SECTION 4 COUNTY PROFILE

This profile provides general information for Chenango County's physical setting, population and demographics, general building stock, land use and population trends, and critical facilities located within the county. Analyzing this information leads to an enhanced understanding of the study area. The economic, structural, and demographic contexts can be related to hazards analyzed later in this plan.

4.1 GENERAL INFORMATION

Chenango is a word from Oneida tribal language name meaning "pleasant river flowing through the land of the bull thistle". Chenango County was named after the Chenango River, which runs through the County (McFee, 2000). This largely rural and wooded county is located within the "Southern Tier Region" of New York State and was established on March 15, 1798, which included all of Madison County and Chenango County (Chenango County Visitors Guide, 2005, NYGenWeb, 2007). Today's boundaries were established on March 21, 1806 (Sullivan, 1927). According to the American Community Survey, the 2018 estimated population for Chenango County is 48,348 (U.S. Census, 2018).

Currently, Chenango County comprises 899 square miles and includes numerous state forests, rural landscapes, residential areas, business districts, over 103,000 acres of agricultural land, four rivers, various transportation systems, natural features, over 112,700 acres of forested land, and educational facilities (Draft Chenango Comprehensive Plan, 2013). This combination of natural and developed features lays the foundation for Chenango County's vulnerability to natural hazards, both in terms of exposure to a hazard event and the potential impact of hazard events.

Chenango County is comprised of 21 towns, 8 villages, and 1 city as described in the table below.

Towns		Villages	City
Afton	Norwich	Afton	Norwich
Bainbridge	Otselic	Bainbridge	
Columbus	Oxford	Earlville*	
Coventry	Pharsalia	Greene	
German	Pitcher	New Berlin	
Greene	Plymouth	Oxford	
Guilford	Preston	Sherburne	
Lincklaen	Sherburne	Smyrna	
McDonough	Smithville		
New Berlin	Smyrna		
North Norwich			

*Note: * Earlville is located in both Chenango and Madison Counties*

4.2 MAJOR PAST HAZARD EVENTS

Presidential disaster declarations are usually issued for hazard events that cause more damage than local and state governments can handle without federal government assistance, although no specific dollar loss threshold has been established for these declarations. A presidential disaster declaration puts federal recovery programs into motion to assist disaster victims, businesses and public entities. Some programs are matched by state programs. Review of presidential disaster declarations helps establish the probability of reoccurrence for each hazard and identify targets for risk reduction. Table 4-1 shows FEMA disaster declarations that included Chenango County through 2020 (records date back to 1954).

Table 4-1. History of Hazard Events in Chenango County, New York

Disaster Number	Event Date	Declaration Date	Incident Type	Title
DR-4480	January 20, 2020 – Ongoing	3/20/2020	Biological	COVID-19 Pandemic
EM-3434	January 20, 2020 – Ongoing	3/13/2020	Biological	COVID-19
DR-4472	October 31 – November 1, 2019	12/19/2019	Severe Storm(s)	Severe Storms, Straight-Line Winds, and Flooding
DR-4397	August 13 – August 15, 2018	10/1/2018	Flood	Severe Storms and Flooding
DR-4322	March 14 – March 15, 2017	7/12/2017	Snow	Severe Winter Storm and Snowstorms
DR-4129	June 26 – July 10, 2013	7/12/2013	Flood	Severe Storms and Flooding
EM-3351	October 27 – November 8, 2012	10/28/2012	Hurricane	Hurricane Sandy
DR-4031	September 7 – September 11, 2011	9/13/2011	Severe Storm(s)	Remnants of Tropical Storm Lee
EM-3341	September 7 – September 11, 2011	9/8/2011	Severe Storm(s)	Remnants of Tropical Storm Lee
DR-1993	April 26 – May 8, 2011	6/10/2011	Flood	Severe Storms, Flooding, Tornadoes, and Straight-Line Winds
DR-1857	August 8 – August 10, 2009	9/1/2009	Severe Storm(s)	Severe Storms and Flooding
EM-3299	December 11 – December 31, 2008	12/18/2008	Severe Storm(s)	Severe Winter Storm
DR-1670	November 16 – November 17, 2006	12/12/2006	Severe Storm(s)	Severe Storms and Flooding
DR-1650	June 26 – July 10, 2006	7/1/2006	Severe Storm(s)	Severe Storms and Flooding
EM-3262	August 29 – October 1, 2005	9/30/2005	Hurricane	Hurricane Katrina Evacuation
DR-1589	April 2 – April 4, 2005	4/19/2005	Severe Storm(s)	Severe Storms and Flooding
DR-1565	September 16 – September 24, 2004	10/1/2004	Severe Storm(s)	Tropical Depression Ivan
DR-1534	May 13 – June 17, 2004	8/3/2004	Severe Storm(s)	Severe Storms and Flooding
EM-3186	August 14 – August 16, 2003	8/23/2003	Other	Power Outage
DR-1467	April 3 – April 5, 2003	5/12/2003	Severe Ice Storm	Ice Storm
EM-3184	February 17 – February 18, 2003	3/27/2003	Snow	Snow
EM-3173	December 25 – January 4, 2002	2/25/2003	Snow	Snowstorms
DR-1391	11-Sep-01	9/11/2001	Fire	Fires and Explosions
EM-3155	May 22 – November 1, 2000	10/11/2000	Other	West Nile Virus
DR-1335	May 3 – August 12, 2000	7/21/2000	Severe Storm(s)	Severe Storms and Flooding
DR-1222	May 31 – June 2, 1998	6/16/1998	Severe Storm(s)	Severe Storms and Tornadoes
DR-1095	January 19 – January 30, 1996	1/24/1996	Flood	Severe Storms and Flooding
EM-3107	March 13 – March 17, 1993	3/17/1993	Snow	Severe Blizzard
DR-338	June 23, 1972	6/23/1972	Flood	Tropical Storm Agnes

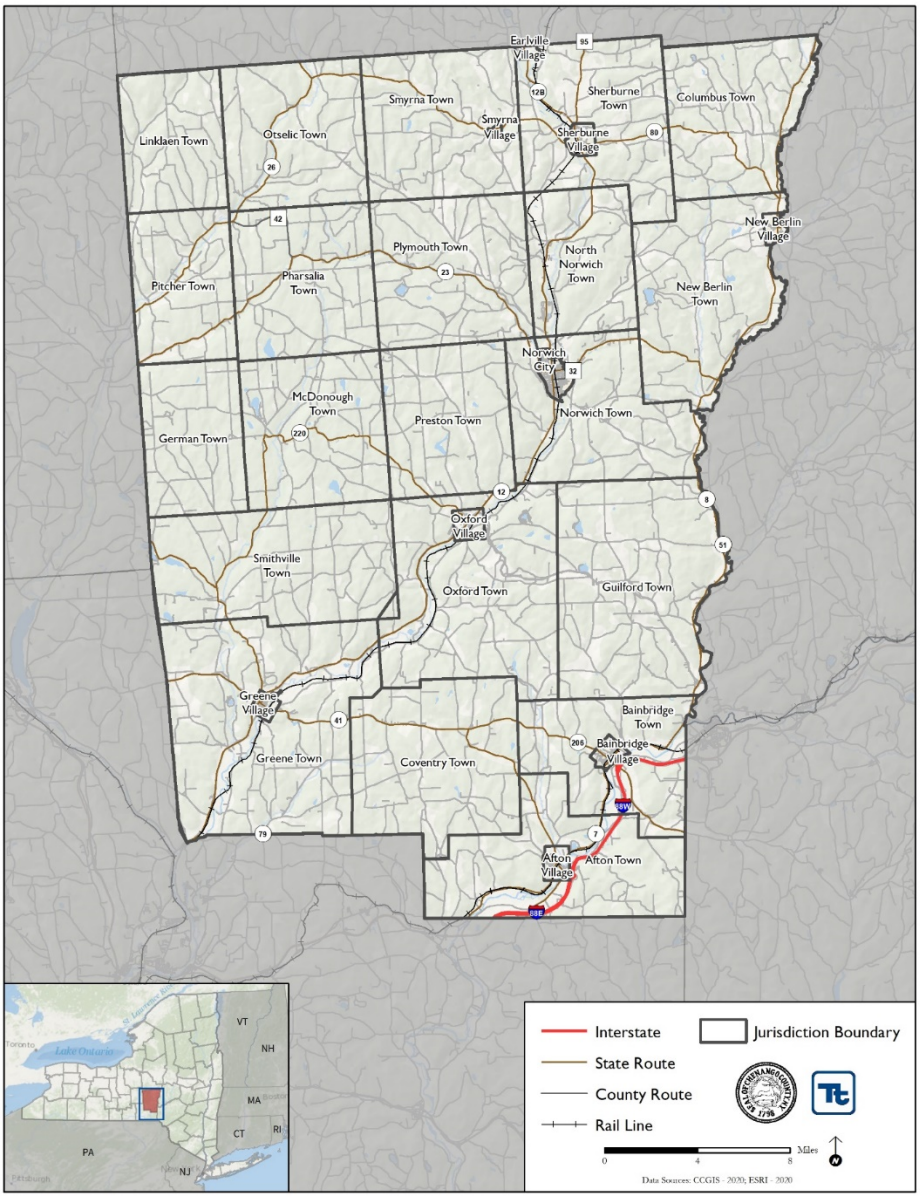
4.3 PHYSICAL SETTING

This section presents the physical setting of the county, including location, hydrography and hydrology, topography and geology, climate, and land use/land cover.

4.3.1 Location

Chenango County lies on the northern edge of the Southern Tier Region of New York State, approximately 50 miles southeast of Syracuse. Chenango County has an area of approximately 903 total square miles (Draft Chenango County 2016). The County is bordered by Madison County to the north, Otsego and Delaware Counties to the east, Broome County to the south, and Cortland County to the west. Chenango County itself is divided into 21 towns, 8 villages, and 1 city (Figure 4-1).

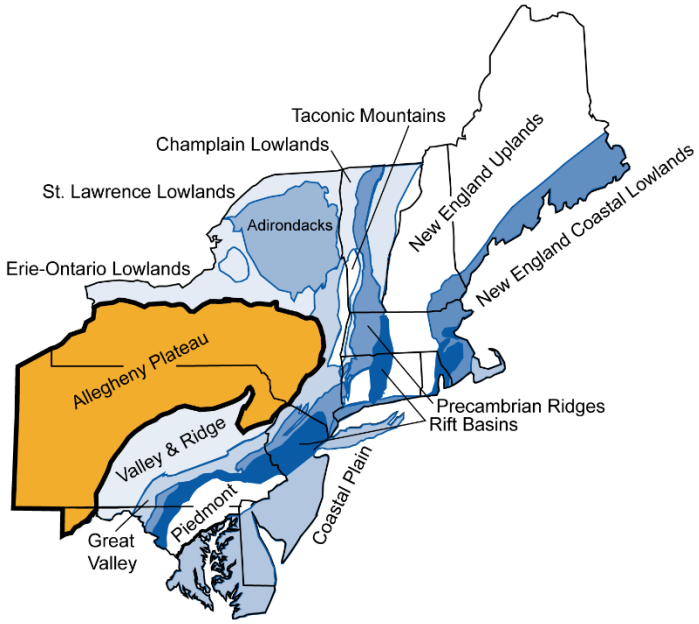
Figure 4-1. Location of Chenango County, New York



4.3.2 Topography and Geology

Chenango County is located within the Alleghany Plateau which extends from the southern tier of New York State through Pennsylvania and Maryland to Alabama. The area was once flat, like a typical plateau, but it uplifted 400 million years ago and is now deeply dissected by streams, making the area hilly, and in some places mountainous (Paleontological Research Institution, 2020). The Plateau is mainly covered by hardwood forests, bounded by the Catskill and Appalachian Mountain ranges.

Chenango County is hilly with many creeks and streams; hills lay in parallel ridges running from the northern section to the southern section of the county (Bainbridge Chamber of Commerce 2006). Elevations within Chenango county average around 900-1,000 feet above seal level, with upland areas reaching 1,500 feet or more. The highest point in Chenango County is approximately 2,000 feet above sea level, just west of the City of Norwich. The lowest point in the Chenango Valley is near the Chenango River in Greene (Chenango County 2016). The majority of land area within Chenango Coutny lies within the 3-8% slope, or 8-15% slope categories, which determines the land use and settlement patterns of the county as well as natural drainage and run-off patterns.



Source: Palentological Research Institution, 2020

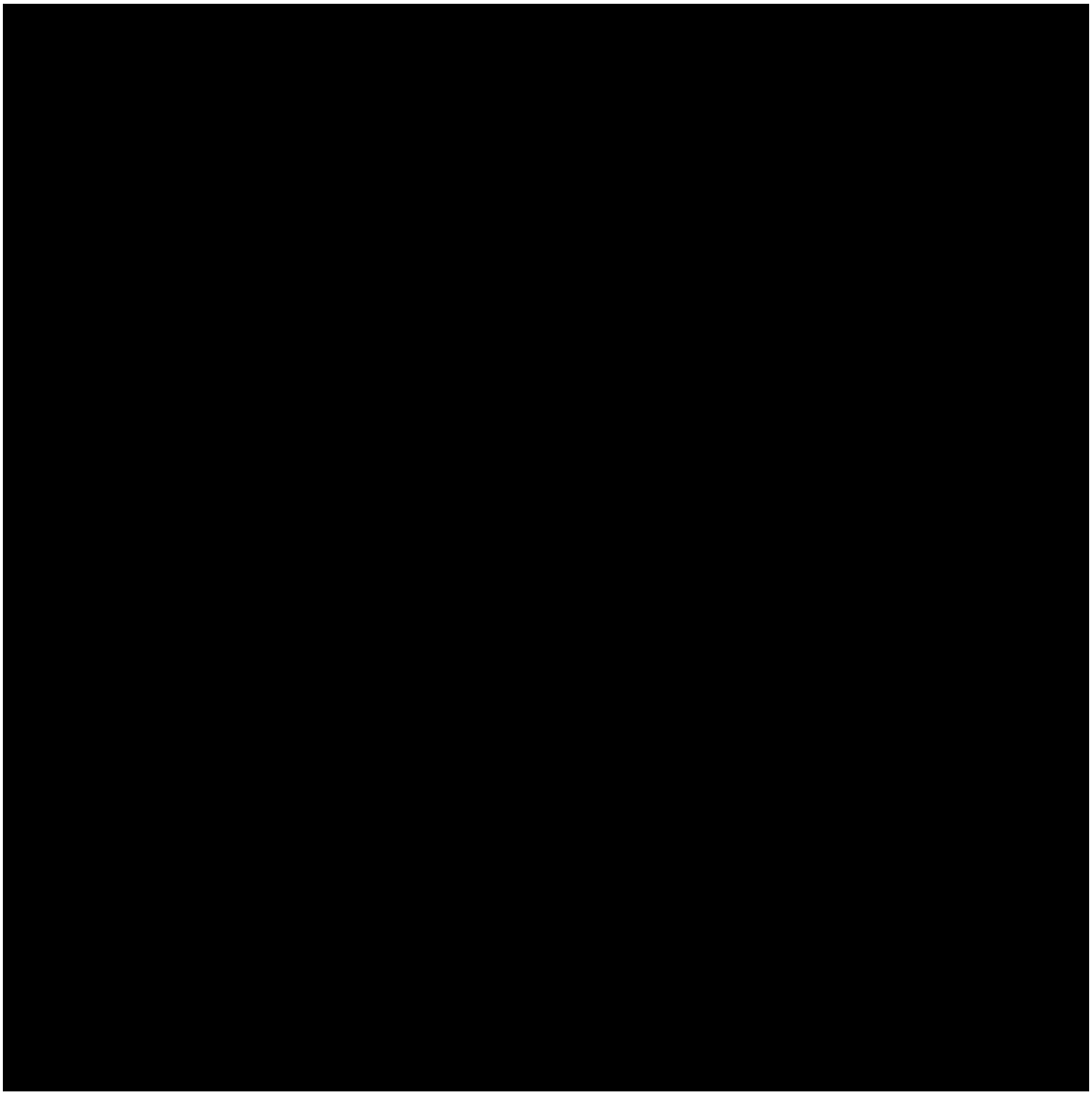
4.3.3 Hydrography and Hydrology

Chenango County lies almost entirely within the Upper Susquehanna Subbasin of the Susquehanna River Basin (Figure 4-2). The Susquehanna River Basin, comprised of six major subbasins, drains more than 27,500 square miles, including half the land area of Pennsylvania and portions of New York and Maryland, and is considered one of the most flood prone areas in the country. The drainage area for the Upper Susquehanna Subbasin is approximately 4,944 square miles. The area of the Upper Susquehanna Subbasin is mainly sloped steeply with hills and ridges and dominated by forest land; agricultural areas are found in the areas that are less steep. The three major tributaries for this Subbasin are the Chenango, Tioughnioga, and Unadilla Rivers (Susquehanna River Basin Commission [SRBC] 2006).

The major rivers of Chenango County include the Otselic, Susquehanna, Unadilla, and the Chenango Rivers. The Otselic River extends from the north to southwest and eventually joins with the Tioughnioga River, located in Broome County. The Susquehanna River is extends from the north to south, and is located in the southeast corner of Chenango County. The Susquehanna River joins with the Unadilla River in Sidney and the Chenango River in Binghamton. The Chenango River is centrally located in the county and is a tributary of the Susquehanna River. The Unadilla River flows south along the eastern border of Chenango County and into the Susquehanna River.

The major creeks within Chenango County include the Genegantslet, Canasawacta, Oquaga Creeks and Kelsey Brook. The Genegantslet Creek extends from the north to south and eventually joins with the Chenango River. The Canasawacta Creek is centrally located, and extends to the southeast before flowing into the Chenango River. The Oquaga Creek is located in the southeast corner of the county in Afton, and flows southeast into the Cannonsville Reservoir, located in Delaware County. Kelsey Brook flows south out of the Town of Oxford through the Towns of Afton and Bainbridge.

Figure 4-2. Upper Susquehanna Subbasin



Source: HAZUS-MH

4.3.4 Climate

The climate of New York State is very similar to most of the Northeast U.S. and is classified as Humid Continental. Differences in latitude, character of topography, and proximity to large bodies of water all have an effect on the climate across New York State. Precipitation during the warm, growing season (April through September) is characterized by convective storms that generally form in advance of an eastward moving cold

front or during periods of local atmospheric instability. Occasionally, tropical cyclones will move up from southern coastal areas and produce large quantities of rain. Both types of storms typically are characterized by relatively short periods of intense precipitation that produce large amounts of surface runoff and little recharge (Cornell, Date Unknown).

The cool season (October through March) is characterized by large, low-pressure systems moving northeastward along the Atlantic coast or the western side of the Appalachian Mountains. Storms forming in these systems are characterized by long periods of steady precipitation in the form of rain, snow, or ice, and tend to produce less surface runoff and more recharge than the summer storms because they have a longer duration and occasionally result in snowmelt (Cornell, Date Unknown).

Chenango County generally experiences seasonable weather patterns characteristic of the northeastern U.S. Warm summers are typically experienced, with occasional high temperatures and humidity. Midsummer temperatures range in the middle and upper 70s°F (Fahrenheit). The winters of Chenango County are long and cold. Winter high temperatures are usually in the middle to upper 20s°F, with temperatures of -15°F expected. During the winter, temperatures are cooler than the temperatures in areas located near large bodies of water. Snow accumulates to an average depth of 40-80 inches each year (Chenango County 2016).

4.3.5 Land Use and Land Cover

Chenango County is predominantly rural with 17.73% of the land used for agriculture, 19.36% is forested, less than 1% of the County's total land area is developed in commercial and industrial, and approximately 34.98% of the land is residential (Chenango County 2016) (Figure 4-3).

Table 4-2. Land Use in Chenango County (2016)

Land Use	Total Acreage	Total Area (sq. mi.)	Percent of County (%)
Agricultural	150,820.3	235.7	26.2
Barren Land	568.9	.9	0.1
Developed	31,937.6	49.9	5.6
Forest	365,534.0	571.1	63.5
Water	4,013.2	6.3	0.7
Wetlands	22,262.9	34.8	3.9
Chenango County:	**575,136.9**	**898.7**	**100**

Source: USGS, 2016
Note: sq. mi. = square miles

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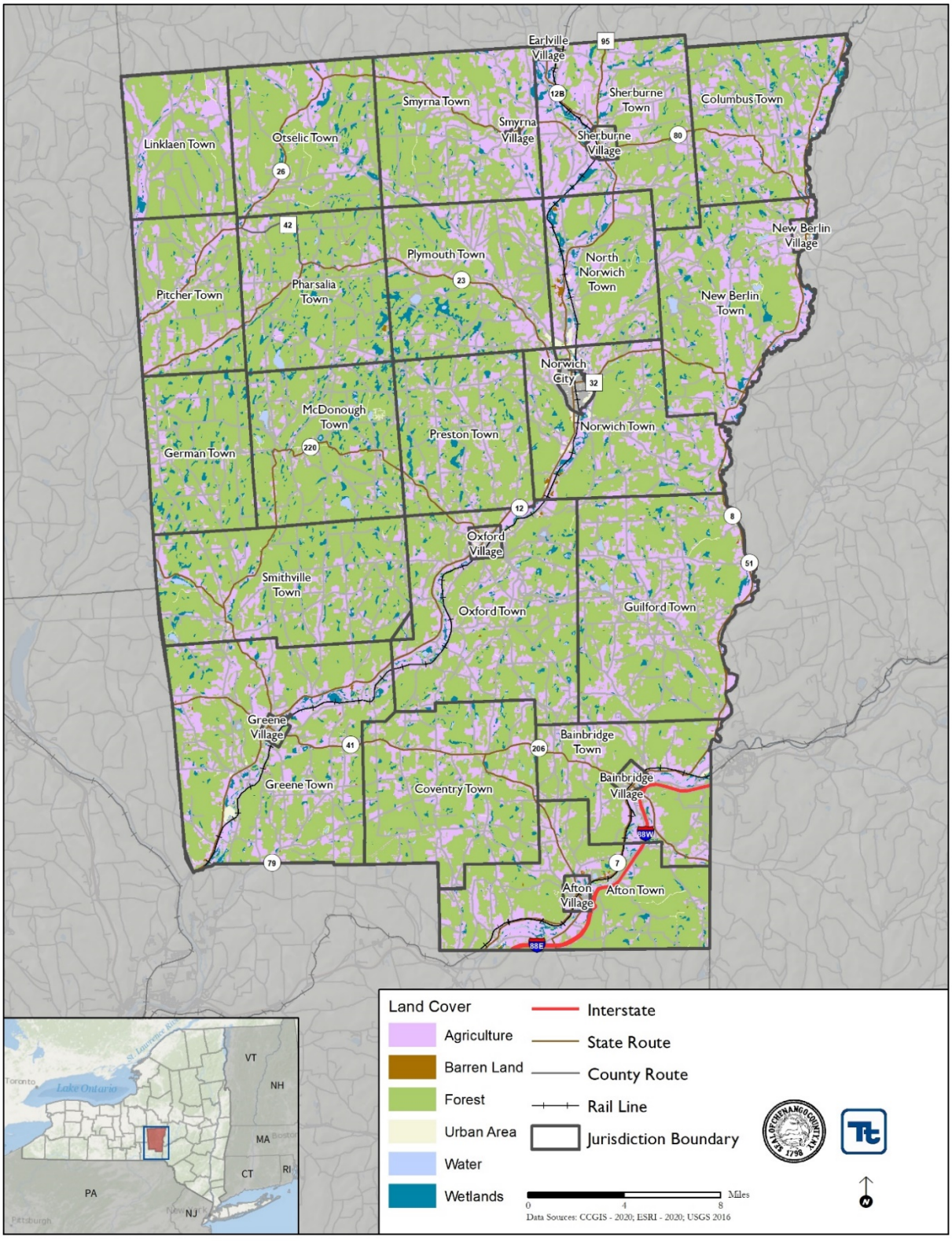
Figure 4-3. Land Use in Chenango County



4.4 POPULATION AND DEMOGRAPHICS

An understanding of the planning area population characteristics provides a foundation for deciphering the impacts of natural hazards in the county. As noted in Section 5.1 (Methodology) of this plan, modeling of the impacts of natural hazards on the population was performed using FEMA's Hazards U.S. Multi-Hazard (HAZUS-MH) in which the available population information includes the 2010 U.S. Decennial Census data, which indicates a county population of 50,477. However, more current data, according to the 2018 American Community Survey 5-Year Estimate, estimates a county population of approximately 48,348, which is a 4.4% decrease from the 2010 population. A detailed population table for the 2000, and 2010 Census are shown below in Table 4-3. A detailed table for the 2018 American Community Survey is included in Appendix E. Table 4-3 illustrates the population of each municipality as a total percentage of the county population. Figure 4-4 shows the distribution of the 2010 U.S. Census general population density (persons per square mile) by census block. Both sets of statistics are provided for context, but for the purposes of this plan, the data available in HAZUS-MH v4.2 are used (representing 2010 data) to support the analysis so the more recent data does not significantly skew the analysis.

Various Census Bureau products were used as sources for the population trends section. The Decennial Census is the official population count taken every 10 years. American Community Survey 5-Year Estimates are used to show annual population changes, but it is not an official population county. 5-Year Estimates are used because they are the most accurate form of American Community Survey with the largest sample size which allows for greater accuracy at smaller geographic areas. The American Community Survey 5-Year Estimate products were used to establish annual changes in population. The numbers provided are not official census counts, but are official estimates provided to communities so that they may have a greater understanding in population changes within their jurisdictions.

According to the 2010 U.S. Census, the County had a population of 50,477 people. Table 4-3 presents the population statistics for Chenango County based on the 2000 and 2010 U.S. Census data, and the 2018 American Community Survey 5-Year Estimate. While it is recognized that the population of Chenango County has slightly decreased in the last 10 years, the decline is not uniform across the county as there are areas that have experienced an increase. Please note that the population documented in each jurisdiction does not include the population of villages within the town limits; the village populations are shown separately on the table.

Table 4-3. Chenango County Population Statistics

Municipality	2018 ACS Estimated Population	U.S. Census 2010			U.S. Census 2000				
		Total	65+ Pop.	% of 65+ Pop. of Total	Total	65+ Pop.	% of 65+ Pop. of Total	Low-Income Pop. **	% Low-Income Pop. of Total
Town of Afton	1,767	2,029	342	16.9	2,141	268	12.5	273	12.7
Village of Afton	986	822	157	19.1	836	172	20.6	77	9.8
Town of Bainbridge	1,756	1,953	354	18.1	2,036	284	13.9	199	10.1
Village of Bainbridge	1,442	1,355	216	15.9	1,365	206	15.1	160	12
Town of Columbus	903	975	165	16.9	931	105	11.3	199	21.3
Town of Coventry	1,601	1,655	234	14.1	1,589	151	9.5	250	14.9
Town of German	385	370	56	15.1	378	32	8.5	90	21.2
Town of Greene	3,526	4,024	587	14.6	4,028	476	11.8	388	9.5
Village of Greene	1,704	1,580	316	20.0	1,701	296	17.4	197	11.8
Town of Guilford	2,834	2,922	463	15.8	3,046	418	13.7	365	12
Town of Lincklaen	366	396	55	13.9	416	47	11.3	73	17
Town of McDonough	773	886	161	18.2	870	138	15.9	87	9.8

Municipality	2018 ACS Estimated Population	U.S. Census 2010			U.S. Census 2000				
		Total	65+ Pop.	% of 65+ Pop. of Total	Total	65+ Pop.	% of 65+ Pop. of Total	Low-Income Pop. **	% Low-Income Pop. of Total
Town of New Berlin	1,618	1,654	279	16.9	1,674	215	12.8	238	14.6
Village of New Berlin	927	1,028	273	26.6	1,129	261	23.1	194	18.5
Town of North Norwich	1,558	1,783	257	14.4	1,966	223	11.3	317	16.1
City of Norwich	6,813	7,190	1,259	17.5	7,355	1,556	21.2	1,294	18.7
Town of Norwich	3,802	3,998	593	14.8	3,836	546	14.2	502	13.1
Town of Otselic	910	1,054	133	12.6	1,001	105	10.5	156	16
Town of Oxford	2,325	2,451	586	23.9	2,408	520	21.6	270	13.1
Village of Oxford	1,430	1,450	232	16.0	1,584	276	17.4	223	14.3
Town of Pharsalia	632	593	89	15.0	542	60	11.1	112	22.1
Town of Pitcher	708	803	110	13.7	848	95	11.2	141	17
Town of Plymouth	1,806	1,804	292	16.2	2,049	197	9.6	250	14.3
Town of Preston	1,089	1044	162	15.5	928	125	13.5	109	11.5
Town of Sherburne	1,320	1,809	257	14.2	1,733	246	14.2	287	16.5
Village of Sherburne	1,414	1,367	240	17.6	1,455	267	18.4	268	18.6
Village of Earlville*	1,153	872	140	16.1	791	106	13.4	87	11.8
Town of Smithville	1,451	1,330	207	15.6	1,347	137	10.2	125	9.7
Town of Smyrna	1,119	1,067	157	14.7	1,177	99	8.4	236	18.9
Village of Smyrna	230	213	31	14.6	241	27	11.2	28	12
Chenango County (Total)	48,348	50,477	8,403	16.6	51,401	7,654	14.9	7,195	14.4

Source(s): U.S. Census Bureau, 2000 and 2010; HAZUS-MH; American Community Survey 5-Year Estimate, 2018
Pop. = Population
** The Village of Earlville is located in both Chenango County and Madison County. The population shown is a total of the persons residing in both Chenango and Madison Counties.*
*** Individuals below poverty level in 1999 (Census poverty threshold for a three-person family unit is approximately $14,000).*

It is noted that the census data for household income provided in HAZUS-MH includes two ranges ($0-$10,000 and $10,000-$20,000/year) that were totaled to provide the "low-income" data used in this study. This does not correspond exactly with the "poverty" thresholds established by the U.S. Census Bureau, which identifies households with an annual household income below $15,000 per year as "low income" for this region. This difference is not believed to be significant for the purposes of this planning effort.

The 2010 Census data also identified 3,790 households as having an annual income of $15,000 or less. The 2010 U.S. Census data indicates a total of 14.4% of all persons living in households fall below the poverty level. Figure 4-4 shows the distribution of the general population density (persons per square mile).

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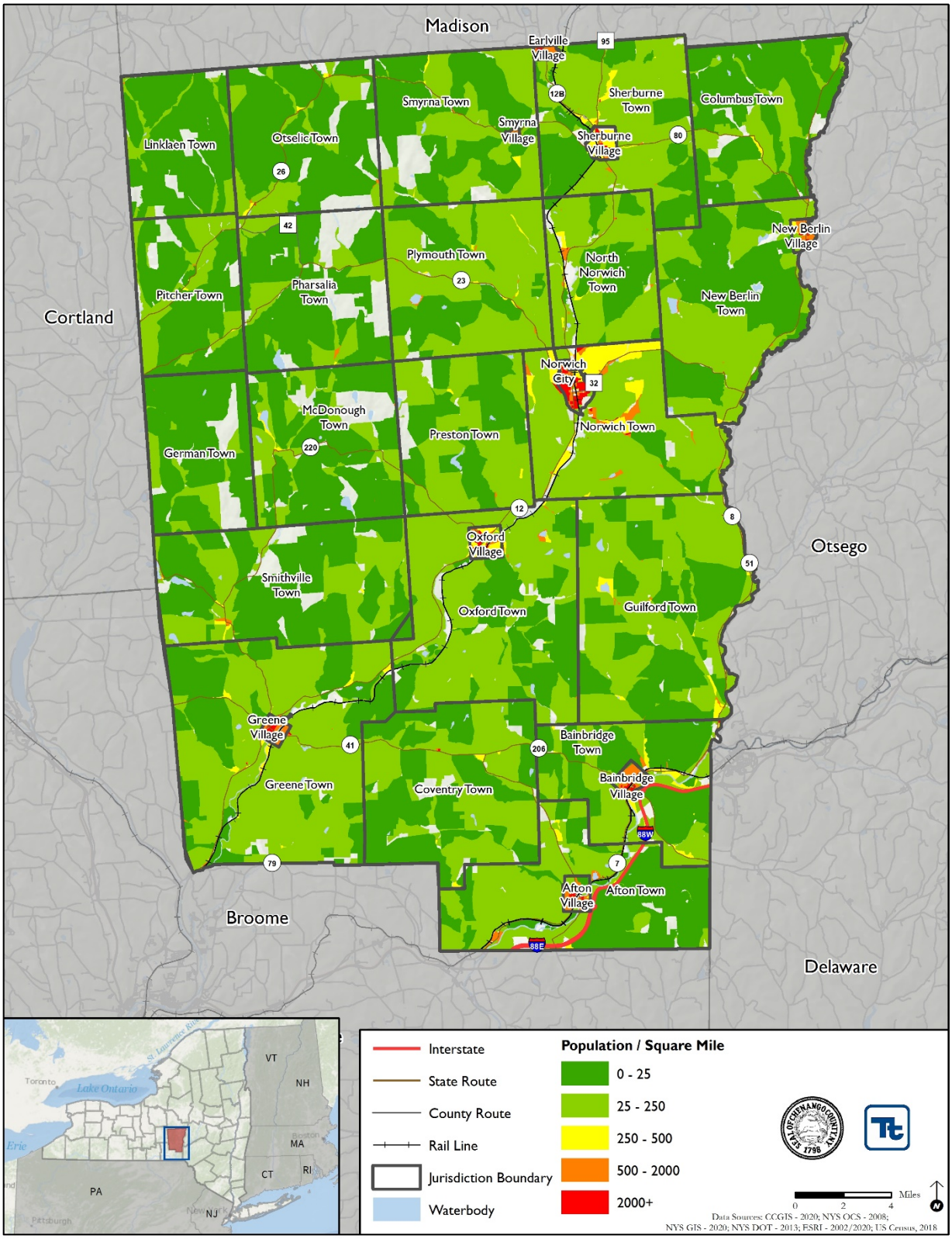
Figure 4-4. Distribution and Density of General Population for Chenango County, New York



4.4.1 Vulnerable Populations

DMA 2000 requires that HMPs consider socially vulnerable populations. These populations can be more susceptible to hazard events, based on a number of factors including their physical and financial ability to react or respond during a hazard and the location and construction quality of their housing. For the purposes of this study, vulnerable populations shall include (1) the elderly (persons aged 65 and over) and (2) low-income (household annual income below $20,000 per year).

Populations with a higher level of vulnerability can be more seriously affected during the course of an emergency or disaster. Vulnerable populations have unique needs that need to be considered by public officials to help ensure the safety of demographics with a higher level of risk.

Age

Children are considered vulnerable to hazard events because they are dependent on others to safely access resources during emergencies and may experience increased health risks from hazard exposure. The elderly is more apt to lack the physical and economic resources necessary for response to hazard events and are more likely to suffer health-related consequences. Those living on their own may have more difficulty evacuating their homes. The elderly are also more likely to live in senior care and living facilities where emergency preparedness occurs at the discretion of facility operators. According to the 2018 American Community Survey 5-Year Estimates, the median age in Chenango County was 44.7 years.

Income

The 2018 American Community Survey 5-Year Estimates provides that the median household income in Chenango County was $50,595, and the per capita income was $26,717 The U.S. Census Bureau identifies households with two adults and two children with an annual household income below $25,465 per year as *low income* (U.S. Census 2018) . The 2018 American Community Survey 5-Year Estimates indicates a total of 15.1 percent persons below the poverty level within the county.

The spatial U.S. Census data for household income provided in HAZUS-MH includes two ranges (less than $10,000 and $10,000-$20,000/year) that were totaled to provide the *low-income* data used in this study. This does not correspond exactly with the *poverty* thresholds established by the 2016 U.S. Census Bureau data. This difference is not believed to be significant for the purposes of this planning effort; therefore, for the exposure and loss estimations in the risk assessment, the 2010 U.S. Census data in HAZUS-MH is reported. Refer to Figure 4-5 below which illustrates the low-income population density in Chenango County.

Physically or Mentally Disabled

According to the Centers for Disease Control, “Persons with a disability include those who have physical, sensory, or cognitive impairment that might limit a major life activity (Centers for Disease Control 2015).” Cognitive impairments can increase the level of difficulty that individuals might face during an emergency and reduce an individual’s capacity to receive, process, and respond to emergency information or warnings. Individuals with a physical or sensory disability can face issues of mobility, sight, hearing, or reliance on specialized medical equipment. According to the 2018 American Community Survey, 19.2 percent of residents in Chenango County are living with a disability. Figure 4-5 shows the geographic distribution of disabled individuals throughout Chenango County, including individuals living with hearing, vision, cognitive, ambulatory, self-care, and independent living difficulties.

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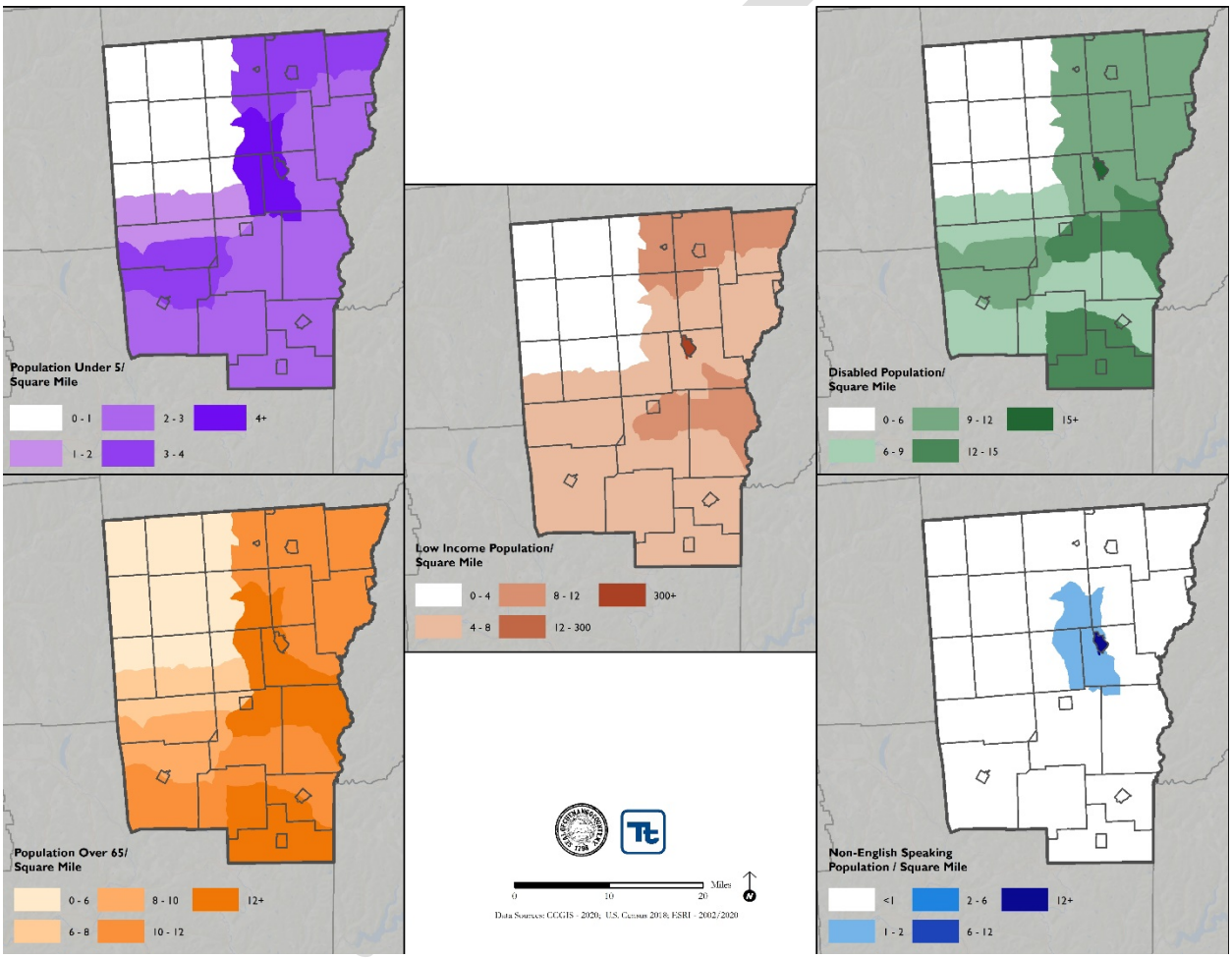
Non-English Speakers

Individuals who are not fluent or working proficiency in English are vulnerable because they can have difficulty with understanding information being conveyed to them. Cultural differences also can add complexity to how information is being conveyed to populations with limited proficiency of English (Centers for Disease Control 2015). According to the 2018 American Community Survey, 3.7 percent of the county's population over the age of 5 primarily speaks a language other than English at home; within that group approximately 369 individuals are reported as speaking English "less than very well." Of the county's population, 1.9 percent speak Spanish and 1.4 percent speak other Indo-European languages. Figure 4-5 shows the geographic distribution of individuals who speak English less than "very well."

Figure 4-5. Vulnerable Population Densities, Chenango County, New York



4.4.2 General Building Stock

The 2010 Census data identifies 20,436 households in Chenango County. A household includes all the people who occupy a housing unit as their usual residence. The Census data identified 24,710 housing units in Chenango County, an increase of 3.43% from 2000; this includes single family homes as well as multi-family units. A housing unit is a house, apartment, mobile home or trailer, a group of rooms, or a single room occupied as separate living quarters, or if vacant, intended for occupancy as separate living quarters. The median price of a single-family home in Chenango County was estimated at $88,200 in 2010 (Census, 2010).

For the purposes of this HMP, a custom general building stock was created using 2018 Microsoft building footprints, 2019 NYS GIS Program Office and NYS Department of Taxation and Finance's Office of Real Property Tax Services (ORPTS) tax records and parcel data and replaced the default database in Hazus v4.2. The updated building inventory contains 31,120 buildings with a total building replacement value (structure and content) of greater than $13 billion. This inventory was incorporated into FEMA Hazus at the structure and aggregate level. Approximately 83.5% of the buildings (25,993 buildings) and 46.5% of the building stock replacement value (or $10.7 Billion) are associated with residential housing. Commercial buildings make up the second building classification at approximately 7.9% of the buildings and 29.3% of the total building replacement value. The Town of Greene has the greatest number of structures at with 2,711 and the Village of Smyrna has the smallest number of structures with 99. Table 4-4 below shows the percentage of total building replacement value by occupancy.

The 2010 Census data identify that the majority of housing units (78.5% or 24,419 units) in Chenango County are single-family detached units and mobile homes (10% or 3,111 units).

Figure 4-6 shows the distribution and density of residential building value in Chenango County. The density is the dollar value of structures per unit area, exclusive of the building content value. The densities are shown in units of $1,000 ($K) per square mile.

Figure 4-7 shows the distribution and value density of buildings in the commercial occupancy category. The 2017 U.S. Census Bureau's County Business Patterns data identified 916 business establishments employing 13,853 people in Chenango County.

Figure 4-8 shows the distribution and value density of industrial buildings in Chenango County. The density is the dollar value of structures per unit area, exclusive of the building content value. The densities are shown in units of $1,000 ($K) per square mile.

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Table 4-4. Building Stock Replacement Value by Occupancy Class (Structure and Contents)

Municipality	All Occupancies				Residential		Commercial		Industrial	
	Count	Replacement Cost Value (Structure Only)	Replacement Cost Value (Contents Only)	Total Replacement Cost Value (Structure + Contents)	Count	Total Replacement Cost Value (Structure + Contents)	Count	Total Replacement Cost Value (Structure + Contents)	Count	Total Replacement Cost Value (Structure + Contents)
Afton (T)	1,609	$521,121,238	$343,578,461	$864,699,700	1,331	$532,628,331	178	$224,686,376	1	$1,677,600
Afton (V)	531	$551,676,566	$467,512,238	$1,019,188,804	467	$252,492,985	46	$626,789,923	1	$1,104,041
Bainbridge (T)	1,493	$533,629,097	$381,900,673	$915,529,770	1160	$455,185,271	278	$382,755,751	5	$6,065,019
Bainbridge (V)	697	$336,420,607	$248,536,576	$584,957,184	611	$263,652,093	70	$227,455,479	4	$6,179,012
Columbus (T)	748	$459,290,997	$403,063,997	$862,354,994	446	$168,681,001	228	$307,604,344	9	$261,658,830
Coventry (T)	1,255	$403,970,706	$299,266,665	$703,237,371	875	$314,112,125	294	$291,804,567	4	$6,233,650
Earlville (V)	155	$52,892,635	$34,260,725	$87,153,360	137	$55,895,731	15	$24,418,874	0	$0
German (T)	395	$128,697,115	$74,409,810	$203,106,925	350	$162,861,915	3	$1,570,759	0	$0
Greene (T)	2,711	$817,852,368	$501,883,723	$1,319,736,091	2,498	$947,905,937	87	$134,744,128	14	$21,029,556
Greene (V)	700	$392,090,447	$294,663,874	$686,754,321	587	$292,279,720	77	$193,731,718	16	$75,065,470
Guilford (T)	1,963	$611,982,875	$399,004,345	$1,010,987,220	1,719	$638,935,588	70	$110,600,841	7	$5,988,241
Linklaen (T)	398	$138,832,746	$90,838,976	$229,671,722	332	$143,981,313	3	$4,739,651	0	$0
McDonough (T)	807	$206,486,750	$132,602,802	$339,089,552	674	$221,651,844	91	$87,272,473	0	$0
New Berlin (T)	1,225	$459,561,738	$319,151,787	$778,713,525	1,017	$421,229,852	49	$52,373,678	1	$5,232,994
New Berlin (V)	411	$245,530,367	$187,075,404	$432,605,770	350	$175,364,889	43	$193,638,738	1	$410,905
North Norwich (T)	1,121	$470,562,339	$352,492,387	$823,054,726	949	$354,209,855	55	$115,449,824	15	$184,312,426
Norwich (C)	2,503	$1,773,960,078	$1,366,999,020	$3,140,959,099	2,258	$1,220,883,174	192	$1,532,435,436	13	$104,189,315
Norwich (T)	2,013	$1,152,570,810	$927,859,990	$2,080,430,801	1,638	$674,132,460	178	$929,743,052	19	$152,092,232
Otselic (T)	741	$267,690,532	$193,682,719	$461,373,250	587	$222,023,439	36	$54,493,865	1	$25,694,557
Oxford (T)	1,731	$570,965,024	$387,365,856	$958,330,880	1,432	$550,797,506	21	$27,632,031	3	$4,926,853
Oxford (V)	648	$387,073,484	$292,294,294	$679,367,779	579	$284,337,570	45	$284,832,722	1	$3,475,428
Pharsalia (T)	583	$224,584,665	$165,279,287	$389,863,952	446	$177,916,135	12	$19,289,849	0	$0
Pitcher (T)	609	$190,794,165	$124,550,365	$315,344,531	526	$198,731,400	8	$12,758,503	0	$0
Plymouth (T)	1,244	$322,263,869	$188,565,777	$510,829,645	1,140	$401,094,276	18	$19,198,236	0	$0
Preston (T)	782	$219,259,016	$129,689,410	$348,948,426	705	$268,708,818	3	$2,898,859	0	$0
Sherburne (T)	1,463	$628,071,329	$485,150,409	$1,113,221,738	1,194	$428,762,759	61	$184,539,835	5	$27,371,513

Municipality	All Occupancies Count	All Occupancies Replacement Cost Value (Structure Only)	All Occupancies Replacement Cost Value (Contents Only)	All Occupancies Total Replacement Cost Value (Structure + Contents)	Residential Count	Residential Total Replacement Cost Value (Structure + Contents)	Commercial Count	Commercial Total Replacement Cost Value (Structure + Contents)	Industrial Count	Industrial Total Replacement Cost Value (Structure + Contents)
Sherburne (V)	611	$438,226,063	$330,559,616	$768,785,678	489	$322,999,342	93	$227,814,037	10	$173,767,839
Smithville (T)	1,032	$396,670,788	$294,312,828	$690,983,617	844	$307,073,880	21	$133,179,524	0	$0
Smyrna (T)	842	$293,719,687	$226,139,220	$519,858,907	577	$202,741,399	181	$188,213,419	0	$0
Smyrna (V)	99	$86,092,230	$75,364,721	$161,456,951	75	$32,182,528	22	$125,807,922	0	$0
Chenango County	**31,120**	**$13,282,540,334**	**$9,718,055,955**	**$23,000,596,289**	**25,993**	**$10,693,453,136**	**2478**	**$6,722,474,412**	**130**	**$1,066,475,483**

Source: Chenango County Office of GIS – 2020, New York State Department of Taxation and Finances Office of Real Property Tax Services (ORPTS) – 2019; RS Means 2019
Note:
C = City, T= Town, V = Village
All occupancies represent residential, commercial, industrial, agriculture, religious, government and education classes

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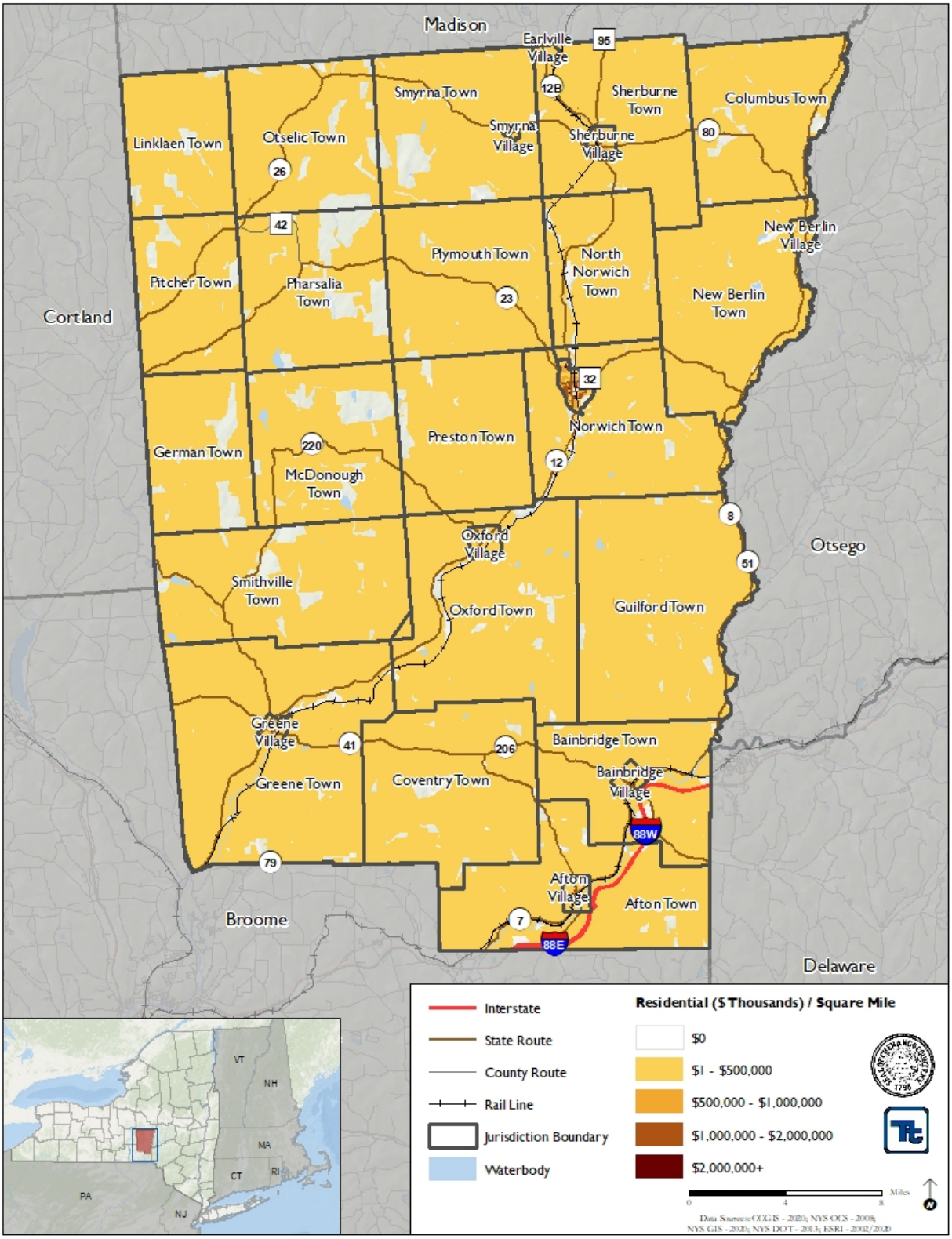
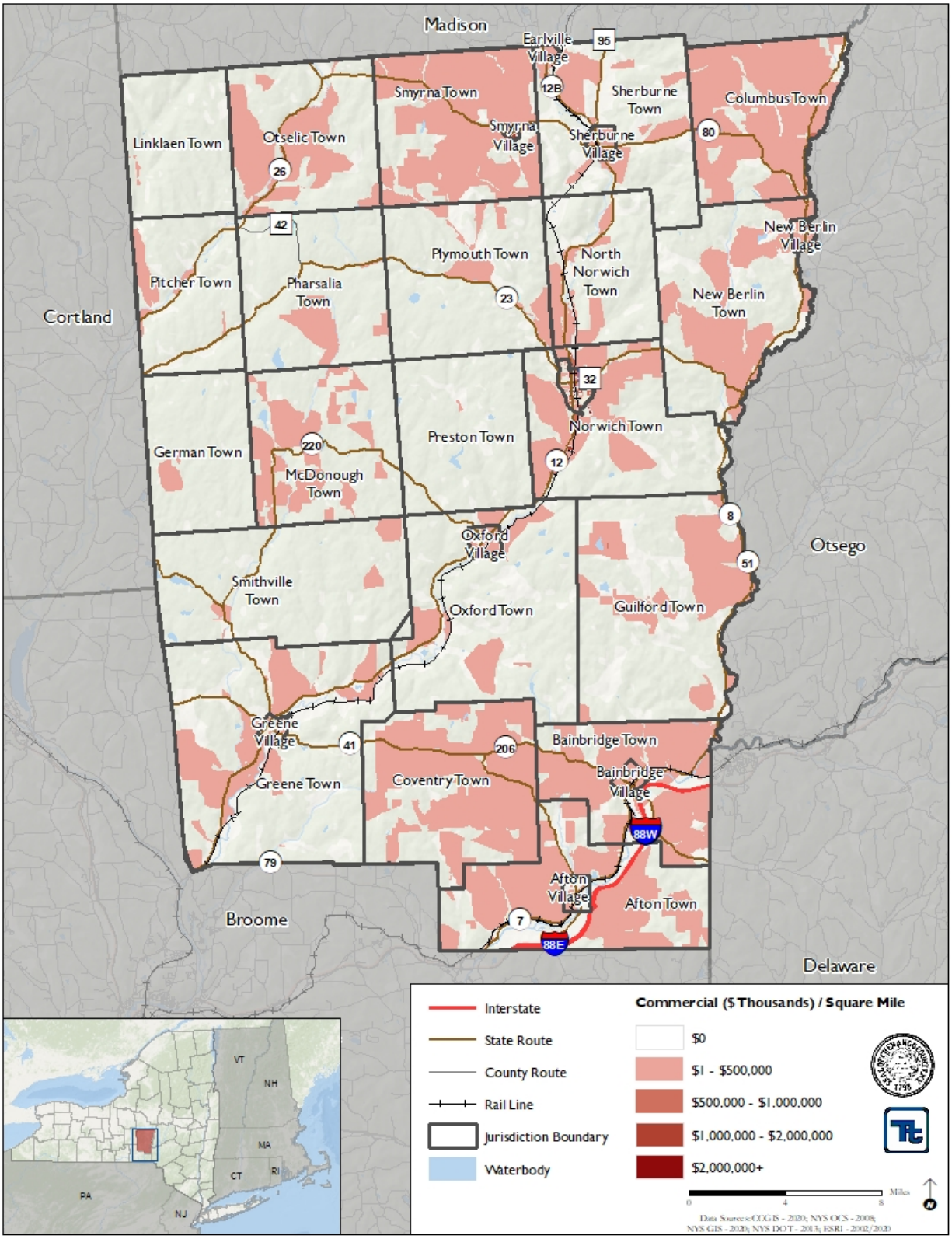
Figure 4-6. Distribution of Residential Building Stock and Value Density in Chenango County, New York



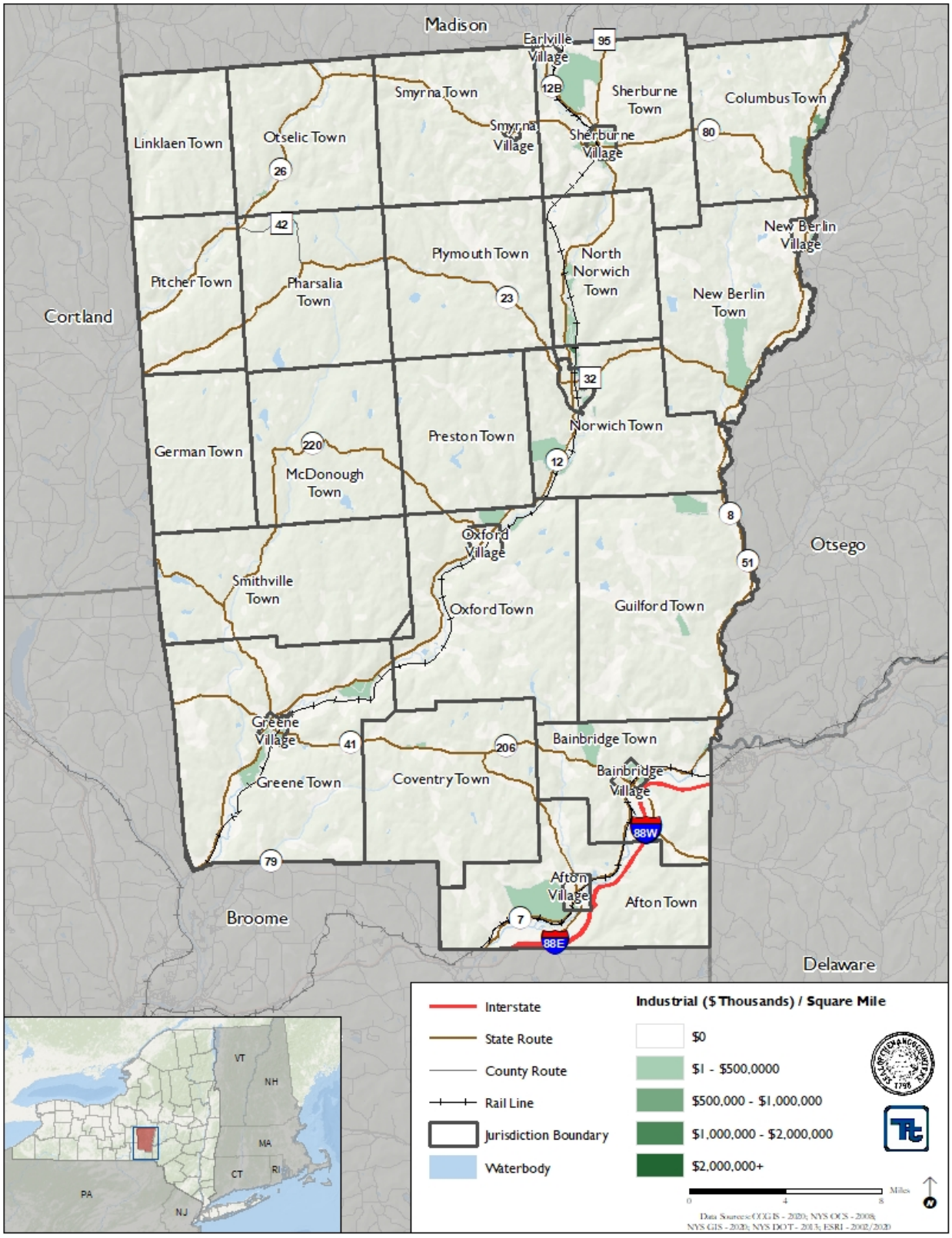
Source: HAZUS-MH 4.2

Figure 4-7. Distribution of Commercial Building Stock and Value Density in Chenango County, New York



Source: HAZUS-MH 4.2

Figure 4-8. Distribution of Industrial Building Stock and Value Density in Chenango County, New York



Source: HAZUS-MH 4.2

4.5 LAND USE AND POPULATION TRENDS

Land use regulatory authority is vested in New York State's towns, villages, and cities. However, many development and preservation issues transcend location political boundaries. DMA 2000 requires that communities consider land use trends, which can impact the need for and prioritization of mitigation options over time. Land use trends significantly impact exposure and vulnerability to various hazards. For example, significant development in a hazard area increases the building stock and population exposed to that hazard.

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

4.5.1 Land Use Trends

Economy

Commerce Chenango, Inc. serves as the Economic Development Agency for Chenango County. Throughout the recent pandemic, they served on the front lines of business advocacy and education, a liaison with the state, shut down and reopening support, vaccinations and recovery strategies. The COVID-19 pandemic shed light on inequities throughout Chenango County, but also spotlighted some opportunities (2021+):

- **Broadband Access:** The inequity of broadband service and access throughout the county has been a hindrance to economic development projects, attracting new investments from businesses and the attraction of new residents. In addition to these initiatives, the lack of broadband access points and spotty service put an additional strain on our education system and health services.

  A coalition began meeting in the spring of 2020 to identify funding opportunities, work on education and advocacy and possible collaborations to find ways to bring broadband to rural communities in Chenango County. Independently a small coalition from Chenango County has been simultaneously working on grants, advocacy and education surrounding this equity issue.

- **Hotel and Lodging:** The limited availability of adequate and attractive lodging is a problem for our tourism industry. As the county begins reopening, the Development Chenango Corporation is working with local developers to acquire a site to open a hotel, which will add to the business development of Chenango County and help our tourism industry. In addition, the approval of the Occupancy Tax by the Chenango County Board of Supervisors (March 2020) will add a much needed infusion of revenue into the tourism program, which is administered by Commerce Chenango.

- **Business Development and Attraction of Large-Scale Industry:** The Development Chenango Corporation has made a significant financial investment into marketing tools for the attraction of developers, projects and large-scale industries to Chenango County. This endeavor will be made possible through targeted marketing and a new GIS system for project development. With this sophisticated digital platform, the County will be able to target developers, industries, and feature available properties and development sites to those seeking to bring their business to Chenango County.

- **Green Initiatives:** The Climate Leadership and Community Protection Act of 2019 establishes certain emission reduction limits as well as additional goals to address climate change. These requirements and goals include:

  - Limit statewide greenhouse gas emissions to 40% of 1990 levels by 2030 and 85% by 2050
  - A plan to achieve net zero greenhouse gas emissions across New York State's economy

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- 70% renewable electricity by 2030
- 100% zero emission electricity by 2040

The Chenango County IDA (Industrial Development Agency) has seen a significant increased number of solar and wind projects in Chenango County. The Chenango County IDA approved one (1) project in Norwich in 2018, one (1) project in the Town of Greene in 2020, one (1) project in North Norwich in 2021, and has multiple proposals that they expect to become full applications in 2021 and 2022.

As part of the green initiative, Chenango County is including a mitigation strategy in the 2021 HMP Update to help achieve the initiative. Refer to Section 9.1 for details on the mitigation strategy.

There are currently no wind energy projects, but on March 11, 2021 the New York State Board on Electric Generation Siting and the Environment approved an environmental study for a wind project in the Town of Guilford. The CCIDA expects a PILOT application in 2021 for the project, however it is unclear what the final outcome will be.

- **Railroad**: The CCIDA, is working with FEMA and the NYS&W Railway on improvements needed to the 42 miles of track throughout Chenango County. In the previous report, it was noted that an effort was being made to bring the rail back online after washouts in 2006. This project was completed in 2019, and in the fall of 2019 another series of washouts occurred, putting an immediate stop to the use of the track once again.

  In addition it was discovered that some of the bridges in Chenango County were unpassable by the train, and these needed improvements were not part of the EDA application or improvements. Currently the Chenango County IDA is working with FEMA on an application to address the October 31, 2019 washouts, and working with NYS&W to determine any possible next steps to bringing the rail back online, and/or pursuing other opportunities.

- **NYS DRI, CFA and other funding opportunities:** The 2019 DRI Application was unsuccessful, and the Development Chenango Corporation formed a DRI Steering Committee in January 2020 to pursue a new application, with feedback received on our first attempt. In the spring of 2020, with the COVID-19 pandemic freezing all new spending, the DRI application process did not come to fruition, and our efforts were put on hold.

  Commerce Chenango, and DCC are currently waiting for the new Consolidated Funding Application terms and programs to open for 2021 project inquiries and if/when the DRI program begins again the County will plan to apply.

  With the help of Chenango County Planning and Southern Tier 8, Commerce Chenango is currently vetting and reviewing all possible grant and funding opportunities that will support the economic development goals of Chenango County.

U.S. Census Bureau's County Business Patterns for Chenango County

The U.S. Census Bureau's County Business Pattern provides an annual series of sub-national economic data by industry covering the majority of the country's economic activity. According to the 2017 Chenango County Business Pattern, the county had a total of 916 business establishments. Altogether, these establishments employed 13,853 workers and generated $636 million in annual payroll.

The manufacturing sector employs the largest segment of the County's workforce, providing nearly 4,500 jobs and generating $247.7 million in annual payroll. This represents 32% of all jobs and 39% of annual payroll. The healthcare and social assistance field provides the second-most number of jobs in the County, as well as $72.8

million in annual payroll. The retail trade comprised the largest share of businesses. Table 4-5 provides 2017 industry and employment information in Chenango County.

Table 4-5. 2017 Economic Census for Chenango County, New York

Meaning of NAICS code	Number of establishments	Number of employees	Annual payroll ($1,000)
Total for all sectors	916	13,853	$ 636,754
Agriculture, forestry, fishing and hunting	10	26	$ 931
Construction	92	284	$ 14,136
Manufacturing	62	4,478	$ 247,785
Wholesale trade	27	262	$ 11,501
Retail trade	159	1,703	$ 42,825
Transportation and warehousing	21	223	$ 8,863
Information	25	588	$ 22,398
Finance and insurance	45	1,195	$ 87,105
Real estate and rental and leasing	25	99	$ 3,246
Professional, scientific, and technical services	54	241	$ 9,631
Management of companies and enterprises	4	e	S
Administrative and support and waste management and remediation services	24	764	$ 36,598
Educational services	11	52	$ 1,372
Health care and social assistance	112	1,963	$ 72,865
Arts, entertainment, and recreation	25	200	$ 3,070
Accommodation and food services	101	841	$ 13,341
Other services (except public administration)	116	408	$ 9,970

Source: U.S. Census, County Business Pattern 2017
** = This number only includes paid employees*
E = 250-499 employees
S= Withheld because estimate did not meet publication standards. Employment or payroll field set to zero.

Agriculture

According to the USDA 2017 NASS, there are 770 farms occupying 148,982 acres of land in Chenango County. In 2017, the highest sales by dollar amount is for "other crops and hay", followed by grains, oilseeds, dry beans, and dry peas. Milk from cows represents the largest share of sales by dollar volume, comprising 83% of the $50 million in agricultural products in 2017. In total, the County generated $67.9 million in agricultural sales, approximately 26% of which comes from cops and of which 74% comes from livestock and related products. The number of farms and acreage of land used for farming has decreased significantly since 1940. The number of farms decreased by 77%, and the total acreage of farmland decreased by 67%. Table 4-6 shows the number of farms and land use in Chenango County.

Table 4-6. Farms and Land Use in Chenango County

Year	Number of Farms	Land in Farms (acres)	Total Cropland (acres)	Permanent Pasture (acres)	Total Woodland (acres)	Other Land (acres)
1940	3,371	450,226	NA	NA	86,430	NA
1950	2,689	416,052	163,949	137,969	99,438	14,696
1959	1,889	375,581	148,700	117,972	96,048	12,861
1969	1,196	273,750	132,604	NA	75,236	NA
1978	1,054	254,549	126,891	41,739	66,672	19,247

Year	Number of Farms	Land in Farms (acres)	Total Cropland (acres)	Permanent Pasture (acres)	Total Woodland (acres)	Other Land (acres)
1982	1,006	230,069	116,794	32,970	63,367	16,938
1987	1,040	231,500	119,700	29,200	65,300	17,300
1992	935	206,700	112,500	26,400	53,600	14,200
1997	960	197,000	109,800	24,600	48,600	14,000
1998	970	199,800	112,500	24,500	48,400	14,400
1999	995	201,300	115,400	23,400	47,500	15,000
2000	970	200,100	NA	NA	NA	NA
2001	960	195,300	NA	NA	NA	NA
2002	955	190,000	100,601	19,401	53,162	16,636
2003	955	189,800	NA	NA	NA	NA
2007	908	177,267	86,719	24,690	50,146	NA
2012	828	167,226	79,255	21,572	52,341	13,879
2017	770	148,982	77,079	17,878	40,255	10,429

Source: USDA NASS, 2020

According to the 2012 Chenango County Agriculture and Farmland Protection Plan, the County Agriculture and Farmland Protection Board (AFPB) established four goals:

1. Promote agricultural economic development
2. Assist agricultural producers with cost-control measures
3. Encourage the proper use of land and the monitoring/reporting of changes
4. Educate producers, consumers, and policy makers

The County is working with the Agriculture and Farmland Protection Board to update the Agriculture and Farmland Protection Protection plan currently.

Corridors and Gateways

The transportation routes in Chenango County are networks of corridors and gateways that impact land use patterns. The major route in the County is Interstate 88, which passes through the southeast corner of the County and connects it to Interstates 81 and 90. These primary corridors are defined as those roadways that have a NYSDOT functional classification of interstate or expressway. Figure 4-15 illustrates the transportation corridors in Chenango County.

The secondary corridors of the county experience lower traffic volumes but are still heavily traveled. In the county, the secondary corridors have a NYSDOT functional classification of principal or minor arterial. Many local and regional travelers use these corridors and merit special attention. These secondary corridors include the following:

NYS Route 7	NYS Route 8
NYS Route 12	NYS Route 23
NYS Route 41	NYS Route 80
NYS Route 206	

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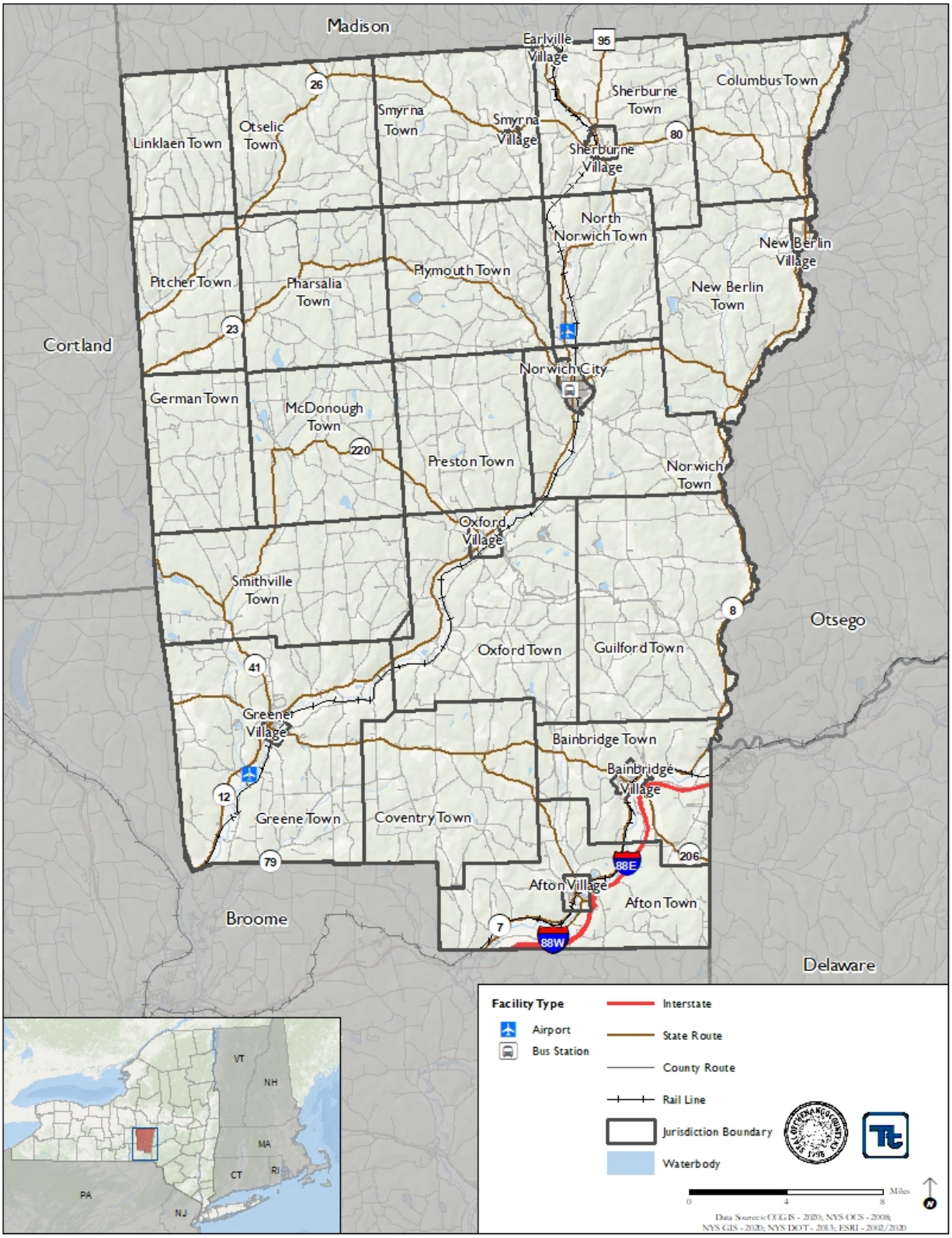
Figure 4-9. Transportation Corridors of Chenango County, New York



Source: HAZUS-MH 4.2

4.5.2 Population Trends

Chenango County's population has decreased slightly since 2010. Figure 4-13 below, which shows the annual population estimate from the 2010 to the 2018 American Community Survey 5 Year Estimates. Two Census Bureau products were used in the population trends section. The 2010 Census is the official population count of a municipality, performed each decade. The American Community Survey is performed on a more frequent basis to provide updated population and demographics information to communities.

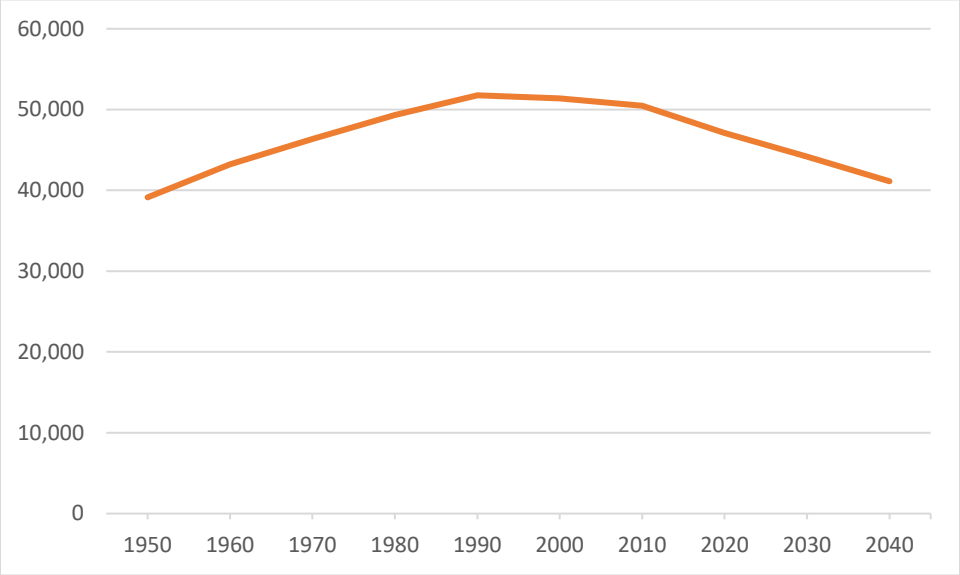
The majority of communities in Chenango County saw decreased populations between 2010 and 2018. Based on historical data, population projections from the Cornell University Program on Applied Demographics have been created which show Chenango County's population will continue to decrease over time (Cornell University 2018).

Chenango County's elderly population has increased significantly (by approximately 17%), whereas the County's population and its population of children under five years old has decreased by 5.3% and 6.7%, respectively.

The 2006 Economic Development Strategy Plan noted that the aging of the County's population represented an economic issue of improtantce to the County. The decrease of residents under the age of five and the increase of residents over the age of 65 indicate that slow or negative population growth may continue into the future. This is reflected in Figure 4-16, which shows population projections from Cornell University. By 2040, the population is expected to decrease to levels last seen in 1950.

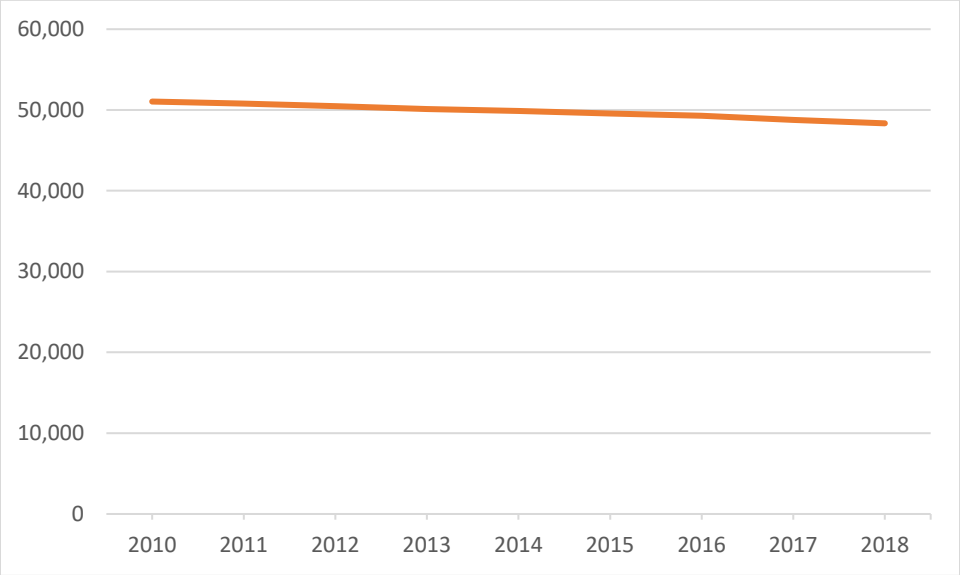
The U.S. Census Bureau estimates that Chenango County's population in 2018 was 48,348 a 5.3 percent decrease from 2010 population of 50,477 (U.S. Census Bureau 2010). Between 1950 and 1990, the county experienced growth in population, and ultimately reached peak population in 1990. The biggest increase was seen between 1950 and 1960, when the population increased 10.5% or by 4,105 residents. Figure 4-12 shows the county population and projected population from 1950 to 2040, while Figure 4-13 indicates the annual estimated population change from 2010 to 2018. Refer to Appendix E (Supplementary Data) for the municipal population change over this period.

Figure 4-10. Population Change 1950 to 2040 in Chenango County, New York



Source: U.S. Census Bureau; Cornell University 2018

Figure 4-11. Annual Population Change, 2010 to 2018 American Community Survey Estimates in Chenango County, New York



Source: U, S. Census Bureau American Community Survey; 5 Year Estimates 2010-2018

4.5.3 Future Growth and Development

A summary of development planned within Chenango County is provided in the Figure 4-14 below. Municipalities that did not identify any significant residential/commercial, or infrastructure development within the next 5 years are not included in the figure. Details regarding development specific to each participating municipality is provided in Appendix E. Locations of planned developments are indicated on the Hazard Area Extent and Location Maps included in Section 9 (Jurisdictional Annexes).

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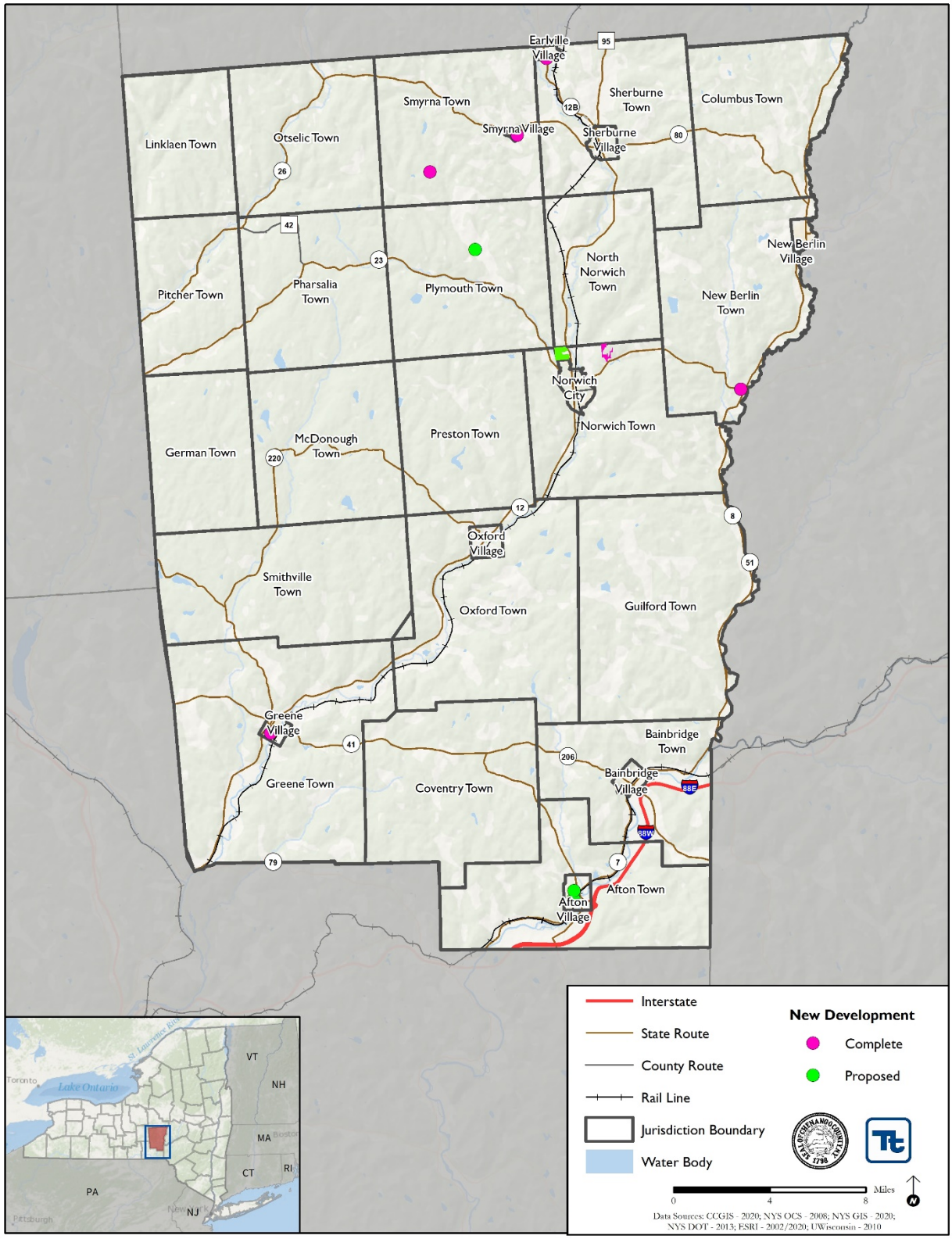
Figure 4-12. Planned Development in Chenango County, New York



4.6 CRITICAL FACILITIES AND LIFELINES

Critical facilities and infrastructure are those that are essential to the health and welfare of the population. These become especially important after any hazard event. Critical facilities are typically defined to include police and fire stations, schools, and emergency operations centers. Critical infrastructure can include the roads and bridges that provide ingress and egress and allow emergency vehicles access to those in need and the utilities that provide water, electricity, and communication services to the community. Also included are Tier II facilities (hazardous materials) and rail yards; rail lines hold or carry significant amounts of hazardous materials with a potential to impact public health and welfare in a hazard event.

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

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

Lifelines enable the continuous operation of critical business and government functions and are essential to human health and safety or economic security.

Beginning in 2017, FEMA developed a new construct to increase effectiveness for disaster operations and position response to catastrophic incidents. This construct, known as "community lifelines", represents the most fundamental services in the community that, when stabilized, enable all other aspects of society. Following a disaster event, intervention is required to stabilize community lifelines. Lifelines are divided into seven categories which include:

- Safety and Security
- Food, Water, Shelter
- Health and Medical
- Energy (Power and Fuel)
- Communications
- Transportation
- Hazardous Materials

To facilitate consistency with the National Response Framework, FEMA Strategic Plan, and guidance for the Building Resilient Infrastructure and Communities grant program, critical facilities in Chenango County are discussed in terms of lifelines.

A comprehensive inventory of critical facilities in Chenango County was developed from various sources, including Chenango County and input from the Steering and Planning Committees. The inventory of critical facilities presented in this section represents the current state of this effort at the time of publication of the draft HMP and used for the risk assessment in Section 5 (Risk Assessment). The number and type of critical facilities and infrastructure identified for this plan are indicated in Figure 4-15 and summarized in Appendix E (Supplemental Data). A complete listing of the inventory used for analysis in this plan is provided in Appendix F (Critical Facilities).

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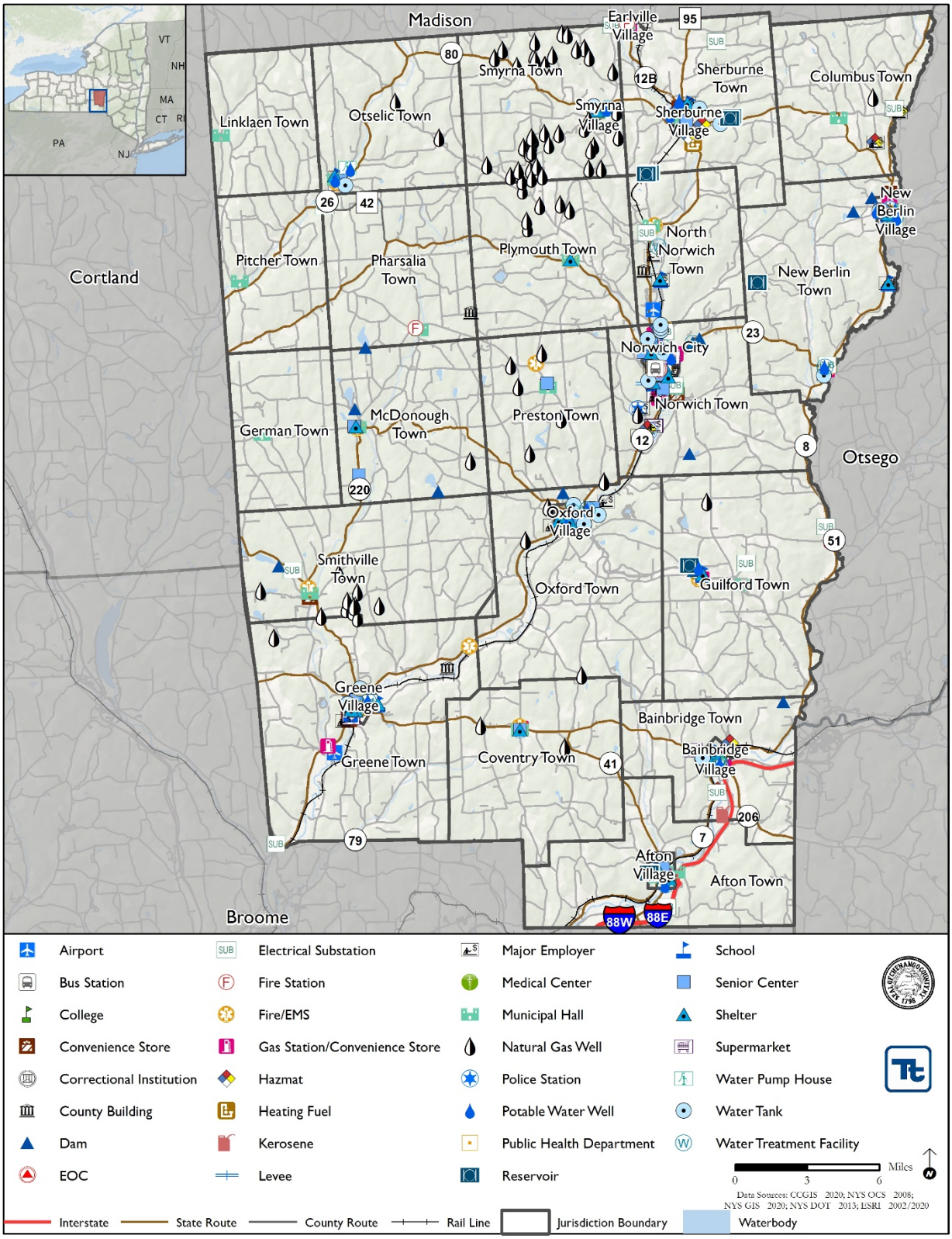
Figure 4-13. Lifelines in Chenango County, New York



4.6.1 Essential Facilities

This section provides information on emergency facilities, hospital and medical facilities, schools, shelters and senior care and living facilities. For the purposes of this plan, emergency facilities include police, fire, emergency medical services (EMS), and emergency operations center. Figure 4-20 shows the location of the facilities and a list of the critical facilities is provided in Appendix F (Critical Facilities).

Emergency Facilities

For the purposes of this Plan, emergency facilities include police, fire and emergency medical services (EMS). Figure 4-16 displays the location of these facilities based on the HAZUS-MH inventory data and input from the Planning Committee.

Police Departments

There are 11 police stations located in Chenango County, consisting of local, county and state police. The Chenango County Sheriff's Office is divided into six divisions: K-9 unit, detectives, Hazardous Entry & Arrest Team, marine patrol, road patrol, and snowmobile patrol.

Fire Departments

According to the Chenango County Fire Mutual Aid Plan, a mutual aid agreement is maintained with all fire departments within the County. Mutual aid is provided to, and received from, adjacent counties (Madison, Otsego, Delaware, Broome and Cortland) through their respective County Fire Control Centers under the direction of their respective Fire Coordinator or legally appointed deputies. The Chenango County Fire Control Center is located on County Road 46 in Norwich. The Fire Coordinator is responsible for all activities of the Chenango County Fire Control Center (Chenango County Bureau of Fire, 2006). There are three fire stations located throughout Chenango County; however, there are 18 fire/EMS facilities in the County which provide both fire and EMS services.

Emergency Services

Chenango County also maintains an Emergency Services Mutual Aid Plan. In accordance with the New York State Department of Health, every certified ambulance or EMS provider signs, and operates in accordance with, a mutual aid plan. Each EMS provider in Chenango County must adopt the County plan, or write one of their own and obtain approval through both the County and State. Chenango County has also provided a copy of its Emergency Services Mutual Aid Plan to neighboring EMS agencies that service the County (Beckwith, 2007). Central dispatch for EMS is through Chenango County Fire Control (Chenango County EMS Advisory Board, 2002). Overall, there are 18 fire/EMS facilities in the County.

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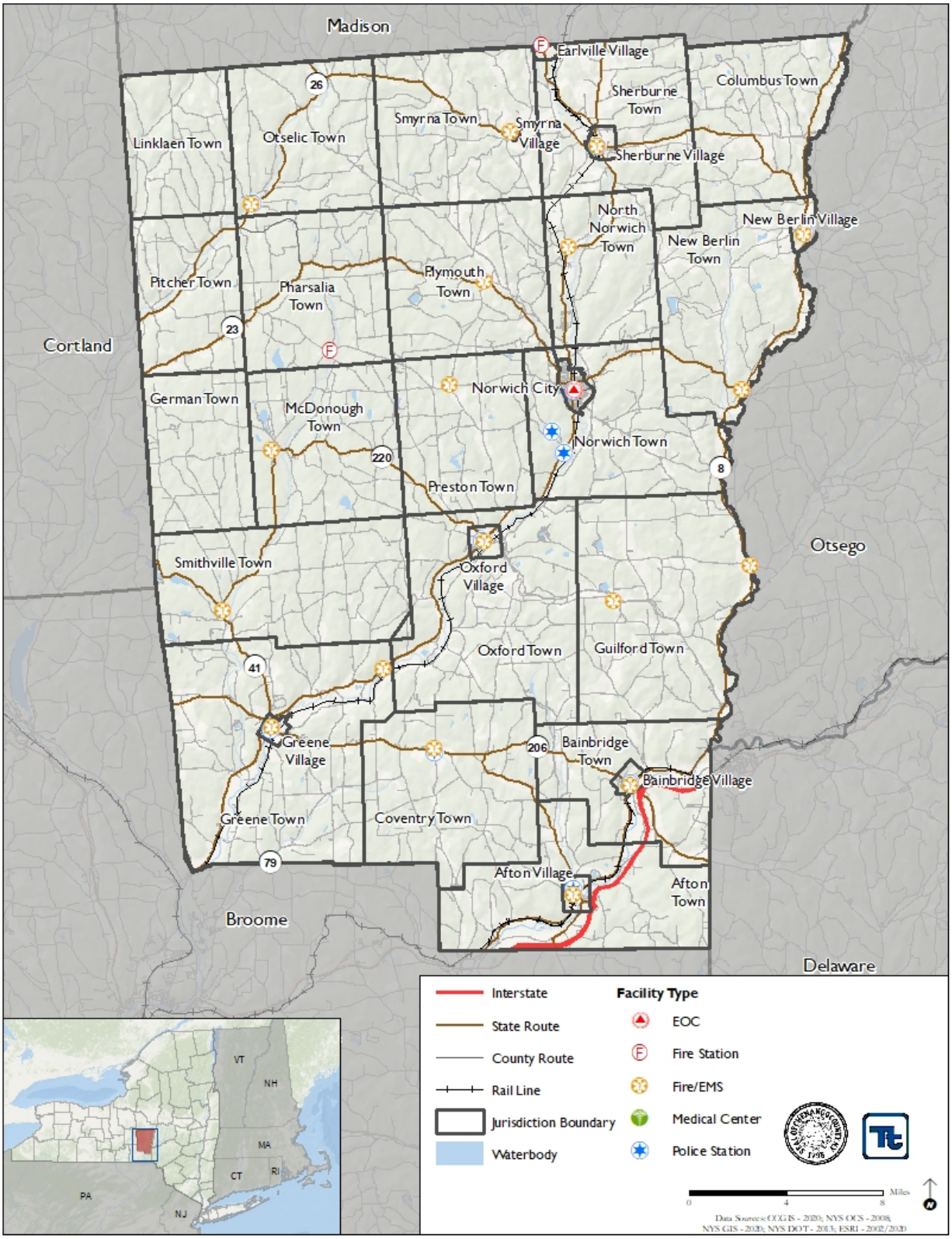
Figure 4-14. Emergency Facilities in Chenango County



Hospitals and Medical Facilities

There are nine medical facilities located in Chenango County, include UHS Chenango Memorial Hospital.

Schools

According to the New York State Education Department there are nine (9) public school districts that serve the County with a total enrollment of 6,955 students. This represents a decrease from the 2012-2013 school year, when there were 7,523 students. One of the nine school districts is located outside of the County (Gilbertsville-Mt. Upton). In addition, Chenango County is home to a campus of SUNY Morrisville in Norwich. The Delaware, Chenango, Madison, Otsego Board of Cooperative Educational Services (BOCES), located in North Norwich, provides services to area school districts including adult and continuing education and training programs for area businesses. Chenango County also offers nursery school, pre-school and after-school programs. There are 20 schools located in Chenango County. Figure 4-17 displays the locations of these schools.

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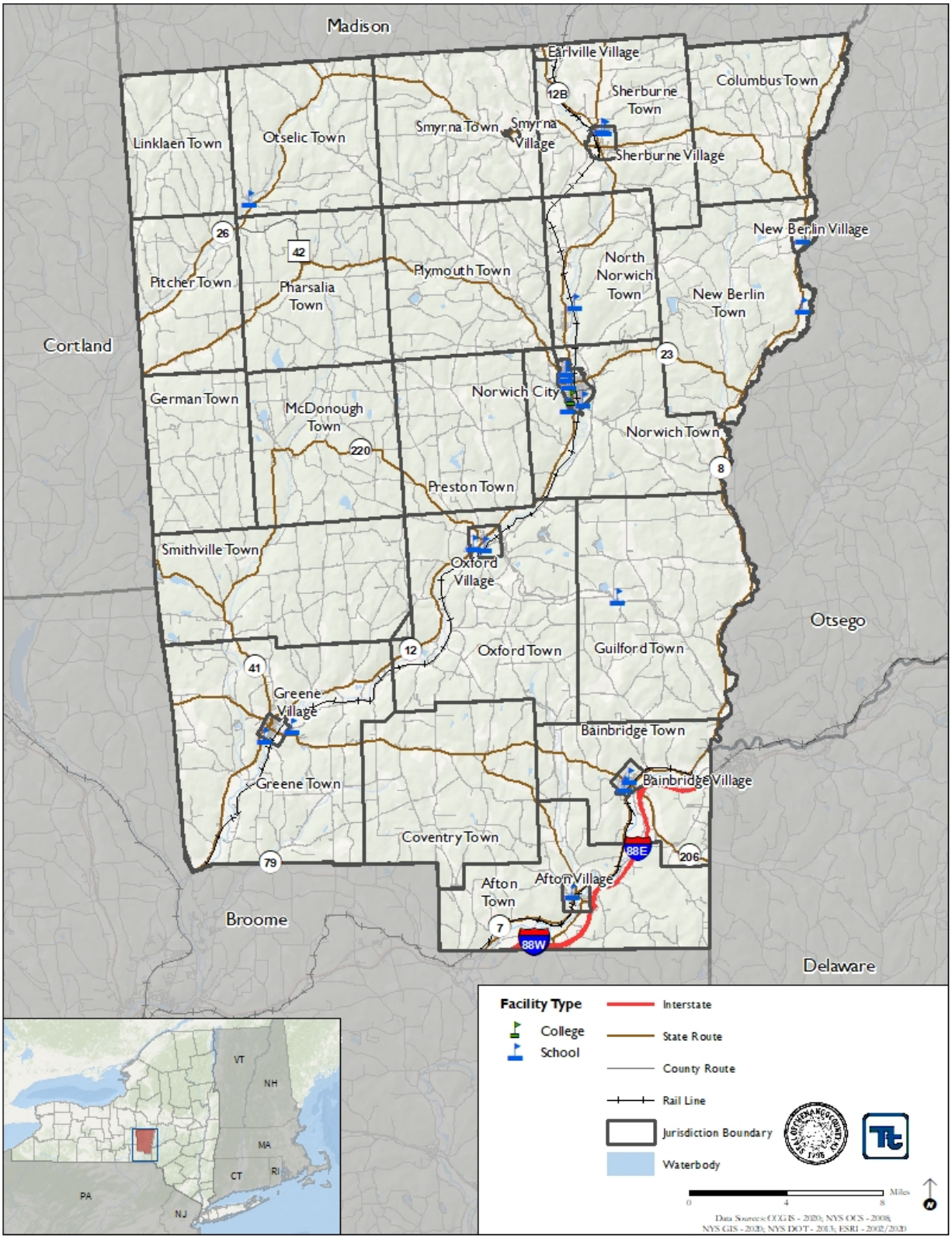
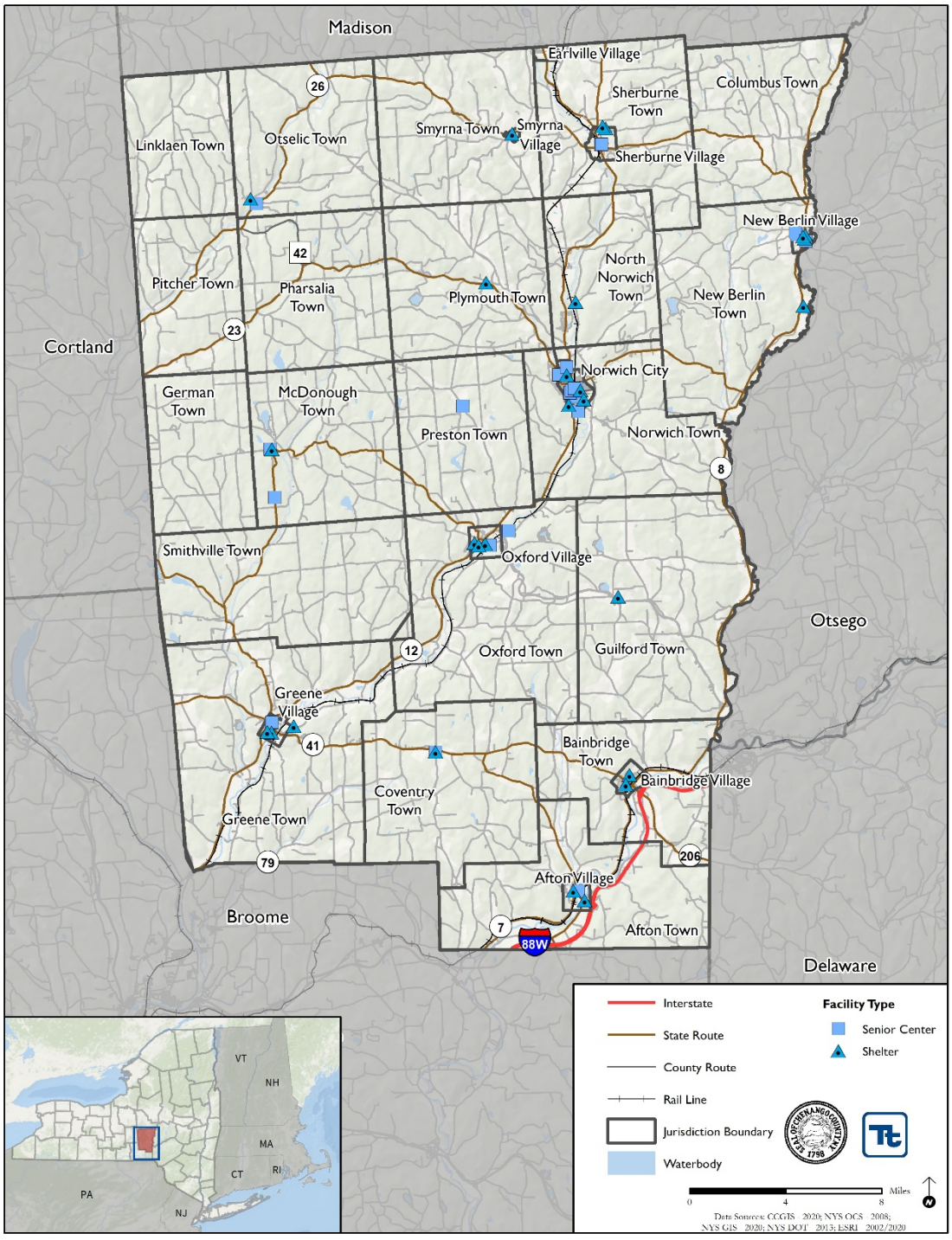
Figure 4-15. Schools in Chenango County, New York



Shelters

With support and cooperation of the American Red Cross and local jurisdictions, the County references an inventory of suitable shelter locations and can assist with the coordination and communication of shelter availability as necessitated by the execution of local municipal emergency operation plans. Figure 4-18 displays the location of these facilities.

Figure 4-16. Senior Facilities and Shelters in Chenango County, New York



4.6.2 Transportation Systems

This section presents available inventory data for roadways, airports, railways and other transportation systems for Chenango County. Figure 4-19 shows regional transportation lifelines serving Chenango County.

Highway, Roadways and Associated Systems

The Chenango County highway network encompasses approximately 304 miles including interstate, state, county and local highways, routes, and roads. The County's only interstate is Interstate Route 88 (I-88), which runs northeast-southwest through the Towns of Afton and Bainbridge in the southeast portion of the County. Major New York State Routes include Routes 7, 8, 12, 23, 41, 80 and 206 (Laberge Group, 2006; Long, 2007). Major County Routes that have been identified as possible evacuation routes include Routes 5, 7, 8, 10, 12, 13, 20, 29, 30, 32, and 39.

According to the Chenango County Economic Strategic Plan, other than I-88, the most important road in the County is New York State Route 12. This highway is a major north-south corridor that runs through the County providing easy access to the New York State Thruway, Interstates Routes 81, 88, and 86, and several of the larger communities, including Sherburne, Norwich, Oxford, and Greene (Laberge Group, 2006).

New York State Route 8 runs north to south along the County's eastern border. New York State Route 23 runs east to west through the County's center; New York State Route 80 runs east to west through the northern half of the County; and New York State Route 206 runs east to west through the southern half of the County. State roads generally have 55 mile per hour (mph) speed limits, except where they traverse populated areas and villages and the speed limit is lower (Laberge Group, 2006).

HAZUS-MH indicates there are 239 highway bridges present in the County.

Airports and Heliports

Chenango County includes 6 small airports and airfields. The Lt. Warren Eaton Airport is a county-owned general aviation airport located in the Town of North Norwich. Services provided at this airport include t-hangars, a jet hangar, fuel sales, and repairs (private company). In addition, there are five private airfields and landing areas located in the towns of: Afton, Columbus, Coventry, Greene and Sherburne. A small portion of the Sidney Airport is also located in the County. Public airports located within an hour's drive include the Binghamton Regional Airport in Binghamton, the Oneida City Airport in Utica, and the Hancock International Airport in Syracuse.

Bus and Other Transit Facilities

Chenango County Public Transit (CCPT) operated by First Transit provides fixed bus services to 15 of the 21 towns of Chenango County. Lincklaen, Pitcher, German, McDonough, and Smithville in the western section of the County do not have fixed service. Services provided by Christian Cares, American Cancer Society, Coach USA, Medicaid, and 511NY Rideshare service provide transportation services on a limited basis (Chenango County Coordinated Transportation Plan, 2019).

Railroad Facilities

Rail transportation in the County is used for freight only and is served by the New York Susquehanna & Western Railroad and the Delaware and Hudson Railway. Freight service is maintained on the New York Susquehanna and Western Railway between Binghamton and Utica. Connections are available to CSX Transportation in Syracuse and North Bergen, New Jersey; the Canadian Pacific Railway in Binghamton; and Norfolk Southern are in Binghamton, New York and Passaic Junction, New Jersey (Laberge Group, 2006). In addition, the Canadian Pacific Railway (Norfolk Southern Railway Co. owns the tracks) is a freight rail line that runs the

Towns of Afton and Bainbridge (Long, 2007). In 2018, the rail lines along the Chenango River from Chenango Forks to Norwich that had been closed due to damage incurred in 2006 flooding events was reopened. On January 7, 1966, a mechanical flaw caused 39 rail cars to derail in the center of the Village of Bainbridge, causing extensive damages including two deaths, and property damages to four cars, the fire department and homes throughout the area.

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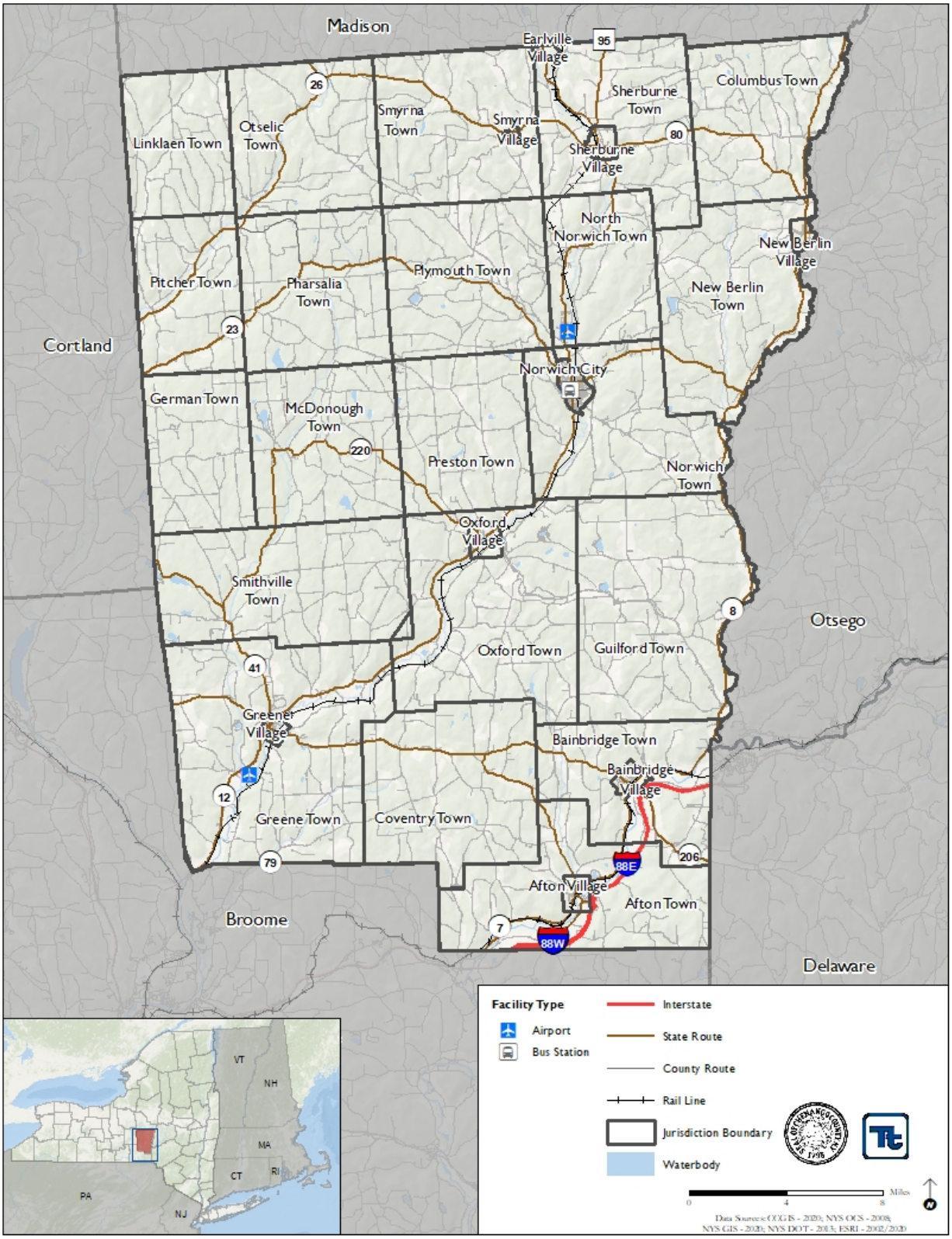
Figure 4-17. Transportation Features in Chenango County, New York



4.6.3 Lifeline Utility Systems

This section presents data and information on potable water, wastewater, energy resources, and communication utility systems. Due to heightened security concerns, local utility lifeline data needed to complete the analysis were only partially obtained. Figure 4-25 through Figure 4-27 show the locations of the facilities for these various lifeline utility systems in Chenango County.

Potable Water

According to the Chenango County's Department of Environmental Health, the following maintain public water systems: Villages of Afton, Bainbridge, Greene, New Berlin, Oxford, Sherburne, and Smyrna; City of Norwich; and Guilford, Mount Upton, South New Berlin, and South Otselic water districts. Due to heightened security concerns, the locations of the groundwater wells and surface water sources for municipal water supplies were not provided. However, based on the approximate population serviced by municipal water sources, at least 31,000 residents obtain water from private water supplies (Sutton, 2007).

Wastewater Facilities

Chenango County has six public waste discharge and sewage treatment facilities. They are located in the City of Norwich, and the Villages of Bainbridge, Greene, Oxford, Sherburne, and Smyrna. There are six wastewater treatment facilities and 21 wastewater pump stations in Chenango County. Figure 4-20 maps these facilities.

Energy Resources

New York State Electric & Gas (NYSEG) is the primary electric and gas utility in Chenango County. In addition, the Village of Greene has two municipal electric power plants and NYSEG maintains a substation and compressor in the Town of Norwich. Electrical Substation, Natural Gas Well, and other energy resource locations are displayed in Figure 4-21. Additionally, there are the following natural gas resources within the County:

- Texas Eastern Products Pipeline Company (TEPPCO) pipeline runs east to west across Chenango County, through the Towns of McDonough, Preston, Oxford and Norwich (Planning Committee, 2007).
- The New York State Department of Environmental Conservation reports 43 active natural gas wells in the County. There are 201 wells in the database, with the remainder being cancelled, abandoned, having an expired permit, or other issues.
- EmKey Resources, LLC at this time operates a low-pressure natural gas gathering pipeline system connecting natural gas wells in the towns of Smyrna, Plymouth and Preston.
- EmKey Resources, LLC planned to construct a high-pressure pipeline from Madison County through the center of Chenango County into Broome County, in 2012. This would serve as future infrastructure to service additional natural gas wells in Chenango County and as a potential north/south connection to the east/west interstate natural gas lines in NYS. However, this project was halted shortly after the proposal.
- Construction was proposed for the interstate 30 inch, "Constitution" Natural Gas pipeline that would pass through the towns of Afton and Bainbridge from Pennsylvania connecting with the Iroquois Transmission pipeline in Schoharie County. The project has since been halted by the company proposing it.

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Figure 4-18. Water Utilities in Chenango County

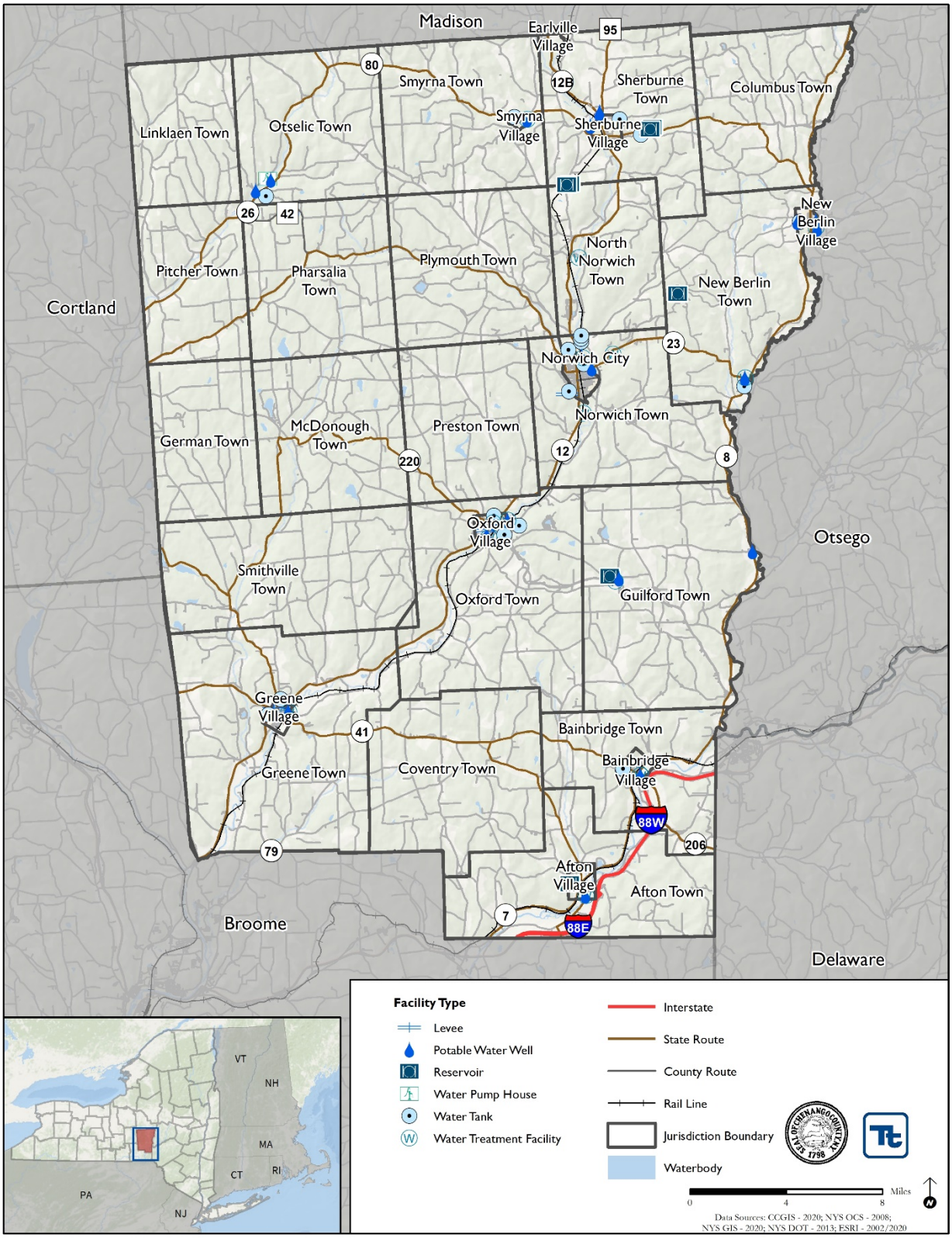
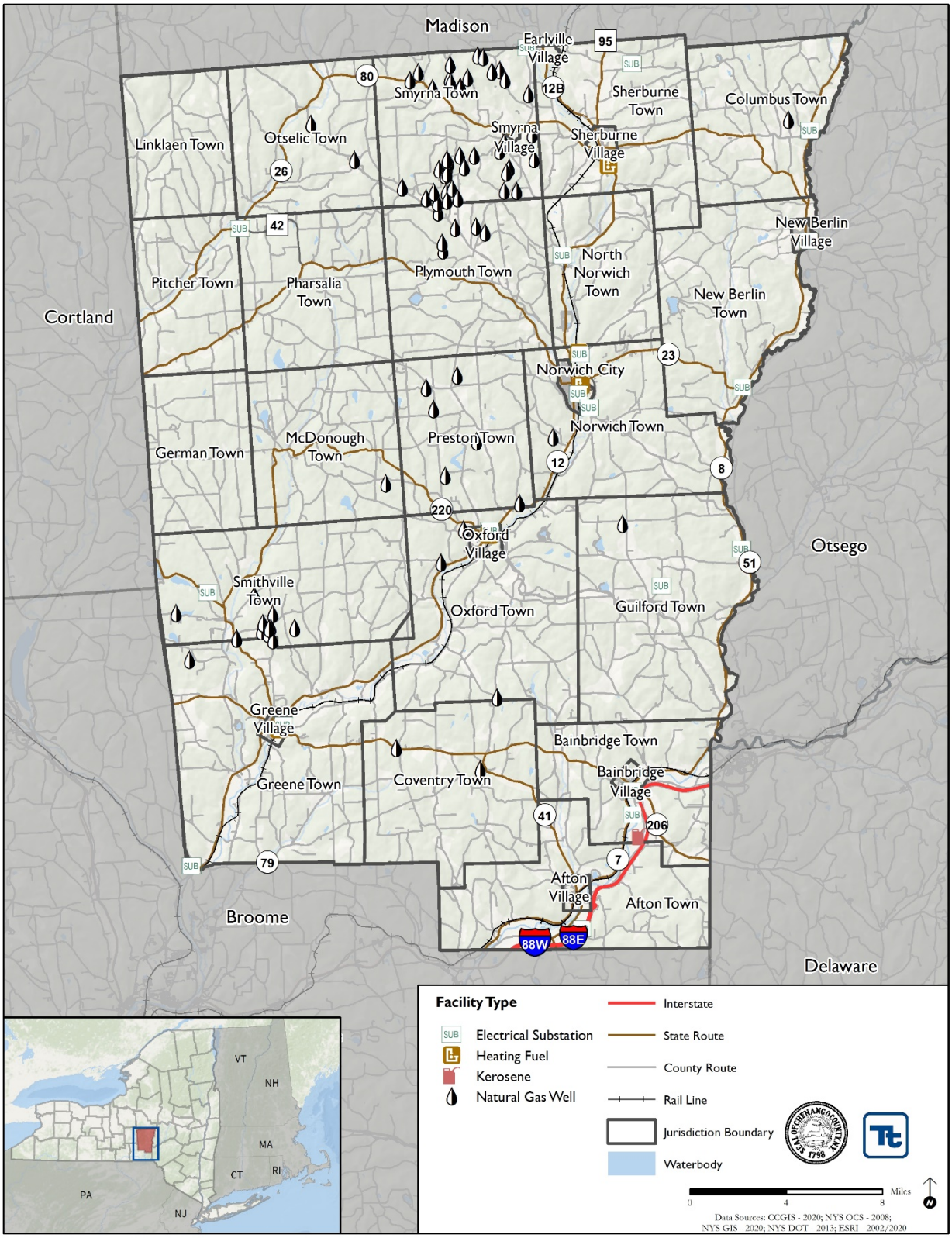


Figure 4-19. Energy Utility Facilities in Chenango County



Communication Services

Telephone and wireless communication services are available in the County through a range of providers; specific information on these resources (wireless towers, providers, etc.) is not included in this plan because of the volume of information and diverse sources; also, emergency communications systems are maintained separately to support critical facility communications. Radio service is provided by Banjo Communications Group Inc. (Banjo Communications) and WCDO. Banjo Communications maintains three broadcast facilities within the Town of Norwich (Commerce Chenango, 2007; HAZUS-MH, 2005).

According to the Chenango County Comprehensive Emergency Management Plan, information and warnings to the public can be accomplished through the use of: NY Alert, the Emergency Alert System (EAS) (formerly known as Emergency Broadcast System), Hyper-Reach, NOAA Weather Radio (NWR), stationary fire sirens, and the Notify Chenango Emergency Notifications mobile app. EAS utilizes television, radio, and cable TV, to issue emergency warnings. NWR is the "All Hazards Radio Network" of the National Weather Service that provides continuous 24-hour radio broadcasts of the latest weather information including severe weather warnings directly from the Weather Service office in Binghamton. NWR will also broadcast emergency warnings and post event information, for all types of hazards, both natural and environmental, such as hazardous materials spills. NWR broadcasts on seven high-band FM frequencies, the local frequency being 162.525 Megahertz. Radios with NWR frequencies, automated alarm capabilities, and Specific Area Message Encoding (SAME) technology are generally available.

4.6.4 High-Potential Loss Facilities

High-potential loss facilities are categories of critical facilities that, if damaged, have significant potential for causing a large scale of damage. These include dams, levees, hazardous materials (HAZMAT) facilities, nuclear power plants, and military installations. For the 2021 HMP update, there are two types of these facilities in Chenango County: HAZMAT facilities and dams.

HAZMAT Facilities

A Superfund site consists of land in the United States that has been contaminated by hazardous waste and identified by the U.S. Environmental Protection Agency (EPA) as a candidate for cleanup because it poses a risk to human health or the environment. These sites are placed on the National Priorities List (NPL), the list of national priorities among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories. The NPL is intended primarily to guide EPA in determining which sites warrant further investigation.

Abandoned hazardous waste sites placed on the federal NPL include those that EPA has determined present *a significant risk to human health or the environment*, with the sites being eligible for remediation under the Superfund Trust Fund Program. As of 2018, Chenango County hosts one hazardous sites in the federal Superfund Program that is listed as on the NPL (CERCLIS 2018).

The EPA Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) (Superfund) Public Access Database (CPAD) reports that there are currently nine archived Superfund sites located in Broome County (CERCLIS 2018). An archived Superfund site is one that has no further interest under the Federal Superfund Program based on available information and is no longer part of the CERCLIS inventory. Archived and active Superfund sites are accessible through the same database but are differentiated by status.

In addition to the hazardous waste sites, there are numerous hazardous facilities in Chenango County cataloged by the NYSDEC's Bulk Storage Program Database. The Bulk Storage Program includes three types of facilities;

Petroleum Bulk Storage (PBS), and Chemical Bulk Storage (CBS) that require registration with NYSDEC for all facilities with a total storage capacity of petroleum products of the following:

- PBS—1,100 gallons or more
- CBS underground tanks and all stationary aboveground tanks—185 gallons or more

As of April 2020, there are 1,520 sites listed in the NYSDEC's Bulk Storage Program Database in Chenango County, New York (NYSDEC 2020). The vast majority (95%) of these sites are petroleum bulk storage sites. The remaining 5% are chemical bulk storage sites.

Dams

For the purpose of this hazard mitigation plan, dams and levees are considered community lifelines. A summary of the dams in the county is presented in this section to provide an awareness of the number and types of these structures within the county.

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

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

The New York State Inventory of Dams, identifies 158 dams in Chenango County: 116 low hazard, 11 intermediate hazard, 11 high hazard, 17 negligible or no hazard classification, and 3 with an unknown classification (NYS DEC 2020).

4.6.5 Housing and Relocation

Chenango County and municipalities recognize the need to identify potential sites for temporary housing and relocation and ensuring residents are aware of these facilities is critical.

Temporary Housing

Chenango County has identified potential locations to be used as temporary housing for residents displaced by a disaster. Table 4-15 lists the locations of the potential temporary housing locations identified by each municipality. Municipalities that did not identify any temporary housing locations are not included in the table.

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Table 4-7. Potential Temporary Housing Locations in Chenango County

Municipality	Location Name	Location Address
Chenango County	Super 8 Motel	6067 NY-12, Norwich, NY 13815
Chenango County	Norwich Motor Lodge	2-6 E Main St, Norwich, NY 13815
Chenango County	Red Roof Inn Hotel	75 N Broad St, Norwich, NY 13815
Afton (T)	Empty Lot Behind Town Hall	204 County Rd 39, Afton, NY 13730
Bainbridge (V)	Mobile Home Park	120 Paddock Park, Bainbridge, NY 13733
Greene (T)	Fire Station Parking Lot	8 N Canal St, Greene, NY 13778
Greene (T)	School Parking Lot	40 South Canal Street Greene, NY 13778
Guilford (T)	Town Hall/Highway Garage Parking Lot	223 Marble Road, Guilford, NY 13780
Guilford (T)	Mount Upton Park	1683 NY-8, Guilford, NJ 13809
Lincklaen (T)	Town Hall/Town Barn	651 Union Valley Lincklaen Rd, Deruyter, NY 13052
Lincklaen (T)	Lincklaen Mobile Park	Not Indicated
Oxford (V)	Oxford High School Parking Lot	50 S Washington Ave, Oxford, NY 13830
Plymouth (T)	Fields behind Firehouse	3461 State RTE 23 South Plymouth, NY 13844
Sherburne (V)	Sherburne Earlville School Field	15 School St, Sherburne, NY 13460
Smithville (T)	Eagle Scout Park	Eagle Scout Park Smithville Flats, NY 13841
Smyrna (T)	School House Apartments	2 E School St, Smyrna, NY 13464

Source: Chenango County Planning Partnership Input

Long-Term Housing

To support identification of potential sites suitable for relocating houses out of hazard areas (i.e., the floodplain) or building new homes once properties in hazard areas or the floodplain are acquired, the County performed a buildable parcel analysis. The analysis identified potential areas for post-disaster development in accordance with the 2017 NYSDHSES Hazard Mitigation Planning Standards Guide requirement "to identify long-term housing options for relocating displaced residents to maintain post-disaster social and economic stability". The County analysis provides an indication of vacant land suitable for development. In this case, vacant land is defined as a parcel that is classified as vacant and is located outside the following hazard areas:

1) FEMA floodplain.
2) wetlands.
3) federal, state and county park land.
4) utility public land.
5) land that has steep slopes (>15% gradient) without consideration of ownership or availability.

Figure 4-23 provides potential long-term housing locations in Chenango County.

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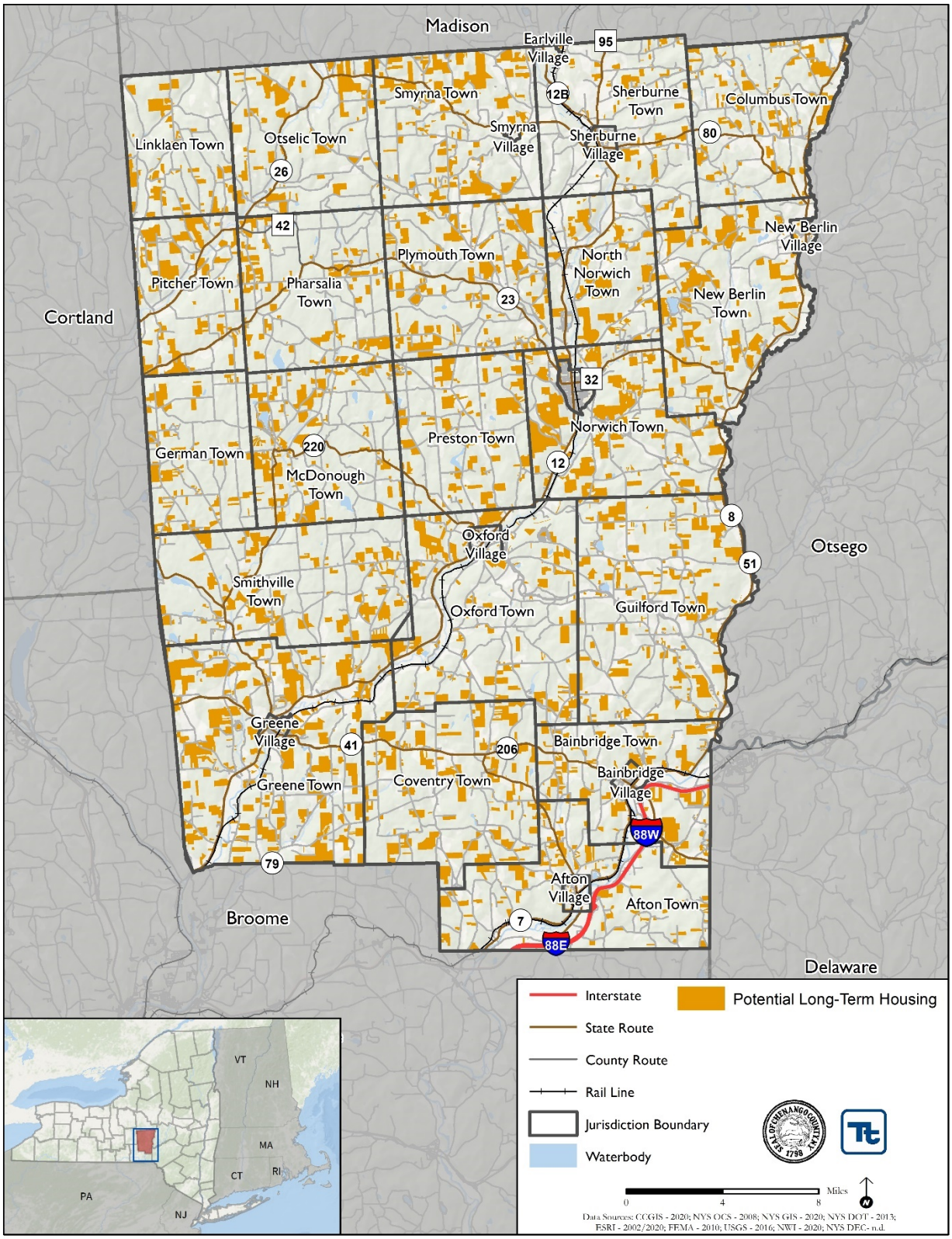
Figure 4-20. Potential Long-Term Housing Locations in Chenango County



Evacuation Routes

Chenango County Emergency Management notes that there are no specific evacuation routes identified in the County, as hazard conditions (e.g. flooding) are unpredictable. As such Hyper-Reach and Notify Chenango alerts are sent to residents advising them of evacuations, as necessary, along with routes to travel. Similarly, residents should obtain real-time information through such sources in the event that sheltering is needed, as shelters are opened on an event-specific basis.

While there are no specific evacuation routes, municipalities were asked to identify potential routes that could be used for evacuations during a disaster. Table 4-16 lists the locations of the potential evacuation routes identified by each municipality. Municipalities that did not identify any evacuation routes are not included in the table.

Table 4-8. Evacuation Routes in Chenango County

Municipality	Evacuation Routes
Chenango County	SR-23, SR-26, SR-206, SR-12, CR 32
Afton (T)	I-88, SR-41, CR-7
Afton (V)	I-88, SR-7, SR-41, CR-30, CR-39
Bainbridge (V)	SR-206, CR-7
Coventry (T)	SR-235
Greene (T)	SR 41, SR-206
Lincklaen (T)	CR-12, CR-13
McDonough (T)	NY-220, CR-7, CR-5
New Berlin (T)	NY-80, CR-29, NY-8, NY-80
New Berlin (V)	NY-80, CR-29, NY-8, NY-81
North Norwich (T)	NY-12
Norwich (C)	NY-12, NY-23
Norwich (T)	NY-12, NY-23, NY-8, CR-33, CR-36, CR-10A
Otselic (T)	SR-80, SR-26
Oxford (T)	NY-12 NY-220
Oxford (V)	SR-12, SR-220
Pharsalia (T)	NY-23, CR-10
Pitcher (T)	NY-26, NY-23
Plymouth (T)	NY-23, SR-16
Sherburne (T)	SR-12, SR-12B, SR-80
Sherburne (V)	NY-12, NY-80
Smyrna (T)	CR-20, NY-80, local roads
Smyrna (V)	NY-80

To support public notification during emergency situations (including evacuation and sheltering instructions) Chenango County Emergency Management works closely with the City of Norwich, as together have developed a smart phone emergency management application (app), designed as a one-stop resource for emergency preparedness and response. The application allows for push notifications to reach people quickly during an emergency situation, and includes the following features:

- Notify Chenango alerts of road closures, emergency evacuations (both locations where evacuations are being ordered, as well as specified evacuation routes), shelter information and more.
- Live weather conditions direct from the weather station at the joint City/County Emergency Operations Center.
- Local National Weather Service forecasts, including hour-by-hour information.
- Weather camera of downtown Norwich, updated every several minutes.

- River and stream gauge information for all local rivers running through Chenango County, plus the Canasawacta Creek in Norwich and South Plymouth.
- Countywide school closings, as reported to The Evening Sun.
- A link to NYSEG power outages for Chenango County, broken down by town and road.
- Road work updates from the NY-511 system.
- Live NOAA Weather Radio feed from the Norwich transmitter.
- Emergency preparedness information.

The City of Norwich Emergency Management Office, working with the Binghamton Office of the National Weather Service, monitors regional and national weather information for its potential impact on the City. This is particularly true during flooding and severe storm seasons.

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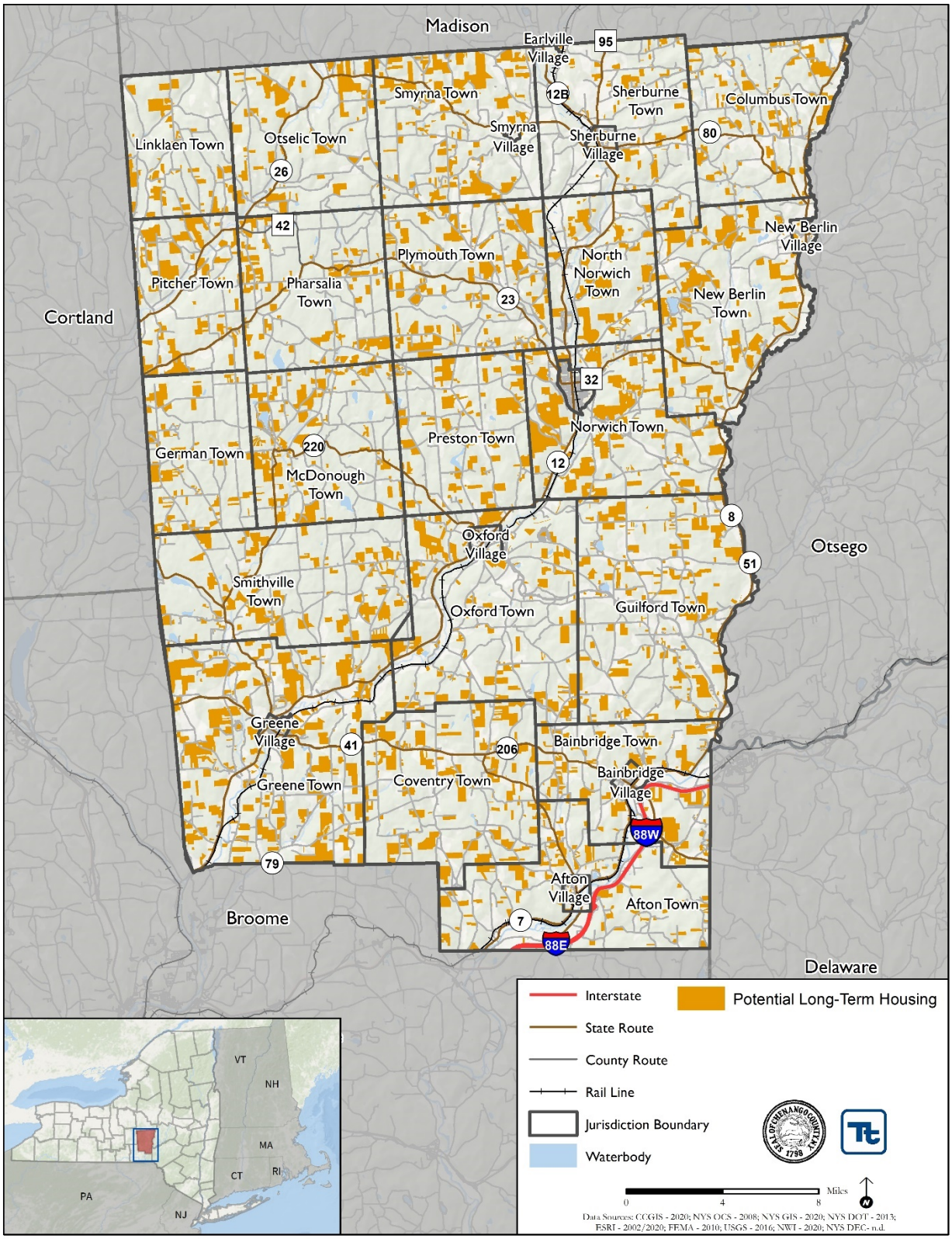
Figure 4-21. Evacuation Routes in Chenango County