Schoharie County, New York

Multi-Jurisdictional Hazard Mitigation Plan

FINAL – June 2019

Prepared by:

Schoharie County Office of Community Development Services

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Chapter 1 Introduction

Chapter 1 describes the authorities and principles that provide the basis for the Schoharie County's (County's) mitigation program as well as provides a description of that organization and how the plan is organized to support it.

1.1 Purpose

The purpose of this Multi-Jurisdictional Hazard Mitigation Plan (HMP) is to give Schoharie County and its municipalities an integrated strategy and direction for planning development and implementing hazard mitigation projects that will minimize disaster impacts and losses. The goals and objectives set forth in this plan, including the proposed projects and actions to be taken, have been cooperatively determined and agreed upon by all governing bodies within Schoharie County. It is understood that this is not an emergency response plan, but a plan to guide future projects and development with the goal of protecting lives and decreasing or eliminating damages to property and infrastructure caused by natural and manmade hazards that affect our communities.

1.2 Scope

This is a multi-jurisdiction, all-hazards mitigation plan. It addresses the risks, vulnerabilities and strategies for mitigating all hazards in Schoharie County and each of its sixteen (16) towns and six (6) villages, which have participated in development and approval of the plan.

The plan is intended to meet hazard mitigation planning requirements established by federal law in the *Disaster Mitigation Act of 2000*, (DMA 2000), Public Law 106-390.

1.3 Authority

The Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988 (Stafford Act), as amended by the Disaster Mitigation Act of 2000 (DMA 2000), Public Law 106-390, and its implementing Code of Federal Regulations (CFR) provisions, 44 CFR § 201, provide the legal authority for local hazard mitigation planning. The DMA 2000 requires state, local, and tribal governments to develop a hazard mitigation plan that identifies the jurisdiction's natural hazards, risks, vulnerabilities, and mitigation strategies. The planning process requirements mandated by the Federal Emergency Management Agency (FEMA) (outlined in 44 CFR §201.6) include the following activities:

- Document the planning process.
- Provide stakeholders with an opportunity to participate.
- Conduct and document public involvement.
- Incorporate existing plans and reports.
- Discuss continued public participation and plan maintenance.
- Provide a method for monitoring, evaluating, and updating the hazard mitigation plan.

Once complete, the hazard mitigation plan must be submitted to FEMA for approval. FEMA's approval of a hazard mitigation plan is a prerequisite for federal Hazard Mitigation Assistance grant program eligibility (outlined in 42 CFR §5165(a)).

The Schoharie County HMP was prepared in accordance with the requirements of the Stafford Act, as amended by the DMA 2000, and the implementing 44 CFR § 201 provisions. The County will integrate appropriate Americans with Disabilities Act (ADA) standards into mitigation projects and actions implemented as a part of the planning process. For example, alterations to existing facilities, such as seismic retrofits, will comply with all applicable federal accessibility requirements.

1.4 Plan Organization

The 2018 update of the Schoharie County HMP is organized into the following sections:

- **Chapter 1 – Introduction.** Identifies the authorities on which the plan is based, describes the plan's purpose and scope, describes how the plan is organized, and identifies changes to the plan since 2013.
- **Chapter 2 – Planning Process.** Describes the process used to update the plan, including data sources and plan integration activities, outreach and engagement strategies, HMPC activities, and plan development milestones.
- **Chapter 3 – Risk Assessment.** Identifies the specific hazards Schoharie County communities are at risk of experiencing. Determination of hazards was based on jurisdiction-specific analyses.
- **Chapter 4 – Hazard Profiles.** Contains a summary of the hazards that could potentially impact the County, including a hazard-ranking table.
- **Chapter 5 – Vulnerability Assessment.** Considers the hazards presented in Chapters 3 and 4 and attributes potential vulnerabilities in both general terms and hazard-specific where able.
- **Chapter 6 – Mitigation Strategy.** Provides updated goals and objectives for the County's mitigation program and identifies a comprehensive set of prioritized mitigation actions that would contribute to the County's resiliency.
- **Chapter 7 – Program Implementation.** Describes the County's plan for monitoring, evaluating, and updating the HMP over the next five-year period.

In addition to the base document, the Schoharie County HMP is supported by a series of appendices that provide documentation of the planning process, expanded map sets, and additional data supporting the Vulnerability Assessment. These appendices have been removed from the Basic Plan to improve readability and ease of use.

FEMA

A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for [Schoharie County]? (Requirement §201.6(c)(1))

1.5 Background

Following devastating floods in 1996, community leaders determined that a proactive and committed stance needed to be taken throughout Schoharie County to reduce future flood losses and disaster impacts. The need to implement strong hazard mitigation measures and to improve community protection was underscored by severe flooding again in 2006 and once more reinforced by the unprecedented and record-breaking flooding in 2011.

On the heels of these high-profile disasters, it was realized more than ever that an integrated community strategy and new approaches to funding disaster prevention and mitigation were essential. These hard-hitting disasters and the community's resolve to strengthen our disaster mitigation approach were paralleled by implementation of the federal *Disaster Mitigation Act of 2000 (DMA 2000),* which provides support and funding for hazard mitigation planning and improvements. In response to community needs and following the requirements of DMA 2000, Schoharie County -- including all towns and villages located in the county – prepared a Multi-Jurisdictional All-Hazards Mitigation Plan (HMP) in 2006, which was updated in 2013, and is replaced and updated by this 2018 plan.

> ***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 process a jurisdiction uses and the document it prepares to evaluate potential natural hazards and implement strategies and actions to mitigate such hazards.

DMA 2000 was enacted by Congress to improve disaster preparedness and prevention by providing incentives and resources to states and local governments to develop pre-disaster mitigation plans and implement hazard mitigation actions. Congress has authorized funding and the Federal Emergency Management Agency (FEMA) has issued requirements for development of hazard mitigation plans, including revisions and updates. The New York State Office of Emergency Management (NYSOEM) administers the DMA 2000 program in New York and supports local government planning and project funding.

DMA 2000 requires that hazard mitigation plans be updated every five (5) years in order to effectively prepare for disasters and reduce potential hazards. DMA 2000 is intended to facilitate cooperation between state and local authorities by encouraging agencies to communicate and collaborate with each other in the planning process. This kind of integrated government planning better enables local and state governments to prioritize community mitigation needs and develop a unified hazard mitigation strategy that includes the entire county.

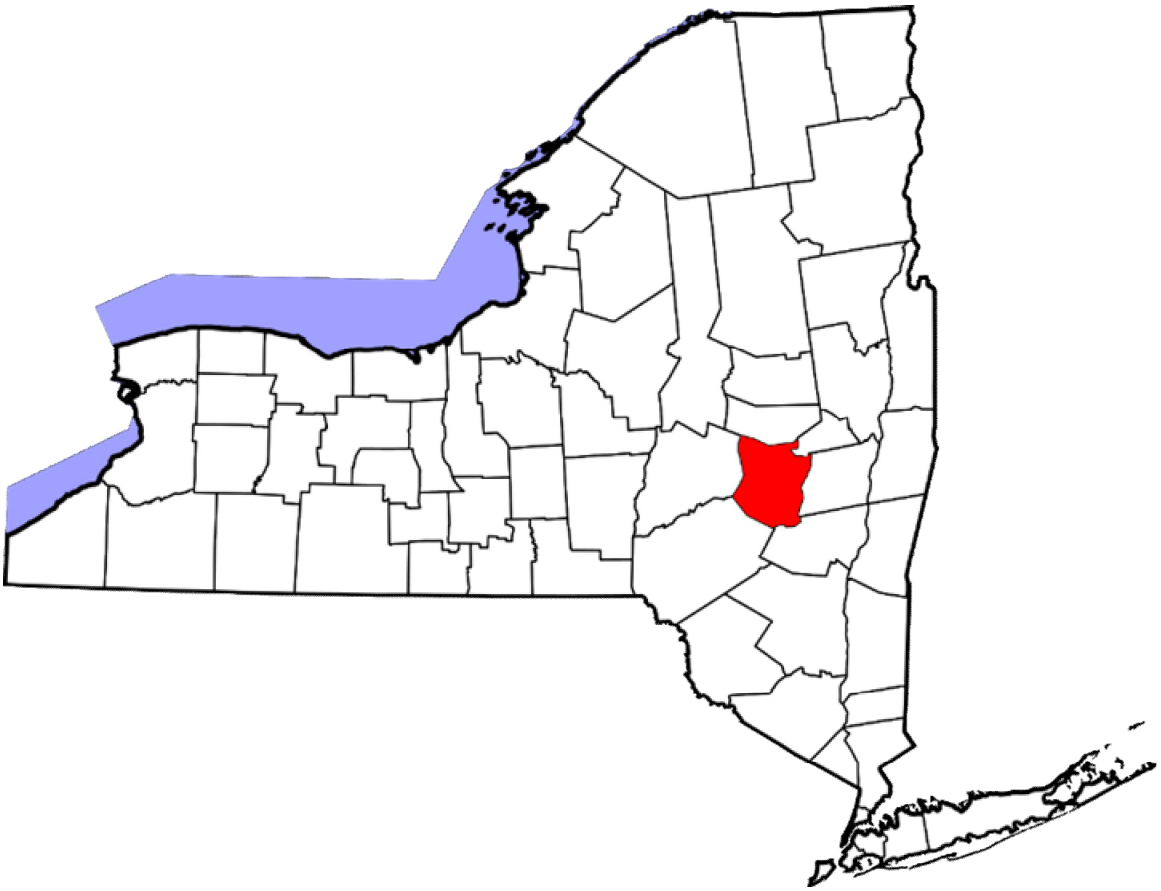
1.6 Community Overview

Geography

Schoharie County is located in the east-central part of upstate New York, approximately 30 miles west of Albany and 135 miles north of New York City. The County is primarily identified by its rural, community oriented character and natural features. Schoharie County is part of the Albany – Schenectady – Troy Metropolitan Statistical Area (MSA) and shares borders with Montgomery, Schenectady, Albany, Greene, Delaware, and Otsego Counties. Schoharie County is the least populated county in the region with 31,667 people (2012-2016 American Community Survey).

The County occupies approximately 622 square miles (2010 US Census Bureau). The terrain is a mix of rounded mountain sides and flat, narrow valleys. Elevation ranges from an average of 1,200 feet in the northern limestone plateau of the County to approximately 2,000 feet in the

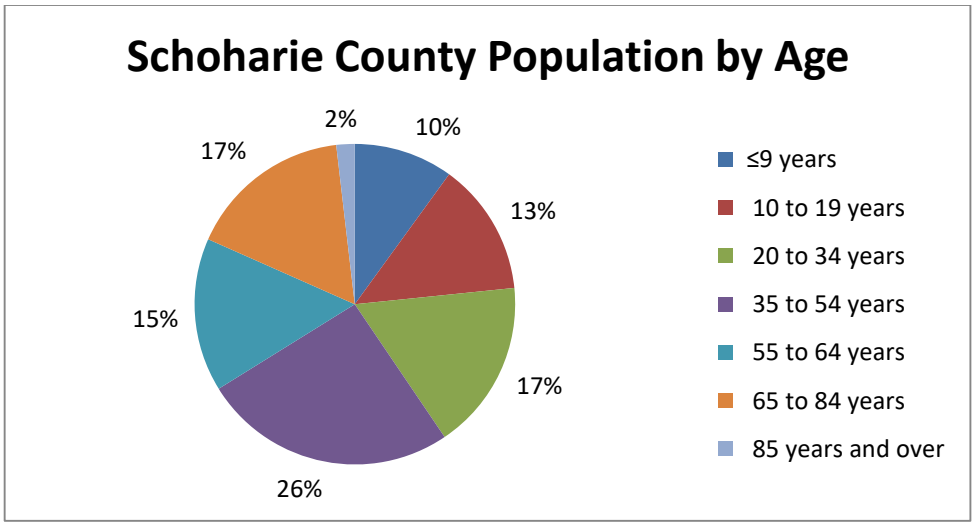
higher southern plateaus. Higher elevations exceeding 2,500 feet exist in the south of the County which are part of the Catskill Mountain range. Schoharie Creek flows north from the Catskill Mountains and Greene County, forming a south to north stream corridor through the center of Schoharie County to the Mohawk River. The Schoharie Creek watershed spans an area of approximately 950 square miles. The course of Schoharie Creek includes two (2) reservoir-dam systems; the Gilboa Dam and Schoharie Reservoir, which are part of and managed by the New York City Water Supply System, and the Blenheim-Gilboa dam and reservoir that is a hydro-electric power generating station operated by the New York Power Authority (NYPA).



Graphic Source: NationalAtlas.gov

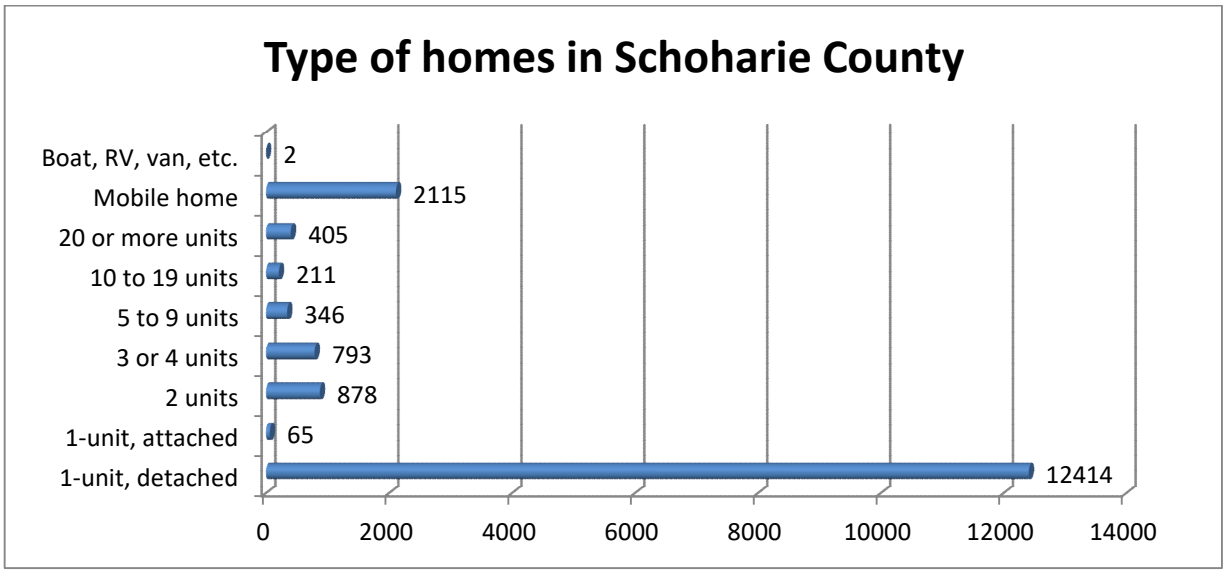
Population and Housing

According to the 2012-2016 American Community Survey, the Schoharie County population was 31,667 in 2016, with 2.44 persons per household, and the median age of residents was 44 years. Approximately 14.1% of persons are below the poverty level. As of the 2010 U.S. Census, the population density of Schoharie County is 52.7 persons per square mile.



2012-2016 ACS 5-Year Estimates

According to the 2012-2016 U.S. Census American Community Survey (ACS) Five (5) Year Estimates, there are 17,229 total housing units in Schoharie County. Of those housing units, 12,414 are a one (1) unit detached structure and 2,115 are mobile homes. 71.8% of housing units are occupied, while approximately 28.2% are vacant.



2012-2016 ACS 5-Year Estimates

Schoharie County, Municipal and Regional Population Changes 1990 to 2016

Comparisons between 2000 and 2010 data are highlighted **red**

Comparisons between 2010 and 2016 data are highlighted **green**

County	1990	2000	2010	Difference	% Change	2016	Difference	% Change
Schoharie	31,859	31,582	32,749	1,167	3.70%	31,667	-1,082	-3.30%
Delaware	47,225	48,055	47,980	-75	-0.16%	46,480	-1,500	-3.13%
Greene	44,739	48,195	49,221	1,026	2.13%	48,069	-1,152	-2.34%
Montgomery	51,981	49,708	50,219	511	1.03%	49,667	-552	-1.10%
Otsego	60,517	61,676	62,259	583	0.95%	60,979	-1,280	-2.06%
Schenectady	149,285	146,555	154,727	8,172	5.58%	154,845	118	0.08%
Albany	292,594	294,565	304,204	9,639	3.27%	307,891	3,687	1.21%
Saratoga	181,276	200,635	219,607	18,972	9.46%	224,929	5,322	2.42%

Town	1990	2000	2010	Difference	% Change	2016	Difference	% Change
Blenheim	332	330	377	47	14.24%	321	-56	-14.85%
Broome	926	947	973	26	2.75%	812	-161	-16.55%
Carlisle	1,672	1,758	1,948	190	10.81%	1,786	-162	-8.32%
Cobleskill	2,002	1,874	1,947	73	3.90%	1,926	-21	-1.08%
Conesville	684	726	734	8	1.10%	760	26	3.54%
Esperance	1,777	1,663	1,731	68	4.09%	1,463	-268	-15.48%
Fulton	1,514	1,495	1,442	-53	-3.55%	1,270	-172	-11.93%
Gilboa	1,207	1,215	1,307	92	7.57%	1,341	34	2.60%
Jefferson	1,190	1,285	1,410	125	9.73%	1,423	13	0.92%

Middleburgh	1,860	2,117	2,246	129	6.09%	2,072	-174	-7.75%
Richmondville	1,554	1,626	1,692	66	4.06%	1,494	-198	-11.70%
Schoharie	2,324	2,269	2,283	14	0.62%	2,186	-97	-4.25%
Seward	1,651	1,637	1,763	126	7.70%	1,687	-76	-4.31%
Sharon	1,349	1,296	1,288	-8	-0.62%	1,517	229	17.78%
Summit	973	1,123	1,148	25	2.23%	1,168	20	1.74%
Wright	1,385	1,547	1,539	-8	-0.52%	1,684	145	9.42%

Village	1990	2000	2010	Difference	% Change	2016	Difference	% Change
Cobleskill Village	5,268	4,533	4,678	145	3.20%	4,554	-124	-2.65%
Esperance Village	324	380	345	-35	-9.21%	347	2	0.58%
Middleburgh Village	1,436	1,398	1,500	102	7.30%	1,535	35	2.33%
Richmondville Village	843	786	918	132	16.79%	922	4	0.44%
Schoharie Village	1,045	1,030	922	-108	-10.49%	881	-41	-4.45%
Sharon Springs Village	543	547	558	11	2.01%	518	-40	-7.17%

Cumulative population of Towns 22,910

Cumulative population of Villages 8,757

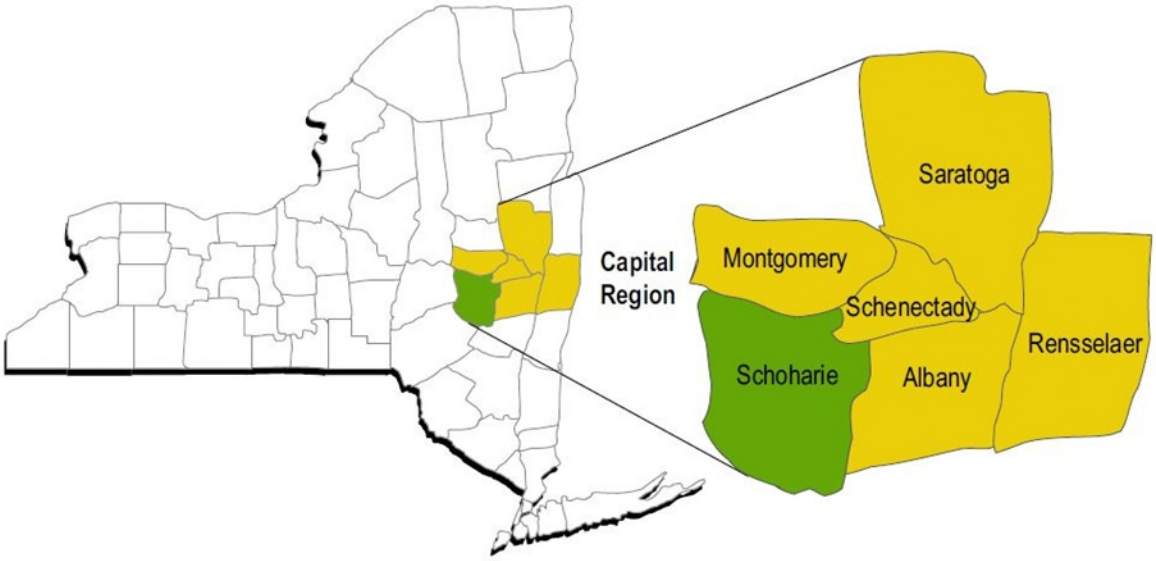
Sum of the Towns and Villages 31,667

Sources: U.S. Census, 2010, 2000 and 1990; American Community Survey 5-Year Estimates 2012-2016

Economy and Employment

Agricultural activity has been the traditional leader of the Schoharie County economy, and while not an income and employment growth sector, the Schoharie County Agricultural and Farmland Protection Plan (2000) notes that agriculture remains the predominant industry in Schoharie County and that dairy production accounts for 66% of agricultural sales.

Schoharie County is part of New York State's Capital District economic center and shares in portions of the growth and development that have occurred across this region. Schoharie County and its capital region partners are well positioned with transportation, technical and education resources that make it an attractive commercial hub for serving northeast America and Canada.



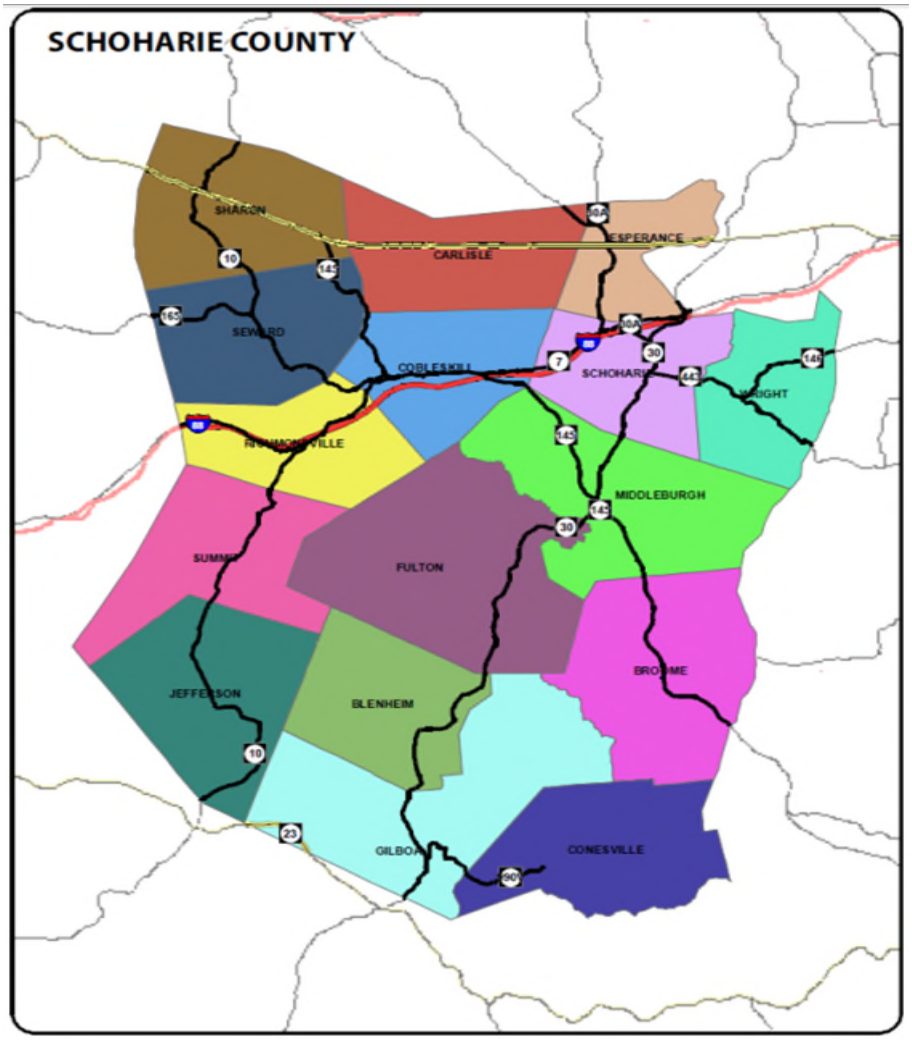
Renewed manufacturing opportunities that focus on small business and technical applications continue to be a target growth area for Schoharie County. The area is now home to plastics manufacturers that make medical device packaging for international companies and there is manufacturing capacity and a skilled workforce available to support local expansion.

Limestone mining in Schoharie County has also been an important part of the local economy for decades, providing a natural resource used in roadway engineering and pharmaceutical products. Three natural gas and propane pipelines traverse portions of Schoharie County, which are an important source of local revenues and modestly contribute to the county's employment profile. As part of the growing Capital District economic region and in conjunction with programs at the State University of New York at Cobleskill, Schoharie County is also well positioned to take advantage of developing trends in the region's rapidly expanding bio and nanotechnology fields.

Tourism has been a successful and long-standing cultural and economic asset for Schoharie County. In the late 1800's, visitors were first drawn to Schoharie County to take advantage of what many considered were 'healing' natural mineral waters. The Howe Caverns have been one of New York State's most popular natural attractions for decades. The dams, reservoirs and hydro-electric generation facilities in the Schoharie Valley – combined with the regions rich

history, recreational resources, rural markets, picturesque hills and valleys, natural features and vistas generate significant economic benefits.

Transportation



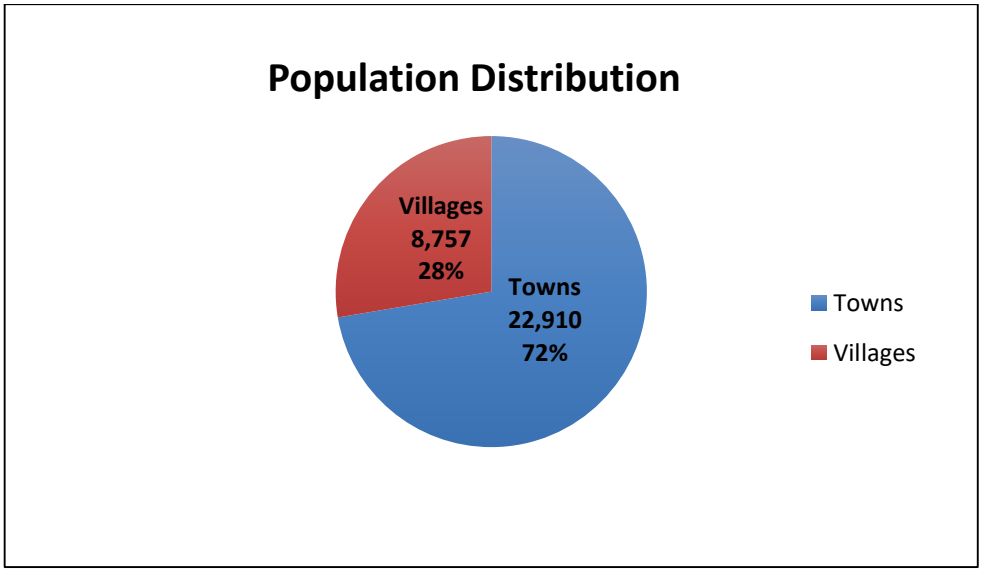
Major interstate and regional transportation systems that run east-west through the north and center of Schoharie County include Interstate 88, U.S. Route 20, NYS Routes 7 and 443, and the Canadian Pacific railway. The railroad has freight service through Esperance, Schoharie, Cobleskill and Richmondville, but no passenger service. State highways with north-south routes include NYS Routes 10, 30, 30A and 145. According to the New York State Department of Transportation (NYDOT) 2017 Highway Mileage Report, the County contains 1,166 miles of highway road. According to 2015 Annual Average Daily Traffic estimates, the busiest average daily vehicle count is on State Route 7 through the Village of Cobleskill, with an average of 17,471 vehicles per day (up from 16,248 vehicles per day in 2013). Interstate 88 (a four lane divided highway) has an average daily count of 10,000 –11,500 vehicles. The busiest County highways are Mineral Springs Road and Barnerville Road in the Village of Cobleskill, with approximately 5,500 and 3,500 vehicles per day respectively. There are no commercial airports in the County and two private airport serving small aircraft (Schoharie Creek Airport and Blue

Heron Airport). The County relies on major terminals and national carriers in nearby Albany and Schenectady for passenger rail and air services.

Land Use

Schoharie County's modest population, rural character and agricultural focus means open space is plentiful; with farmland, scenic valleys and vibrant forests dominating the landscape. Life and activity in Schoharie County are centered in historic communities and villages that are principally located along the Schoharie Creek valley and the interstate highway and rail transportation corridor. Even in the populated villages, densities are very low compared to urban and suburban communities elsewhere in the state; and where multi-family housing exists, it is likely to be buildings with four (4) or fewer units that are only two or three stories high.

28% of the population in Schoharie County is concentrated in the Villages of Cobleskill, Schoharie, Middleburgh, Sharon Springs, Richmondville, and Esperance - all in the northern half of the County.



Schoharie County – Distribution of Land Uses (Percent of Total Acres)

Jurisdiction	Residential	Commercial and Industrial	Agricultural	Public and Recreation	Woodland and Forest	Unused	Total Acres
Blenheim	31 %	< 1 %	6 %	7 %	35 %	20 %	21,638
Broome	41	1	10	< 1	25	22	30,401
Carlisle	26	< 1	55	< 1	2	16	21,397

Cobleskill, T	18	4	47	5	7	18	16,644
Cobleskill, V	23	19	13	28	0	16	1,922
Conesville	38	< 1	15	3	18	27	25,388
Esperance, T	40	3	27	< 1	< 1	29	11,963
Esperance, V	35	2	8	5	0	50	293
Fulton	28	< 1	15	< 1	33	22	40,217
Gilboa	35	< 1	25	7	4	27	37,376
Jefferson	38	< 1	24	2	6	29	27,396
Middleburg, T	45	2	20	1	5	28	30,846
Middleburgh, V	41	6	25	11	2	16	690
Richmondville, T	31	1	3	3	< 1	33	17,369
Richmondville, V	37	3	23	10	< 1	28	884
Schoharie, T	29	2	40	1	< 1	28	17,030
Schoharie, V	41	6	33	15	0	7	1,001
Seward	26	1	42	< 1	5	25	22,851
Sharon	14	1	53	3	3	14	23,349
Sharon Springs	34	23	4	15	< 1	24	1,102
Summit	45	< 1	11	< 1	9	35	23,442
Wright	38	1	37	< 1	4	19	17,896
Total Countywide	33 %	1 %	26 %	3 %	11 %	24 %	391,097

Source: Schoharie County Planning Department (2018)

Percentages may not total 100 due to rounding Town figures

1.7 What's New in the 2018 Update?

In the years since the release of the 2013 plan, the County has undergone many changes. As disaster recovery and hazard mitigation funding continues to become available, the County and participating jurisdictions have continued to acquire repetitive loss properties and further protect critical facilities and infrastructure.

One of the largest differences between the 2013 HMP and this 2018 HMP is the restructuring of how towns and villages integrate into the plan. Much of the jurisdiction-specific information (risk assessments, capability assessments, mitigation actions) have been moved to separate, Jurisdiction Annexes. Jurisdiction Annexes have been created for each participating jurisdiction as standalone documents that enhance the overall Schoharie County Multi-Jurisdictional Hazard Mitigation Plan. This has been done to help ensure each jurisdiction internalizes the plan and understands their role in the hazard mitigation program moving forward.

The 2018 update of the Schoharie County Multi-Jurisdictional Hazard Mitigation Plan includes the following major revisions to the 2013 plan:

- Incorporation of additional hazards and more comprehensive risk assessments (See chapter 3 and 4 and Jurisdiction Annexes);
- Expanded capability assessments (See Jurisdiction Annexes);
- Comprehensive, but focused mitigation strategy with achievable actions to be completed within the next five years (See Chapter 6); and
- Integration of hazard mitigation planning into existing mechanisms (See Chapter 7 and Jurisdiction Annexes).

Additionally, to aid in plan review and to ensure that all DHSES and FEMA planning requirements are met, text box callouts have been inserted into the plan that identify the planning element, based on FEMA's local mitigation plan review tool, that is addressed in that particular section of the plan. The plan also strives to make robust use of internal call outs to ensure that plan users can easily find related information. For example, in Chapter 2, which addresses the planning process, the following text box appears:

FEMA	**A1.** Does the Plan document the planning process, including how it was prepared and who was involved in the process for [Schoharie County]? (Requirement §201.6(c)(1))

See Appendix E for the completed FEMA Local Plan Mitigation Review Tool for the Schoharie County HMP.

Chapter 2 Planning Process

Chapter 2 provides a narrative description of the planning process the County conducted to ensure that the County's mitigation strategy was informed by input from key County departments, community partners, and the public. The process was based on principles of strategies for inclusive engagement and integration with existing planning efforts.

FEMA	**A1.** Does the Plan document the planning process, including how it was prepared and who was involved in the process for [Schoharie County]? (Requirement §201.6(c)(1))

A hazard mitigation plan's organization is driven by the needs of the County. The following priorities were used to steer development of the HMP:

- Communicate priorities and values through mitigation strategies;
- Build community through a comprehensive and inclusive planning process; and
- Engage community members, leadership, and our partners to ensure an equitable plan and mitigation program.

FEMA recommends nine tasks for developing or updating hazard mitigation plans (see Figure 2-1). Tasks 1 through 3 include the people and process involved in the all-hazards mitigation plan development or update; Tasks 4 through 8 focus on the analytical and decision steps that need to be taken; and Task 9 includes suggestions for plan implementation.

Figure 2-1 FEMA Recommended Mitigation Planning Tasks

Source: FEMA Local Mitigation Planning Handbook, March 2013

2.1 Planning Area

The planning area refers the geographic area covered by the plan (FEMA Local Mitigation Planning Handbook 2013). In the case of the Schoharie County HMP, the planning area includes all areas within the County limits, as well as each participating jurisdiction. The following jurisdictions are outlined in the HMP and supporting Jurisdiction Annexes:

Towns

- Town of Broome
- Town of Carlisle

Villages

- Village of Cobleskill
- Village of Esperance
- Village of Middleburgh

- Town of Cobleskill
- Town of Esperance
- Town of Fulton
- Town of Gilboa
- Town of Jefferson
- Town of Middleburgh
- Town of Richmondville
- Town of Schoharie
- Town of Seward
- Town of Sharon
- Town of Summit
- Town of Wright
- Village of Richmondville
- Village of Schoharie
- Village of Sharon Springs

2.2 Data Collection and Incorporation of Existing Plans

FEMA	**A4.** Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))

Data collection efforts for the Schoharie County HMP focused on documents pertaining to the planning area and examples of best practices in hazard mitigation planning. The primary source document for the plan update was the 2013 Schoharie County HMP. Additionally, related emergency management plans, and state hazard mitigation plans, and Town and Village plans with relevant hazard mitigation topics, such as stormwater management, were reviewed as part of the data collection efforts. Examples of hazard mitigation planning best practices were also reviewed for their applicability to the Schoharie County HMP.

Plan Title	Incorporation into HMP
Schoharie County Comprehensive Emergency Management Plan (CEMP)	The Multi-Jurisdiction Hazard Mitigation Plan is a part of the comprehensive plan that more specifically addresses preparedness and recovery activities related to preventing and/or reducing the occurrence and/or impacts of disasters. The CEMP forms the foundation and pattern for development of the Hazard Mitigation Plan by setting policies and objectives for inter-governmental and inter-agency coordination of emergency management activities in the county. The integration of resources, leadership and mutual-aid set-forth in the CEMP establish the framework for implementing cooperative strategies essential in a multi-jurisdiction hazard mitigation process.
Town and Village Comprehensive	Most towns and villages in Schoharie County have prepared community master plans that serve as a long range guide for growth and development. The master plans identify local goals and objectives that set the direction and focus for local decision making affecting land use, economic activity, community infrastructure and services. Provisions and goals outlined in

Community Master Plans	these plans are reviewed when considering hazard mitigation projects and activities. The table in Section V of this plan outlines the status of local master plans.
Schoharie County Hazard Analysis (HAZNY)	The HAZNY is part of the County Comprehensive Emergency Management Plan and is the tool used to identify, evaluate, rank and prioritize the natural and man-made hazards that can impact Schoharie County. The HAZNY is equally essential to the Hazard Mitigation plan where it serves as the foundation for developing the comprehensive risk assessment. The HAZNY was first completed in January, 1999, revised in 2003 and 2012 and updated again in 2018 for this HMP update.
Public Health Emergency Operations Plans	The Schoharie County Public Health emergency plan addresses special health preparedness considerations for public health emergencies, natural hazards, pandemic flu outbreaks and terrorist events that threaten safety and health. Planning undertaken for health emergencies is particularly valuable to the hazard mitigation planning process because the goals, strategies, data and information prepared in planning for health threats are key resources needed for implementing mitigation actions related to many hazards that have health impacts.
Schoharie County Hazardous Materials Response Plan	The Schoharie County Hazardous Material Plan maintained by the Local Emergency Planning Committee (LEPC) and required under provisions of the federal Superfund Amendments and Reauthorization Act (SARA) Title, III Act, provides a plan for response to facilities that manufacture or use hazardous materials. In most situations, facilities must identify the types, amounts and locations of chemicals they use or store, and in other situations they must participate with the LEPC in planning for a chemical release or response at or near their site. The plan provides valuable background for the Multi-Jurisdiction Hazard Mitigation Plan and Schoharie County's Haz-Mat Response Team in developing actions and strategies to mitigate hazardous material emergencies.
NYS Hazard Mitigation Plan (2014)	The State Hazard Mitigation Plan is an excellent resource that provides information and guidance for development of the County plan. Many communities across New York share similar experiences and vulnerabilities to hazards. The State Plan shows how exposure, preparedness and mitigation for many hazards are often similar from region to region, while at the same time demonstrating how certain areas and communities face specific concerns and have varied priorities.
Schoharie Valley Flooding	The plan supplement's the Schoharie County CEMP by establishing procedures specific to mitigation, response and recovery operations for a failure at the Gilboa Reservoir dam that is part of the New York City water

and/or Dam Failure Guidelines (2007)	supply system located in the south of Schoharie County. Special emphasis is placed on the use of phased planning and evacuation to increase the safety of residents in the Schoharie Creek valley. The plan prepares for a *Type A* event – when a breach or failure of the dam is imminent or has occurred; and a *Type B* event – when a potentially hazardous situation at the dam is developing.
New York Rising Community Construction Plans	Multiple Schoharie County communities participated in the New York Rising Community Construction Programs and developed local plans to ensure action on their efforts. The final plans provided considerable data to inform the HMP's risk assessments, unmet needs, and identification of mitigation (recovery and resiliency) strategies.

2.2.1 Community-Wide Emergency Agreements

In accordance with New York State General Municipal Law, Schoharie County has established *Mutual Aid Assistance Agreements* with other county and local governments. These agreements provide a mechanism for participating organizations to request assistance and share resources and services in responding to and mitigating a disaster or emergency.

The Schoharie County Office of Emergency Management maintains these agreements with local governments and public safety organizations. Participants in these agreements can also include government departments and agencies, public schools and the college, medical facilities, food pantries and human service organizations, veterinary clinics, church and religious service organizations, businesses and commercial enterprises and industries.

Current agreements exist between Schoharie County and the following local governments and organizations.

County Mutual Aid Agreements	**Local Municipal Plan Agreements**
Greene County	Town of Gilboa
Montgomery County	Town of Blenheim
Otsego County	Village of Middleburgh
Schenectady County	Village of Schoharie
Delaware County	Cobleskill
Albany County	West Fulton Fire Department
	Central Bridge Fire Department

	Esperance Fire Department

2.3 Hazard Mitigation Planning Committee

The Schoharie County Office of Community Development Services is the lead County agency responsible for development and maintenance of the Schoharie County Multi-Jurisdiction Hazard Mitigation Plan. The Senior Planner in the department is project leader for the planning process and is also designated the Schoharie County Hazard Mitigation Coordinator. Principal leadership support for Hazard Mitigation Plan development and maintenance is provided by the Schoharie County Office of Emergency Services Director. Funding, guidance and resources for Plan development in 2006, 2013, and the 2018 update were provided by the Federal Emergency Management Agency (FEMA) Pre-Disaster Mitigation (PDM) Grant program and the New York State Office of Emergency Management (NYS OEM) Mitigation Program.

The Schoharie County Hazard Mitigation Planning Committee (HMPC) consists of a broad range of local government officials and key agency leaders who are responsible for providing guidance, developing policy and organizing government and community support in the development and maintenance of the Schoharie County Multi-Jurisdiction Hazard Mitigation Plan. A key role of the Hazard Mitigation Planning Committee is to support coordination and activities needed to secure resources and insure that the goals, objectives and projects outlined in the Plan are effectively implemented. The HMPC is chaired by the Chairman of the Schoharie County Board of Supervisors. The County Office of Community Development Services provides organizational resources and support for the HMPC and the Senior Planner serves as Deputy Chair and Administrative Officer for the HMPC. The Board of Supervisors approved a resolution in July 2017 (Appendix A) that revised and appointed members of the HMPC; the membership in 2018 includes the following.

HMPC Membership		
Name	**Title**	**Jurisdiction**
Joe Falsarello	Highway Supervisor	Town of Sharon
Ken Cole	Deputy Supervisor	Jefferson
Gary Ovitt	Highway Supervisor	Esperance
Eva Gigandet	Public Health Preparedness Coordinator	Schoharie County DOH
Stephen Weinhofer	Town Supervisor	Town of Broome

Richard Lape	Town Supervisor	Town of Richmondville
Don Airey	Town Supervisor	Town of Blenheim
Colleen Flynn	Emergency Management Coordinator	Schoharie County Office of Emergency Services
Lloyd Stannard	Codes Officer	Town of Carlisle
Zach Thompson	Planner	Schoharie County OCDS
Peter Erwin	PES Secretary	Village of Cobleskill
Jason Wayman	Highway Superintendent	Town of Broome
John Bates	Supervisor	Town of Seward
Jay Balliett	Trustee	Village of Schoharie
Lynn Herzog	Deputy Supervisor	Town of Wright
Alex Luniewski	Supervisor	Town of Wright
Alicia Terry	Senior Planner	Schoharie County Office of Ag. Dev.
Lillian Bruno	Planner	Schoharie County OCDS
Shane Nickle	Senior Planner	Schoharie County OCDS
Caitlin Dufraine	Deputy Project Manager	Ecology and Environment, Inc.
Amy Mahl	Project Manager	Ecology and Environment, Inc.

Refer to Jurisdiction Annexes for additional HMC membership specific to towns and villages.

The Board of Supervisors resolution creating the Hazard Mitigation Planning Committee also states that municipalities, when contacted, are encouraged to cooperate and participate in the update and implementation of the Hazard Mitigation Plan

The Schoharie County Local Emergency Planning Committee (LEPC), which serves as an emergency management, disaster response and hazardous materials preparedness coordinating body, also assists the HMPC with programs and activities related to development and implementation of the Hazard Mitigation Plan.

2.3.1 HMPC Meetings

Plan needs were discussed and key deliverables were reviewed at the HMPC's formal meetings. The HMPC convened for a series of three meetings over the course of the project (see Table 2-2) where representatives from each participating jurisdiction and other County stakeholders had the opportunity to provide project insights, engage with the project consulting team, and collaboratively work on plan content. HMPC members were informed of meetings via email reminders and conference call-in lines were provided for those unable to attend meetings.

The HMPC meetings served as the primary data gathering mechanism throughout the planning process, and the importance of these meetings cannot be overstated. This includes data collection, determination of goals and objectives, articulation of specific hazards and risks, and development of a comprehensive mitigation strategy.

The following table outlines the dates that HMC meetings were held to discuss and prepare development of this 2018 plan update. A sampling of meeting notices, agendas and topics is included in Appendix A.

Table 2-2 Hazard Mitigation Committee Meetings

HMPC Meeting	**Date**	**Objectives**
Kickoff Meeting – Pre-HMPC Coordination	2/23/2018	Introduce County staff to contract support team. Develop project coordination plan.
Coordination Meeting with NY DHSES	3/21/2018	Discuss plan requirements from the State's perspective and develop coordination approach for working with jurisdictions.
HMC Meeting #1 – Formal Project Kickoff Workshop	4/23/2018	Provide an overview of the planning process, review and refine goals and objectives from the 2013 plan, develop a public engagement strategy, and identify next steps and action items.

HMC Meeting #2 – Risk Assessment	6/13/2018	Review of updated risk assessment and development of additional risk characteristics.
HMC Meeting #3 – Mitigation Strategies	7/24/2018	Review of 2013 mitigation strategy and development of new mitigation actions for inclusion in 2018 plan update.

2.4 Participating Jurisdictions and Agencies

Each of the sixteen (16) towns and six (6) villages located within Schoharie County were included in the original 2006 Multi-Jurisdiction Hazard Mitigation Plan and were again participants in the 2013 and 2018 plan updates. Participating officials from the towns were the Supervisors of each jurisdiction, who also serve on the Schoharie County Board of Supervisors, and the Mayors of each of the six (6) villages. The input of these officials was also supplemented by key staff in their respective jurisdictions; including the Highway/Streets Superintendent, Planning and Zoning officials, Code and Building officers and Fire Chiefs.

Jurisdiction	Supervisor or Mayor
Town of Blenheim	Don M. Airey
Town of Broome	Stephen Weinhofer
Town of Carlisle	John H. Leavitt
Town of Cobleskill Village of Cobleskill	Leo McAllister Mayor Linda Holmes
Town of Conesville	William Federice
Town of Esperance Village of Esperance	Earl Van Wormer Mayor Charles Johnston
Town of Fulton	Philip Skowfoe Jr.
Town of Gilboa	Anthony T. VanGlad
Town of Jefferson	Margaret Hait
Town of Middleburgh Village of Middleburg	Gerald Coppolo Mayor Matthew Avitable
Town of Richmondville	Richard Lape

Jurisdiction	Supervisor or Mayor
Village of Richmondville	Mayor Kevin Neary
Town of Schoharie Village of Schoharie	Alan Tavener Mayor John Borst
Town of Seward	John S. Bates, Jr.
Town of Sharon Sharon Springs Village	Sandra Manko Mayor Doug Plummer
Town of Summit	Harold Vroman
Town of Wright	Alex Luniewski

2.4.2 State and Federal Agencies

The following agencies provided planning support, technical input and/or data to inform the Schoharie County HMP. Representatives and contacts from supporting agencies changed through the planning process, depending on the special knowledge or program experience required and availability.

Schoharie County Soil and Water Conservation District

NYS Division of Homeland Security & Emergency Services (DHSES)

NYS Department of Environmental Conservation (DEC)

NYS Department of State, Code Enforcement

NYS Department of Taxation and Finance

National Weather Service (NWS), Albany and/or Binghamton, NY

U.S. Army Corps of Engineers

New York Power Authority

NYS Department of Transportation (DOT)

NYC Department of Environmental Protection (NYCDEP)

Governor's Office of Storm Recovery (GOSR)

Federal Emergency Management Agency (FEMA)

2.4.3 Type of Participation in the Hazard Mitigation Planning Process

The above-mentioned jurisdictions and agencies provided varying types of participation throughout the planning process. The table below indicates how each participant participated in the development of the Schoharie County HMP.

Participant	Type of Participation
Board of Supervisors	Project Supervision and Oversight Plan Review and Input Identify and Develop Mitigation Goals and Strategies Provide Information to the Public and Seek Citizen Input
Hazard Mitigation Planning Committee (HMPC)	Project Supervision and Oversight Plan Review and Input Research, Data Collection and Fact-Finding Document Preparation and Organization Meeting Coordination and Presentations Identification and Evaluation of Hazards Identify and Develop Mitigation Goals and Strategies Provide Information to the Public and Seek Citizen Input
Participating Jurisdiction Representatives	Plan Review and Input Identification and Evaluation of Hazards Identify and Develop Mitigation Goals and Strategies Provide Information to the Public and Seek Citizen Input
Project Consultant	Project Guidance and Advice Research, Data Collection and Fact-Finding Document Preparation and Organization Preparation of Maps and Graphics Meeting Coordination and Presentations Identification and Evaluation of Hazards Identify and Develop Mitigation Goals and Strategies
NY DHSES / FEMA	Plan Guidance, Review, Input and Approval

Supporting State and Federal Agencies	Plan Review and Input Research, Data Collection and Fact-Finding Preparation of Maps and Graphics Identification and Evaluation of Hazards Identify and Develop Mitigation Goals and Strategies

2.5 Coordination with Neighboring Counties and Plans

FEMA	**A2.** Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2)) **A3.** Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))

Throughout the planning process, staff met with and had regular discussions with the Emergency Management Directors and mitigation officers in neighboring counties. These discussions included a review of common hazard mitigation concerns and goals in area communities and helped to identify potential mitigation strategies, resources and projects.

Schoharie County Emergency Management staff participate in regular monthly meetings of county emergency management staff in the eastern region of New York. These meetings include representatives of the New York State Office of Emergency Management and the National Weather Service; hazard mitigation planning and programs are regularly discussed.

Schoharie County Office of Community Development Services staff regularly meet with planning officers from other counties in the region, including forums scheduled by the Southern Tier Eight Regional Planning and Development Board. The regional planning board is very active in hazard mitigation activities, particularly in areas of water resource protection, stormwater and floodplain management and development standards.

County highway and public works staff participate in regional meetings with the State Department of Transportation (DOT), where their counterparts from other counties in the region are also present. Hazard Mitigation priorities, projects and funding related to roads, highways, bridges and local storm drainage systems are regularly discussed at these meetings.

In preparing the Schoharie County Multi-Jurisdiction Hazard Mitigation Plan, planning staff reviewed and referenced the hazard mitigation plans of other rural, upstate New York counties; including the hazard mitigation plans prepared by Yates, Tioga, Jefferson and Oswego counties.

Schoharie County and neighboring Greene County are both part of the Schoharie Creek watershed, where much of the upland drainage collects in Greene County and eventually flows through Schoharie County. Flood protection and prevention for Schoharie County can be significantly affected by what is done or not done in Greene County. Schoharie County community development and emergency management staff regularly meet with officials of neighboring Greene County to discuss hazard mitigation projects, priorities and opportunities.

2.6 Public Engagement

FEMA	**A2.** Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2)) **A3.** Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))

Discussion at Public Meetings

As noted above, the Hazard Mitigation Planning Committee and planning team members encouraged municipal officials to seek public input and discuss the Hazard Mitigation plan at public meetings and forums whenever possible. While it is commonly acknowledged, and is described in the section below, that public participation was incorporated into the planning process, not all jurisdictions captured citizen participation activities in local records or reports.

Integrated Public Participation

The principal method for soliciting public participation in the hazard mitigation plan was through direct contact the planning team members had with citizens and community groups. Over the planning period, members of the HMPC were involved in discussions and listened to the views of interested parties throughout the county related to hazard mitigation needs, proposals and improvements. Most of these personal interactions were not recorded in reports or meeting minutes, but were shared and incorporated in the planning process as hazard mitigation goals and objectives were developed.

As noted in the introduction to this plan, Schoharie County is sparsely populated and best known for its rural, small-town character. As a result of the strong community ties and integrated involvement of citizens and leaders among government and civic organizations, ample means and opportunities are available to insure the public has a say when it comes to the goals and content of the Hazard Mitigation Plan. Those responsible for preparing this Hazard Mitigation Plan - including members of the planning committee, agency leaders and representatives of the participating jurisdictions - are also members, or are associated with a wide range of boards, committees and public interest groups in the County. For example, members of the Hazard Mitigation Planning Committee who also serve as Town Supervisors and/or Village Mayors are elected by residents to hear and represent citizen interests. Further strengthening the lines for feedback and cooperation is the recognition that local elected and agency officials in Schoharie County, including those responsible for preparing the Hazard Mitigation Plan, are members of

their local volunteer fire departments, civic and veterans clubs, school boards, planning and zoning boards and related community service organizations. This kind of integrated community networking and cross-cultural participation provide a valuable and very effective platform to insure that public contributions are a fundamental part of the Hazard Mitigation Plan. In such a close-knit communal setting, many of the hazard mitigation objectives and actions listed in Section VI of this plan would have first been discussed at the kitchen tables of local citizens or at the village restaurants where members of the public and government leaders mingle.

Targeted Citizen Access and Input

Due to the complexity of the Hazard Mitigation Plan and other factors, local officials in Schoharie County continue to believe the best opportunities for insuring citizen participation involve local government leaders and planning staff going directly to the people, often in one-on-one discussions with residents and neighbors, or at regular local organization meetings held at the town and village halls or fire stations. Schoharie officials have avoided using dedicated public forums or citizen briefings to present the Hazard Mitigation Plan, mostly because few residents have the time or expertise to not only read through a complex planning document, but also articulate their opinions and concerns in a large and open community forum. The HMP planning process was discussed at the following events and locations:

- Spring Rabies Clinic
- Noticed with contact information posted at every town hall and library
- Technopalooza at Middleburgh High School
- County Office of Emergency Services social media
- Fourth Friday Street Fest
- Annual Gas Up
- Arts in the Park at the Village of Cobleskill
- Schoharie County Fair

Plan Review and Public Comment Period

An initial public comment period was held from 9/10/2018 and 11/18/2018. Community members were invited to share their thoughts about what hazards concern them most, and how they think the County should prioritize its activities to reduce hazard risks. No public comments were received during this time period, but the County will continue to socialize the plan and solicit input to guide the mitigation program.

Refer to Appendix A for press releases related to the HMP public comment period.

2.7 Local Adoption

FEMA completed their review of the content and provisions of the updated Schoharie County Multi-Jurisdiction Hazard Mitigation Plan in December of 2018 and notified the County that the plan is '*Approved Pending Adoption'*. This pending approval indicates that the plan meets federal hazard mitigation planning requirements and standards and that final FEMA approval will be granted after the Schoharie County Board of Supervisors and each of the town and village boards adopt the plan and submit their approved local resolution to the county.

The sample adoption resolution and each of the approved local adopting resolutions (when available) are included in Section 7 of each Jurisdictional Annex.

2.8 Plan Development and Review

The Schoharie County HMP development process was conducted according the process outlined above and described in detail in FEMA's Local Mitigation Planning Handbook. Update of the County's mitigation strategy was treated as the plan's primary purpose and the plan serves as the written record of the comprehensive planning process. In addition, the HMP reflects the County's current needs and hazard concerns. The development of the HMP update occurred over a 9-month period from March 2018 to December 2018. The plan development was conducted through a series of seven steps as detailed in Table 2-5. Many of the steps occurred concurrently. Table 2-5 also illustrates the corresponding FEMA local mitigation planning task for each HMP development milestone.

Table 2-5 Schoharie County HMP Update Milestones and Timeline

HMP Update Development Milestone	Corresponding FEMA Recommended Local Mitigation Planning Task[1]	Timeline
1. Data Collection and Document Review	Task 1 – Determine the Planning Area and Resources Task 5 – Conduct a Risk Assessment	March May 2018
2. Mitigation Working Group Coordination	Task 2 – Build the Planning Team	April-October 2018
3. Stakeholder Engagement and Outreach	Task 3 – Create an Outreach Strategy	April-October 2018
4. Hazard Mitigation Strategy Update	Task 4 – Review Local Capabilities Task 6 – Develop a Mitigation Strategy	July-September 2018
5. Draft Hazard Mitigation Plan[1]	Written documentation of the planning process (all tasks)	March-August 2018
6. Final Hazard Mitigation Plan	Written documentation of the planning process (all tasks)	September-November 2018
7. Plan Adoption	Task 8 – Review and Adopt the Plan	December 2018

Chapter 3 Risk Assessment

Chapter 3 identifies the specific hazards Schoharie County communities are at risk of experiencing. Determination of hazards was based on jurisdiction-specific analyses.

FEMA	**B1.** Does the Plan include a description of the type, location, and extent of all natural hazards that can affect [Schoharie County]? (Requirement §201.6(c)(2)(i)) **B2.** Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for [Schoharie County]? (Requirement §201.6(c)(2)(i))

3.1 Program and Method

Schoharie County performed the risk assessment and all-hazard analysis using the New York State Emergency Management Office *Hazard Analysis - New York (HAZNY)* program, which was supplemented by the U.S. Department of Homeland Security's *Threat and Hazard Identification and Risk Assessment (THIRA)* application and hazard research performed by the planning committee. The HAZNY was performed on a County-wide basis, and also prepared for each of the County's jurisdictions where unique concerns and threats were identified.

A joint meeting was held with the Hazard Mitigation Planning Committee (HMPC) and the Local Emergency Planning Committee (LEPC) that used *HAZNY and THIRA* to begin revision of the Risk Assessment for this updated Hazard Mitigation plan. The HAZNY and THIRA are used to examine the kinds of hazards that could potentially affect Schoharie County and serve as building blocks for the comprehensive risk assessment included in this section.

The following factors were considered in the HAZNY analysis that examines potential hazards.

Framing Question	Description
Where could the hazard occur?	▪ a large region (affecting an area greater than half of the municipality) ▪ a small region (affecting an area one third to one half the municipality) ▪ several individual locations ▪ a single location
How often does the hazard occur - historical data was analyzed to	▪ a rare event (less than once every fifty (50) years), an infrequent event (once every eight (8) to fifty (50) years)

determine how often a hazard occurred in the municipality?	▪ a regular event (once a year to once every seven (7) years) ▪ a frequent event (more than once a year)
What are the cascade effects - the HAZNY asked "Could the hazard trigger another hazard"?	▪ For example, a flood can trigger a hazardous materials release, or a severe storm will result in a power outage
How will the hazard impact the population, private property and public infrastructure?	▪ serious injury or death is unlikely ▪ death or injury is likely but not in large numbers ▪ death or injury is likely in large numbers ▪ death or injury is likely to extremely large numbers

Damage options are selected for private and public property:	▪ 'Little' is defined as either:
	  ▪ a significant number of structures still habitable or useable but in need of minor repair, or
	  ▪ severe damage to a very limited number of structures
	▪ 'Moderate' means the property is not habitable or useable, but can be repaired – and 'moderate' can mean there was damage to a sizeable number (a quarter) of structures in the area
	▪ 'Severe' is defined as a total loss and a sizeable number of structures must be replaced

How much warning will you receive - options include:	▪ no warning ▪ several hours ▪ one day ▪ several days ▪ more than a week
How long will the hazard remain active - options included:	▪ less than one day ▪ one day ▪ two to three days ▪ four days to a week ▪ more than one week

How long will emergency operations continue - options included:	▪ less than one day ▪ one to two days ▪ three days to a week ▪ one to two weeks ▪ more than two weeks

Risk Assessment Data Collection and Analysis

In addition to the HAZNY, historical and statistical data of disaster occurrences and damages has been compiled, analyzed and included in this section. Sources primarily include records and data from the following sources.

- National Weather Service (NWS)
- National Climate Data Center (NCDC)
- U.S. Geological Survey (USGS)
- Federal Emergency Management Agency (FEMA)
- National Flood Insurance Program (NFIP)
- New York State Hazard Mitigation Plan (2011)
- Schoharie County Office of Community Development Services
- Schoharie County Emergency Management
- Schoharie County Soil and Water Conservation District (SWCD)
- New York Power Authority (NYPA)
- New York City Department of Environmental Protection (NYC DEP)
- New York State Department of Environmental Conservation (DEC)

3.2 Hazard Rankings

The HAZNY applies a numerical rating from 0 to 400 for each hazard based on the criteria noted in Section A above, and then ranks hazards in the following groups.

High Hazard	321 to 400
Moderately High Hazard	241 to 320
Moderately Low Hazard	161 to 240
Low Hazard	44 to 160

The Schoharie County HAZNY, updated for the 2018 Hazard Mitigation Plan, ranked the hazards as follows. Additional man-made hazards that were included in the THIRA analysis were applied using the HAZNY criteria and ratings, producing the consolidated rankings below.

Hazard definitions can be found in Appendix D4.

A HAZNY was performed for each individual jurisdiction, findings for which are available in the corresponding Jurisdiction Annex and Appendix B.

No hazards were ranked as a 'High Hazard' -- to be ranked a high hazard means that death and injury are likely in high numbers and the event would have widespread catastrophic impacts.

Two (2) hazards were ranked as 'Moderately High' – which means that death and injuries are likely and that damages and impacts could have severe consequences for the community. These would also be considered 'Hazards of Concern'.

Hazard	Rating	Rank	2013 Rating
FLOOD	296	Moderately High	304
ANIMAL DISEASE	265	Moderately High	155

The HAZNY ranked 20 hazards as 'Moderately Low' – which means the event poses significant risks for a community, particularly for locations or areas where it occurs; but widespread consequences and numerous deaths and injuries are not likely.

Hazard	Rating	Rank	2013 Rating
WINTER STORM (SEVERE)	239	Moderately Low	194
HURRICANE	232	Moderately Low	274
EPIDEMIC	223	Moderately Low	143
DAM FAILURE	212	Moderately Low	258
IMPROVISED NUCLEAR DEVICE (IND)	210	Moderately Low	182
DROUGHT	204	Moderately Low	164
SEVERE STORM	201	Moderately Low	237
UTILITY FAILURE	200	Moderately Low	215

WATER SUPPLY CONTAMINATION	178	Moderately Low	230
EXTREME TEMPS	172	Moderately Low	178
TRANS ACCIDENT	168	Moderately Low	211
EARTHQUAKE	166	Moderately Low	181
ICE STORM	165	Moderately Low	214
EXPLOSION	151	Moderately Low	210
IMPROVISED EXPLOSIVE DEVICE (IED)	151	Moderately Low	184
CYBER ATTACK	150	Moderately Low	227
MAJOR FIRE	134	Moderately Low	225
TORNADO	132	Moderately Low	189
HAZMAT (FIXED SITE)	128	Moderately Low	194
LANDSLIDE	128	Moderately Low	181
STRUCTURAL COLLAPSE	122	Moderately Low	175
OIL SPILL	120	Moderately Low	231
OTHER CBRNE ATTACKS	120	Moderately Low	205

Of the 20 hazards ranked as 'Moderately Low', the following were selected for inclusion in the HMP for the stated reasons:

- **Tornado** – the County has been impacted by a tornado as recently as 2013, after the County's previous HMP had been developed.
- **Winter Storm (Severe)** – the frequency of winter storms requires that the County consider mitigation actions to ease the constant impacts associated with the hazard.
- **Severe Storm** – similar to winter storms, the frequency of severe storms requires the County to consider mitigation actions to ease constant impacts.
- **Ice Storm** – similar to winter storms, the frequency of ice storms requires the County to consider mitigation actions to ease constant impacts.
- **Earthquake** – the County has been impacted by earthquakes in recent history, and while it is a moderately low risk, it can occur and poses a high potential magnitude of damage.
- **Dam Failure** – the presence of numerous dams within the County poses a high potential magnitude of damage, despite the low frequency of events.

The following 12 hazards were ranked as 'low' hazards – which are those having little chance of occurring, or if there is an event they are not expected to have a significant impact on the community.

Hazard	Rating	Rank	2013 Rating
WILDFIRE	178	Low	159
FOOD CONTAMINATION	201	Low	158
ICE JAM	158	Low	154
AIR CONTAMINATION	107	Low	152
FUEL SHORTAGE	135	Low	150
EPIDEMIC	223	Low	143
RADIOLOGICAL (IN TRANSIT)	122	Low	142
ACTIVE SHOOTER	164	Low	138
MINE COLLAPSE, CAVE FAILURE	114	Low	136
CAVING ACCIDENT	116	Low	132
FOOD SHORTAGE	126	Low	116

Hazards Likely to Occur Most Often

Flood	Animal Disease	Winter Storm

Hazards That Can Occur With Little or No Warning

Flood	Animal Disease	Dam Failure
Drought	Food Contamination	Improvised Nuclear Explosion
Severe Storm	Utility Failure	Water Supply Contamination
Wildfire	Extreme Temperatures	Transportation Accident
Earthquake	Terrorism	Active Shooter
Explosion	Cyber Attack	Improvised Explosive Device
Haz-Mat (In Transit and Fixed Site)	Fire	Tornado

Landslide	Structural Collapse	Oil Spill
Other CBRNE Attack	Caving Accident	Mine Collapse

Hazards That Pose The Greatest Threat To Life

Epidemic	Dam Failure	Transportation Accident
Terrorism		

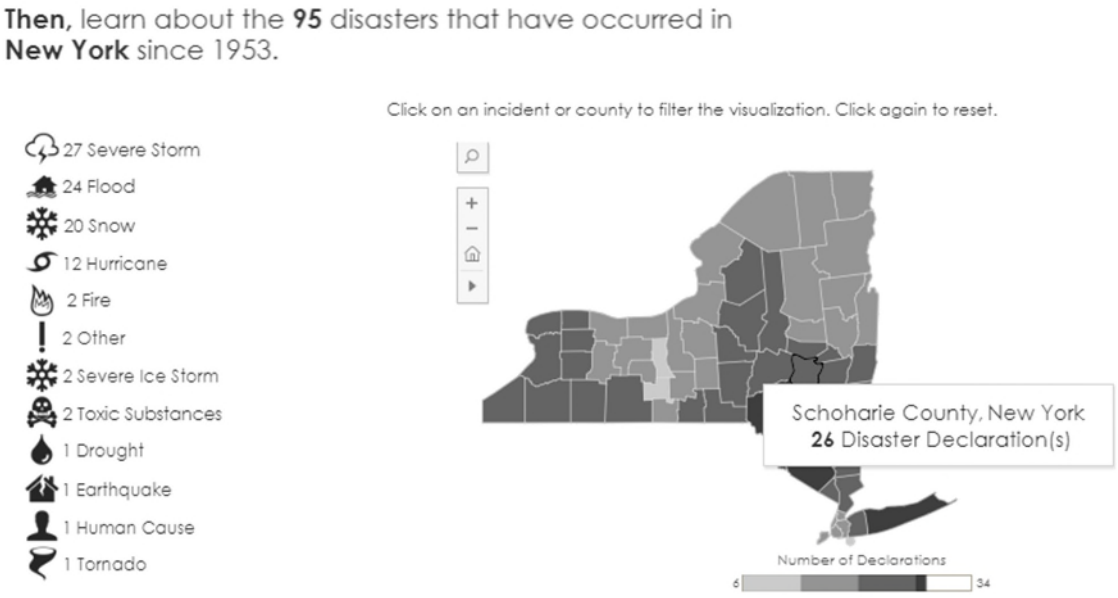
HAZNY Results for the Towns and Villages

Jurisdiction	Ranked Moderately High or High	
Blenheim	Flood HazMat – Fixed Site	Dam Failure Landslide
Broome (**None ranked above Moderately Low)**	Earthquake Severe Storm	Radiological – In Transit Hurricane
Carlisle	Drought	Cyber Attack
Cobleskill, T	Flood Hurricane Dam Failure Terrorism	HazMat – In Transit Oil Spill Severe Storm
Cobleskill, V		
Conesville	Flood	Dam Failure
Esperance, T	Flood Hurricane	Oil Spill
Esperance, V		
Fulton	Dam Failure	
Gilboa	Flood	Dam Failure
Jefferson (**None ranked above Moderately Low)**	Drought Utility Failure	Tornado Severe Storm
Middleburgh, T	Flood	Dam Failure
Middleburgh, V		
Richmondville, T	Dam Failure	Hurricane
Richmondville, V		
Schoharie, T	Flood Hurricane	Terrorism HazMat – In Transit
Schoharie, V		

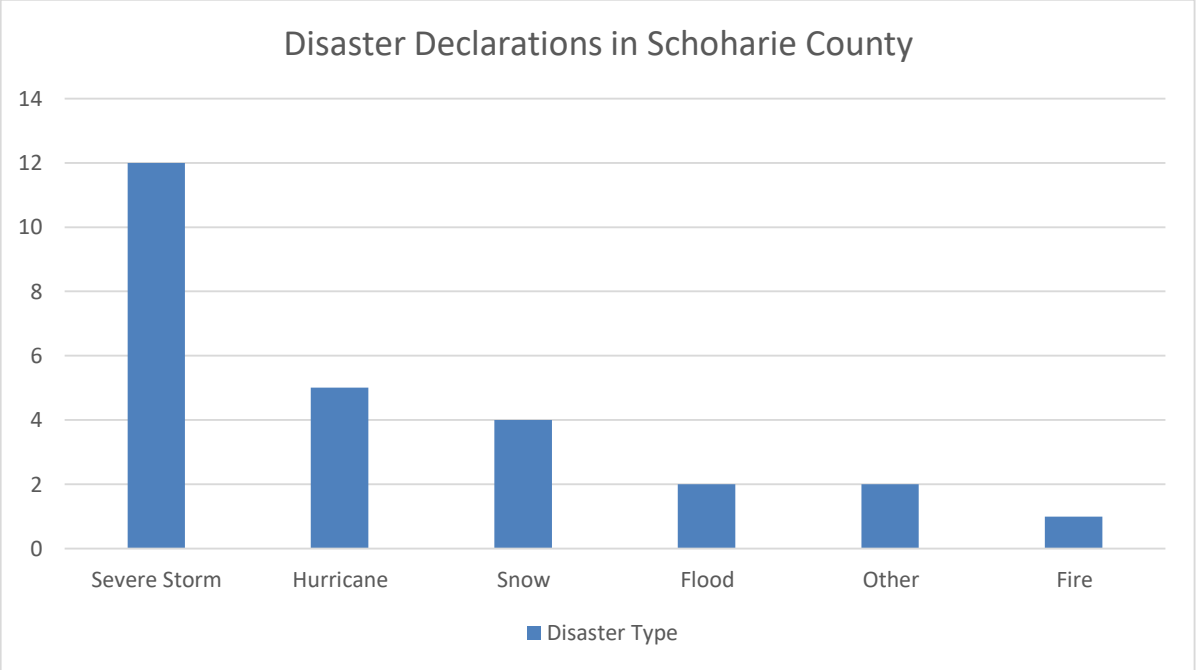
Jurisdiction	Ranked Moderately High or High	
	Dam Failure	Oil Spill
	Water Supply Contamination	Severe Storm
Seward	Flood	Severe Storm
Sharon	Drought	Cyber Attack
	Flood	Terrorism
Sharon Springs	Hurricane	HazMat – In Transit
	Dam Failure	
Summit	Severe Storm	
Wright	Flood	Dam Failure

3.3 Major Disaster Declaration History

Since 1953, Schoharie County has received twenty six (26) Disaster Declarations. The County's first declaration occurred in 1987, the most declarations occurred in 2011 (four declarations), and the most recent declaration occurred in 2017.



Ten (10) of these fifteen (15) federal disaster declarations were for flooding, three (3) for severe winter storms, one (1) for severe spring thunderstorms and one (1) for the 2003 northeast power outage.



Chapter 4 Hazard Profiles

Chapter 4 contains hazard profiles for the hazards of greatest concern to determine the potential impact of hazard to the people, economy, and built and natural environments of Schoharie County. They have been streamlined to increase the effectiveness and usability of the HMP.

4.1 General

A hazard profile follows for each of the six (6) natural hazards identified in Chapter 3 that were designated as 'Hazards of Concern'. A hazard profile is also included for one man-made hazard, Dam Failure, because it is a factor of potential risk and vulnerability for the County and could have dramatic flood consequences.

Profiled Hazards of Concern	
Flood	Tornado
Ice Storm	Dam Failure
Winter Storm	Severe Storm
Earthquake	Animal Disease

The risk assessment determined that these hazards pose a significant risk, or a serious occurrence could have major impacts for Schoharie County. The unique characteristics of each community have a significant influence on the severity or impacts of a particular hazard and how it will affect the area. For example, because Schoharie County is not densely populated and has abundant open space with modest development, hazards such as transportation accidents or winter storms have a largely different profile and impact than they would in an urban setting. In addition, hazards produce different kinds of effects as they vary in magnitude, duration or intensity. In the past, tornados in Schoharie County have been infrequent and of minimal impact, but Schoharie County could just as likely experience the kind of devastating tornados that have affected other New York communities. Geography, demographics, development, environmental, economic and other factors all impact how a hazard will affect Schoharie County. The hazard profiles examine these features to determine in what ways, and to what extent the hazard can impact Schoharie County.

Refer to Section 2 of each Jurisdiction Annex for additional hazard profile information for hazards specific to each participating jurisdiction.

4.2 Hazard Profile – Flood

Hazard	Previous Events	Likely Impacts	Probability of Future Event

Flood Definition: When water bodies, channels and natural drainage pathways overflow their capacities and cause significant damage and disruption. Impact Area: Countywide	88 flood events since 1996 13 had major and/or significant community impacts	Death and Injuries Property and structural damage Damage to roads, utilities, bridges, infrastructure Evacuations of residents and stranded victims Water rescue and other high risk response Breakdown of emergency communications Disruption of transportation Delayed access for emergency services Alteration of natural drainage patterns Damage to designed drainage systems Damage to flood protection systems Shelter, feeding and temporary housing Economic impacts, property value and tax losses Employment and business disruption and losses Damage to natural features and habitat Increased health risks Contamination and disease Water supply contamination Secondary hazardous materials exposure Threat to dams and secondary flooding Power outages	Average of 1 to 2 flood events each year in Schoharie County There is a 72% chance each year of having a flood with significant community impacts There is a 56% chance each year of a flood that will result in federal disaster declaration As many as 6 separate flood events occurred in a single year (1996), and there were 4 flood events in 2003 Some type of flooding has occurred in 14 of the past 18 years. No flooding was recorded in only 4 of these years (1997, 1999, 2002 and 2012)

		Increased demand for health/medical services Increased need for human and social services Disruption of home medical and care services Disrupted access for pharmacy and health needs Crisis counseling and mental health services Institutional threats; prisons, nursing homes, etc.	

Rebuilding Schoharie Creek bridge in the Town of Blenheim after the 2011 flooding

Photo: fema.gov

The National Climatic Data Center (NCDC) reports that eighty-eight (88) flood events have occurred in Schoharie County from 1996 to 2018. Thirteen (13) of these floods had damage and losses that were significant in scope, resulting in the organization of damage assessments and a major community response. Ten (10) resulted in federal disaster declarations. Seven (7) of the eleven (11) most serious floods on record were influenced by late winter snowmelt in combination with heavy precipitation.

See Appendix D6 for complete list of historic floods.

Schoharie County homeowners talk with a FEMA representative in 2011 about flood hazard mitigation improvements they can make to their property

Photo: fema.gov

Disaster Declarations for Flooding

As noted in Section III, Schoharie County has received ten (10) federal disaster declarations for flooding since 1954; the most recent in 2011. A federal disaster declaration is requested by the Governor and only available when there are extraordinary disaster impacts and the ability to recover from the disaster exceeds the resources and capabilities of the state and local government.

Only four (4) counties in New York State have received more federal disaster declarations for flooding than Schoharie.

Delaware County (15)	Ulster County (12)
Allegany County (11)	Sullivan County (11)

Four (4) other counties in New York have received the same number of federal disaster declarations (10) for flooding.

Broome County	Steuben County
Montgomery County	Tioga County

Schoharie County is among 15% of New York's 62 counties that have received the highest number of federal disaster declarations for flooding. 53 other counties (85%) have received fewer declarations for flooding.

About 3 in 10 of all recorded flood events in Schoharie County, or 34%, were eligible to receive a federal disaster assistance declaration. Of the 13 most significant flood events where damage assessments were performed, 10 of the 13 resulted in approved federal disaster declarations for flooding.

Post-flood streambank stabilization work on Schoharie Creek – 2011 photo: fema.gov

Areas of Flood Risk

This is a general description of areas of greatest concern and at risk for flooding. This section provides a broad view of areas of the County most susceptible to flooding and is included to assist with hazard planning. It does not include all high-hazard flood zones and does not provide the kind of detail needed to determine if any particular site or property is at risk to flooding. Refer to FEMA Flood Insurance Rate Maps (FIRM) available online at fema.gov, or at local town and village planning office, to determine if specific sites or properties are in a flood zone. This list addresses flood threats associated with recognized creeks, streams and waterways and does not include areas susceptible to landslide or steep slope failure during heavy rains.

Schoharie Creek Watershed

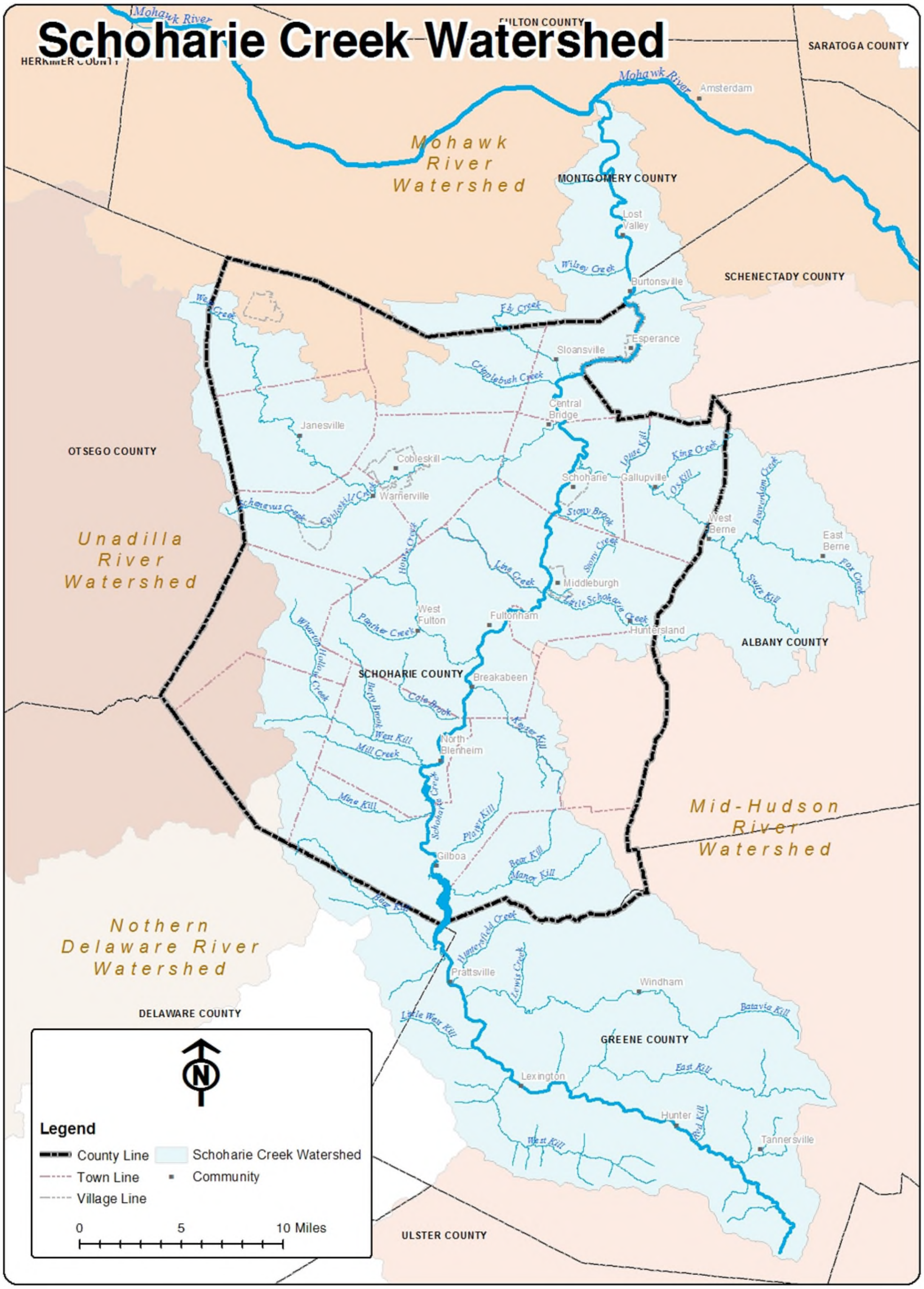
The following map outlines the area and boundary of the Schoharie Creek watershed, which is the largest and highest profile flood threat range in Schoharie County. The Schoharie Creek watershed spans approximately 950 square miles and includes portions of both Schoharie and Greene counties. The watershed drains a portion of the Catskill Mountains, with headwaters in

Greene County that flow northward into Schoharie; then it collects more runoff along the way as the creek travels the south to north length of the county before exiting to the Mohawk River through Montgomery County. The Schoharie Creek valley and basin are the area most frequently exposed to flooding, and the villages and hamlets along the course of the creek – including Gilboa, Blenheim, Fulton, Middleburgh, Schoharie and Esperance - are most vulnerable to flood impacts and losses.

The southern portion of the Schoharie Creek includes two reservoir-dam systems; the Blenheim-Gilboa dam and reservoir maintained by the New York Power Authority (NYPA), where they operate a hydro-electric power generation facility; and the Schoharie Reservoir, which is maintained by the City of New York, Department of Environmental Protection (NYC DEP) as part of the City's public water supply system. The dams and reservoirs are not operated or used as flood control structures and all excess flow exceeding peak capacities are passed downstream into the Schoharie Creek. The reservoir-dam systems do play an important role in aiding flood forecasting and warning for downstream areas of the Schoharie Creek. Schoharie County emergency officials work closely with NYPA and NYC DEP to monitor water levels and rates of rising water at the reservoirs to evaluate potential flood threats and downstream impacts. Minor flooding will occur in the floodplains downstream when flows at the Blenheim-Gilboa pump station are approximately 10,000 cubic feet per second (cfs), evacuations are usually initiated at 14,000 cfs and major flooding will occur when flows exceed 20,000 cfs.

As demonstrated by the Schoharie Creek flood-of-record in 2011, widespread flooding in the Schoharie watershed can also occur on many of the feeder streams and tributaries that flow to the main creek channel. The supply from these tributaries is also a significant additional source of watershed runoff that adds to downstream flood risks. The After-Action Report and Improvement Plan prepared after the 2011 flooding identified Fox Creek-Warner's Lake, West, Cobleskill, Fly, Little Schoharie, Manner Kill and Line Creeks as areas where tributary flooding occurred and should be targeted for future monitoring.

The higher elevations and steep slopes across the southern and western portions of Schoharie County are generally characterized by sparse population, less development and dense natural growth -- but property owners at some scattered sites, even far above the creek basins and floodplains, must still be mindful that heavy rains can sometimes result in hillside flooding where sheets of water from intense storms wash down steep embankments. Even when the heavy rains do not prompt erosion and landslides, a wall of swiftly moving water can severely damage hillside structures, particularly where there are open spaces, ridges and natural collection swales or gullies above.


Schoharie Creek Watershed
Mohawk River Watershed
Unadilla River Watershed
Mid-Hudson River Watershed
Northern Delaware River Watershed
FULTON COUNTY
SARATOGA COUNTY
HERKIMER COUNTY
MONTGOMERY COUNTY
SCHENECTADY COUNTY
OTSEGO COUNTY
SCHOHARIE COUNTY
ALBANY COUNTY
DELAWARE COUNTY
GREENE COUNTY
ULSTER COUNTY
Amsterdam
Lost Valley
Burtonsville
Esperance
Sloansville
Central Bridge
Janesville
Cobleskill
Warnerville
Schoharie
Gallupville
West Berne
East Berne
Middleburgh
West Fulton
Fultonham
Huntersland
Breakabeen
North Blenheim
Gilboa
Prattsville
Windham
Lexington
Hunter
Tannersville
Mohawk River
Schoharie Creek
Legend
County Line
Schoharie Creek Watershed
Town Line
Community
Village Line
0
5
10 Miles

Other Schoharie County Areas of Flood Risk

The map on the next page outlines floodplain risk zones in various areas of Schoharie County, including those outside the Schoharie watershed. In 2001, floods and inadequate stormwater drainage caused flooding in the Village of Sharon Springs resulting in flooding along route 20 and approximately $20,000 in property damage. A small area in the southeast of the County is drained by Charlotte Creek which flows west to the Susquehanna River, although population densities are low and intermittent flooding in this sector results in fewer problems. In the eastern part of the County, the Catskill Creek drains east to the Hudson River and flood problems sometimes occur near Franklinton in the Town of Broome. Fox Creek can cause flooding in the Town of Wright.

Cobleskill and West Creeks are tributaries to the Schoharie Creek, but extend into the central-northwest area of the County where they run through Sharon and Seward and can result in flooding in the more densely populated communities near Richmondville and Cobleskill.

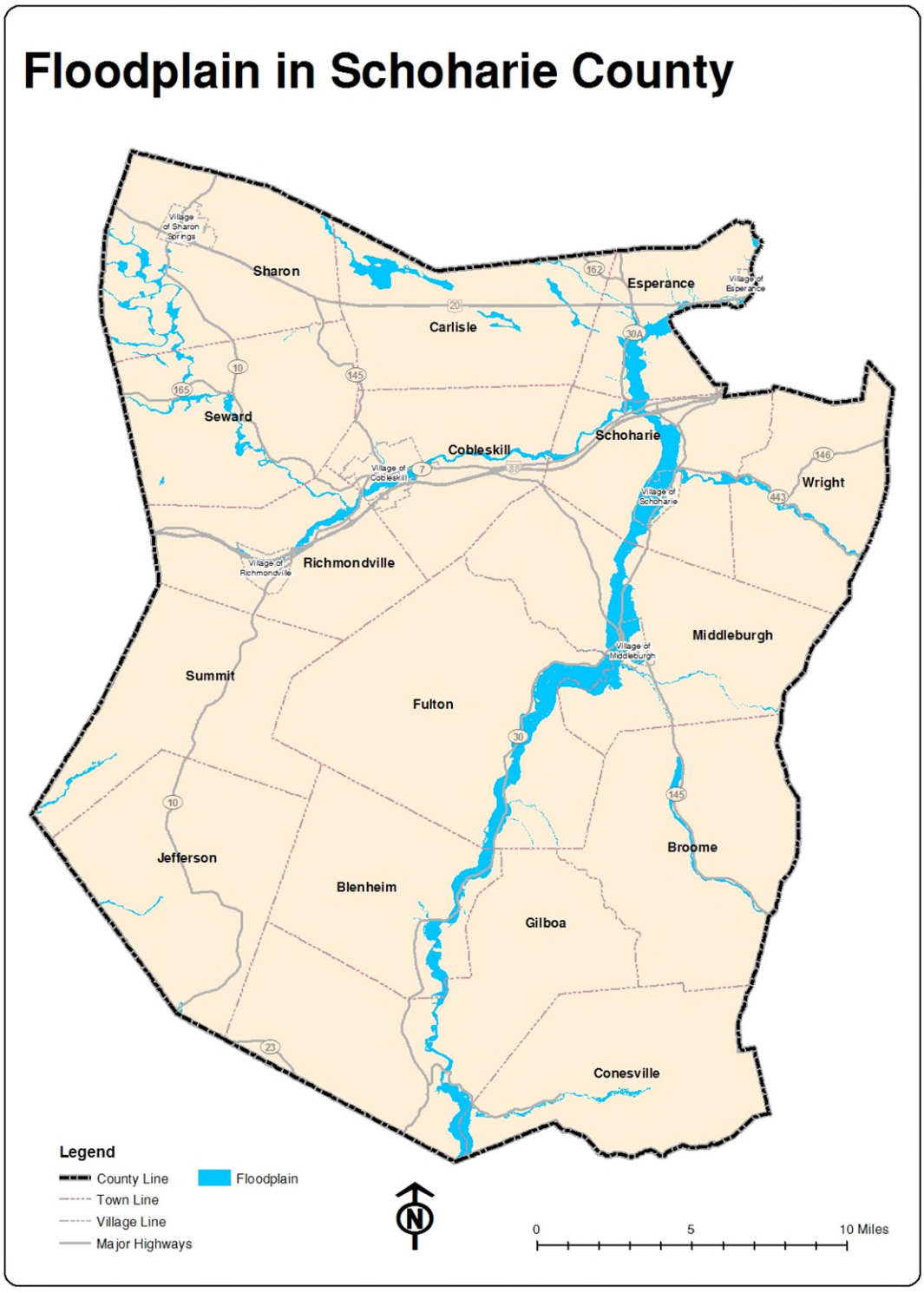
West Creek floods Main St., Cobleskill – Hurricane Irene 2011

Photo: Episcopal Diocese of Albany

Catskill Creek Watershed flows to the Hudson River from the Towns of Broome and Conesville

Flood debris on bridge over Fox Creek in the Town of Wright

Photo: Schoharie County Sheriff


Floodplain in Schoharie County
Village of Sharon Springs
Sharon
Esperance
Village of Esperance
Carlisle
Seward
Cobleskill
Village of Cobleskill
Schoharie
Village of Schoharie
Wright
Richmondville
Village of Richmondville
Middleburgh
Village of Middleburgh
Summit
Fulton
Jefferson
Blenheim
Gilboa
Broome
Conesville
Legend
County Line
Town Line
Village Line
Major Highways
Floodplain
N
0
5
10 Miles

4.3 Hazard Profile – Tornado

Hazard	Previous Events	Likely Impacts	Probability of Future Event
Tornado Definition: F1 or greater, confirmed by NWS Impact Area: Countywide Greater vulnerability for villages and populated areas	3 Tornados 1950-2013 2 F1 1 F3*	Property damage Infrastructure, utility damage Deaths, injuries Power outages, electrical hazards Debris – flying, dense accumulation Transportation disruption Strain on medical services Disruption of services Temporary housing School and business closings Economic impacts Mental health/crisis counseling	There is a 6% chance each year of an **F1** or greater tornado in Schoharie County There is a 1% to 2 % chance each year of an **F3** tornado in Schoharie County Statewide: it can be expected that 1 or 2 **F2** tornados will occur each year somewhere in the state There is a 10% chance each year that an **F4** tornado will occur somewhere in upstate New York

Tornado – Fujita Scale

Enhanced Fujita Scale Source: NOAA National Climatic Data Center			
Scale	Wind Speed	Description	Typical Damages
F0	40-72 mph	- Gale - Light Damage	Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; signboards damaged.

F1	73-112 mph	- Weak - Moderate Damage	Peels surface off roofs, mobile homes pushed off foundations or overturned, moving autos blown off roads.
F2	113-157 mph	- Strong - Considerable Damage	Peels surface off roofs; mobile homes pushed off foundations or overturned, moving autos blown off roads.
F3	158-206 mph	Severe Damage	Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.
F4	207-260 mph	Devastating Damage	Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown and large missiles generated.
F5	261-318 mph	Incredible Damage	Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 meters (109 yds); trees debarked; incredible phenomena will occur.

Schoharie County Tornado History

3 Tornados were reported in Schoharie County, New York between 01/01/1950 and 105/28/2018

Source: NOAA National Climatic Data Center

Mag: Magnitude
Dth: Deaths
Inj: Injuries
PrD Property Damage

Location or County	Date	Type	Mag	Dth	Inj	PrD
2 Carlisle and Schoharie	07/10/1989	Tornado	F4*	0	20	25 Million
3 SCHOHARIE	05/2/1992	Tornado	F1	0	0	250K

4 Jefferson	05/29/2013	Tornado	F1	0	0	Minor

The most destructive tornado in Schoharie County was an F3 on July 10, 1989 that made a 12-mile path through Carlisle and Schoharie. It caused $25 million in damages to 20 homes and local facilities and injured 20 people. An F1 tornado occurred on May 2, 1992, causing $250,000 in damages, and another F1 tornado on May 29, 2013 in the Town of Jefferson damaged trees in rural areas near Dutch Hill and Wharton Hollow Roads, but no property losses were reported.

* Note: The July 1989 tornado was originally classified as an F3 tornado and later reassigned an F4. Tornados are largely classified by wind speed, which may vary over the course of the storm, and there is also some variation in transitioning data from the original Fujita Scale to the current 'Enhanced' Fujita Scale. NWS and the NYS Hazard Mitigation Plan both list the 1989 tornado as an F4, but most local observers and many reports note that the impacts on the ground were more consistent with the description used for an F3 tornado.

Tornados are the most violent storms on earth and wind speeds can exceed 200 mph. Tornados are usually associated with thunderstorms, but it is common for tornados to form and strike with little or no warning. New York State ranks 30th in tornado frequency compared to other states; over 350 tornados have occurred in New York since 1952 and averages of five (5) tornados occur every year. And contrary to most beliefs, hills and mountains offer no protection from tornados.

Early warning capabilities and moving people to well-designed shelters are important for tornado preparedness, and improved structural standards and building practices are essential for effective tornado resistance. The NYS Building Code requires that structures be built to withstand 90 mph winds, and beginning in 2003, structures that pose a higher hazard to human life were required to meet a more stringent standard.

F2 and Greater Tornados in New York State

Tornados in New York State – F2 and Greater – 1950 thru 2009		
Scale	**Number**	**Location**
F2	78	Statewide
F3	24	Statewide
F4*	6	Columbia, Chautauqua, Montgomery, **Schoharie**, Albany, Green
F5	0	None

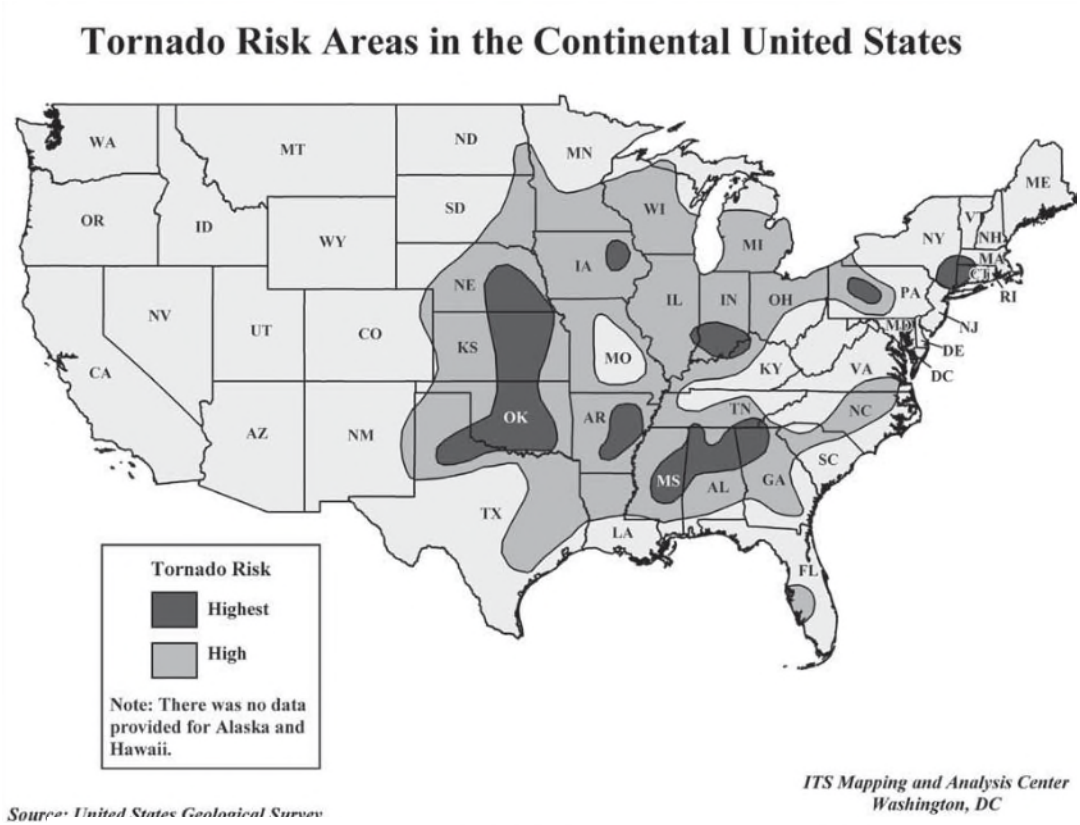
Source: NOAA National Climatic Data Center

Residential damage in Schoharie County from the 1989 tornado

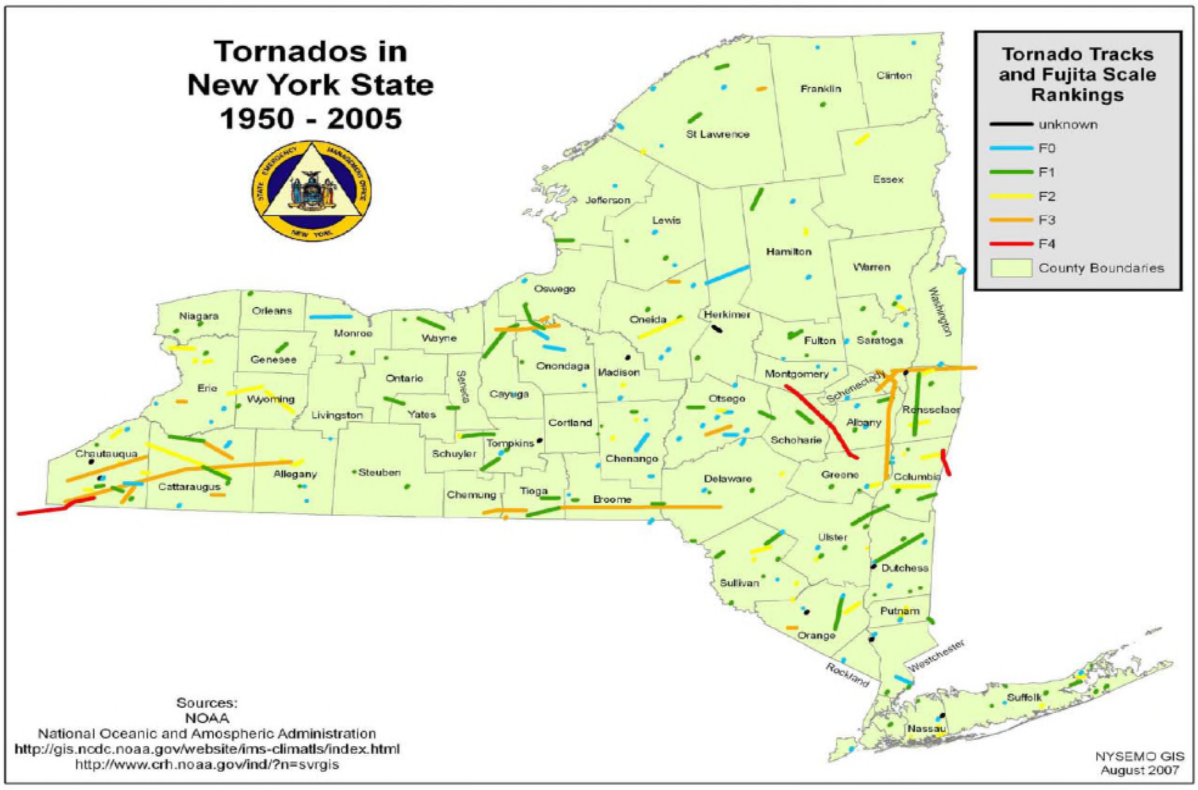
Path of the July 1989 F3 Tornado

Source: TornadoHistoryProject.com

Tornado Risk Areas in the Continental United States



Source: United States Geological Survey



4.4 Hazard Profile – Severe Winter Storm

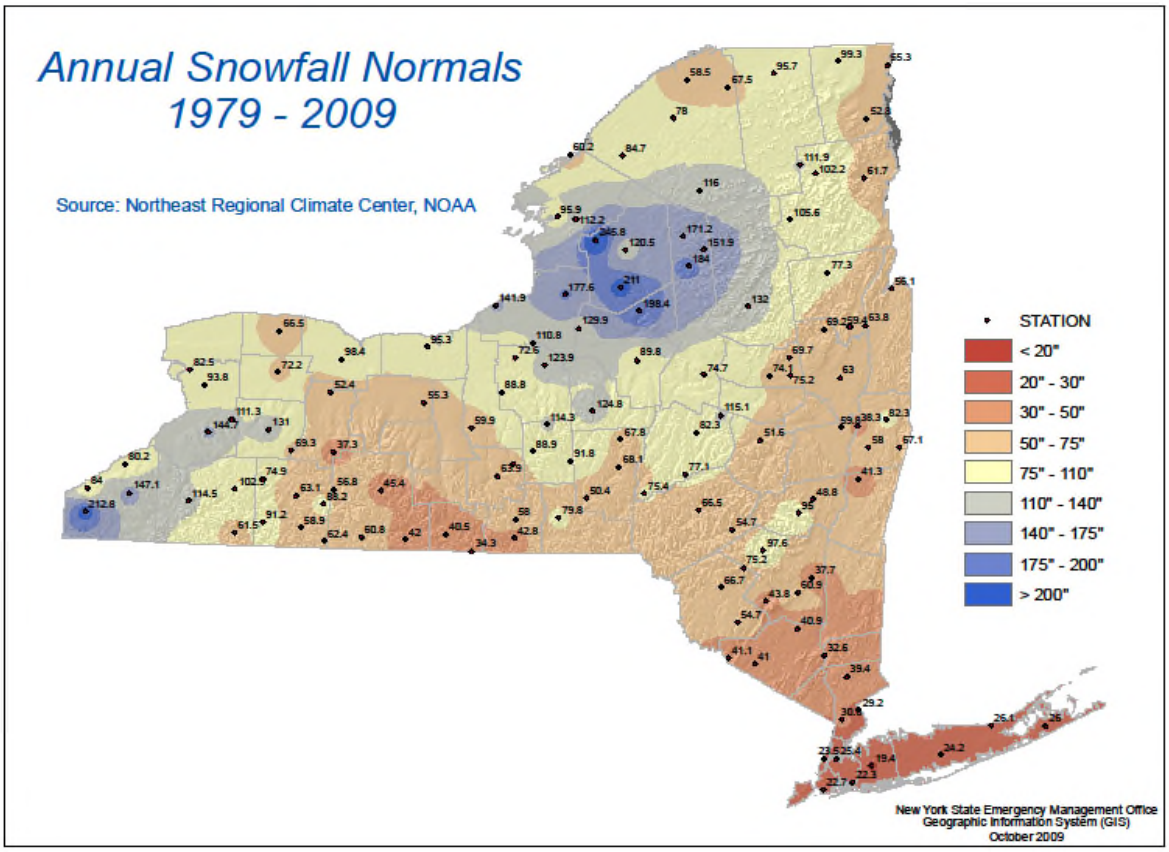
Hazard	Previous Events	Likely Impacts	Probability of Future Event
Severe Winter Storm Definition: Severe and/or sustained hazardous winter weather that poses a threat to life and/or property; including any, or a combination of the following: heavy snow, blowing snow, blizzard, freezing rain, sleet, and strong winds. Impact Area: Countywide	55 events from 1996 to 2018 15 had reported property damage	Transportation and road disruption/closings School, business and government disruption/closings Increased traffic accidents, including injuries and deaths Health and medical injuries, emergencies and deaths Disruptions/delays in fire, medical, and safety services Delays/disruption in scheduled medical services Difficulties and disruption with pharmaceutical Supplies Roof and structural damage, collapse Stranded motorists, citizens, travelers Power outages and heating disruptions Need for shelters, warming centers, food and transportation Food, lodging and services for critical workers Downed/suspended/unsafe trees, limbs and wires Abandoned vehicles Public access hazards for schools, medical facilities, etc. Generator and power support issues Carbon monoxide hazards Extended snow and ice maintenance, operations and materials	Average 3 severe winter storms each year

Weather Channel forecast map for the December 2008 Snowstorm

From 1996 to 2018, the National Weather Service has recorded fifty-five (55) winter storm events in Schoharie County. Fifteen (15) of these winter storms were of notable significance and prompted a community-wide response and resulted in property damage. The most severe damage was reported in the winter storm of March 31, 1997, when $500,000 in property damage was reported. Repeated severe snow storms in December 2002 through January 2003 resulted in Schoharie County and local governments receiving $380,000 in federal snow emergency assistance to help with the cost of snow removal. Reports of private property damage in each of the 13 other most severe storms averaged approximately $10,000, although local government snow removal expenses were not included in these figures.

Eastern New York is vulnerable to storms known as “Nor’easters”. These storms usually form off the East Coast near the Carolinas then follow a track northward along the coast until they blow out to sea, hence the term “Northeaster”. Occasionally these storms are large enough to encompass almost the entire state. One such storm was the Blizzard of 1993. Most often, however, Nor’easters affect primarily eastern and southern New York. Nor’easters are most notable for snow accumulations in excess of nine (9) inches, accompanied by high, sometimes gale force, winds. Major property damage and power outages are not uncommon.

See Appendix D6 for complete list of historic winter storms.



The NYS Hazard Mitigation rated local snow storm vulnerability by assigning factors and data for average snowfall, the potential for extreme snowfall events, federally declared snow emergencies and population density.

Counties Most Threatened by Snow and Vulnerable to Snow Loss - South Central NY

County	Rating Score (Max 25)	Annual Average Snowfall (inches)	*Extreme Snowfall Potential (no/yes)	# of Snow Related Disasters	Population Density (per square mile)	Total # of Structures (HAZUS)
Warren	9	75.6	no	1	68	26234
Herkimer	9	140.4	yes	2	44.2	22928
Montgomery	9	87.1	no	2	121.2	14829

Otsego	9	85.5	no	2	60.8	21815
Schoharie	9	71.3	no	3	56.1	12026
Steuben	8	54.8	no	1	70.3	34710
Washington	8	62.5	no	2	72.6	20361
Cortland	7	95	no	1	97	13599
Essex	7	87.7	no	1	21.2	17157
Hamilton	7	129.2	yes	1	3	6252
Schuyler	7	53.9	no	1	85.4	7378
Tioga	7	61.5	no	1	99.1	17232
Allegany	6	68.4	no	1	48.2	18096
Yates	6	56.5	no	1	65.5	9542
Seneca	5	58.7	no	1	40.6	11423

	Rating Score	Annual Average Snowfall (inches)	Extreme Potential (no/yes)	# of Snow Related Emergencies or Disasters	Population Density (per square mile)	Total # of Structures
Rating Score – Variables Distributions and Point Values	score value 1	1-40 inches		1	1 – 49	1-17K
	score value 2	41-70 inches	Yes	2	50 – 99	18-24K
	score value 3	71-100 inches		3	100 –299	25-40K
	score value 4	101-140 inches		4	300 – 1999	41-80K
	score value 5	141 + inches		5+	2000 – 67,000	81-462K

Extreme snowfall potential areas: The analysis identified counties with extreme snowfall potential as they fit into 2 general categories as follows; 1. Those areas that are historically vulnerable to persistent heavy Lake Effect/Enhanced snow from Lakes Erie and Ontario and those with elevation and latitude snow vulnerability. Counties in these classification include; Erie, Cattaraugus, and Chautauqua counties lee of Lake Erie. Oswego, Jefferson Lewis, Onondaga, Madison, Oneida, and Herkimer, lee of Lake Ontario. Hamilton, also lee of Lake Ontario, is also in an area categorized as potentially vulnerable to extreme snow enhanced by elevation and/or latitude as are St. Lawrence and Franklin counties.

*Sources: National Climatic Data Center NCDC average snowfall data, FEMA disaster declaration data, and HAZUS. Analysis supported by GIS technology.

4.5 Hazard Profile – Severe Storm

Hazard	Previous Events	Likely Impacts	Probability of Future Event
Severe Storm Definition: A thunderstorm that can produce tornados, lightning and hail with winds of 58 mph or more Impact Area: Countywide	68 storms from 1996 to 2018	Flash Flooding Drainage systems over-capacity Structural damage Downed trees, limbs, wires and utility poles Power outages Scattered, dense debris Deaths and injuries Electrical hazards Transportation and road disruption/closings Increased traffic accidents and injuries	Average is 2 to 3 severe storms each year in Schoharie County Chances are about one-half (50%) that a severe storm will result in multiple property

		Health and medical injuries, emergencies and deaths Disruptions/delays in fire, medical, and safety services Food, lodging and services for critical workers Generator and power support issues Carbon monoxide exposure and chain saw injuries	damage reports

The NOAA National Climatic Data Center reports that sixty-eight (68) severe storms have occurred in Schoharie County from 1996 to 2018. Property damage was reported in 24 of these storms. The most severe were a July 3, 1997 storm that affected Charlotteville and Middleburgh, an August 13, 1999 storm in Esperance and May 18, 2000 storms in Schoharie, Jefferson and Gilboa, where reported private property damage approached or exceeded $100,000 in each storm. Thunderstorms across Schoharie County on June 15, 2013 produced flash flooding, stranded motorists and forced school children to remain at school. Three (3) inches of heavy rain in a short time overwhelmed drainage systems, damaged culverts and roads and a State of Emergency was declared for the villages of Middleburgh and Schoharie. This event caused over $1,000,000 in damages to the Town and Village of Middleburgh

Thunderstorm Flash Flooding in Schoharie County, June 15, 2013

Photo Credit: Cindy Schultz / Times Union; examiner.com

Strong and violent winds in thunderstorms are referred to by several different names depending on the storm's features; including straight-line winds, downbursts, microbursts and derecho. Strong winds in thunderstorms often originate high in the atmosphere and are carried to the

earth's surface in downdrafts of rain-cooled air. Thunderstorm winds can exceed 100 mph and cause damage equal to a tornado.

Thunderstorm Wind and Damage Characteristics	
Straight-Line Winds	High velocity winds in a single direction across a wide area. High wind warnings are issued when winds reach 58 mph.
Downburst	Local currents of air that blast down from thunderstorms and shear or change direction near the ground, producing outward bursts of violent winds extending in all directions. The sharp downward and outward wind pattern differs from the linear path and circular pattern associated with tornado winds. Downburst winds can exceed 150 mph.
Microburst	A term used to describe the size of a downburst. Microbursts are downbursts where the damaging wind extends out to 2.5 miles from the downburst; a macro-burst extends more than 2.5 miles from the downburst.
Derecho	A derecho is a widespread, long-lived storm associated with a band of rapidly moving thunderstorms that produce strong straight-line winds. To be classified a derecho, a storm must have a wind damage swath that extends more than 240 miles and wind gusts of 58 mph or greater along most of its length.
Supercell Thunderstorm	Supercell thunderstorms are a special kind of highly organized single cell thunderstorm that can persist for many hours. Supercells are characterized by veering and turning updraft winds that produce storm-scale rotation that can reach more than 100 mph. They are responsible for nearly all of the significant tornadoes produced in the U.S. and for most of the hailstones larger than golf ball size. Supercells are known to produce extreme winds and flash flooding.
Tornado	A violent column of rotating air extending from a storm cloud that makes contact with the surface of the earth. Usually associated with severe thunderstorms, tornados are the most destructive of all atmospheric phenomena. Multiple tornados can form in a single storm; some might touch ground only briefly, while the most damaging can leave a destructive path for miles. Tornado winds can exceed 200 mph and the damage pattern affecting trees and debris on the ground will show its circular rotation.

68 Severe Storm event(s) were reported in Schoharie County between 1/01/1996 and 7/28/2018

Source: NOAA National Climatic Data Center

Mag: Magnitude
Dth: Deaths
Inj: Injuries
PrD: Property Damage

Location	Date(s)	Type	Mag	Dth	Inj	PrD*
COUNTYWIDE	01/19/1996	Thunderstorm Wind		0	0	10.00K
LAWYERSVILLE	05/10/1996	Thunderstorm Wind		0	0	5.00K
SUMMIT				0	0	10.00K
SCHOHARIE				0	0	10.00K
ESPERANCE				0	0	10.00K
COBLESKILL	07/26/1996	Thunderstorm Wind		0	0	2.00K
COBLESKILL				0	0	2.00K
JEFFERSON	02/22/1997	Thunderstorm Wind		0	0	4.00K
CHARLOTTEVILLE	07/03/1997	Thunderstorm Wind		0	5	100.00K
MIDDLEBURG				0	0	4.00K
MIDDLEBURG	07/15/1997	Thunderstorm Wind		0	0	2.00K
CENTRAL BRIDGE	05/29/1998	Thunderstorm Wind		0	0	2.00K
SCHOHARIE	05/31/1998	Thunderstorm Wind		0	0	10.00K
NORTH BLENHEIM				0	0	8.00K
MIDDLEBURG				0	0	10.00K
RICHMONDVILLE				0	0	20.00K
BREAKABEEN				0	0	15.00K
SCHOHARIE				0	0	15.00K
COBLESKILL	06/29/1998	Thunderstorm Wind		0	0	4.00K
MIDDLEBURG	07/20/1998	Thunderstorm Wind		0	0	5.00K
CARLISLE	09/07/1998	Thunderstorm Wind		0	0	10.00K
SHARON				0	0	2.00K
COBLESKILL	09/26/1998	Thunderstorm Wind		0	0	1.00K
COBLESKILL	07/03/1999	Thunderstorm Wind		0	0	1.00K
SUMMIT	07/04/1999	Thunderstorm Wind		0	0	3.00K

Location	Date(s)	Type	Mag	Dth	Inj	PrD*
COBLESKILL	07/06/1999	Thunderstorm Wind		0	0	2.00K
COBLESKILL				0	0	3.00K
ESPERANCE	08/13/1999	Thunderstorm Wind		0	0	100.00K
GILBOA	05/18/2000	Thunderstorm Wind		0	0	15.00K
JEFFERSON				0	0	22.00K
CONESVILLE				0	0	55.00K
ESPERANCE	06/02/2000	Thunderstorm Wind		0	0	35.00K
CHARLOTTEVILLE	09/21/2000	Thunderstorm Wind		0	0	13.00K
RICHMONDVILLE	05/31/2002	Thunderstorm Wind		0	0	17.00K
COBLESKILL				0	0	15.00K
MIDDLEBURG				0	0	9.00K
CHARLOTTEVILLE	06/05/2002	Thunderstorm Wind		0	0	22.00K
COBLESKILL				0	0	7.00K
GALLUPVILLE	08/16/2002	Thunderstorm Wind		0	0	5.00K
MIDDLEBURG	07/21/2003	Thunderstorm Wind	60 kts. ES	0	0	1.00K
SCHOHARIE				0	0	1.00K
RICHMONDVILLE	04/18/2004	Thunderstorm Wind	60 kts. EG	0	0	0.00K
MIDDLEBURG	05/23/2004	Thunderstorm Wind	60 kts. EG	0	0	0.00K
MIDDLEBURG	05/24/2004	Thunderstorm Wind	60 kts. EG	0	0	0.00K
DORLOO				0	0	0.00K
JEFFERSON	06/09/2004	Thunderstorm Wind	60 kts. EG	0	0	0.00K
MIDDLEBURG	08/20/2004	Thunderstorm Wind	60 kts. EG	0	0	0.00K
JEFFERSON	06/06/2005	Thunderstorm Wind	60 kts. EG	0	0	0.00K
NORTH BLENHEIM				0	0	10.00K
NORTH BLENHEIM	07/22/2005	Thunderstorm Wind	60 kts. EG	0	0	0.00K
SHARON	09/29/2005	Thunderstorm Wind	60 kts. EG	0	0	0.00K
MIDDLEBURG				0	0	0.00K
MIDDLEBURG	02/17/2006	Thunderstorm Wind	71 kts. MG	0	0	0.00K
CARLISLE	05/30/2006	Thunderstorm Wind	60 kts. EG	0	0	0.00K
NORTH BLENHEIM				0	0	0.00K
MIDDLEBURG	07/03/2006	Thunderstorm Wind	60 kts. EG	0	0	0.00K
MIDDLEBURG	09/24/2006	Thunderstorm Wind	60 kts. EG	0	0	0.00K

Location	Date(s)	Type	Mag	Dth	Inj	PrD*
JEFFERSON	06/27/2007	Thunderstorm Wind	50 kts. EG	0	0	0.00K
CHARLOTTEVILLE	08/25/2007	Thunderstorm Wind	50 kts. EG	0	0	0.00K
JEFFERSON				0	0	0.00K
SHARON				0	0	0.00K
MIDDLEBURG	09/09/2007	Thunderstorm Wind	50 kts. EG	0	0	0.00K
JEFFERSON	05/31/2008	Thunderstorm Wind	50 kts. EG	0	0	0.00K
SCHOHARIE	06/10/2008	Thunderstorm Wind	50 kts. EG	0	0	0.00K
LIVINGSTONVILLE				0	0	0.00K
SCHOHARIE	07/18/2008	Thunderstorm Wind	50 kts. EG	0	0	0.00K
CENTRAL BRIDGE				0	0	0.00K
RICHMONDVILLE	05/04/2010	Thunderstorm Wind	50 kts. EG	0	0	0.00K
MIDDLEBURG	06/06/2010	Thunderstorm Wind	50 kts. EG	0	0	0.00K
COBLESKILL				0	0	0.00K
GILBOA	06/06/2010	Thunderstorm Wind	50 kts. EG	0	0	0.00K
CARLISLE				0	0	0.00K
JEFFERSON	07/17/2010	Thunderstorm Wind	50 kts. EG	0	0	0.00K
SLOANSVILLE	08/19/2010	Thunderstorm Wind	50 kts. EG	0	0	0.00K
				0	0	0.00K
MIDDLEBURG	04/28/2011	Thunderstorm Wind	50 kts. EG	0	0	0.00K
SUMMIT	05/26/2011	Thunderstorm Wind	50 kts. EG	0	0	0.00K
SHARON SPGS				0	0	0.00K
MIDDLEBURG				0	0	0.00K
SCHOHARIE				0	0	0.00K
LEESVILLE	07/26/2011	Thunderstorm Wind	50 kts. EG	0	0	0.00K
SEWARD				0	0	0.00K
MIDDLEBURG				0	0	0.00K
RICHMONDVILLE	09/08/2012	Thunderstorm Wind	50 kts. EG	0	0	0.00K
SCHOHARIE				0	0	0.00K
RICHMONDVILLE	5/22/2013	Thunderstorm Wind	50 kts. EG	0	0	0.00K
WARNERVILLE	5/22/2013	Thunderstorm Wind	60 kts. EG	0	0	0.00K
SCHOHARIE	5/29/2013	Thunderstorm Wind	50 kts. EG	0	0	0.00K
JEFFERSON	5/29/2013	Thunderstorm Wind	50 kts. EG	0	0	0.00K

Location	Date(s)	Type	Mag	Dth	Inj	PrD*
LEESVILLE	9/11/2013	Thunderstorm Wind	50 kts. EG	0	0	0.00K
CARLISLE	9/11/2013	Thunderstorm Wind	50 kts. EG	0	0	0.00K
SOUTH GILBOA STN	10/7/2013	Thunderstorm Wind	50 kts. EG	0	0	0.00K
SUMMIT	7/2/2014	Thunderstorm Wind	50 kts. EG	0	0	0.00K
RICHMONDVILLE	7/2/2014	Thunderstorm Wind	50 kts. EG	0	0	0.00K
SCHOHARIE	7/2/2014	Thunderstorm Wind	64 kts. MG	0	0	0.00K
SCHOHARIE	7/2/2014	Thunderstorm Wind	60 kts. EG	0	0	0.00K
COBLESKILL	7/7/2014	Thunderstorm Wind	50 kts. EG	0	0	0.00K
BARNERVILLE	7/7/2014	Thunderstorm Wind	50 kts. EG	0	0	0.00K
CARLISLE	7/7/2014	Thunderstorm Wind	50 kts. EG	0	0	0.00K
SCHOHARIE	7/9/2014	Thunderstorm Wind	50 kts. EG	0	0	0.00K
JEFFERSON	6/12/2015	Thunderstorm Wind	50 kts. EG	0	0	0.00K
SUMMIT	6/12/2015	Thunderstorm Wind	50 kts. EG	0	0	0.00K
COBLESKILL	7/19/2015	Thunderstorm Wind	50 kts. EG	0	0	0.00K
SCHOHARIE	7/19/2015	Thunderstorm Wind	50 kts. EG	0	0	0.00K
MIDDLEBURG	7/19/2015	Thunderstorm Wind	50 kts. EG	0	0	0.00K
NORTH BLENHEIM	6/21/2016	Thunderstorm Wind	50 kts. EG	0	0	0.00K
JEFFERSON	7/1/2016	Thunderstorm Wind	50 kts. EG	0	0	0.00K
FULTONHAM	7/1/2016	Thunderstorm Wind	50 kts. EG	0	0	0.00K
MIDDLEBURG	7/1/2016	Thunderstorm Wind	50 kts. EG	0	0	0.00K
RICHMONDVILLE	7/18/2016	Thunderstorm Wind	50 kts. EG	0	0	0.00K
LEESVILLE	8/13/2016	Thunderstorm Wind	50 kts. EG	0	0	0.00K

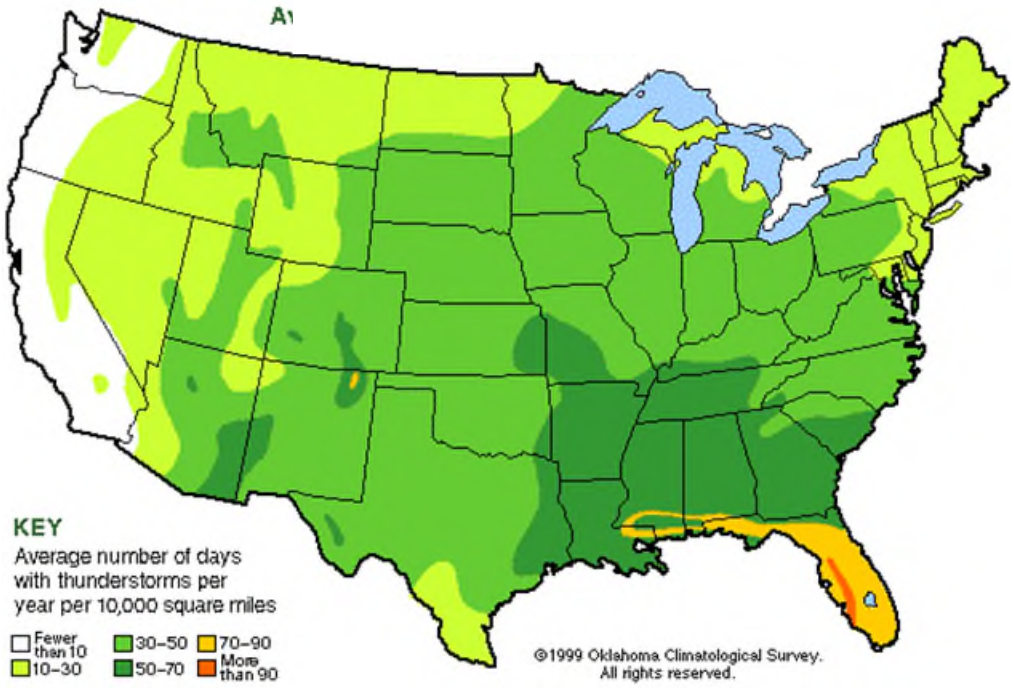
Location	Date(s)	Type	Mag	Dth	Inj	PrD*
ARGUSVILLE	8/13/2016	Thunderstorm Wind	50 kts. EG	0	0	0.00K
SUMMIT	8/13/2016	Thunderstorm Wind	50 kts. EG	0	0	0.00K
COBLESKILL ARPT	8/13/2016	Thunderstorm Wind	50 kts. EG	0	0	0.00K
CHARLOTTEVILLE	5/1/2017	Thunderstorm Wind	50 kts. EG	0	0	0.00K
CARLISLE	5/1/2017	Thunderstorm Wind	50 kts. EG	0	0	0.00K
JEFFERSON	5/1/2017	Thunderstorm Wind	50 kts. EG	0	0	0.00K
MIDDLEBURG	5/1/2017	Thunderstorm Wind	70 kts. EG	0	0	0.00K
MIDDLEBURG	5/1/2017	Thunderstorm Wind	70 kts. MG	0	0	0.00K
SLOANSVILLE	8/12/2017	Thunderstorm Wind	50 kts. EG	0	0	0.00K
RICHMONDVILLE	8/12/2017	Thunderstorm Wind	50 kts. EG	0	0	0.00K
RICHMONDVILLE	8/12/2017	Thunderstorm Wind	50 kts. EG	0	0	0.00K
RICHMONDVILLE	8/12/2017	Thunderstorm Wind	50 kts. EG	0	0	0.00K
RICHMONDVILLE	8/12/2017	Thunderstorm Wind	50 kts. EG	0	0	0.00K
RICHMONDVILLE	8/12/2017	Thunderstorm Wind	50 kts. EG	0	0	0.00K
DORLOO	8/22/2017	Thunderstorm Wind	50 kts. EG	0	0	0.00K
CARLISLE	8/22/2017	Thunderstorm Wind	50 kts. EG	0	0	0.00K
ESPERANCE	8/22/2017	Thunderstorm Wind	50 kts. EG	0	0	0.00K
SHARON SPGS	5/4/2018	Thunderstorm Wind	50 kts. EG	0	0	0.00K
SHARON SPGS	5/4/2018	Thunderstorm Wind	50 kts. EG	0	0	0.00K
SCHOHARIE	5/4/2018	Thunderstorm Wind	50 kts. EG	0	0	0.00K
MIDDLEBURG	5/4/2018	Thunderstorm Wind	50 kts. EG	0	0	0.00K
CONESVILLE	5/4/2018	Thunderstorm Wind	50 kts. EG	0	0	0.00K

Location	Date(s)	Type	Mag	Dth	Inj	PrD*
SCHOHARIE	5/10/2018	Thunderstorm Wind	50 kts. EG	0	0	0.00K

Supercell thunderstorm with tornados approaches Schoharie County in July 2003

Source: NWS

Figure 4-X Average Number of Thunderstorms Days Per Year



4.6 Hazard Profile – Ice Storm

Hazard	Previous Events	Likely Impacts	Probability of Future Event
Ice Storm Definition: A winter storm event where 0.25 inches of freezing rain accumulates on exposed surfaces Impact Area: Countywide	3 ice storms from 1996 to 2018	Structural damage Downed trees, limbs, wires and utility poles Power outages Scattered, dense debris Deaths and injuries Electrical hazards Disrupted heating Shelters and food services for disaster victims Transportation and road disruption/closings Increased traffic accidents and injuries	There is a 14 % chance of an ice storm each year There is approximately an 8% chance each year of an ice storm that results in historically significant damages and costs

		Health and medical injuries, emergencies and deaths Disruptions/delays in fire, medical, and safety services Food, lodging and services for critical workers Generator and power support issues Carbon monoxide exposure and chain saw injuries Hazards from hanging broken limbs and debris	

Three (3) ice storms are included in the National Climatic Data Center records for Schoharie County from 1996 to 2018. Although power and services were disrupted, overall damages and impacts for these three (3) storms were not reported to be significant. In earlier reports, however, it is noted that a severe ice storm occurred in eastern New York and Schoharie County on December 4-5, 1964 when freezing rain caused ice accumulations up to 1.5 inches, which crippled the region and resulted in widespread power outages, downed wires and tree limbs.

Ice storm was not ranked as a high hazard for Schoharie County when the risk assessment was performed countywide, but as noted in Section III, there is a history of severe ice storms occurring in upstate New York, particularly the 1991 ice storm in the Genesee Valley and Finger Lakes and the 1998 North Country ice storm – plus, ten (10) of the Schoharie town and village risk assessments determined that ice storms posed a significant risk and vulnerability.

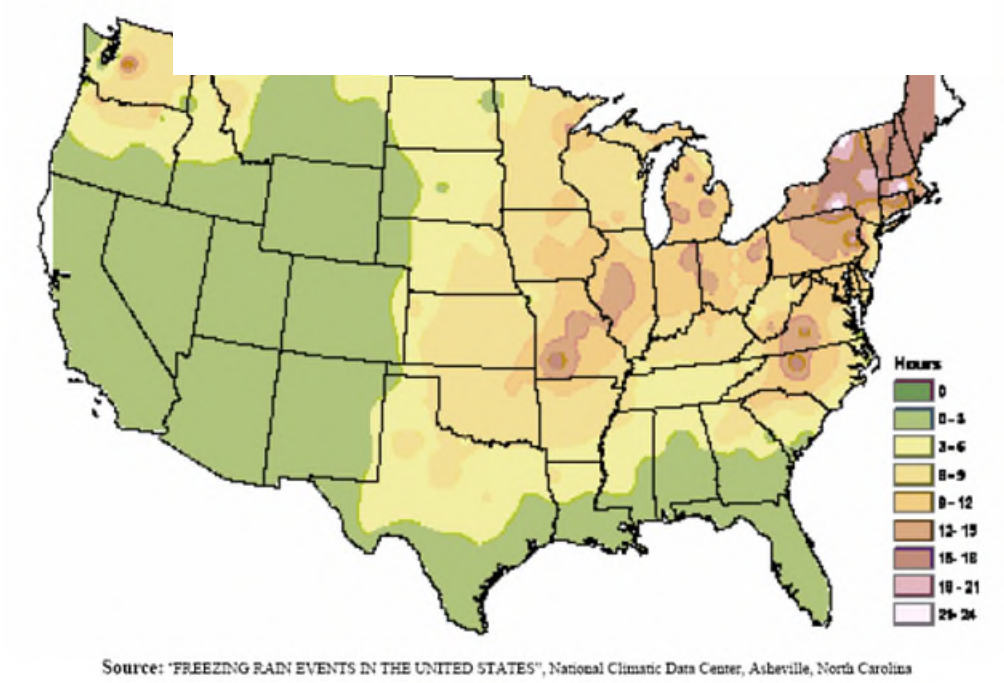
3 Ice Storm event(s) were reported in Schoharie County between 1/01/1996 and 2/28/2013

Source: NOAA National Climatic Data Center

Mag: Magnitude
Dth: Deaths
Inj: Injuries
PrD: Property Damage

County/Zone	Date	Type	Mag	Dth	Inj	PrD
SCHOHARIE	01/15/2007	Ice Storm		0	0	0.00K
SCHOHARIE	03/04/2008	Ice Storm		0	0	0.00K
SCHOHARIE	12/11/2008	Ice Storm		0	0	0.00K

Average Hours per Year with Freezing Rain



Source: "FREEZING RAIN EVENTS IN THE UNITED STATES", National Climatic Data Center, Asheville, North Carolina

4.7 Hazard Profile – Earthquake

Hazard	Previous Events	Likely Impacts	Probability of Future Event
Earthquake Definition: An earthquake occurs when two of the earth's geologic plates or layers shift, causing vibrations, and/or shaking to at and below the earth's surface Impact Area: Countywide	None	Death and Injuries Property and structural damage Damage to roads, utilities, bridges, infrastructure Stranded or trapped residents and victims Rescue operations and other high risk response Breakdown of emergency communications Disruption of transportation Delayed access for emergency services Fire risks from ruptured gas lines Damage to flood protection systems	There is a 10% chance over 50 years of a minor earthquake occurring in Schoharie County that would produce noticeable shaking but no damages There are no reliable or accurate methods for predicting the probability of a severely damaging earthquake in Schoharie County The NYS Hazard Mitigation Plan

		Shelter, feeding and temporary housing Economic impacts, property value and tax losses Employment and business disruption and losses Damage to natural features and habitat Increased health risks Contamination and disease Water supply contamination Secondary hazardous materials exposure Threat to dams and secondary flooding Power outages Increased demand for health/medical services Increased need for human and social services Disruption of home medical and care services Disrupted access for pharmacy and health needs Crisis counseling and mental health services Institutional threats; prisons, nursing homes, etc.	calculates that a damaging earthquake will occur somewhere in the state on average once every 22 years; and that a damaging earthquake is most likely to occur in the North Country, NYC/Long Island or Western NY regions of the state

There has not been any recorded earthquake occurrence or reports of earthquake damage in Schoharie County. Local residents have felt tremors and shaking from earthquakes that have occurred elsewhere in the northeast, and other counties in upstate New York have had damaging earthquakes.

The earthquake risk in New York State is often misunderstood and underestimated. While other natural hazards occur more frequently and result in higher awareness, earthquakes have the potential to cause widespread damage that few hazards can match. The State's history of building construction has only recently begun to incorporate seismic provisions, which presents vulnerability for even moderate size events throughout New York.

The New York State Emergency Management Office and New York Geological Survey report there have been four earthquakes in New York State with magnitudes greater than 5.0 in the last

100 years, the largest was a 5.8 in Massena in 1944. Earthquakes of these magnitudes are considered "moderate size," falling in the range between magnitudes 5.0 to 6.0 on the Richter scale. A magnitude 5.0 earthquake in June 2010 was centered north of Ottawa, Canada and felt through all of New York State, but did not result in any damage. In contrast, minor earthquakes with magnitudes less than 3.0 are common in New York State and occur on average, about one a week. These low magnitude earthquakes often go unfelt, or are only felt by citizens in the immediate vicinity of the epicenter. Soil type can substantially increase earthquake risk. For instance, amplification or strengthened shaking and ground motion occurs in softer soils. The predominant soil classifications in Schoharie County are sedimentary rock or firm ground at higher elevations and soft to medium clay or sand in the valleys and basins.

Even in a moderate size earthquake, there is a relatively low probability of building collapse for typical structures, but a moderate earthquake could cause significant damage, particularly to poorly maintained masonry walls, chimneys, foundations, plaster, as well as compounding problems such as gas and water line leaks and falling objects. Damages can easily run to tens of thousands of dollars for affected structures.

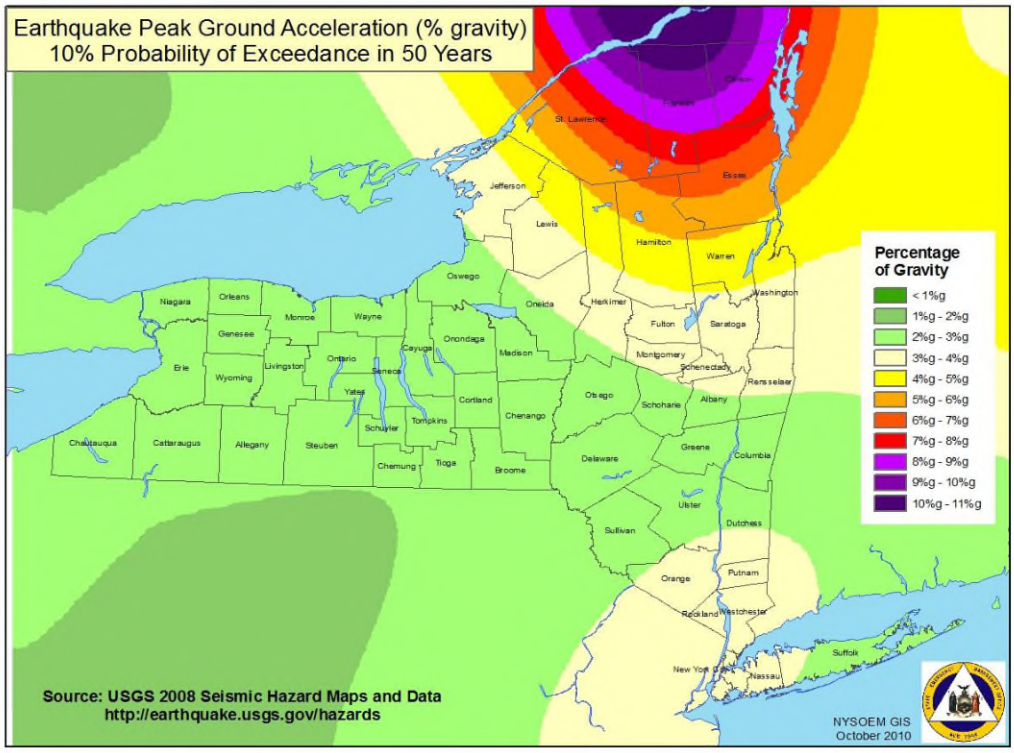
According to USGS maps, the probability of a serious earthquake in Schoharie County is less than most other areas of New York State and there is no record of a serious earthquake occurring in Schoharie County.

Peak Ground Acceleration (PGA), as mapped by the United States Geological Survey (USGS) below, is a common earthquake measurement that shows three things; the geographic area affected (all colored areas on the map), the probability of an earthquake of each given level of severity (10% chance in 50 years), and the strength of ground movement (severity). The PGA for Schoharie of 2-3 percent gravity, when compared with the next table showing damage intensities associated with PGA levels, indicates there is a 10% probability over 50 years that an earthquake will occur in Schoharie County that exceeds peak acceleration – but even then, the impact of such an earthquake would be limited to light shaking and is not likely to result in any damage.

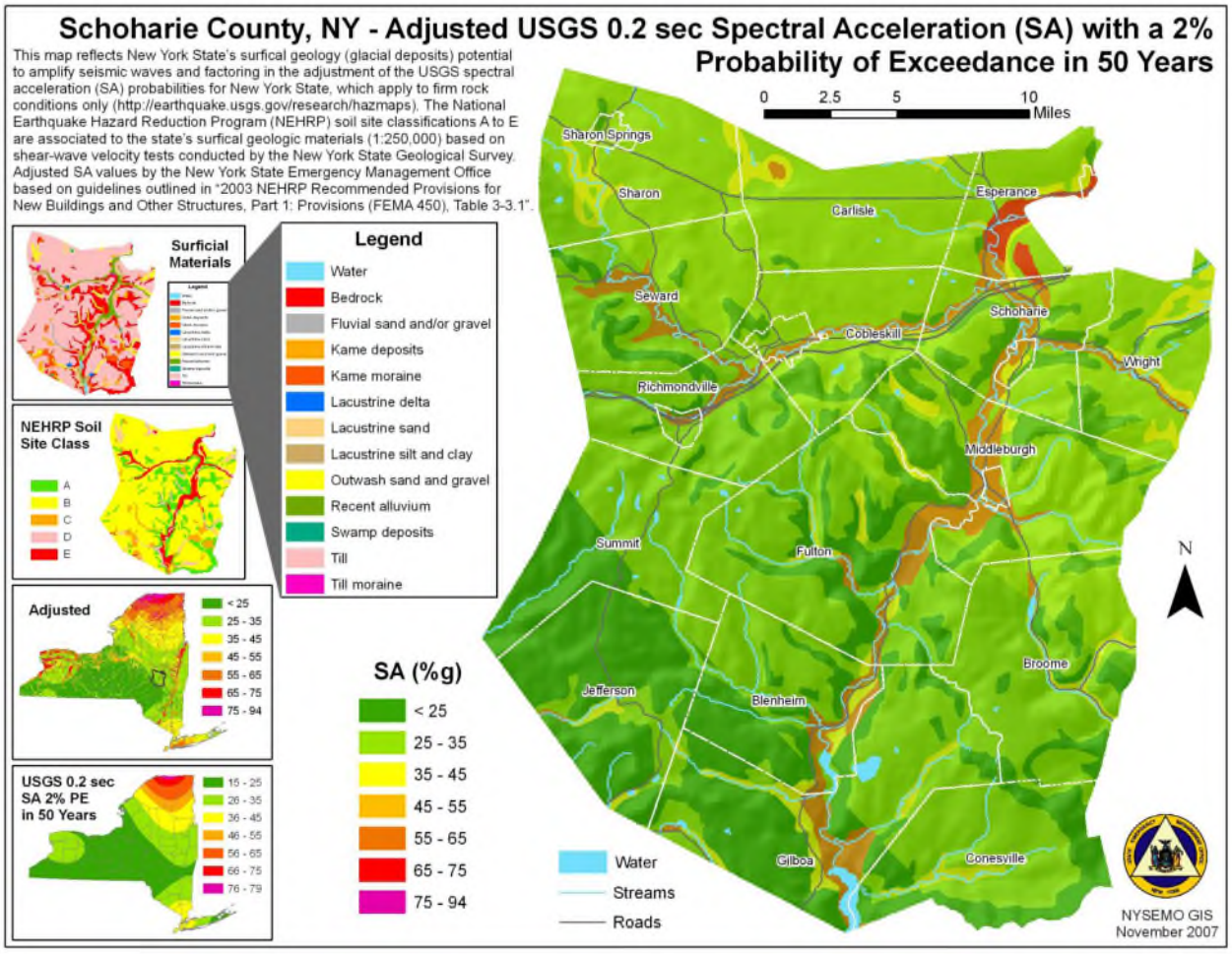
Table 3-53
Modified Mercalli Intensity (MMI) and PGA Equivalents

MMI	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
XI	> 124	Extreme	Very Heavy
XII	> 124	Extreme	Very Heavy

Source: FEMA mitigation planning "how to" guide 386-2.

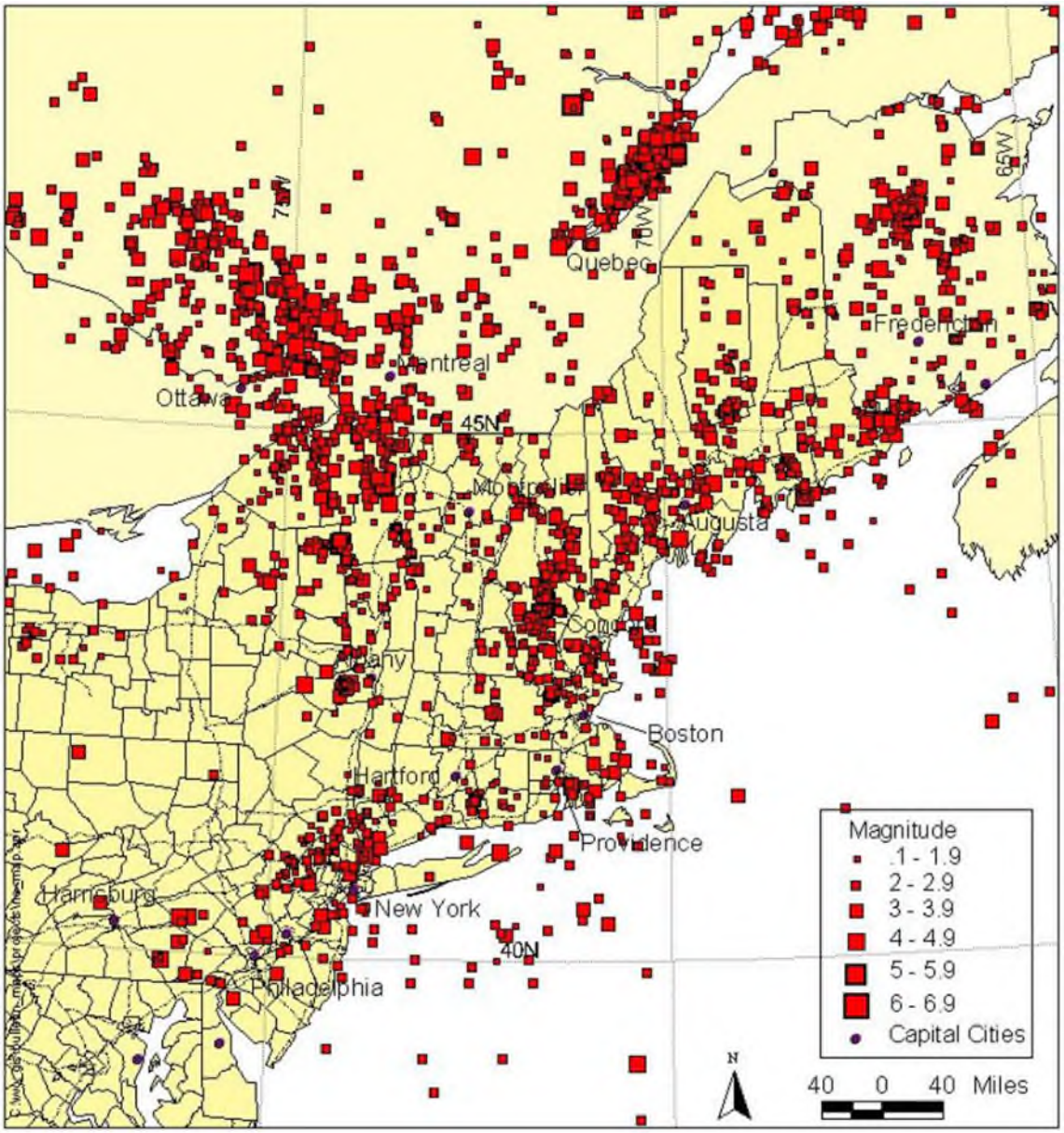


Adjusted spectral acceleration was mapped below for Schoharie County in the NYS Hazard Mitigation Plan (2011), which adjusts earthquake probability by factoring local soil conditions for their ability to amplify or transfer seismic activity. Most areas of sedimentary rock outside the valleys and basins are more resistant to seismic amplification.



Northeast seismic activity from October, 1975 - March, 2010

Source: USGS


75W
70W
65W
Quebec
Fredericton
Montreal
Ottawa
45N
Augusta
Albany
Boston
Hartford
Providence
Harrisburg
New York
40N
Philadelphia
Magnitude
.1 - 1.9
2 - 2.9
3 - 3.9
4 - 4.9
5 - 5.9
6 - 6.9
Capital Cities
N
40 0 40 Miles

4.8 Hazard Profile – Dam Failure

Hazard	Previous Events	Likely Impacts	Probability of Future Event
Dam Failure Definition: The uncontrolled release of impounded water resulting in downstream flooding and hazards Impact Area: Primarily the Schoharie Valley below the Schoharie and Blenheim-Gilboa dams; including Gilboa, Blenheim, Fulton, Middleburgh, Schoharie and Esperance. Also the low-lying downstream vicinities of dams in Summit and Cobleskill	None	Death and Injuries Property and structural damage Damage to roads, utilities, bridges, infrastructure Evacuations of residents and stranded victims Water rescue and other high risk response Breakdown of emergency communications Disruption of transportation Delayed access for emergency services Damage to flood protection systems Shelter, feeding and temporary housing Economic impacts, property value and tax losses Employment and business disruption and losses Damage to natural features and habitat Increased health risks Secondary hazardous materials exposure Increased demand for health/medical services Increased need for human and social services Disruption of home medical and care services Disrupted access for pharmacy and health needs Crisis counseling and mental health services	A probability estimate is not available because there is no history for this type of event, plus regular design improvements and increased protection at these facilities continually reduces the probability and scope of a failure

There have been no dam failures in Schoharie County. There are reports that agricultural levees have failed or breached, but these are not dams and even these breaks did not pose a threat to the community or have any impact beyond the farm property. It was long rumored that a 1939 flood in the Town of Cobleskill was the result of a dam failure, but this has been proven false and there are no records to substantiate that a dam failure was involved.

Dam failures can occur as a result of structural deterioration, progressive erosion of an embankment or footing that supports dam walls, a natural disaster such as a flood or earthquake; and actions caused by man such as a maintenance or construction accident, criminal activity or terrorism, and overtopping and breaching by a severe flood. According to the International Commission on Large Dams (ICOLD), the three major causes of dam failure are overtopping by a flood, foundation defects and piping.

The NYS Department of Environmental Conservation (DEC) Hazard Classifications for dams are assigned based on the particular physical characteristics of a dam, its location and potential hazards and is not necessarily related to the size of the dam. The hazard classification represents the consequences of a dam failure and is not a representation of a dam's condition.

Class "A" or "Low Hazard" A dam failure is unlikely to result in damage to anything more than isolated or unoccupied buildings, undeveloped lands, minor roads such as town or county roads; is unlikely to result in the interruption of important utilities, including water supply, sewage treatment, fuel, power, cable or telephone infrastructure; and/or is otherwise unlikely to pose the threat of personal injury, substantial economic loss or substantial environmental damage.

Class "B" or "Intermediate Hazard" A dam failure may result in damage to isolated homes, main highways, and minor railroads; may result in the interruption of important utilities, including water supply, sewage treatment, fuel, power, cable or telephone infrastructure; and/or is otherwise likely to pose the threat of personal injury and/or substantial economic loss or substantial environmental damage. Loss of human life is not expected.

Class "C" or "High Hazard" A dam failure may result in widespread or serious damage to home(s); damage to main highways, industrial or commercial buildings, railroads, and/or important utilities, including water supply, sewage treatment, fuel, power, cable or telephone infrastructure; or substantial environmental damage; such that the loss of human life or widespread substantial economic loss is likely.

Class "D" or "Negligible or No Hazard" 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 "0" dams are considered to be defunct dams posing negligible or no hazard. The department may retain pertinent records regarding such dams.

Schoharie County Dam Inventory

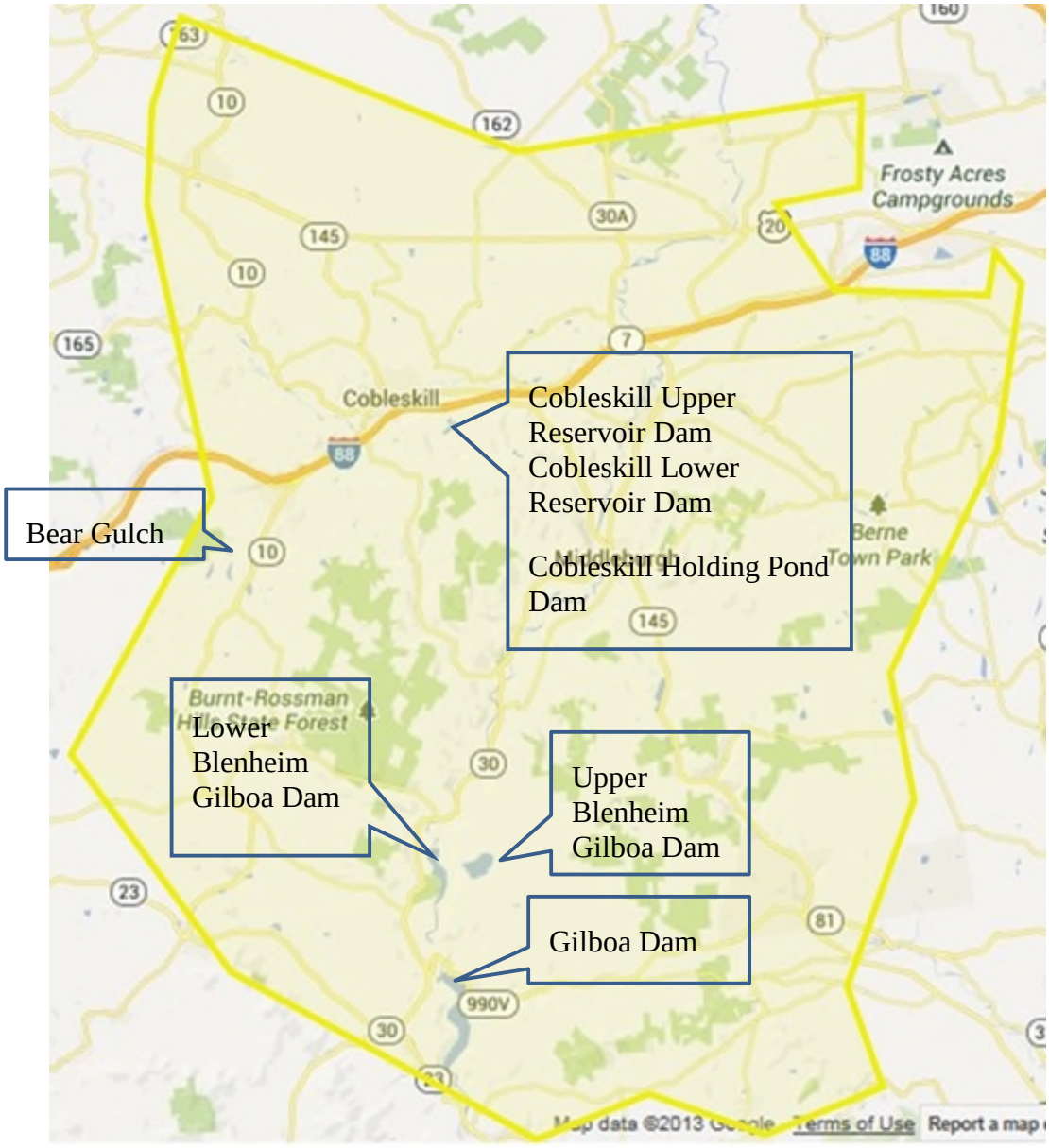
There are approximately one hundred thirty-two (132) dams that could impact Schoharie County, including dams in Greene and Albany counties. In Schoharie County, there are a total of seventy-eight (78) dams registered and classified by the NYS Department of Environmental

Conservation. There are seven (7) Class C High Hazard dams, nineteen (19) Class B Intermediate Hazard dams, forty-nine (49) Class A Low-Hazard dams and four (4) Class 0 Negligible/No Hazard dams. Records and information about these dams is contained in the NYS Inventory of Dams maintained by DEC and available online at the DEC website. Class C High Hazard Dams in Schoharie County include the following.

Class C High Hazard Dams in Schoharie County

Dam	Location	Type	Storage Capacity (acre-feet)	River/Creek	Purpose
Gilboa Dam	Gilboa	Masonry, Earth	64,000	Schoharie Creek	NYC Water Supply
Blenheim-Gilboa Upper Reservoir Dam	Gilboa	Earth, Rockfill	15,000	Schoharie Creek	Hydroelectric Generation
Blenheim-Gilboa Lower Reservoir Dam	Blenheim	Earth, Rockfill	8,600	Schoharie Creek	Hydroelectric Generation and Recreation
Bear Gulch Pond Dam	Summit	Earth	214	Bear Gulch Brook	Recreation
Cobleskill Upper Reservoir Dam	Cobleskill	Earth	239	Smith Brook	Municipal Water Supply
Cobleskill Lower Reservoir Dam	Cobleskill	Earth	272	Dow Brook	Municipal Water Supply
Village of Cobleskill Holding Pond Dam	Cobleskill	Earth	311	Cobleskill Creek	Municipal Water Supply

Figure 4-X Class C High Hazard Dams in Schoharie County



NYS DEC Dam Safety Requirements by Class

Owners of Class C - High Hazard dams are required to:

- Submit an Annual Certification to DEC
- Have an Emergency Action Plan (EAP) prepared by a Professional Engineer and submit the Plan to DEC.
- Develop and implement an Inspection and Maintenance Plan.
- Have an Engineering Assessment (EA) conducted by a Professional Engineer and submit the Report to DEC every ten (10) years.

- Have a Safety Inspection conducted by a Professional Engineer on a regular schedule as defined in the Inspection and Maintenance Plan.
- Report flows in erodible auxiliary spillways to DEC within five (5) days.

Owners of Class B - Intermediate Hazard dams are required to:

- Submit an Annual Certification to the DEC.
- Develop and submit to DEC an Emergency Action Plan (EAP).
- Develop and implement an Inspection and Maintenance Plan.
- Have an Engineering Assessment (EA) conducted by a Professional Engineer and submit the Report to DEC every ten (10) years.
- Have a Safety Inspection conducted by a Professional Engineer on a regular schedule as defined in the Inspection and Maintenance Plan.
- Report flows in erodible auxiliary spillways to DEC within five (5) days.

All Class C High Hazard Dams and Class B Intermediate Hazard Dams are required to have an Emergency Action Plan (EAP). Each of the dam operators works with Schoharie County Emergency Management, local government and public safety officials on preparedness measures. The Gilboa and Blenheim-Gilboa facility managers regularly coordinate plans, training and exercises with local officials because these high-profile dams and reservoirs hold significantly higher quantities of water than other dams in the region. In fact, the NYC Gilboa dam and reservoir retains almost 75% of the water held behind all seven (7) High-Hazard dams in the county. Detailed safety precautions and procedures are maintained – including evacuation planning and early warning systems - to protect downstream interests on the Schoharie Creek.

Dam failure flood inundation maps have been prepared that outline potential flood risk areas along the Schoharie Creek floodplains for the Gilboa and Blenheim-Gilboa dams. These inundation maps are part of the Emergency Action Plans for these facilities and are available at the Schoharie County Office of Emergency Services. The downstream Schoharie Valley villages and hamlets of North Blenheim, Breakabeen, Middleburgh, Schoharie, Central Bridge and Esperance are exposed to the greatest risk and vulnerability for a dam failure at these facilities.

4.9 Hazard Profile – Animal Disease and Epidemic

For the purposes of capturing all aspects of animal disease and epidemics, the County is defining these threats with the term biosecurity, which involves the risk of transmission of infectious diseases and infestations in humans, crops, tree stands, fisheries, and livestock. Various concerns for biosecurity are discussed below.

- Diseases that affect livestock and fisheries, such as foot and mouth disease or Bine Spongiform Encephalopathy, aside from their potential to infect humans, can rapidly spread through livestock flocks or herds, sometimes requiring entire flocks/herds to be put down and causing significant financial hardship.

- Diseases that affect tree stands and other crops, such as root rot, can spread easily through insects and same-species trees. The result could be a loss of harvest and downed trees during storms, which could cause significant financial hardship.

- Infestation of insects, parasites, and other pests can affect human health, livestock, fisheries, and crops. Many insects carry diseases and can easily transmit those diseases to a host. Infestation can cause many problems, such as loss of revenue from crops and livestock, financial hardships, human diseases, and water contamination.

4.10 Climate Change

Potential impacts of climate change include increased average temperatures, decreased snow accumulation, and increased peak stream flow. The increasing average temperature is expected to be more pronounced during summer months, and decreased summer precipitation is expected to accompany this shift. The frequency and magnitude of extreme precipitation events is also expected to increase, particularly in the winter. In short, what it is currently viewed as a 100-year event, may soon be reconsidered as a 10-year event. This would place further stress onto storm drainage systems and natural stream systems – placing residents at an increased risk for flooding.

Furthermore, changing precipitation and temperature may impact potable water availability. If precipitation falls during a shorter period of the year, with a longer, drier, hotter summer, the need for water storage may grow. Decreased water availability combined with increased demand may exacerbate water rights conflicts.

Finally, changing climate conditions can impact ecosystems, with complicated feedbacks that may affect ecosystem services that County residents rely on for recreation, water quality, and overall well-being. Below are potential climate change impacts based on projects from Cornell University.

Potential Flooding Impacts from Climate Change

As climate shifts occur globally, precipitation and surface wind patterns are likely to shift with them. Exactly how these shifts occur is widely debated among scientists. The precise effects of climate change on flood risks in the County remain unknown; however, increases in precipitation and storm events are estimated to increase the hazard risk. Precipitation in the New York Department of Environmental Conservation Region 2 from 1971-2000 was 48 inches on average and is expected to change from 1 to 8% by 2020, 3 to +11% by 2050 and +6 to 14% by 2080s (NYS Climate Projections).

The County and participating jurisdictions have crafted mitigation actions (see Section 6.6) that address the potential increase in storm frequency and magnitude.

Potential Severe Storm Impacts from Climate Change

While exact changes in precipitation patterns remain unknown, future Atlantic hurricanes such as Hurricane Sandy are more likely to move farther up the coast and inland, which may lead to extreme rainfall, as occurred in 2012. Additionally, more powerful frontal systems driving down out of the Arctic through Canada may contain higher winds with larger amounts of precipitation throughout the year, which can pose a risk to the County.

Potential Winter Storm Impacts from Climate Change

Climate and weather patterns are hard to predict but the increase in the number of winter storms in recent years and related damages increases this hazard's risk in the County. Additionally, any powerful frontal systems driving down out of the Arctic through Canada in future years can contain higher winds with larger amounts of precipitation that can result in more intense winter storms.

Potential Tornado Impacts from Climate Change

The risk of tornados is directly tied to that of severe storms. Cascading hazard events such as tornados may be more likely to spawn from more powerful frontal systems than individual stand-alone events.

Potential Heat-related Impacts from Climate Change

Reliable science indicates that global temperatures are on the rise and this may exacerbate the impacts associated with heat-related hazards. Heat waves (defined as days per year above 90 degrees Fahrenheit) in the New York Department of Environmental Conservation Region 2 from 1971-2000 was 12 days on average and is expected to change from 19-25 days by 2020, 31 to 47 days by 2050 and 38-77 days by 2080s (NYS Climate Projections).

Chapter 5 Vulnerability Assessment

Chapter 5 considers the hazards presented in Chapters 3 and 4 and attributes potential vulnerabilities in both general terms and hazard-specific where able. Chapter 5 is supported by jurisdiction-specific vulnerability assessments which can be found in Section 3 of each Jurisdiction Annex.

5.1 Vulnerability Overview

The purpose of the vulnerability assessment is to identify and characterize property and populations at risk from potential hazards. The types of hazards that impact a community and the potential scope or intensity of the hazard combine with the vulnerability of people, property, facilities and services to define the overall threat and outcomes of a disaster. The vulnerability assessment for Schoharie County looks at the following six (6) factors to determine potential vulnerability to the communities, people, infrastructure, facilities and services.

- Vulnerable Populations
- Impact on Improved Property
- Evaluation of Repetitive Loss Properties
- Vulnerability of Critical Facilities, Infrastructure and Services
- Potential Disaster Costs and Losses
- Consideration of Future Growth and Development

5.2 Vulnerable Populations

Jurisdiction	2010 Population[1]	14 years of age and under[1]	65 years of age and over[1]	[a]Families below poverty level[2]	[b]Persons 5 years and older with a disability[3]
Blenheim	377	71 19%	87 23%	5.9%	196 52%
Broome	973	131 13%	209 21%	5.4%	264 27%
Carlisle	1948	384 20%	219 11%	7.9%	417 21%
Cobleskill, T	1947	326 17%	340 17%	9.2%	386 20%
Cobleskill, V	4678	517 11%	641 14%	11.3%	1584 34%
Conesville	734	98 13%	170 23%	5.7%	211 29%

Jurisdiction	2010 Population[1]	14 years of age and under[1]	65 years of age and over[1]	[a]Families below poverty level[2]	[b]Persons 5 years and older with a disability[3]
Esperance, T	1731	326 19%	244 14%	4.8	590 34%
Esperance, V	345	56 15%	44 13%	3.7	107 31%
Fulton	1442	230 16%	228 16%	14.2	383 26%
Gilboa	1307	218 17%	249 19%	9.6	496 38%
Jefferson	1410	260 18%	254 18%	9.1	475 34%
Middleburgh, T	2246	376 17%	351 16%	11.5	615 27%
Middleburgh, V	1500	233 15%	263 17%	12.2	547 36%
Richmondville, T	1692	258 15%	298 18%	5.5	496 29%
Richmondville, V	918	204 22%	119 13%	5.4	283 31%
Schoharie, T	2283	356 16%	339 15%	3.8	624 27%
Schoharie, V	922	111 12%	195 21%	5.9	341 37%
Seward	1763	293 17%	230 13%	5.9	396 22%
Sharon	1288	224 17%	215 16%	10.8	409 32%
Sharon Springs	558	103 18%	107 19%	8.5	329 59%
Summit	1148	212 18%	228 20%	10.9	484 42%
Wright	1539	242 16%	200 13%	5.5	355 23%

Sources: [1]U.S. Census 2010 Summary File, NYS Data Center

[2]U.S. Census, 2009 Estimates, Schoharie County Chamber of Commerce

[3]U.S. Census 2000 Summary File, NYS Data Center

a Average number of persons per household in Schoharie County is 2.42 (2010). The U.S. Department of Health and Human Services calculated the 2008-2009 poverty level to be $22,050 for a family of four.

b 2000 data for non-institutional population. Includes persons 5 years and older that report having a long-lasting sensory, physical, mental or self-care disability; and those that report difficulty going outside the home or have difficulty working at a job because of a physical, mental or emotional condition.

5.3 Improved Property

Broad Use Category	Description	Parcel Count
100	Agricultural Properties	806
200	Residential Properties	13,172
300	Vacant Land	6,862
400	Commercial Properties	732
500	Recreation and Entertainment Properties	54
600	Community Service Properties	393
700	Industrial Properties	69
800	Public Service Properties	516
900	Public Parks, Wild, Forested and Conservation Properties	582
Total Parcels in All Broad Use Categories		**23,186**

Refer to Section 3 of each Jurisdiction Annex for information regarding improved property within each participating jurisdiction.

5.4 National Flood Insurance Program (NFIP)

- All Schoharie County jurisdictions participate in National Flood Insurance Program (NFIP)
- There are 67 *Repetitive Loss Properties* (RLP) identified in Schoharie County
- There is one *Severe Repetitive Loss* property identified in Schoharie County

- 265 properties located in high-risk flood zones (Zone A) carry NFIP coverage
- 1 municipality in Schoharie County participates in the *Community Rating System (CRS)*

Repetitive Loss Properties (RLP)

The National flood Insurance Program (NFIP) identifies properties that have been repeatedly flooded and where multiple claims for flood losses have been made through the NFIP fund.

Certain repetitive loss properties represent a significant portion of annual flood insurance program claims. In 2004, NFIP calculated that only about 1 percent of properties insured by NFIP are considered to be repetitive loss properties -- properties for which policyholders have made two or more $1,000 flood claims -- but approximately 38 percent of all NFIP claim costs were the result of damage to repetitive loss properties. Federal action was authorized to reduce program losses by targeting repetitive loss properties and setting priorities to use hazard mitigation grant funds to buy-out or retrofit repetitive loss properties, thus eliminating flood risks and reducing flood recovery costs. The strategy also includes proposals to phase out coverage or begin charging full and actuarially based rates for repetitive loss property owners who refuse to accept FEMA's offer to purchase or mitigate the effect of floods on their structures.

Source: National Flood Insurance Program, Actions to Address Repetitive Loss Properties, 2004

Repetitive Loss Properties

CID	Jurisdiction	Number of Repetitive Loss Properties	Total Losses	Value of All Repetitive Loss Properties	Average Payment	Property Type(s)
361580	Blenheim	1	2	$ 164,674	$39,212.94	1 Single Family
360743	Cobleskill, V	1	2	196,152	$21,123.71	1 Single Family
361194	Esperance, T	10	26	1,232,824	$34,738.34	10 Single Family
361542	Esperance, V	6	13	696,481	$39,000.87	6 Single Family
361195	Fulton	1	2	66,500	$8,237.50	1 Single Family
361433	Gilboa	2	4	206,183	$8,491.68	2 Single Family
360744	Middleburgh, T	9	24	2,032,126	$27,890.04	8 Single Family 1 Non-Residential
361245	Middleburgh, V	25	74	3,761,457	$13,542.26	15 Single Family 2 Multiple Family 3 Condominium Buildings 1 Other Residential

CID	Jurisdiction	Number of Repetitive Loss Properties	Total Losses	Value of All Repetitive Loss Properties	Average Payment	Property Type(s)
						4 Non-Residential
	Richmondville, V	1	3	180,383	$60,127.82	1 Single Family
361198	Schoharie, T	2	5	821,936	$72,642.00	2 Single Family
361061	Schoharie, V	9	20	1,652,966	$50,420.35	8 Single Family 1 Multiple Family
361202	Wright	1	2	160,100	$2,223.72	1 Single Family

Source: NFIP Community Information System, 2018

Since 1196, seventy-eight (78) projects in twelve (12) jurisdictions have been completed or are ongoing that address flood hazard mitigation for ***Repetitive Loss Properties***. Projects are further detailed in Section VI and involve acquisition, relocation and retrofitting of flood-prone properties. *Refer to Appendix C for additional detail on HMGP projects within the County.*

(Data privacy policies apply -- contact the Schoharie County Office of Community Development Services for information)

Severe Repetitive Loss Properties (SRL)

The National Flood Insurance Program (NFIP) identifies Severe Repetitive Loss (SRL) Properties to promote and encourage actions that will reduce or eliminate the long-term risk of flood damage to targeted structures that are insured under NFIP. A SRL property is defined as a residential property that is covered under an NFIP flood insurance policy and:

(a) 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

(b) 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 (a) and (b) above, at least two of the referenced claims must have occurred within any ten-year period and must be greater than ten (10) days apart.

The SRL program helps communities and property owners who have suffered repeated flood damage by providing federal funds to buy-out, elevate or floodproof the property and eliminate the risk of future damage. The program also protects the lives of local responders and reduces the burden of future response and recovery costs to the state and local governments, plus it

eliminates future claims through the NFIP fund. In New York State, approved SRL funding often covers up to 90% of the project costs.

In 2014, one property in Schoharie County was identified as a Severe Repetitive Loss property.

Community	Properties	Building Payments	Contents Payments	Total Payments	Average Payment	Number of Losses
Town of Middleburgh	1	$65,741.	$23,599.	$89,340.	22,335.	4

Source: NYS Hazard Mitigation Plan, 2014

Community Rating System (CRS)

The Community Rating System (CRS) is a voluntary program of the National Flood Insurance Program (NFIP) where communities and property owners can take advantage of incentives and are eligible for flood insurance rate discounts when they go beyond the minimum floodplain management requirements by implementing extra measures to provide protection from flooding. Schoharie County communities with active status in the CRS include the following.

- Town of Esperance

NFIP Policies and Coverage

CID	Community	# of NFIP Policies	A Zone Policies*	Coverage in Force	NFIP Claims 1978 - 2012	NFIP Claims Paid 1978 - 2012
361580	Blenheim	14	12	$ 2,654,500	18	$ 436,488
361431	Broome	11	3	1,667,700	13	215,165
361193	Carlisle	4	1	995,900		0
361573	Cobleskill, T	11	5	1,302,200	10	42,768
360743	Cobleskill, V	52	20	10,953,000	26	174,759
361606	Conesville	7	1	959,000	4	55,014
361194	Esperance, T	24	23	4,488,800	91	4,490,295
361542	Esperance, V	3	4	805,000	29	971,224
361195	Fulton	25	12	3,648,700	28	917,314

361433	Gilboa	4	2	1,225,000	9	102,396
361198	Jefferson	4	0	1,125,000		0
360744	Middleburgh, T	50	29	8,384,800	78	3,708,177
361245	Middleburgh, V	90	60	16,098,700	205	5,897,008
361197	Richmondville, T	8	0	1,899,200	4	35,349
361060	Richmondville, V	2	1	264,600	2	22,783
361198	Schoharie, T	24	7	6,173,200	26	1,509,387
361061	Schoharie, V	101	69	21,607,900	130	12,791,974
361199	Seward	8	2	1,435,400	1	0
361200	Sharon	9	1	1,618,700	2	1,402
361549	Sharon Springs	4	2	707,000		0
361201	Summit	5	0	1,330,000		0
361202	Wright	16	11	2,524,300	12	242, 909

Source: FEMA, Community Rating System (April 1, 2018)

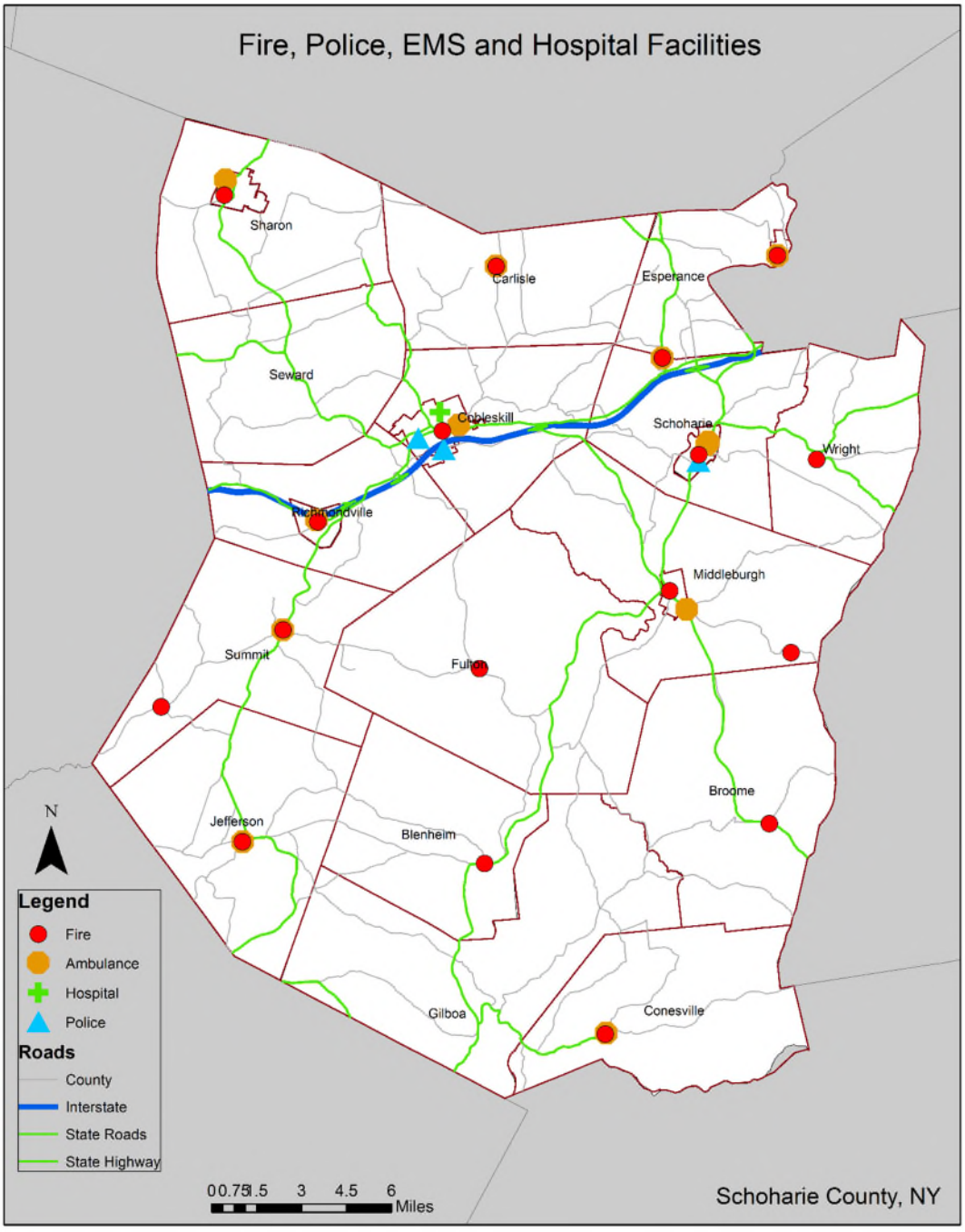
***** **Zone A -** Areas with a 1% chance of flooding each year, and a 1-in-4 chance of flooding over the life of a 30-year mortgage. In communities that participate in the NFIP, mandatory flood insurance purchase requirements apply to improved properties in Zone A.

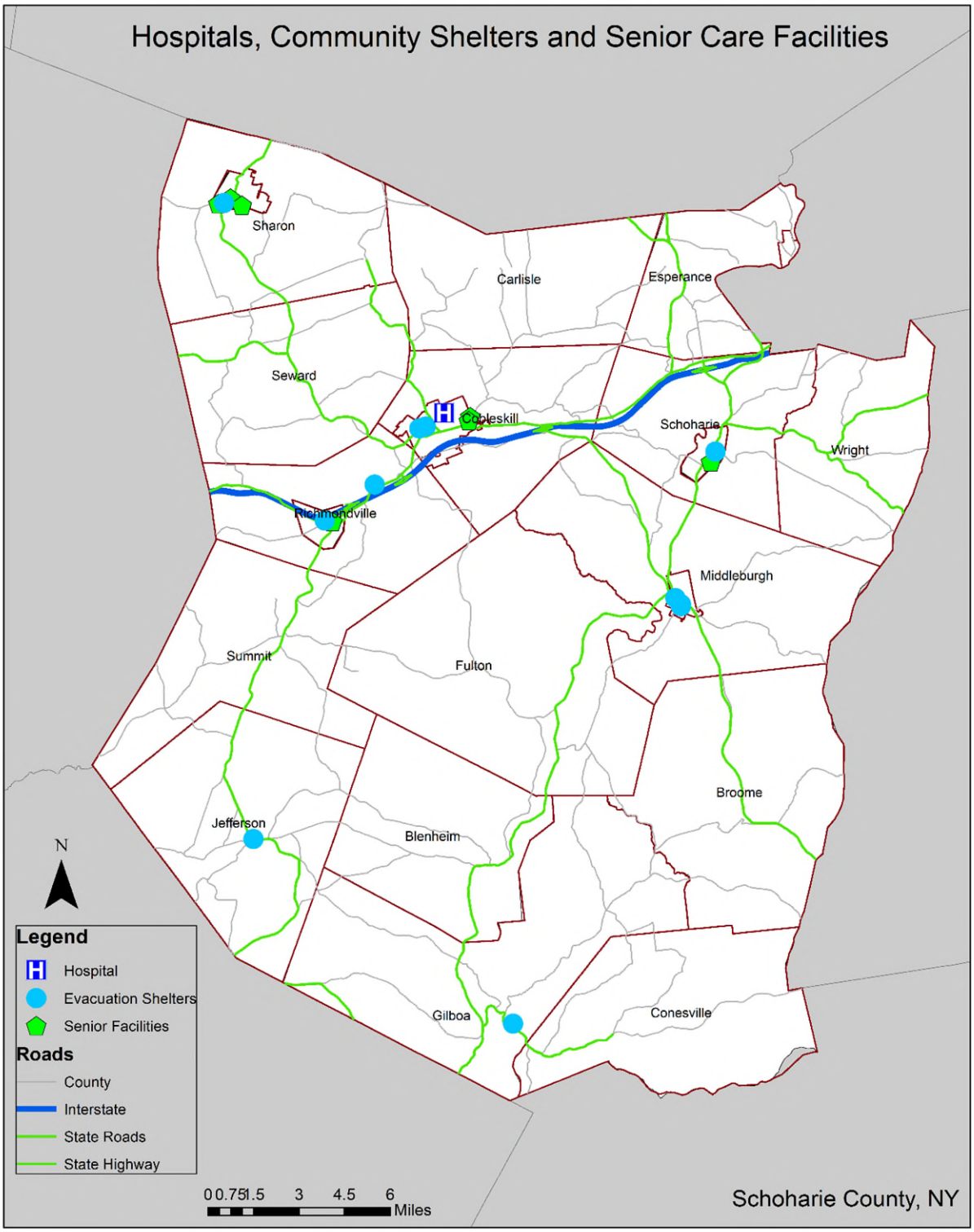
FEMA emphasizes that over 20% of NFIP claims are received from properties in lower risk areas outside Zone A, and that one-third of funding for flood assistance is provided to properties outside the high hazard zone.

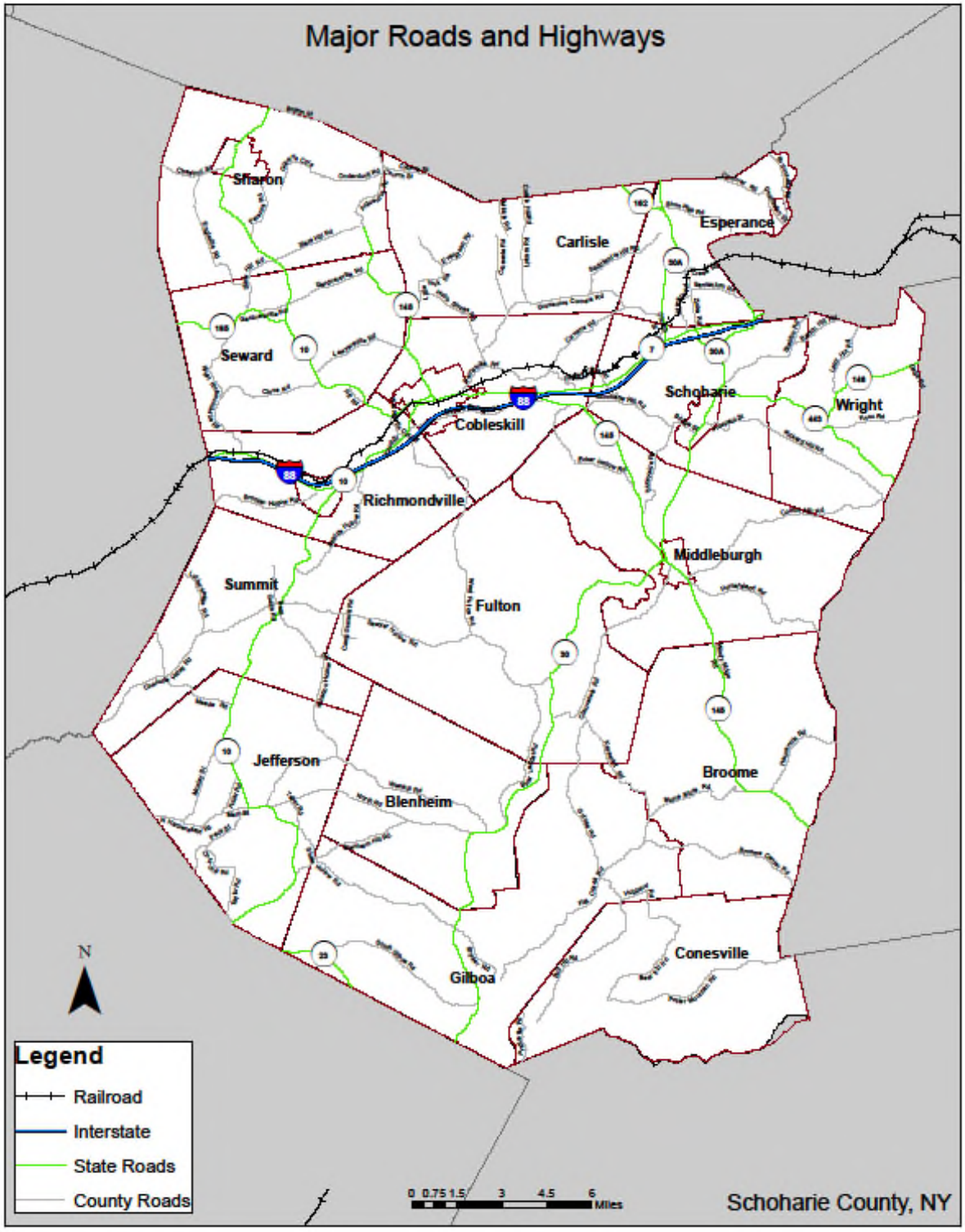
Source: NFIP FloodSmart,gov 2012

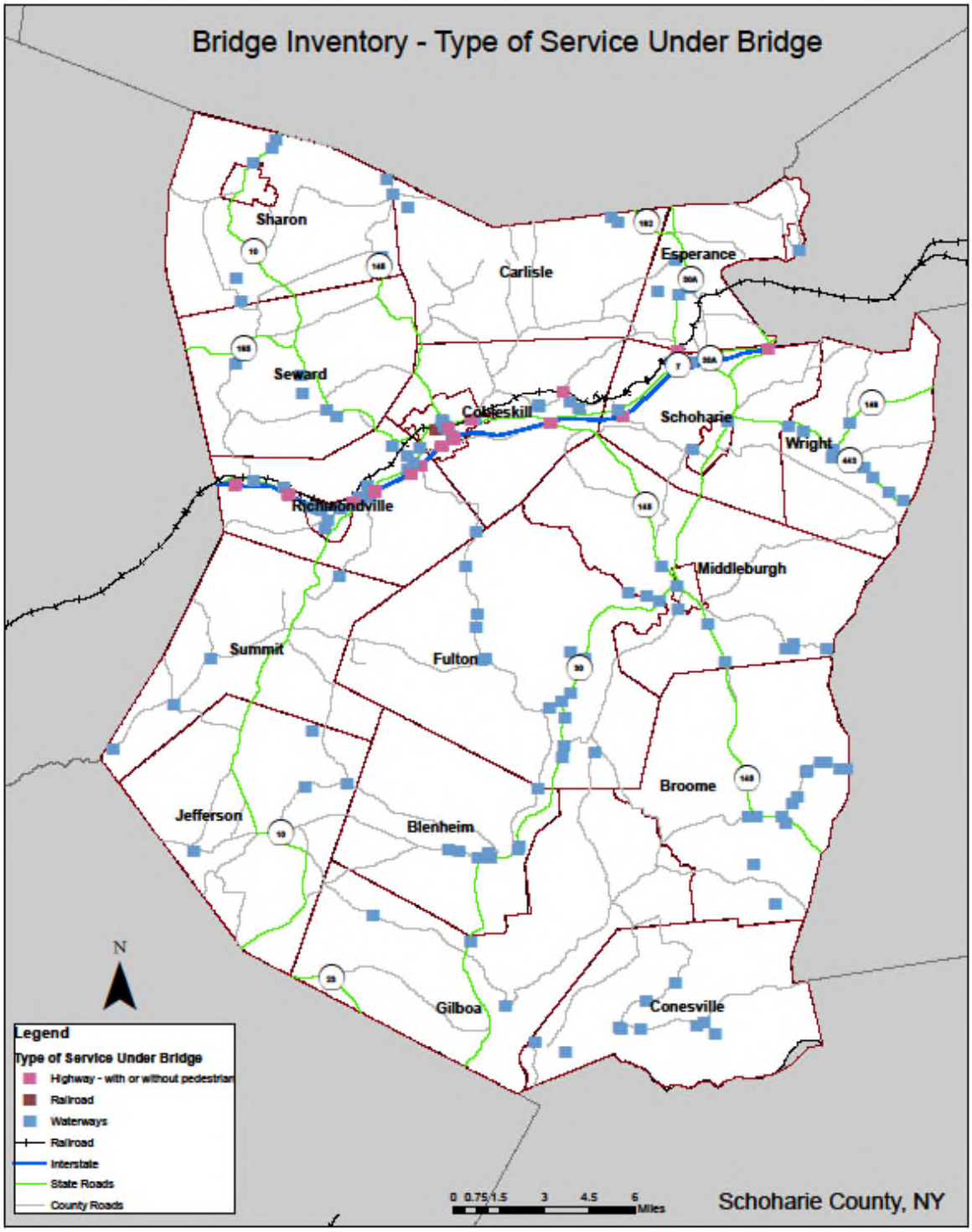
5.5 Critical Facilities, Infrastructure and Services

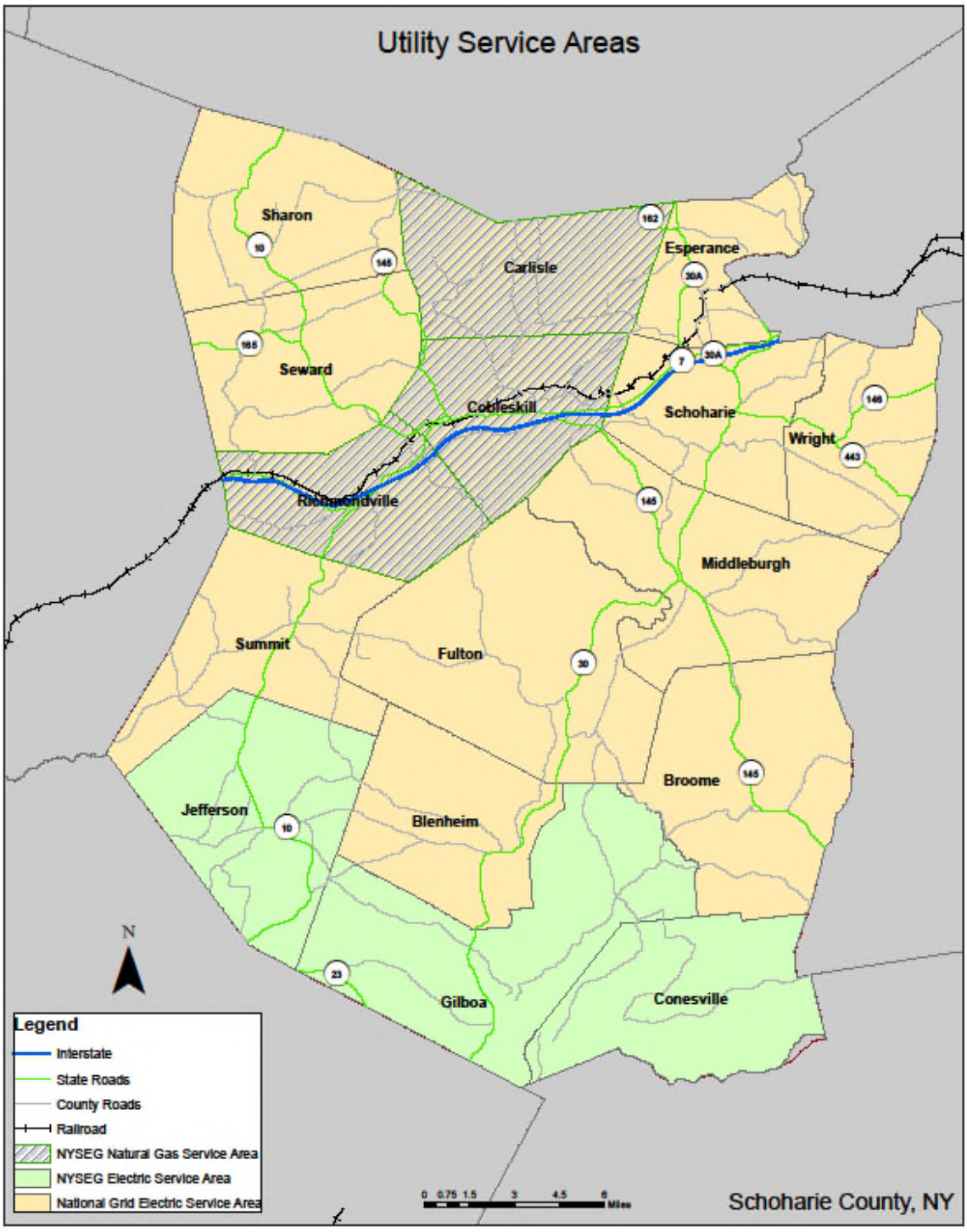
Refer to Section 3.3 of each Jurisdiction Annex to review critical infrastructure within each community and Appendix D8a and D8b for maps of critical infrastructure within each community.




Hospitals, Community Shelters and Senior Care Facilities
Sharon
Carlisle
Esperance
Seward
Cobleskill
Schoharie
Wright
Richmondville
Middleburgh
Summit
Fulton
Broome
Jefferson
Blenheim
Gilboa
Conesville
N
Legend
Hospital
Evacuation Shelters
Senior Facilities
Roads
County
Interstate
State Roads
State Highway
0 0.75 1.5 3 4.5 6
Miles
Schoharie County, NY

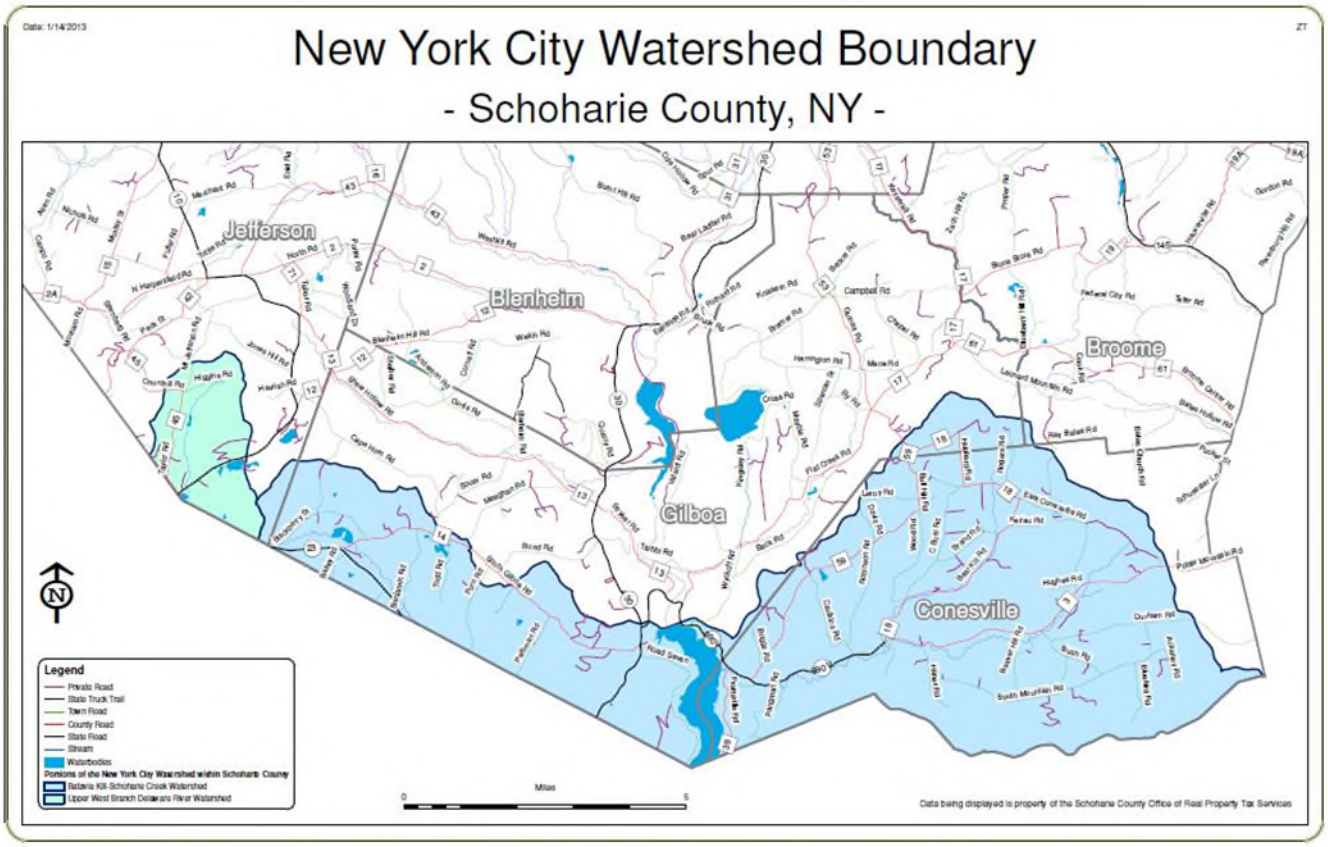

Major Roads and Highways
Sharon
Carlisle
Esperance
Seward
Schoharie
Wright
Cobleskill
Richmondville
Middleburgh
Summit
Fulton
Jefferson
Blenheim
Broome
Gilboa
Conesville
N
Legend
Railroad
Interstate
State Roads
County Roads
0 0.75 1.5 3 4.5 6
Miles
Schoharie County, NY

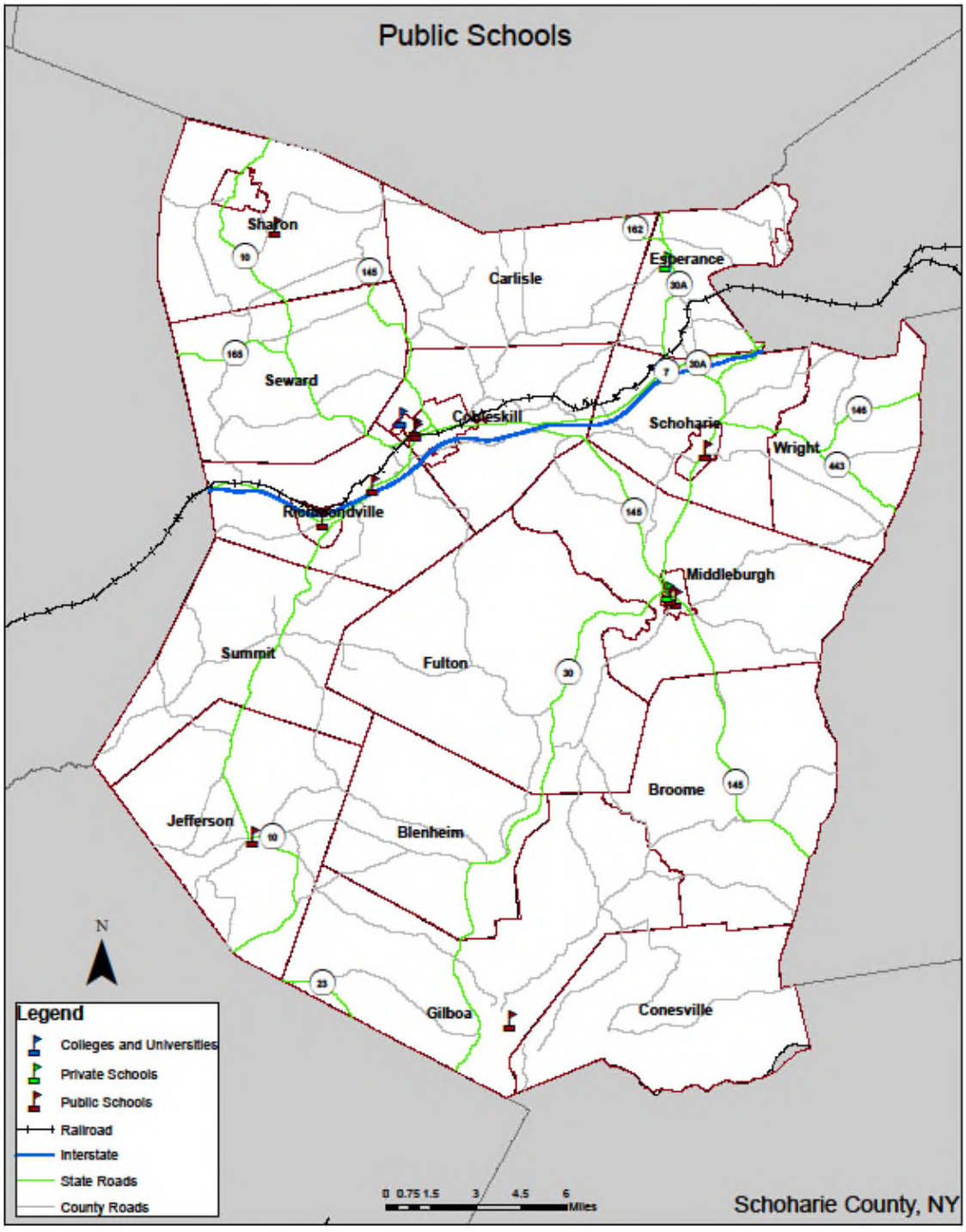

Bridge Inventory - Type of Service Under Bridge
Sharon
Carlisle
Esperance
Seward
Cobleskill
Schoharie
Wright
Richmondville
Middleburgh
Summit
Fulton
Broome
Jefferson
Blenheim
Gilboa
Conesville
N
Legend
Type of Service Under Bridge
Highway - with or without pedestrian
Railroad
Waterways
Railroad
Interstate
State Roads
County Roads
0 0.75 1.5 3 4.5 6
Miles
Schoharie County, NY


Utility Service Areas
Sharon
Carlisle
Esperance
Seward
Cobleskill
Schoharie
Wright
Richmondville
Middleburgh
Summit
Fulton
Broome
Jefferson
Blenheim
Gilboa
Conesville
N
Legend
Interstate
State Roads
County Roads
Railroad
NYSEG Natural Gas Service Area
NYSEG Electric Service Area
National Grid Electric Service Area
0 0.75 1.5 3 4.5 6 Miles
Schoharie County, NY

New York City Water Supply

New York City draws much of its water supply from the Catskill and Schoharie region of upstate New York. The watershed supply area extends into the southern portion of Schoharie County in the Towns of Jefferson, Gilboa, Conesville and Broome. The City of New York's water supply reservoir and pumping facilities are located in the Towns of Gilboa and Conesville. The reservoir and watershed are included as vulnerability due to the potential for security threats and watershed contamination that would affect the city's water supply; and a breach or failure of the reservoir dam poses downstream flood risks through the Schoharie Valley. New York City is responsible for maintenance, monitoring and safety provisions associated with potential failure of their reservoir dam, and the City would be responsible for disaster recovery operations and costs involving their facilities. The impact and estimate of potential loss for Schoharie County that could results from a reservoir dam failure are captured by the analysis in the flooding and dam safety portions of this assessment.




Public Schools
Sharon
Carlisle
Esperance
Seward
Cobleskill
Schoharie
Wright
Middleburgh
Summit
Fulton
Broome
Jefferson
Blenheim
Gilboa
Conesville
N
Legend
Colleges and Universities
Private Schools
Public Schools
Railroad
Interstate
State Roads
County Roads
0 0.75 1.5 3 4.5 6
Miles
Schoharie County, NY

5.6 Estimate of Potential Losses

This section describes hazard vulnerability based on potential dollar losses for each hazard related to improved property, community infrastructure, facilities and services**.**

An estimate of potential losses follows for four (4) of the natural hazards designated as *'Hazards of Concern'* in Chapter 3, where it was determined the hazard poses a significant risk, or a serious occurrence could have major impacts for improved property in Schoharie County.

Flooding Severe Winter Storm Tornado Ice Storm

Since the threat and impact related to a Dam Failure is flooding, there is not an independent vulnerability assessment for dam failure and the analysis for flooding can be applied. The vulnerability associated with Severe Storms is related to wind damage and flooding; thus the impacts of Severe Storms are referenced in the sections for Severe Winter Storm (Wind) and Flooding. No estimate of potential losses for Earthquake was prepared for this Plan, because as noted in the Section IV Hazard Profiles, the risk of a severe event is considered very low and the sections prepared for Tornados and Floods can be used to provide a reasonable analysis.

A vulnerability assessment is also provided in this section for the following hazards – which were not designated '*Hazards of Concern'* in Section III – but they could have serious consequences for certain groups, areas or populations in Schoharie County and it was determined that including an assessment of these hazards would improve overall community preparedness for these events.

Extreme Temperatures	Transportation Accident	Oil Spill
Utility/Power Failure	Hazardous Materials – In Transit	Landslide
Animal Disease/Epidemic		

Flooding

Nationally and in New York, flooding is the most common and costliest natural disaster.

According to the United States Geological Survey (USGS), floods are the most frequent and costly U.S. natural disasters in terms of human hardship and economic loss. The USGS estimates as much as 90% of damage related to natural disasters (excluding drought) is caused by floods. According to the NYS Hazard Mitigation Plan (2014), flooding is the primary natural hazard in New York and damaging floods occur somewhere in the State each year.

Based on NFIP statistics, it is estimated that only between 30% and 50% of at-risk properties are covered by flood insurance. Assuming that the number of current NFIP policies represents only about 50% of properties that should be insured, this means an additional 162,500 statewide properties could be at risk in the state's Special Flood Hazard Areas (A-Zones).* But looking at properties at risk in the high hazard flood zones defines only a portion of the problem, since FEMA emphasizes that as many as 25% of the properties damaged by flooding are in lower risk flood zones outside the 100-year floodplain.

* Source: NYS Hazard Mitigation Plan, 2014

> The term '100-year floodplain' is commonly mis-applied. It does not mean that a flood will occur every 100 years, rather it means there is a 1% chance a flood will occur in any year, and in the 100-year floodplain there is a 26% chance a property will be flooded over the period of a 30-year mortgage (more than once in 100 years), which FEMA notes is about five times higher than the risk for a severe fire.

The 2004 Flood Insurance Rate Map (FIRM) study for Schoharie County determined that flooding is the most frequent and damaging natural disaster in Schoharie County. The highest profile flood risk areas are those along the Schoharie Creek that drains a 950 square-mile watershed that carries runoff from the Catskill Mountains to the Mohawk and Hudson Rivers. The significance of the flood threat in the Schoharie Creek valley is amplified by flood risks that exist on its many adjacent and feeder tributaries, streams and creeks; as repeatedly demonstrated by the 2011 Hurricane Irene flooding and other previous floods. Schoharie County can also have flooding in the sparsely developed southwest area of the county that is drained by Charlotte Creek which flows to the Susquehanna River; and in the east of the county a small area near Franklinton in the Town of Broome is drained by the Catskill Creek to the Hudson River.

Even when properties are not situated on creeks and streams – such as those on steep hills and gentle slopes – they can experience flooding when heavy, inundating rains produce sheets of water that overwhelm natural gullies and swales; and in flat terrain away from streams and creeks, ditches and drainage paths can quickly be overtaken when drenching rains occur. This is a particular problem in villages and developed areas when channeled drainage, catch basins and storm sewers swell beyond capacity. Floodplains and flood risk also change over time as development occurs up and down stream, and when natural stream and runoff patterns are altered as debris build-up and shifting sedimentation transforms a channel's hydrology.

National Flood Insurance Program (NFIP)

The extent of participation in the NFIP can be a significant factor in a community's vulnerability to flooding and its capability to recover from flood losses.

When a mortgage or loan is taken against improved property that is located in a Zone A 100-year flood zone, most lenders will require that the property owner purchase and maintain flood insurance. Anytime a mortgage or loan is obtained from a federally regulated institution that involves a property in the high-hazard flood zone, federal law requires the property owner to purchase and maintain flood insurance -- this includes most types of mortgages, home equity loans and lending where the property is used as collateral. If a property is not covered by flood insurance and it is damaged by a flood, and federal disaster assistance is obtained, the property owner will be required to purchase and maintain flood insurance as a condition of receiving flood damage reimbursement.

Not all flood events will meet the federal criteria needed to make federal disaster aid available to help with losses; flood insurance may often be the only way a property owner can recover flood damages. It is FEMA's goal that all properties in the high-hazard flood zone be covered by flood insurance and they recommend that property owners in moderate and low risk areas also

purchase flood insurance – policy costs for those in moderate and lower risk areas outside A-Zone are significantly less – renters can also purchase flood insurance.

To determine the number and value of properties at risk to flooding in a community, an analysis of properties in the special flood hazard zones is typically undertaken, which is usually the A zones on local flood maps or what is also called the 100-year flood zone. This assessment for Schoharie County is performed as part of the National Flood Insurance Program (NFIP) which is administered by the Department of Environmental Conservation (DEC) in New York. In many areas of New York, the assessment applies Geographic Information System (GIS) mapping technology to produce the FEMA 'Q3' digital flood mapping that assesses potential flood impacts in the high-risk flood zones. This 'Q3' digital analysis is not yet available for Schoharie and twenty-one (21) other counties in New York. While this analysis evaluates the risk of flooding in a community's high risk areas and is useful when comparing flood vulnerabilities for one community to another, it is not the most complete method of evaluating the total number of properties at risk in a county, because it does not consider properties at risk in areas outside the high risk or A-Zone. As noted above, serious flooding can occur outside the 100-year floodplain, even where the risk is considered much lower.

The 2014 NYS Hazard Mitigation Plan prepared a statewide assessment that evaluates and ranks county vulnerability to losses from flooding. In the statewide analysis, all counties are ranked relative to their vulnerability for flood losses, which is a combined rating that factors the history of flooding, density of the population and the potential loss or cost based on the value of property covered under NFIP policies.

In the state's analysis, the flood loss rating for Schoharie County was nineteen (19), on a scale where the least vulnerability to flood loss was rated seven (7) and the greatest vulnerability was thirty-three (33). Of the fifty-eight (58) New York counties, Schoharie shared the #19 rating with five (5) other upstate counties (Albany, Chenango, Greene, Oneida and Rensselaer). There were thirty-three (33) counties that had a rating less than nineteen (19) (less vulnerable to flooding), and nineteen (19) counties ranked higher than Schoharie, indicating increased vulnerability. The vulnerability ratings for Nassau, Suffolk, New York City and Westchester were significantly higher than any other areas of the state due to their urban density and the considerably higher number of developed properties.

This rating or score does not represent the risk of flooding, since all counties have flooding, rather it shows how a greater density of population and increased numbers of properties in high risk flood zones increases vulnerability. This data is from the 2011 NYS Hazard Mitigation Plan and was prepared prior to the 2011 flooding in Schoharie County, but a significant change in Schoharie County's rating or position would not occur if the analysis were updated to reflect post 2011 flood data. In the post-2011 flood period, it would be expected that more properties would be added to those covered by NFIP insurance, but increasing market values would be somewhat offset by the loss of insured properties and reduced property values linked to the flooding. In this statewide analysis, Schoharie's sparse population and low density development would work to maintain its mid-range position relative to more vulnerable urban and suburban areas, although Schoharie still has greater flood vulnerability than many other small and medium size counties.

What does the above analysis mean for Schoharie County?

It emphasizes that high density development in flood zones is the dominant factor influencing flood vulnerability, plus it highlights the vital role flood insurance plays in managing flood losses for existing and future development.

Source: NYS Hazard Mitigation Plan 2014 - Table 3-19

As noted above, serious flooding can occur outside the 100-year floodplain, even where the flood risk is considered much lower, but it is impractical to perform 'Q3' digital flood mapping or other kinds of technical analysis for all areas like that done for the high-risk zones. The table below outlines potential flood damages relative to all residential properties in each a community, thus providing a means to estimate overall flood impacts across all areas. It estimates the value of residential property that could be impacted by a flood that damages 1% of the properties in Schoharie County or as many as 15% of properties.

Value of Potential Flood Damage to Residential Properties						
Jurisdiction	Occupied Residences	Total Residential Property Value	1% of Properties Damaged	Potential Value	15% of Properties Damaged	Potential Value
Blenheim	299	$22,280,200	3	$222,802.00	45	$3,342,030.00
Broome	717	$77,593,000	7	$775,930.00	108	$11,638,950.00
Carlisle	671	$62,443,299	7	$624,432.99	101	$9,366,494.85
Cobleskill, T	1460	$140,138,405	15	$1,401,384.05	219	$21,020,760.75
Conesville	671	$73,447,337	7	$734,473.37	101	$11,017,100.55
Esperance, T	675	$76,685,646	7	$766,856.46	101	$11,502,846.90
Fulton	743	$51,224,319	7	$512,243.19	111	$7,683,647.85
Gilboa	996	$1,647,526	10	$16,475.26	149	$247,128.90
Jefferson	849	$61,316,711	8	$613,167.11	127	$9,197,506.65
Middleburgh, T	1238	$103,124,607	12	$1,031,246.07	186	$15,468,691.05
Richmondville, T	931	$115,442,383	9	$1,154,423.83	140	$17,316,357.45
Schoharie, T	1058	$136,926,300	11	$1,369,263.00	159	$20,538,945.00
Seward	682	$66,703,145	7	$667,031.45	102	$10,005,471.75
Sharon	726	$58,721,975	7	$587,219.75	109	$8,808,296.25
Summit	858	$53,211,189	9	$532,111.89	129	$7,981,678.35

Wright	596	$67,875,700	6	$678,757.00	89	$10,181,355.00

Sources: NYS Office of Real Property Tax Services, Municipal Profile, 2017

Note: Property assessment administration and reports for villages are consolidated with the respective township

Schoharie County has a long and detailed history of documented costs and vulnerabilities related to flooding.

2011 -- More than 1,880 property owners, families and residents from Schoharie County applied for disaster relief due to the August and September 2011 Hurricane Irene and Tropical Storm Lee flooding - the greatest number of applicants for any New York county affected by these back-to-back flood events. Fifty-five (55) properties located in the high risk A-zones that were damaged by the 2011 floods have been approved for buy-outs and demolition. Building officials determined that 657 homes in the fifteen (15) towns and villages affected by the floods sustained major damage and repair costs for residential structures are expected to reach $90 million. It took up to a year before many residents were able to move back into their homes. Aside from repair costs, the Schoharie County Real Property Tax office also reported that the floods negatively affected taxable property values in these fifteen (15) towns and villages, where local assessors determined flood damage reduced the taxable property values of 423 parcels by approximately $30 million.

Damage to public infrastructure in Schoharie County, which includes roads and public buildings, exceeded $50 million. About one-half of the losses, $25 million, were for repair of roads and bridges. Costs to repair the flooded Schoharie County office building was more than $5 million, and another $2.5 million was to be spent on improvements to prevent future flood damage. The federal and state governments helped with these expenses, although typically there is a local cost share. The County is also receiving state and federal disaster assistance to restore flood damage and mitigate future flooding at the county jail and public safety center, where the total cost was estimated to be $9 million.

When federal disaster assistance is authorized, the federal portion of the flood restoration costs are usually 75%, and the state typically reimburses 12 ½ %, leaving a 12 ½ % share to be borne by local governments. Due to the extensive and overwhelming impacts of the 2011 flooding, the state agreed to cover the entire non-federal share of 25%. This level of reimbursement is rare, however, and after most major disasters, local governments may still incur thousands or millions of dollars in disaster losses. Many less severe floods and natural disasters may not even meet the criteria needed to trigger state and federal assistance, leaving the county and municipal governments exposed to significant disaster expenses.

2006 – From June 26th through June 28th 2006, tropical moisture and a stalled cold front combined to produce heavy rain and flooding across wide areas of eastern and central New York. In Schoharie County, flooding was most severe in areas west of the Schoharie Creek; including the towns of Seward, Richmondville, Cobleskill, Summit and Gilboa. 4-5 inches of rain fell in a

short time through Gilboa and around Cobleskill, and as much as 6 inches fell in areas of Seward, Richmondville and Summit.

Up to $160,000 in damages were reported to municipal roads, bridges and other infrastructure; while 2 (two) homes had major flood damage and 60 others had minor damage. 73 individuals and families applied for FEMA disaster aid. A local bridge was severely damaged in Charlotteville, there were mudslides and evacuations in Richmondville, Route 7 in east Cobleskill and Route 10 in west Cobleskill were flooded and closed, buildings and roads were flooded in Warnersville, Keyserkill Creek in Gilboa flooded Campbell Road and Route 145 in Broome Center was flooded. Approximately 35,125 acres, or 43 percent of the farmland in Schoharie County was damaged and extensive structural damage was also reported to farm properties. Many residents said the flooding caught them off guard.

FEMA Approves $82,000 Project to Mitigate Flood Damage in Richmondville

Press Release date: March 29, 2007 Release Number: 1650-155

ALBANY, N.Y. -- Repairs to Franzen Road in the Town of Richmondville, Schoharie County, damaged during the June 2006 flooding were designed to a higher standard, and may be less vulnerable to future flooding.

Thanks to a New York State and Federal Emergency Management Agency (FEMA) policy, extra funding is provided to mitigate against future damages to public infrastructure.

"We have a temporary conduit drain pipe there now," says Highway Superintendent Keith Alheiser, "but we need to get started with the bigger new culvert. The new one will solve a couple of problems: the volume problem, and the internal water routing problem. This one will be straight through."

A major FEMA goal is to mitigate, where it is cost effective, when restoring damaged infrastructure so the repaired facility is better able to withstand future disaster damages. Extra money spent now can reduce future impacts and costs.

"Mitigation activities such as these are a smart way of doing business by spending monies now to lessen the threat to communities before an event occurs in the future," said State Coordinating Officer John R. Gibb, Director of SEMO. "This is an excellent example of an investment in improvements that will pay dividends for years to come," said FEMA Federal Coordinating Officer Marianne C. Jackson.

2001 – A storm and drainage problems in the Village of Sharon Springs flooded areas along Route 20 resulting in about $20,000 in damage to residential properties and several businesses were temporarily closed and lost revenue. No federal aid was available.

1996 – Heavy rain and warm temperatures combined with rapidly melting snow to create extensive flooding in the Schoharie Valley. Two (2) drowning's were attributed to the flood and

there was widespread damage to homes, businesses, roads and bridges. More than forty (40) homes were substantially damaged by flooding and costs to restore community infrastructure were estimated to be $1.5 million. The severity of this flood highlighted the vulnerabilities that existed in Schoharie County and prompted a new outlook on preparedness and floodplain management.

1987 – April storms producing up to nine (9) inches of rain combined with late winter runoff and already saturated soils to create extensive flooding in the Schoharie Valley. The extremely powerful flow of the Schoharie Creek resulted in the collapse of the New York State Thruway bridge and 10 fatalities downstream in neighboring Montgomery County.

Other major flood events in Schoharie County occurred in 1784, 1858, 1869, 1901, 1903, 1936, 1938, 1955, 1977, 1983, 1996, 1999, and 2000.

Nine (9) of the twenty-two (22) towns and villages in Schoharie County were significantly impacted by the 2011 flooding; municipal costs and recovery in the hardest hit communities like Middleburgh and Schoharie could reach $15-$20 million as they cope with restoration of flood damaged infrastructure, emergency response and clean-up.

Municipal flood recovery costs vary widely depending on the scope of the flooding, the extent and types of facilities damaged; in addition to the size of the community, the density of development and property values. Based on data from the New York State Office of Emergency Management for recent floods, costs to local jurisdictions in rural upstate communities typically range from several thousand dollars to more than $16 million. In the August 2009 flood in Cattaraugus County, expenses in the Village of Gowanda (population: 2,600) amounted to $16.6 million, and in the Town of Perrysburg (population: 1,771) the cost was $5.2 million. In addition to clean-up costs and road repair, both these areas had extensive damage to municipal water systems, bridges, schools and hospitals. Costs in the Village of Perrysburg (population: 408) were $2 million, and in Yorkshire (population: 4,210) and East Otto (population: 1,105) they were $1.2 million each. These latter communities primarily had flood losses associated with repair of roads, drainage, parks and public grounds, debris clean-up and emergency response costs.

Severe flooding is common in many rural upstate New York communities. In 2009, flooding in Chautauqua, Cattaraugus and southern Erie counties affected several rural villages and small towns. In the Chautauqua County village of Silver Creek and four nearby towns, 43 homes were destroyed and 325 were damaged. In the Village of Gowanda that borders Cattaraugus and Erie counties, one-third of the village's 1000 homes were damaged in the same flood.

Factors that affect the severity of flooding in these areas differ from that of Schoharie County, just as there are similarities. The core of Schoharie County's flood vulnerability is associated with populated and developed areas of the Schoharie Valley, but the history and flood profile of Schoharie County – which includes many related tributaries, floodplains and other watersheds -- demonstrates that all communities in Schoharie County share, or may even exceed the vulnerability to flooding that exists throughout New York.

Severe Winter Storm

Structural losses associated with winter storms are most often related to damages caused by wind, heavy snow loads, water damage and freezing pipes. Communities also experience extraordinary expenses for health and emergency services, snow removal and debris disposal; and there are significant economic impacts when there are power outages, transportation is disrupted and schools and businesses are closed.

In 2016, the Insurance Information Institute reported that the average homeowners claim for wind and hail damage was $8,625, and if the claim included water and freezing damage, the average increased to $9,633.

Value of Potential Severe Storm Damage to Residential Properties				
Jurisdiction	Occupied Residences	10% of Properties Damaged	Potential Value (wind and hail)	Potential Value (water and freezing)
Blenheim	299	30	$257,887.50	$288,026.70
Broome	717	72	$618,412.50	$690,686.10
Carlisle	671	67	$578,737.50	$646,374.30
Cobleskill, T	1460	146	$1,259,250.00	$1,406,418.00
Conesville	671	67	$578,737.50	$646,374.30
Esperance, T	675	68	$582,187.50	$650,227.50
Fulton	743	74	$640,837.50	$715,731.90
Gilboa	996	100	$859,050.00	$959,446.80
Jefferson	849	85	$732,262.50	$817,841.70
Middleburgh, T	1238	124	$1,067,775.00	$1,192,565.40
Richmondville, T	931	93	$802,987.50	$896,832.30
Schoharie, T	1058	106	$912,525.00	$1,019,171.40
Seward	682	68	$588,225.00	$656,970.60
Sharon	726	73	$626,175.00	$699,355.80
Summit	858	86	$740,025.00	$826,511.40
Wright	596	60	$514,050.00	$574,126.80

Structures built in compliance with NYS building codes would be designed to withstand expected snow loads, so those at greatest risk would be older or non-compliant structures. While local communities have applied building codes for decades, the New York State Uniform Fire Prevention and Building Code went into effect in 1984 to apply statewide standards. Structures built prior to 1984 are sometimes thought to be at the greatest risk, but in rural farm communities of upstate New York, only a portion of those built prior to 1984 can be considered at higher risk,

since the quality of early building techniques and materials make many older structures as strong or more stable than those built using today's standards.

A severe winter storm in Buffalo and Erie County, NY in 2001 accumulated seven (7) feet of heavy snow over five (5) days and there were twenty-two (22) structures with collapsed roofs, some totally destroyed and others with partial damage. There was also widespread damage to carports, porch roofs and accessory structures, which are often not reinforced as strongly as residential or commercial construction. The National Weather Service notes the maximum record snowfall in Schoharie County was twenty-one (21) inches or less than two (2) feet; and structural densities are also much less in Schoharie County than in Buffalo and Erie. The U.S. Census Bureau estimated the 2010 median home value in Schoharie County is $147,600, so if one-half the jurisdictions in Schoharie County (11) were exposed to a heavy snow-load storm that destroyed half as many residences as occurred in Erie County (11 homes), the potential cost could be about $1.62 million across the county or $147,600 in each of eleven (11) jurisdictions.

Tornado

The most destructive tornado in Schoharie County was an F3 on July 10, 1989 that made a 12-mile path through Carlisle and Schoharie. It caused $25 million in damages to 20 homes and local facilities and injured 20 people. An F1 tornado occurred on May 2, 1992, causing $250,000 in damages, and another F1 tornado on May 29, 2013 in the Town of Jefferson damaged trees in rural areas near Dutch Hill and Wharton Hollow Roads, but no property losses were reported.

An F1 tornado in Corfu, Genesee County in 2009 resulted in power outages, damage to thirty (30) homes, two (2) businesses, a farm and barn, and several vehicles. Property damage, clean up and municipal costs in two affected municipalities totaled $2 million, although the greatest impacts and costs were in the Village of Corfu.

One of the most serious tornados in New York State was the 1998 F3 tornado in Mechanicville, Saratoga County. It resulted in $60 million in property damage across nine towns and villages. There were seventy (70) injuries, fifty-five (55) homes were destroyed and 280 homes and businesses were damaged. Several farms were damaged and twenty-five (25) cows were lost when a barn collapsed. Local governments incurred emergency service and debris cleanup costs that ranged from a few thousand to more than $1 million.

Many of the communities across New York that were affected by these tornados are similar in size and profile, and also have the same risk of tornado occurrence, as jurisdictions in Schoharie County. Potential tornado losses to communities in Schoharie County could be similar to any of these events. Since tornados tend to concentrate damages in defined areas or paths where they touchdown or pass, villages and towns that have population centers or areas of greater structural density have an increased potential for loss.

All structures in Schoharie County are at risk of tornado damage, although only certain areas would be affected by any single tornado or event. The U.S. Census Bureau estimated the 2011 median home value in Schoharie County was $147,600. If any jurisdiction in Schoharie County sustained tornado losses similar to the 1998 F3 tornado in Mechanicville, Saratoga County, and 55 homes were destroyed, the potential loss to property in that town or village could be $8.1

million. And, if an additional 280 homes had 20 % damage, the loss total could more than double to $16.4 million.

Ice Storm

An ice storm can result in property and infrastructure damage, particularly when there are downed trees and limbs, or when problems associated with lack of power and heat contribute to equipment failure, water damage and structure fires. The most significant costs of ice storms are usually the economic impacts linked to power outages, utility restoration and the disruption of transportation that affects commerce and closes businesses and schools. Costs of debris clean-up, emergency power, spoiled food, sheltering and emergency services are also significant. Two of the most costly natural disasters in New York were the 1991 ice storm in Rochester and portions of the Finger Lakes and the 1998 North Country ice storm.

In 2007, the Insurance Information Institute reported that the average homeowners claim for wind damage was $3,500, and if the claim included water and freezing damage, the average increased to $5,095. Potential losses for wind and water damage associated with an ice storm would be similar to that estimated in the section above for Severe Storms - see the previous table above 'Estimate of Severe Storm Losses to Residential Property'.

The potential costs of a prolonged power outage following a severe ice storm would be similar to the losses estimated for power outages that can occur from many other hazards and are estimated below in the section 'Utility Failure / Power Outages'.

The most significant costs to local governments in an ice storm are related to debris clearance and disposal, emergency services, sheltering and temporary emergency power. Data provided by the New York State Emergency Management Office shows that disposal costs for rural local governments affected by a declared disaster that involve significant amounts of downed debris can typically range from a few thousand to $150,000.

The NYS Hazard Mitigation Plan (2011) prepared a statewide assessment that evaluates and ranks county vulnerability to ice storms. A rating score is derived by combining an evaluation of the number of ice storm disasters that occurred in a county, the population density per square mile in the county and the total number of structures in the county. Schoharie County has not had any serious ice storm events, plus the population and structural densities are low, so the ice storm rating for Schoharie County's was 1, on a scale of 1 (least vulnerable) to 9 (most vulnerable). Schoharie was among five (5) counties in the state that have the least vulnerability to ice storms and fifty-seven (57) New York counties have a higher ice storm rating or vulnerability.

Jurisdictions Most Threatened and Vulnerable to Ice Storm Loss (New York)

County	Rating Score	# of Ice Storm disasters	Total # of Structures
Schoharie	1	0	12,026

Source: NYS Hazard Mitigation Plan 2014 (Table 3-37)

The economic and demographic profiles of the northern New York counties are similar to that of Schoharie County and the 1998 North Country Ice Storm resulted in power outages for 320,000 people in seven counties, requiring disaster assistance payments totaling $55,950,736, or an average loss of about $175. per person.* If one-third the population of Schoharie County (2016: 31,667) were similarly affected, the estimated loss in Schoharie County would be close to $2.0 million.

* Source: NYS Office of Emergency Management report

Severe Storms

For severe storm wind damage, see Severe Winter Storms, for flooding associated with severe storms, see Flooding.

Dam Failure

For dam failure vulnerability, see Flooding.

Hurricane and Tropical Storm

For estimates of hurricane and tropical storm losses, see sections for Severe Storms and Flooding. Once a hurricane moves inland into upstate New York and Schoharie County, they are characterized by high winds and/or flooding and lack the storm surge features that threaten coastal communities.

Transportation Accidents

Property damage associated with transportation accidents would usually be localized or concentrated at an accident site and costs are commonly born by the responsible party or insurer. The most significant impact of transportation accidents is the potential for multiple deaths and injuries and the costs of emergency response, medical care, security and investigative services.

Given the traffic and transportation profile of Schoharie County, the greatest potential for a serious accident is associated with school and tour bus transportation, where vehicles carry up to fifty (50) passengers, or a multi-vehicle chain reaction pile-up on the interstate highway involving fog or poor visibility. Response to an accident of this type could cost the local community and response agencies thousands of dollars, and would be a demanding organizational and emotional challenge, but much of the cost would be spread across several mutual-aid departments and services, and it can be expected that some costs would be recovered through responsible parties and insurers. For local governments and agencies, there may also be potential costs associated with liability claims, but only if it is determined that local infrastructure, facilities or maintenance were contributing factors to the accident.

The single private airport in Schoharie County serves small aircraft that carry only a few passengers, and the low density structural profile of Schoharie County limits risks associated small aircraft accidents. Hazards associated with commercial air traffic using regional facilities in neighboring counties are considered extremely remote.

A rare and unlikely, but credible worst-case transportation threat would be a commercial airplane accident similar to the 2009 Colgan air crash in the small town of Clarence Center, near Buffalo, New York where there were fifty (50) casualties. Another example would be an event similar to the hijacked 9-11, United Flight 93 that crashed in rural Pennsylvania killing forty-four (44). The 2009 Colgan disaster destroyed two homes and the 9-11 Flight 93 crash occurred in a remote farm and mining area. In the Colgan air crash, the Town of Clarence and local response agencies submitted claims to the airline for reimbursement of $1.2 million in costs, while Erie County sought reimbursement of $750,000. Major costs involved recovery of victims and remains, security, medical examiner and autopsy expenses, firefighting, safety measures and monitoring, equipment rental, repairs to streets and sidewalks and incident management.[1]

There is active freight traffic on the principal railway traversing Schoharie County and while no major rail crashes have occurred, the physical damages and impacts associated with a rail accident, particularly one involving hazardous materials, could be severe. The threat is greater in more densely populated villages that border the rail line, and more so in Cobleskill where the railway goes through the village center. There are generally fewer casualties associated with freight train accidents, unless hazardous materials or other multi-passenger vehicles are involved.

A 2011 train accident occurred in a residential neighborhood of Rochester, NY when seven (7) cars of a forty-two (42) car train derailed and two of the cars were carrying hazardous materials. Thousands of gallons of the chemicals methylene chloride and acetone were spilled and caught fire and the derailed cars severely damaged two homes. There was only one injury to a rail employee, but neighboring homes were evacuated for several hours and plumes of black smoke from the burning cars could be seen more than ten (10) miles away. Emergency services were involved in the response through the night and much of the next day; railway crews and emergency contractors worked for several days to contain and reclaim the chemicals, clean-up the site and remove the rail cars. Costs were primarily born and reimbursed by the rail company and their insurer.[1]

[1] Source: NYS Emergency Management Office reports

Oil Spill

There are 204 sites throughout Schoharie County that have NYDEC petroleum bulk storage permits; where they primarily transport, transfer and/or store gasoline, fuel oil and related petroleum products. In the years 2009, 2010 and 2012, there was an average of fifty (50) oil spills in Schoharie County in each of those three (3) years. In 2011, a total of 211 oil spills were reported, the greater number attributed to Hurricane Irene flooding.[1] Most spills are minor and are remediated quickly and costs are commonly covered by the property owner, facility operator or transportation company that is responsible for the spilled product. NYSDEC notes that a spill of fifty (50) to 300 gallons can cost from $2,000 to $10,000 in cleanup and remediation, but can be as much as $50,000 if groundwater and other factors complicate the response. An oil spill at the Schoharie County Office Building several years ago disrupted government operations for days and the cleanup cost exceeded $150,000. There can also be emergency response costs to local governments and fire departments, which are sometimes reimbursed by the party responsible for the spill, or costs may be minimal and are considered a common and regular expense of emergency response operations.

A large or more widespread oil spill could result in major costs for environmental protection and clean up. Damage to homes or improved property might not be a factor, but a spill that seriously impacts groundwater, public water supplies, or a severe spill affecting recreational waterways could pose significant costs for businesses, the local economy and tourism. Local governments in Schoharie County do not have the resources and could not absorb the costs associated with a major oil spill. Action by the responsible party or support from state and/federal agencies would be essential to response and recovery from any serious spill.

Source: NYS DEC Spill Incident and Bulk Storage Databases

Hazardous Materials – In Transit

-- Highway and Rail --

Risks and costs associated with hazardous materials transportation accidents are potentially highest in the Towns and Villages of Cobleskill and Richmondville and the Town of Schoharie where Interstate 88 and the freight railway traverse. Almost one-third of Schoharie County's population or about 11,000 people live in the communities adjacent to or in the vicinity of this transit corridor. Potential risks exist on any of the State highways in Schoharie County; including Routes 20, 7, 10, 145, 162, 30, 30A and any route providing access to facilities using hazardous materials. There are eight (8) facilities in Schoharie County that maintain chemical bulk storage permits with NYSDEC where regulated types and amounts of hazardous chemicals are used, stored and/or transported. Twenty-one (21) facilities in Schoharie County are subject to reporting requirements under the federal Emergency Planning and Community Right-to-Know Act (EPCRA) Title III, which means they report and/or participate in preparedness measures for hazardous chemicals that are used or processed at these sites.

EPCRA Title III requires that spills of certain hazardous chemicals above threshold quantities be reported to the National Response Center (NRC). From 2000 thru 2017, there were forty (40) hazardous material releases or spills in Schoharie County that were reported to the NRC. Twenty-nine (29) were oil or petroleum spills, four (4) involved natural gas or propane and seven (7) involved other hazardous materials – of the seven (7), one was transportation related and six (6) were at fixed sites. The transportation-related incident occurred in the Town of Gilboa and involved a small amount of anti-freeze leaking from a truck and no property damage was reported.

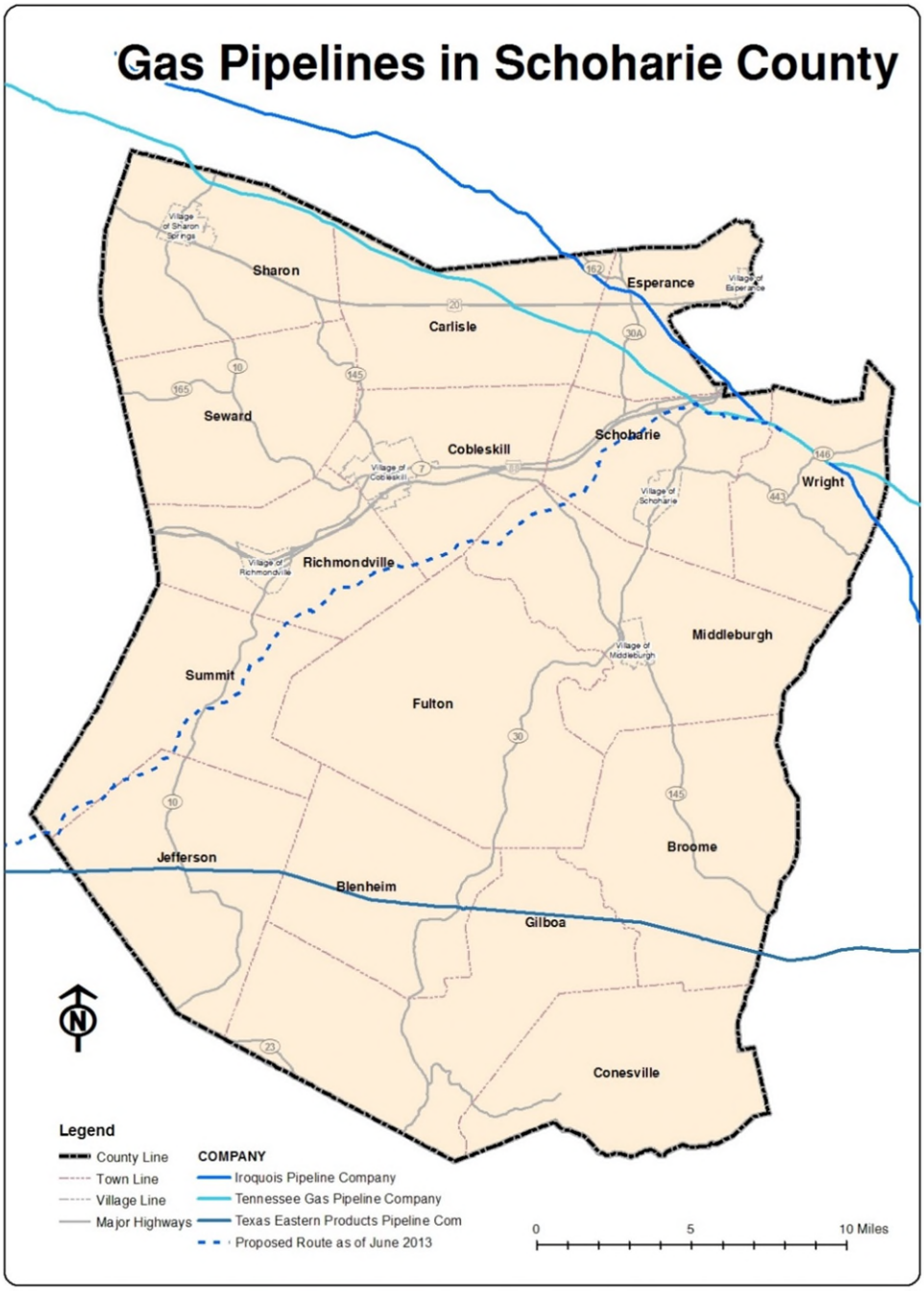
Historically, hazardous materials incident costs have not been a significant burden for local governments in Schoharie County, but the potential for serious threats exist that could impact public health, damage homes, improved property and infrastructure. In the previous section on oil spills, it was noted that cleanup and remediation costs can exceed $150, 000, and it could be expected that a serious spill or release involving hazardous chemicals could run into the millions of dollars. Cleanup and remediation of chemical hazards would typically be borne by a responsible party or covered through an environmental protection fund, but local governments cannot always be assured that emergency response costs or the cost of restoring public infrastructure will be reimbursed. The Firefighters Association of New York (FASNY) has asked the NYS Legislature to budget up to $10,000 for reimbursement to volunteer fire departments involved in a hazardous materials response. The American Red Cross (ARC) estimates that

community shelter or temporary housing costs can be as much as $100 per day/per-person, so if a hazardous materials evacuation zone covered a 1-mile radius in or near a village area involving 100 people, community expenses could quickly approach $20,000 to $30,000 in 2-3 days.

-- Gas Pipelines --

Three (3) natural gas transmission pipelines that cross Schoharie County are also considered a hazardous materials transportation risk. The natural gas industry is subject to regulatory safety requirements and applies extensive technologies to prevent hazards, but gas pipeline disasters have historically been costly in both loss of life and property damage. The 1990 gas pipeline explosion in North Blenheim, Schoharie County killed two people and destroyed 10 homes.

Local governments can expect that costs associated with a pipeline hazard will be borne by the pipeline operator. Local hazard mitigation efforts generally center on using local laws and zoning to authorize and approve site plans for natural gas facilities; and in working with pipeline operators, plus state and federal regulators to enhance and monitor safety design and systems.


Gas Pipelines in Schoharie County
Sharon
Esperance
Carlisle
Seward
Cobleskill
Schoharie
Wright
Richmondville
Middleburgh
Summit
Fulton
Jefferson
Broome
Blenheim
Gilboa
Conesville
Legend
County Line
Town Line
Village Line
Major Highways
COMPANY
Iroquois Pipeline Company
Tennessee Gas Pipeline Company
Texas Eastern Products Pipeline Com
Proposed Route as of June 2013
0
5
10 Miles

Extreme Temperatures

Extreme temperatures are not expected to pose significant losses to improved property or infrastructure, where costs would primarily be associated with damaged water lines, frost heaving in concrete drives and roadways, plus fire damage linked to reduced or disrupted water supply. Costs associated with extreme temperatures would be more directly related to emergency services and health care for people at risk to extreme heat or cold, temporary heating facilities, impacts on water supply and losses to the agricultural community.

The National Weather Service (NWS) reports that four (4) extreme temperature events are recorded for Schoharie County from 2000 to 2012. No property losses were reported for Schoharie County in these events, but the average loss was about $3,000 per property in other affected counties where losses were recorded. Property damage losses from the most severe temperature event in 2004 that included twenty-one (21) New York counties totaled $220,000, or an average of $10,500 for any county. The National Oceanographic and Atmospheric Administration (NOAA) estimated in 2005 that the average hospitalization costs to treat a victim of extreme heat or cold was $16,741 for a typical 3.5 days stay.

Landslide

Most of the steep slopes in Schoharie County that are subject to slope failure are in undeveloped or sparsely populated areas and the steeper hillsides where failures are most likely to occur have even less development that the valleys and less sloped terrain. The United States Geological Survey (USGS) estimates that Schoharie County has low landslide susceptibility and while five (5) slope failures have been recorded by the USGS, they are all related to development or man-made modifications to the land and there are no USGS recorded natural landslides in Schoharie County. Landslide incidents are commonly associated with heavy rain and runoff and affect very specific and localized sites that involve small sections of road or infrastructure and only a few undeveloped properties. These landslides have not caused serious residential damage, but a washout could result in costly damage affecting natural drainage-ways and channels, sections of local roads, culverts and related infrastructure. It is well established that construction on steep slopes will increase the risk of landslides (source: Schoharie County Soil and Water Conservation District (SWCD).

A landslide that damages a small and isolated section of roadway and associated infrastructure could result in repair costs up to about $100,000. Partial damage to a home or structure might cost up to $150,000, or more depending on the value of the structure and extent of damage.

If long stretches of roadway are damaged and accompanying slope reinforcement or protective measures are needed, the costs can be much higher. In 2009, Erie County, NY completed the restoration of 750 feet of a flood damaged rural roadway that included drainage and slope reinforcement. The cost was approximately $2 million, or about $14.1 million per mile.

Utility Failure / Power Outage

Disruption of electrical service is the most common utility interruption and usually the result of severe storms, ice storms, high winds, equipment and technological failure, terrorist or criminal activity, fires and accidents. Natural gas service can be affected by supply disruptions, equipment or technical failure, terrorism or sabotage, fires and accidents. Communication services are also at risk to severe weather, storms, high winds, equipment or technical failure, terrorism or criminal activity, fires and accidents.

Damages and costs to improved property and municipal infrastructure associated with utility outages are most often related to surges that damage electrical services, equipment and appliances. Damaged equipment and structural impacts can also occur when heat and power loss cause freezing and water damage. Fires are a further concern when there are electrical malfunctions or gas leaks, and when alternate heating sources and generators are misused during outages.

While not directly affecting improved property and infrastructure, there are many other utility and power outage costs that impact the community. Spoiled food and the replacement cost of food, emergency response and sheltering, and health care costs linked to increased injuries and the loss of heat and air conditioning are common. The most costly impacts to the community from a sustained, widespread power outage can be economic and include the closing of businesses and schools, disruption of commerce, suspension of transportation and public services and unemployment. Agricultural operations typically experience significant losses as well when there are utility failures.

The most power sensitive facilities and customers typically include:

- Mission-critical computer systems
- Industrial processing companies
- High-tech manufacturing facilities and clean rooms
- Financial institutions
- Digital communication facilities (phone, television, satellite)
- Military operations
- Wastewater treatment facilities
- Hospitals and other health care facilities

Power outages or service interruptions impose direct costs on facilities and customers in the following ways:

- Damaged facility equipment
- Diminished or off-specification product and output
- Extra maintenance costs
- Cost for replacement or repair of failed components
- Loss of revenue due to downtime that cannot be made up
- Costs for idle labor
- Liability for safety/health

Note: The data below was also used to estimate potential losses in the 2013 Schoharie County HMP. An extensive search indicated that this data I still the most reliable source available.

The U.S. Environmental Protection Agency (EPA) maintains data that estimates electric power reliability and the associated costs that customers experience when there is an interruption of power *(US EPA, Calculating Reliability Benefits, last updated, July 2009).* Their analysis estimated the cost of outages per kilowatt hour for Pacific Gas and Electric (PG&E) customers.

Costs of Power Interruption

Customer Class	$/kWh un-served
Industrial	$12.70 - $424.80
Commercial	$40.60 - $68.20
Agricultural	$11.50 - $11.70
Residential	$5.10 - $8.50

Note: A kilowatt hour is a unit of energy equal to 1000 watt hours. A heater rated at 1000 watts (1 kilowatt), operating for one hour uses one kilowatt hour of energy. Using a 60 watt light bulb for one hour consumes 0.06 kilowatt hours of electricity, or using a 60 watt light bulb for one thousand hours consumes 60 kilowatt hours of electricity.

The U.S. Energy Information Administration (EIA) estimated in 2008 that residential customers in New York State used an average of 19.7 kilowatt hours of electricity per day. Using the EPA and EIA estimates, residential customers in Schoharie County would have costs that range from $100 to $167 each day there is an outage. If electric service is disrupted throughout an entire town or village, the cost to all residents in each town are outlined in the following table.

Power Outage - Daily Cost to Residents

Potential Residential Power Outage Costs Per Day			
Jurisdiction	Occupied Residences[1]	Average Cost Per Day	Total Daily Cost Per Jurisdiction
Blenheim	299	$133	$39,767
Broome	717		$95,361
Carlisle	671		$89,243
Cobleskill, T	1460		$194,180
Conesville	671		$89,243
Esperance, T	675		$89,775
Fulton	743		$98,819
Gilboa	996		$132,468

Jefferson	849		$112,917
Middleburgh, T	1238		$164,654
Richmondville, T	931		$123,823
Schoharie, T	1058		$140,714
Seward	682		$90,706
Sharon	726		$96,558
Summit	858		$114,114
Wright	596		$79,268
TOTAL	**13,170**		**$1,751,610**

[1] NYS Office of Real Property Tax Services, 2017 Assessments

5.7 Analysis of Development Trends

Development Management Tools

The primary planning documents and local boards that analyze development trends in Schoharie County and local communities include the following.

- Comprehensive Master Plans prepared by most of the county's towns and villages
- New York Rising Communities Program Plans: Blenheim, Fulton, Esperance, Middleburgh, Schoharie
- Schoharie County Long Range Economic Development
- Schoharie County / New York City Watershed: Low Impact Development Design Strategies
- Cobleskill Small Urban Area Corridor Plan
- Schoharie County Highways Shared Services / Consolidation Study
- Cobleskill Water and Sanitary Sewer Master Plan
- Blenheim Long-Term Recovery Plan
- Schoharie Planning Commission's Guide for Local Officials
- Schoharie County Board of Supervisors
- Schoharie County Planning Commission
- Schoharie County Agriculture & Farmland Protection Board
- Southern Tier East Regional Planning Development Board (STERPDB)
- Mohawk Valley Regional Economic Development Council
- Schoharie Area Long-Term Disaster Recovery Coalition (SALT)

Refer to Section 4 of each Jurisdiction Annex for additional detail regarding existing plans, programs, and policies and full Capability Assessments.

Local Development Policies

Summary of Relevant Plans, Regulations and Zoning					
Jurisdiction	Comprehensive Master Plan	Zoning or Land Use Law	Subdivision	Planning Board	Zoning Board of Appeals

			Regulations		
Blenheim	Adopted, 2014	None	None	None	None
Broome	Adopted, 2004	Building Site	Yes	Yes	None
Carlisle	Adopted, 2006	Building Site	Yes	Yes	None
Cobleskill, T	Adopted, 1964	Zoning	Yes	Yes	Yes
Cobleskill, V	Adopted, 1999	Zoning	Yes	Yes	Yes
Conesville	Adopted, 2007	None	Yes	Yes	None
Esperance, T	Adopted, 2008	Zoning	Yes	Yes	Yes
Esperance, V	Adopted, 2004	Zoning	Yes *	Yes	Yes
Fulton	Adopted, 2014	Building Site	Yes	Yes	None
Gilboa	Adopted, 2004	Building Site	Yes	Yes	None
Jefferson	Adopted, 2008	Rural Development	Yes	Yes	Yes
Middleburgh, T	Adopted, 2015	Zoning	Yes	Yes – Joint Town/Village Board	Yes
Middleburgh, V	Adopted, 2015	Zoning	Yes		Yes
Richmondville, T	Adopted, 2006	Zoning	Yes	Yes	Yes
Richmondville, V	Adopted, 2006	Zoning	Yes	Yes	Yes
Schoharie, T	Adopted, 1997	Zoning	Yes	Yes	Yes
Schoharie, V	Adopted, 2017	Zoning	Yes	Yes	Yes
Seward	In Progress	Zoning	Yes	Yes	Yes
Sharon	Adopted, 2012	Zoning	Yes	Yes – Joint Town/Village Board	Yes
Sharon Springs	Adopted, 2002	Zoning	Yes		Yes
Summit	Adopted, 2008	Land Use	Yes	Yes	Yes
Wright	Adopted, 2017	Building Site	Yes	Yes	Yes

Source: Schoharie County Office of Community Development Services, August 2018

* Not a full subdivision review, new lots must meet minimal area requirements

1. Population Trends

Population growth and associated development in Schoharie County will not significantly influence hazard mitigation goals and priorities in the years ahead. As noted by the 2010 U.S. Census, much of Schoharie County experienced slight population growth over the last decade -- primarily in Blenheim, Carlisle, Jefferson and the Village of Richmondville – but even in these communities the gains are modest and the low-density character of the areas is not expected to change.

Population Trends

2012-2016 ACS 5-Year Estimates

County	2010	2016	Difference	% Change
Schoharie	32,749	31,667	-1,082	-3.30%
Delaware	47,980	46,480	-1,500	-3.13%
Greene	49,221	48,069	-1,152	-2.34%
Montgomery	50,219	49,667	-552	-1.10%
Otsego	62,259	60,979	-1,280	-2.06%
Schenectady	154,727	154,845	118	0.08%
Albany	304,204	307,891	3,687	1.21%
Saratoga	219,607	224,929	5,322	2.42%

Town	2010	2016	Difference	% Change
Blenheim	377	321	-56	-14.85%
Broome	973	812	-161	-16.55%
Carlisle	1,948	1,786	-162	-8.32%
Cobleskill	1,947	1,926	-21	-1.08%
Conesville	734	760	26	3.54%
Esperance	1,731	1,463	-268	-15.48%
Fulton	1,442	1,270	-172	-11.93%
Gilboa	1,307	1,341	34	2.60%

Jefferson	1,410	1,423	13	0.92%
Middleburgh	2,246	2,072	-174	-7.75%
Richmondville	1,692	1,494	-198	-11.70%
Schoharie	2,283	2,186	-97	-4.25%
Seward	1,763	1,687	-76	-4.31%
Sharon	1,288	1,517	229	17.78%
Summit	1,148	1,168	20	1.74%
Wright	1,539	1,684	145	9.42%

Village	2010	2016	Difference	% Change
Cobleskill Village	4,678	4,554	-124	-2.65%
Esperance Village	345	347	2	0.58%
Middleburgh Village	1,500	1,535	35	2.33%
Richmondville Village	918	922	4	0.44%
Schoharie Village	922	881	-41	-4.45%
Sharon Springs Village	558	518	-40	-7.17%

Population growth and related development are expected to remain manageable in the years ahead due to the following factors.

- Economic and employment growth will primarily be linked to tourism and small business development, where modest increases or changes in job patterns are not expected to significantly offset adjustments or losses in other employment sectors.
- Communities are not planning expansion of water and sewer services (except in Cobleskill, where options for expanded services have been evaluated but not enacted), which limits opportunities for residential growth and development. In fact, some towns have expressed opposition to water and sewer expansion in their master plans because it would encourage growth that is not consistent with goals for preserving the agricultural, natural resource and rural character of their communities.
- Most plans recommend that residential expansion occur in proximity to the villages and hamlets, to take advantage of the associated infrastructure and services already provided, and to reduce development pressure on areas dedicated to agriculture, natural resources and rural uses.

- While part of the Albany-Capital District region, Schoharie County is situated well outside the core commercial zone and transportation hub that is most attractive to businesses and employers. Although Schoharie County looks to be successful in attracting businesses and jobs that seek a more rural setting combined with interstate transportation access and a more cost-effective business environment, such growth is not expected to dramatically increase the area's population and development profile in the near future.

2. Development Priorities

Most of the development and master plans prepared by Schoharie County, local municipalities and area resource management groups call for applying a sustainable development approach; one that balances modest growth with the protection of agriculture, preservation of the community's rural and small town features and conservation of natural resources.

Tourism and Cultural Resources

Schoharie County is situated in the central upstate New York region where the preponderance of natural resources, historic features and transportation access make it an attractive destination for those from throughout the northeast. These natural resources have combined to generate a significant tourism industry in the county centered on the many rural markets, beautiful vistas, outdoor recreation, water resources, culture and history.

Efforts are focused on developing gateway access that will welcome and orient visitors, making it easier for tourists and visitors to access Schoharie County using the interstate highways that connect the county to northeast urban centers.

Agricultural Preservation

The history and economy of Schoharie County are closely linked to its agricultural roots and the dominant rural character of the area is a key feature that attracts visitors, tourists and new residents.

There is widespread support for retention and promotion of the agriculture economy, the preservation of farms and rural activities. The quiet and sparse rural setting of Schoharie County, combined with its extraordinary natural resources, forested areas, quaint valleys and vistas are significant attractions that appeal to visitors, vacationers, retirement home buyers and new residents who seek a country and small town lifestyle.

Residential Development

Demand for residential expansion in Schoharie County is expected to remain modest, primarily focused on scattered single family housing or town-house and related low-density construction. The greatest potential for development exists in the highway and rail transportation corridor crossing the county through Esperance, Schoharie, Cobleskill and Richmondville. Other communities like Blenheim and Jefferson have seen modest growth as people look to retire or relocate to these attractive rural and natural settings, but any increase in population has been gradual and in low density single family units that have not demanded significant outlays of

infrastructure and services. These kinds of development have led communities to adopt or consider strengthening local zoning and ordinances to manage building in sensitive natural areas, and it is still expected that any significant residential expansion should take place in or near the villages and hamlets with existing water and sewer services.

Commercial Development and Services

To maintain a progressive local economy that supports jobs, active communities and a vibrant quality of life, Schoharie County must seek business and commercial activity that sustains employment and revenue. Local planning calls for the development of commerce and commercial services in proximity to the villages and hamlets of Schoharie County, especially in the highway and rail transportation corridor crossing the county through Esperance, Schoharie, Cobleskill and Richmondville. There is general acceptance that pressure for commercial growth along the I-88 corridor should be concentrated in pockets where business activity has already established a foothold, in or near areas of existing water and sewer services.

Schoharie County has endorsed an economic development strategy that focuses on building a sustainable economy that links Schoharie County with the opportunities and resources available in the greater Capital Region of New York. The strategy outlines prospects for commercial growth, employment and community development using the following objectives.

- Rebuild and expand local employment opportunities for county residents by attracting and supporting businesses that offer challenging, good-paying jobs
- Enhance the tax base of the county to off-set the burden residents bare to maintain quality schools, public services and community infrastructure
- Improve access to goods and services that enhance local quality of life
- Provide the kind of community resources and quality of life that will attract professionals to Bassett Hospital and related medical facilities, draw top quality educators for local schools and SUNY Cobleskill and appeal to businesses leaders and technical specialists needed to support commerce and community services
- Preserve the natural beauty, historic character and heritage of the area, including the ability to maintain family farms and sustain small-town living

Commercial and economic sectors that are targeted for implementing this development strategy include the following.

- Technology-Related Manufacturing
- Traditional Manufacturing
- Distribution Warehousing
- Information Technology
- Financial Services/Back Office Operations
- Recreation/Tourism

Managing Development and Protecting Natural Resources

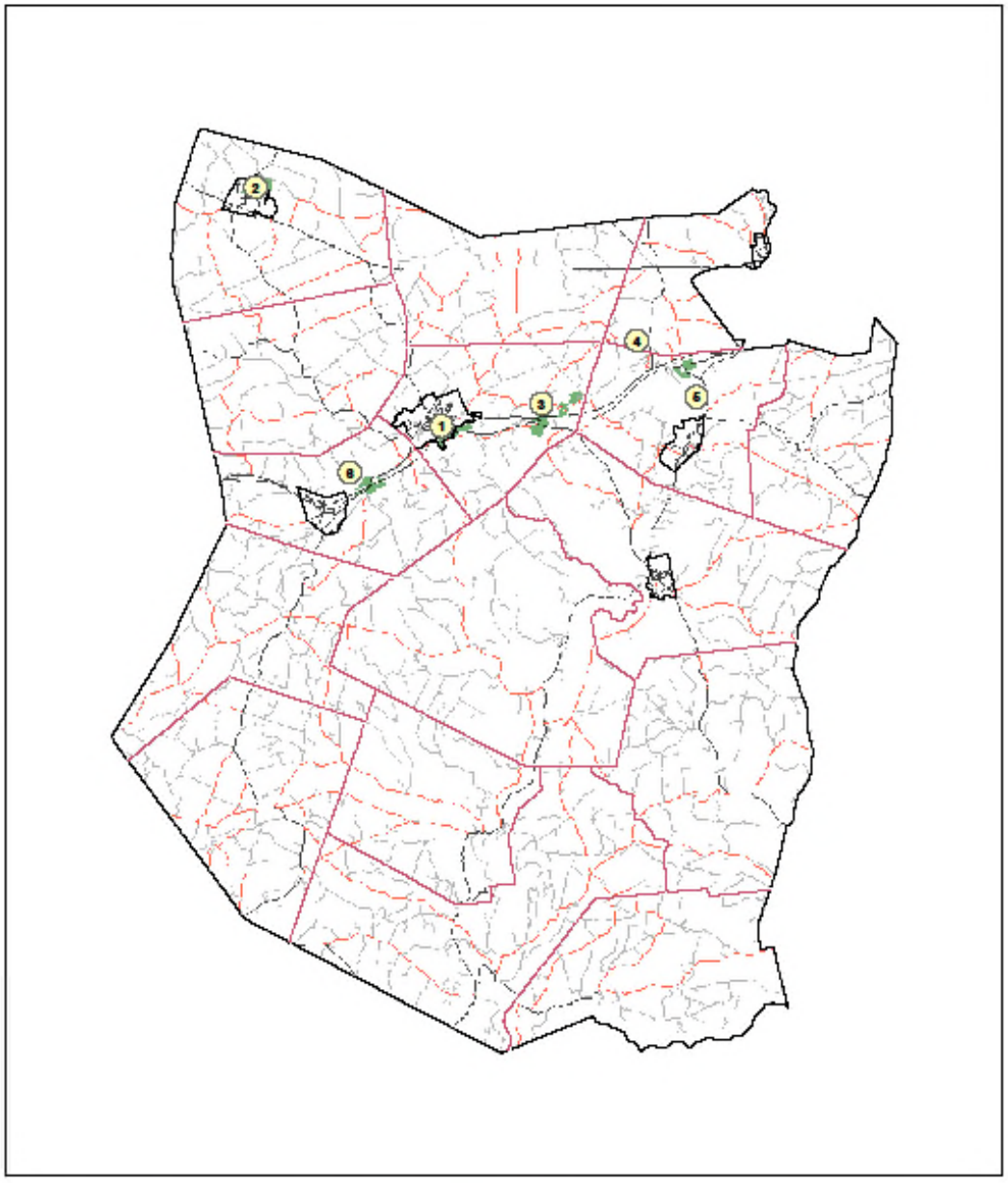
Planning is focused on ways to enhance commerce, tourism, recreational opportunities and access to history and culture while protecting natural resources. Local officials and development policies reflect the importance of managing growth in a way that protects natural resources; including forestlands, wetlands, drainage systems, conservation areas, slopes, vistas and water

quality. Plans further emphasize that industrial uses should be located away from these natural resources and that development must consider storm water management.

To manage commercial and industrial expansion, Schoharie County participates in the *Empire Zone* program sponsored by New York's Empire State Development (ESD). Empire Zones are geographically defined areas within Schoharie County where businesses who have located in these zones are eligible for incentive loans, grants and tax credits. While the Empire Zone program no longer offers benefits to new businesses that are not currently in the program, the designation and geographic identification of these zones continues to serve as a plan and spatial footprint that targets preferred locations for commercial expansion. In Schoharie County, six (6) such zones have been identified as areas for promoting economic growth.

1. Cobleskill – Mineral Springs
2. Sharon Springs
3. East Cobleskill and Howe's Cave
4. Central Bridge – Railway Area
5. Town of Schoharie – I-88/Exit 23 Vicinity
6. Richmondville

Figure 5-X Schoharie County Empire Zones



Schoharie County
Proposed Empire Zone Overview

Legend
Empire Zone

August 12, 2005

1 inch equals 5 miles
Miles
0
5

3. Potential Development Considerations

Gas Pipelines

There are currently three (3) major pipelines transporting fuel underground in Schoharie County and proposals have been made to add two more pipelines in the central and northern towns of the county. The pipelines carry natural gas or propane and the proposed new pipelines are in the planning and review stages and have not been approved.

The rapidly changing energy market, including the public's demand for cleaner, lower-cost fuel and less reliance on foreign supplies, has prompted the expansion and development of pipeline projects. Schoharie County is in the center of a regional distribution network that strives to move fuel supplies from Canada and the Gulf of Mexico – and now Appalachian states – to high demand users throughout the northeast.

For many, the pipelines are an attractive economic development opportunity because they yield tax revenue for long-suffering municipalities and school districts. Others think they could also add desperately needed jobs, and they could be even more beneficial if the gas lines were to be accessed as a direct, lower cost fuel source for businesses and homeowners. Many in the community, however, are opposed to pipeline expansion because it means giving up land and it could negatively impact property values and quality of life -- and they fear the health and safety consequences as highlighted by the pipeline disasters of 1990 and 2004.

Aside from direct health and safety hazards associated with pipeline operations, the overall economic impact of pipeline construction and how it might influence other hazards through residential, commercial and infrastructure expansion are not clearly known. Pipeline construction and operations would be required to meet state and federal regulatory standards and would have to incorporate designs to prevent flood hazards in the community. Some think that smart pipeline planning could actually be used to enhance flood protection by designing or altering drainage patterns in the course of construction as a means for improving overall groundwater management. Existing pipeline operations have been a valuable asset for job growth and revenue in the county, but at the same time the limited number of jobs that are generated and the extent of secondary business activity related to the pipelines have not dramatically changed the overall economic condition and profile of the county.

Natural Gas Shale Extraction

Deep underground shale deposits throughout the Appalachian region contain valuable natural gas reserves that can be accessed through a drilling process called hydraulic fracturing. This extraction has been occurring in Pennsylvania and other states and can be economically lucrative for landowners and local governments. The balance of risks and benefits associated with hydraulic fracturing are controversial, however, especially the issues related to the health and hazard concerns. New York State has not approved the extraction process, although it is being reviewed and a decision is pending this continuing evaluation. If New York State decides to approve hydraulic fracturing, it is expected there would be immediate pressure and interest to proceed with natural gas extraction in Schoharie County, although many local governments

oppose the practice and have passed resolutions banning it in their jurisdictions, and other towns have authorized moratoriums to delay fracturing until more information and analysis is available.

The geologic and environmental impacts of natural gas extraction are beyond the scope of this plan, but it is clear that surface operations associated with extraction work can have significant consequences for the economy, lifestyle, public services and infrastructure in the communities where it occurs. In Bradford and Susquehanna counties of Pennsylvania, just south of the New York border, there has been extensive natural gas drilling and operations have been expanding. The extraction process brings immediate revenues for landowners and municipal governments, draws a large workforce at much higher wage rates, swells demand for temporary housing, results in a greater need for community services and has wide-ranging impacts on local infrastructure.

Cornell University and Penn State University are two regional research institutions that have examined the economic development prospects for natural gas extraction in local communities. Work at both universities concur that the employment, revenue and economic activity generated during the active drilling period can be extensive, but the Penn State study emphasizes that natural gas is a non-renewable resource, so by definition, drilling will end at some point and so will its local economic impact.[1] The Penn State analysis further highlights that it may be possible for drilling activity to continue at various locations across a county for up to 30 years, but the evaluation by Cornell cautions that any specific site or area might only sustain drilling activity for 5 to 7 years.[2] Both research groups summarize that the long-term economic impacts of natural gas extraction for local communities is uncertain. In this research, Cornell determined that much of the long-term employment and economic revenue is eventually redirected away from the drilling communities back to larger, more permanent corporate sites in other states. In these studies, both research groups note than any lasting employment and economic impacts are largely dependent on the ability of communities to capture revenues during the drilling period and invest them in transitional measures that will sustain economic opportunities after drilling ends.

[1] Economic Impacts of Marcellus Shale in Bradford County: Employment and Income in 2010 Timothy W. Kelsey (Penn State), Martin Shields (Colorado State), James R. Ladlee (Penn State), and Melissa Ward (Penn State), in cooperation with Tracy L Brundage (Penn College), Larry L Michael (Penn College), and Thomas B. Murphy (Penn State)

[2] The Economic Consequences of Marcellus Shale Gas Extraction: Key Issues

Cornell University Department of City & Regional Planning, 2011 www.cardi.cornell.edu

Susan Christopherson, Professor, Department of City & Regional Planning, Cornell University

5.8 Evacuation Sheltering, and Housing

Evacuation

Evacuation is a local decision and past disasters have taught the County to not actively publicize evacuation routes. In 2011, the County had identified routes but discovered that these routes were often inundated by downed trees and overwhelmed culverts. Therefore, the County pushes early evacuations and identifies shelter locations to allow residents to determine their own best route to safe ground. Local Fire Departments are responsible for coordinating early evacuations and have established evacuation zones with the following priority for evacuation: 1) those within the 100-year floodplain; 2) those within the 500-year floodplain; 3) all other potentially impacted residents. The County is supporting local jurisdictions in development of a list of all addresses that will need to be contacted within these priority groupings.

In addition, the County has established evacuation centers at each of the six school districts for evacuees to be sent to. Each of these sites is ADA compliant with additional amenities. These centers provide information, allow for phone charging, access to food and water, and the ability to make a plan for next steps.

Sheltering and Housing

In previous disasters, the County has found that shelters go under-utilized and are therefore rarely opened in the County. However, the County does maintain coordination with the American Red Cross to establish shelters as necessary. In addition, the County opens warming centers to allow temporary relocation during hazard events as necessary. All six school districts have been established as shelters and the American Red Cross will manage shelters when more than ten individuals are impacted. For all smaller events, hotel vouchers are provided.

During previous Federally-declared disasters that have resulted in intermediate housing needs, the County has not been provided information on where FEMA will establish these sites. FEMA Individual Assistance temporary housing units are coordinated between FEMA and individual homeowners on a private basis. However, the County is currently investigating County-owned property as a potential location for temporary housing. The County traditionally refers those located in an impacted FSHA with temporary housing needs with State and FEMA Individual Assistance Programs. In addition, the County tells all impacted homeowners to not relocate back into the floodplain if their property is purchased.

Chapter 6 Mitigation Strategy

Chapter 6 describes the County's mitigation strategy which is the primary focus of the County's mitigation planning efforts. This strategy represents the blueprint for the approach chosen by the County to reduce or prevent losses flowing from hazards identified within this plan.

6.1 General

The strategy is made up of three main required components: mitigation goals and objectives, mitigation actions, and a mitigation action plan for implementation (see Figure 6-1). These components provide the framework to identify, prioritize, and implement actions to reduce risk from hazards.

Figure 6-1 Mitigation Strategy Process

6.2 Mitigation Strategies - Past and Present

Schoharie County and its municipalities have demonstrated a commitment to hazard mitigation that has been particularly focused on reducing flood losses for more than a decade. The devastating flooding of 2006 and 2011 has further strengthened the resolve of the community and its leaders to make changes and take action to reduce flood and other hazard impacts and insure a safer, more livable environment. These accomplishments have been achieved through cooperative inter-municipal efforts that involve local governments, the county, regional, state and federal partners. The following table serves as an illustration of the progress the County and its partners have made since the devastating flooding of 2006 and 2011.

Community	HMP Type	Acreage	Tax Map #	Other Info
T. Blenheim	Buyout	0.62	161.-2-2	Irene 2011
T. Blenheim	Buyout	5.61	161.-2-1	HMGP
T. Blenheim	Buyout	0.5	161.-2-7	HMGP
T. Blenheim	Buyout	0.68	172.-1-6	Irene 2011
T. Blenheim	Buyout	0.59	172.-1-25	Irene 2011
T. Blenheim	Buyout	0.3	172.-1-24	Irene 2011

T. Blenheim	Buyout	1.1	172.-1-23	Irene 2011
T. Broome	Buyout	0.4	164.-3-7	Irene 2011
T. Broome	Buyout	34.9	164.-3-8	Irene 2011
T. Broome	Buyout	3.01	176.-2-17	HMGP
T. Conesville	Buyout	0.34	209.-1-2	PDM - Erosion
T. Esperance	Buyout	1	37.-2-3	Irene 2011
T. Esperance	Buyout	0.48	28.-2-22	Irene 2011
T. Esperance	Buyout	0.9	19.1-2-50	Irene 2011
T. Esperance	Buyout	0.24	19.1-2-32	Irene 2011
T. Esperance	Buyout	0.16	19.1-2-22	Irene 2011
T. Esperance	Elevation		19.1-2-4	
T. Fulton	Buyout	1	115.-2-10	Due to erosion
T. Fulton	Buyout	1.5	128.-4-24	HMGP
T. Fulton	Buyout	0.8	128.-4-22.2	Irene 2011
T. Fulton	Buyout	0.58	149.2-1-3	Irene 2011
T. Fulton	Buyout	0.88	149.-4-3	Irene 2011
T. Fulton	Buyout	3.95	149.-3-17	Irene 2011
T. Fulton	Buyout	1	149.-3-16	Irene 2011
T. Fulton	Buyout	8.8	149.-3-19	HMGP
T. Fulton	Buyout	1.4	149.-3-11.2	HMGP
T. Fulton	Buyout	2.73	149.3-13	HMGP
T. Fulton	Buyout	19.6	149.-6-1	HMGP
T. Fulton	Buyout	1	149.-6-16	HMGP
T. Gilboa	Buyout	10.78	200.-3-17.111	Irene 2011
T. Gilboa	Buyout	0.4	200.-3-17.12	HMGP
T. Gilboa	Buyout	16.1	220.-6-4	HMGP
T. Gilboa	Buyout	1.4	201.-5-1	HMGP
T. Gilboa	Buyout	13.7	201.-5-2	HMGP
T. Gilboa	Buyout	0.9	201.-5-3	HMGP
T. Gilboa	Buyout	0.5	201.-5-4	HMGP
T. Gilboa	Buyout	1.7	201.-5-5	HMGP
T. Gilboa	Buyout	1.1	201.-5-7	HMGP
T. Gilboa	Buyout	0.38	201.-5-8	HMGP
T. Gilboa	Buyout	2.2	201.-5-9	HMGP
T. Gilboa	Buyout	1.2	201.-5-10	HMGP
T. Gilboa	Buyout	1.6	201.-5-11	HMGP
T. Gilboa	Buyout	1.9	201.-5-12	HMGP
T. Gilboa	Buyout	1.3	201.-5-13	HMGP
T. Gilboa	Buyout	0.4	201.-5-6	HMGP
T. Gilboa	Buyout	10.5	201.-6-9	HMGP
T. Gilboa	Buyout	2.04	201.-3-4	Irene 2011

T. Gilboa	Relocation		207.-2-9.2	HMGP Church Relocation
T. Middleburgh	Buyout	2.05	95.-7-4	Irene 2011
T. Middleburgh	Buyout	1.84	117.-2-6	Irene 2011
T. Middleburgh	Buyout	1.03	95.-7-26	Irene 2011
T. Middleburgh	Buyout	3.39	95.-3-16	HMGP
T. Middleburgh	Buyout	1.87	95.-3-17	Irene 2011
T. Middleburgh	Buyout	2.05	95.-7-1	Irene 2011
T. Middleburgh	Buyout	2.4	95.-7-2	Irene 2011
T. Middleburgh	Buyout	0.4	95.-7-3	Irene 2011
T. Middleburgh	Buyout	5.8	95.-7-5	Irene 2011
T. Middleburgh	Elevation		131.-5-23	HMGP
T. Schoharie	Buyout	0.55	47.-7-8	Irene 2011
T. Schoharie	Buyout	0.2	47.-7-3	Irene 2011
T. Schoharie	Buyout	0.18	47.-7-4	Irene 2011
T.Gilboa	Buyout	0.75	200.-6-3	HMGP
V. Cobleskill	Buyout	1.4	68.10-1-3	HMGP
V. Middleburgh	Buyout	0.1	106.15-3-5	2002 HMGP
V. Middleburgh	Buyout	0.56	106.15-9-6	2010 State Program
V. Middleburgh	Buyout	0.63	106.15-9-7	2008 HMGP
V. Middleburgh	Buyout	0.29	106.19-1-9	HMGP
V. Middleburgh	Buyout	0.13	106.19-1-8	HMGP
V. Middleburgh	Buyout	0.17	106.19-1-7	HMGP
V. Middleburgh	Buyout	0.78	106.19-1-5	2010 State Program
V. Middleburgh	Buyout	0.5	106.15-10-1	HMGP
V. Middleburgh	Buyout	0.56	106.19-1-1	2010 State Program
V. Middleburgh	Buyout	0.59	106.-2-2	Irene 2011
V. Middleburgh	Elevation		106-11-1-3	Home 1998
V. Schoharie	Buyout	0.74	71.16-1-8.2	Irene 2011
V. Schoharie	Buyout	0.2	71.20-2-4	Irene 2011
V. Schoharie	Buyout	0.3	71.20-2-5	Irene 2011
V. Schoharie	Buyout	0.26	71.20-2-9.2	Irene 2011

Improved Land Use Management

In New York State land use regulation is largely a discretionary authority delegated to local units of local government – cities, towns and villages. Typical land use regulatory tools available to municipalities include zoning, which controls the type of land use; subdivision regulations, which govern the division of real property for sale and its use; site plan regulations, which govern the arrangements of buildings or improvements in the development of specific properties; and specialized regulations to protect unique community assets such as aquifers, or to regulate specific types of land uses such as mobile homes. The county role in land use management is

limited to one of coordination under provisions of §239 of the General Municipal Law. The County Planning Commission meets monthly to review new laws, comprehensive plans and projects and can use their advisory capacity to help the municipalities mitigate hazards in planning and new construction. A table outlining the status of land use regulations in each of the municipalities in Schoharie County is included in Section 4 of each Jurisdictional Annex.

All municipalities in Schoharie County participate in the National Flood Insurance Program. Construction standards for structures in the mapped 100-year floodplain or floodway have been regulated through flood damage prevention laws since the 1980s. Each municipality has a designated floodplain administrator and proper orientation and training of the administrators continues to be a priority. As with many municipalities, most development in Schoharie County villages and hamlets occurred in areas where building and transportation access was easiest, commonly the flat, easily accessible floodplain. The Village of Middleburgh and the Village of Schoharie predominately developed in the Schoharie Creek floodplain. To a lesser extent, the Village of Cobleskill and Village of Esperance have some development in the floodplain. Schoharie County received new countywide digital Flood Insurance Rate Maps in early 2004 and all twenty-two (22) municipalities adopted the maps and updated flood damage prevention laws in 2004.

Some communities have used local land use regulations to limit development in the floodplain. For example, in 2004 the Town of Middleburgh adopted a new zoning amendment requiring twenty (20) acres for newly created lots in the floodplain. Much of the land in the Town is predominately agricultural and classified as a New York State agricultural district, but some commercial development pressure on the edge of the Village of Middleburgh has been felt over the last decade, including the construction of a commercial bank. The twenty (20) acre lot size will help ensure that the predominate use of the land remains agricultural and that any new development will be sparse. In fact, a large farm in the floodplain, commonly referred to as “Pindar Flats” was listed for sale in 2005 and is impacted by the twenty (20) acre lot size requirement. This will help limit potential flood damages and emergency operations in the Town of Middleburgh. The Village and Town of Cobleskill zoned some floodplain portions of the Cobleskill Creek as ‘Land-Conservation’ limiting it to agricultural and recreational uses.

The table of local development standards in Section III shows that of the twenty-two (22) towns and villages in Schoharie County, all but three have written comprehensive plans; and except for three (3), all have local regulations governing the subdivision of land. Twelve (12) have zoning regulations in force that govern the minimum size and use of properties in the community, while one is in the process of being developed. Only five (5) have site plan reviews in place. In addition to these mentioned, there are six (6) municipalities in Schoharie County that have a homesite law, which similar to a zoning law in that it regulates area requirements (setback and acreage) and some minor uses.

6.2.1 Review of 2013 Hazard Mitigation Actions

Most hazard mitigation goals and projects identified in the 2013 plan have been carried over or are ongoing and extended to the 2018 plan update. Even where projects have been undertaken or completed, most of the objectives are considered long-term initiatives to be implemented in phases over many years. For example, most communities have set goals to acquire and remove

at-risk and repetitive loss properties from floodplains, and in many jurisdictions they may have targeted up to 8 or 10 properties for floodproofing and removal, but given limited funding and related factors, it may only be possible to act on 1-3 properties every few years. The following table provides the status of County-led actions included in the 2013 plan update.

The status of Town and Village led actions are included in Section 5 of each Jurisdiction Annex.

Schoharie County Led Actions		
2013 Plan Action ID	**Description**	**2018 Project Status and/ Projects Completed Since 2013**
1	Provide support for ongoing compliance and enhanced participation in the National Flood Insurance Program (NFIP) Assist municipalities with NFIP Community Assistance Visits (CAVs) Provide support for enrollment/participation in the Community Rating System (CRS)	These 3 efforts occur annually and are ongoing.
2	Continue to promote and assist municipalities with adopting regulatory standards to decrease vulnerability to natural hazards Provide support for municipalities to incorporate consideration of steep slopes, vegetation management, riparian and wetland buffers, and floodplain management in local land-use decisions. Encourage promotion of Municipal comprehensive plans and land use regulations to include: Development patterns in which major transportation routes are located away from major population areas, schools and gathering areas. Encourage interconnection of commercial properties in order to reduce use of major arterials Encourage underground utilities in new development Encourage plan to eliminate at-grade railroad crossings on State Routes and County Roads	These efforts occur, typically at time of Town/Village comprehensive plan adoption/updates and are ongoing.

3	Continue to support and facilitate FEMA floodplain study/remapping and Risk MAP programs	Ongoing
4	Create Floodplain Management Advisory Committee Members to include Planning/Hazard Mitigation Officer, Office of Emergency Services, NYSDEC Floodplain, and local Building Code Officials/Floodplain Administrators Avenue for communication, best practices, planning, training, and mutual aid. Pursue a more stringent site plan review for properties/development within the Special Flood Hazard Area	Cancelled - County Stream Team is used for this purpose. Ongoing, occurs when land use regulations are proposed/amended.
5	Continue to provide support for ongoing and future mitigation related planning efforts at the municipal and regional level Create or Update Mitigation-related plans (included but not limited to): * Highway Management Plans * Long-Term Community Recovery Plans * Stream Corridor/Watershed Management Plans * Building Code Official/ FPA Handbook Maintain and expand partnerships and coordination through organizations actively involved in hazard reduction activities.	Ongoing
6	Continue to work with county departments, local municipalities, schools, community agencies and businesses on planning efforts to address all-hazards and all phases of emergency management (including but not limited to: COOP/COG, EAP's, SOP/SOG's, School SAVE plans, Sunshine Fair EAP, etc.)	Ongoing
7	Provide outreach and support to Class A - High Hazard & Class B - Moderate Hazard Dam Owners in creating/updating Emergency Action Plans, including Inspection & Maintenance Plans	Ongoing

	Coordinate planning with local emergency response agencies and Schoharie County Emergency Management Continue to encourage NYS Dam Safety and the Federal Energy Regulatory Commission (FERC) to establish protocol for Class A dams to be used for flood control in potential flood situations, where technically feasible and when it does not endanger the dam	Ongoing Ongoing
8	Provide outreach and support to facility owners with Hazardous Material storage and handling in creating/updating Emergency Action Plans (including all Tier II facilities)	Ongoing
9	Continue County participation in, and encourage and support further local participation, in the NOAA/NWS "Storm Ready" and "SkyWarn Spotter" programs. Provide information on the "Storm Ready" program to towns and villages Facilitate public outreach and awareness programs	Ongoing, done annually Ongoing
10	Evaluate worst-case drought scenarios within Schoharie County for possible further action.	Completed
11	Integrate & Coordinate the findings and recommendations of the Multi-Jurisdiction All Hazards Mitigation Plan with other county and local planning and regulatory mechanisms.	Ongoing
12	Provide copies of all approved plans for public review at Town/Village Halls, Public Libraries, Office of Emergency Services, Planning & Development Office, Clerk of the Board and post online at the Schoharie County Website	Completed
13	Continue to promote, support and develop applications for Hazard Mitigation grant funding to mitigate flood prone structures and infrastructure Continue to develop inventory of at-risk buildings and infrastructure and develop mitigation priorities Conduct targeted outreach to repetitive loss and severe repetitive loss properties and other important mitigation targets	Ongoing Ongoing Ongoing Ongoing

	Conduct analysis to understand the cost benefit of mitigation projects, including socio-economic and community character impacts, through the following sub-tasks: • Assist with the development of municipal applications • Develop applications at the county level as appropriate • Locate and apply for appropriate match funds	All three sub-tasks ongoing
14	Maintain viability and operation of Critical Facilities Review and maintain the list of all Critical Facilities within the County Ensure new critical facilities are located in areas of low hazard potential and properly constructed Work with utility companies to identify critical utility lines and ways to ensure their safety during hazard events Ensure critical facilities have backup power supply (or manual hookup for emergency generator)	Ongoing Ongoing Ongoing Carryover
15	Relocate the County Public Safety Facility outside of the floodplain (1% annual & 0.2% annual)	Ongoing - in progress
16	Continue efforts to appropriate funding and implement mitigation projects as identified in county Department of Public Works Capital Programs	Ongoing
17	Consider road abandonment for non-essential roads in high-hazard areas, specifically those vulnerable to flood and slope failure	Ongoing
18	Continue to work with SCSWCD and USDA-NRCS to manage and implement the Emergency Watershed Protection (EWP) program to mitigate damage to infrastructure	Ongoing - in progress
19	Provide hazard prevention and preparedness training for the general public Work with existing federal, state and county programs to bring appropriate training to the general public, including but not limited to:	Ongoing

	Family Disaster Planning Emergency Supplies and Personal Preparedness Kits Shelter in Place & Evacuation Procedures Safety: including but not limited to; fire protection, outdoor and recreation safety, transportation, weather and hazard specific awareness, etc. Animals in Disaster & Community Animal Response Team (CART) First Aid & CPR Community Emergency Response Team (CERT)	Ongoing
20	Improve public understanding of disaster preparedness and what to do before, during and after emergency Develop education and outreach programs to address specific issues, including but not limited to: Personal preparedness Multiple sources for Information and situational awareness Available notification and warning services Evacuation routes and shelter locations Travel advisories and safe travel tips Generator and space heater use and dangers	Ongoing
21	Develop partnership programs and encourage the participation of media organizations in promoting awareness and public education for personal preparedness and hazard mitigation activities	Ongoing
22	Increase awareness of health related safety, precautions and emergencies - including but not limited to; influenza, rabies, ringworm, water-borne pathogens, lyme disease, anthrax, West Nile, and white powder substance	Ongoing -For this one in the next revision change “lyme disease”

		to “tick borne diseases”. We are having increasing numbers of the other ones as well. Foodborne illness, and probably algae blooms could be added as well. I would ask our Environmental and nursing staff for wording and any other additions.
23	Create and encourage partnerships among existing community resources and organizations to assist with Public Education and Awareness Campaigns This would include, but is not limited to; the National Flood Insurance Program (NFIP), floodplain management and stream protection and maintenance. It would include groups such as Building Code Officials/Floodplain Managers, Real Estate Agents, Insurance Companies and local Agents, Surveyors, and Contractors Efforts would include topics related to personal preparedness, flood safety, mold remediation, and other hazard specific information. Human services groups such as Churches, SC CAP, Human Services Community Council, Social Services, Mental Health, DOH and others can assist with public outreach	Ongoing
24	Continue to work with SC Information Technology (IT) to develop a user-friendly, comprehensive website and internet applications for emergency public information and hazard education Including but not limited to; preparedness, planning, situational awareness, road closures - plus identification and notification of potential threats and hazardous or damage areas	Completed, always ongoing

	Expanded applications and use of social networking and group notification capabilities to increase the scope and speed of public notification and information efforts	
25	Research new, cost-effective ways of stabilizing failing soil slopes Inventory existing slope failures; research stabilization methods	Carryover
26	Develop a Stream Corridor Management Program for Schoharie Creek, other drainage areas and major tributaries Conduct a study of major streams in Schoharie County and develop a program to implement projects for stabilizing stream channels and restoring natural stream processes that will reduce flood threats Evaluate opportunities and implement measures to alleviate floods by using retention and related upstream water management	Ongoing, carryover
27	Conduct "Post-Flood Emergency Stream Intervention" Training Conduct regular training for municipal public works personnel and contractors who preform work in stream corridors.	Ongoing
28	Promote and support partnerships between county and municipal Public Works and Highway personnel with the SCSWCD Stream Program Manager for repair and flood mitigation work affecting roads and drainage systems Including but not limited to: culvert sizing, ditch erosion, slope failure and stream work	Ongoing
29	Work with utility companies to promote implementation of vegetation management plans to protect lines and prevent outages	Carryover
30	Develop and implement a strategy for maintenance of privately owned storm water drainage systems & secondary stream channels Educate owners and maintenance personnel about flood mitigation measures and opportunities	Carryover Ongoing

31	Facilitate training and exercise programs for municipal officials, staff, first responders and community agencies	Ongoing
32	Develop and Implement a county-wide flood monitoring and warning system Inventory existing resources in the county and neighboring counties, and develop partnerships to implement flood monitoring and warning systems, which could include: * Stream Gages * Rain Gages * Snow Pillows * Equipment & Software to collect and monitor data * Equipment & Software to model flood hazards Identify gaps in sensor coverage & work with adjacent counties to extend coverage Develop funding proposal to cover additional sensors, other hardware, data transfer and storage, software and administration Develop and Identify funding source(s) to cover maintaining system	Completed Ongoing Ongoing Ongoing Carryover
33	Implement a continuing review and updating process for maintenance and improvement of evacuation routes, signs and supporting technologies Management of the evacuation route system should include revised paper and digital mapping which are linked to websites, communications systems and social networking Review the effectiveness and placement of stationary signs and replace as appropriate Consider technology improvements for signs and information management; including lighting and automated operation, LED applications, variable message systems and cellular applications Include alternate routes for emergency vehicles around known high-risk hazard areas	All efforts ongoing, in progress

	Revise and exercise activation and notification procedures for emergency responders, communications personnel, public officials and citizens	
34	Promote continuing use and enhancements of Highway/Roadway signs to inform the public about flood hazard areas, evacuation routes and procedures Improve sign design, placement and maintenance Use signage for multiple hazards to improve recognition and familiarity; including applications for zoning, floodplain management, evacuations, flood hazard instructions, shelter locations Consider LED and alternate sign designs to enhance recognition and efficiency	All efforts ongoing, in progress
35	Improve County GIS Capabilities and Data Repository Create a live damage assessment and road closure mapping platform Identify gaps in current data repository Develop a funding proposal to cover additional hardware, software, storage and administration of data	All efforts ongoing, in progress
36	Improve countywide emergency communications capabilities and infrastructure Encourage legislators to petition the FCC to improve cell phone coverage throughout the county Continue implementation of the countywide communication system study and upgrade project Improve mobile communications capabilities in the county; including vehicles and mobile equipment to support emergency expansion, remote demands and system disruptions Continue to identify and offer available county and municipal properties for expansion of cellular facilities and coverage	Ongoing Ongoing, in progress Ongoing Ongoing Ongoing
37	Maintain, enhance and update Mutual Aid agreements with surrounding communities	All efforts ongoing

	Revise procedures to implement provisions of local government mutual aid authorities added to NYS Executive Law, Article 2-B Conduct inter-governmental briefings and Tabletop Exercises to reinforce implementation of Mutual-Aid plans	
38	Continue to improve the operation and use of the automated emergency public notification system Investigate systems available for emergency notification, including stand-alone systems and CAD options Implement appropriate system for the widest coverage and successful outreach	Ongoing Ongoing Ongoing
39	Promote an expanded role and resources for the county's RACES amateur radio volunteer group in supporting emergency communications Identify deficiencies in equipment and training Develop Standard Operating Procedure for activation Prepare funding proposal and identify revenue opportunities for improvements Include RACES participation in emergency training, exercises and activations	All efforts ongoing
40	Develop and Implement a functional needs registry, monitoring system and evacuation plans for residents with functional access needs Create registry database Work with existing agencies and departments to develop monitoring system for vulnerable populations during hazardous weather Work with existing agencies and departments to develop evacuation assistance plans, identify areas or sites where services are needed, and determine specific residents who would need evacuation and/or transportation help Promote, support and develop local & county Fire and EMS functional needs evacuation plans	Ongoing Ongoing Ongoing Completed Ongoing

41	Identify deficiencies in equipment and training in local Fire Departments and EMS Squads Work with Coordinators to seek local input Develop asset lists & MOU agreements Develop funding proposal to cover additional equipment	All efforts ongoing
42	Assign roles, identify backup and replacement personnel and participate in training and exercises related to emergency response plans. Each department and agency should designate staff for specific positions and roles they are assigned in emergency response plans Develop multi-level line of succession for each position Provide training and exercises related to emergency response Regularly review and update personnel availability, assignments and lines of succession	All efforts ongoing
43	Support funding and applications to purchase backup generators and other redundant utilities for critical facilities and intersection traffic lights	Carryover
44	Continue to support and enhance SC Highway Management Program Complete inventory of current highway infrastructure at county and local level Create and apply design standards for bridges, culverts and scour protection Replace or retrofit undersized structures to meet current standards Develop programs to implement coordinated maintenance and mitigation activities to reduce risk to public infrastructure	All efforts ongoing

6.3 Mitigation Goals and Objectives

FEMA	**C3.** Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))

Mitigation goals are intended to represent what the County seeks to achieve through mitigation plan implementation. The goals are general guidelines and provide a framework for identifying more detailed objectives and actions. The HMPC reviewed the goals and objectives from the 2013 plan update and refined them for the 2018 update to reflect the County's continually improving emergency management program. Goals that focus on protection of natural and cultural resources and collaborative and integrated mitigation planning were added.

Schoharie County has outlined the following goals and objectives to guide multi-jurisdictional hazard mitigation project planning and implementation to address priority hazards described in the risk and vulnerability assessments.

Goal 1: Protect Life and Property

Objective 1-1: Implement mitigation activities that will assist in protecting lives and property by making homes, businesses, infrastructure, and critical facilities more resistant to hazards.

Objective 1-2: Encourage homeowners and businesses to take preventive actions in areas that are especially vulnerable to hazards.

Objective 1-3: Build upon past efforts to characterize flood events by conducting additional flood studies and creating flood models.

Objective 1-4: Review existing local laws and ordinances, building codes, safety inspection procedures, and applicable rules to help ensure that they employ the most recent and generally accepted standards for the protection of buildings and environmental resources.

Objective 1-5: Encourage homeowners, renters, and businesses to purchase insurance coverage for damages caused by hazards.

Objective 1-6: Integrate the recommendations of this plan into existing local and county programs.

Objective 1-7: Implement mitigation activities that encourage environmental stewardship and protection of the environment.

Goal 2: Increase Public Awareness

Objective 2-1: Develop and implement additional education and outreach programs to increase public awareness of the risks associated with hazards and to educate the public on specific, individual preparedness activities.

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

Objective 2-3: Implement mitigation activities that enhance the technological capabilities of the jurisdictions and agencies in the County to better profile and assess exposure of hazards.

Goal 3: Encourage Partnerships

Objective 3-1: Strengthen inter-jurisdiction and inter-agency communication, coordination, and partnerships to foster hazard mitigation strategies and/or projects designed to benefit multiple jurisdictions.

Objective 3-2: Identify and implement ways to engage public agencies with individual citizens, non-profit organizations, business, and industry to implement mitigation activities more effectively.

Goal 4: Provide for Emergency Services

Objective 4-1: Encourage the establishment of policies at the local level to help ensure the prioritization and implementation of mitigation strategies and/or projects designed to benefit essential facilities, services, and infrastructure.

Objective 4-2: Where appropriate, coordinate and integrate hazard mitigation activities with existing local emergency operations plans.

Objective 4-3: Identify the need for, and acquire, any special emergency services and equipment to enhance response capabilities for specific hazards.

Objective 4-4: Review and improve, if necessary, emergency traffic routes; communicate such routes to the public and communities.

6.4 Mitigation Action Categories

Development of this Hazard Mitigation Plan and the ongoing evaluation of hazards that have been taking place for many years, have resulted in identification of several mitigation measures that will enhance the protection of citizens and property in Schoharie County. Local community leaders have targeted the following actions and priorities to guide local hazard mitigation efforts in the years ahead. These hazard mitigation objectives were selected based on the findings of the Risk and Vulnerability Assessments outlined in Sections IV and V of this plan, and they complement the Hazard Mitigation Goals listed in Part A of this section. The Hazard Mitigation proposals included in this section reflect one or more of the following generally accepted types of hazard mitigation solutions.

- **Prevention and Planning**: actions taken to prevent disasters from occurring and measures implemented to reduce the impacts of a disaster when they do occur, including government administrative or regulatory actions that influence the way land is developed and structures are built.
- **Property Protection**: actions that involve the modification of existing buildings or structures to protect them from a hazard or remove them from the hazard area.
- **Public Education and Awareness**: actions to inform and educate the public about potential hazards and how they can protect themselves and their families.

- **Natural Resource Protection**: actions that preserve or restore the functions of natural features and systems.
- **Emergency Services**: actions that provide the resources a community needs to protect people and property during and immediately after a disaster.
- **Structural Projects**: actions that involve the construction of structures to reduce the impact of a hazard.

6.5 Developing, Evaluating, and Prioritizing Mitigation Actions

Once mitigation actions were identified, the HMPC during HMPC Meeting #3, and other key stakeholders went through the exercise of evaluating and prioritizing each action to determine which actions are most suitable for the County to implement. A mitigation action worksheet was developed for each action that included the following information:

Description of the Action	***Specific*** – Target a specific area for improvement. ***Measurable*** – Quantify or at least suggest an indicator of progress. ***Assignable*** – Specify who will do it. ***Realistic*** – State what results can be achieved realistically, given available resources. ***Time-related*** – Specify when the result(s) can be achieved.
Action Status	***New*** – The action is new and will be included for the first time in the 2018 plan update. ***Existing*** – The action was implemented prior to the 2018 plan update, but is ongoing and additional or ongoing action is required for completion. ***Complete*** – The action has been completed.
Type of Action	Plans and Regulations Infrastructure/Capital Project Natural Systems Protection Education and Awareness Preparedness and Response
Lead and supporting departments	Local or County agencies State agencies Others
Timeline for Implementation and	Less than 1 year 1 to 3 years

Expected Life of the Action	3 to 5 years
Other	Hazards Addressed by the Action Anticipated Cost and Funding Source Mitigation Goals Supported by the Action

A complete mitigation implementation plan is provided in Table 6-5.

6.5.1 Maximizing Loss Reduction

The County's mitigation strategy is directed by the mitigation goals identified in Section 6.2. However, equally important, the County seeks to prioritize actions that lead to the greatest return on investment. The ultimate goal of this plan is to maximize loss reduction, and this perspective is baked into the County's mitigation strategy.

6.5.2 STAPLEE Analysis

In addition to the information noted above, each action was self-evaluated using STAPLEE criteria as described in Table 6-3. Evaluators were asked to rate each STAPLEE criteria to come up with a total score that determined the relative suitability of each action.

Table 6-3 STAPLEE Criteria

STAPLEE Criteria	Evaluation Rating
S: Is it Socially acceptable?	Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0
T: Is it Technically feasible and potentially successful?	
A: Does the responsible agency/department have the Administrative capacity to execute this action?	
P: Is it Politically acceptable?	
L: Is there Legal authority to implement?	
E: Is it Economically beneficial?	
E: Will the project have either a neutral or positive impact on the natural Environment? (score a 3 if positive impact, 2 if neutral impact)	
Will historic structures or key cultural resources be saved or protected?	
Could it be implemented quickly?	

6.5.3 Mitigation Effectiveness Analysis

In addition to the STAPLEE analysis, HMPC members were asked to rate the effectiveness of each action as described in Table 6-4.

Table 6-4 Mitigation Effectiveness Criteria

Mitigation Effectiveness Criteria	Evaluation Rating
Will the implemented action result in lives saved?	High = 5 Medium = 3 Low = 1
Will the implemented action result in a reduction of disaster damage?	High = 5 Medium = 3 Low = 1

HMPC members were asked during the HMPC Meeting #3 to prioritize the actions based on the STAPLEE and mitigation effectiveness score.

STAPLEE scores can range from a low of 0 to a high of 27. Mitigation effectiveness scores can run from a low of 2 to a high of 10. Combined, mitigation actions can score within a range of 2 to 38 points.

FEMA regulations do not require a formal cost-benefit analysis for hazard mitigation plans; however, a formal cost-benefit analysis of mitigation measures is required in order to be approved for Hazard Mitigation Grant Program funding. Therefore, a more formal cost-benefit analysis will be conducted as a component of any future mitigation grant applications.

6.6 2018-2023 Mitigation Implementation Plan

The actions identified by participating jurisdictions is taking a more targeted approach for implementation in the 2018 HMP Update. The mitigation actions outlined in the update are more targeted and specific, designed to ensure feasibility.

The mitigation implementation plan lays the groundwork for how the mitigation plan will be incorporated into existing planning mechanisms and how the mitigation actions will be prioritized, implemented, and administered by the County. The implementation plan includes both short-term strategies that focus on planning and assessment activities, and long-term strategies that will result in ongoing capability or structural projects to reduce vulnerability to hazards.

See Appendix C for Mitigation Action Worksheet instructions and completed Mitigation Action Worksheets for each action listed in Table 6-5.

Table 15 2018-2023 Mitigation Strategy

Strategy	Mitigation Action	Applies to New or Existing Assets	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Cost	Sources of Funding	Timeline
County Actions									
Scho-Cty-1	Continue education efforts (e.g. web based, print media, maps, attendance at County events) to educate people about flood hazards, proper floodplain management, and evacuation zones and shelters.	New	Flooding, Severe Storm, Dam Failure	All Goals	County Emergency Services, County Community Development	County Soil and Water	$10,000 annually	CDBG-DR, County funds	1-5 years
Scho-Cty-2	Undertake a riparian buffer education effort directly with County Village/Town Planning Boards. Undertake a riparian buffer demonstration project within the Fox Creek Floodway on County Historical Society Property. Long Term Goal is to increase width and length of riparian buffers in Schoharie County.	New	Flooding, Severe Storm	All Goals	County Soil and Water, County Community Development	None at this time	$5,000	County funds	1 year
Scho-Cty-3	Floodplain enhancement and sediment removal as recommended in the Schoharie Creek Flood Mitigation Study will be pursued. This scenario was found to be effective at lowering water surface elevations by up to 2 feet over a distance of two-thirds of a mile upstream, which includes the North Blenheim hamlet. Many structures would be removed from the FEMA SFHA while those that would remain in the SFHA would see reductions in flood elevations. The construction of this enhancement and sediment removal scenario would impact approximately 1,100 linear feet of Schoharie Creek and would require the removal of approximately 20,000 cubic yards of material.	New	Flooding	All Goals	County Soil and Water, County Emergency Services	County Community Development	$900,000-$1,000,000	HMGP, PDM, Local budgets	2-4 years
Town of Blenheim									
Blen-1	Buyout properties through DR Project # 095-011	Existing	Flooding, Severe Weather	All Goals	Town Supervisor	Town Board	$474,249	HMGP	1-3 years
Blen-2	Buyout properties through DR Project # 095-014	Existing	Flooding, Severe Weather	All Goals	Town Supervisor	Town Board	$240,510	HMGP	1-3 years
Blen-3	Ongoing – Relocate Municipal Complex out of floodplain.	New	Flooding	All Goals	Town Supervisor, Town Board	None at this time	$4,000,000	CDBG-DR	1-2 years
Blen-4	North Blenheim Property Acquisition	Existing	Flooding, Severe Weather	All Goals	Town Board	None at this time	$175,000	HMGP, PDM	1-5 years
Blen-5	Install resized culverts in up to 6 identified areas	New	Flooding	All Goals	Town Highway, Town Board	None at this time	$1,200,000	CDBG-DR, Town funds (if needed), HMGP, PDM	1-5 years
Town of Broome									
Broome-1	Purchase backup generator for Town Hall	Existing	All Hazards	All Goals	Public Works Department, Fire Department	None at this time	$20,000-50,000	HMGP, PDM	1 year

Table 15 2018-2023 Mitigation Strategy

Broome-2	Develop and adopt stream dumping regulations.	New	Flooding, Water Contamination	All Goals	Town Board	None at this time	Minimal, labor costs	Local budget	1 year
Broome-3	Develop and adopt a riparian buffer ordinance to support stream stabilization efforts.	New	Flooding, Landslides	All Goals	Town Board	None at this time	Minimal initial costs, ongoing enforcement costs	Local budget	1 year
Broome-4	Replace Woods Road Culvert and redevelop stream channel from culvert.	New	Flooding, Severe Storms	All Goals	Highway Department	None at this time	$500,000	FEMA HMA, NYS CHIPS, NYS DEC Hudson River Estuary	1 year
Town of Carlisle									
Car-1	Evaluate culverts on Town Roads for potential sizing upgrades	Existing	Flood	All Goals	Town Highway	County Soil and Water	$100,000 for evaluations (does not include repair costs)	HMGP	3 years
Car-2	Identify abandoned structures for potential land bank rehabilitation/demolition	Existing	All Hazards	All Goals	Planning Board	County Community Development/Mohawk Valley Land Bank	$50,000 (does not include rehab/demo costs)	GMVLB/Local Match	2 years
Car-3	Enact a local buffer ordinance to protect stream buffers from development.	Existing	Flooding	All Goals	Town Board	None at this time	Minimal initial costs, ongoing enforcement	Town funding	2-3 years
Car-4	Provide public education regarding residential drought and identify water-saving measures to be taken by community members.	New	Drought	All Goals	Town Board, Planning Board	None at this time	$20,000	NYS DEC Mohawk River Basin	1-3 years
Car-5	Provide public education to farmers to implement improved soil and water conservation practices.	New	Drought	All Goals	Town Board, Planning Board	None at this time	$10,000	NYS DEC Mohawk River Basin	1-3 years
Car-6	Develop and adopt a Sediment Management Plan.	New	Flooding	All Goals	Town Board	None at this time	Minimal initial costs, ongoing enforcement	Town funding	2-3 years
Town and Village of Cobleskill (Joint Projects									
Cobl-1	Study existing Town and village road culverts for sizing	New	Flood	All Goals	Town Highway	County Soil and Water	$100,000	HMGP, local budget	2-4 years
Cobl-2	General Hazard Education	New	Top 5 Hazards	All Goals	Town Board	County EMS	$50,000	Local budget, EMPG	2-4 years
Town of Cobleskill									
T.Coble-3	Replace Mickle Hollow Culvert with properly sized concrete box culvert.	New	Flooding	All Goals	Consolidated Highway Department	None at this time	$100,000	PDM, HMGP, Local budget	3-5 years
Village of Cobleskill									
V.Coble-4	Install underdrain along with stone-filled ditches at Grandview Drive to intercept groundwater and receive road runoff.	New	Flooding	All Goals	Consolidated Highway Department	None at this time	$300,000	DEC CSC, FEMA PDM/HMGP, Local Budget	3-5 years
Town of Conseville									
Cone-1	A local flood analysis conducted in 2017 indicated several homes in Manorkill were identified as candidates for buyout by NYSDEP as a result of repetitive flood damage.	Existing	Flooding	Goal 1, 2, 4	NYSDEP	None at this time	$1,200,000	NYSDEP	1-4 years
Cone-2	The Durham Road Bridge approximately 200 feet from Potter Mountain Road was identified in a local flood analysis as the cause of upstream flooding. Project is to replace the Durham Road Bridge to alleviate this issue.	New	Flooding	Goal 1, 4	Schoharie County Department of Public Works, Town Administration	None at this time	$500,000	NYSDEP, Schoharie County Public Works	5 years

Table 15 2018-2023 Mitigation Strategy

Cone-3	Ongoing. Evaluate and implement projects for stabilizing streambanks in locations where erosion threatens development and agriculture. A priority is Manor Kill. Town of Conesville completed a Local Flood Analysis in June 2017 to evaluate flood risks and assess potential mitigation measures aimed at reducing flood inundation and the associated damages. Ongoing project is to implement identified mitigation measures outlined in this analysis.	Existing	Flooding	Goals 1, 2, 4	Department of Public Works, Town Administration	Town Board	$100,000	NYSDEP, HMGP, Local budget	1-3 years
Cone-4	Work with the County to identify, create and maintain firebreaks on forested steep slopes near structures	New	Wildfire, Landslides	All Goals	Department of Public Works, Fire Department, County Emergency Management	None at this time	$50,000	Local budget, HMGP	3-5 years
Town of Esperance									
Esp-1	Replace current culverts with larger size based on watershed analysis (Stream Stats). Add rip rap to ditches.	Existing	Flooding	All Goals	Town Highway Dept.	None at this time	$50,000 - $200,000	HMGP	3-5 years
Esp-2	Buy out properties on Priddle Camp Road and Smith Camp Road.	Existing	Flooding	All Goals	Town Board	County Community Development	$1 million to $2 million	HMGP	3-5 years
Esp-3	Enact a local buffer ordinance to protect stream buffers from development. Buffers improve stream health and water quality by slowing runoff, filtering pollution, preventing soil erosion, contributing essential nutrients to the food chain through leaf litter, providing woody debris for in-stream habitat, and shading the stream to keep waters cool. Buffers also absorb and slow flood waters, which protects property and human safety (Source: NYSDEC).	New	Flooding	All Goals	Town Board, Planning Board	None at this time	$1,000,000 - 2,000,000	Local Budget	3-5 years
Esp-4	Upgrade the Landis Arboretum Meeting House to serve as an emergency shelter. Install back-up generator and a water purification and filtration system. The Meeting House is well-known as a popular local gathering place.	New	All Hazards	All Goals	Town Administrator	Town Board	$40,000	NY Rising Communities	1-3 years
Esp-5	Repurpose destroyed mobile home park. Although homes in the mobile park home on Junction Road were completely destroyed by flooding, the site is now stable and functional utilities still remain. The proposed project is to covert the site for use by RVs; creating an opportunity for tourism for the area.	Existing	Flooding, Hurricane	All Goals	Public Works, Town Administrator	Town Board	$100,000	NY Rising Communities, HMGP	3-5 years
Esp-6	Implement water supply and transmission line improvements for Central Bridge to prevent the intake of floodwaters at the water treatment plant during storm events and impacts to water quality.	New	All Hazards	All Goals	Public Works	None at this time	$1,280,000 (phase 1) $1,200,000 (phase 2)	NY Rising Communities	3-5 years
Village of Esperance									
V-Esp-1	Relocate the Village fire house to an elevated location, construct a new rescue facility. Relocate Central Bridge firehouse to an elevated location.	New	Flooding	All Goals	Public Works, Fire Department	None at this time	$2,900,000	NY Rising Communities, HMGP	1 year
V-Esp-2	Conduct engineering study, prepare an engineering design and install a sewer trunk line and wastewater treatment plant in the Village of Esperance. Septic leach fields adjacent to groundwater wells were flooded during Irene, putting the groundwater supply and community health at risk. The leach fields are aging, not maintained and no program exists for testing.	Existing	Flooding, Hurricane	All Goals	Public Works	None at this time	$2,400,000	NY Rising Communities, HMGP	3-5 years
V-Esp-3	Conduct engineering study, prepare an engineering design, and install a collection system to connect the remaining residences in the proposed sewer district in the Village of Esperance to the trunk line on Main Street that was installed as part of the proposed first phase of this project. Septic leach fields adjacent to groundwater wells were flooded during Irene, putting the groundwater supply and community health at risk.	Existing	Flooding, Hurricane, Drinking Water Contamination	All Goals	Public Works	None at this time	$1,700,000	NY Rising Communities	1-3 years

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V-Esp-4	Ongoing - Evaluate 11 residences in the special flood hazard area, including Steuben St., to determine if property acquisition, or the elevation and flood-proofing of structures and utilities are warranted.	Existing	Flooding	All Goals	Public Works, Town Administration	County OCDS	$0	HMGP	3-5 years
V-Esp-5	Support the Esperance Volunteer Fire Department by maintaining equipment and initiating recruitment initiatives.	Existing	All Hazards	All Goals	Fire Department, Town Administration	Town Board	$10,000	Local budget	1 year
Town of Fulton									
Fult-1	Culverts have been identified and prioritized for replacement. Undersized culverts make roads impassable during high water events. Action is to replace culverts to proper diameters.	New	Flooding	Goal 1, Goal 3, Goal 4	Highway Department	County Public Works Department	$75,000 per culvert	HMGP, Town budget	Within 3 years
Fult-2	Replace Town Hall and Highway Department	New	All Hazards	Goal 1, Goal 2, Goal 3, Goal 4	Town Board	None at this time	$3.5 million	Town Budget, CDBG-DR	1-3 years
Fult-3	Improve the West Fulton Fire Department by completing necessary upgrades to reduce conflicts between different operations simultaneously.	Existing	All Hazards	All Goals	Town Board, Fire Department	None at this time	$700,000-$800,000	CDBG-DR	1-3 years
Town of Gilboa									
Gil-1	Bank stabilization along stream-side of roads has caused trees to slide into the road. Perform inspection and maintenance of trees from private property.	Existing	Flooding, Landslides	Goal 1, Goal 3, Goal 4	Highway Department	County Public Works Department	$10,000 per year ($250,000 overall estimate)	Highway Department funds	Ongoing during summer months
Gil-2	Perform routine maintenance by pipeline company to ensure proper safety.	Existing	All Hazards	Goal 1	Tennessee Gas Company	Highway Department	None	Company funds	Ongoing
Gil-3	Perform ongoing inspection of beaver dams that cause flooding. Receive proper permits to dismantle dams. Estimated cost of dam floods is approx. $350,000 every three years.	Existing	Flooding	Goal 1, Goal 3, Goal 4	Highway Department	County Public Works Department	$5,000 per permit	Town and County budgets	Ongoing
Gil-4	Acquisition of property as 825 Shew Hollow Road.	Existing	Flooding, Severe Storms	All Goals	Town Board	None at this time	$250,000	PDM, HMGP, Town budget (if needed)	2-3 years
Town of Jefferson									
Jeff-1	Purchase a backup generator for Town Hall to ensure functional operations during utility failures.	New	All Hazards, Utility Failure	Goal 1, Goal 4	Town Board	None at this time	$5,000	HMPG	ASAP – 1 year
Jeff-2	Perform routine maintenance by pipeline company to ensure proper safety.	Existing	All Hazards	Goal 1	Tennessee Gas Company	Highway Department	None	Company funds	Ongoing
Jeff-3	Carryover. Evaluate 3 residences located in the special flood hazard area to determine if property acquisition, or the elevation and flood-proofing of structures and utilities are warranted	Existing	Flooding	All Goals	Department of Public Works	Town Administration	$300,000	HMGP	3-5 years
Jeff-4	Install enlarged culverts at Mill Creek/Porter Road. One large box culvert has been replaced. One small culvert has been replaced. The remaining sites are in progress as funding becomes available.	New	Flooding	All Goals	Department of Public Works	None at this time	$60,000	HMGP	1-3 years
Jeff-5	Develop and adopt a riparian buffer zone regulation to protect waterways and reduce flood potential from future development.	New	Flooding	All Goals	Town Administration, Town Board	Department of Public Works, Code Enforcement Officer	Administrative costs and enforcement	Local budget	1 year
Town of Middleburgh									

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T-Mid-1	This project includes two feasibility studies. The first will consider property siting and acquisition, permitting, infrastructure improvements, and business incentives as part of the development of a commercial node outside the floodplain. The second will evaluate the feasibility and conduct a cost/benefit analysis of extending public utilities to the potential commercial node areas.	Existing	All Hazards	All Goals	Public Works, Town Administration	Town Board	$140,000	NY Rising Communities, HMGP	1-3 years
T-Mid-2	Conduct hydrologic study of approximately one mile of Gorge Creek to determine measures to stabilize the creek banks and increase the capacity of the creek in order to mitigate downstream flooding. Study would include a geomorphic assessment, watershed analysis, soils characterization, sediment transport analysis, riparian assessment, bank stabilization design, and hydraulic and hydrologic modeling.	Existing	Flooding	All Goals	Public Works	None at this time	$40,000	NY Rising Communities, HMGP	1 year
T-Mid-3	Evaluate structures located in the special flood hazard area to determine if property acquisition, or the elevation and flood-proofing of the structure and utilities are warranted	New	Flooding	All Goals	Public Works, Town Administration	None at this time	$150,000	HMGP	1-3 years
T-Mid-4	Mitigate slope failure on Huntersland Road through slope hardening.	Existing	Landslides, Flooding	All Goals	Public Works	None at this time	$150,000	HMGP	1-3 years
T-Mid-5	Engineering design, procurement, and installation of generators and associated equipment for the Town Hall and Town Highway Garage Facility to provide an uninterrupted power supply. These generators for these critical facilities will reduce vulnerability to essential services during times of hazards.	Existing	Flood, Severe Storm	All Goals	Highway Superintendent	Town Board	$20,000-50,000	HMGP, PDM	1 year
T-Mid-6	The Town will work with Schoharie County Emergency Management Office and the Town Floodplain Administrator to apply to the NFIP's CRS program to become a participating community by completing activities that exceed the minimum standards of the NFIP. The Town will initially inform the FEMA Regional Office of its interest in applying to the CRS and will eventually submit a CRS application, along with documentation that shows it is implementing the activities for which credit is requested. The application will be submitted to the Insurance Service Office, Inc. The hope is that the Town's activities and performance are reviewed during a verification visit. FEMA will establish credit to be granted and notifies the Town, State, insurance companies, and other appropriate parties. Residents will receive an annual deduction on their flood insurance.	New	Flood, Severe Storm	All Goals	Town Floodplain Administrator	Schoharie County Emergency Management	$2,000	Town Budget	1 year
T-Mid-7	The Town Floodplain Administrator has unofficially reached out to the property to gauge an interest in acquisition of this property. There appears to be interest. If this interest is still there, the Town would like to acquire the property and change the land use from commercial to parkland or wildland. This will spur economic development for the Town, that will bring visitors into parkland overlooking the Schoharie Creek.	Existing	Flood	All Goals	Town Board, Town Floodplain Administrator	Schoharie County OCDS	$500,000	FEMA HMA	1 year
Village of Middleburgh									
V-Mid-1	Engineering design, procurement, and installation of generators and associated equipment for the Firehouse and Water Treatment Facility to provide an uninterrupted power supply. These generators for these critical facilities will reduce vulnerability to essential services during times of hazards.	Existing	Flood, Severe Storm	All Goals	Village Trustees, Code Enforcement Officer	Fire Chief	$20,000-50,000	HMGP, PDM	1 year
V-Mid-2	Village to consider securing easements (if needed) to create two (2) access roads to be utilized only in times of emergency. One (1) access road would connect River Street to Pine Street to the Rod and Gun Club providing residents an additional access to evacuate in times of flooding. A second access road would be	New	Flood, Severe Storm	All Goals	Village Trustees, Highway Dept.	None at this time	$10,000	CHIPS, Highway Department funds	5 years

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	secured at Clauverwie Road to Lawyer's Lane to the Middleburgh Elementary School providing residents options to access during floods.								
V-Mid-3	During Hurricane Irene, the Village's Sewer Treatment Plant received an estimated six (6) to seven (7) feet of water from the Schoharie Creek and damaged the functioning of that facility. This facility is located adjacent to the Schoharie Creek and the SFHA. The Village has initiated temporary fixes after flooding to ensure the Sewer Treatment Plant is in compliance and operational, but needs a permanent solution. Currently, the Village is in the process of securing funding to elevate this critical facility. Elevation will allow the facility to become flood resistant and not be cut-off in operation during times of floods.	New	Flood	All Goals	Public Works	Village Trustees	$3.7 million	USDA, OCR, WIIA, loan from USDA	1-3 years
V-Mid-4	This project includes the Main Street Business District including Main Street and periphery Streets of this Business District and includes: completion of engineered plans; repair of stormwater systems; demolition of damaged infrastructure or replacement where repair would not be sufficient; installation of new storm sewer pipe in areas where it does not currently exist; installation of catch basins; repair and replacement of sidewalk/green infrastructure; and repairing damaged asphalt. Some engineering plans (framework) for this project has been completed through NY Rising funding, but is not complete.	New	Flood, Severe Storms	All Goals	Village Trustees	None at this time	$2.4 million	NY Rising Grant, CDBG Public Infrastructure	5 years
V-Mid-5	This project proposes to replace the existing Gorge Creek Culvert under NYS 145 near the Middleburgh High School; create a retention pond on the upper portion of Gorge Creek to build capacity for future storm events; repair/replace culvert that runs underneath the School, and improve drainage of this waterflow to the Schoharie Creek. This entire project is dependent on costs not exceeding the 3 million allotted from NY Rising funding.	New	Flood, Severe Storm	All Goals	Village Trustees	NYS DOT, MCSD	$3 million	NY Rising grant, HMGP	1-3 years – ongoing
V-Mid-6	The Village will provide outreach to property owners to inform and identify appropriate mitigation actions for each property. Mitigation actions will include acquisition, however at this time many remaining property owners are not interested in acquisition because it can be expensive and disrupt the historic and social morale of the Village; elevation of structure; elevation of utilities; relocation; dry-proofing; fill in basement; etc. If property owners are okay with an identified solution, the Village will work with County OCDDS to apply for funding to achieve a mitigation solution to reduce future costs associated with disaster response, recovery, and repair.	Existing	Flood, Severe Storm	All Goals	Village Trustees, Floodplain Administrator	County OCDS, Property Owner	$2-5 million	FEMA HMA, PDA, FMA, local share from homeowner	6 – 12 months – ongoing
V-Mid-7	The Village will work with the Schoharie County Emergency Management Office and the Village Floodplain administrator to apply to the NFIP's CRS program to become a participating community by completing activities that exceed the minimum standards of the NFIP. This Village will initially inform FEMA Regional Office of its interest in applying to the CRS and will eventually submit a CRS application, along with documentation that shows it is implementing the activities for which credit is requested. The application is submitted to the Insurance Services Office, Inc. The hope is that the Village's activities and performance are reviewed during a verification visit. FEMA will then establish the credit to be granted and notifies the Village, the State, insurance companies, and other appropriate parties.	New	Flood, Severe Storm	All Goals	Floodplain Administrator	County Emergency Management, Village Board	$2,000	Local budget, in-kind time	18 months
Town of Richmondville									
Rich-1	Increase the size of existing culvert on Cobleskill Creek at the lower end of Podpadic Road. The culvert is often overwhelmed, flooding nearby homes.	Existing	Flooding	Goal 1, Goal 4	Highway Department	None at this time	$50,000	HMGP	1 year

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Rich-2	Complete an analysis to re-channel the Cobleskill Creek at Palmer Road to prevent flooding of homes during storms.	New	Flooding	Goal 1, Goal 3, Goal 4	Highway Department	County Public Works Department	$200,000	HMGP	2 years
Village of Richmondville									
V-Rich-1	Residential property acquisition at 411 Main Street. Property is within the 100 year floodplain and sustains frequent flood damage.	Existing	Flooding	Goal 1	Village Board of Trustees	None at this time	$156,000	HMGP, PDM	3-5 years
V-Rich-2	Repair Bunn Mill Dam and stream banks due to deterioration.	Existing	Flooding	Goal 1, Goal 4	Village Board of Trustees, Contractors	None at this time	$500,000	NYS DEC, HMGP, PDM	2-3 years
V-Rich-3	Bear Gulch Creek Streambank Stabilization Project. Failing banks of stream threaten buildings and properties in the core of downtown.	Existing	Flooding, Landslide	Goal 1, Goal 4	Village Board of Trustees, Contractors	None at this time	$200,000	HMGP, PDM	1-2 years
Town of Schoharie									
T-Scho-1	Central Bridge Main Street Repairs. Installation of storm sewer pipe and catch basins, creation of a stone lined ditch, sidewalk replacements, and asphalt repairs to address Hurricane Irene damage.	New	Flooding, Hurricane	All Goals	Public Works	County Public Works	$1,150,00	NY Rising Communities, CDBG – Public Infrastructure	1-3 years
T-Scho-2	Evaluate flooding along Fox Creek near SR30 bridge.	Existing	Flooding	Goals 1, 2, 4	Public Works	County Public Works	$40,000	NY Rising Communities	1 year
T-Scho-3	Provide outreach to residents to inform of different options to mitigate their homes. Determine if they will consider acquisition. If the property owners are okay with acquisition, the Town will work with the County OCDS to apply for funding to acquire the properties. This will reduce the future costs associated with disaster response, recovery, and repair. In addition, it will protect lives.	Existing	Flooding	All Goals	Town Administrator	None at this time	$400,000	HMGP	1-3 years
T-Scho-4	Improve evacuation route signs to make them visible at night, include radio station tuning information and consider billboards or related measures for public awareness	New	All Hazards	All Goals	County Office of Emergency Services	Town Administration	$35,000	Local budget	3-5 years
T-Scho-5	Engineering design, and installation of a generator and associated equipment for the Town DPW to provide an uninterrupted power supply. The Town of Schoharie has procured a single-phase generator from the fire department for this critical facility, but lacks the funds to install this vital piece of equipment. Engineering design, procurement, and installation of a generator and associated equipment for the Town Hall to ensure continuity of services.	New	Flood, Severe Storm	All Goals	Town Board, Public Works	None at this time	$5,000-6,000	HMGP, Public Works funds	1-2 years
T-Scho-6	Once there is property owner permission, remove fill and bring back the property to its original state before fill was placed, by being at the 0% threshold level. After fill is removed, plant trees and shrubs to stabilize property and absorb water to create a riparian habitat.	Existing	Flood, Severe Storm	All Goals	Town Administrator, Public Works	Town CEO	$100,000-125,000	HMGP	2-4 years
Village of Schoharie									
V-Scho-1	This project includes the acquisition and repair of the Parrott House. This project will purchase the building, making resiliency and flood mitigation repairs by raising the utilities to the first floor, and bringing the building up to code so it can be re-sold for commercial use. The ground floor of the building is a commercial space and the upper floors are apartments. The Parrott House was impacted by Hurricane Irene and Tropical Storm Lee. The building is currently vacant and at risk of blight.	Existing	Flooding, Hurricane	All Goals	Village Board, Administrator	None at this time	$980,000	NY Rising Communities, HMGP	1-3 years
V-Scho-2	This project includes the acquisition and repair of the Taylor Block building. This project will purchase the building, make resiliency and flood mitigation repairs by raising the utilities to the first floor, and bring the building up to code so it can be	Existing	Flooding, Hurricane	All Goals	Village Board, Administrator	None at this time	$655,000	NY Rising Communities, HMGP	1-3 years

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	re-sold for commercial use. The ground floor of the building is a commercial space and the upper floors are apartments. The Village believes that this is keystone project that addresses an urgent need related to the flood, impacts low/moderate income families, and addresses economic development.								
V-Scho-3	Conduct a Land Use Study to identify lands to support strategic relation of buildings and promote development outside of flood-prone areas. Long-range planning and floodplain management are interrelated as many floodplain management strategies include the adoption of local laws to address flooding and flood damage mitigation.	New	All Hazards	All Goals	Village Board, Administrator	None at this time	$100,000	NY Rising Communities, HMGP	1 year
V-Scho-4	Stabilize and protect the main source of drinking water for the Village of Schoharie. During Irene geologic shifting threatened the water supply. This project would harden siphon pipes for water intake.	Existing	Flooding, Water Supply Contamination	Goals 1, 2, 4	Public Works	None at this time	$70,000	NY Rising Communities, HMGP	1-3 years
V-Scho-5	A Master Drainage Plan will help the Village be proactive in its engineering and planning both for future storm events and additional mixed-use development in the Community. A Master Drainage Plan is a key component in the decision process for both continued maintenance and upgrade improvements to the storm drainage system.	Existing	Flooding, Hurricane	All Goals	Public Works, Village Board	None at this time	$288,000	NY Rising Communities, NYSDEC Mohawk River basin, Hudson River Estuary	1-3 years
V-Scho-6	Elevate seven structures to get them out of the floodplain without forcing people to move out of the Village**.**	Existing	Flooding, Hurricane	All Goals	Village Board	None at this time	$700,000	FEMA HMGP, PDM	3-5 years
Town of Seward									
Sew-1	Perform streambank stabilization and re-direct stream on West Creek. Streambank is currently eroding at Patrick Road and other nearby locations.	Existing	Flooding, Landslides	Goal 1, Goal 3, Goal 4	County Public Works Department	Highway Department	$500,000	HMGP, PDM	2-3 years
Sew-2	Remove beaver dams from existing culverts. Beaver dams regularly block culvers on two major roads, causing the Highway Department to clear debris during an incident.	Existing	Flooding	Goal 1	Highway Department	None at this time	$5,000 per permit	Town funding	1-3 year
Sew-3	Develop and adopt a riparian buffer ordinance to assist with erosion and prevent future flood losses.	New	Flooding, Landslides	All Goals	Code Enforcement Officer, Town Administration	Town Board	Minimal	Town funding	2-3 year
Sew-4	Develop GIS database to inventory and track locations of erosion and streamside plantings to utilize when applying for funding.	New	Flooding, Landslides	All Goals	Public Works, Town Administration	None at this time	$50,000	HMGP, Town funding	3-5 years
Town of Sharon									
T-Shar-1	Raise and widen White Road. Gas pipeline crosses White Road at a depth of 23 inches.	Existing	All Hazards	Goal 1, Goal 3, Goal 4	Department of Public Works, Kinder Morgan	None at this time	$100,000	Town funds, Solar Host Community Benefits – NExtERA, CHIPS	1-3 years
T-Shar-2	Carryover- Evaluate 14 residences located in the special flood hazard area to determine if property acquisition, or the elevation and flood-proofing of structures and utilities are warranted	Existing	Flooding	All Goals	Town Administration, Code Enforcement Officer	County OCDS	$1 million	Local funding/ HMGP, PDM. Solar Host Benefits – NextERA	2-4 years
T-Shar-3	Ongoing- Evaluate opportunities to extend municipal sewer and water services to prevent flooding	Existing	Flooding	Goal 1, Goal 4	Department of Public Works	None at this time	$1.5 million	CDBG, Solar Host Benefits - NextERA	3-5 years
Village of Sharon Springs									

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V Shar-1	Target floodplain structures for utility elevation, below grade fill-ins, and/or floodproofing to reduce future costs associated with disaster response, recovery, and repair.	Existing	Flood	All Goals	Code Enforcement Officer	County OCDS	$500,000 to $1.5 million	HMGP, PDM	2-5 years
V Shar-2	The reservoir should be dredged to accommodate for heavy rainfall and surface water influx, and to act as a flood buffer and control mechanism.	Existing	Flood	All Goals	Village DPW	None at this time	$1,000,000	WQIP	1-3 years
V Shar-3	Permeable pavement is shown to be effective in managing runoff from paved surfaces and preventing serious erosion and siltation in nearby surface water bodies. Re-paving the DPW parking lot with permeable pavement may mitigate future flooding at this critical facility.	Existing	Flood	All Goals	Village DPW	None at this time	$300,000	FEMA 406 funds	1-3 years
Town of Summit									
Summ-1	The Summit Highway Department and Fire Department will work with the Schoharie County Fire Coordinator to identify structures close to forested areas, particularly forested areas with steep slopes, and recommend/create firebreaks by removing vegetation to prevent potential fires. The town will monitor and maintain these firebreaks with property owner cooperation.	New	Wildfire, Landslides	All Goals	Highway Department, Fire Department	County Office of Emergency Services	$50,000	Local budget, HMGP	3-5 years
Summ-2	Develop and adopt a riparian buffer zone regulation to protect waterways and reduce flood potential to future development. Without an ordinance, the town has limited legal authority to require and enforce riparian buffers on private land. Protection of the Chesapeake Bay is a high priority to the 4 States located in the watershed.	Existing	Flood	All Goals	Town Board, Planning Board, Code Enforcement Officer	None at this time	Minimal, administrative costs and enforcement	Local budget	1-3 years
Town of Wright									
Wri-1	Ongoing. Study, develop, and implement projects for stabilizing streambanks on Fox and King Creeks where erosion threatens development and agriculture. Streambank stabilization via armoring and riparian plantings will reduce long-term threats posed by natural stream processes as well as shorter-term threats posed during a flood event.	Existing	Flooding, Landslides	All Goals	Public Works, Town Administration	County Office of Emergency Services	$500,000	HMGP, PDM	2-3 years
Wri-2	Develop a SMP for the Town of Wright that will utilize biological, hydrological, geomorphological, and other data to assess stream flows and other conditions necessary to support the environmental, agricultural, and recreational values of the Town. This was recommended in the Schoharie Basin Flood Mitigation Study conducted by Milone & MacBroom.	New	Flooding	Goals 1, 2, 4	Public Works, Code Enforcement, Town Administration	Town Board	$75,000	HMA Advance Assistance	2-4 years
Wri-3	Develop a GIS database of bridges within the Town and coordinate with Schoharie County for regular inspections and repairs. The NYSDOT bridge data would be used as a starting point and built upon to include the geospatial data.	New	All Hazards	All Goals	Public Works, Town Administration	None at this time	$25,000	HMGP, local funding	1 year
Wri-4	Study the feasibility of joining an existing municipal water supply and determine the feasibility of contemporary sewage treatment in the Hamlet of Gallupville.	New	Flooding, Water Contamination	All Goals	Public Works, Town Administration	County Planning	$50,000 (initial study phase)	HMGP, local funding	3-5 years

Chapter 7 Plan Implementation, Review and Updating

Chapter 7 provides an overview of the overall strategy for plan maintenance and outlines the method and schedule for monitoring, updating, and evaluating the plan. The chapter also discusses incorporating the plan into existing planning mechanisms and how to address continued public involvement.

7.1 Review and Updates

It is the responsibility of the Schoharie County Hazard Mitigation Committee, identified in Section II of this Plan, to insure that a process and resources for evaluating and updating the Multi-Jurisdiction Hazard Mitigation Plan are implemented. Under the leadership of the Chairman of the Schoharie County Board of Supervisors, and with the support and participation of the County Local Emergency Planning Committee and the County Office of Emergency Services, it is the responsibility of the Hazard Mitigation Committee to meet as appropriate and take actions necessary to insure the plan is maintained and updated. The Hazard Mitigation Committee shall meet at least annually, or more often if necessary, to review the status of the plan and any requirements for modifying or updating the plan.

The review of the Multi-Jurisdictional All-Hazard Mitigation Plan shall include an evaluation of the following areas.

- Reassess the role, influence and success of the Hazard Mitigation Committee; including the composition and participation of its members and the Committee's ability to exercise leadership that leads to implementation of Hazard Mitigation goals and objectives outlined in Section VI, C
- Evaluate the status, progress, problems and schedule associated with each of the Hazard Mitigation Goals and Objectives
- Review the role, progress and capabilities of the primary and supporting jurisdictions, agencies and officials responsible for implementing each of the Hazard Mitigation Goals and Objectives
- Reassess the hazards, risk and vulnerability assessments included in the plan to determine if changes or modifications are needed. Base the evaluation on new or modified data and information available and changes to existing resources and capabilities
- Insure that citizen and public participation are incorporated in the planning process, including public involvement in the implementation of project goals, plan updates and modifications

The Hazard Mitigation Committee shall meet at least annually to review and update the plan, but the following situations or conditions will require that the Hazard Mitigation Committee meet more frequently to evaluate plan issues, reviews and updates.

- There are significant changes related to risks, vulnerabilities and capabilities associated with any of the hazards that are of principal concern or pose a significant vulnerability for Schoharie County.
- There are changes associated with the risks, vulnerabilities and related factors for hazards previously not considered relevant that require reevaluation or consideration by the Hazard Mitigation Committee.

- A disaster or emergency occurs and a timely review or evaluation is necessary to determine if hazard mitigation resources would contribute to the recovery; or if elements of the hazard mitigation plan and mitigation goals and objectives included in the plan should be modified.
- Problems are identified that impede or threaten timely and successful progress toward implementation of any of the Hazard Mitigation goals and objectives included in Section VI, C
- There are changes to key personnel responsible for implementation of hazard mitigation goals and objectives; including those on the Hazard Mitigation Committee and those representing participating jurisdictions and support agencies.
- Grants, funding or resources become available that require immediate action or support by the Hazard Mitigation Committee to insure applicable goals and objectives are addressed.

7.2 Monitoring

The Schoharie County Office of Community Development Services Senior Planner is responsible for managing activities and requirements needed to monitor, maintain and update the plan, which includes establishing a process for gathering and collecting information needed to monitor planning maintenance and updates. The Schoharie County Emergency Management Director will assist and the support the Senior Planner with plan monitoring and data collection. Information and recommendations related to plan updates will be provided to the Hazard Mitigation Committee to review the status of the plan and requirements for future plan updates.

In monitoring requirements to review and update the plan, the Hazard Mitigation Committee should work with and seek input from the following officials and representatives or others as appropriate.

- Schoharie County Supervisors
- Flood Committee, Schoharie County Board of Supervisors
- Schoharie County Office of Community Development Services
- Town/Village Flood Plain Managers
- Local Emergency Planning Committee (LEPC)
- Public / Private Sector Leaders
- Schoharie County Public Health
- Schoharie County Sheriff
- Schoharie County Public Works
- Municipal Highway and Public Works Superintendents
- Schoharie County Farm Bureau
- Schoharie County Soil and Water Conservation District (SWCD)
- Schoharie County Fire Coordinator:
- Schoharie County Emergency Services Director
- Bassett Hospital
- Schoharie County Emergency Medical Services (EMS)

<u>Plan monitoring should focus on the following issues</u>

- The status, progress and any problems associated with each of the hazard mitigation goals and objectives included in Section VI, C

- Maintain contact and collect information about hazard mitigation goals, objectives and issues from representatives of participating jurisdictions and supporting agencies
- Monitor information about hazard mitigation resources and funding that can be used to implement hazard mitigation goals and objectives
- Monitor changes related to risks, vulnerabilities and capabilities associated with hazards relevant or potentially significant to Schoharie County
- Insure that citizen and public participation are incorporated in the planning process, including public involvement in the implementation of project goals, plan updates and modifications

Refer to Appendix F for a progress report template designed to support jurisdictions in monitoring and tracking progress made on mitigation actions.

7.3 Participating Jurisdictions and Agencies

Planning Contact

Each participating jurisdiction, department and agency listed in Section II of this Plan shall provide a representative and actively participate in evaluation and review of the plan. Each jurisdiction, department and agency will maintain a primary Planning Contact, as noted in Section II of this Plan, that is available to provide the local or agency coordination needed to address issues and activity related to the Plan. The jurisdiction or agency shall also insure that contact information about the current and active representative is maintained with the Schoharie County Office of Community Development Services and made available to the Hazard Mitigation Committee.

Local Hazard Mitigation Plan Review

-- Monitoring Plan Goals and Objectives --

Each participating municipal jurisdiction shall continuously monitor progress associated with successful implementation of the hazard mitigation goals and objectives identified for their jurisdiction in *Section VI, C - Table of Town and Village Hazard Mitigation Initiatives and Projects*. Anytime there are significant changes or problems related to implementation of applicable hazard mitigation goals - and least annually - the jurisdiction will review the status of local goals and projects identified in the Plan. The results of the annual or interim reviews; including a summary of any achievements, problems, schedule changes or modifications shall be reported to the Schoharie County Office of Community Development Services and made available to the Hazard Mitigation Committee.

Plan Review and Update Report

The following format can be used to report progress and issues associated with applicable mitigation goals and objectives to the Schoharie County Office of Community Development Services and the Hazard Mitigation Committee.

In addition, the County will utilize the Progress Report template included in Appendix F to track mitigation program progress on an ongoing basis.

Schoharie County Multi-Jurisdiction Hazard Mitigation Plan -- Plan Review and Updating Report --	
Jurisdiction:	
Refer to Goals and Objectives listed in Section VI, C Table of Town and Village Hazard Mitigation Initiatives and Projects	
Goal and Objective #:	Review Date:
Title or Description:	
Report the status, achievements, problems and modifications associated with the following:	
Description, Definition, Design or Scope of the Project:	
Leadership, Staffing or Assigned Responsibilities for Implementing the Objective:	
Schedules, Milestones, Delays and Target Dates Associated with the Project:	
Issues Related to Project Costs, Budget and Funding:	
Other Indicators of Project Success, Difficulties or Modifications:	
Organizational, Political and Public Concerns or Issues:	
Other Comments, Findings or Requirements:	

Identification of New Projects

Jurisdictions will utilize State of New York DHSES-provided Project Worksheets (see Appendix C) to identify new hazard mitigation goals or projects that are being considered which should be included in the Hazard Mitigation Plan.

Typical hazard mitigation project proposals that appear in mitigation plans statewide include the following. Proposals must generally be cost-effective and environmentally sound.

1. Permanent storm drainage improvements; increased capacity, culverts, pipes, catchbasins
2. Permanent solutions for streambank erosion, stabilization and protection
3. Structural flood control or protection; such as berms, diversions channels and retention areas
4. Systems for stream debris collection, removal and management
5. Hill and landslide stabilization, bank stabilization, erosion control
6. Installation of back flow valves and flap gates
7. Retrofitting public facilities and private properties; such as elevating buildings above flood elevations, filling-in basements, providing open flow access in structures below flood level, and raising the elevation of electronics, controls, heating and related utilities
8. Acquisition or relocation of public and private properties that remove the structure from a flood hazard area
9. Public education, awareness and notification
10. Communications, security and safety improvements
11. Strengthening floodplain management programs and capabilities
12. Proposals that limit or prevent damage to properties and reduce future insurance claims
13. Development and adoption of local mitigation standards and codes to reduce or eliminate risks
14. Strengthening and amending local codes and ordinances to enhance hazard protection
15. Development of inter-jurisdiction stormwater management plans
16. Inter-jurisdiction, shared resource stream debris clearance and maintenance

Monitoring Public Participation

Public participation and citizen input are important to a successful hazard mitigation program and vital to the implementation of goals and objectives outlined in the plan. In both annual and interim reports, local jurisdictions should include a review of how citizen participation has been incorporated into local hazard mitigation activities. Factors and considerations related to public participation would include, but are not limited to the following.

- Public comments and input documented at local meetings and hearings
- Citizen participation in local forums, workshops and out-reach sessions
- Presentations and briefings provided by local and other public officials
- Meetings with residents during site visits and field work
- Inquiries made by citizens to municipal officials and at municipal offices
- Information posted to and available to the public on websites and related media

Local Participation in County Multi-Jurisdiction Objectives

Aside from hazard mitigation objectives in Section VI, C that target specific action by certain jurisdictions, there are County-wide or multi-jurisdiction objectives that require active participation and input by all municipalities. High priority planning, development and natural hazard prevention objectives that require continuous monitoring and active involvement by all jurisdictions and local leaders are summarized in the following table.

Multi-Jurisdiction Objectives

High Priority Multi-Jurisdiction Objectives	
Goal #1 Objectives 1-1 to 1-9 Develop and use local policies and laws that provide incentives to prevent or manage development in hazardous areas Strengthen and consistently apply Zoning, Site Plan Reviews and other Land-Use laws to reduce flood risks Encourage homeowners, renters and businesses to purchase Flood Insurance to protect their property and belongings	Enact local initiatives, programs and public incentives that will encourage private property owners and developers to implement hazard mitigation measures. Examples that have successfully been applied in communities elsewhere include: Tax reductions or other incentives for landowners that leave buffers or green areas along streams Incentives that allow storm water projects to be built on private property for the protection of downstream residents Creation of special 'drainage or stream tax districts' to fund stream maintenance and other vital flood mitigation improvements in vulnerable areas Construction of retention basins or wetlands that will reduce flooding and erosion Streambank stabilization and protection Water conservation and groundwater protection that safeguard water supplies and enhance wildlife habitat
	Develop more effective zoning and land use tools that will strengthen the community's ability to manage development and growth in a way that assures protection from flooding and other natural hazards. This can include programs and requirements that address the following areas. Better identification of floodplains and flood prone areas Education for public officials and citizens regarding the effectiveness or 'pay-offs and benefits' associated with protective regulations and local enforcement

	Stronger local 'Site-Plan Review' processes that address drainage, flooding, watershed and water quality issues Development and implementation of storm water management programs consistent with requirements of NYS DEC MS4 stormwater permits Municipal cooperation in the development and management of hazard reduction programs that can increase effectiveness and reduce costs

7.4 Schedule

The Multi-Jurisdiction Hazard Mitigation Plan can be updated at any time. Regular updates are recommended to insure that goals, projects, activities and responsibilities outlined in the plan are current, accurate and applicable.

The Hazard Mitigation Committee and each participating jurisdiction shall review the plan at least annually and that review should include an evaluation of the status and applicability of goals and projects outlined in *Section VI, C - Table of Town and Village Hazard Mitigation Initiatives and Projects.*

The Disaster Mitigation Act of 2000 requires that Hazard Mitigation Plans be updated every five years in order for participating jurisdictions to remain eligible for hazard mitigation project funding. This must be a comprehensive multi-jurisdiction update that follows planning standards required by the Disaster Mitigation Act and FEMA. Annual reviews, or more frequent updates, by the Hazard Mitigation Committee and each participating jurisdiction are necessary to meet basic maintenance standards set forth in this plan, but these local reviews alone will not meet requirements for the five (5) year comprehensive update. The five (5) year comprehensive update can take up to one (1) year to complete, so the Hazard Mitigation Committee will need to begin organizing the update process at least one (1) year in advance.

7.5 Continuing Public Participation

Public participation, review and input are essential to successful preparation and updating of the Multi- Jurisdiction Hazard Mitigation Plan. Public participation in plan implementation, monitoring and updating will be assured in the following ways.

- The plan is available for public review and comment on the Schoharie County website, at the Schoharie County Office of Community Development Services, the Schoharie County Office of Emergency Services and each town and village municipal office.
- The Hazard Mitigation Committee -- working with local elected officials, community leaders and agency representatives -- seeks direct and continuous input, recommendations and participation from citizens, property owners, community and business leaders, organizations and interest groups in the hazard mitigation planning process.

- Annual or interim reports by local jurisdiction representatives should address ongoing public participation activities related to hazard mitigation planning and implementation of hazard mitigation goals and objectives
- The best public participation opportunities are often linked with organized citizen groups, panels and boards that have related interest in hazard mitigation and community improvements. The membership of these organizations are typically community volunteers that regularly exchange information about local needs and concerns with a cross-section of people that live and work in Schoharie's towns and villages. Local officials should monitor and report on public involvement in meetings and activities sponsored by these and other citizen organizations.

  Schoharie County Board of Supervisors Flood Committee

  Town and Village Boards

  Schoharie County Planning Commission

  Town and Village Planning and Zoning Boards

  Schoharie County Industrial Development Agency (IDA)

  Cornell Cooperative Extension of Schoharie County

  Schoharie County Long-Term Recovery Group

  Blenheim Long-Term Community Recovery Committee

  Schoharie County Agriculture & Farmland Protection Board

  Schoharie Farm Bureau

  Schoharie Land Trust

  Schoharie County Chamber of Commerce

  Schoharie County Soil and Water Conservation District (SWCD)

  Schoharie County Geographic Information System (GIS) Committee

  Schoharie County Citizen Corps

  Organized Property and Landowner Associations

  Schoharie County Rural Preservation Corps

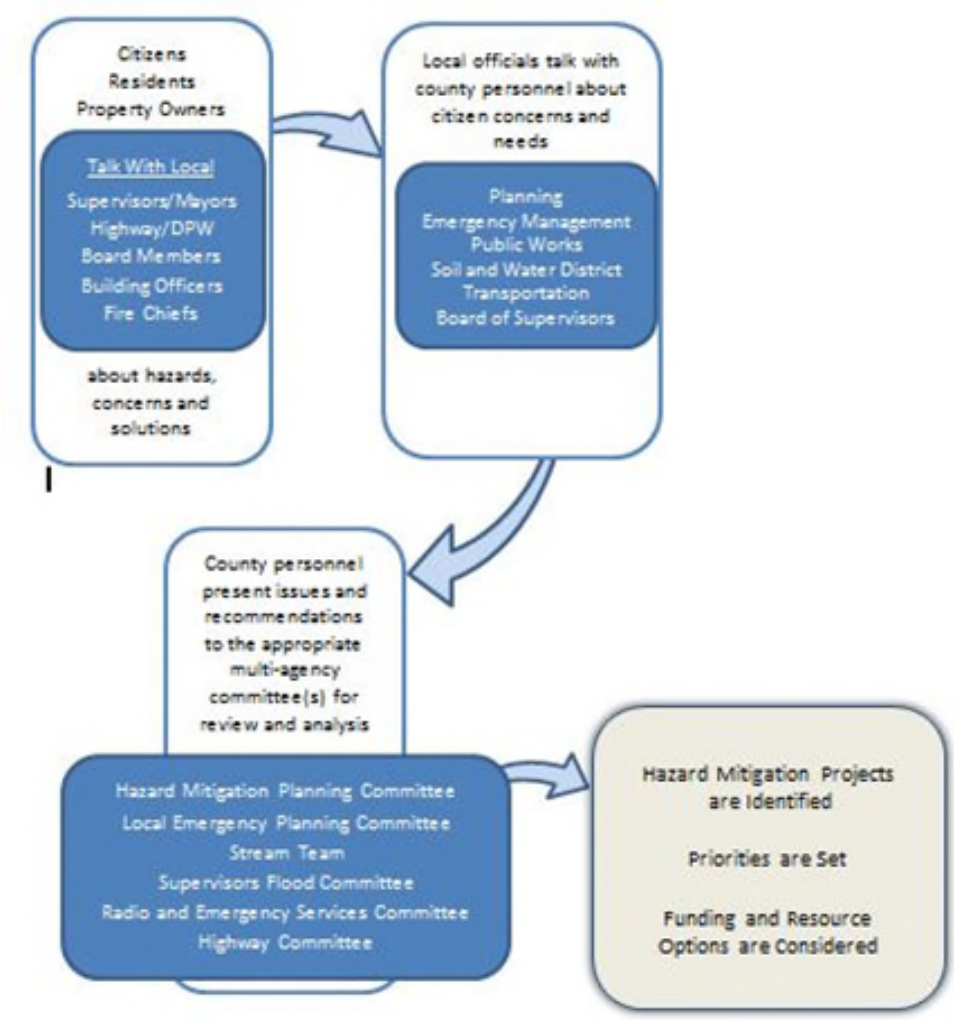
  Schoharie Colonial Heritage Association

  Schoharie County Fire Chiefs

Schoharie County School Boards and Superintendents

As noted in the introduction to this Plan, Schoharie County is best known for its sparse population and community-oriented character. As a result of the strong community ties and integrated involvement of citizens and leaders among government and civic organizations in the community, ample means and opportunities are available to insure the public is aware of goals set forth in the Hazard Mitigation Plan, and to be certain that public input and opinions will be heard as the Plan is implemented and updated. Those responsible for insuring successful implementation of the Hazard Mitigation Plan – including members of the Hazard Mitigation Committee, agency leaders and local government representatives – are either members of the groups listed above, or they know the leaders and associates of these organizations very well. Further strengthening the lines for feedback and cooperation is the recognition that local elected and government officials in Schoharie County, including those responsible for maintaining the hazard mitigation plan, are also members of their local volunteer fire departments, civic and veterans clubs, school boards and other community interest groups. This kind of integrated community networking and cross-cultural participation provides a valuable and productive platform to promote and sustain public contributions in the hazard mitigation plan. Furthermore, this strategy is aligned with the whole-community approach as outlined in the National Planning Framework (NPF). It is the responsibility of the Hazard Mitigation Committee and the local jurisdiction representatives to insure this kind of comprehensive community involvement and public participation is captured in the annual and interim reports noted above in Part C. (Local Hazard Mitigation Plan Review), so that citizen involvement can be incorporated in Plan revisions and updates.

Continuing Public Participation Strategy



7.6 Incorporation of Existing Planning Mechanisms

Implementation of goals and projects outlined in the Multi-Jurisdiction Hazard Mitigation Plan and review of the Plan should always insure that proposals remain consistent with objectives and policies established in other local plans. Similarly, when provisions and programs outlined in other local plans and policies are implemented or updated, they should acknowledge and be consistent with objectives and proposals established by the Multi-Jurisdiction Hazard Mitigation Plan. This should include local comprehensive master plans, zoning, regulations and ordinances as outlined in *Section V, Part I. Analysis of Development Trends, Table of Local Development Policies*. Projects and plan updates should also examine consistency among the Hazard Mitigation Plan and other local development plans as listed below and outlined in *Section II. F. Review of Existing Plans.*

- Local Comprehensive Community Master Plans
- Schoharie County Long-Range Economic Development Strategy
- Schoharie county and Blenheim Long-Term Community Recovery Plans
- Cobleskill Small Urban Area Corridor Plan
- Schoharie County and Local Comprehensive Emergency Management Plans

- Schoharie County Community-Wide Emergency Agreements
- Public Health Emergency Operations Plan
- Schoharie County Hazardous Material Plan
- Schoharie Valley Flooding and/or Dam Failure Guidelines
- Schoharie County Highways Shared Services Consolidation Study
- New York City Watershed Low Impact Development Design Strategies

7.7 Plan Implementation Strategies

The Schoharie County Multi-Jurisdiction Hazard Mitigation Plan will be included as an appendix to the County Comprehensive Emergency Management Plan and included as a part of each local emergency response plan.

> Schoharie County and each participating jurisdiction should emphasize and include references and links to the Multi-Jurisdiction Hazard Mitigation Plan in other local plans and documents where appropriate

Many goals and projects described in the Plan are multi-jurisdictional efforts that will require integrated leadership, planning and resources from a number of governmental levels and agencies. In these instances, one or two key local representatives often take or share a leadership role, while other interests and participants serve on an existing or ad-hoc team or committee that will guide implementation of the proposal. Other objectives and initiatives included in the Plan are specific to a certain municipality or agency, where it is expected that leadership for these targeted objectives would come from the municipality or agency sponsoring the improvement; even though most of these activities still require participation and support, and funding, from multiple governments and sources.

> It is important that goals, projects and priorities established by the Multi-Jurisdiction Hazard Mitigation Plan be reviewed and considered when the county and local governments prepare annual operating budgets, capital improvement programs, economic development initiatives, land use policies and strategic management plans

The County is considering establishing protocols for capital development and improvements that would require county projects be reviewed for hazard vulnerability, hazard resistant design and site planning. The County could also work with municipal governments to enact similar provisions, including strengthened local codes and standards that encourage hazard resistant design of structures and sites. Such actions could be particularly effective when designing community infrastructure and critical facilities such as government buildings, water and wastewater systems and emergency facilities.

Schoharie County will also work with each municipality to encourage that jurisdictions develop a process to ensure hazard vulnerability and mitigation are considered when approving private land-use, zoning and development.