/12/2015 1:30 PM
2	mmcherubini@aol.com	12/10/2015 9:16 PM
3	cmmellon@gmail.com	12/2/2015 9:09 PM
4	cheif08lgfd@nycap.rr.com	12/2/2015 8:24 PM
5	dgoedert@roadrunner.com	12/2/2015 2:14 PM
6	gffire26@gmail.com	12/2/2015 12:11 PM
7	gffd_history@yahoo.com	12/2/2015 10:04 AM
8	elettus35@sqfd.org	12/2/2015 9:39 AM
9	518-744-8978	12/2/2015 9:17 AM
10	laflureb@co.warren.ny.us	9/25/2015 12:57 PM

Q4 Please identify the location of your facility(ies) and or primary service area:

Answered: 13 Skipped: 4



Answer Choices	Responses	Count
Bolton, Town of	7.69%	1
Chester, Town of	7.69%	1
Glen Falls, City of	23.08%	3
Hague, Town of	15.38%	2
Horicon, Town of	0.00%	0

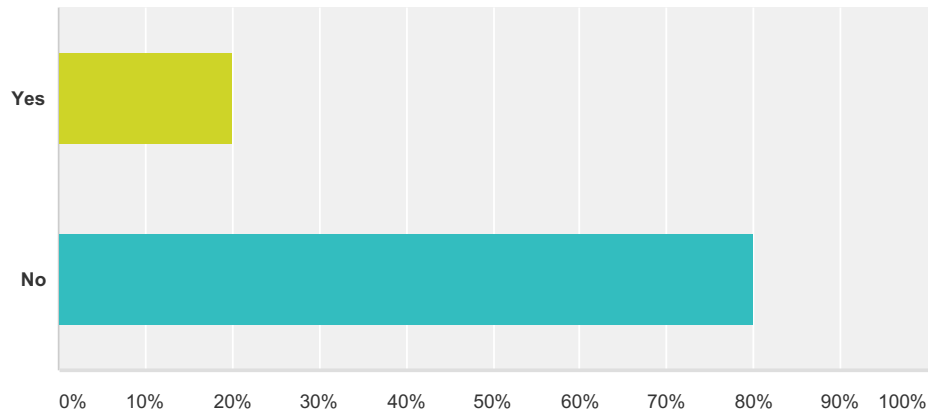
Warren County NY HMP - Firefighter Survey

Johnsburg, Town of	7.69%	1
Lake George, Town of	7.69%	1
Lake George, Village of	0.00%	0
Lake Luzerne, Town of	0.00%	0
Queensbury, Town of	30.77%	4
Stony Creek, Town of	0.00%	0
Thurman, Town of	0.00%	0
Warrensburg, Town of	0.00%	0
Total		13

#	Other (please specify)	Date
1	Minerva	12/2/2015 10:17 AM
2	Warren County	9/25/2015 12:57 PM

Q5 Has your fire department been impacted by natural hazard events (damaged, closed for extended periods, etc.)?

Answered: 15 Skipped: 2

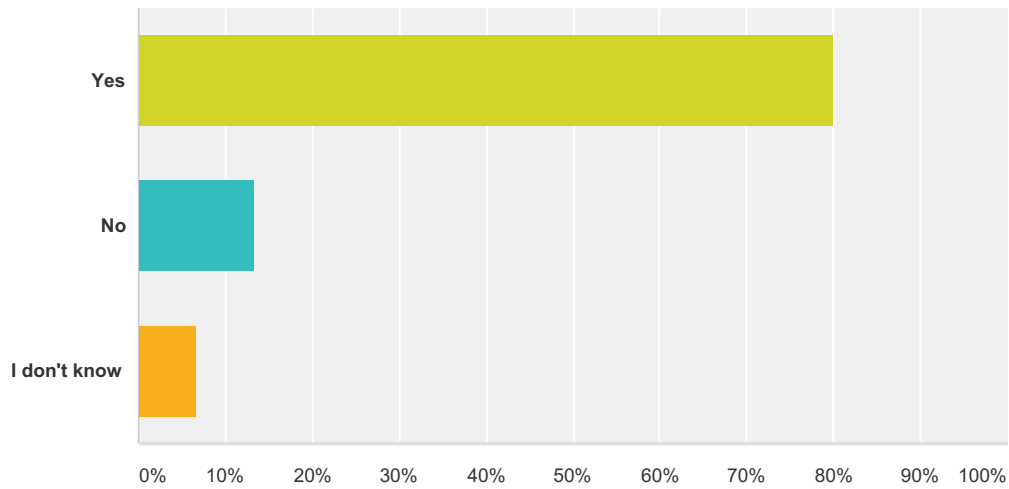


Answer Choices	Responses
Yes	20.00% 3
No	80.00% 12
Total	15

#	If you answered "YES", please identify the events and provide a brief description of the damages or loss of service	Date
1	Some incidents resulted in extended power outages. Other incidents resulted in people being displaced from their homes. Some incidents resulted in utilizing the fire station as an emergency shelter, since it has an emergency generator.	12/2/2015 9:09 PM
2	Hurricane Irene, Tropical storm Lee, Memorial Day storm in the Town of Thurman.	9/25/2015 12:57 PM

Q6 Do you think that critical and essential facilities (incl. fire departments, EMS, hospitals and medical centers) are disaster-resistant (e.g. are properly located and constructed, and have back-up power as appropriate)?

Answered: 15 Skipped: 2

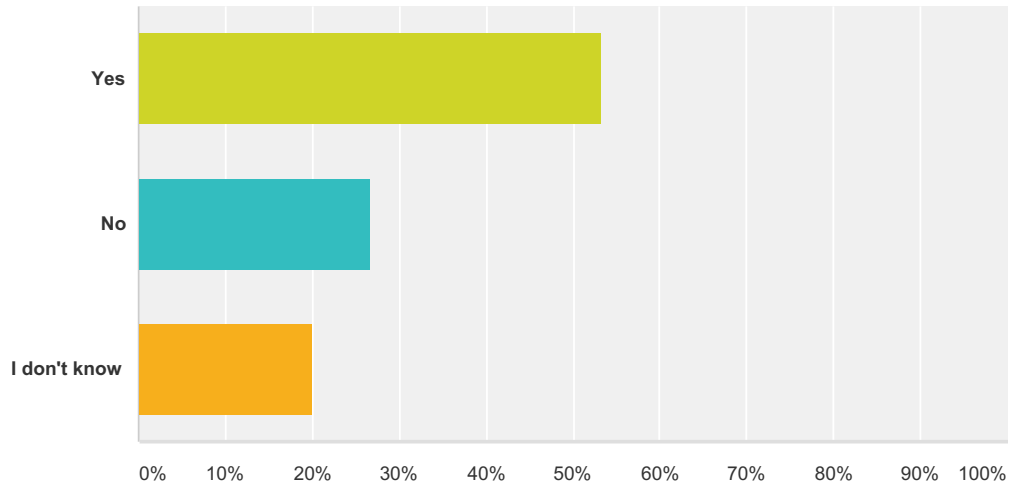


Answer Choices	Responses
Yes	80.00% 12
No	13.33% 2
I don't know	6.67% 1
Total	15

#	Please explain	Date
1	The only building with-in the district is the fire house. It is equipped with a generator so it can always be operational.	12/12/2015 1:30 PM
2	Central to our district, we do have back up electric but don't have necessary cots, blankets, etc.	12/10/2015 1:05 PM
3	Most	12/3/2015 12:18 AM
4	Many facilities have back-up power and/or appear to be constructed properly. But I am not qualified to determine if they are disaster resistant.	12/2/2015 9:09 PM
5	Queensbury Central has a well-constructed building with a backup generator to run 95% of the facility. All of the key elements will work on backup power, such as lights, heat, kitchen, and fuel pumps.	12/2/2015 2:14 PM

Q7 Do you think that the transportation infrastructure serving your facilities (e.g. roads and bridges) are properly designed to withstand closures and/or damage due to natural hazards?

Answered: 15 Skipped: 2

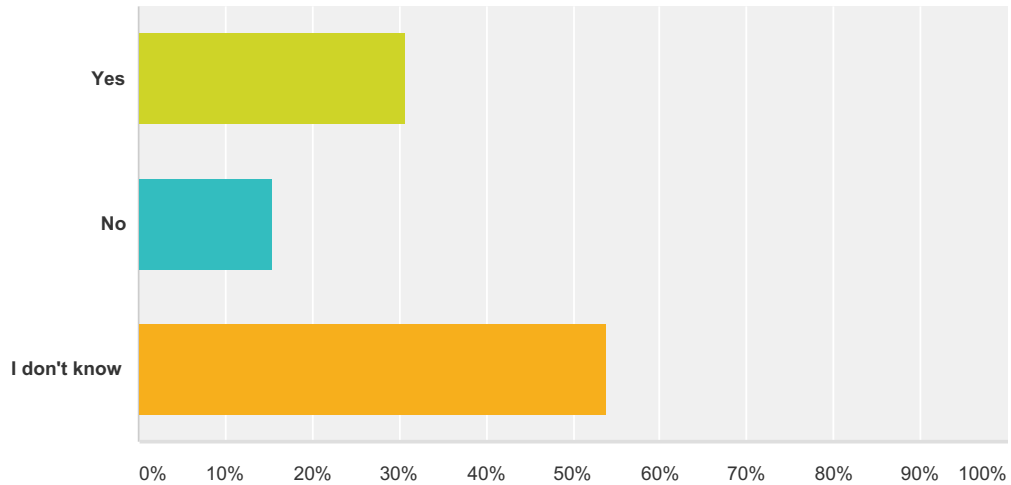


Answer Choices	Responses
Yes	53.33% 8
No	26.67% 4
I don't know	20.00% 3
Total	15

#	Please explain	Date
1	Two ways into and out of Hague.	12/12/2015 1:30 PM
2	NYS and Warren County is lacking im maintaining infrastructure.	12/3/2015 12:18 AM
3	Continued updating, through funding, is needed.	9/25/2015 12:57 PM

Q8 Do you think that the utility infrastructure (specifically electricity and communications) is sufficiently disaster-resistant to support school functions after natural hazard events?

Answered: 13 Skipped: 4

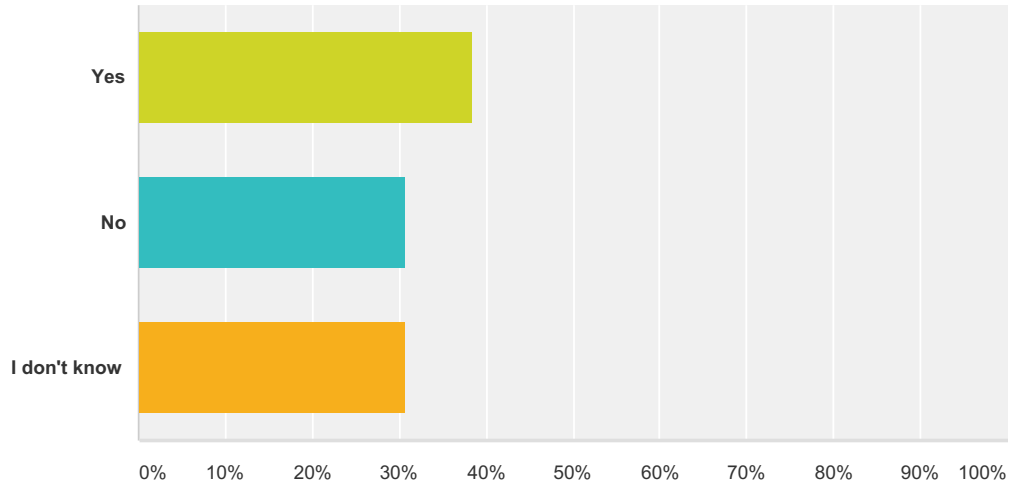


Answer Choices	Responses
Yes	30.77% 4
No	15.38% 2
I don't know	53.85% 7
Total	13

#	Please explain	Date
1	The school is located in a different fire district .	12/12/2015 1:30 PM
2	Communications has improved and those responsible continue to work at improving	12/3/2015 12:23 AM
3	Minerva school has a generator and is a disaster location for the town.	12/2/2015 10:18 AM
4	Too much distribution is aerial, not underground.	9/25/2015 1:03 PM

Q9 Do you think that local public education and awareness programs are effective at informing the public on what they should do to be prepared for and reduce their personal risk to natural disasters, so as not to increase the need for fire fighting services during hazard events?

Answered: 13 Skipped: 4

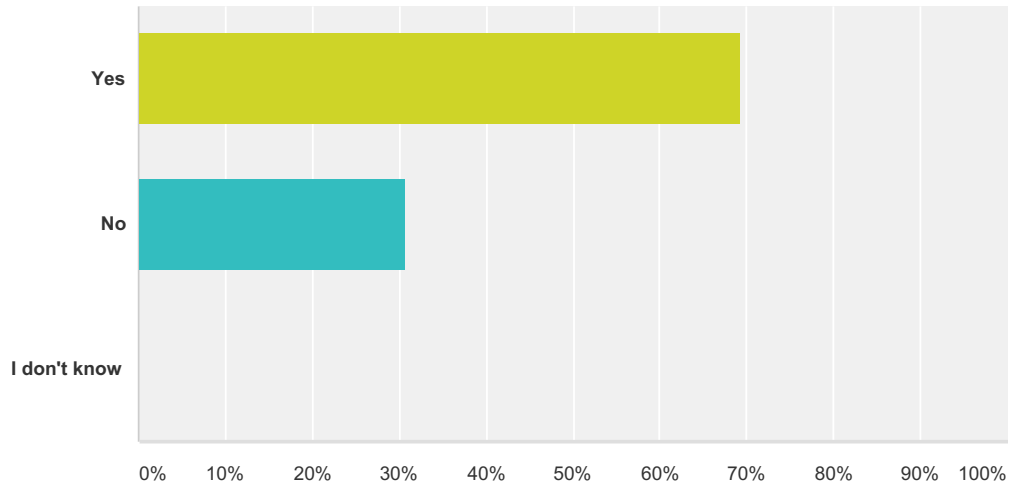


Answer Choices	Responses
Yes	38.46% 5
No	30.77% 4
I don't know	30.77% 4
Total	13

#	Please explain	Date
1	I think we need to more education to the residence.	12/12/2015 1:30 PM
2	I believe they are at the best they can be. With the advent of text messaging, TV, radio, and email the word get out prior to storms. As for civilians preparing for disaster, some will and others just wait till it is too late. Some just cannot afford to buy what they need ahead of time.	12/2/2015 2:33 PM
3	I can not recall hearing any PSA, radio,TV, or print that gives information.	12/2/2015 10:50 AM
4	Schools do not inform students about the emergency services in general.	12/2/2015 10:07 AM
5	Programs are good, participation is the issue.	9/25/2015 1:03 PM

Q10 Do you think that announcements of road closures and pending road closures are sufficiently accurate and available to support fire department functions during natural hazard events?

Answered: 13 Skipped: 4

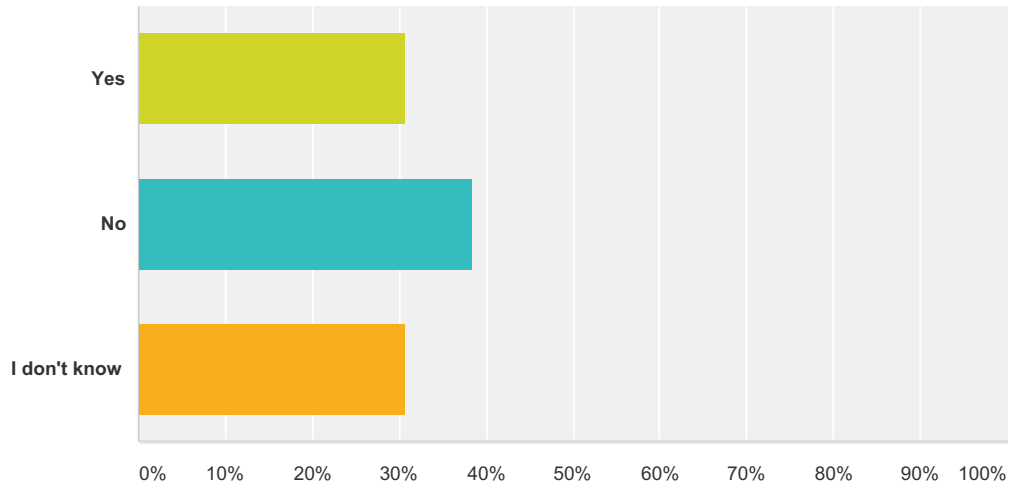


Answer Choices	Responses
Yes	69.23% 9
No	30.77% 4
I don't know	0.00% 0
Total	13

#	Please explain	Date
1	At times do not receive the emergency or maintenance road closings.	12/12/2015 1:30 PM
2	County dispatchers do a great job notifying the departments of closures.	12/2/2015 2:33 PM
3	Our dispatch center announces weather hazards and road closures in a timely manner.	12/2/2015 10:50 AM
4	Additional information,real time, is needed for the First Responders.	9/25/2015 1:03 PM

Q11 Do you think that the public is aware of, understands, and takes advantage of emergency warning and notification systems and services (reverse 911, audible alerts, cell and text services)?

Answered: 13 Skipped: 4

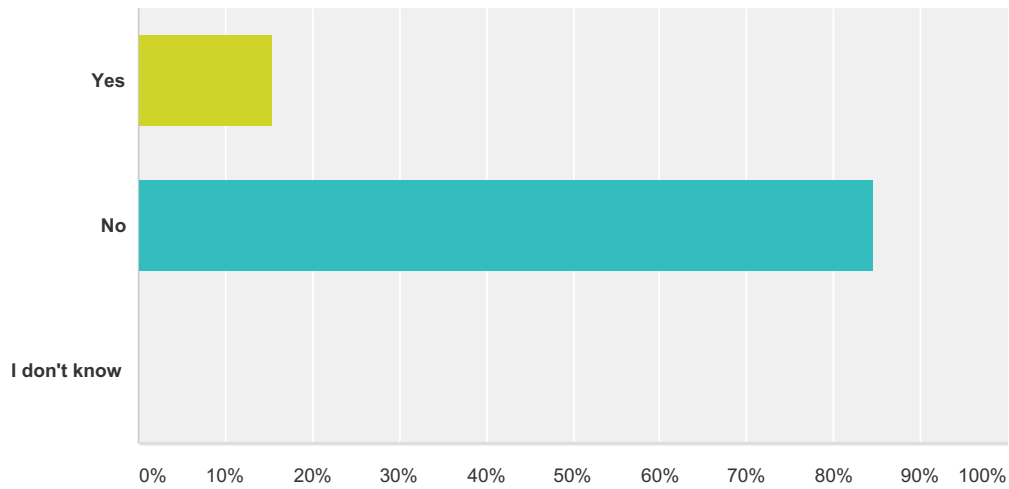


Answer Choices	Responses
Yes	30.77% 4
No	38.46% 5
I don't know	30.77% 4
Total	13

#	Please explain	Date
1	We have no cell service in Hague.	12/12/2015 1:30 PM
2	More advertising is needed so more are aware of the services available	12/3/2015 12:23 AM
3	I'm not aware that our county has reverse 911 or sends txt msgs.	12/2/2015 10:50 AM

Q12 Do you think that your department/fire district works to inform your constituents of how they can better manage their risk to natural hazards (e.g. proper use of portable heaters and generators, defensible space for wildfires, etc.)?

Answered: 13 Skipped: 4

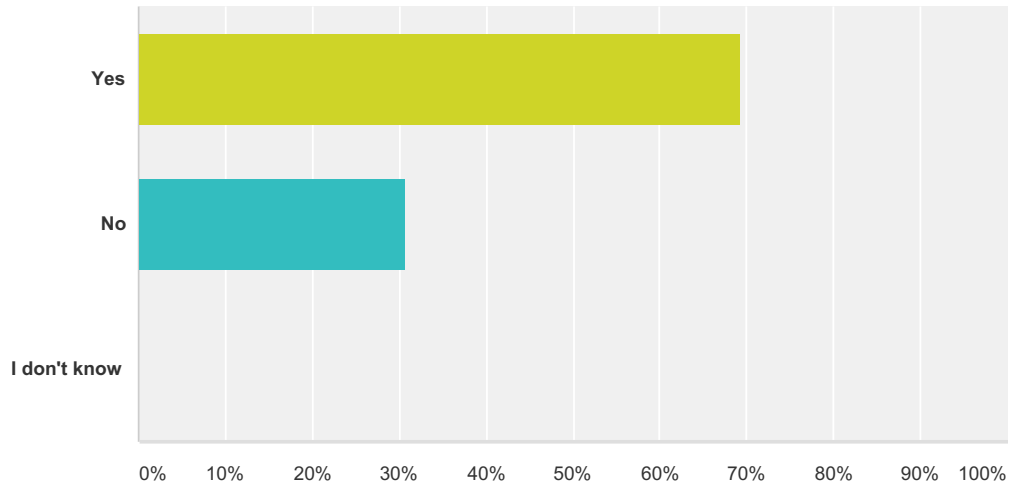


Answer Choices	Responses
Yes	15.38% 2
No	84.62% 11
I don't know	0.00% 0
Total	13

#	Please explain	Date
1	Not sure if everyone knows. We do post info. Should look into a education program locally.	12/12/2015 1:30 PM
2	The volunteer world struggles to maintain the necessities let alone public education beyond grade school fire prevention education.	12/3/2015 12:23 AM
3	We do a lot of fire prevention in the schools, but not much adult education	12/2/2015 2:33 PM
4	I'm not aware of any PSA/education provided while on duty.	12/2/2015 10:50 AM
5	Could be more outreach by the local res[ponders]. However them being volunteers, that's not possible.	9/25/2015 1:03 PM

Q13 Do you think that emergency response planning, services, and equipment are adequate to manage and respond properly to natural disasters in your community?

Answered: 13 Skipped: 4

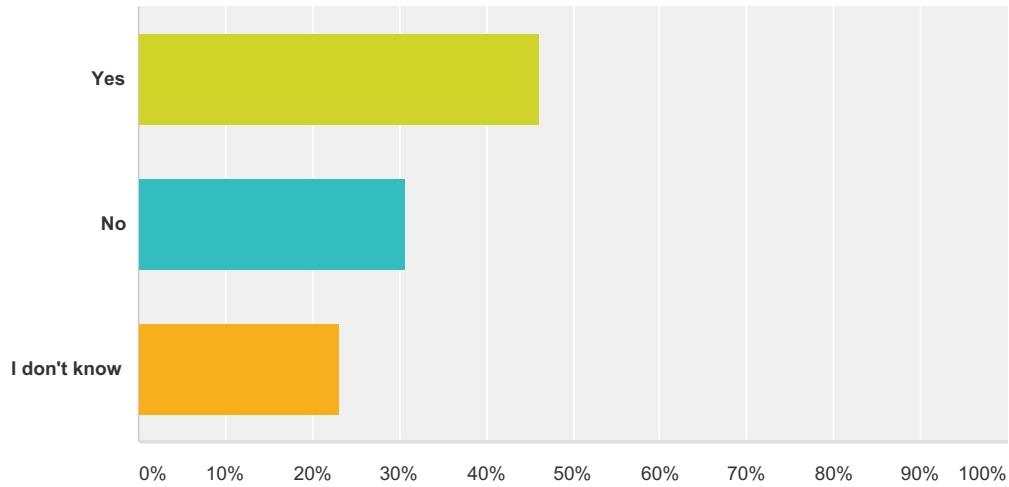


Answer Choices	Responses
Yes	69.23% 9
No	30.77% 4
I don't know	0.00% 0
Total	13

#	Please explain	Date
1	We have resource available to the town to be used in the event of a natural disaster .	12/12/2015 1:30 PM
2	Drastically improving	12/3/2015 12:23 AM
3	In the event of a large scale natural disaster it would be difficult to recall members. Traveling into the city may be difficult.	12/2/2015 10:50 AM
4	Good, but more training would be good.	9/25/2015 1:03 PM

Q14 Do you think that local government understands, supports, and possess the resources for natural hazard risk reduction efforts in the community?

Answered: 13 Skipped: 4

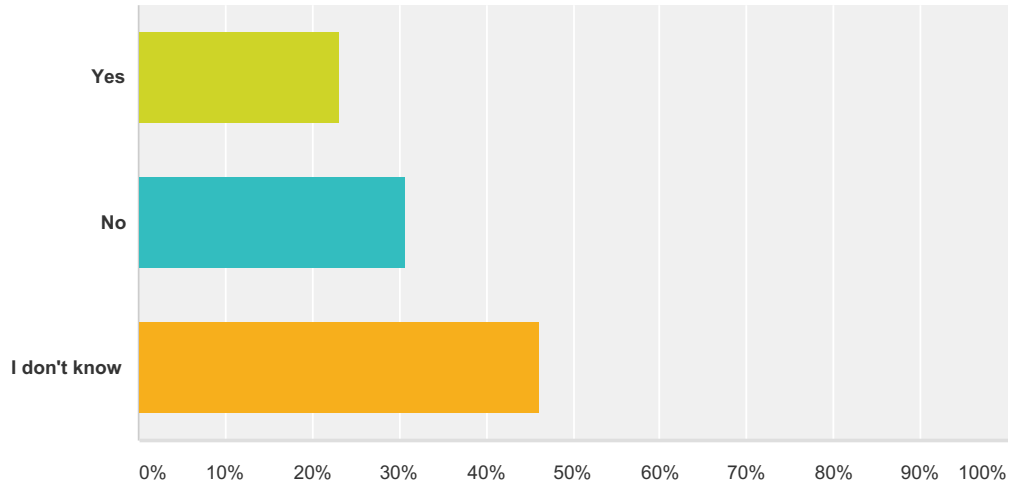


Answer Choices	Responses
Yes	46.15% 6
No	30.77% 4
I don't know	23.08% 3
Total	13

#	Please explain	Date
1	We need update and training with in the community.	12/12/2015 1:30 PM
2	The Town of Queensbury has a Comprehensive Emergency Management Plan that has identified probable target areas.	12/2/2015 9:22 PM
3	Emergency Services is the necessary evil. Government will say one thing and do something different. Always seem to be the last to get the necessary funds.	12/2/2015 10:07 AM
4	It's all about the \$\$.	9/25/2015 1:03 PM

Q15 Is your organization covered by a Continuity of Operations (COOP) plan? COOP plans examine an organization's ability to perform minimum essential functions during any situation, and support the continuance of your organization's functions.

Answered: 13 Skipped: 4



Answer Choices	Responses
Yes	23.08% 3
No	30.77% 4
I don't know	46.15% 6
Total	13

#	If "Yes", please explain.	Date
1	COOP plan needed, Countywide and locally.	9/25/2015 1:03 PM

Q16 Can you identify projects or programs that will reduce your facility's vulnerability to damages and losses, including loss of operation/service, to hazard events?

Answered: 2 Skipped: 15

#	Responses	Date
1	Our facility has served as a shelter during 2+ storm/flood related incidents...generator is in place...my thought would be to have an alternative location for a civilian shelter	12/3/2015 12:25 AM
2	Building generator's are present. If municipal water service was interrupted for any reason, there is no storage/reserve for in-house use or dispensing to the constituents of the city.	12/2/2015 10:53 AM

Q17 Do you have any other comments, questions, or concerns?

Answered: 1 Skipped: 16

#	Responses	Date
1	None	12/2/2015 10:07 AM

Q1 Name of your health care facility:

Answered: 4 Skipped: 0

#	Responses	Date
1	TEMP	12/9/2015 10:38 AM
2	COUNTRYSIDE ADULT HOME	10/30/2015 8:47 AM
3	Adirondack Tri-County Nursing and Rehabilitation Center	9/28/2015 1:25 PM
4	test	8/25/2015 12:32 PM

Q2 Name of respondent:

Answered: 2 Skipped: 2

#	Responses	Date
1	DEANNA PARK	10/30/2015 8:47 AM
2	Hal G. Payne	9/28/2015 1:25 PM

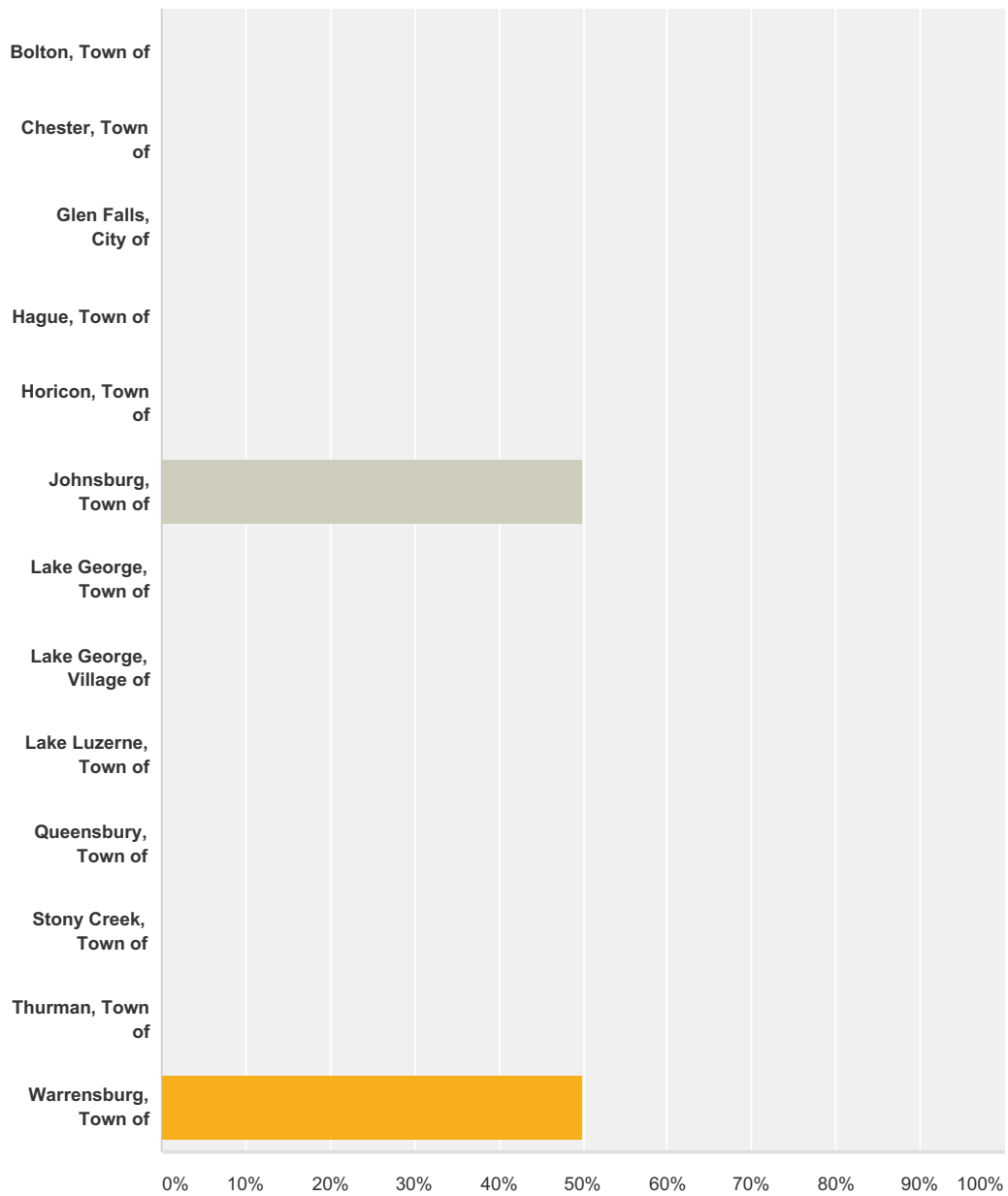
Q3 Contact information (email address or phone number) - optional:

Answered: 2 Skipped: 2

#	Responses	Date
1	parkd@warrencountyny.gov	10/30/2015 8:47 AM
2	halp@adironacknursing.com	9/28/2015 1:25 PM

Q4 Please identify the location of your facility(ies) and or primary service area:

Answered: 2 Skipped: 2



Answer Choices	Responses
Bolton, Town of	0.00% 0
Chester, Town of	0.00% 0
Glen Falls, City of	0.00% 0
Hague, Town of	0.00% 0
Horicon, Town of	0.00% 0

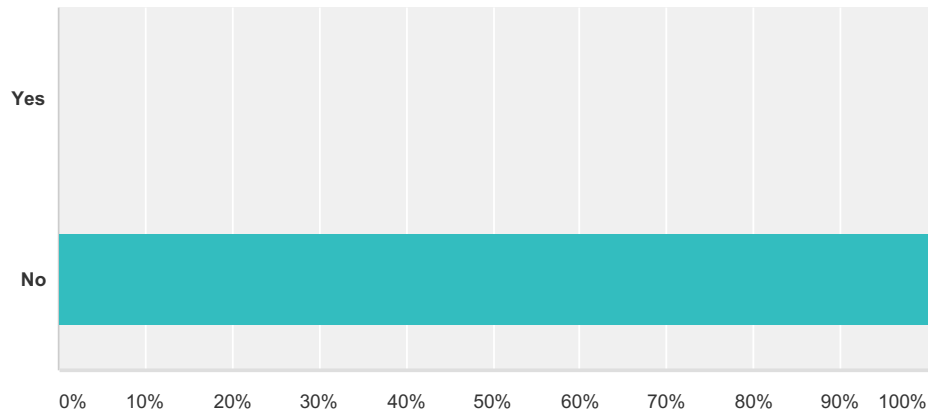
Warren County NY HMP - Hospital and Health Care Provider Survey

Johnsburg, Town of	50.00%	1
Lake George, Town of	0.00%	0
Lake George, Village of	0.00%	0
Lake Luzerne, Town of	0.00%	0
Queensbury, Town of	0.00%	0
Stony Creek, Town of	0.00%	0
Thurman, Town of	0.00%	0
Warrensburg, Town of	50.00%	1
Total		2

#	Other (please specify)	Date
	There are no responses.	

Q5 Have your facilities been impacted by natural hazard events (damaged, closed for extended periods, etc.)?

Answered: 2 Skipped: 2

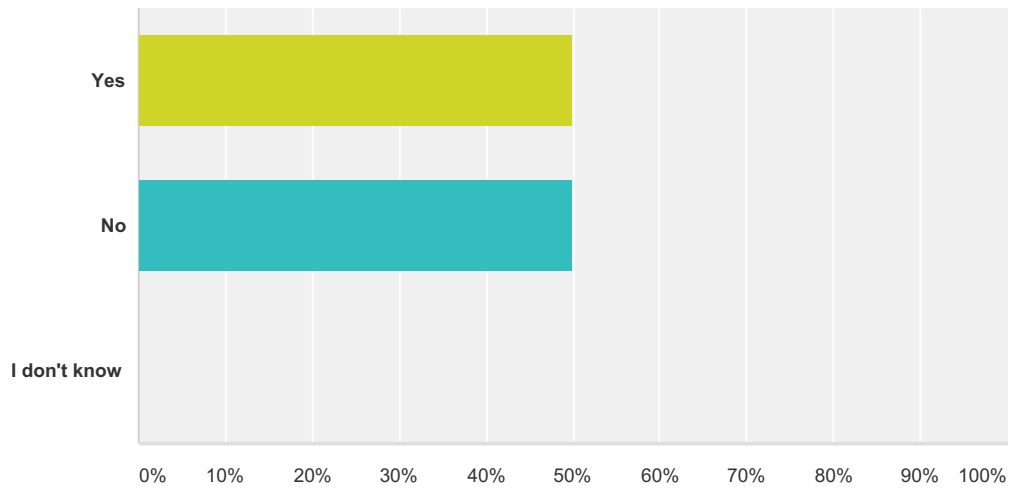


Answer Choices	Responses
Yes	0.00% 0
No	100.00% 2
Total	2

#	If you answered "YES", please identify the events and provide a brief description of the damages or loss of service	Date
	There are no responses.	

Q6 Do you think that critical and essential facilities (incl. hospitals and medical centers, EMS facilities, schools, etc.) are disaster-resistant (e.g. are properly located and constructed, and have back-up power as appropriate)?

Answered: 2 Skipped: 2

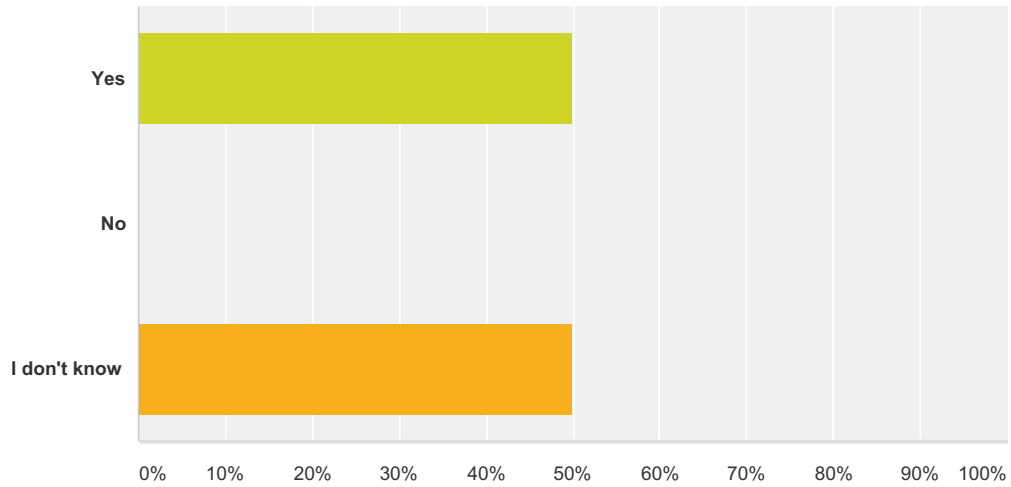


Answer Choices	Responses
Yes	50.00% 1
No	50.00% 1
I don't know	0.00% 0
Total	2

#	Please explain	Date
	There are no responses.	

Q7 Do you think that the transportation infrastructure serving your facilities (e.g. roads and bridges) are properly designed to withstand closures and/or damage due to natural hazards?

Answered: 2 Skipped: 2

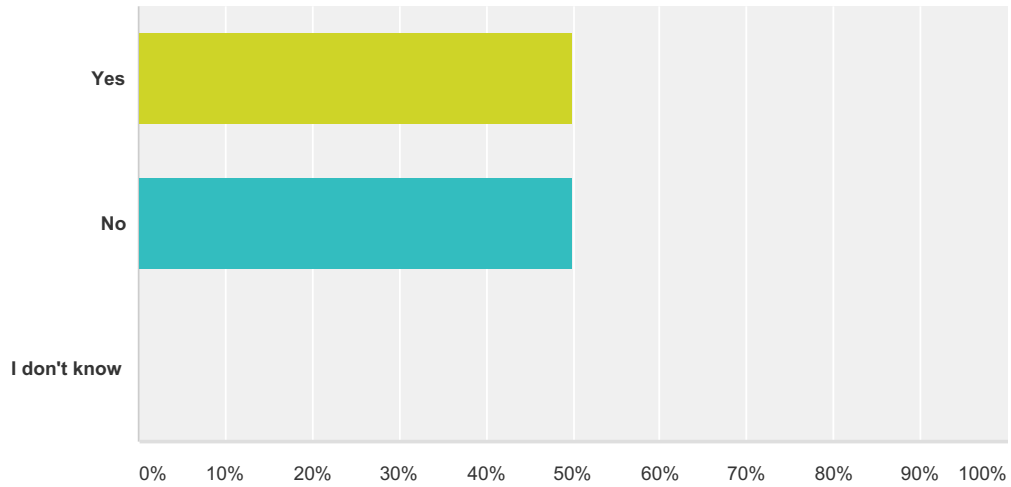


Answer Choices	Responses
Yes	50.00% 1
No	0.00% 0
I don't know	50.00% 1
Total	2

#	Please explain	Date
	There are no responses.	

Q8 Do you think that the utility infrastructure (specifically electricity and communications) is sufficiently disaster-resistant to support your facility's health care functions during and after natural hazard events?

Answered: 2 Skipped: 2

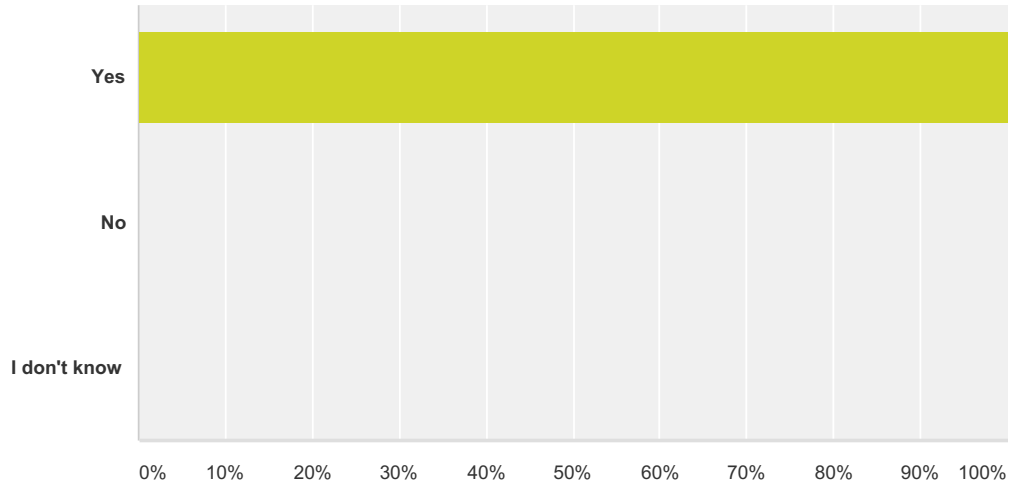


Answer Choices	Responses
Yes	50.00% 1
No	50.00% 1
I don't know	0.00% 0
Total	2

#	Please explain	Date
1	Phone and Inetnet Service is interuppted to easily.	9/28/2015 1:31 PM

Q9 Do you think that local public education and awareness programs are effective at informing the public on what they should do to be prepared for and reduce their personal risk to natural disasters, so as not to increase the need for health care services during hazard events?

Answered: 2 Skipped: 2

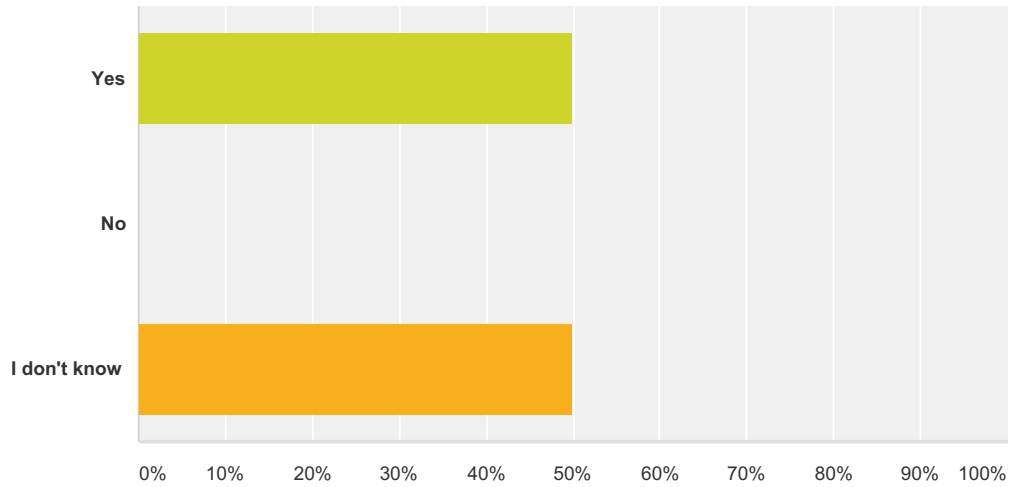


Answer Choices	Responses
Yes	100.00% 2
No	0.00% 0
I don't know	0.00% 0
Total	2

#	Please explain	Date
	There are no responses.	

Q10 Do you think that announcements of road closures and pending road closures are sufficiently accurate and available to support hospital functions during natural hazard events?

Answered: 2 Skipped: 2

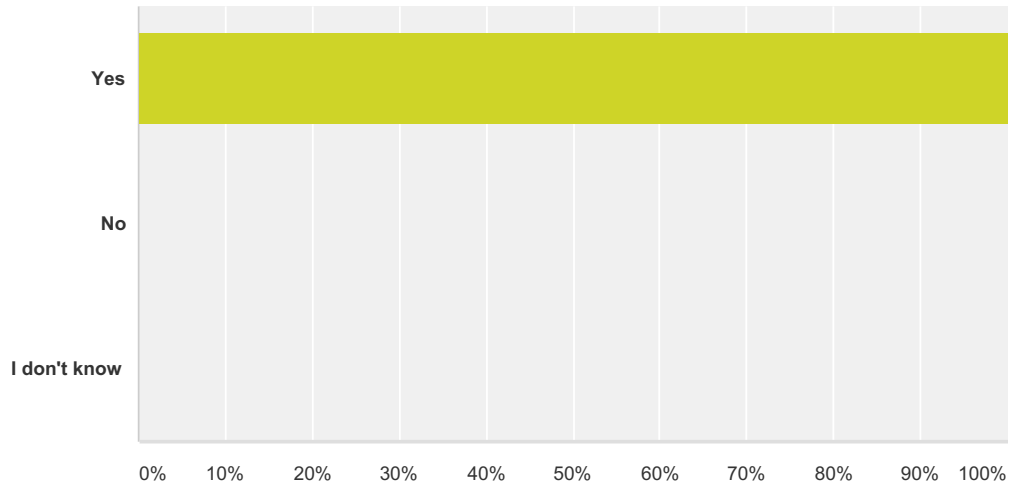


Answer Choices	Responses
Yes	50.00% 1
No	0.00% 0
I don't know	50.00% 1
Total	2

#	Please explain	Date
	There are no responses.	

Q11 Do you think that the public is aware of, understands, and takes advantage of emergency warning and notification systems and services (reverse 911, audible alerts, cell and text services)?

Answered: 2 Skipped: 2

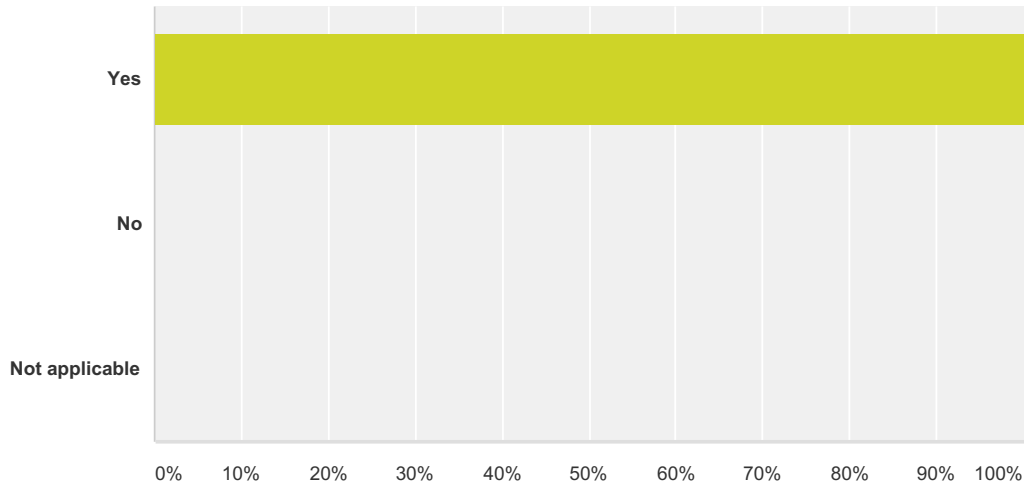


Answer Choices	Responses
Yes	100.00% 2
No	0.00% 0
I don't know	0.00% 0
Total	2

#	Please explain	Date
	There are no responses.	

Q12 Do you think that your organization works to inform your constituents of how they can better manage their risk to natural hazards?

Answered: 2 Skipped: 2

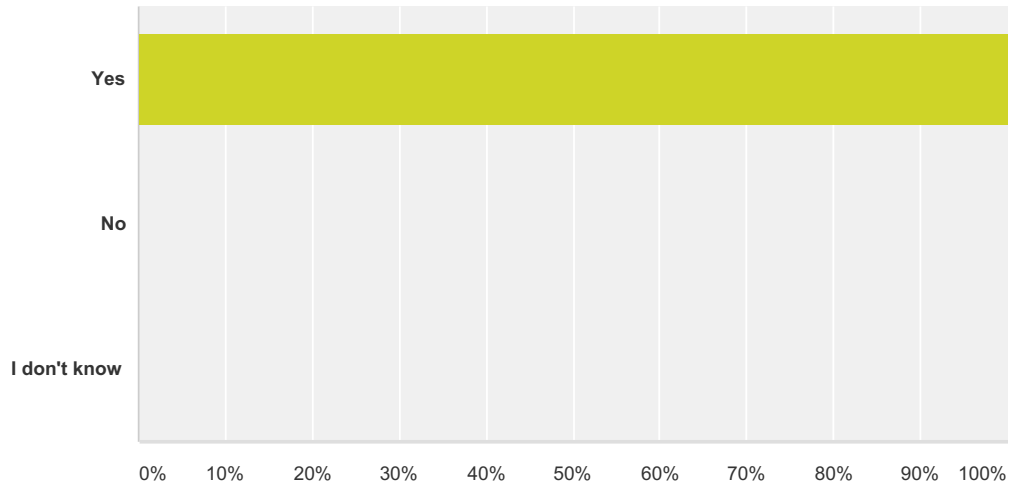


Answer Choices	Responses
Yes	100.00% 2
No	0.00% 0
Not applicable	0.00% 0
Total	2

#	Please explain	Date
	There are no responses.	

Q13 Do you think that emergency response planning, services, and equipment are adequate to manage and respond properly to natural disasters in your community?

Answered: 2 Skipped: 2

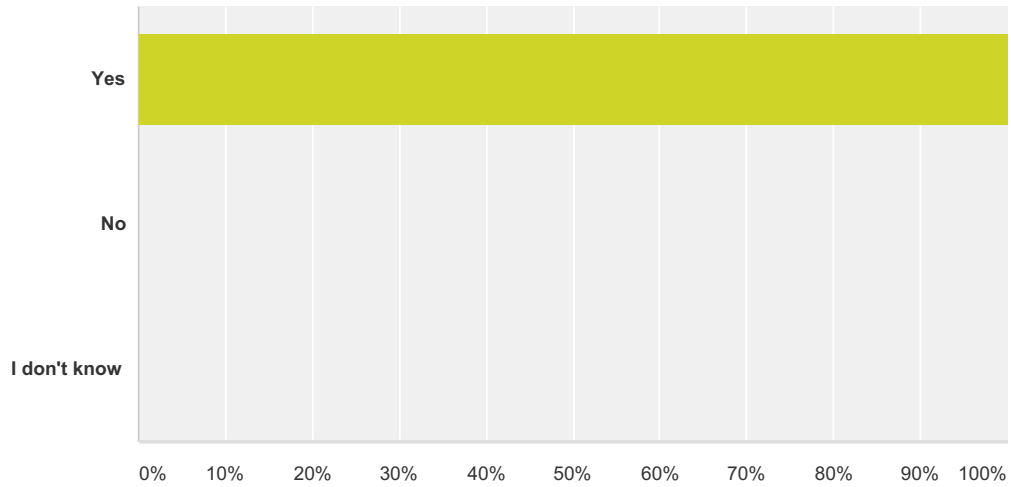


Answer Choices	Responses
Yes	100.00% 2
No	0.00% 0
I don't know	0.00% 0
Total	2

#	Please explain	Date
	There are no responses.	

Q14 Do you think that local government understands, supports, and possess the resources for natural hazard risk reduction efforts in the community?

Answered: 2 Skipped: 2

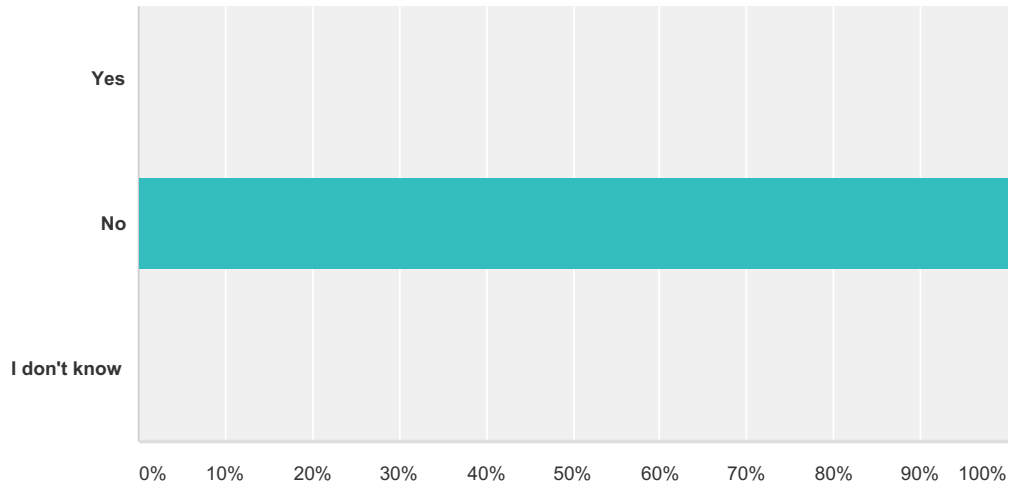


Answer Choices	Responses
Yes	100.00% 2
No	0.00% 0
I don't know	0.00% 0
Total	2

#	Please explain	Date
	There are no responses.	

Q15 Is your organization covered by a Continuity of Operations (COOP) plan? COOP plans examine an organization's ability to perform minimum essential functions during any situation, and support the continuance of organization functions.

Answered: 2 Skipped: 2



Answer Choices	Responses
Yes	0.00% 0
No	100.00% 2
I don't know	0.00% 0
Total	2

#	If "Yes", please explain.	Date
1	We have a Disaster Manual, but not a specific COOP plan	10/30/2015 8:49 AM

Q16 Can you identify projects or programs that will reduce your facility's vulnerability to damages and losses, including loss of operation/service, to hazard events?

Answered: 0 Skipped: 4

#	Responses	Date
	There are no responses.	

Q17 Do you have any other comments, questions, or concerns?

Answered: 0 Skipped: 4

#	Responses	Date
	There are no responses.	

Warren County NY HMP - Law Enforcement Survey

Q1 Name of your police department or law enforcement agency:

Answered: 26 Skipped: 0

#	Responses	Date
1	Glens Falls Police Department	12/14/2015 10:24 AM
2	TEMP	12/9/2015 10:37 AM
3	Glens Falls Police Department	12/8/2015 3:19 PM
4	Glens Falls Police	12/7/2015 11:05 PM
5	GLENS FALLS POLICE DEPARTMENT	12/7/2015 11:04 PM
6	GLENS FALLS POLICE DEPARTMENT	12/7/2015 11:02 PM
7	GLENS FALLS POLICE	12/7/2015 5:06 PM
8	Glens Falls Police	12/7/2015 8:07 AM
9	Glens Falls Police Department	12/6/2015 8:22 PM
10	Glens Falls PD	12/6/2015 3:05 PM
11	Glens Falls Police Dept.	12/6/2015 9:14 AM
12	Glens Falls Police Department	12/5/2015 7:13 AM
13	Glens Falls PD	12/4/2015 7:20 AM
14	Warren County Sheriff's Office	12/3/2015 5:31 PM
15	testing	12/3/2015 1:20 PM
16	Glens Falls PD	12/3/2015 8:33 AM
17	Glens Falls Police Department	12/3/2015 7:14 AM
18	Glens Falls Police Department	12/3/2015 4:25 AM
19	Glens Falls Police	12/2/2015 10:41 PM
20	Glens Falls police	12/2/2015 9:26 PM
21	Glens Falls Police Department	12/2/2015 5:31 PM
22	Glens Falls Police Department	12/2/2015 4:41 PM
23	test	12/2/2015 3:35 PM
24	test	12/2/2015 3:33 PM
25	weadwe	12/2/2015 2:06 PM
26	test	8/25/2015 12:26 PM

Warren County NY HMP - Law Enforcement Survey

Q2 Name of Respondent:

Answered: 22 Skipped: 4

#	Responses	Date
1	James Fiorini	12/14/2015 10:24 AM
2	P/O Miguel Chico	12/8/2015 3:19 PM
3	Randy Strattman	12/7/2015 11:05 PM
4	P.O. D.L. LYONS	12/7/2015 11:04 PM
5	WILLIAM HOLMES	12/7/2015 11:02 PM
6	SGT MARTY CHITTENDEN	12/7/2015 5:06 PM
7	D/Sgt French	12/7/2015 8:07 AM
8	Michael Campbell	12/6/2015 8:22 PM
9	Carl Mattion	12/6/2015 3:05 PM
10	Sgt S.A. Lovelace	12/6/2015 9:14 AM
11	Flewelling	12/4/2015 7:20 AM
12	C. Shawn Lamouree, Undersheriff	12/3/2015 5:31 PM
13	Anthony Lydon	12/3/2015 8:33 AM
14	Gerald Willette	12/3/2015 7:14 AM
15	PO Ryan Schroeck	12/3/2015 4:25 AM
16	Chris Eggleston	12/2/2015 10:41 PM
17	Peter Casertino	12/2/2015 9:26 PM
18	Officer Macura	12/2/2015 5:31 PM
19	Chief Michelle Arnold	12/2/2015 4:41 PM
20	Test	12/2/2015 3:35 PM
21	Test	12/2/2015 3:33 PM
22	qdqwde	12/2/2015 2:06 PM

Warren County NY HMP - Law Enforcement Survey

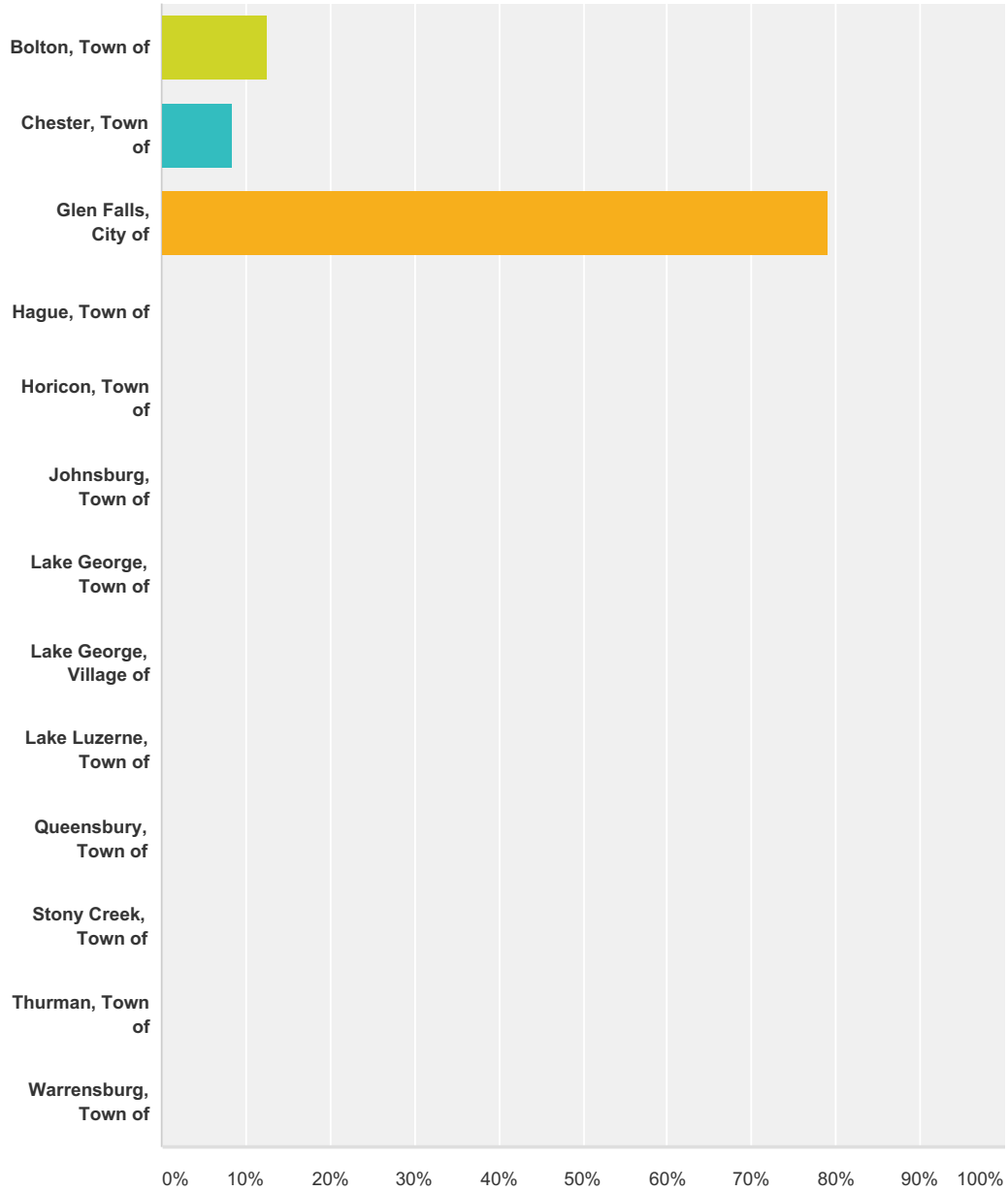
Q3 Contact information (email address or phone number) - optional:

Answered: 11 Skipped: 15

#	Responses	Date
1	518-761-3840	12/14/2015 10:24 AM
2	518-361-2291	12/7/2015 11:04 PM
3	WHOLMES@GLENSFALLSPD.COM	12/7/2015 11:02 PM
4	sfrench@glensfallspd.com	12/7/2015 8:07 AM
5	slovelace@glensfallspd.com	12/6/2015 9:14 AM
6	shawn.lamouree@sheriff.co.warren.ny.us	12/3/2015 5:31 PM
7	alydon@glensfallspd.com	12/3/2015 8:33 AM
8	gwillette@glensfallspd.com	12/3/2015 7:14 AM
9	Pcasertino@glensfallspd.com	12/2/2015 9:26 PM
10	marnold@glensfallspd.com	12/2/2015 4:41 PM
11	wdqw	12/2/2015 2:06 PM

Q4 Please identify the location of your facility(ies) and or primary service area:

Answered: 24 Skipped: 2



Answer Choices	Responses	Count
Bolton, Town of	12.50%	3
Chester, Town of	8.33%	2
Glen Falls, City of	79.17%	19
Hague, Town of	0.00%	0
Horicon, Town of	0.00%	0

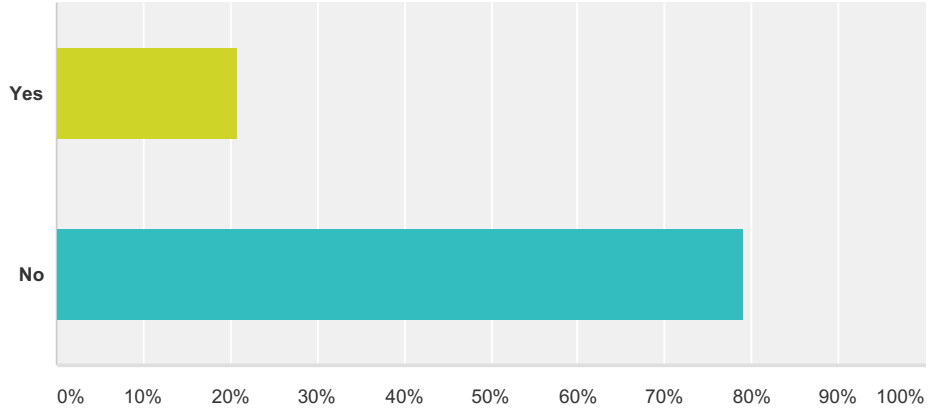
Warren County NY HMP - Law Enforcement Survey

Johnsburg, Town of	0.00%	0
Lake George, Town of	0.00%	0
Lake George, Village of	0.00%	0
Lake Luzerne, Town of	0.00%	0
Queensbury, Town of	0.00%	0
Stony Creek, Town of	0.00%	0
Thurman, Town of	0.00%	0
Warrensburg, Town of	0.00%	0
Total		24

#	Other (please specify)	Date
1	qwdd	12/2/2015 2:06 PM

Q5 Have your facilities been impacted by natural hazard events (damaged, closed for extended periods, etc.)?

Answered: 24 Skipped: 2

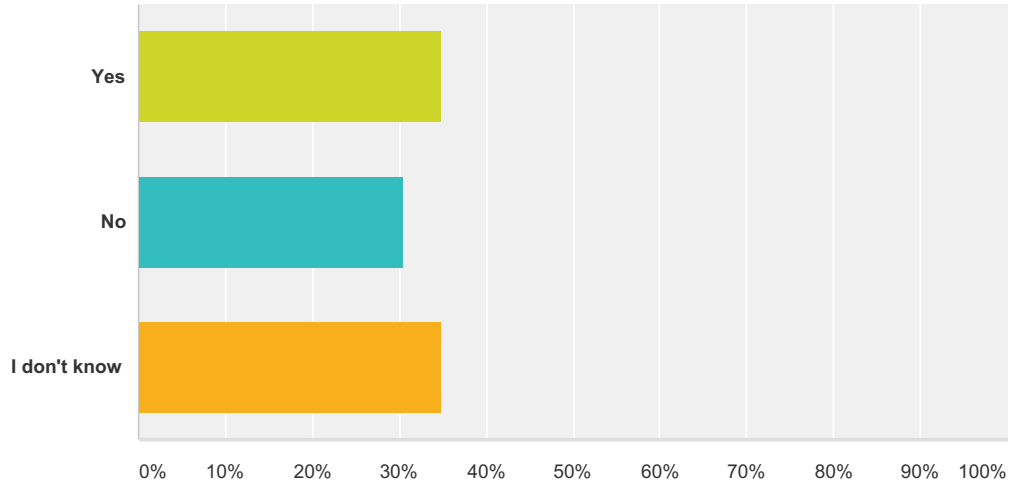


Answer Choices	Responses
Yes	20.83% 5
No	79.17% 19
Total	24

#	If you answered "YES", please identify the events and provide a brief description of the damages or loss of service	Date
1	Minor flooding during periods of heavy rain. Has since been taken care of with grate and drainage work.	12/6/2015 9:14 AM
2	Flooding; Possible mold (Work stations have been closed off preventing employees from using them)	12/3/2015 4:25 AM
3	Flooded by rain.	12/2/2015 10:41 PM
4	qwd	12/2/2015 2:06 PM

Q6 Do you think that critical and essential facilities (incl. police stations, jails and detention centers) are disaster-resistant (e.g. are properly located and constructed, and have back-up power as appropriate)?

Answered: 23 Skipped: 3

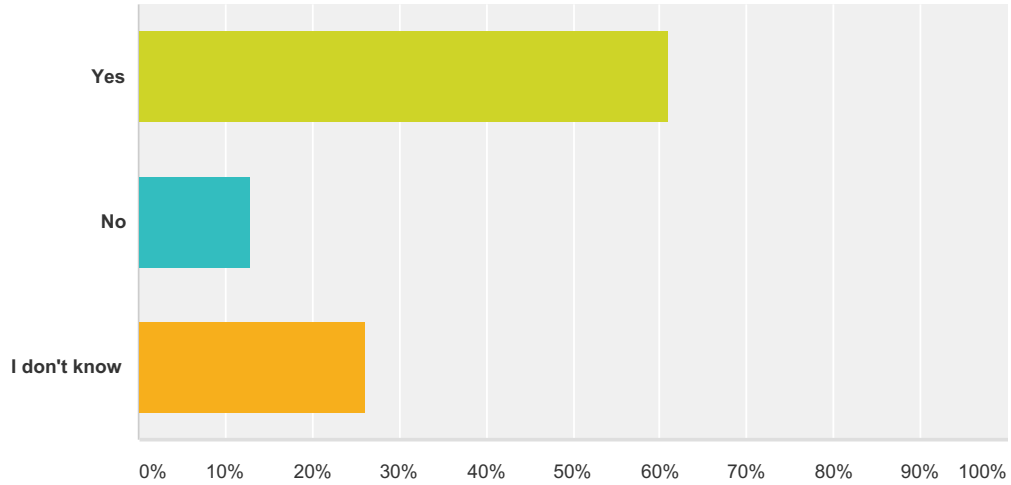


Answer Choices	Responses
Yes	34.78% 8
No	30.43% 7
I don't know	34.78% 8
Total	23

#	Please explain	Date
1	As long as the drainage system does not fail again in the future.	12/6/2015 9:14 AM
2	The Warren County Sheriff's Office / Jail / Communications / Law Enforcement has a backup power supply capable of powering the Sheriff's Office for extended periods of time.	12/3/2015 5:31 PM
3	Our station is located in a basement. If there was flooding, we would not be able to use this location.	12/3/2015 7:14 AM
4	location and back up power is good but construction is concerning	12/2/2015 4:41 PM

Q7 Do you think that the transportation infrastructure serving your facilities (e.g. roads and bridges) are properly designed to withstand closures and/or damage due to natural hazards?

Answered: 23 Skipped: 3

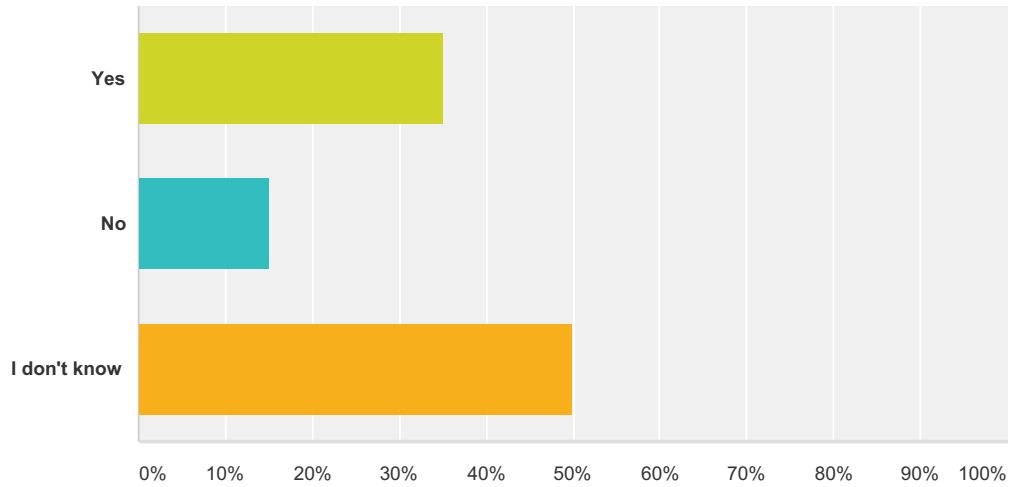


Answer Choices	Responses
Yes	60.87% 14
No	13.04% 3
I don't know	26.09% 6
Total	23

#	Please explain	Date
1	City streets flood easily causing transportation issues.	12/6/2015 3:05 PM

Q8 Do you think that the utility infrastructure (specifically electricity and communications) is sufficiently disaster-resistant to support law enforcement functions during and after natural hazard events?

Answered: 20 Skipped: 6

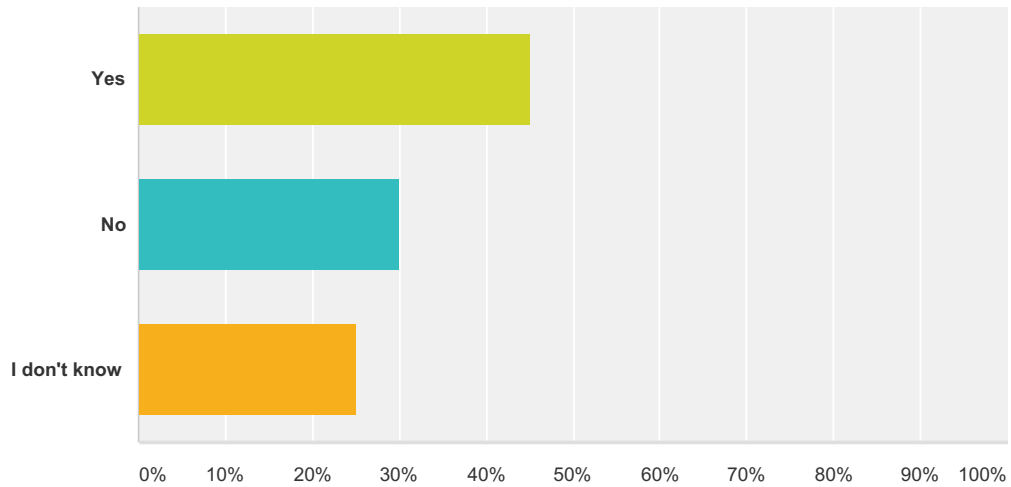


Answer Choices	Responses
Yes	35.00% 7
No	15.00% 3
I don't know	50.00% 10
Total	20

#	Please explain	Date
1	Unknown given the age of our current building. Wiring could be an issue at some point in the future.	12/6/2015 9:18 AM
2	Wireless communications are undependable during good weather in Warren County. Most of the utilities (power) in Warren County are above ground and more likely to be effected by foul weather events.	12/3/2015 5:35 PM

Q9 Do you think that local public education and awareness programs are effective at informing the public on what they should do to be prepared for and reduce their personal risk to natural disasters, so as not to increase the need for law enforcement and police protective services during hazard events?

Answered: 20 Skipped: 6

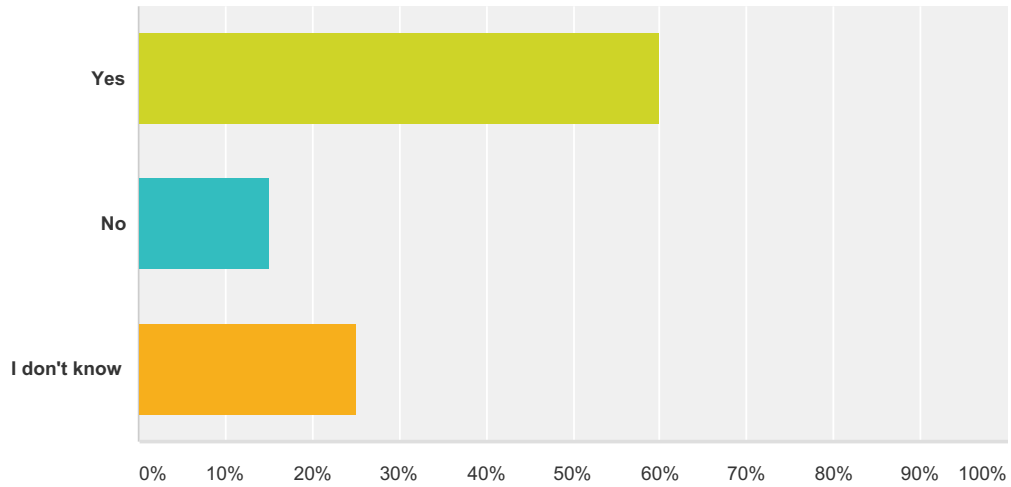


Answer Choices	Responses
Yes	45.00% 9
No	30.00% 6
I don't know	25.00% 5
Total	20

#	Please explain	Date
1	I am not aware of any public education programs designed to educate the public as to what to do and where to go.	12/3/2015 7:19 AM
2	Often called repeatedly for flooded streets during heavy rain and power outages in neighborhoods.	12/3/2015 4:29 AM

Q10 Do you think that announcements of road closures and pending road closures are sufficiently accurate and available to support law enforcement and police protective service functions during natural hazard events?

Answered: 20 Skipped: 6

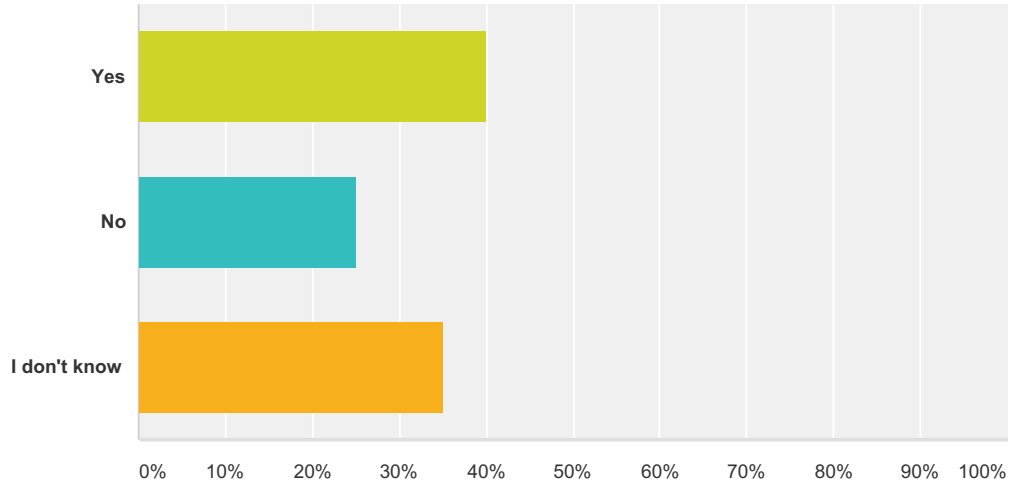


Answer Choices	Responses
Yes	60.00% 12
No	15.00% 3
I don't know	25.00% 5
Total	20

#	Please explain	Date
1	City residents are occassionally not aware of the winter parking ban	12/3/2015 4:29 AM

Q11 Do you think that the public is aware of, understands, and takes advantage of emergency warning and notification systems and services (reverse 911, audible alerts, cell and text services)?

Answered: 20 Skipped: 6

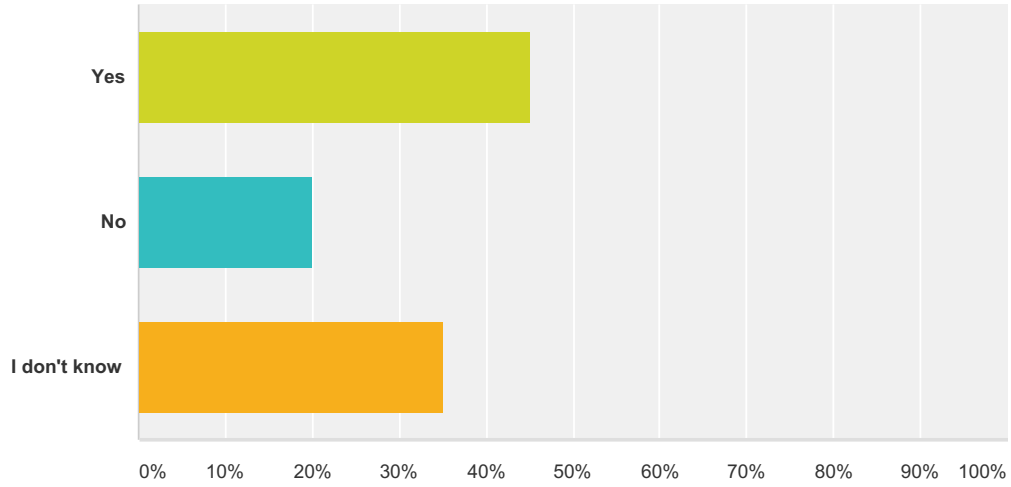


Answer Choices	Responses
Yes	40.00% 8
No	25.00% 5
I don't know	35.00% 7
Total	20

#	Please explain	Date
1	Services are offered to the public, but we have no way of knowing who takes advantage of these tools.	12/3/2015 5:35 PM

Q12 Do you think that emergency response planning, services, and equipment are adequate to manage and respond properly to natural disasters in your community?

Answered: 20 Skipped: 6

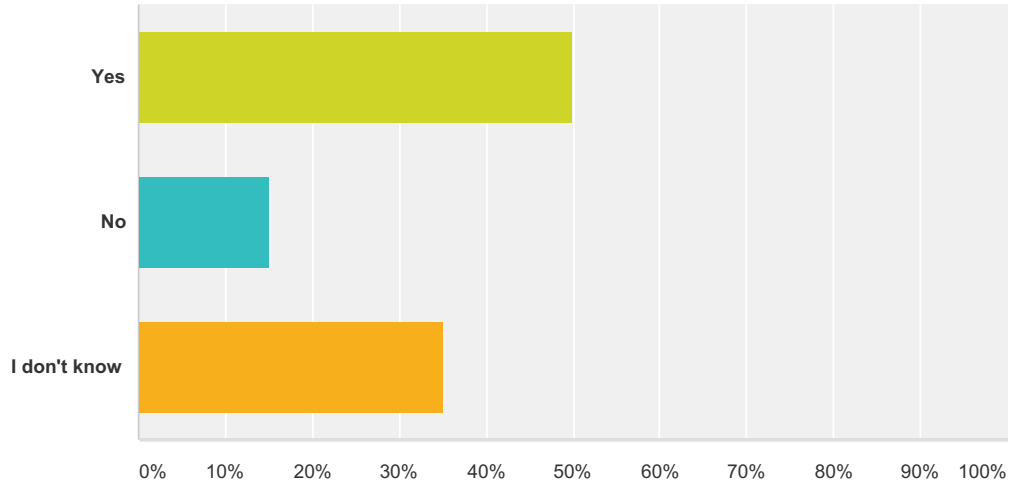


Answer Choices	Responses
Yes	45.00% 9
No	20.00% 4
I don't know	35.00% 7
Total	20

#	Please explain	Date
	There are no responses.	

Q13 Do you think that local government understands, supports, and possess the resources for natural hazard risk reduction efforts in the community?

Answered: 20 Skipped: 6

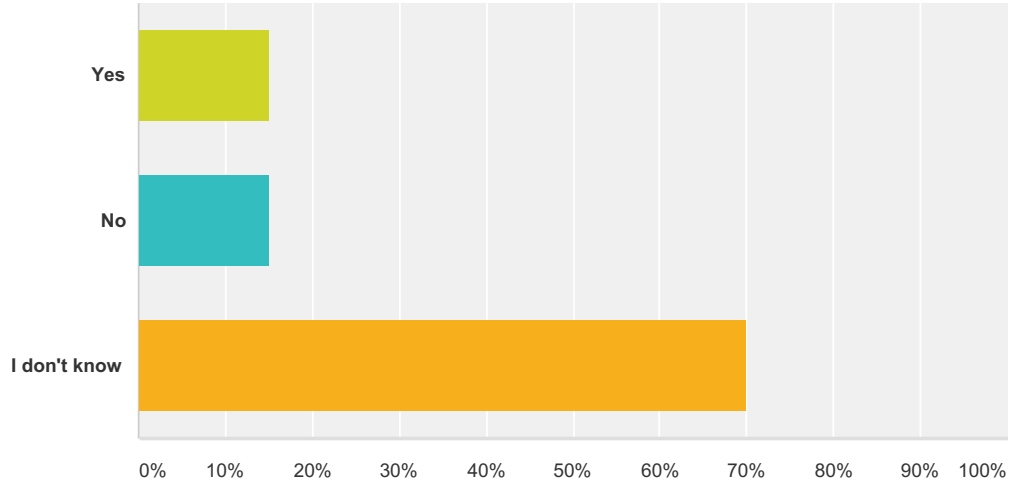


Answer Choices	Responses	
Yes	50.00%	10
No	15.00%	3
I don't know	35.00%	7
Total		20

#	Please explain	Date
	There are no responses.	

Q14 Is your organization covered by a Continuity of Operations (COOP) plan? COOP plans examine an organization's ability to perform minimum essential functions during any situation, and support the continuance of your organization's functions.

Answered: 20 Skipped: 6



Answer Choices	Responses
Yes	15.00% 3
No	15.00% 3
I don't know	70.00% 14
Total	20

#	If "Yes", please explain.	Date
1	Contingency plans are in place to maintain minimum essential functions.	12/3/2015 5:35 PM

Q15 Can you identify projects or programs that will reduce your facility's vulnerability to damages and losses, including loss of operation/service, to hazard events?

Answered: 7 Skipped: 19

#	Responses	Date
1	None at this time.	12/6/2015 9:18 AM
2	I don't know	12/5/2015 7:15 AM
3	N/A	12/3/2015 5:35 PM
4	I do not know what assets or programs our local agencies have to reduce any vulnerabilities. Further how they would be utilized.	12/3/2015 7:19 AM
5	Not at this time.	12/3/2015 4:29 AM
6	Test Jon	12/2/2015 3:36 PM
7	Test J. Raser	12/2/2015 3:33 PM

Q16 Please provide any additional comments here. Thank you!

Answered: 3 Skipped: 23

#	Responses	Date
1	None	12/6/2015 9:18 AM
2	N/A	12/3/2015 5:35 PM
3	sdfsdf	12/2/2015 3:36 PM

**Q1 Name of your Academic Institution
(school, district, higher education
institution):**

Answered: 6 Skipped: 0

#	Responses	Date
1	TEMP	12/9/2015 10:35 AM
2	test	12/2/2015 3:03 PM
3	s	12/2/2015 2:13 PM
4	Lake George CSD	9/25/2015 7:33 AM
5	re	8/27/2015 3:10 PM
6	test	8/25/2015 12:23 PM

Q2 Name of Respondent:

Answered: 3 Skipped: 3

#	Responses	Date
1	test	12/2/2015 3:03 PM
2	Andrew J caruso	9/25/2015 7:33 AM
3	test	8/25/2015 12:23 PM

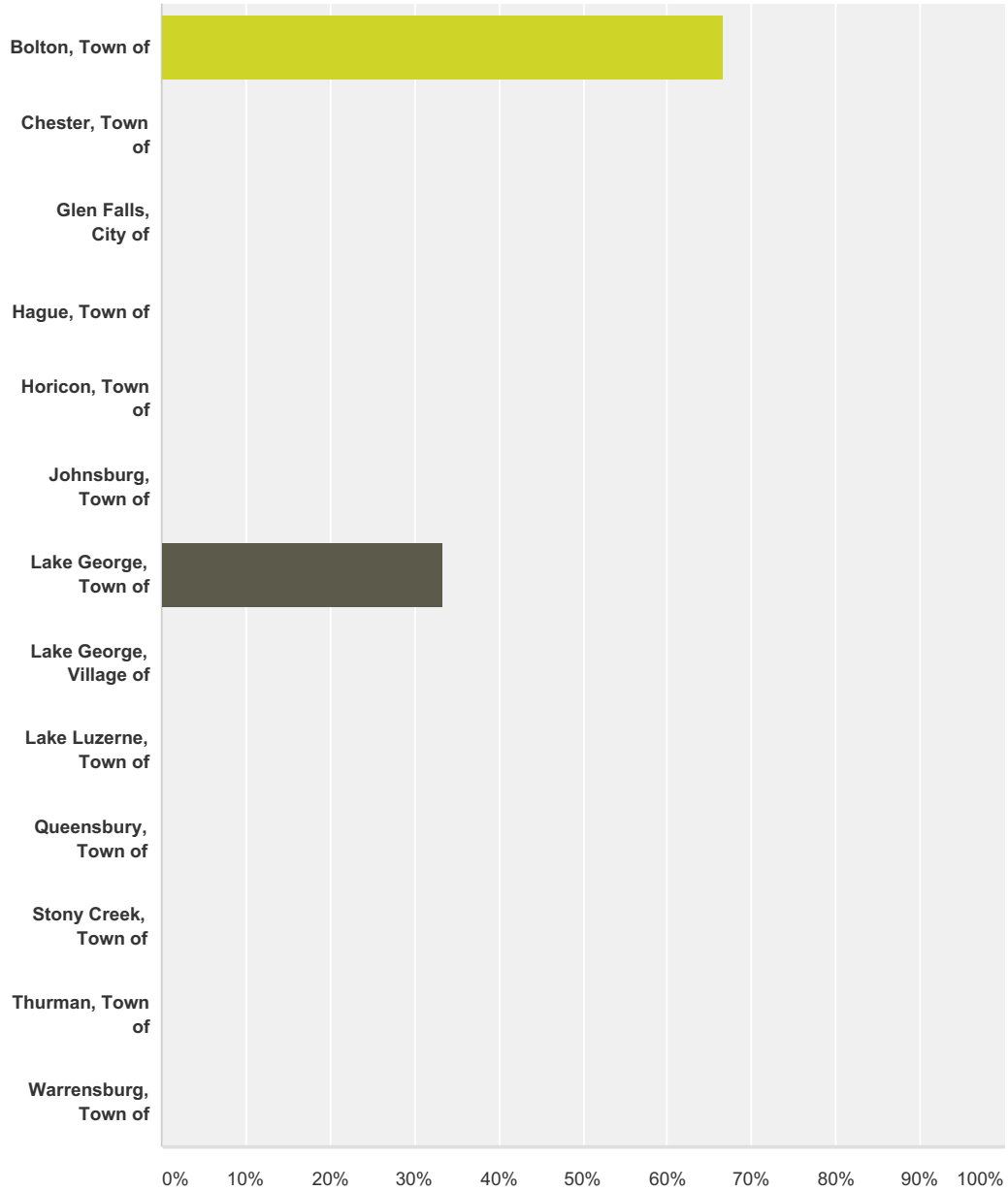
Q3 Contact information (email address or phone number) - optional:

Answered: 3 Skipped: 3

#	Responses	Date
1	test	12/2/2015 3:03 PM
2	carusoa@lkgeorge.org	9/25/2015 7:33 AM
3	test	8/25/2015 12:23 PM

Q4 Please identify the location of your facility(ies) and or primary service area:

Answered: 3 Skipped: 3



Answer Choices	Responses
Bolton, Town of	66.67% 2
Chester, Town of	0.00% 0
Glen Falls, City of	0.00% 0
Hague, Town of	0.00% 0
Horicon, Town of	0.00% 0

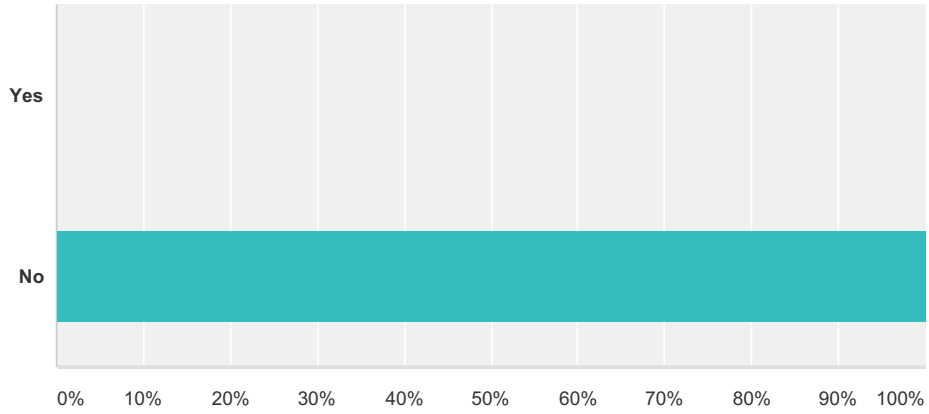
Warren County NY HMP - Academia Survey

Johnsburg, Town of	0.00%	0
Lake George, Town of	33.33%	1
Lake George, Village of	0.00%	0
Lake Luzerne, Town of	0.00%	0
Queensbury, Town of	0.00%	0
Stony Creek, Town of	0.00%	0
Thurman, Town of	0.00%	0
Warrensburg, Town of	0.00%	0
Total		3

#	Other (please specify)	Date
1	HS in LGV and ES in LGT	9/25/2015 7:33 AM

Q5 Has your academic institution been impacted by natural hazard events (damaged, closed for extended periods, etc.)?

Answered: 3 Skipped: 3

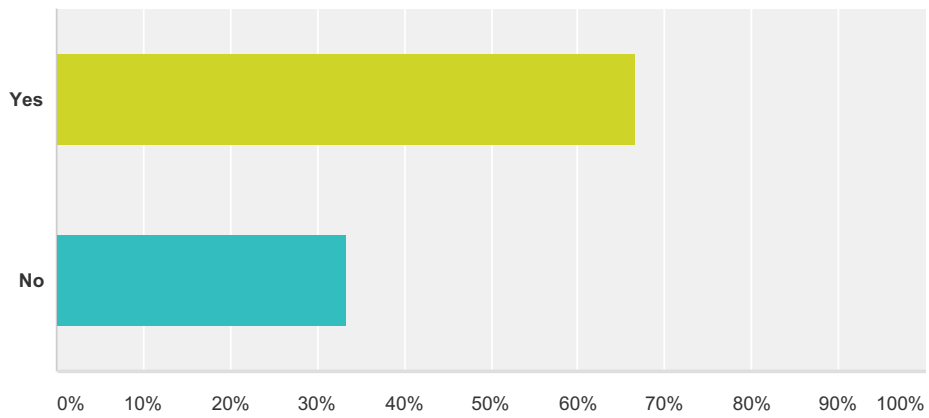


Answer Choices	Responses
Yes	0.00% 0
No	100.00% 3
Total	3

#	If you answered "YES", please identify the events and provide a brief description of the damages or loss of service	Date
	There are no responses.	

Q6 Do your facilities provide sheltering services during hazard events?

Answered: 3 Skipped: 3

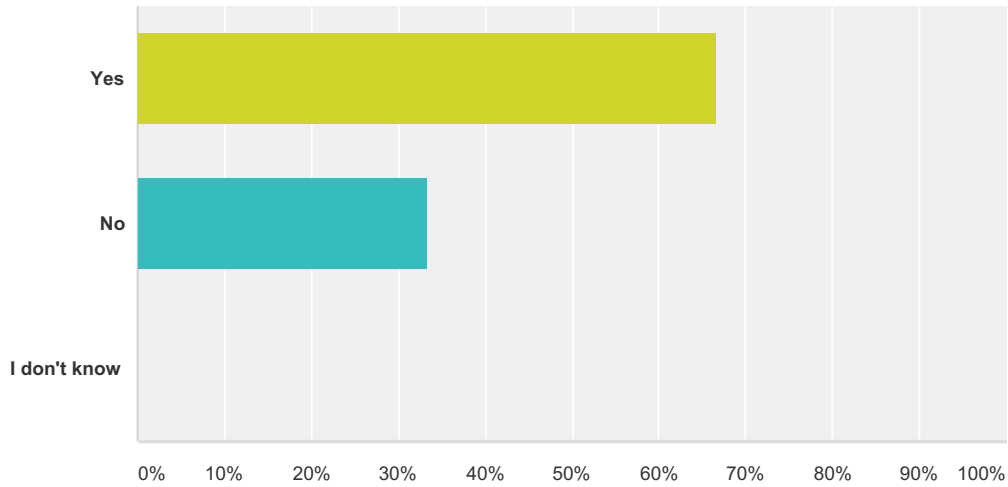


Answer Choices	Responses
Yes	66.67% 2
No	33.33% 1
Total	3

#	If you answered "YES", please indicate those services that you are capable of providing.	Date
1	Elementary School: shelter, cooking facilities	9/25/2015 7:33 AM
2	test	8/25/2015 12:23 PM

Q7 Do you believe that your facilities and associated infrastructure are disaster-resistant, or capable of withstanding a natural disaster (e.g. are properly located and constructed, and have back-up power as appropriate)?

Answered: 3 Skipped: 3

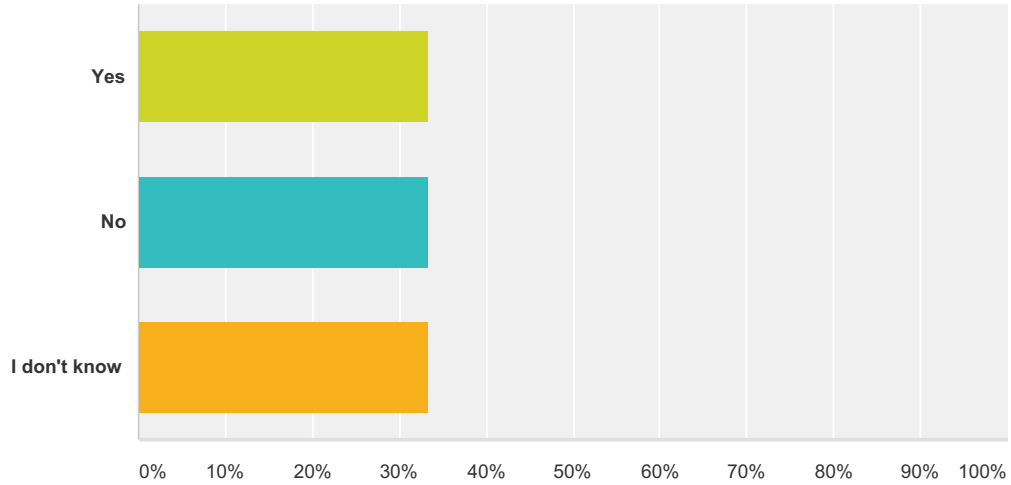


Answer Choices	Responses
Yes	66.67% 2
No	33.33% 1
I don't know	0.00% 0
Total	3

#	Please explain	Date
	There are no responses.	

Q8 Do you think that the transportation infrastructure serving your facilities (e.g. roads and bridges) are properly designed to withstand closures and/or damage due to natural hazards?

Answered: 3 Skipped: 3

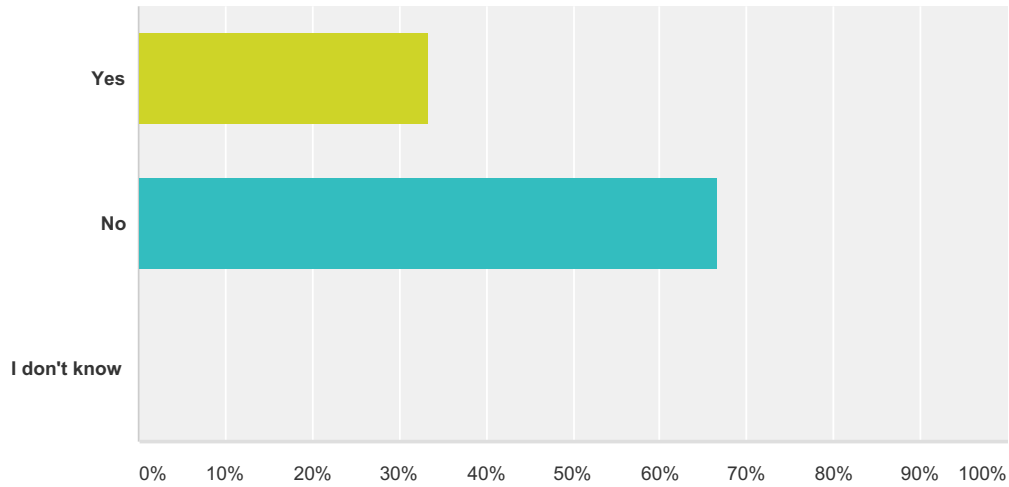


Answer Choices	Responses
Yes	33.33% 1
No	33.33% 1
I don't know	33.33% 1
Total	3

#	Please explain	Date
	There are no responses.	

Q9 Do you think that the utility infrastructure (specifically electricity and communications) is sufficiently disaster-resistant to support your academic functions during and after natural hazard events?

Answered: 3 Skipped: 3

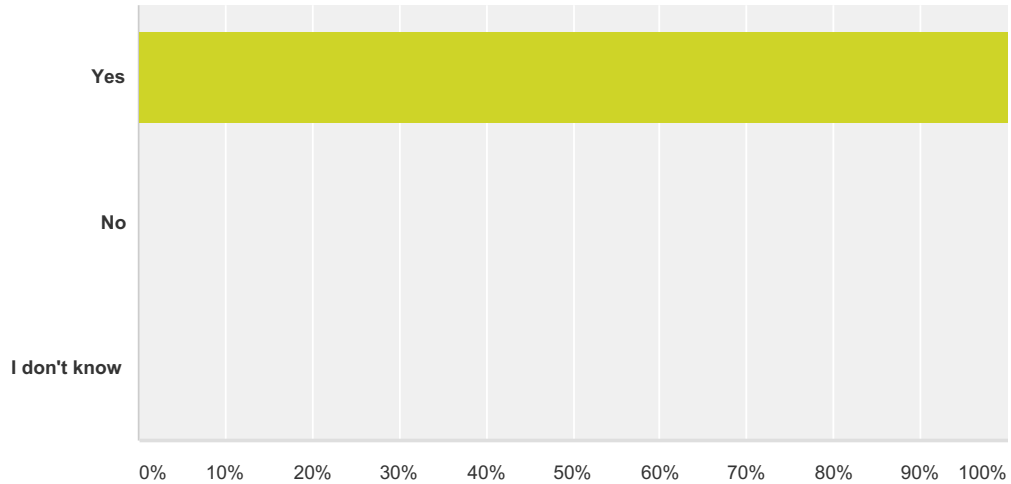


Answer Choices	Responses
Yes	33.33% 1
No	66.67% 2
I don't know	0.00% 0
Total	3

#	Please explain	Date
1	Limited emergency electric with mobile backup generator. Mainly designed to keep the heat on and any referation running.	9/25/2015 7:36 AM

Q10 If your facilities are American Red Cross designated shelters, do you believe they are adequately designed and equipped to support sheltering during and after natural hazard events? Do your facilities have generator capabilities to support the American Red Cross shelter?

Answered: 3 Skipped: 3

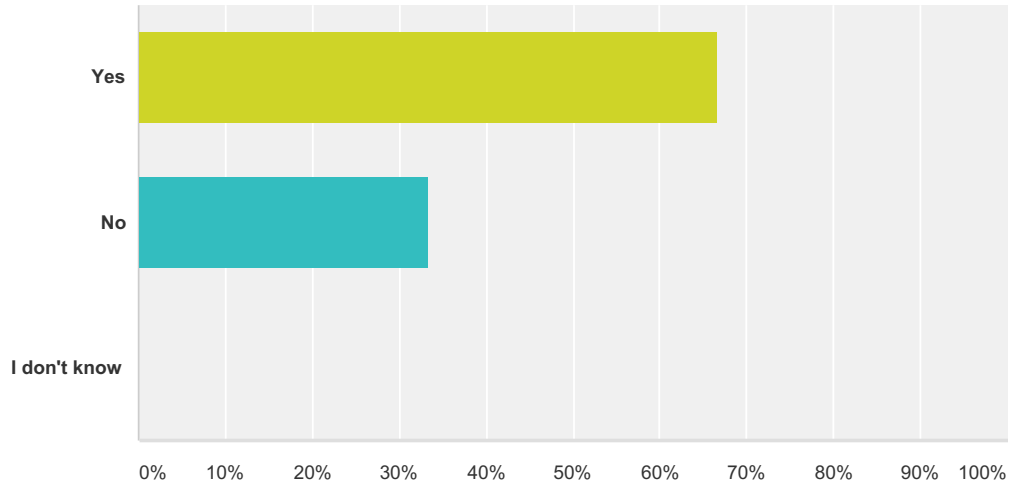


Answer Choices	Responses
Yes	100.00% 3
No	0.00% 0
I don't know	0.00% 0
Total	3

#	Please explain	Date
1	Elementary School. Limited emergency electric capabilities	9/25/2015 7:36 AM

Q11 Do you think that weather forecasts and announcements of road closures and pending road closures are sufficiently accurate and available to support your institution's operation and student transportation decisions in the event of natural hazard events?

Answered: 3 Skipped: 3

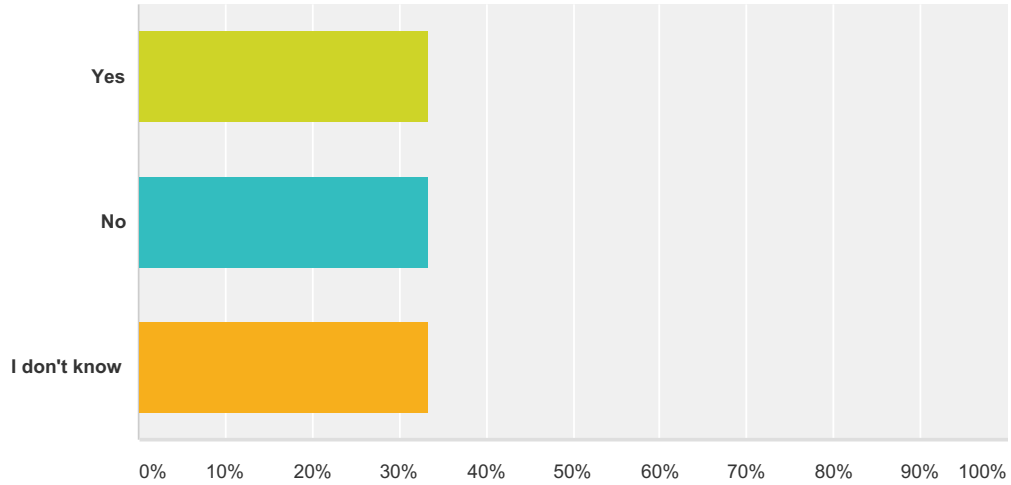


Answer Choices	Responses
Yes	66.67% 2
No	33.33% 1
I don't know	0.00% 0
Total	3

#	Please explain	Date
	There are no responses.	

Q12 Do you believe that emergency response planning, services, and equipment are capable of managing and responding properly to natural disasters in your community?

Answered: 3 Skipped: 3

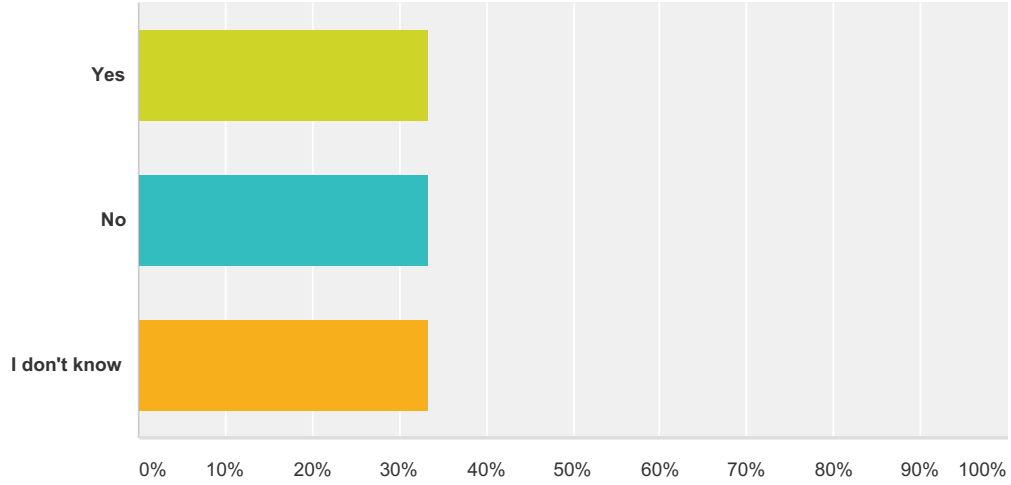


Answer Choices	Responses
Yes	33.33% 1
No	33.33% 1
I don't know	33.33% 1
Total	3

#	Please explain	Date
	There are no responses.	

Q13 Do you believe that local government understands, supports, and possesses adequate resources for natural hazard risk reduction efforts in the community?

Answered: 3 Skipped: 3

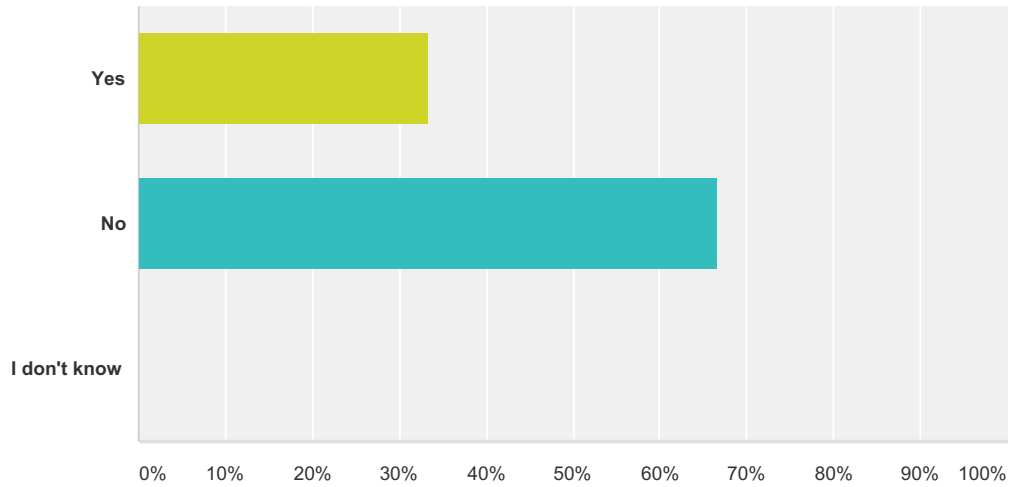


Answer Choices	Responses
Yes	33.33% 1
No	33.33% 1
I don't know	33.33% 1
Total	3

#	Please explain	Date
	There are no responses.	

Q14 Is your institution covered by a Continuity of Operations (COOP) plan? COOP plans examine an institution’s ability to perform minimum essential functions during any situation, and support the continuance of institution functions.

Answered: 3 Skipped: 3



Answer Choices	Responses
Yes	33.33% 1
No	66.67% 2
I don't know	0.00% 0
Total	3

#	If "Yes", please explain.	Date
	There are no responses.	

Q15 Can you identify projects or programs that will reduce your facility's vulnerability to damages and losses, including loss of operation/service, to hazard events?

Answered: 2 Skipped: 4

#	Responses	Date
1	THiws is a test. Jon Raser	12/2/2015 3:03 PM
2	District Wide Strategic planning is in progress at this time.	9/25/2015 7:37 AM

Q16 Do you have any other comments, questions, or concerns?

Answered: 1 Skipped: 5

#	Responses	Date
1	No	12/2/2015 3:03 PM

Q1 Name of your utility:

Answered: 3 Skipped: 0

#	Responses	Date
1	TEMP	12/9/2015 10:38 AM
2	mme	8/27/2015 3:08 PM
3	test	8/25/2015 12:31 PM

Q2 Name of respondent:

Answered: 0 Skipped: 3

#	Responses	Date
	There are no responses.	

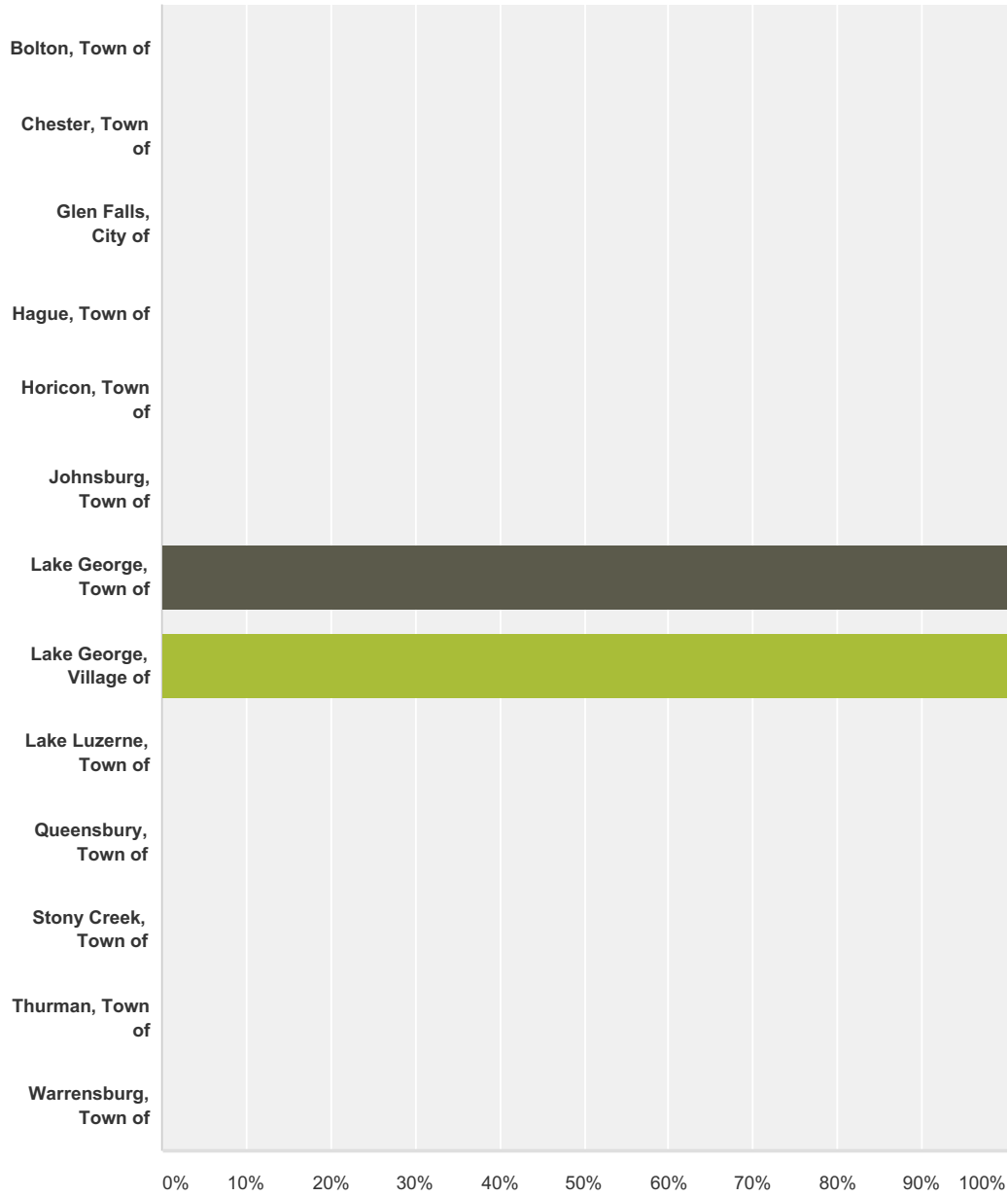
Q3 Contact information (email address or phone number) - optional:

Answered: 0 Skipped: 3

#	Responses	Date
	There are no responses.	

Q4 Please identify the location of your facility(ies) and or primary service area (you may pick more than one choice):

Answered: 1 Skipped: 2



Answer Choices	Responses
Bolton, Town of	0.00% 0
Chester, Town of	0.00% 0
Glen Falls, City of	0.00% 0
Hague, Town of	0.00% 0
Horicon, Town of	0.00% 0

Warren County NY HMP - Utility Survey

Johnsburg, Town of	0.00%	0
Lake George, Town of	100.00%	1
Lake George, Village of	100.00%	1
Lake Luzerne, Town of	0.00%	0
Queensbury, Town of	0.00%	0
Stony Creek, Town of	0.00%	0
Thurman, Town of	0.00%	0
Warrensburg, Town of	0.00%	0
Total Respondents: 1		

#	Other (please specify)	Date
	There are no responses.	

Q5 Has your utility been impacted by natural hazard events (damaged, closed for extended periods, etc.)?

Answered: 0 Skipped: 3

! No matching responses.

Answer Choices	Responses
Yes	0.00% 0
No	0.00% 0
Total	0

#	If you answered "YES", please identify the events and provide a brief description of the damages or loss of service	Date
	There are no responses.	

Q6 Do you believe that your facilities and infrastructure are disaster-resistant (e.g. are properly located, constructed, and protected from damage from natural hazards)?

Answered: 0 Skipped: 3

! No matching responses.

Answer Choices	Responses
Yes	0.00% 0
No	0.00% 0
I don't know	0.00% 0
Total	0

#	Please explain	Date
	There are no responses.	

Q7 Do you believe that your facilities and infrastructure have sufficient redundancy and/or are sufficiently networked to provide a minimal level of service to your customers (esp. critical and essential services such as police, fire, hospitals) in the event that you suffer damage/loss to your equipment?

Answered: 0 Skipped: 3

! No matching responses.

Answer Choices	Responses
Yes	0.00% 0
No	0.00% 0
I don't know	0.00% 0
Total	0

#	Please explain	Date
	There are no responses.	

Q8 Do you think that local public education and awareness programs are effective at informing the public on what they should do to be prepared for and reduce their personal risk to natural disasters, so as to reduce their reliance on your services during and after hazard events?

Answered: 0 Skipped: 3

! No matching responses.

Answer Choices	Responses
Yes	0.00% 0
No	0.00% 0
I don't know	0.00% 0
Total	0

#	Please explain	Date
	There are no responses.	

Q9 Do you think that announcements of utility outages and service restoration schedules are sufficiently accurate and available to support the needs of emergency management, as well as owners/operators of critical and essential facilities?

Answered: 0 Skipped: 3

! No matching responses.

Answer Choices	Responses
Yes	0.00% 0
No	0.00% 0
I don't know	0.00% 0
Total	0

#	Please explain	Date
	There are no responses.	

Q10 Do you think that the public is aware of, understands, and takes advantage of emergency warning and notification systems and services (reverse 911, audible alerts, cell and text services)?

Answered: 0 Skipped: 3

! No matching responses.

Answer Choices	Responses
Yes	0.00% 0
No	0.00% 0
I don't know	0.00% 0
Total	0

#	Please explain	Date
	There are no responses.	

Q11 Do you think that vegetation management programs (e.g. tree trimming and removal) are sufficient to manage the risk of utility outages during natural hazard events?

Answered: 0 Skipped: 3

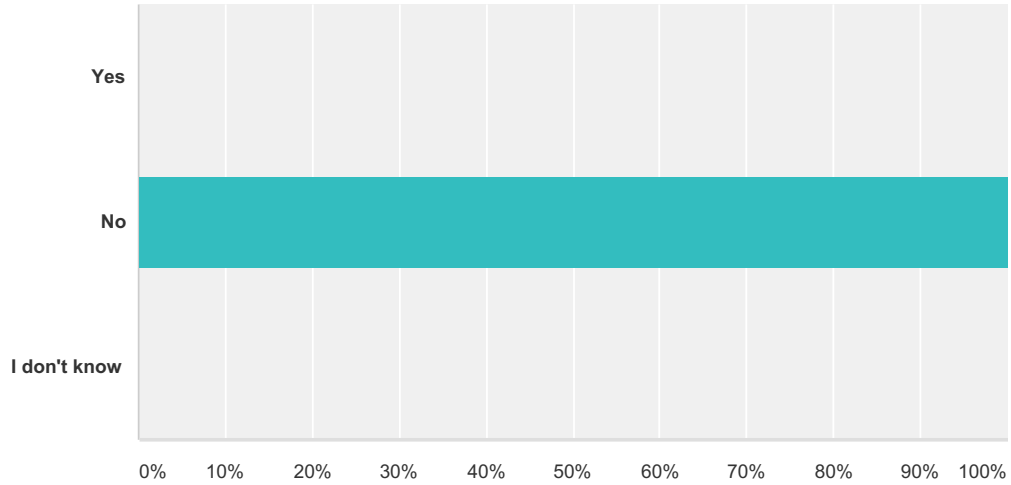
! No matching responses.

Answer Choices	Responses
Yes	0.00% 0
No	0.00% 0
I don't know	0.00% 0
Total	0

#	Please explain	Date
	There are no responses.	

Q12 Do you think that emergency response planning, services, and equipment are adequate to manage and respond properly to natural disasters in your community?

Answered: 1 Skipped: 2



Answer Choices	Responses
Yes	0.00% 0
No	100.00% 1
I don't know	0.00% 0
Total	1

#	Please explain	Date
	There are no responses.	

Q13 Do you think that local government understands, supports, and possess the resources for natural hazard risk reduction efforts in the community?

Answered: 0 Skipped: 3

! No matching responses.

Answer Choices	Responses
Yes	0.00% 0
No	0.00% 0
I don't know	0.00% 0
Total	0

#	Please explain	Date
	There are no responses.	

Q14 Is your organization covered by a Continuity of Operations (COOP) plan? COOP plans examine an organization's ability to perform minimum essential functions during any situation, and support the continuance of your organization's functions.

Answered: 0 Skipped: 3

! No matching responses.

Answer Choices	Responses
Yes	0.00% 0
No	0.00% 0
I don't know	0.00% 0
Total	0

#	If "Yes", please explain.	Date
	There are no responses.	

Q15 Can you identify projects or programs that will reduce your facility's vulnerability to damages and losses, including loss of operation/service, to hazard events?

Answered: 0 Skipped: 3

#	Responses	Date
	There are no responses.	

Q16 Do you have any other comments, questions, or concerns?

Answered: 0 Skipped: 3

#	Responses	Date
	There are no responses.	

Name	Title / Position	Attended Meeting(s)	Completed Information Gathering Worksheets / Surveys	Provided Data and Information	Reviewed/Updated Inventories (e.g. Critical Facilities)	Identified vulnerabilities	Identified progress on original Mitigation Strategy	Supported update of Mitigation Strategy	Facilitated/Supported public and stakeholder outreach	Supported Integration/Coordination with other Planning Mechanisms	Reviewed/Approved Draft and Final Plan Sections	Designated Project Point of Contact
Warren County												
Jim Lieberum, CPESC	District Manager/County Hazard Mitigation Coordinator; WC Soil and Water Conservation District	X	X	X	X	X	X	X	X	X	X	X (SC)
Amy Drexel Hirsch	Emergency Services Coordinator, WC Office of Emergency Services	X	X	X	X	X	X	X	X	X	X	X (SC)
Brian A. LaFlure	Director/Fire Coordinator, WC Office of Emergency Services	X		X	X	X	X	X	X	X	X	X (SC)
Sara Frankenfeld	GIS Coordinator; WC Planning	X	X	X	X	X	X	X	X	X	X	X (SC)
Dean L. Moore	Sr. District Technician; WC Soil and Water Conservation District	X	X	X	X	X	X	X	X	X	X	X (SC)
Laura E. Moore	Planner, Town of Queensbury	X		X		X		X		X		X (SC)
Amanda Allen	Assisted with public outreach (sending out invitations to meetings)	X							X			
George VanDusen	Highway Manager; WC DPW	X	X	X	X	X	X	X				
Patricia Auer	Director, WC Public Health/Patient Services	X				X		X			X	
Mike Colvin	Director; WC Information Technology	X						X			X	
Dan Herr	WC Sheriff's Office	X						X				
Wayne E. LaMothe, AICP	County Planner/Director						X	X			X	
Dan Durkee	Warren County Health Services; Senior Health Educator, Emergency Preparedness Coordinator			X				X			X	
C. Shawn Lamouree	Warren County Sheriff's Office; Undersheriff			X				X			X	
Martin Auffredou	County Attorney	X										
City of Glens Falls												
James P. Schrammel	Fire Chief	X	X	X		X	X	X			X	X
Steve Gurzler	City Engineer; Stormwater Manager; Water/Sewer Superintendent	X		X		X						X
James G. Buxton	Code Enforcement Officer, NFIP FPA		X	X		X				X		
Judy Villa White	Human Resources	X		X								
Devin Fish	City Intern - Human Resources	X		X								
Susanne Kasitch	City Controller	X		X								



Name	Title / Position	Attended Meeting(s)	Completed Information Gathering Worksheets / Surveys	Provided Data and Information	Reviewed/Updated Inventories (e.g. Critical Facilities)	Identified vulnerabilities	Identified progress on original Mitigation Strategy	Supported update of Mitigation Strategy	Facilitated/Supported public and stakeholder outreach	Supported Integration/Coordination with other Planning Mechanisms	Reviewed/Approved Draft and Final Plan Sections	Designated Project Point of Contact
Michelle Arnold	Chief of Police	X		X		X						
Bud Taylor	Supervisor	X										
Dan Girard	Supervisor	X										
Town of Bolton												
Ronald Conover	Town Supervisor	X		X		X						X
Susan Wilson	Deputy Supervisor											X
Pamela Kenyon	Zoning Administrator, NFIP FPA	X		X		X						
Catherine (Katie) Persons		X	X	X	X	X	X	X	X	X	X	
Matt Coon		X		X		X	X	X				
William A. Sherman	Highway Superintendent	X		X		X	X	X				
James Neuman	Police Chief	X		X		X						
Thomas A. French II		X		X		X						
Mayann Huck		X						X				
Town of Chester												
Craig R. Leggett	Supervisor			X	X	X	X	X		X	X	X
Frederick H. Monroe	Supervisor (former)	X										
Jason Monroe	Highway Superintendent / Water Superintendent	X						X				X
Walter Tennyson	Zoning Administrator, NFIP FPA		X									
Michael S. Pzei		X						X				
Jeremy Little	Clerk, Secretary to the Planning Board	X						X				
Town of Hague												
Catherine Clark	Zoning Administrator, NFIP FPA	X	X	X	X	X	X	X		X	X	X
Enda A. Frasier	Supervisor	X	X	X	X	X	X	X		X	X	X
Town of Horicon												
Matthew J. Simpson	Supervisor	X	X	X		X	X	X	X	X	X	X
Dawn Higgins	Secretary											X
James Steen	Zoning Administrator, NFIP FPA	X	X					X				
Town of Johnsbury												
Ron Vanselow	Supervisor	X	X	X	X	X	X	X	X	X	X	X



Name	Title / Position	Attended Meeting(s)	Completed Information Gathering Worksheets / Surveys	Provided Data and Information	Reviewed/Updated Inventories (e.g. Critical Facilities)	Identified vulnerabilities	Identified progress on original Mitigation Strategy	Supported update of Mitigation Strategy	Facilitated/Supported public and stakeholder outreach	Supported Integration/Coordination with other Planning Mechanisms	Reviewed/Approved Draft and Final Plan Sections	Designated Project Point of Contact
Daniel Hitchcock	Highway Superintendent	X		X		X	X	X	X			X
Joann Morehouse	Deputy Town Clerk											X
Town of Lake George												
Dennis Dickinson	Supervisor	X										X
Dan Davis	Highway Superintendent	X										
Kathy Bozoni	Environmental Program Manager	X										
Dan Barusch	Director of Planning and Zoning	X	X	X	X	X	X	X	X	X	X	X
Town of Lake Luzerne												
Allen Saheim	Zoning and Safety Officer/NFIP FPA	X	X	X	X	X	X	X	X	X	X	X
Eugene Merlino	Supervisor	X						X				X
Town of Queensbury												
John F. Strough	Supervisor	X		X		X			X			X
Craig Brown	Zoning Administrator	X		X		X						X
David Hatin	Director of Building and Code Enforcement, NFIP FPA	X		X		X						
Ronald Montesi	Deputy Supervisor	X		X		X						
Victoria LaMarque	Executive Assistant to Supervisor	X		X		X						
Barbara Tierney	Budget Officer	X		X		X						
Laura E. Moore	Planner, WC HMP Steering Committee	X	X	X		X	X	X		X	X	
Michael Palmer	Fire Marshall	X		X		X						
David Duell		X		X		X						
Charles Mellon Jr.		X		X		X						
Christopher Harrington	Water Superintendent / Director of Wastewater	X		X		X						
Town of Stony Creek												
Frank E. Thomas	Supervisor, NFIP FPA (per Town LOIP)	X	X	X			X	X	X		X	X
Neil Bradley	Highway Superintendent											X
Ronda Thomas		X						X				
Town of Thurman												
Evelyn M. Wood	Town Supervisor	X	X	X	X	X	X	X	X	X	X	X
Patrick S. Wood	Superintendent of Highways	X						X				X



Name	Title / Position	Attended Meeting(s)	Completed Information Gathering Worksheets / Surveys	Provided Data and Information	Reviewed/Updated Inventories (e.g. Critical Facilities)	Identified vulnerabilities	Identified progress on original Mitigation Strategy	Supported update of Mitigation Strategy	Facilitated/Supported public and stakeholder outreach	Supported Integration/Coordination with other Planning Mechanisms	Reviewed/Approved Draft and Final Plan Sections	Designated Project Point of Contact
Jeff Ackley	Highway Department	X						X				
Town of Warrensburg												
Edward Pennock	Superintendent of Highways		X	X								X
Christopher Belden	Code Enforcement and Building Permits		X	X	X	X	X	X	X	X	X	X
Chip Webster	Water Department	X						X				
Kevin Geraghty	Supervisor	X										
Village of Lake George												
Robert M. Blais	Mayor	X							X			X
David Harrington	Public Works Superintendent	X	X	X	X	X	X	X		X	X	X
Douglas Frost	Code Enforcement Officer / NFIP FPA		X									
Darlene Gunthe	Clerk	X										

- FPA Floodplain Administrator
- GIS Geographic Information System
- LOIP Letter of Intent to Participate
- NFIP National Flood Insurance Program
- SC Steering Committee
- WC Warren County



Appendix E: Action Worksheet Template and Instructions

This appendix provides the Action Worksheet template, including instructions for its completion, used by the participating jurisdictions to document applicable projects identified in their mitigation strategy, including a summary of the action evaluation and prioritization process.



WARREN COUNTY 2015 HAZARD MITIGATION PLAN
Worksheet #7 – Mitigation Action Worksheet



Please complete responses below and send electronic Word version by May 22, 2015 to:
Jonathan Raser or Heather Apgar
 Phone: 973-630-8042 ; 8046 E-mail: jonathan.raser@tetrattech.com; heather.apgar@tetrattech.com

Please complete the following two tables per **NEW action/project** with as much detail as possible, using the guidance beginning on page 3.

Name of Jurisdiction: _____
Name and Title Completing Worksheet: _____
Action Number: _____
Mitigation Action/Initiative: _____

Assessing the Risk	
Hazard(s) addressed:	
Specific problem being mitigated:	
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	1. _____
	2. _____
	3. _____
Action/Project Intended for Implementation	
Description of Selected Action/Project	
Action/Project Category	
Goals Met	
Applies to existing and or new development, or not applicable	
Benefits (losses avoided)	
Estimated Cost	
Priority*	
Plan for Implementation	
Responsible Organization	
Local Planning Mechanism	
Potential Funding Sources	
Timeline for Completion	
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: _____ Progress on Action/Project: _____





WARREN COUNTY 2015 HAZARD MITIGATION PLAN
Worksheet #7 – Mitigation Action Worksheet



Action Number: _____
Mitigation Action/Initiative: _____

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety		
Property Protection		
Cost-Effectiveness		
Technical		
Political		
Legal		
Fiscal		
Environmental		
Social		
Administrative		
Multi-Hazard		
Timeline		
Agency Champion		
Other Community Objectives		
Total		
Priority (High/Med/Low)		



WARREN COUNTY 2015 HAZARD MITIGATION PLAN Worksheet #7 – Mitigation Action Worksheet



Guidance to Complete the Mitigation Action Worksheet

The following provides additional guidance on how to complete the Mitigation Action Worksheet. If you have any questions, please contact: *Jonathan Raser* (jonathan.raser@tetratech.com or 973-630-8042) or *Heather Apgar* (heather.apgar@tetratech.com or 973-630-8046) at Tetra Tech

Assessing the Risk

Hazard(s) addressed: Please enter the hazard of concern you are mitigating.

Specific problem being mitigated: Please describe the specific problem being mitigated.

Evaluation of Potential Actions/Projects

Actions/Projects Considered: Please consider different options to mitigate the problem identified. One alternative is always to accept the current level or risk (tolerate the vulnerability/problem) by deciding to take no action at this time. If you choose to take no action, please complete the worksheet up to and including this section and this will be noted in the Plan.

Please include the name of the action considered and a brief reason as to why the action was not selected. The reasoning documents the consideration of these alternatives.

Action/Project Intended for Implementation

Description of the Selected Project: Please provide a brief description of the selected project.

Mitigation Action Type:

- Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.
- Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.
- Natural Systems Protection (NSP) – These are actions that minimize damage and losses, and also preserve or restore the functions of natural systems.
- Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.

Goals:

Goal 1: Protect Life and Property

Goal 2: Increase Public Awareness

Goal 3: Provide for Emergency Services

Goal 4: Support comprehensive County and local mitigation through the integration of hazard mitigation planning into related state, regional, county and local plans and programs.





WARREN COUNTY 2015 HAZARD MITIGATION PLAN Worksheet #7 – Mitigation Action Worksheet



Goal 5: Encourage the development and implementation of long-term, cost-effective, and resilient mitigation projects to preserve or restore the functions of natural systems.

Benefits: Please describe the losses avoided when the project is implemented. This includes physical property damage; loss of function; road closing/detours; etc.

Estimated Cost: Please provide the estimated cost or use the following ranges:

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

Priority: Please enter High/Medium/Low. Refer to the prioritization exercise and table.

Plan for Implementation

Potential Funding Source: Please identify the anticipated funding source, which could be “Grant funding with local cost share”. Sources may include federal, state and local sources.

Timeline for Completion: Short = 1 to 5 years. Long Term= 5 years or greater. OG = On-going program.

Reporting on Progress

Please provide a status update on the selected action/project. Along with this description, please indicate if the action/project is completed or not completed.

Actions which are not complete may be dropped with a rationale provided (e.g., project deemed unfeasible...). Other incomplete actions should clearly be indicated as continuing; indicate percent complete, and identify any hurdles/obstacles/reasons for change in schedule. Even actions that have had no progress to date can be identified as continuing. For any action that is not yet complete and will continue, always consider modifying the action to promote implementation.

Please note this report on progress should be done, at minimum, each year prior to the annual Planning Committee update outlined in the plan maintenance procedures in Section 7 (Plan Maintenance).



WARREN COUNTY 2015 HAZARD MITIGATION PLAN Worksheet #7 – Mitigation Action Worksheet



Guidance to Complete the Prioritization Table

Complete this table to help evaluate and prioritize each mitigation action being considered by your municipality. Please use these 14 criteria to assist in evaluating and prioritizing new mitigation actions identified. Specifically, for each new mitigation action, assign a numeric rank (-1, 0, or 1) for each of the 14 evaluation criteria in the provided table, defined as follows:

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

Use the numerical results of this exercise to help prioritize your actions as “Low”, “Medium” or “High” priority. Your municipality may recognize other factors or considerations that affect your overall prioritization; these should be identified in narrative in the Priority field of the worksheet. The 14 evaluation/prioritization criteria are:

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



WARREN COUNTY 2015 HAZARD MITIGATION PLAN
Worksheet #7 – Mitigation Action Worksheet



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?

This appendix includes FEMA 386-4 Guidance worksheets to facilitate plan maintenance and review by the Warren County planning partnership.

Plan Goal(s)/Objective(s) Addressed:

Goal: _____

Objective: _____

Indicator of Success (e.g., losses avoided as a result of the acquisition program):

In most cases, you will list losses avoided as the indicator. In cases where it is difficult to quantify the benefits in dollar amounts, you will use other indicators, such as the number of people who now know about mitigation or who are taking mitigation actions to reduce their vulnerability to hazards.

Status (Please check pertinent information and provide explanations for items with an asterisk. For completed or canceled projects, see Worksheet #2 — to complete a project evaluation):

Project Status

Project on schedule

Project completed

Project delayed*

*explain: _____

Project canceled

Project Cost Status

Cost unchanged

Cost overrun*

*explain: _____

Cost underrun*

*explain: _____

Summary of progress on project for this report:

A. What was accomplished during this reporting period?

B. What obstacles, problems, or delays did you encounter, if any?

C. How was each problem resolved?

When gearing up for the plan evaluation, the planning team should reassess its composition and ask the following questions:

	YES	NO
Have there been local staffing changes that would warrant inviting different members to the planning team?		
Comments/Proposed Action:		
Are there organizations that have been invaluable to the planning process or to project implementation that should be represented on the planning team?		
Comments/Proposed Action:		
Are there any representatives of essential organizations who have not fully participated in the planning and implementation of actions? If so, can someone else from this organization commit to the planning team?		
Comments/Proposed Action:		
Are there procedures (e.g., signing of MOAs, commenting on submitted progress reports, distributing meeting minutes, etc.) that can be done more efficiently?		
Comments/Proposed Action:		
Are there ways to gain more diverse and widespread cooperation?		
Comments/Proposed Action:		
Are there different or additional resources (financial, technical, and human) that are now available for mitigation planning?		
Comments/Proposed Action:		

If the planning team determines the answer to any of these questions is “yes,” some changes may be necessary.

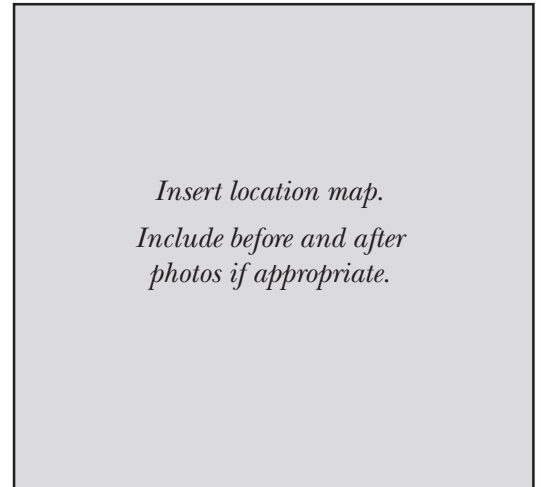
Project Name and Number: _____

Project Budget: _____

Project Description: _____

Associated Goal and Objective(s): _____

Indicator of Success (e.g., losses avoided): _____



Was the action implemented? YES NO



Why not?

Was there political support for the action?

Were enough funds available?

Were workloads equitably or realistically distributed?

Was new information discovered about the risks or community that made implementation difficult or no longer sensible?

Was the estimated time of implementation reasonable?

Were sufficient resources (for example staff and technical assistance) available?

YES NO



What were the results of the implemented action? _____

	YES	NO
Were the outcomes as expected? If No, please explain:		
Did the results achieve the goal and objective(s)? Explain how:		
Was the action cost-effective? Explain how or how not:		
What were the losses avoided after having completed the project?		
If it was a structural project, how did it change the hazard profile?		
Additional comments or other outcomes:		

Date: _____

Prepared by: _____

Risk Assessment Steps	Questions	YES	NO	COMMENTS
Identify hazards	Are there new hazards that can affect your community?			
Profile hazard events	Are new historical records available?			
	Are additional maps or new hazard studies available?			
	Have chances of future events (along with their magnitude, extent, etc.) changed?			
	Have recent and future development in the community been checked for their effect on hazard areas?			
Inventory assets	Have inventories of existing structures in hazard areas been updated?			
	Is future land development accounted for in the inventories?			
	Are there any new special high-risk populations?			
Estimate losses	Have loss estimates been updated to account for recent changes?			

If you answered "Yes" to any of the above questions, review your data and update your risk assessment information accordingly.

Worksheet #1

Progress Report

step 2

Page 1 of 3

Progress Report Period: October 1, 2003 to December 31, 2003
(date) (date)

Project Title: Raging River Views Park Flood Acquisition Project Project ID#: HVMP-2003-01

Responsible Agency: Hazardville Department of Planning

Address: 1909 Burnham Way

City/County: Hazardville, Emergency

Contact Person: Eustoe Eudlid Title: Grants Administrator

Phone #(s): (555) 555-8478 email address: eeudlid@town.hazardville.oh

List Supporting Agencies and Contacts:

Hazardville Department of Housing: Noah Hudson (555) 555-8465

Hazardville Habitat for Humanity: Carter Goodman (555) 555-9432

Total Project Cost: \$360,000

Anticipated Cost Overrun/Underrun: \$N/A

Date of Project Approval: July 21, 2003 Start date of the project: November 15, 2003

Anticipated completion date: Summer 2005

Description of the Project (include a description of each phase, if applicable, and the time frame for completing each phase):

Acquire and demolish 14 structures located at the Raging River Views Park. Work with Habitat for Humanity and the Department of Housing to construct new housing or rehabilitate existing housing for displaced low-income residents. The Department of Housing will also provide funds for temporary housing to displaced residents.

Milestones	Complete	Projected Date of Completion
Conduct surveys of ground and first-floor elevations	✓	
Obtain Notices of Intent by owners	✓	
Conduct structure appraisals	✓	
Send letters of offer to homeowners		1/31/04
Perform title work		3/30/04
Acquire structures		6/30/04
Begin construction of new housing or reconstruction of existing housing for relocated residents		6/30/04
Send payment for relocation to centers		9/30/04
Finalize contract for demolition		1/12/05
Demolish structures		4/26/05
Landscape open parcels		6/30/05

Plan Goal(s)/Objective(s) Addressed:

Goal: Minimize losses to existing and future structures within hazard areas.

Objective: Reduce potential damages to the manufactured home park in the floodplain.

Indicator of Success (e.g., losses avoided as a result of the acquisition program):

In most cases, you will list losses avoided as the indicator. In cases where it is difficult to quantify the benefits in dollar amounts, you will use other indicators, such as the number of people who now know about mitigation or who are taking mitigation actions to reduce their vulnerability to hazards.

Losses Avoided. After a major flood (100-year), the Department of Economic Development will assist the Planning Department in calculating the losses avoided.

Status (Please check pertinent information and provide explanations for items with an asterisk. For completed or canceled projects, see Worksheet #2 — to complete a project evaluation):

Project Status	Project Cost Status
<input checked="" type="checkbox"/> Project on schedule	<input checked="" type="checkbox"/> Cost unchanged
<input type="checkbox"/> Project completed	<input type="checkbox"/> Cost overrun*
<input type="checkbox"/> Project delayed*	*explain: _____
*explain: _____	_____
<input type="checkbox"/> Project canceled	<input type="checkbox"/> Cost underrun*
	*explain: _____

Summary of progress on project for this report:

A. What was accomplished during this reporting period?

The Department of Planning contacted the owners of the properties vulnerable to floods to determine their willingness to sell their properties. Of the 14 property owners contacted, 10 agreed to have their homes acquired. An appraiser contracted by the Department of Planning estimated the value of the 10 properties.

B. What obstacles, problems, or delays did you encounter, if any?

The owners of four properties refused to sell. There has been some limited neighborhood opposition to various suggestions for the community open space created by the acquisitions.

C. How was each problem resolved?

The Department of Planning has proposed to the residents a design charrette to develop alternatives for the open space that would be created, with the understanding that no permanent structures can be constructed on the open parcels after acquisition and demolition has been completed. Recreational activities will be limited to passive uses such as trails and bike paths.

Worksheet #2 Evaluate Your Planning Team step **3**

<i>When gearing up for the plan evaluation, the planning team should reassess its composition and ask the following questions:</i>	YES	NO
Have there been local staffing changes that would warrant inviting different members to the planning team?		✓
Comments/Proposed Action: NA		
Are there organizations that have been invaluable to the planning process or to project implementation that should be represented on the planning team?	✓	
Comments/Proposed Action: Hazardville Habitat for Humanity has been invaluable to assisting the relocation of former Ragin River Views Park residents. The organization should be invited to participate in THORR.		
Are there any representatives of essential organizations who have not fully participated in the planning and implementation of actions? If so, can someone else from this organization commit to the planning team?	✓	
Comments/Proposed Action: It is essential that the Department of Public Works be represented at each meeting because so many mitigation actions involve them. However, representatives from the department have been unable to attend meetings consistently since the development of the plan. THORR will work with the department's director to find consistent, active representation.		
Are there procedures (e.g., signing of MOAs, commenting on submitted progress reports, distributing meeting minutes, etc.) that can be done more efficiently?	✓	
Comments/Proposed Action: Again, the Department of Public Works has been unable to provide timely progress reports of its mitigation actions. Administrative duties and paperwork have fallen through the cracks since the department has been assigned numerous new duties to Hazardville's mitigation efforts. Perhaps the department, in partnership with THORR, should approach the Town Council for funding for more department staff.		
Are there ways to gain more diverse and widespread cooperation?	✓	
Comments/Proposed Action: THORR members believe that better publicity about mitigation actions will garner more interest from the public, affected/interested organizations, and state agencies.		
Are there different or additional resources (financial, technical, and human) that are now available for mitigation planning?	✓	
Comments/Proposed Action: THORR has learned about new PDM funding. The state has asked that local jurisdictions submit applications for brick and mortar projects and risk assessments studies.		

If the planning team determines the answer to any of these questions is "yes," some changes may be necessary.



Worksheet #3 Evaluate Your Project Results **step 3**

page 1 of 2

Project Name and Number:

Raging River Views Park Flood Acquisition Project (HVMP-2003-01)

Project Budget:

\$360,000

Project Description:

Acquisition and demolition of 14 flood-prone structures

Associated Goal and Objective(s):

Goal: Minimize losses to existing and future structures within hazard areas

Objective: Reduce potential damages to the manufactured home park in the floodplain

Indicator of Success (e.g., losses avoided):

Losses avoided by acquisition and demolition of flood-prone structures



Town of Hazardville Composite Loss Map developed previously during risk assessment (see FEMA 386-2).

Was the action implemented? YES NO

IF NO

Why not?

Was there political support for the action?

YES NO

Were enough funds available?

Were workloads equitably or realistically distributed?

Was new information discovered about the risks or community that made implementation difficult or no longer sensible?

Was the estimated time of implementation reasonable?

Were sufficient resources (for example staff and technical assistance) available?

IF YES

What were the results of the implemented action?

Of the 14 proposed properties, 10 were acquired. The benefit-cost ratio is 2.19, based on project benefits of \$789,000 and costs of \$360,274. Benefits are based on the net present value of the avoided damages over the project life. Furthermore, about 40 people are no longer in the path of a potential flood, making emergency rescue operations in that area less likely and evacuation easier.

	YES	NO
Were the outcomes as expected? If No, please explain:		<input checked="" type="checkbox"/>
The project originally set out to acquire 14 properties. Four of the 14 owners did not want to participate in the buyout program.		
Did the results achieve the goal and objective(s)? Explain how:	<input checked="" type="checkbox"/>	
Despite four properties still in harm's way, the objective has been largely met. See additional comments.		
Was the action cost-effective? Explain how or how not:	<input checked="" type="checkbox"/>	
The FEMA Limited Data module was used to perform the benefit-cost analysis. Data for the analysis was collected from historical flood data and used as benchmarks in the before mitigation section of the analysis. The damages after mitigation section was left blank, due to the properties being permanently acquired, and the economic risk removed completely. The analysis resulted in a benefit-cost ratio of 2.19, with benefits totaling \$789,000 for 10 properties.		
What were the losses avoided after having completed the project?		
Total avoided losses are \$789,000 over the lifetime of the project (estimated at 100 years).		
If it was a structural project, how did it change the hazard profile?		
N/A		
Additional comments or other outcomes:		
The Planning Department has agreed to work with the remaining four homeowners in evaluating other flood-proofing options.		

Date: October 12, 2005

Prepared by: Hazardville Department of Economic Development
Hazardville Department of Planning

Worksheet #4 Revisit Your Risk Assessment **step 4**

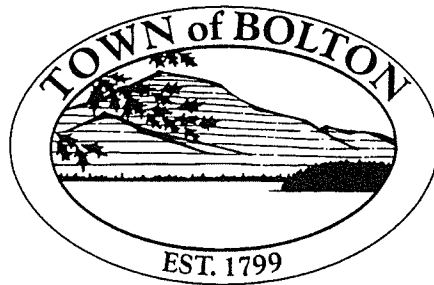
Risk Assessment Steps	Questions	YES	NO	COMMENTS
Identify hazards	Are there new hazards that can affect your community?		✓	
Profile hazard events	Are new historical records available?		✓	
	Are additional maps or new hazard studies available?	✓		Recently completed maps and studies showing vulnerability of the new coastal development to erosion and tidal surge are available.
	Have chances of future events (along with their magnitude, extent, etc.) changed?		✓	
	Have recent and future development in the community been checked for their effect on hazard areas?	✓		
Inventory assets	Have inventories of existing structures in hazard areas been updated?	✓		
	Is future land development accounted for in the inventories?	✓		The Planning Department is preparing a coastal development plan to ensure that any future development is set back far enough to be outside the erosion zones and the coastal high hazard areas. Current and future road configurations will also be studied to ensure adequate evacuation routes before hurricane events.
	Are there any new special high-risk populations?	✓		Coastal residents and business owners.
Estimate losses	Have loss estimates been updated to account for recent changes?	✓		

If you answered "Yes" to any of the above questions, review your data and update your risk assessment information accordingly.



This appendix provides copies of the municipal Letters of Intent to Participate, as described in Section 3 - “Planning Process”.

Assessor
644-2894
Justice Court
644-2202
Planning
644-2893



Supervisor
644-2461
Town Clerk
644-2444
Fax
518-644-2476

Date: June 2, 2015

Amy J. Hirsch, AEM
Emergency Services Coordinator
Deputy Director
Warren County Office of Emergency Services
1340 State Route 9
Lake George, NY 12845

Subject: Warren County All Hazards Mitigation Plan
Authorization and Letter of Intent to Participate – Town of Bolton

Dear Ms. Hirsch:

Per our letter, dated June 2, 2015, the Town of Bolton is committed to participating in the Warren County All Hazards Mitigation Plan (HMP) project. By way of this letter, the Town of Bolton:

1. Authorizes the Warren County Hazard Mitigation Steering Committee (“Steering Committee”), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.
2. Agrees to meet the minimum requirements of municipal participation (a.k.a. the Planning Partner Expectations), specifically:
 - Execute and return this “Authorization and Acknowledgement” letter to the Warren County Office of Emergency Services, attention: Amy J. Hirsch.
 - Identify municipal representatives to serve as the planning point of contacts (POC), below. These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
 - Support the Steering Committee selected to oversee the development of this plan.
 - Provide representation at municipal Planning Committee meetings (~ 3 meetings over 6-8 months, including a Kick-Off Meeting and a Mitigation Strategy Workshop).
 - Provide data and information about your community as requested by the Steering Committee or the contract consultant, including:

- Structure and facility inventory data
 - Identification of new development and anticipated development
 - Identification of natural hazard risk areas
 - Identification of natural hazard events and losses that have impacted your community in the last five years
 - Identification of plans, studies, reports and ordinances addressing natural hazard risk
 - Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions.
- Support public outreach efforts in your community which may include:
 - Providing notices of the planning project on your municipal website with links to a County project website
 - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
 - Advertising and supporting public meetings in your area
 - Supporting outreach to National Flood Insurance Program (NFIP) Repetitive Loss and Severe Repetitive Loss property owners in your community.
- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
 - Completing data and information collection survey forms in a timely manner.
 - Identify specific mitigation actions to address each of the natural hazards posing significant [or high or medium] risk to your community.
 - Involve your local NFIP Floodplain Administrator in the planning process.
 - Review draft Plan sections when requested and provide comment and input as appropriate.
 - Adopt the Plan by resolution of their governing body after FEMA conditional approval.
 - Periodically provide the Steering Committee with reports of municipal staff and volunteer labor spent on the planning process.

3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at municipal Planning Committee meetings, and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC: Ronald Conover	Position/Department: Town Supervisor
Phone Number: (518) 644-2461	Email Address: Supervisor@town.bolton.ny.us
Alternate/Secondary POC: Robert MacEwan	Position/Department: Deputy Supervisor
Phone Number: (518) 644-9105	Email Address: rmacewan@nycap.rr.com

4. Our designated local Floodplain Administrator (FPA) under the NFIP is:

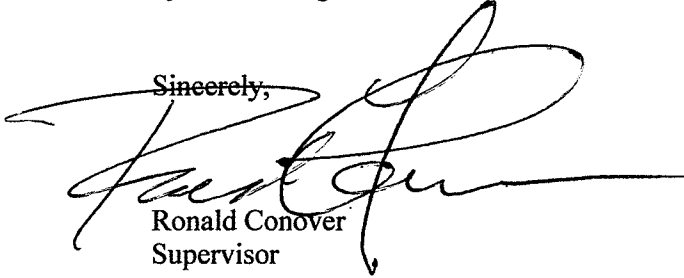
Name of NFIP FPA: Pamela Kenyon	Position/Department: Zoning Administrator
---------------------------------	---

Phone Number: (518) 644-2893

Email Address: planning@town.bolton.ny.us

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely,

A handwritten signature in black ink, appearing to read "Ronald Conover", written over the word "Sincerely,".

Ronald Conover
Supervisor

Town of Chester

P.O. Box 423
Chester town, New York 12817
(518)-494-2711
Fax (518) 494-4146
finonroes@nycap.ny.gov
www.townofchester.ny.gov
Equal Opportunity Employer
TDD Relay - Dial 711



Date: July 14, 2015

Amy J. Hirsch, AEM
Emergency Services Coordinator
Deputy Director
Warren County Office of Emergency Services
1340 State Route 9
Lake George, NY 12845

Subject: Warren County All Hazards Mitigation Plan
Authorization and Letter of Intent to Participate - Town of Chester

Dear Ms. Hirsch:

Per your letter, the Town of Chester is committed to participating in the Warren County All Hazards Mitigation Plan (HMP) project. By way of this letter, the Town of Chester:

1. Authorizes the Warren County Hazard Mitigation Steering Committee ("Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.
2. Agrees to meet the minimum requirements of municipal participation (a.k.a. the Planning Partner Expectations), specifically:
 - Execute and return this "Authorization and Acknowledgement" letter to the Warren County Office of Emergency Services, attention: Amy J. Hirsch.
 - Identify municipal representatives to serve as the planning point of contacts (POC), below. These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
 - Support the Steering Committee selected to oversee the development of this plan.
 - Provide representation at municipal Planning Committee meetings (~ 3 meetings over 6-8 months, including a Kick-Off Meeting and a Mitigation Strategy Workshop).
 - Provide data and information about your community as requested by the Steering Committee or the contract consultant, including:
 - Structure and facility inventory data
 - Identification of new development and anticipated development
 - Identification of natural hazard risk areas
 - Identification of natural hazard events and losses that have impacted your community in the last five years
 - Identification of plans, studies, reports and ordinances addressing natural hazard risk

- Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions.
- Support public outreach efforts in your community which may include:
 - Providing notices of the planning project on your municipal website with links to a County project website
 - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
 - Advertising and supporting public meetings in your area
 - Supporting outreach to National Flood Insurance Program (NFIP) Repetitive Loss and Severe Repetitive Loss property owners in your community.
- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
- Completing data and information collection survey forms in a timely manner.
- Identify specific mitigation actions to address each of the natural hazards posing significant [or high or medium] risk to your community.
- Involve your local NFIP Floodplain Administrator in the planning process.
- Review draft Plan sections when requested and provide comment and input as appropriate.
- Adopt the Plan by resolution of their governing body after FEMA conditional approval.
- Periodically provide the Steering Committee with reports of municipal staff and volunteer labor spent on the planning process.

3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at municipal Planning Committee meetings, and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC: Fred Monroe	Position/Department: Supervisor
Phone Number: 518-796-2415	Email Address: Fmonroe2@gmil.com
Alternate/Secondary POC: Jason Monroe	Position/Department: Highway Superintendent
Phone Number: 518-796-7698	Email Address: chesterhighway@yahoo.com

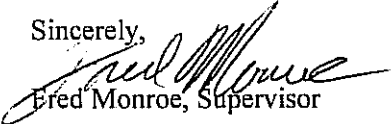
4. Our designated local Floodplain Administrator (FPA) under the NFIP is:

Name of NFIP FPA: Walt Tennyson	Position/Department: Zoning 7 Floodplain Administrator
------------------------------------	---

Phone Number: 518-494-7369	Email Address: Chester_zoning@yahoo.com
-------------------------------	--

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely,



Fred Monroe, Supervisor



MUNICIPALITY LETTERHEAD

May 28, 2015

Amy J. Hirsch, AEM
Emergency Services Coordinator
Deputy Director
Warren County Office of Emergency Services
1340 State Route 9
Lake George, NY 12845

Subject: Warren County All Hazards Mitigation Plan
Authorization and Letter of Intent to Participate – City of Glens Falls

Dear Ms. Hirsch:

Per your letter, dated May 26, 2015, the City of Glens Falls, is committed to participating in the Warren County All Hazards Mitigation Plan (HMP) project. By way of this letter, the City of Glens Falls:

1. Authorizes the Warren County Hazard Mitigation Steering Committee (“Steering Committee”), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.
2. Agrees to meet the minimum requirements of municipal participation (a.k.a. the Planning Partner Expectations), specifically:
 - Execute and return this “Authorization and Acknowledgement” letter to the Warren County Office of Emergency Services, attention: Amy J. Hirsch.
 - Identify municipal representatives to serve as the planning point of contacts (POC), below. These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
 - Support the Steering Committee selected to oversee the development of this plan.
 - Provide representation at municipal Planning Committee meetings (~ 3 meetings over 6-8 months, including a Kick-Off Meeting and a Mitigation Strategy Workshop).
 - Provide data and information about your community as requested by the Steering Committee or the contract consultant, including:
 - Structure and facility inventory data
 - Identification of new development and anticipated development
 - Identification of natural hazard risk areas
 - Identification of natural hazard events and losses that have impacted your community in the last five years
 - Identification of plans, studies, reports and ordinances addressing natural hazard risk
 - Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions.
 - Support public outreach efforts in your community which may include:
 - Providing notices of the planning project on your municipal website with links to a County project website

- Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
 - Advertising and supporting public meetings in your area
 - Supporting outreach to National Flood Insurance Program (NFIP) Repetitive Loss and Severe Repetitive Loss property owners in your community.
- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
 - Completing data and information collection survey forms in a timely manner.
 - Identify specific mitigation actions to address each of the natural hazards posing significant [or high or medium] risk to your community.
 - Involve your local NFIP Floodplain Administrator in the planning process.
 - Review draft Plan sections when requested and provide comment and input as appropriate.
 - Adopt the Plan by resolution of their governing body after FEMA conditional approval.
 - Periodically provide the Steering Committee with reports of municipal staff and volunteer labor spent on the planning process.

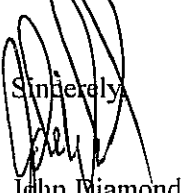
3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at municipal Planning Committee meetings, and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC: James Schrammel	Position/Department: Chief, Fire Department
Phone Number: (518) 761-3822	Email Address: firechief@cityofglensfalls.com
Alternate/Secondary POC: Steve Gurzler	Position/Department: City Engineer
Phone Number: (518) 761-3850	Email Address: engineer@cityofglensfalls.com

4. Our designated local Floodplain Administrator (FPA) under the NFIP is:

Name of NFIP FPA: Jim Buxton	Position/Department: Building & Codes
Phone Number (518) 761-3848	Email Address: building-codes@cityofglensfalls.com

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely,

 John Diamond
 Mayor

Town of Hague

Community Center • 9793 Graphite Mountain Road • P.O. Box 509 • Hague, NY 12836

Date: July 13, 2015

Amy J. Hirsch, AEM
Emergency Services Coordinator
Deputy Director
Warren County Office of Emergency Services
1340 State Route 9
Lake George, NY 12845

Subject: Warren County All Hazards Mitigation Plan
Authorization and Letter of Intent to Participate –Town of Hague

Dear Ms. Hirsch:

Per your letter, the Town of Hague is committed to participating in the Warren County All Hazards Mitigation Plan (HMP) project. By way of this letter, the Town of Hague:

1. Authorizes the Warren County Hazard Mitigation Steering Committee (“Steering Committee”), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.
2. Agrees to meet the minimum requirements of municipal participation (a.k.a. the Planning Partner Expectations), specifically:
 - Execute and return this “Authorization and Acknowledgement” letter to the Warren County Office of Emergency Services, attention: Amy J. Hirsch.
 - Identify municipal representatives to serve as the planning point of contacts (POC), below. These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
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 - Identification of natural hazard events and losses that have impacted your community in the last five years
 - Identification of plans, studies, reports and ordinances addressing natural hazard risk
 - Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions.
 - Support public outreach efforts in your community which may include:
 - Providing notices of the planning project on your municipal website with links to a County project website

Phone: (518) 543-6161 • Fax: (518) 543-6273

- Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
 - Advertising and supporting public meetings in your area
 - Supporting outreach to National Flood Insurance Program (NFIP) Repetitive Loss and Severe Repetitive Loss property owners in your community.
- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
 - Completing data and information collection survey forms in a timely manner.
 - Identify specific mitigation actions to address each of the natural hazards posing significant [or high or medium] risk to your community.
 - Involve your local NFIP Floodplain Administrator in the planning process.
 - Review draft Plan sections when requested and provide comment and input as appropriate.
 - Adopt the Plan by resolution of their governing body after FEMA conditional approval.
 - Periodically provide the Steering Committee with reports of municipal staff and volunteer labor spent on the planning process.

3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at municipal Planning Committee meetings, and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC: Cathy Clark	Position/Department: Zoning Enforcement Officer
Phone Number: 518-543-6161 x14	Email Address: zoning@townofhague.org
Alternate/Secondary POC: Edna Frasier	Position/Department: Supervisor
Phone Number: 518-543-6161 x12	Email Address: supervisor@townofhague.org

4. Our designated local Floodplain Administrator (FPA) under the NFIP is:

Name of NFIP FPA: Cathy Clark	Position/Department: ZEO/Planning & Zoning Dept.
Phone Number: 518-543-6161 x14	Email Address: zoning@townofhague.org

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely,



Edna A. Frasier
Supervisor

TAX COLLECTOR/TOWN CLERK
KRISTA WOOD
TOWN BOARD
KENNETH HIGGINS
FRANK HILL
ROBERT OLSON
SYLVIA SMITH

SUPERVISOR
MATTHEW SIMPSON
(518) 494-3647
FAX: (518) 494-7721

HIGHWAY SUPERINTENDENT
PAUL M. SMITH
CODING OFFICER
JAMES STEEN
ASSESSOR
CHRISTINE HAYES
TOWN COUNSEL
MARK SCHACHNER

HAMLET OF
ADIRONDACK



HAMLET OF
BRANT LAKE

P.O. Box 90
Brant Lake, N. Y. 12815-0090

Date: 07/30/2015

Amy J. Hirsch, AEM
Emergency Services Coordinator
Deputy Director
Warren County Office of Emergency Services
1340 State Route 9
Lake George, NY 12845

Subject: Warren County All Hazards Mitigation Plan
Authorization and Letter of Intent to Participate – Town of Horicon

Dear Ms. Hirsch:

Per your letter, dated 07/30/2015, the Town of Horicon is committed to participating in the Warren County All Hazards Mitigation Plan (HMP) project. By way of this letter, the Town of Horicon:

1. Authorizes the Warren County Hazard Mitigation Steering Committee (“Steering Committee”), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.
2. Agrees to meet the minimum requirements of municipal participation (a.k.a. the Planning Partner Expectations), specifically:
 - Execute and return this “Authorization and Acknowledgement” letter to the Warren County Office of Emergency Services, attention: Amy J. Hirsch.
 - Identify municipal representatives to serve as the planning point of contacts (POC), below. These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
 - Support the Steering Committee selected to oversee the development of this plan.
 - Provide representation at municipal Planning Committee meetings (~ 3 meetings over 6-8 months, including a Kick-Off Meeting and a Mitigation Strategy Workshop).

- Provide data and information about your community as requested by the Steering Committee or the contract consultant, including:
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 - Identification of natural hazard events and losses that have impacted your community in the last five years
 - Identification of plans, studies, reports and ordinances addressing natural hazard risk
 - Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions.

- Support public outreach efforts in your community which may include:
 - Providing notices of the planning project on your municipal website with links to a County project website
 - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
 - Advertising and supporting public meetings in your area
 - Supporting outreach to National Flood Insurance Program (NFIP) Repetitive Loss and Severe Repetitive Loss property owners in your community.

- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
- Completing data and information collection survey forms in a timely manner.
- Identify specific mitigation actions to address each of the natural hazards posing significant [or high or medium] risk to your community.
- Involve your local NFIP Floodplain Administrator in the planning process.
- Review draft Plan sections when requested and provide comment and input as appropriate.
- Adopt the Plan by resolution of their governing body after FEMA conditional approval.
- Periodically provide the Steering Committee with reports of municipal staff and volunteer labor spent on the planning process.

3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at municipal Planning Committee meetings, and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC: Matthew J. Simpson	Position/Department: Supervisor
Phone Number: 518-494-3647	Email Address: supervisor@horiconny.gov
Alternate/Secondary POC: Dawn Higgins	Position/Department: Secretary
Phone Number: 518-494-3647	Email Address: dhiggins@horiconny.gov

4. Our designated local Floodplain Administrator (FPA) under the NFIP is:

Name of NFIP FPA: James Steen	Position/Department: Zoning Administrator
Phone Number: 518-494-4245	Email Address: zoningplannig@horiconny.gov

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely,





TOWN OF JOHNSBURG

219 Main Street, North Creek, NY 12853
Phone: (518) 251-2421 ~Fax: (518) 251-9991

**Bakers Mills
Johnsburg
North Creek
North River
Riparius
Wevertown**

MUNICIPALITY LETTERHEAD

Date: 8/17/15

Amy J. Hirsch, AEM
Emergency Services Coordinator
Deputy Director
Warren County Office of Emergency Services
1340 State Route 9
Lake George, NY 12845

Town Supervisor
Ron Vanselow
(518) 251-2421x23

Town Council
Gene Arsenault
Arnold Stevens
Pete Olesheski
Katie Nightingale

Highway Superintendent
Daniel B. Hitchcock
(518) 251-2113

Town Clerk
Jo A. Smith
(518) 251-2421x28

Town Assessor
Christian Holt
(518) 251-2421x25

Zoning Enforcement
Danae Tucker
518-251-2421x27

Subject: Warren County All Hazards Mitigation Plan
Authorization and Letter of Intent to Participate – Town of Johnsburg

Dear Ms. Hirsch:

Per your letter, dated July 7 2015, the Town of Johnsburg is committed to participating in the Warren County All Hazards Mitigation Plan (HMP) project. By way of this letter, the Town of Johnsburg:

1. Authorizes the Warren County Hazard Mitigation Steering Committee (“Steering Committee”), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.
2. Agrees to meet the minimum requirements of municipal participation (a.k.a. the Planning Partner Expectations), specifically:
 - Execute and return this “Authorization and Acknowledgement” letter to the Warren County Office of Emergency Services, attention: Amy J. Hirsch.
 - Identify municipal representatives to serve as the planning point of contacts (POC), below. These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
 - Support the Steering Committee selected to oversee the development of this plan.
 - Provide representation at municipal Planning Committee meetings (~ 3 meetings over 6-8 months, including a Kick-Off Meeting and a Mitigation Strategy Workshop).
 - Provide data and information about your community as requested by the Steering Committee or the contract consultant, including:
 - Structure and facility inventory data
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 - Identification of natural hazard events and losses that have impacted your community in the last five years

- Identification of plans, studies, reports and ordinances addressing natural hazard risk
- Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions.
- Support public outreach efforts in your community which may include:
 - Providing notices of the planning project on your municipal website with links to a County project website
 - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
 - Advertising and supporting public meetings in your area
 - Supporting outreach to National Flood Insurance Program (NFIP) Repetitive Loss and Severe Repetitive Loss property owners in your community.
- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
- Completing data and information collection survey forms in a timely manner.
- Identify specific mitigation actions to address each of the natural hazards posing significant [or high or medium] risk to your community.
- Involve your local NFIP Floodplain Administrator in the planning process.
- Review draft Plan sections when requested and provide comment and input as appropriate.
- Adopt the Plan by resolution of their governing body after FEMA conditional approval.
- Periodically provide the Steering Committee with reports of municipal staff and volunteer labor spent on the planning process.

3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at municipal Planning Committee meetings, and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC: Ron Vanselow	Position/Department: supervisor
Phone Number: 251-2412	Email Address:supervisor@johnsburgny.com
Alternate/Secondary POC:Dan Hitchcock	Position/Department: highway superintendent
Phone Number: 251-2113	Email Address: johnsburghwy1@frontiernet.net

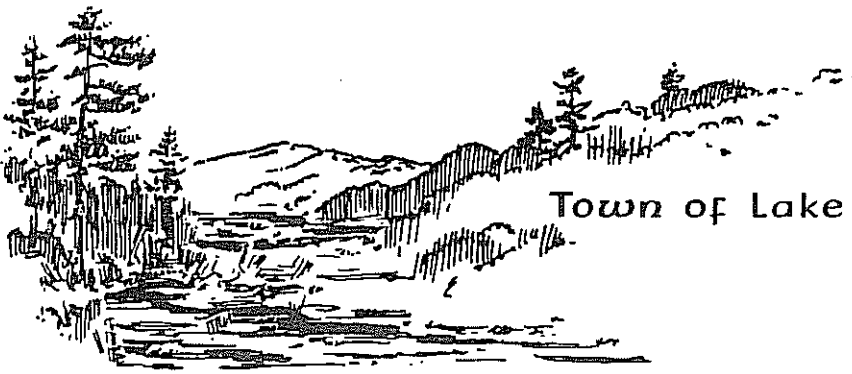
4. Our designated local Floodplain Administrator (FPA) under the NFIP is:

Name of NFIP FPA: Danae Tucker	Position/Department: ZEO
Phone Number: 251-2421	Email Address:

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely,

A handwritten signature in black ink, consisting of a large, stylized 'Z' followed by a cursive 'L' and a long, sweeping horizontal line that ends in a small upward hook.



Town of Lake Luzerne, New York, 12846

Date: July 8th 2015

Amy J. Hirsch, AEM
Emergency Services Coordinator
Deputy Director
Warren County Office of Emergency Services
1340 State Route 9
Lake George, NY 12845

Subject: Warren County All Hazards Mitigation Plan
Authorization and Letter of Intent to Participate – Town of Lake Luzerne

Dear Ms. Hirsch:

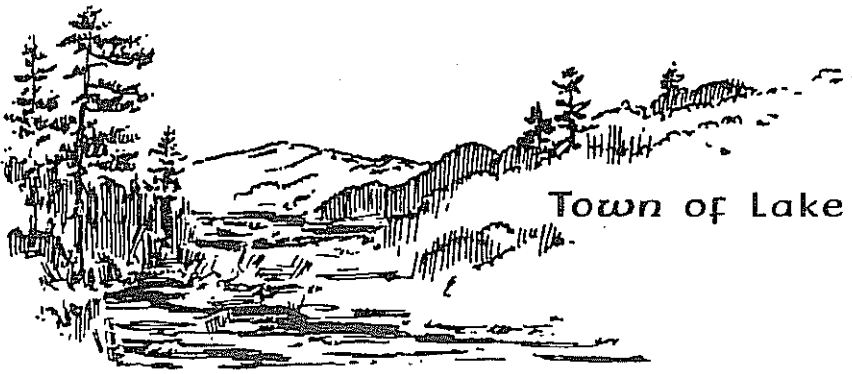
Per your letter, dated July 8th 2015 the Town of Lake Luzerne is committed to participating in the Warren County All Hazards Mitigation Plan (HMP) project. By way of this letter, the Town of Lake Luzerne:

1. Authorizes the Warren County Hazard Mitigation Steering Committee (“Steering Committee”), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.
2. Agrees to meet the minimum requirements of municipal participation (a.k.a. the Planning Partner Expectations), specifically:
 - Execute and return this “Authorization and Acknowledgement” letter to the Warren County Office of Emergency Services, attention: Amy J. Hirsch.
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 - Provide representation at municipal Planning Committee meetings (~ 3 meetings over 6-8 months, including a Kick-Off Meeting and a Mitigation Strategy Workshop).
 - Provide data and information about your community as requested by the Steering Committee or the contract consultant, including:
 - Structure and facility inventory data
 - Identification of new development and anticipated development
 - Identification of natural hazard risk areas



Town of Lake Luzerne, New York, 12846

- Identification of natural hazard events and losses that have impacted your community in the last five years
 - Identification of plans, studies, reports and ordinances addressing natural hazard risk
 - Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions.
- Support public outreach efforts in your community which may include:
 - Providing notices of the planning project on your municipal website with links to a County project website
 - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
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 - Review draft Plan sections when requested and provide comment and input as appropriate.
 - Adopt the Plan by resolution of their governing body after FEMA conditional approval.
 - Periodically provide the Steering Committee with reports of municipal staff and volunteer labor spent on the planning process.



Town of Lake Luzerne, New York, 12846

3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at municipal Planning Committee meetings, and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC: Allen Saheim	Position/Department: Zoning Officer & Floodplain Administrator
Phone Number: 696-2711 Ext: 4	Email Address: Lakeluzerne41@roadrunner.com
Alternate/Secondary POC:	Position/Department:
Phone Number:	Email Address:

4. Our designated local Floodplain Administrator (FPA) under the NFIP is:

Name of NFIP FPA: Allen Saheim	Position/Department: Zoning Officer & Floodplain Administrator
Phone Number: 696-2711 Ext: 4 Cell Number: 338-6121	Email Address: Lakeluzerne41@roadrunner.com

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely, Eugene Merlino
Supervisor, Town of Lake Luzerne



Dennis Dickinson, Supervisor
Vincent Crocitto, Councilperson
Marisa Muratori, Councilperson
Dan Hurley, Councilperson
Nancy Stannard, Councilperson

20 Old Post Road
Lake George, NY 12845
518.668.5722 Fax 668.6269
www.town.lakegeorge.ny.us

Deborah Foley, Town Clerk
Wendy Baird, Comptroller
Doug Frost, Enforcement Officer
Lori Barber, Assessor
Dan Davis, Highway Superintendent
Jim Martino, Buildings & Ground

July 15, 2015

Amy J. Hirsch, AEM
Emergency Services Coordinator
Deputy Director
Warren County Office of Emergency Services
1340 State Route 9
Lake George, NY 12845

Subject: Warren County All Hazards Mitigation Plan
Authorization and Letter of Intent to Participate - Town of Lake George

Dear Ms. Hirsch:

The Town of Lake George is committed to participating in the Warren County All Hazards Mitigation Plan (HMP) project. By way of this letter, the Town of Lake George:

1. Authorizes the Warren County Hazard Mitigation Steering Committee ("Steering Committee") to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.
2. Agrees to meet the minimum requirements of municipal participation (a.k.a. the Planning Partner Expectations), specifically:
 - Execute and return this "Authorization and Acknowledgment" letter to the Warren County Office of Emergency Services, **Attention: Amy J. Hirsch**.
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 - Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions.

- Providing notices of the planning project on your municipal website with links to a County project website;
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 - Advertising and supporting public meetings in your area;
 - Supporting outreach to National Flood Insurance Program (NFIP) Repetitive Loss and Severe Repetitive Loss property owners in your community.
- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
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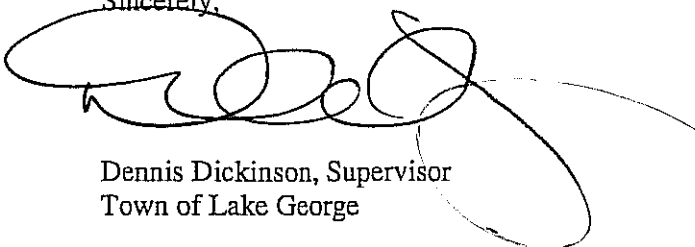
Primary POC: Dennis Dickinson	Position/Department: Supervisor, Town of Lake George
Phone Number: 518.668.5722 x 1	Email Address: supervisor@lakegeorgetown.org
Alternate/Secondary POC: Dan Davis	Position/Department: Highway Department Superintendent
Phone Number: 518.668.2742	Email Address: highway@lakegeorgetown.org

4. Our designated local Floodplain Administrator (FPA) under the NFIP is:

Name of NFIP FPA: Zoning Office	Position/Department: Director of Planning and Zoning (position open)
Phone Number: 518.668.5131 x5	Email Address: pzclerk@lakegeorgetown.org

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely,



Dennis Dickinson, Supervisor
Town of Lake George

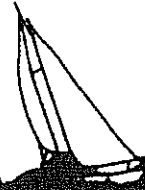


VILLAGE OF LAKE GEORGE, NEW YORK

P.O. BOX 791
12845

ROBERT M. BLAIS
Mayor

DARLENE V. GUNTHER
Clerk-Treasurer



TRUSTEES
John Earl
Ray Perry
John Root
Joseph Mastrodomenico, Jr.
ENFORCEMENT OFFICER
Douglas Frost
518-668-5771
Fax: 518-668-3735
E-mail: lgville@nycap.rr.com

Amy J. Hirsch, AEM
Emergency Services Coordinator
Deputy Director
Warren County Office of Emergency Services
1340 State Route 9
Lake George, NY 12845

Subject: Warren County All Hazards Mitigation Plan
Authorization and Letter of Intent to Participate – Village of Lake George

Dear Ms. Hirsch:

Per your letter, dated July 7, 2015, the Village of Lake George, is committed to participating in the Warren County All Hazards Mitigation Plan (HMP) project. By way of this letter, the Village of Lake George

1. Authorizes the Warren County Hazard Mitigation Steering Committee ("Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.

2. Agrees to meet the minimum requirements of municipal participation (a.k.a. the Planning Partner Expectations), specifically:

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3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at municipal Planning Committee meetings, and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

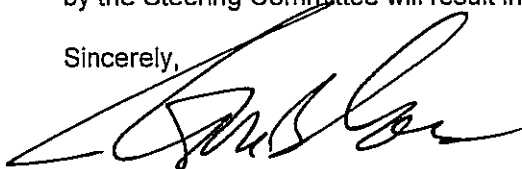
Primary POC: Robert M. Blais	Position/Department: Mayor
Phone Number: 518-668-5771 X 25	Email Address: lgvmayor@nycap.rr.com
Alternate/Secondary POC: David Harrington	Position/Department: Superintendent of Public Works
Phone Number: 518-796-5543	Email Address: lgwtp@hotmail.com

4. Our designated local Floodplain Administrator (FPA) under the NFIP is:

Name of NFIP FPA: Douglas Frost	Position/Department: Code Enforcement Officer
Phone Number: 518-668-5771 ext. 29	Email Address: lakeman_lg@yahoo.com

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely,



Robert M. Blais
Mayor

RMB/dvg



TOWN OF QUEENSBURY

"Home of Natural Beauty...A Good Place to Live" Settled 1763

July 9, 2015

Amy J. Hirsch, AEM
Emergency Services Coordinator
Deputy Director
Warren County Office of Emergency Services
1340 State Route 9
Lake George, NY 12845

Subject: Warren County All Hazards Mitigation Plan
Authorization and Letter of Intent to Participate – Town of Queensbury

Dear Ms. Hirsch:

The Town of Queensbury, is committed to participating in the Warren County All Hazards Mitigation Plan (HMP) project. By way of this letter, the Town of Queensbury:

1. Authorizes the Warren County Hazard Mitigation Steering Committee ("Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.

2. Agrees to meet the minimum requirements of municipal participation (a.k.a. the Planning Partner Expectations), specifically:

- Execute and return this "Authorization and Acknowledgement" letter to the Warren County Office of Emergency Services, attention: Amy J. Hirsch.
- Identify municipal representatives to serve as the planning point of contacts (POC), below. These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
- Support the Steering Committee selected to oversee the development of this plan.
- Provide representation at municipal Planning Committee meetings (~ 3 meetings over 6-8 months, including a Kick-Off Meeting and a Mitigation Strategy Workshop).
- Provide data and information about your community as requested by the Steering Committee or the contract consultant, including:
 - Structure and facility inventory data
 - Identification of new development and anticipated development
 - Identification of natural hazard risk areas



TOWN OF QUEENSBURY

"Home of Natural Beauty...A Good Place to Live" Settled 1763

- Identification of natural hazard events and losses that have impacted your community in the last five years
 - Identification of plans, studies, reports and ordinances addressing natural hazard risk
 - Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions.
-
- Support public outreach efforts in your community which may include:
 - Providing notices of the planning project on your municipal website with links to a County project website
 - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
 - Advertising and supporting public meetings in your area
 - Supporting outreach to National Flood Insurance Program (NFIP) Repetitive Loss and Severe Repetitive Loss property owners in your community.
-
- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
 - Completing data and information collection survey forms in a timely manner.
 - Identify specific mitigation actions to address each of the natural hazards posing significant [or high or medium] risk to your community.
 - Involve your local NFIP Floodplain Administrator in the planning process.
 - Review draft Plan sections when requested and provide comment and input as appropriate.
 - Adopt the Plan by resolution of their governing body after FEMA conditional approval.
 - Periodically provide the Steering Committee with reports of municipal staff and volunteer labor spent on the planning process.



TOWN OF QUEENSBURY

"Home of Natural Beauty...A Good Place to Live" Settled 1763

3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at municipal Planning Committee meetings, and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.


Primary POC: John Strough	Position/Department: Town Supervisor
Phone Number: 518-761-8229	Email Address: qbysupervisor@queensbury.net
Alternate/Secondary POC: Craig Brown	Position/Department: Planning/Community Development Director
Phone Number: 518-761-8220	Email Address: CraigB@queensbury.net

4. Our designated local Floodplain Administrator (FPA) under the NFIP is:

Name of NFIP FPA: Dave Hatin	Position/Department: Building and Codes Director
Phone Number: 518-761-8256	Email Address: DaveH@queensbury.net

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely,


John Strough
Town Supervisor



Town Clerk/Tax Collector

Susan Harrington

TOWN OF STONY CREEK
52 Hadley Road
P.O. Box 96
Stony Creek, NY 12878
518-696-3575 Fax 518-696-3948

Supervisor
Frank E. Thomas

Town Council
Nate Thomas
Doreen Ryan
John D. Thomas
Carl Thomas

July 9, 2015

Amy J. Hirsch, AEM
Emergency Services Coordinator
Deputy Director
Warren County Office of Emergency Services
1340 State Route 9
Lake George, NY 12845

Subject: Warren County All Hazards Mitigation Plan
Authorization and Letter of Intent to Participate – Town of Stony Creek

Dear Ms. Hirsch:

Per your letter, the Town of Stony Creek is committed to participating in the Warren County All Hazards Mitigation Plan (HMP) project. By way of this letter, the Town of Stony Creek:

1. Authorizes the Warren County Hazard Mitigation Steering Committee (“Steering Committee”), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.
2. Agrees to meet the minimum requirements of municipal participation (a.k.a. the Planning Partner Expectations), specifically:
 - Execute and return this “Authorization and Acknowledgement” letter to the Warren County Office of Emergency Services, attention: Amy J. Hirsch.
 - Identify municipal representatives to serve as the planning point of contacts (POC), below. These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
 - Support the Steering Committee selected to oversee the development of this plan.
 - Provide representation at municipal Planning Committee meetings (~ 3 meetings over 6-8 months, including a Kick-Off Meeting and a Mitigation Strategy Workshop).
 - Provide data and information about your community as requested by the Steering Committee or the contract consultant, including:
 - Structure and facility inventory data
 - Identification of new development and anticipated development
 - Identification of natural hazard risk areas
 - Identification of natural hazard events and losses that have impacted your community in the last five years
 - Identification of plans, studies, reports and ordinances addressing natural hazard risk
 - Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions.
 - Support public outreach efforts in your community which may include:

- Providing notices of the planning project on your municipal website with links to a County project website
 - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
 - Advertising and supporting public meetings in your area
 - Supporting outreach to National Flood Insurance Program (NFIP) Repetitive Loss and Severe Repetitive Loss property owners in your community.
- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
 - Completing data and information collection survey forms in a timely manner.
 - Identify specific mitigation actions to address each of the natural hazards posing significant [or high or medium] risk to your community.
 - Involve your local NFIP Floodplain Administrator in the planning process.
 - Review draft Plan sections when requested and provide comment and input as appropriate.
 - Adopt the Plan by resolution of their governing body after FEMA conditional approval.
 - Periodically provide the Steering Committee with reports of municipal staff and volunteer labor spent on the planning process.

3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at municipal Planning Committee meetings, and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.


Primary POC: Frank E. Thomas	Position/Department: Supervisor
Phone Number: 518-696-3575 x302	Email Address: tscsupvr@frontier.com
Alternate/Secondary POC: Neil Bradley	Position/Department: Highway Superintendent
Phone Number: 518-955-0714	Email Address: Neilbradley70@yahoo.com

4. Our designated local Floodplain Administrator (FPA) under the NFIP is:

Name of NFIP FPA: Frank E. Thomas	Position/Department: Supervisor
Phone Number: 518-696-3575 x302	Email Address: tscsupvr@frontier.com

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely,



Frank E. Thomas
Supervisor

Town of Thurman

P.O. Box 29
311 Athol Road
Athol, New York 12810

Phone 518-623-9641

Fax 518-623-4291

ThurmanSupervisor@Verizon.net



Evelyn M. Wood
Town Supervisor

Date: 7/15/15

Amy J. Hirsch, AEM
Emergency Services Coordinator
Deputy Director
Warren County Office of Emergency Services
1340 State Route 9
Lake George, NY 12845

Subject: Warren County All Hazards Mitigation Plan
Authorization and Letter of Intent to Participate – Town of Thurman

Dear Ms. Hirsch:

Per your letter, dated July 1, 2015 the town of Thurman, is committed to participating in the Warren County All Hazards Mitigation Plan (HMP) project. By way of this letter, the town of Thurman

1. Authorizes the Warren County Hazard Mitigation Steering Committee (“Steering Committee”), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.

2. Agrees to meet the minimum requirements of municipal participation (a.k.a. the Planning Partner Expectations), specifically:

- Execute and return this “Authorization and Acknowledgement” letter to the Warren County Office of Emergency Services, attention: Amy J. Hirsch.
- Identify municipal representatives to serve as the planning point of contacts (POC), below. These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
- Support the Steering Committee selected to oversee the development of this plan.
- Provide representation at municipal Planning Committee meetings (~ 3 meetings over 6-8 months, including a Kick-Off Meeting and a Mitigation Strategy Workshop).

- Provide data and information about your community as requested by the Steering Committee or the contract consultant, including:
 - Structure and facility inventory data
 - Identification of new development and anticipated development
 - Identification of natural hazard risk areas
 - Identification of natural hazard events and losses that have impacted your community in the last five years
 - Identification of plans, studies, reports and ordinances addressing natural hazard risk
 - Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions.

- Support public outreach efforts in your community which may include:
 - Providing notices of the planning project on your municipal website with links to a County project website
 - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
 - Advertising and supporting public meetings in your area
 - Supporting outreach to National Flood Insurance Program (NFIP) Repetitive Loss and Severe Repetitive Loss property owners in your community.

- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
- Completing data and information collection survey forms in a timely manner.
- Identify specific mitigation actions to address each of the natural hazards posing significant [or high or medium] risk to your community.
- Involve your local NFIP Floodplain Administrator in the planning process.
- Review draft Plan sections when requested and provide comment and input as appropriate.
- Adopt the Plan by resolution of their governing body after FEMA conditional approval.
- Periodically provide the Steering Committee with reports of municipal staff and volunteer labor spent on the planning process.

3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at municipal Planning Committee meetings, and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.


Primary POC: <i>Evelyn Wood</i>	Position/Department: <i>Town Supervisor</i>
Phone Number: <i>623-9649</i>	Email Address: <i>thurmensupervisor@verizon.net</i>
Alternate/Secondary POC: <i>Pat Wood</i>	Position/Department: <i>Highway Superintendent</i>
Phone Number: <i>623-9614</i>	Email Address: <i>highwaydept@yahoo.com</i>

4. Our designated local Floodplain Administrator (FPA) under the NFIP is:

Name of NFIP FPA: <i>Town Board</i>	Position/Department: <i>Town Board</i>
Phone Number: <i>623-9649</i>	Email Address: <i>thorman.supervisor@verizon.net</i>

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely,



TOWN OF WARRENSBURG
“*Queen Village of the Adirondacks*”

3797 MAIN STREET

WARRENSBURG, NEW YORK 12885-1628

TEL (518) 623-9511

FAX (518) 623-3831

TOWN CLERK:
DONNA A. COMBS,
RMC/CMC

TOWN COUNCIL:
JOHN ALEXANDER
LINDA MARCELLA
JOYCE REED
BRYAN ROUNDS

KEVIN B. GERAGHTY, SUPERVISOR

JOHN S. ALEXANDER, DEPUTY SUPERVISOR

WWW.WARRENSBURGNY.US

Date: July 7, 2015

Amy J. Hirsch, AEM
Emergency Services Coordinator
Deputy Director
Warren County Office of Emergency Services
1340 State Route 9
Lake George, NY 12845

Subject: Warren County All Hazards Mitigation Plan
Authorization and Letter of Intent to Participate – Town of Warrensburg

Dear Ms. Hirsch:

Per your letter, dated July 7, 2015, the Town of Warrensburg is committed to participating in the Warren County All Hazards Mitigation Plan (HMP) project. By way of this letter, the Town of Warrensburg:

1. Authorizes the Warren County Hazard Mitigation Steering Committee (“Steering Committee”), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.
2. Agrees to meet the minimum requirements of municipal participation (a.k.a. the Planning Partner Expectations), specifically:
 - Execute and return this “Authorization and Acknowledgement” letter to the Warren County Office of Emergency Services, attention: Amy J. Hirsch.
 - Identify municipal representatives to serve as the planning point of contacts (POC), below. These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
 - Support the Steering Committee selected to oversee the development of this plan.
 - Provide representation at municipal Planning Committee meetings (~ 3 meetings over 6-8 months, including a Kick-Off Meeting and a Mitigation Strategy Workshop).
 - Provide data and information about your community as requested by the Steering Committee or the contract consultant, including:
 - Structure and facility inventory data
 - Identification of new development and anticipated development
 - Identification of natural hazard risk areas
 - Identification of natural hazard events and losses that have impacted your community in the last five years
 - Identification of plans, studies, reports and ordinances addressing natural hazard risk
 - Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions.

TOWN OF WARRENSBURG
“Queen Village of the Adirondacks”

3797 MAIN STREET
 WARRENSBURG, NEW YORK 12885-1628
 TEL (518) 623-9511
 FAX (518) 623-3831

TOWN CLERK:
DONNA A. COMBS,
 RMC/CMC

TOWN COUNCIL:
JOHN ALEXANDER
LINDA MARCELLA
JOYCE REED
BRYAN ROUNDS

KEVIN B. GERAGHTY, SUPERVISOR
 JOHN S. ALEXANDER, DEPUTY SUPERVISOR
WWW.WARRENSBURGNY.US

- Support public outreach efforts in your community which may include:
 - Providing notices of the planning project on your municipal website with links to a County project website
 - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
 - Advertising and supporting public meetings in your area
 - Supporting outreach to National Flood Insurance Program (NFIP) Repetitive Loss and Severe Repetitive Loss property owners in your community.
- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
- Completing data and information collection survey forms in a timely manner.
- Identify specific mitigation actions to address each of the natural hazards posing significant [or high or medium] risk to your community.
- Involve your local NFIP Floodplain Administrator in the planning process.
- Review draft Plan sections when requested and provide comment and input as appropriate.
- Adopt the Plan by resolution of their governing body after FEMA conditional approval.
- Periodically provide the Steering Committee with reports of municipal staff and volunteer labor spent on the planning process.

3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at municipal Planning Committee meetings, and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC: Edward Pennock	Position/Department: Highway Supt.
Phone Number: 518-232-2329	Email Address: Edward.Pennock@townofwarrensburg.net
Alternate/Secondary POC: Chris Belden	Position/Department: Code Enforcement
Phone Number: 518-623-9214	Email Address: Chris.Belden@townofwarrensburg.net

4. Our designated local Floodplain Administrator (FPA) under the NFIP is:

Name of NFIP FPA: Chris Belden	Position/Department: Code Enforcement
Phone Number:	Email Address:

TOWN OF WARRENSBURG
"Queen Village of the Adirondacks"

3797 MAIN STREET

WARRENSBURG, NEW YORK 12885-1628

TEL (518) 623-9511

FAX (518) 623-3831

TOWN COUNCIL:

JOHN ALEXANDER

LINDA MARCELLA

JOYCE REED

BRYAN ROUNDS

TOWN CLERK:
DONNA A. COMBS,
RMC/CMC

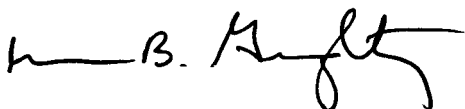
KEVIN B. GERAGHTY, SUPERVISOR

JOHN S. ALEXANDER, DEPUTY SUPERVISOR

WWW.WARRENSBURGNY.US

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely,



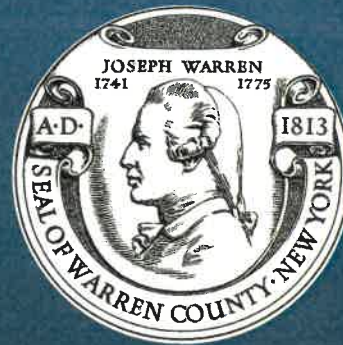
Supervisor
Town of Warrensburg



WARREN COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN UPDATE

DECEMBER 2016

VOLUME I
AND
VOLUME II



Prepared by:



6 Century Drive, 3rd Floor | Parsippany, New Jersey



GLOSSARY

This resource defines terms that are used in or support the risk assessment document. These definitions were based on terms defined in documents included in the reference section, with modifications as appropriate to address the Warren County specific definitions and requirements.

1% flood (100-year flood) – A flood that has a 1-percent chance of being equaled or exceeded in any given year. This flood event is also referred to as the base flood. The term "100-year flood" can be misleading; it is not the flood that will occur once every 100 years. Rather, it is the flood elevation that has a 1- percent chance of being equaled or exceeded each year. Therefore, the 100-year flood could occur more than once in a relatively short period of time. The 100-year flood, which is the standard used by most federal and state agencies, is used by the National Flood Insurance Program (NFIP) as the standard for floodplain management to determine the need for flood insurance.

0.2 % flood (500-year flood) – A flood that has a 0.2-percent chance of being equaled or exceeded in any one year.

Aggregate Data – Data gathered together across an area or region (for example, census tract or census block data).

Annualized Loss – The estimated long-term value of losses from potential future hazard occurrences of a particular type in any given single year in a specified geographic area. In other words, the average annual loss that is likely to be incurred each year based on frequency of occurrence and loss estimates. Note that the loss in any given year can be substantially higher or lower than the estimated annualized loss.

Annualized Loss Ratio – Represents the annualized loss estimate as a fraction of the replacement value of the local building inventory. This ratio is calculated using the following formula: Annualized Loss Ratio = Annualized Losses / Exposure at Risk. The annualized loss ratio gauges the relationship between average annualized loss and building value at risk. This ratio can be used as a measure of relative risk between hazards as well as across different geographic units

Asset – Any man-made or natural feature that has value, including but not limited to people, buildings, infrastructure (such as bridges, roads, and sewer and water systems), and lifelines (such as electricity and communication resources or environmental, cultural, or recreational features like parks, dunes, wetlands, or landmarks).

At-Risk – Exposure values that include the entire building inventory value in census blocks that lie within or border the inundation areas or any area potentially exposed to a hazard based on location.

Base Flood – Flood that has a 1-percent probability of being equaled or exceeded in any given year. It is also known as the 100-year flood.

Base Flood Elevation (BFE) – Elevation of the base flood in relation to a specified datum, such as the National Geodetic Vertical Datum of 1929. The BFE is used as the standard for the National Flood Insurance Program.

Benefit – Net project outcomes, usually defined in monetary terms. Benefits may include direct and indirect effects. For the purposes of conducting a benefit-cost analysis of proposed mitigation measures, benefits are limited to specific, measurable, risk reduction factors, including a reduction in expected property losses (building, content, and function) and protection of human life.



Benefit-cost analysis (BCA) – Benefit-cost analysis is a systematic, quantitative method of comparing the projected benefits to projected costs of a project or policy. It is used as a measure of cost effectiveness.

Blizzard – Characterized by low temperatures, wind gusts of 35 mph or more and falling and/or blowing snow that reduces visibility to 0.25 miles or less for an extended period of time (three or more hours).

Building – A structure that is walled and roofed, principally aboveground and permanently fixed to a site. The term includes a manufactured home on a permanent foundation on which the wheels and axles carry no weight.

Building Codes – Regulations that set forth standards and requirements for construction, maintenance, operation, occupancy, use, or appearance of buildings, premises, and dwelling units. Building codes can include standards for structures to withstand natural disasters.

Capability Assessment – An assessment that provides a description and analysis of a community or state’s current capacity to address the threats associated with hazards. The capability assessment attempts to identify and evaluate existing policies, regulations, programs, and practices that positively or negatively affect the community or state’s vulnerability to hazards or specific threats.

Climate – The meteorological elements, including temperature, precipitation, and wind that characterizes the general conditions of the atmosphere over a period of time (typically 30-years) for a particular region.

Community Rating System (CRS) – CRS is a program that provides incentives for National Flood Insurance Program communities to complete activities that reduce flood hazard risk. When the community completes specific activities, the insurance premiums of these policyholders in communities are reduced.

Comprehensive Plan – A document, also known as a “general plan”, covering the entire geographic area of a community and expressing community goals and objectives. The plan lays out the vision, policies, and strategies for the future of the community, including all of the physical elements that will determine the community’s future development. This plan can discuss the community’s desired physical development, desired rate and quantity of growth, community character, transportation services, location of growth, and siting of public facilities and transportation. In most states, the comprehensive plan has no authority in and of itself, but serves as a guide for community decision-making.

Critical Facility – Facilities that are critical to the health and welfare of the population and that are especially important following a hazard. Critical facilities include essential facilities, transportation systems, lifeline utility systems, high-potential loss facilities, and hazardous material facilities. As defined for the Warren County risk assessment, this category includes police stations, fire and/or EMS stations, major medical care facilities and emergency communications.

Debris – The scattered remains of assets broken or destroyed during the occurrence of a hazard. Debris caused by a wind or water hazard event can cause additional damage to other assets.

Digital Elevation Model (DEM) – U.S. Geological Survey (USGS) Digital Elevation Model (DEM) data files that are digital representations of cartographic information in a raster form. DEMs include a sampled array of elevations for a number of ground positions at regularly spaced intervals. These digital cartographic/geographic data files are produced by USGS as part of the National Mapping Program.

Digital Flood Insurance Rate Maps (DFIRMs) – These maps are used to calculate the cost insurance premiums, establish flood risk zones and base flood elevations to mitigate against potential future flood damages to properties.



Displacement Time – After a hazard occurs, the average time (in days) that a building’s occupants must operate from a temporary location while repairs are made to the original building due to damages resulting from the hazard.

Disaster Mitigation Act of 2000 (DMA 2000) – Law that requires and rewards local and state pre-disaster planning, promotes sustainability as a strategy for disaster resistance, and is intended to integrate state and local planning with the aim of strengthening state-wide mitigation planning.

Duration – The length of time a hazard occurs.

Earthquake – A sudden motion or trembling that is caused by a release of strain accumulated within or along the edge of earth’s tectonic plates.

Essential Facility – A facility that is important to ensure a full recovery of a community or state following the occurrence of a hazard. These facilities can include: government facilities, major employers, banks, schools, and certain commercial establishments (such as grocery stores, hardware stores, and gas stations). For the Warren County risk assessment, this category was defined to include schools, colleges, shelters, adult living and adult care facilities, medical facilities and health clinics, hospitals.

Exposure – The number and dollar value of assets that are considered to be at risk during the occurrence of a specific hazard.

Extent – The size of an area affected by a hazard or the occurrence of a hazard.

Extra Tropical Cyclone – A group of cyclones defined as synoptic scale, low pressure, weather systems that occur in the middle latitudes of the Earth. These storms have neither tropical nor polar characteristics and are connected with fronts and horizontal gradients in temperature and dew point otherwise known as “baroclinic zones”. These cyclones produce impacts ranging from cloudiness and mild showers to heavy gales and thunderstorms.

Federal Emergency Management Agency (FEMA) – Independent agency (now part of the Department of Homeland Security) created in 1978 to provide a single point of accountability for all federal activities related to disaster mitigation and emergency preparedness, response, and recovery.

Flash Flood – A flood occurring with little or no warning where water levels rise at an extremely fast rate.

Flood – A general and temporary condition of partial or complete inundation of normally dry land areas resulting from (1) the overflow of inland or tidal waters, (2) the unusual and rapid accumulation or runoff of surface waters from any source, or (3) mudflows or the sudden collapse of shoreline land.

Flood Depth – Height of the flood water surface above the ground surface.

Flood Elevation – Height of the water surface above an established datum (for example, the National Geodetic Vertical Datum of 1929, North American Vertical Datum of 1988, or mean sea level).

Flood Hazard Area – Area shown to be inundated by a flood of a given magnitude on a map.

Flood Insurance Rate Map (FIRM) – Map of a community, prepared by the FEMA that shows both the special flood hazard areas and the risk premium zones applicable to the community.

Flood Insurance Study (FIS) – A study that provides an examination, evaluation, and determination of flood hazards and, if appropriate, corresponding water surface elevations in a community or communities.



Flood Mitigation Assistance (FMA) Program – A program created as a part of the National Flood Insurance Report Act of 1994. FMA provides funding to assist communities and states in implementing actions that reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other NFIP insurance structures, with a focus on repetitive loss properties.

Floodplain – Any land area, including a watercourse, susceptible to partial or complete inundation by water from any source.

Flood Polygon – A geographic information system vector file outlining the area exposed to the flood hazard. HAZUS-MH generates this polygon at the end of the flood computations in order to analyze the inventory at risk.

Freezing Rain – Rain that falls as a liquid but freezes into glaze upon contact with the ground.

Frequency – A measure of how often events of a particular magnitude are expected to occur. Frequency describes how often a hazard of a specific magnitude, duration, and/or extent typically occurs, on average. Statistically, a hazard with a 100-year recurrence interval is expected to occur once every 100 years on average, and would have a 1-percent chance of happening in any given year. The reliability of this information varies depending on the kind of hazard being considered.

Fujita Scale of Tornado Intensity – Rates tornadoes with numeric values from F0 to F5 based on tornado wind speed and damage sustained. An F0 (wind speed less than 73 mph) indicates minimal damage such as broken tree limbs or signs, while an F5 (wind speeds of 261 to 318 mpg) indicated severe damage sustained.

Geology – The scientific study of the earth, including its composition, structure, physical properties, and history.

Goals – General guidelines that explain what you want to achieve. They are usually broad policy-type statements, long term in nature, and represent global visions.

Geographic Information Systems (GIS) – A computer software application that relates data regarding physical and other features on the earth to a database to be used for mapping and analysis.

GIS Shape Files – A type of GIS vector file developed by ESRI for their ArcView software. This type of file contains a table and a graphic. The records in the table are linked to corresponding objects in the graphic.

Hailstorm – Storm associated with spherical balls of ice. Hail is a product of thunderstorms or intense showers. It is generally white and translucent, consisting of liquid or snow particles encased with layers of ice. Hail is formed within the higher reaches of a well-developed thunderstorm. When hailstones become too heavy to be caught in an updraft back into the clouds of the thunderstorm (hailstones can be caught in numerous updrafts adding a coating of ice to the original frozen droplet of rain each time), they fall as hail and a hailstorm ensues.

Hazard – A source of potential danger or an adverse condition that can cause harm to people or cause property damage. For this risk assessment, priority hazards were identified and selected for the pilot project effort. A natural hazard is a hazard that occurs naturally (such as flood, wind, and earthquake). A man-made hazard is one that is caused by humans (for example, a terrorist act or a hazardous material spill). Hazards are of concern if they have the potential to harm people or property.

Hazards of Interest – A comprehensive listing of hazards that may affect an area.



Hazards of Concern – Those hazards that have been analytically determined to pose significant risk in an area, and thus the focus of the particular mitigation plan for that area (a subset of the Hazards of Interest).

Hazard Identification – The process of identifying hazards that threaten an area.

Hazardous Material Facilities – Facilities housing industrial and hazardous materials, such as corrosives, explosives, flammable materials, radioactive materials, and toxins.

Hazard Mitigation – Sustained actions taken to reduce or eliminate the long-term risk and effects that can result from the occurrence of a specific hazard. For example, building a retaining wall can protect an area from flooding.

Hazard Mitigation Grant Program (HMGP) – Authorized under Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, HMGP is administered by FEMA and provides grants to states, tribes, and local governments to implement hazard mitigation actions after a major disaster declaration. The purpose of the program is to reduce the loss of life and property due to disasters and to enable mitigation activities to be implemented as a community recovers from a disaster.

Hazard Mitigation Plan – A collaborative document in which hazards affecting the community are identified, vulnerability to hazards assessed, and consensus reached on how to minimize or eliminate the effects of these hazards.

Hazard Profile – A description of the physical characteristics of a hazard, including a determination of various descriptors including magnitude, duration, frequency, probability, and extent. In most cases, a community can most easily use these descriptors when they are recorded and displayed as maps.

Hazards U.S. (HAZUS) – A GIS-based nationally standardized earthquake loss estimation tool developed by FEMA. HAZUS was replaced by HAZUS-MH (see below) in 2003.

Hazards U.S. – Multi-Hazard (HAZUS-MH) – A GIS-based nationally standardized earthquake, flood, and wind loss estimation tool developed by FEMA. The purpose of this pilot project is to demonstrate and implement the use of HAZUS-MH to support risk assessments

HAZUS-MH Risk Assessment Methodology – This analysis uses the HAZUS-MH modules (earthquake, wind--hurricane and flood) to analyze potential damages and losses. For this pilot project risk assessment, the flood and hurricane hazards were evaluated using this methodology.

HAZUS-MH-Driven Risk Assessment Methodology – This analysis involves using inventory data in HAZUS-MH combined with knowledge such as (1) information about potentially exposed areas, (2) expected impacts, and (3) data regarding likelihood of occurrence for hazards. For this risk assessment, a HAZUS-Driven Risk Assessment Methodology could not be used to estimate losses associated with any hazards because of a lack of adequate data. However, the methodology was used, based on more limited data to estimate exposure for the dam failure, urban fire, fuel pipeline breach, and HazMat release hazards.

Heavy Snow – Snowfall accumulating to 4” or more in depth in 12 hours or less; or snowfall accumulating to 6” or more in depth in 24 hours or less.

High Potential Loss Facilities – Facilities that would have a high loss associated with them, such as nuclear power plants, dams, and military installations.

Hurricane – An intense tropical cyclone, formed in the atmosphere over warm ocean areas, in which wind speeds reach 74 miles-per-hour or more and blow in a large spiral around a relatively calm center or "eye."



Hurricanes develop over the North Atlantic Ocean, northeast Pacific Ocean, or the South Pacific Ocean (east of 160°E longitude). Hurricane circulation is counter-clockwise in the Northern Hemisphere and clockwise in the Southern Hemisphere.

Hydraulics – That branch of science, or of engineering, which addresses fluids (especially, water) in motion, its action in rivers and canals, the works and machinery for conducting or raising it, its use as a prime mover, and other fluid-related areas.

Hydrology – The science of dealing with the waters of the earth (for example, a flood discharge estimate is developed through conduct of a hydrologic study).

Infrastructure – The public services of a community that have a direct impact on the quality of life. Infrastructure includes communication technology such as phone lines or Internet access, vital services such as public water supplies and sewer treatment facilities, transportation system (such as airports, heliports; highways, bridges, tunnels, roadbeds, overpasses, railways, bridges, rail yards, depots; and waterways, canals, locks, seaports, ferries, harbors, dry docks, piers and regional dams).

Ice Jam – An accumulation of ice in a river that acts as a natural dam and can flood low-lying areas upstream. They occur when warm temperatures and heavy rains cause rapid snow melt.

Ice Storm – Term used to describe occasions when damaging accumulations of ice are expected during freezing rain situations. Significant accumulations of ice pull down trees and utility lines resulting in loss of power and communication.

Intensity – A measure of the effects of a hazard occurring at a particular place.

Inventory – The assets identified in a study region. It includes assets that can be lost when a disaster occurs and community resources are at risk. Assets include people, buildings, transportation, and other valued community resources.

Level 1 Analysis – A HAZUS-MH analysis that yields a rough estimate or preliminary analysis based on the nationwide default database included in HAZUS-MH. A Level 1 analysis is a great way to begin the risk assessment process and prioritize high-risk communities without collecting or using local data.

Level 2 Analysis – A HAZUS-MH analysis that requires the input of additional or refined data and hazard maps that will produce more accurate risk and loss estimates. Assistance from local emergency management personnel, city planners, GIS professionals, and others may be necessary for this level of analysis.

Level 3 Analysis – A HAZUS-MH analysis that yields the most accurate estimate of loss and typically requires the involvement of technical experts such as structural and geotechnical engineers who can modify loss parameters based on the specific conditions of a community. This level analysis will allow users to supply their own techniques to study special conditions such as dam breaks and tsunamis. Engineering and other expertise is needed at this level.

Lifelines – Critical facilities that include utility systems (potable water, wastewater, oil, natural gas, electric power facilities and communication systems) and transportation systems (airways, bridges, roads, tunnels and waterways).

Lightning – A visible electrical discharge produced by a thunderstorm. The discharge may occur within or between clouds or between a rain cloud and the ground.



Loss Estimation – The process of assigning hazard-related damage and loss estimates to inventory, infrastructure, lifelines, and population data. HAZUS-MH can estimate the economic and social loss for specific hazard occurrences. Loss estimation is essential to decision making at all levels of government and provides a basis for developing mitigation plans and policies. It also supports planning for emergency preparedness, response, and recovery.

Lowest Floor – Under the NFIP, the lowest floor of the lowest enclosed area (including basement) of a structure. For the HAZUS-MH flood model, this information can be used to assist in assessing the damage to buildings.

Magnitude – A measure of the strength of a hazard occurrence. The magnitude (also referred to as severity) of a given hazard occurrence is usually determined using technical measures specific to the hazard. For example, ranges of wind speeds are used to categorize tornados.

Major Disaster Declarations – Post-disaster status requested by a state’s governor when local and state resources are not sufficient to meet disaster needs. It is based on the damage assessment, and an agreement to commit state funds and resources to the long-term recovery. The event must be clearly more than the state or local government can handle alone.

Mean Return Period (MRP) – The average period of time, in years, between occurrences of a particular hazard (equal to the inverse of the annual frequency of exceedance).

Mitigation Actions – Specific actions that help you achieve your goals and objectives.

Mitigation Goals – General guidelines that explain what you want to achieve. They are usually broad policy-type statements, long term, and represent global visions.

Mitigation Objectives – Strategies or implementation steps to attain the identified goals. Unlike goals, objectives are specific and measurable.

Mitigation Plan – A plan that documents the process used for a systematic evaluation of the nature and extent of vulnerability to the effects of natural hazards typically present in a state or community. The plan includes a description of actions to minimize future vulnerability to hazards. This plan should be developed with local experts and significant community involvement.

National Flood Insurance Program (NFIP) – Federal program created by Congress in 1968 that makes flood insurance available in communities that enact minimum floodplain management regulations in 44 Code of Federal Regulations (CFR) §60.3.

Nor’Easter – Named for the strong northeasterly winds blowing in ahead of the storm, are also referred to as a type of extra-tropical cyclones (mid-latitude storms, or Great Lake storms). A Nor’Easter is a macro-scale extra-tropical storm whose winds come from the northeast, especially in the coastal areas of the Northeastern U.S. and Atlantic Canada.

Objectives – Objectives define strategies or implementation steps to attain the identified goals. Unlike goals, objectives are specific and measurable.

Occupancy Classes – Categories of buildings used by HAZUS-MH (for example, commercial, residential, industrial, government, and “other”).

Ordinance – A term for a law or regulation adopted by local government.



Outflow – Associated with coastal hazards and follows water inundation creating strong currents that rip at structures and pound them with debris, and erode beaches and coastal structures.

Parametric Model – A model relating to or including the evaluation of parameters. For example, HAZUS-MH uses parametric models that address different parameters for hazards such as earthquake, flood and wind (hurricane). For example, parameters considered for the earthquake hazard include soil type, peak ground acceleration, building construction type and other parameters.

Planning – The act or process of making or carrying out plans; the establishment of goals, policies and procedures for a social or economic unit.

Post-disaster mitigation – Mitigation actions taken after a disaster has occurred, usually during recovery and reconstruction.

Presidential Disaster Declaration – A post-disaster status that puts into motion long-term federal recovery programs, some of which are matched by state programs, and designed to help disaster victims, businesses, and public entities in the areas of human services, public assistance (infrastructure support), and hazard mitigation. If declared, funding comes from the President's Disaster Relief Fund and disaster aid programs of other participating federal agencies.

Preparedness – Actions that strengthen the capability of government, citizens, and communities to respond to disasters.

Priority Hazards – Hazards considered most likely to impact a community based on frequency, severity, or other factors such as public perception. These are identified using available data and local knowledge.

Provided Data – The databases included in the HAZUS-MH software that allow users to run a preliminary analysis without collecting or using local data.

Probability – A statistical measure of the likelihood that a hazard event will occur.

Public Education and Outreach Programs – Any campaign to make the public more aware of hazard mitigation and mitigation programs, including hazard information centers, mailings, public meetings, etc.

Q3 Flood Zone Data – FEMA flood data that delineate the 100- and 500-year flood boundaries. The Q3 Flood Data are digital representations of certain features of FEMA's Flood Insurance Rate Map (FIRM) product, intended for use with desktop mapping and GIS technology.

Recovery – The actions taken by an individual or community after a catastrophic event to restore order and lifelines in the community.

Regulation – Most states have granted local jurisdictions broad regulatory powers to enable the enactment and enforcement of ordinances that deal with public health, safety, and welfare. These include building codes, building inspections, zoning, floodplain and subdivision ordinances, and growth management initiatives.

Recurrence Interval – The average time between the occurrences of hazardous events of similar size in a given location. This interval is based on the probability that the given event will be equaled or exceeded in any given year.

Repetitive Loss Property – A property that is currently insured for which two or more National Flood Insurance Program losses (occurring more than ten days apart) of at least \$1,000 each have been paid within any 10-year period since 1978.



Replacement Value – The cost of rebuilding a structure. This cost is usually expressed in terms of cost per square foot and reflects the present-day cost of labor and materials to construct a building of a particular size, type and quality.

Resolutions – Expressions of a governing body’s opinion, will, or intention that can be executive or administrative in nature. Most planning documents must undergo a council resolution, which must be supported in an official vote by a majority of representatives to be adopted. Other methods of making a statement or announcement about a particular issue or topic include proclamations or declarations.

Resources – Resources include the people, materials, technologies, money, etc., required to implement strategies or processes. The costs of these resources are often included in a budget.

Risk – The estimated impact that a hazard would have on people, services, facilities, and structures in a community; the likelihood of a hazard occurring and resulting in an adverse condition that causes injury or damage. Risk is often expressed in relative terms such as a high, moderate or low likelihood of sustaining damage above a particular threshold due to occurrence of a specific type of hazard. Risk also can be expressed in terms of potential monetary losses associated with the intensity of the hazard.

Risk Assessment – A methodology used to assess potential exposure and estimated losses associated with priority hazards. The risk assessment process includes four steps: (1) identifying hazards, (2) profiling hazards, (3) conducting an inventory of assets, and (4) estimating losses. This pilot project report documents this process for selected hazards addressed as part of the pilot project.

Risk Factors – Characteristics of a hazard that contribute to the severity of potential losses in the study area.

Riverine – Of or produced by a river (for example, a riverine flood is one that is caused by a river overflowing its banks).

Saffir-Simpson Scale – This scale categorizes or rates hurricanes from 1 (Minimal) to 5 (Catastrophic) based on their intensity. It is used to give an estimate of the potential property damage and flooding expected along the coast from a hurricane landfall. Wind speed is the determining factor in the shape of the coastline, in the landfill region.

Scale – A proportion used in determining a dimensional relationship; the ratio of the distance between two points on a map and the actual distance between the two points on the earth’s surface.

Scour – Removal of soil or fill material by the flow of floodwaters. This term is frequently used to describe storm-induced, localized, conical erosion around pilings and other foundation supports where the obstruction of flow increases turbulence.

Special Flood Hazard Area (SFHA) – An area within a floodplain having a 1-percent or greater chance of flood occurrence in any given year (that is, the 100-year or base flood zone); represented on FIRMS as darkly shaded areas with zone designations that include the letter “A” or “V.”

Stafford Act – The Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law (PL) 100-107 was signed into law on November 23, 1988. This law amended the Disaster Relief Act of 1974, PL 93-288. The Stafford Act is the statutory authority for most Federal disaster response activities, especially as they pertain to FEMA and its programs.

Stakeholder – Stakeholders are individuals or groups, including businesses, private organizations, and citizens, that will be affected in any way by an action or policy.



State Hazard Mitigation Officer (SHMO) – The representative of state government who is the primary point of contact with FEMA, other state and Federal agencies, and local units of government in the planning and implementation of pre- and post-disaster mitigation activities.

Structure – Something constructed (for example, a residential or commercial building).

Study Area – The geographic unit for which data are collected and analyzed. A study area can be any combination of states, counties, cities, census tracts, or census blocks. The study area definition depends on the purpose of the loss study and in many cases will follow political boundaries or jurisdictions such as city limits.

Substantial Damage – Damage of any origin sustained by a structure in a SFHA, for which the cost of restoring the structure to its pre-hazard event condition would equal or exceed 50 percent of its pre-hazard event market value.

Thunderstorm – A local storm produced by a cumulonimbus cloud and accompanied by lightning and thunder. It forms from a combination of moisture, rapidly rising warm air and a force capable of lifting air such as a warm and cold front, a sea breeze, or a mountain.

Topographic – Map that shows natural features and indicate the physical shape of the land using contour lines based on land elevation. These maps also can include man-made features (such as buildings and roads).

Tornado – A violently rotating column of air extending from a thunderstorm to the ground.

Transportation Systems – One of the lifeline system categories. This category includes: airways (airports, heliports, highways), bridges, tunnels, roadbeds, overpasses, transfer centers; railways (tracks, tunnels, bridges, rail yards, depots), and waterways (canals, locks, seaports, ferries, harbors, dry docks, piers).

Tropical Cyclone – A generic term for a cyclonic, low-pressure system over tropical or sub-tropical waters containing a warm core of low barometric pressure which typically produces heavy rainfall, powerful winds and storm surge.

Tropical Depression – An organized system of clouds and thunderstorms with a defined surface circulation and maximum sustained winds of less than 38 mph. It has no “eye” (the calm area in the center of the storm) and does not typically have the organization or the spiral shape of more powerful storms.

Tropical Storm – An organized system of strong thunderstorms with a defined surface circulation and maximum sustained wind between 39 to 73 mph.

Utility Systems – One of the lifeline systems categories. This category includes potable water, wastewater, oil, natural gas, electric power facilities and communication systems.

Vulnerability – Description of how exposed or susceptible an asset is to damage. This value depends on an asset’s construction, contents, and the economic value of its functions. Like indirect damages, the vulnerability of one element of the community is often related to the vulnerability of another. For example, many businesses depend on uninterrupted electrical power. If an electric substation is flooded, it will affect not only the substation itself, but a number of businesses as well. Often, indirect affects can be much more widespread and damaging than direct affects.

Vulnerability Assessment – Evaluation of the extent of injury and damage that may result from a hazard event of a given intensity in a given area. The vulnerability assessment should address impacts of hazard occurrences on the existing and future built environment.



Watershed – Area of land that drains down gradient (from areas of higher land to areas of lower land) to the lowest point; a common drainage basin. The water moves through a network of drainage pathways, both underground and on the surface. Generally, these pathways converge into streams and rivers, which become progressively larger as the water moves downstream, eventually reaching an estuary, lake, or ocean.

Zone – A geographical area shown on a National FIRM that reflects the severity or type of flooding in the area.

Zoning Ordinance – Designation of allowable land use and intensities for a local jurisdiction. Zoning ordinances consist of two components: a zoning text and a zoning map.



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