

## SECTION 4. COUNTY PROFILE

This profile provides general information for Tompkins County (physical setting, past county-wide hazard event history, population and demographics, general building stock, and land use and population trends) and lifeline critical facilities located within the County. Analyzing this information leads to an understanding of the study area, including economic, structural, and population assets at risk, and concerns that could be related to hazards analyzed later in this plan (e.g., low lying areas prone to flooding, high percentage of vulnerable persons in an area).

### 4.1 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.

#### 4.1.1 Location

Tompkins County is located in Upstate New York along the southern portion of Cayuga Lake between Binghamton and Syracuse. Tompkins County is bordered by Cayuga County to the north, Cortland County to the east, Tioga County to the south, Chemung County to the southwest, Schuyler County to the west, and Seneca County to the northwest.

The City of Ithaca serves as Tompkins County's county seat. Tompkins County is home to both Ithaca College and Cornell University. Ithaca is situated near the center of the County.

The County includes one City, nine Towns, six Villages, and 31 Hamlets and shown in Figure 4-1. Tompkins County consists of a total land area of 474.6 square miles and a total water area of 16.9 square miles (2010 Census Gazetteer files, 2012). In terms of total area, the Town of Dryden is the largest jurisdiction within Tompkins County, totaling 94.2 square miles. This equates to almost 20 percent (20%) of the total area of the County. The Town of Ithaca is the smallest Town in Tompkins County, totaling 30.3 square miles in area, which represents only six percent of the total area of Tompkins County. Table 4-1 provides the total areas (in square miles) for each jurisdiction included within Tompkins County.

Table 4-2 provides the political jurisdictions encompassed by the County and in the designated planning area of this hazard mitigation plan.

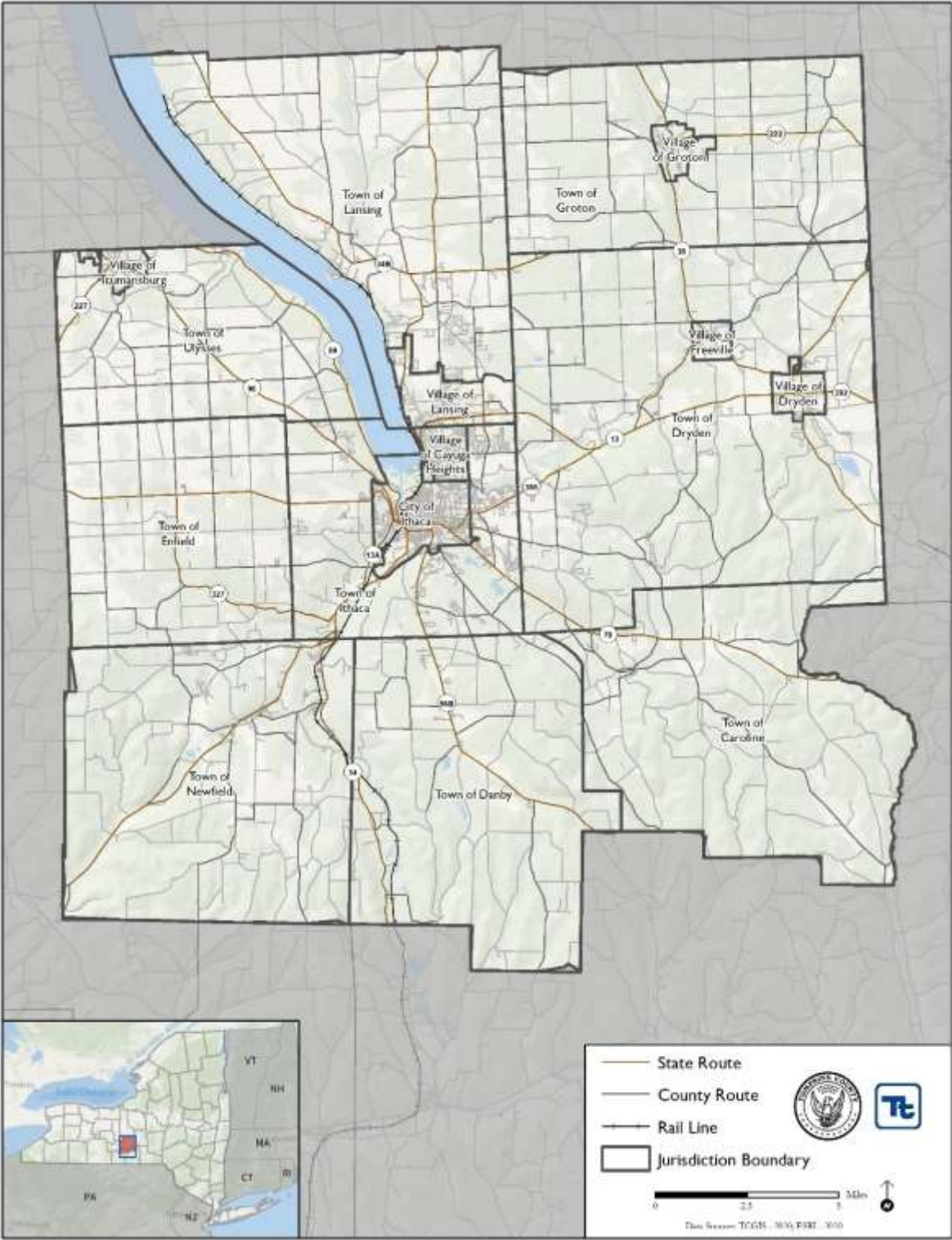
Table 4-1. Approximate Areas for Jurisdictions Within Tompkins County (City Data, 2011)

Jurisdiction	Total Area (square miles)	Total Land (square miles)	Total Water (square miles)	% of Total Area in County
Tompkins County	491.6	474.6	16.9	100.00%
Caroline (Town)	55.1	55.0	0.1	11.2%
Danby (Town)	53.7	53.5	0.2	10.9%
Dryden (Town)	94.2	93.9	0.3	19.2%
Enfield (Town)	36.9	36.9	0.0	7.5%
Groton (Town)	49.6	49.5	0.1	10.0%
Ithaca (Town)	30.3	29.1	1.2	6.2%
Ithaca (City)	6.1	5.5	0.6	1.2%
Lansing (Town)	69.9	60.7	9.2	14.2%
Newfield (Town)	59.0	58.9	0.1	12.0%
Ulysses (Town)	36.8	33.0	3.9	7.5%
Cayuga Heights (Village)	1.8	1.8	0.0	-
Dryden (Village)	1.7	1.7	0.0	-
Freeville (Village)	1.1	1.1	0.0	-
Groton (Village)	1.7	1.7	0.0	-
Lansing (Village)	4.6	4.6	0.0	-
Trumansburg (Village)	1.2	1.2	0.0	-

Table 4-2. Tompkins County Political Jurisdictions

Towns		Villages	City
Caroline	Ithaca	Cayuga Heights	Ithaca
Danby	Lansing	Dryden	
Dryden	Newfield	Freeville	
Enfield	Ulysses	Groton	
Groton		Lansing	
		Trumansburg	

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



## 4.1.2 Topography and Geology

Tompkins County has a diverse terrain that is relatively gentle in the north and more varied and having higher topographic relief in the south. Elevations range from approximately 400 feet above mean sea level (msl) to greater than 2,000 feet above MSL. The highest topographic point in the County, Connecticut Hill, is located in the Town of Newfield. Connecticut Hill reaches an elevation of 2,200 feet above MSL. The lowest elevation within the County is recorded to be 382 feet above MSL, which is the surface water level of Cayuga Lake (2014 County HMP).

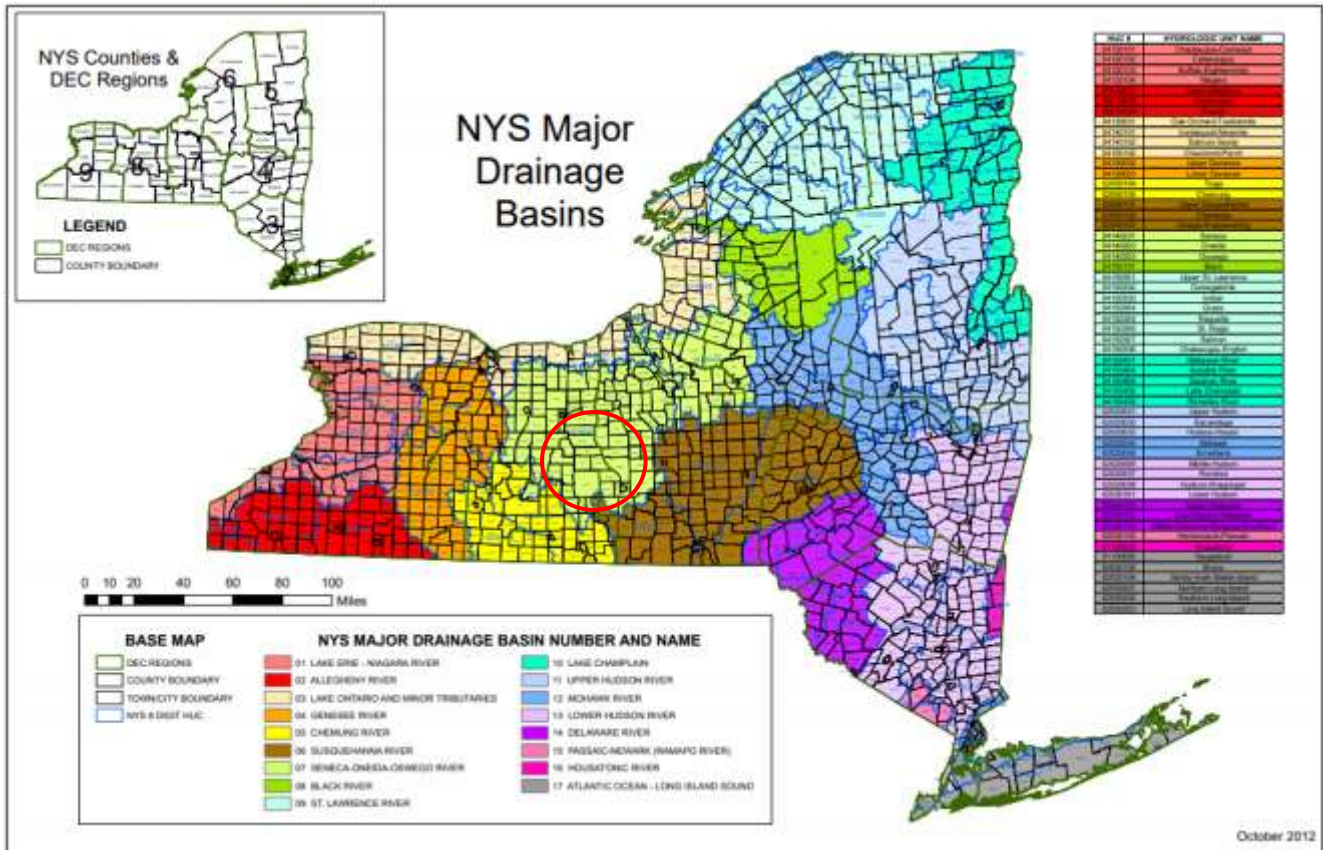
Tompkins County's topography is shaped by glacial features and uplifting events that carved deep gorges now known as the Finger Lakes. Approximately 200 million years ago, drainage flowed south to the Susquehanna instead of north to Lake Ontario. Lakes changed the region's drainage and provided the lifeblood for the area's development (Tompkins County Comprehensive Plan 2015).

## 4.1.3 Hydrography and Hydrology

Cayuga Lake, one of New York's eleven Finger Lakes, is Tompkins County's most prolific water feature. The County accounts for half of the Lake's watershed, with 80% of the County draining into the lake. As the widest and longest of the Finger Lakes, water takes 10 years to fully cycle throughout the lake. From Cayuga Lake, water flows north to Lake Ontario through the Seneca and Oswego Rivers. In the southern portion of the County, water drains to Chesapeake Bay through Susquehanna River tributaries such as the West Branch Oswego River or the Cayuta Creek (Tompkins County Comprehensive Plan 2015).

Figure 4-2. below shows the major drainage basins of New York State. With Tompkins County being located along a watershed divide, the County is part of drainage basin 6 (Susquehanna River) and basin 7 (Seneca-Oneida-Oswego River).

Figure 4-2. Drainage Basins of New York State



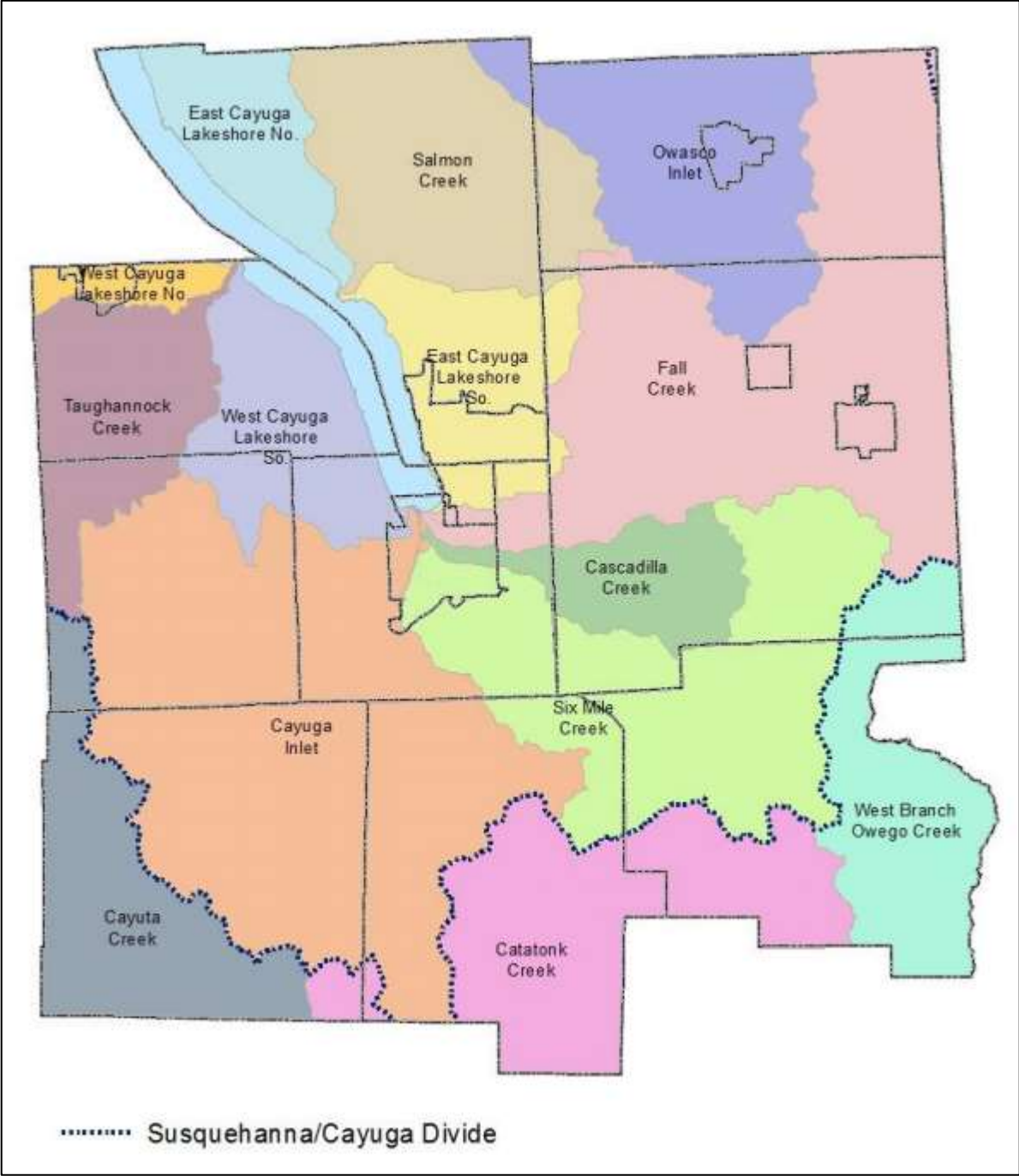
Source: NYSDEC 2012; Note: The circle indicates the approximate location of Tompkins County.

The Oswego/Finger Lakes watershed comprises 8,896 miles of creeks and streams. The watershed flows from headwaters in the southwestern Adirondacks to Lake Ontario. The Finger Lakes are within this watershed and along with smaller lakes together comprise approximately seven percent of all surface area in the watershed. The watershed includes more than 5,000 square miles of land within the State, including much of Tompkins County (NYS DEC).

The Susquehanna River Basin is the largest east of the Mississippi Rivers. The river and its tributaries drain 4,520 square miles of land within New York State and drain to the Chesapeake Bay, encompassing over 8,185 miles of freshwater rivers and streams. The major tributaries to the Susquehanna River in Tompkins County include Owego Creek, the western branch of which passes through the southeast portion of the County (NYS DEC). Figure 4-3 indicates the location of watersheds in Tompkins County.



Figure 4-3. Watersheds of Tompkins County, New York



Source: Tompkins County Comprehensive Plan, 2015

Potable water in Tompkins County is derived from both surface water sources (55%) and groundwater sources (45%). The Villages of Dryden, Groton, Trumansburg and hamlets of Newfield and West Danby utilize groundwater sources and also have municipal water systems. Private wells number in the thousands and are found throughout the County. Surface water sources in Tompkins County include Cayuga Lake, Fall Creek, and

Six Mile Creek. The City of Ithaca, Southern Cayuga Lake Intermunicipal Water Commission (Bolton Point), and Cornell University operate water treatment plants that utilize these surface waters. In addition, several homes along Cayuga Lake withdraw water from the lake. Sodium and arsenic levels as well as the preponderance of septic tanks in areas not served by centralized wastewater systems are major water quality concerns (Tompkins County Comprehensive Plan 2015).

## 4.1.4 Climate

The climate of New York State (including Tompkins County) is very similar to most of the Northeast United States and is classified as Humid Continental. Differences in latitude, topography, and the presence of large bodies of water impact 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 weather systems will move up from southern coastal areas and produce significant quantities of rain. Both types of storms typically are characterized by relatively short periods of intense precipitation that produce substantial surface runoff and little recharge (Cornell Date, n.d.).

The cool season (October through March) is characterized by large, low-pressure systems that move northeastward along the Atlantic coast or the western side of the Appalachian Mountains. Storms that form in these systems are characterized by prolonged 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, n.d.)

Tompkins County generally experiences seasonable weather patterns characteristic of the Northeast United States. The average precipitation for Tompkins County is approximately 37 inches, most of which occurs between April and November. The average snowfall amounts for the County is 64 inches. Average summer temperatures typically range from 60 degrees Fahrenheit (°F) to 68°F, with average daily highs up to 80 degrees in July. Winter high temperatures are between 31°F and 36°F, with minimum temperatures dipping to 15°F (Northeast Regional Climate Center).

## 4.1.5 Land Use and Land Cover

Tompkins County has been inhabited since the Stone Age and was more recently home to the Cayuga Nation who represented one of the six tribes (Mohawks, Oneidas, Onondagas, Cayugas, and Senecas) of the Haudenosaunee Confederacy. After the Revolutionary War, the Cayuga Nation were forced from their land and the County was somewhat sparsely settled as an agricultural area by former American soldiers.

Trade expanded in the region after the opening of the Ithaca-Oswego Turnpike and the Erie and Seneca canals. Industrialization in the early twentieth century brought major industries, and by 1959 a pattern of dispersed

residential settlement was noted and broached as a planning concern. The late twentieth century saw the addition of highways, malls, and higher density housing outside of the established centers, such as the City of Ithaca (Tompkins County Comprehensive Plan 2015).

In terms of land use, Tompkins County continues to be a predominantly agricultural county with over 21 percent of the total acreage consisting of farmland. Farming operations within the County are quite diverse, including dairy, grain, livestock, hay, tree farms, vegetables, horticulture, aquaculture, poultry, vineyards, and orchards. Table 4-4 and Figure 4-4 provide the relative magnitudes of land use in the County as well as the land use trends during the period from 1995 to 2015. The increase in commercial, residential and recreation uses and decrease of agricultural land use are indicated by the data.

## 4.1.6 Major Past Hazard Events

Presidential disaster declarations are typically issued for hazard events that cause more damage than state and local governments can handle without assistance from the federal government, although no specific dollar loss threshold has been established for these declarations. A presidential disaster declaration puts federal recovery programs into motion to help disaster victims, businesses and public entities. Some of the 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. FEMA disaster declarations (Major Disaster Declarations (DR)) are declared when the President decides a disaster has caused damage of such severity that it is beyond the combined capabilities of state and local governments to respond. Broad ranging federal funds for a DR can be used to address the emergency but also larger infrastructure rebuilding; Emergency Declarations (EM) are also declared by the President to but are dedicated to the emergency event and total assistance does not exceed \$5M that included Tompkins County through 2020 (records date back to 1954).

*Table 4-3. History of Hazard Events in Tompkins County, New York*

Disaster Number	Incident Duration	Declaration Date	Incident Type	Title
DR-4480	January 20, 2020-- Ongoing	March 20, 2020	Biological	COVID-19 Pandemic
EM-3434	January 20, 2020— Ongoing	March 13, 2020	Biological	COVID-19 Pandemic
DR-4322	March 14-- March 15, 2017	July 12, 2017	Snow	Severe Winter Storm and Snowstorm
EM-3351	October 27-- November 8, 2012	October 28, 2012	Hurricane	Hurricane Sandy
DR-4031	September 7-- September 11, 2011	September 13, 2011	Severe Storm(s)	Remnants of Tropical Storm Lee
DR-1650	June 26-- July 10, 2006	July 1, 2006	Severe Storm(s)	Severe Storms and Flooding



Disaster Number	Incident Duration	Declaration Date	Incident Type	Title
EM-3262	August 29-- October 1, 2005	September 30, 2005	Hurricane	Hurricane Katrina Evacuation
DR-1534	May 13-- June 17, 2004	August 3, 2004	Severe Storm(s)	Severe Storms and Flooding
EM-3186	August 14-- August 16, 2003	August 23, 2003	Other	Power Outage
DR-1391	September 11, 2001	September 11, 2001	Fire	Fires and Explosions
EM-3155	May 22-- November 1, 2000	October 11, 2000	Other	West Nile Virus
DR-1335	May 3-- August 12, 2000	July 21, 2000	Severe Storm(s)	Severe Storms and Flooding
DR-1233	June 25-- July 10, 1998	July 7, 1998	Severe Storm(s)	Severe Storms and Flooding
DR-1148	November 8-- November 15, 1996	December 9, 1996	Severe Storm(s)	Severe Storms, High Winds, Rains, and Flooding
DR-1095	January 19-- January 30, 1996	January 21, 1996	Flood	Severe Storms and Flooding
EM-3107	March 13-- March 17, 1993	March 17, 1993	Snow	Severe Blizzard
DR-515	July 21, 1976	July 21, 1976	Flood	Severe Storms and Flooding
DR-487	October 2, 1975	October 2, 1975	Flood	Storms, Rains, Landslides, and Flooding
DR-338	June 23, 1972	June 23, 1972	Flood	Tropical Storm Agnes
DR-290	July 22, 1970	July 22, 1970	Flood	Heavy Rains & Flooding

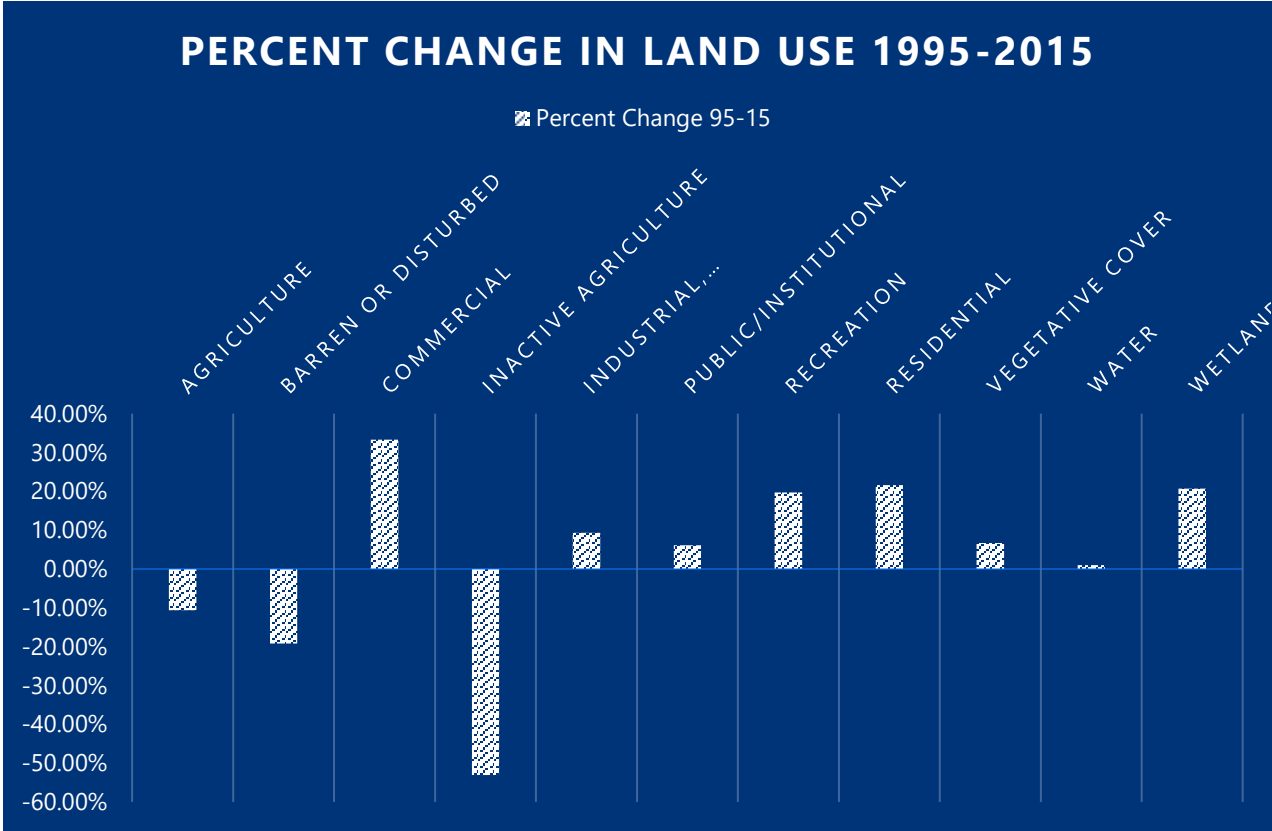
Table 4-4. Land Use (2015) in Tompkins County, New York

Land Use and Cover	Total Acreage	Total Area (sq. mi.)	Percent of County (%)
Agriculture	68,187	106.5	21.6
Barren or Disturbed	921	1.4	0.3
Commercial	1,772	2.8	0.6
Inactive Agriculture	9,237	14.4	2.9
Industrial, Transportation, Transmission	2,587	4.0	0.8
Public/Institutional	1,900	3.0	0.6
Recreation	2,689	4.2	0.9
Residential	26,675	41.7	8.5
Vegetative Cover	17,8625	279.1	56.7
Water	10,951	17.1	3.5

Land Use and Cover	Total Acreage	Total Area (sq. mi.)	Percent of County (%)
Wetlands	11,585	18.1	3.7

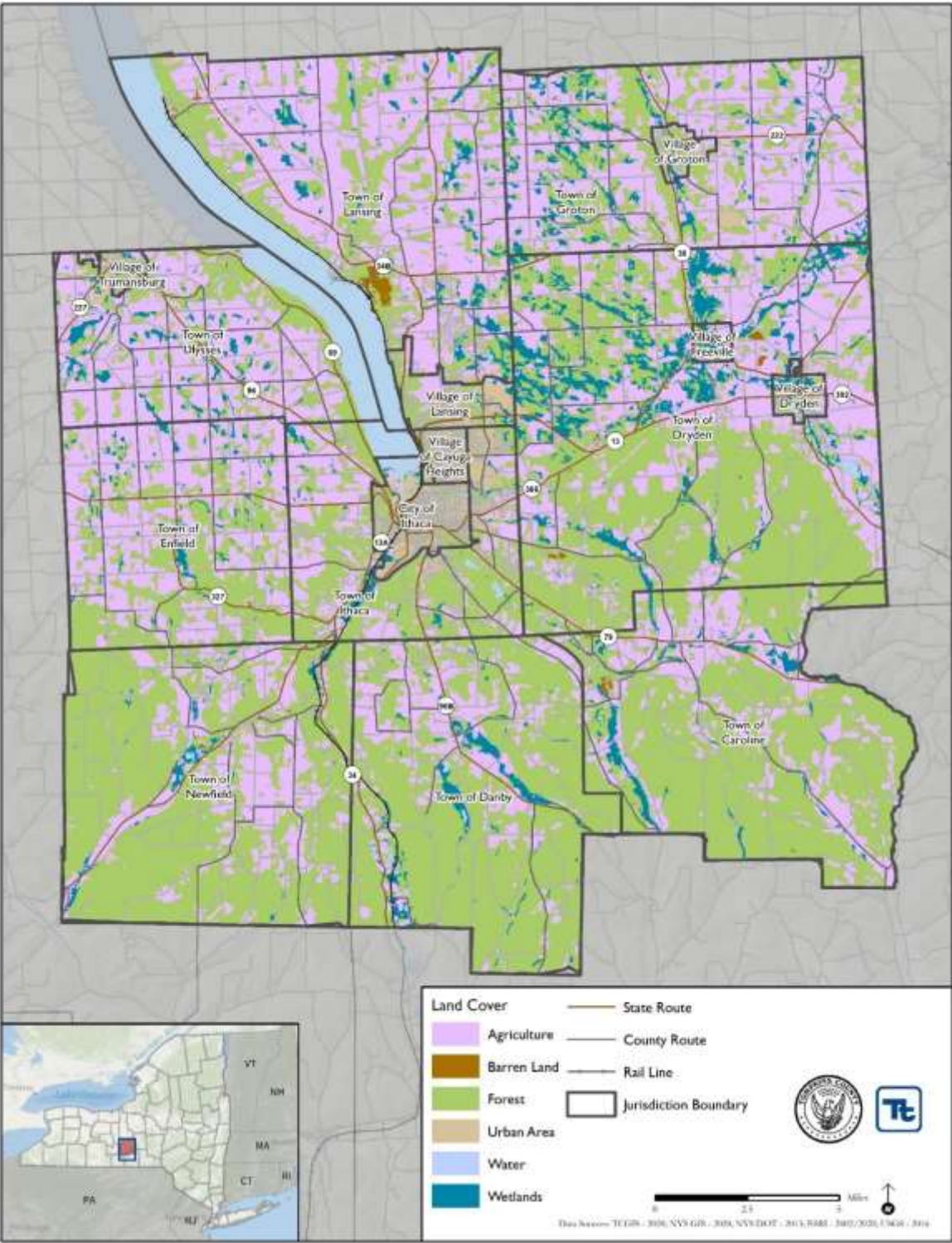
Source: Tompkins County, 2020

Figure 4-4 Tompkins County Land Use Trend (1995 – 2015)



Source: Tompkins County, 2020

Figure 4-5. 2016 Land Use in Tompkins County, New York



## 4.2 Population and Demographics

An understanding of the Tompkins County 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 101,564 residents. However, more current data, according to U.S. Census Bureau, 2018 American Community Survey 5-Year Estimate, estimates a county population of approximately 102,962 residents. This represents a slight increase in population since 2010. A detailed population table for the 2010 Census is shown below in Table 4-5. A detailed table for the 2018 American Community Survey is included in Appendix E.

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.

Table 4-5 provides the population of each municipality as a total percentage of the County population. Figure 4-6 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.

Table 4-5. Population Statistics in Tompkins County, New York

Municipality	U.S. Census 2010								2014-2018 American Community Survey (ACS)									
	Total	Over 65	Percent Over 65	Population Under 5	Percent Under 5	Low Income	Percent Low Income*	Total	Over 65	Percent Over 65	Under 5	Population Percent Under 5	Below Poverty Level	Percent Below Poverty Level	Non-English Speaking	Percent Non-English Speaking	Persons with Disability	Percent Persons with Disability
Caroline (T)	3,282	391	11.9%	193	5.9%	207	6.3%	3,362	388	11.5%	191	5.7%	206	6.13%	68	2.0%	410	12.2%
Cayuga Heights (V)	3,729	737	19.8%	131	3.5%	267	7.2%	3,674	880	24.0%	129	3.5%	265	7.2%	476	13.0%	298	8.1%
Danby (T)	3,329	440	13.2%	185	5.6%	156	4.7%	3,438	668	19%	149	4.3%	529	15.39%	113	3.3%	409	11.9%
Dryden (T)	12,025	1,308	10.9%	655	5.4%	1,422	11.8%	12,311	1,855	15.1%	675	5.5%	2,093	17.0%	906	7.4%	1,343	10.9%
Dryden (V)	1,890	259	13.7%	90	4.8%	178	9.4%	1,832	131	7.2%	79	4.3%	150	8%	163	8.9%	205	11.2%
Enfield (T)	3,512	432	12.3%	226	6.4%	467	13.3%	3,541	610	17.2%	209	5.9%	261	7.4%	87	2.5%	392	11.1%
Freeville (V)	520	74	14.2%	32	6.2%	44	8.5%	501	66	13.2%	22	4.4%	43	8.6%	14	2.8%	57	11.4%
Groton (T)	3,587	454	12.7%	196	5.5%	220	6.1%	3,685	664	18.0%	204	5.5%	344	9.34%	204	5.5%	469	12.7%
Groton (V)	2,363	378	16.0%	137	6%	121	5%	2,287	434	19%	121	5%	114	5%	66	0.0%	308	13%
Ithaca (C)	30,014	1,769	5.9%	700	2.3%	8,721	29.1%	30,568	2,021	7%	546	1.8%	9,631	32%	6,551	21.4%	2,258	7.4%
Ithaca (T)	16,201	1,813	11.2%	665	4.1%	1,688	10.4%	16,233	2,029	12.5%	655	4.0%	1,924	11.9%	2,631	16.2%	1,287	7.9%
Lansing (T)	7,504	1,021	13.6%	379	5.1%	307	4.1%	7,912	1,414	17.9%	480	6.1%	609	7.7%	742	9.4%	488	6.2%
Lansing (V)	3,529	381	10.8%	194	5.5%	359	10.2%	3,417	328	9.6%	291	8.5%	349	10.2%	922	27.0%	195	5.7%
Newfield (T)	5,179	627	12.1%	305	5.9%	455	8.8%	5,218	879	17%	408	7.8%	594	11%	180	3.4%	567	10.9%
Trumansburg (V)	1,797	323	18.0%	96	5.3%	101	5.6%	1,760	311	17.7%	35	2.0%	99	5.6%	70	4%	221	12.6%
Ulysses (T)	3,103	522	16.8%	138	4.4%	236	7.6%	3,223	883	27.4%	60	1.9%	289	9.0%	90	2.8%	378	11.7%
<b>Tompkins County (Total)</b>	<b>101,564</b>	<b>10,929</b>	<b>10.8%</b>	<b>4,322</b>	<b>4.3%</b>	<b>14,949</b>	<b>14.7%</b>	<b>102,962</b>	<b>13,561</b>	<b>13.2%</b>	<b>4,254</b>	<b>4.1%</b>	<b>17,500</b>	<b>17.0%</b>	<b>13,283</b>	<b>12.9%</b>	<b>9,285</b>	<b>9.0%</b>

Source: U.S. Census Bureau, Census 2010; HAZUS-MH; American Community Survey (ACS) 2014-2018

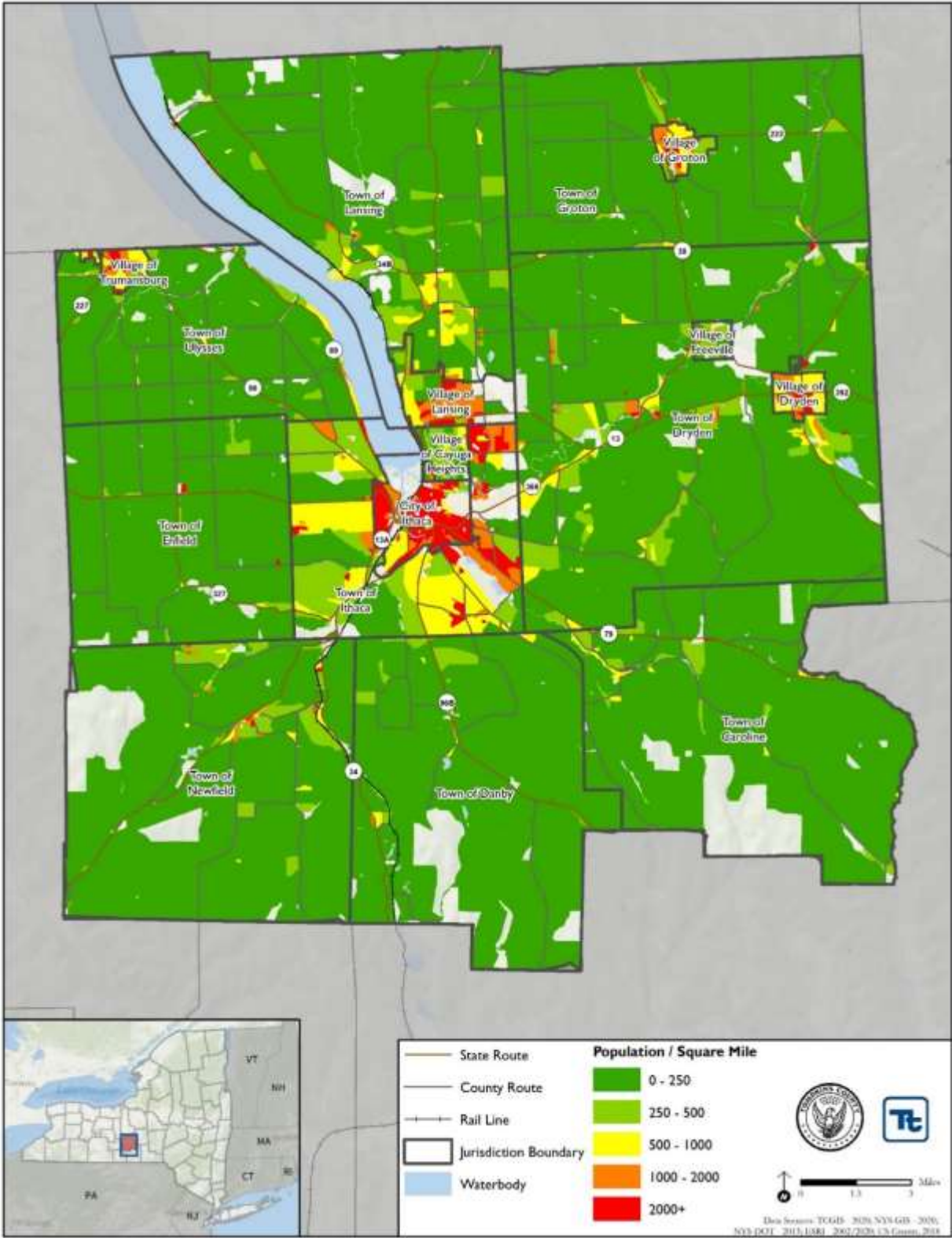
Note (1): The town populations exclude all associated villages within the town in the ACS estimates.

Pop. = Population, V = Village, T = Town, % = Percent

\* Low income population from HAZUS-MH v4.2 is the total of individuals with income \$0-\$10,000 and \$10,000-\$20,000 and \$20,000-\$30,000/year.



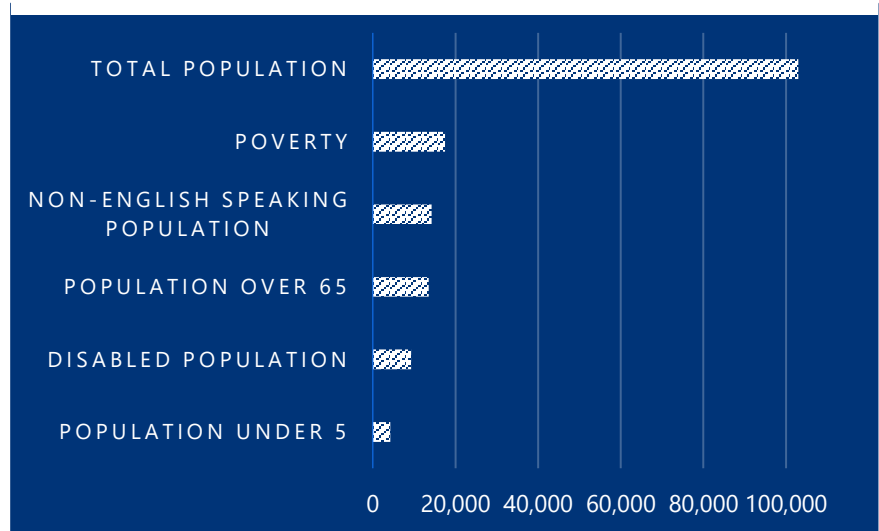
Figure 4-6. Distribution and Density of General Population for Tompkins County, New York



## 4.2.1 Vulnerable Populations

DMA 2000 requires that HMPs consider socially vulnerable populations. These populations can be more susceptible to hazard events based on many factors, including their physical and financial ability to react or respond during a hazard and the location and construction quality of their housing. The vulnerable populations with particular focus for this plan include (1) the elderly (persons aged 65 and over) and (2) those living in low-income households. In the current plan, additional vulnerable populations are identified including: the physically or mentally disabled, and non-English speakers. Identifying concentrations of vulnerable populations can assist communities in advancing preparedness, response, and mitigation actions.

*Figure 4-7. Vulnerable Population Statistics in Tompkins County, New York*

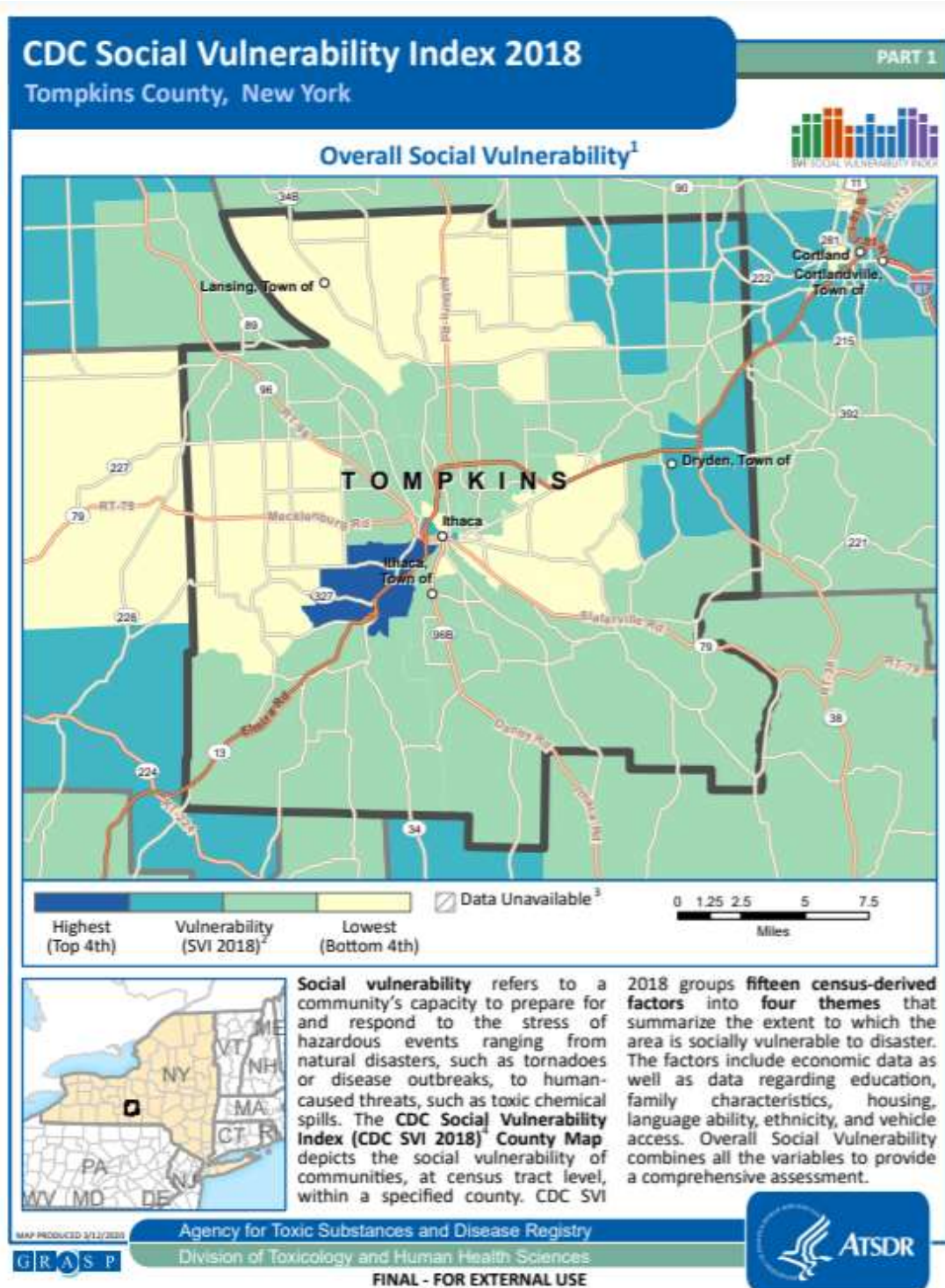


Populations with a higher level of vulnerability can be more seriously affected during the course of an emergency or disaster. Vulnerable populations have unique needs that need to be considered by public officials to help ensure the safety of demographics with a higher level of risk. Figure 4-7 provides Tompkins County Vulnerable Population Statistics.

The Centers for Disease Control and Prevention’s (CDC) 2016 Social Vulnerability Index (SVI) ranks U.S. Census tracts on socioeconomic status, household composition and disability, minority status and language, and housing and transportation. An indication of the distribution of socially vulnerable populations is provided in Figure 4-8. Being aware of the County’s overall ranking can help inform how the communities may react to a natural disaster upon available resources.



Figure 4-8. Tompkins County Social Vulnerability Index



Source: CDC 2021





### 4.2.1.1 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 (65 and over) are more likely to have difficulty accessing 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 is at the discretion of facility operators. According to the 2018 American Community Survey 5-Year Estimates, the median age in Tompkins County was 30.9 years. The lower age is likely due to the demographic influence of Cornell University, home to approximately 15,000 undergraduates (<https://www.cornell.edu/about/facts.cfm>) and Ithaca College and Tompkins County Community College.

HAZUS-MH reports 4.3 percent of the 2010 Tompkins County population is under the age of 5 and 10.8 percent is over the age of 65. Of the 2018 population, 4.1 percent is under the age of 5 and 13.2 percent is over the age of 65. Table 4-5 and Figure 4-9. shows the distribution of persons over 65 and under the age of 16 throughout Tompkins County.

### 4.2.1.2 Income

The 2018 American Community Survey 5-Year Estimates provides that the median household income in Tompkins County was \$58,743 and the per capita income was \$32,261. 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 14.1 percent of people live below the poverty level within the County. Again, these figures are impacted by the large presence of college students in the community.

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 4-9 below which illustrates the low-income population density in Tompkins County.

### 4.2.1.3 Physical or Mental Disabilities

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, 9,285 of 102,962 people, that is 9.1 percent of residents in Tompkins County are living with a disability. Figure 4-9 shows the geographic distribution of disabled individuals throughout Tompkins County, including individuals living with hearing, vision, cognitive, ambulatory, self-care, and independent living difficulties.

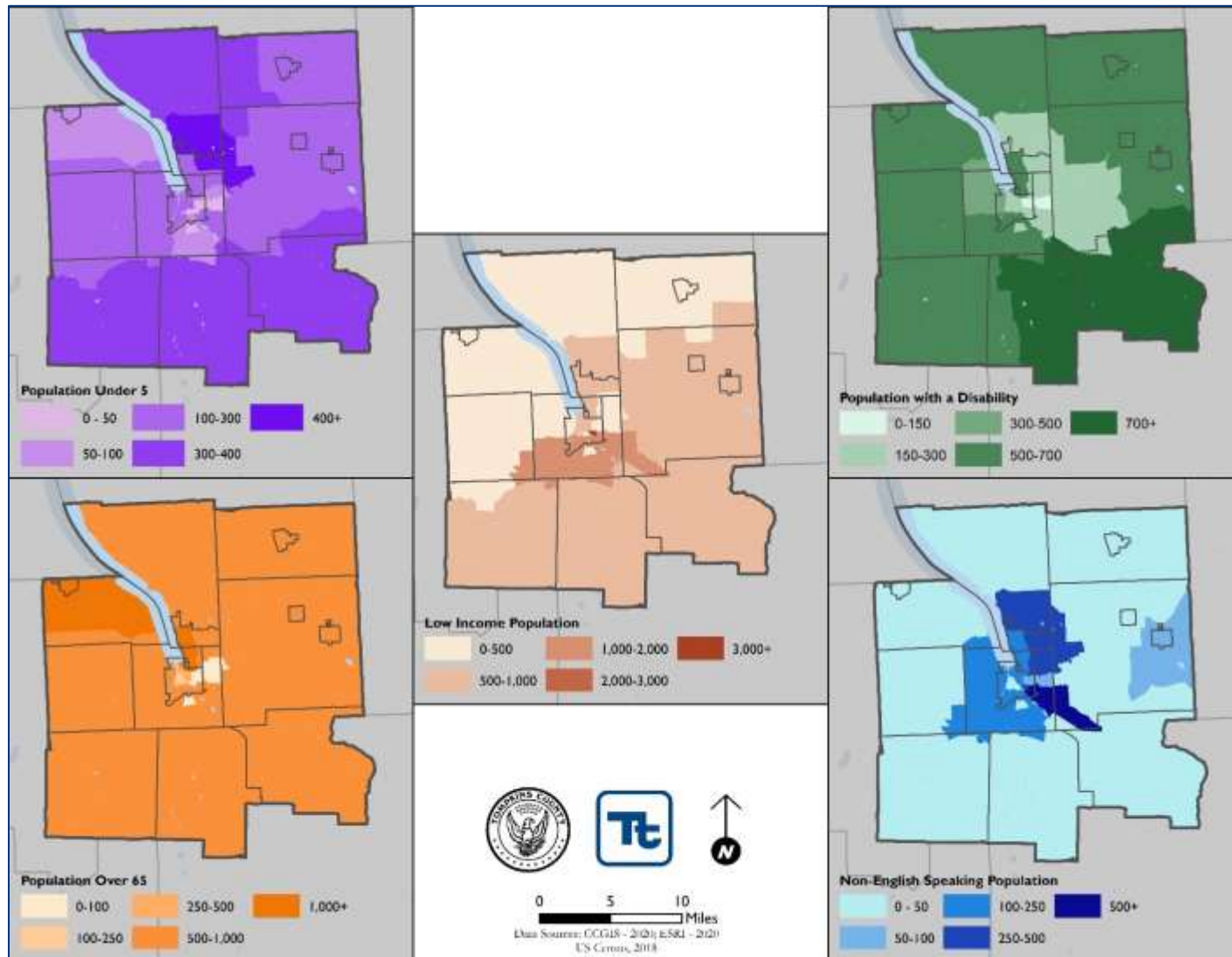
#### 4.2.1.4 Non-English Speakers

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, 14.4 percent of the County's population over the age of 5 primarily speaks a language other than English at home. Within that group, approximately 6,835 individuals are reported as speaking English "less than very well." Of the County's households, 8.5 percent speak Asian and Pacific Islander languages, 5.5 percent speak other Indo-European languages, and 2.8 percent speak Spanish. Figure 4-9 shows the geographic distribution of individuals who speak English less than "very well."





Figure 4-9. Distribution of Socially Vulnerable Populations in Tompkins County, New York



## 4.2.2 General Building Stock

The 2018 American Community Survey data identifies 39,326 households in Tompkins County. The 2018 American Community Survey data estimate that the majority of housing units (50.8 percent) in Tompkins County are single-family, detached units. The U.S. Census Bureau defines household as all the persons who occupy a housing unit and a housing unit as a house, an apartment, a mobile home, a group of rooms, or a single room that is occupied (or if vacant, is intended for occupancy) as separate living quarters. The median price of a single-family home in Tompkins County was estimated at \$199,400 in 2018 (American Community Survey 2018).

For this update, the default general building stock in HAZUS-MH v4.2 was updated and replaced with a custom-building inventory for Tompkins County. The building inventory was developed using the most recent Tompkins County tax parcels, Real Property System tax data, and building footprints provided by Tompkins County ITS. Tetra Tech calculated the replacement cost values (structure and contents) using RSMeans 2019 construction cost data. Generally, contents for residential structures are valued at about 50 percent of the building's value. For non-residential facilities, the value of the content is generally about equal to the building's structural value.

The updated building inventory contains 55,648 buildings with a total building replacement value (structure and content) of greater than \$71 trillion. This inventory was incorporated into HAZUS-MH at the structure and aggregate level. Approximately 78.7-percent of the buildings (approximately 43,800 buildings) and 40.3-percent of the building stock replacement value are associated with residential housing. Commercial buildings make up the second building classification at approximately 12.7-percent of the total building replacement value. The Town of Dryden has the greatest number of structures (8,515) and the Village of Freeville has the smallest number of structures (409). Table 4-6 illustrates the percentage of total building replacement value by occupancy.



Table 4-6. Build Replacement Value by Occupancy in Tompkins County, NY

Municipality	Count	All Occupancies			Residential		Commercial		Industrial	
		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)
Caroline (T)	3,257	\$1,487,983,728	\$1,035,124,619	\$2,523,108,347	2,403	\$1,358,577,326	488	\$522,037,081	9	\$5,223,808
Cayuga Heights (V)	1,183	\$988,872,975	\$559,792,934	\$1,548,665,909	1125	\$1,287,240,123	36	\$97,858,115	0	\$0
Danby (T)	3,008	\$1,283,019,129	\$905,435,192	\$2,188,454,321	2262	\$1,132,751,811	602	\$658,664,565	3	\$2,740,830
Dryden (T)	8,518	\$4,907,823,127	\$3,833,082,976	\$8,740,906,102	6,628	\$3,224,220,454	1252	\$2,249,129,019	38	\$406,854,476
Dryden (V)	1,022	\$666,257,304	\$468,851,796	\$1,135,109,100	886	\$592,216,526	110	\$424,696,715	4	\$17,720,823
Enfield (T)	3,559	\$1,570,072,362	\$1,166,395,869	\$2,736,468,231	2,738	\$1,211,029,479	477	\$665,584,455	2	\$2,285,444
Freeville (V)	409	\$207,286,264	\$149,413,031	\$356,699,295	294	\$173,619,699	41	\$48,310,505	1	\$4,351,018
Groton (T)	3,610	\$1,603,681,200	\$1,201,120,142	\$2,804,801,342	2,557	\$1,207,683,173	532	\$553,733,210	11	\$58,870,604
Groton (V)	1,205	\$706,329,422	\$496,841,768	\$1,203,171,190	1,059	\$628,462,960	110	\$470,116,968	5	\$14,329,050
Ithaca (C)	7,450	\$10,958,043,807	\$8,754,261,867	\$19,712,305,674	6,280	\$6,611,345,821	795	\$7,258,972,188	31	\$325,010,374
Ithaca (T)	6,080	\$6,086,221,207	\$4,781,960,379	\$10,868,181,586	4,919	\$3,912,782,485	393	\$1,044,784,625	15	\$121,899,166
Lansing (T)	6,010	\$3,596,528,415	\$2,673,662,618	\$6,270,191,033	4,706	\$2,768,597,390	706	\$1,738,318,397	69	\$463,367,469
Lansing (V)	1,055	\$1,952,464,025	\$1,483,579,611	\$3,436,043,635	813	\$1,406,653,242	204	\$1,566,545,224	14	\$209,803,783
Newfield (T)	4,669	\$2,180,669,291	\$1,667,535,382	\$3,848,204,673	3,638	\$1,539,401,729	650	\$1,110,380,232	6	\$51,659,570
Trumansburg (V)	1,061	\$721,251,257	\$520,298,713	\$1,241,549,970	950	\$602,857,632	77	\$416,067,237	1	\$1,598,098
Ulysses (T)	3,552	\$1,918,550,903	\$1,453,593,545	\$3,372,144,448	2,542	\$1,394,872,075	620	\$795,052,612	11	\$14,470,124
Tompkins County (Total)	55,648	\$40,835,054,415	\$31,150,950,440	\$71,986,004,856	43,800	\$29,052,311,925	7,093	\$19,620,251,148	220	\$1,700,184,636

Source: Tompkins County GIS 2019, RS Means 2019

Notes: T = Town, V = Village



Appendix E presents Building Stock Statistics by Occupancy Class for Tompkins County based on HAZUS-MH provided data.

Figure 4-10 through Figure 4-12 show the distribution and exposure density of residential, commercial, and industrial buildings in Tompkins County. Exposure density is the dollar value of structures per unit area, including building content value. Generally, contents for residential structures are valued at about 50 percent of the building's value. For commercial facilities, the value of the contents is generally about equal to the building's structural value. The densities are shown in units of \$1,000 (\$K) per square mile.

Viewing exposure distribution maps, such as Figure 4-10 through Figure 4-12 can assist communities in visualizing areas of high exposure and in evaluating aspects of the study area in relation to the specific hazard risks.





Figure 4-10. Distribution of Residential Building Stock and Value Density in Tompkins County, New York

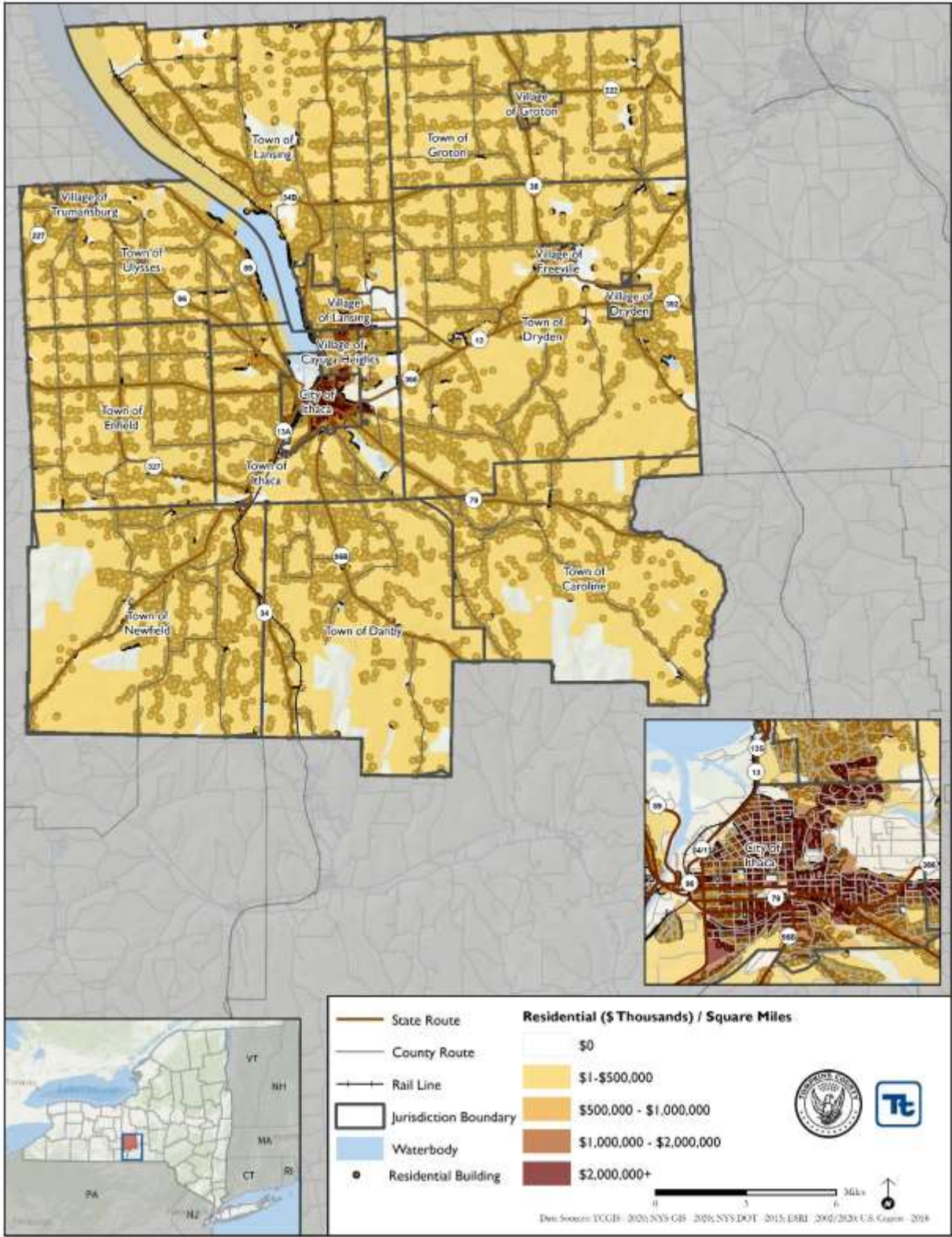




Figure 4-11. Distribution of Commercial Building Stock and Exposure Density in Tompkins County, New York

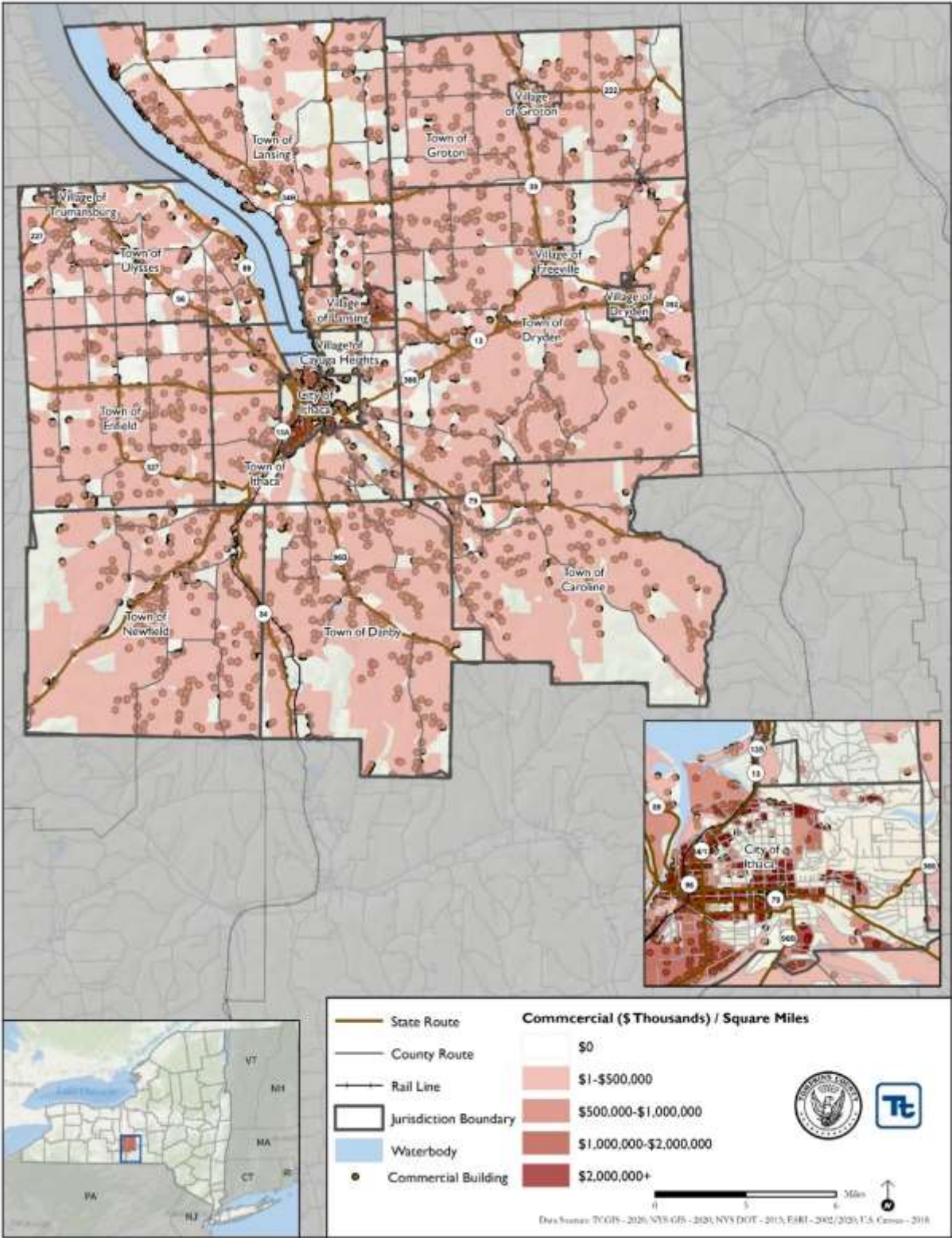


Figure 4-12. Distribution of Industrial Building Stock and Value Density in Tompkins County, New York





## 4.3 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.

### 4.3.1 Land Use Trends

According to the Tompkins County Comprehensive Plan, the County has a development pattern that consists of a spectacular natural landscape, a vibrant college-town urban center, and a diversity of developed landscapes that reflect urban, suburban, and rural development typologies (Tompkins County Comprehensive Plan 2015). The following sections present an overview of the County economy.

#### 4.3.1.1 Economy

The U.S. Census Bureau's County Business Pattern provides an annual series of sub-national economic data by industry covering. This Census includes majority of the country's economic activity. According to the 2017 Tompkins County Business Pattern, the County was home to 2,377 business establishments employing 48,258 people. The role of Cornell University as a major direct and indirect employer is significant in addition to other institutions in the "Education Services" sector. Based on included data, it is anticipated that this accounts for up to nearly 20,000 jobs and \$800 million in payroll. Absent Education Services as the potentially largest employment sector, Tompkins County's largest industries by size include the Healthcare and social assistance sector (6,112 employees and \$256 million in payroll) followed by the accommodation/food services and retail industries, each employing between 4,500 and 5,000 people and supporting \$92 million and \$122 million in annual payroll, respectively.

Table 4-7. provides 2017 industry and employment information in Tompkins County.



Table 4-7. 2017 Economic Census for Tompkins County, New York

Sector	Number of establishments	Number of employees	Annual payroll (\$1,000)
<b>Total for all sectors</b>	<b>2,377</b>	<b>48,258</b>	<b>\$ 1,925,760.00</b>
Agriculture, forestry, fishing, and hunting	6	286	\$ 11,407.00
Mining, quarrying, and oil and gas extraction	4	c	S
Utilities	3	c	S
Construction	188	973	\$ 43,641.00
Manufacturing	88	2,919	\$ 147,021.00
Wholesale trade	45	591	\$ 27,255.00
Retail trade	348	4,958	\$ 122,777.00
Transportation and warehousing	42	552	\$ 24,320.00
Information	66	977	\$60,478.00
Finance and insurance	99	1,167	\$82,428.00
Real estate and rental and leasing	127	713	\$ 26,575.00
Professional, scientific, and technical services	291	2,191	\$ 135,119.00
Management of companies and enterprises	8	539	\$ 48,028.00
Administrative and support and waste management and remediation services	115	746	\$22,236.00
Educational services	38	18,014	S
Health care and social assistance	284	6,112	\$ 256,722.00
Arts, entertainment, and recreation	62	598	\$ 12,506.00
Accommodation and food services	334	4,646	\$ 92,232.00
Other services (except public administration)	228	1,295	\$38,062.00

Source: U.S. Census, County Business Pattern 2017

\* = This number only includes paid employees

C = 100-249 employees

J = high noise infusion

S = Withheld

### 4.3.1.2 Agriculture

Tompkins County is home to a robust agriculture industry. With about 523 farms on at least 91,227 acres, agriculture comprises between one-quarter and one-fourth of land cover in the County. The total value of agricultural products sold in 2017 was \$64.7 million, a four percent decrease from 2012. Net cash farm income has increased significantly in recent years to \$16.8 million. Crops comprise one-quarter of sales, whereas livestock, poultry, and related products totaled three-quarters of sales. In terms of use, 68% of land is used for cropland, 16% is used as woodland, and seven percent is used as pastureland (U.S. Department of Agriculture National Agricultural Statistics Service 2017).

The vast majority of farm sales in Tompkins County are derived from dairies (\$41.1 million). This is followed by cattle and calves (\$6.4 million) and grains, oilseeds, dry beans, and dry peas (\$5.1 million). The County ranks third in the State and 78<sup>th</sup> nationally for sales of cultivated Christmas trees and short rotation woody crops. In



terms of acreage, most crops in the County are forage such as hay. Of the 523 farms in the County, 93 are family farms and at least seven farm organically.

### 4.3.1.3 Corridors and Gateways

Though no interstates pass through Tompkins County, the region has a robust road network connecting it to the region and surrounding counties. Access to the nearest interstate – Interstate 81 – is through NYS Route 13 via Cortland or NYS Route 79 via Lisle and Whitney Point. Access to I-86 is provided via NYS Route 13 through Horseheads. The Principal Arterial Expressway in the County is NYS Route 13 between Hanshaw Road in the Town of Ithaca and Hancock Street in the City of Ithaca. NYS Routes 13 and 79 are both considered Principal Arterials alongside major roadways such as Fulton Street, South Meadow Street, West Seneca Street, and West Green Street.

Other major routes in the County include Minor Arterials such as those listed below. The City of Ithaca has several Minor Arterials passing through the City. These roads include:

- Route 13A
- Route 34
- Route 38
- Route 79
- Route 96
- Route 366
- Elmira Road
- Pine Tree Road
- Pleasant Grove Road
- Triphammer Road
- Warren Road

Figure 4-13 illustrates the transportation corridors in Tompkins County.





Figure 4-13. Transportation Corridors of Tompkins County, New York



## 4.3.2 Population Trends

Tompkins County has seen a slight population increase as illustrated. Two Census Bureau products were used in the population trends section. The 2010 Census is the official population count of a municipality which is performed every ten years. The American Community Survey is performed on a more frequent basis to provide updated population and demographics information to communities.

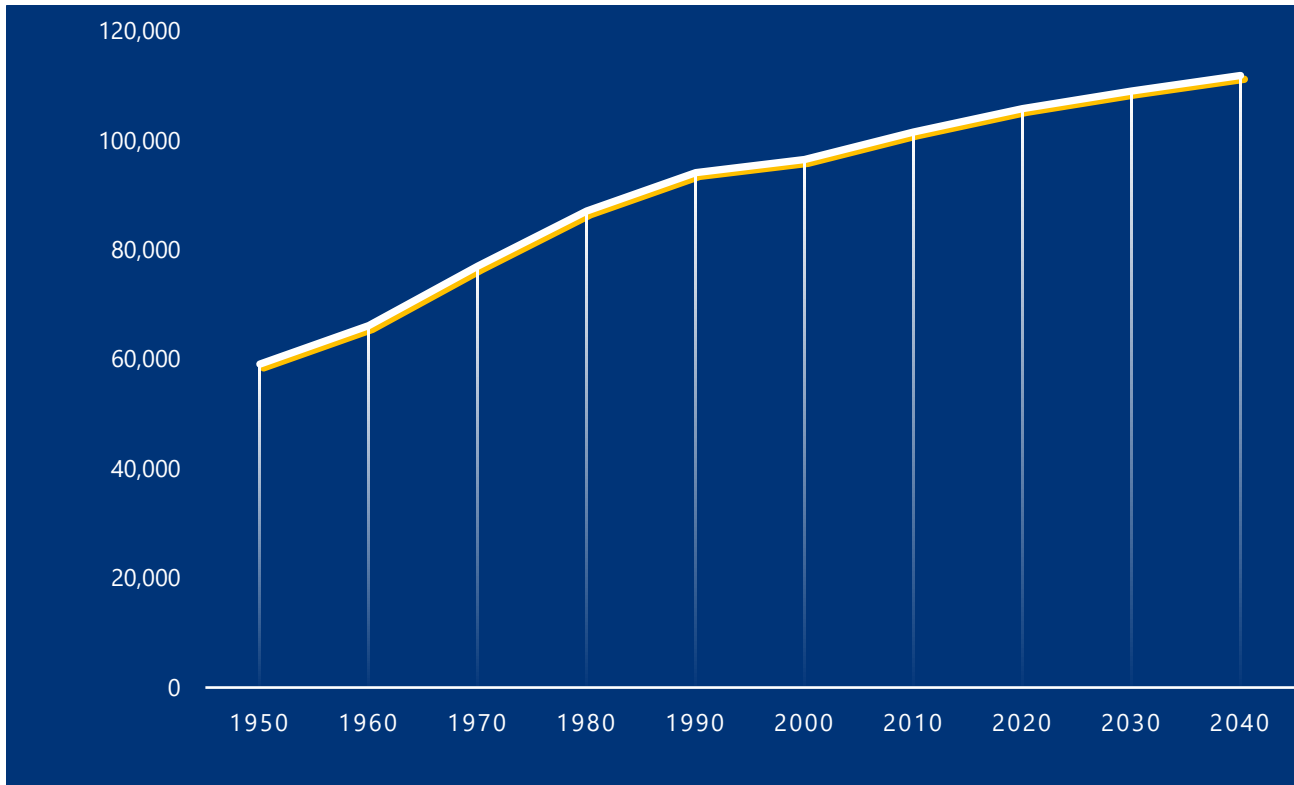
All but three counties have seen population increases between the 2010 and 2018 American Community Surveys. Based on historical data, population projections have been created which show Tompkins County's population to continue to increase over time. However, even as the County's total population has grown, the number of residents under the age of five has decreased by 2.2 percent, while the population of those over the age of 65 has increased by 28.6%.

Cornell University has a large influence on the demographics of the County. With more than 23,000 students and nearly 9,900 employees, the University generates a significant amount of economic activity and provides socioeconomic diversity. Ithaca College, with more than 5,800 students and over 1,700 employees, and TC3 with 5500 students, and over 200 employees also contribute to this influence on demographics. Because the U.S. Census is calculated based on residence on April 1, students at Cornell University and Ithaca College are counted as local residents. This effect is most pronounced in the median age for the City of Ithaca, which is 21.9 years compared to the County-wide median age of 30.9 years (American Factfinder).

The U.S. Census Bureau estimates that Tompkins County's population in 2018 was 102,962 (American Factfinder), a 1.3 percent increase from 2010 population of 101,564 (U.S. Census). The County's population has been increasing steadily since 1950, as shown in Figure 4-14 on the following page. Though 2017-2018 saw a slight decline in the estimated population, the overall trend has been towards population growth and continued growth for the future. Figure E-1 in Appendix E (Supplementary Data) illustrates the municipal population change over this period.



Figure 4-14. Population Change 1950 to 2040 in Tompkins County, New York



Source: U.S. Census Bureau

### 4.3.3 Future Growth and Development

Compared to most Upstate New York communities, Tompkins County is experiencing high rates of new development, particularly along major arterials such as State Route 13, 96, and 79. Much of this development is centered around the Town and City of Ithaca, as well as Cornell University which stretches in to neighboring municipalities including parts of Lansing and Dryden. These new developments include commercial, residential, mixed use, utility (solar energy and communication development), and industrial projects. In part due to its location amidst the Finger Lakes, the County also has a relatively active tourism sector and thus development centered around agricultural production, processing, and distribution.

Historically, general development patterns in Tompkins County have been more similar to other communities across Upstate New York. Since the second half of the 20<sup>th</sup> century, development in Tompkins County has been dominated by suburban sprawl from urban into rural areas. The urban sprawl around the City of Ithaca and its urban sprawl has had major impacts on all its surrounding communities especially the Town of Lansing and Dryden which has seen significant development along the Route 13 corridor (Tompkins County Comprehensive Plan, 2015). Tompkins County annually tracks the type and scale of development that is referred for review subject to NYS General Municipal Law 239. This information in combination of its regular Land-Use Land Cover analysis gives a good sense of where development is occurring throughout the county.-



Due to concerns regarding urban sprawl's negative effect on the existing natural systems and its effects on climate change, the County has been focusing on increasing nodal development that is oriented toward pedestrians and multiple transportation alternatives, rather than dependent on private automobiles. While suburban sprawl had been the norm for sixty-plus years, in recent years most new development has occurred within the County's urban center (which includes the City of Ithaca, much of the Town of Ithaca and the Villages of Cayuga Heights and Lansing). During the earlier trend, roughly two-thirds of new development had occurred in the county's villages and city. That trend has reversed, with two-thirds of new development occurring within the urban core.

While the County does not have direct land use regulatory authority, it has proposed a Development Focus Area Strategy to help encourage development where infrastructure can support it. Such recommendations include infill development within existing urban centers that can accommodate denser development and increased development within existing community nodes across the County. It is the general goal and aspiration of the County to decrease suburban sprawl and develop interconnected communities to increase sustainability and decrease vulnerability to climate change (Tompkins County Comprehensive Plan, 2015).

An indication of development since the 2015 Tompkins County HMP is provided on a municipal basis in each of the Section 9 annexes of this plan wherein each participating jurisdiction has provided a list of permits for major development since 2015 as well as anticipated development within its boundaries. The annex maps display the identified recent and anticipated development in each community and their location to hazard areas (e.g. flood hazard area and WUI).

## 4.4 Housing and Relocation

Tompkins County and its municipalities recognize the need to identify potential sites for temporary housing during and after a disaster event and relocation of structures out of hazard areas.

### 4.4.1.1 Temporary Housing

During the planning process, each municipality was asked to identify potential locations for temporary housing in the event of an emergency. The locations identified by the municipalities are documented in Section 9 (Jurisdictional Annexes). Communities discussed and documented a wide range of temporary housing locations. Those that could identify temporary housing locations agreed that those areas should be located well outside of high hazard areas, namely outside mapped Special Flood Hazard Areas. Several of the Villages had very little safe, vacant land outside of these areas, and as such identified the need to coordinate with the surrounding Town for a good location for temporary housing. Fortunately, Tompkins County does have a wide variety of options that would vary based on the situation and need. Communities discussed a range of locations for potential temporary housing including unoccupied residence halls in and around Ithaca at Cornell University, Ithaca College and in Dryden at Tompkins-Cortland Community College; State Park Land including



cabins, campgrounds and bathrooms at each of the 4 State Parks in the County (some of these parks serve as the historic temporary housing for the Civilian Conservation Corps); municipal park land were also identified by many as locations where campers or trailers could be located over the short-term; the wide range of hotels and motels that normally supports academic and tourist activity could be repurposed for temporary housing as has been the case in supporting positive COVID cases; and various large vacant land was flagged as potential location. While a range of safe locations were identified they would certainly need to be further investigated and formalized in a given hazard situation.

#### 4.4.1.2 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) Mapped wetlands.
- 3) Federal, state and county park land.
- 4) Land that has steep slopes (>20% gradient) without consideration of ownership or availability.

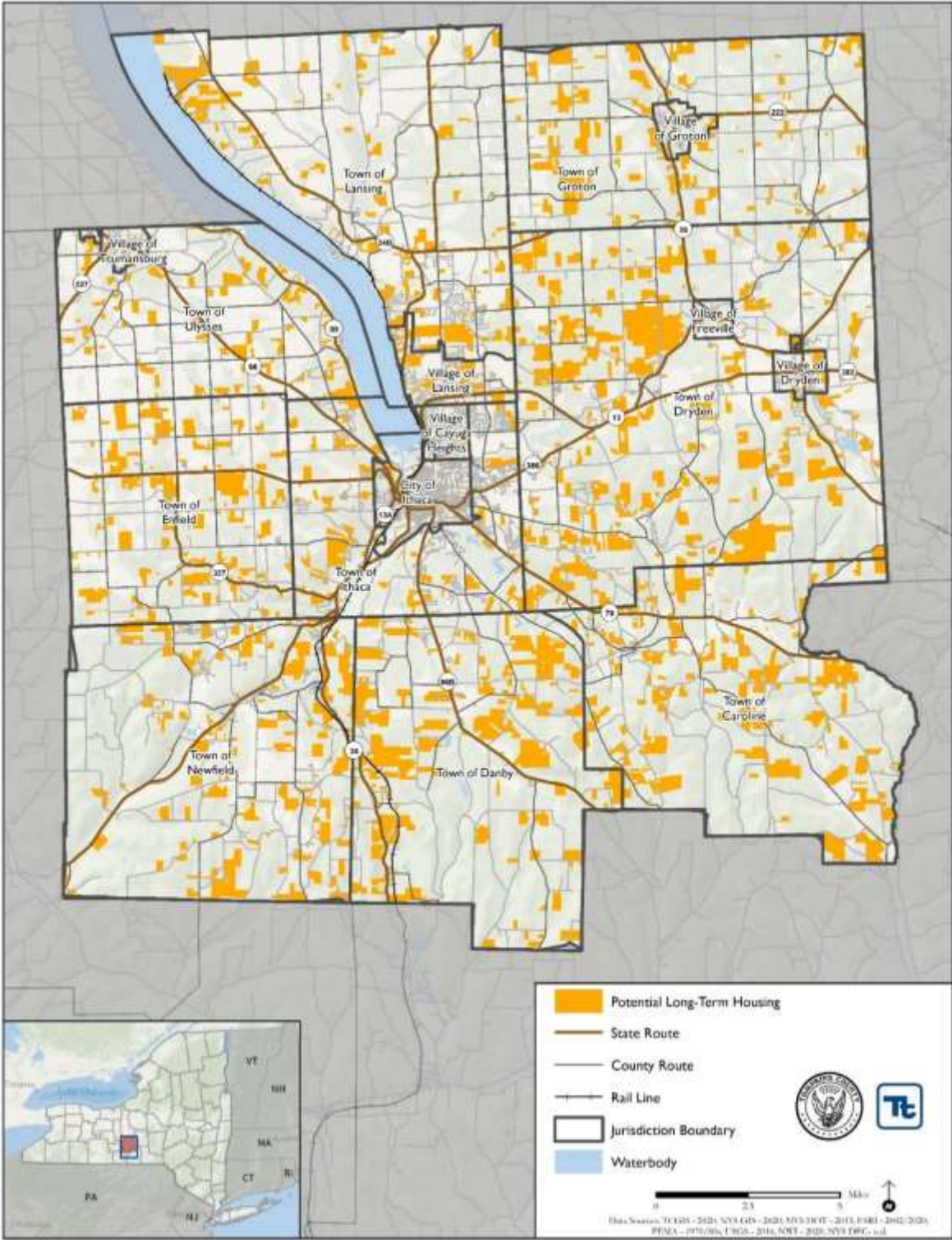
Each municipality has additionally identified the specific location where increased housing density would be appropriate in their individual Comprehensive Plans. In all but three municipalities, the location where long-term housing has further been articulated in their local zoning codes.

Figure 4-15 provides a buildable land analysis to identify potential long-term housing locations in Tompkins County. A more in-depth analysis of the appropriateness of long-term housing is done by each municipality and focuses in on areas that best align with broad ranging community goals.





Figure 4-15. Potential Long-Term Housing Locations in Tompkins County, New York



### 4.4.1.3 Anticipated Evacuation Routes

As part of the planning process, Tompkins County has unofficially identified potential evacuation routes and procedures in the event of a disaster that would warrant an evacuation, as shown in Figure 4-16. At the time of the plan development, evacuation routes have not been formally identified by the County. Thus it was necessary for the consultant and County to develop a general definition for potential evacuation routes. Due to the overall unpredictable nature of the hazards identified in Tompkins County, evacuation routes can vary depending on type and overall magnitude of event. Therefore the overall practicality of establishing evacuation routes is lacking and further studies and discussion would need to be conducted in order to fully understand the purpose of evacuation routes in Tompkins County.

For the general definition, the County has determined that all State Routes entering and exiting the County are the primary evacuation routes for all municipalities. Each municipality in Tompkins County has at least one State Route crossing through it. Therefore, it is reasonable to assume that this list of routes would be relevant to all municipalities:

- New York State Route 96 (Ulysses, Enfield, Trumansburg)
- New York State Route 79 (Caroline, Ithaca, Enfield)
- New York State Route 34/13 South (Ithaca, Newfield, Enfield)
- New York State Route 13 North (Ithaca, Village of Lansing, Village of Cayuga Heights, Dryden)
- New York State Route 34 North (Ithaca, Lansing)
- New York State Route 96B (Ithaca, Danby)
- New York State Route 38 (Freeville, Groton (T/V))

Care should be taken to ensure evacuation routes work around mapped Special Flood Hazard Areas as this is the area most likely to be affected in a flood hazard event. As flood maps are updated the County will further refine evacuation routes around those areas and develop a strategy for outreach to those residents and employees in this frequently impacted areas. In areas of lower flood risk, there is less of a need for clarification of evacuation routes.

Note all routes are centered around Ithaca and branch out in all directions into all municipalities. Thus, for the City and Town of Ithaca, residents may determine the best route based on their circumstances and location within the City/ Town of Ithaca. Note that because Ithaca is one of the lowest in elevation compared to the surrounding municipalities, in case of flooding, communities that are not in Ithaca are encouraged to head in the opposite direction of Ithaca. At time of any specific emergency, Tompkins County Department of Emergency Response will help to clearly communicate through its Swift911 system and through other formats to the public the safest evacuation route.





Figure 4-16. Potential Evacuation Routes in Tompkins County



## 4.5 CRITICAL FACILITIES AND COMMUNITY LIFELINES

Critical facilities and infrastructure are essential to the health and welfare of the population and provide services that support the continuation of operations and essential services. The importance of these facilities is realized in the wake of any hazard event. Critical facilities typically 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<sup>i</sup> (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.

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

**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.

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 and for sake of this plan includes critical facilities and infrastructure, that, when stabilized, enable all other aspects of society. Following a disaster event, intervention is required to stabilize community lifelines. Community lifelines are divided by FEMA into seven categories:

- 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 Tompkins County are categorized under the seven lifeline categories. In order to do so, a comprehensive inventory of lifelines and critical facilities in Tompkins County was developed from various sources, including existing inventories of utility facilities, public assets, emergency management facilities, transportation lines/ facilities, and datasets that contain facilities that provide essential services. Additional guidance and input were provided by the Steering and Planning Committees. The County provided a list of critical facilities to each participating jurisdiction for their review and lifeline identification.

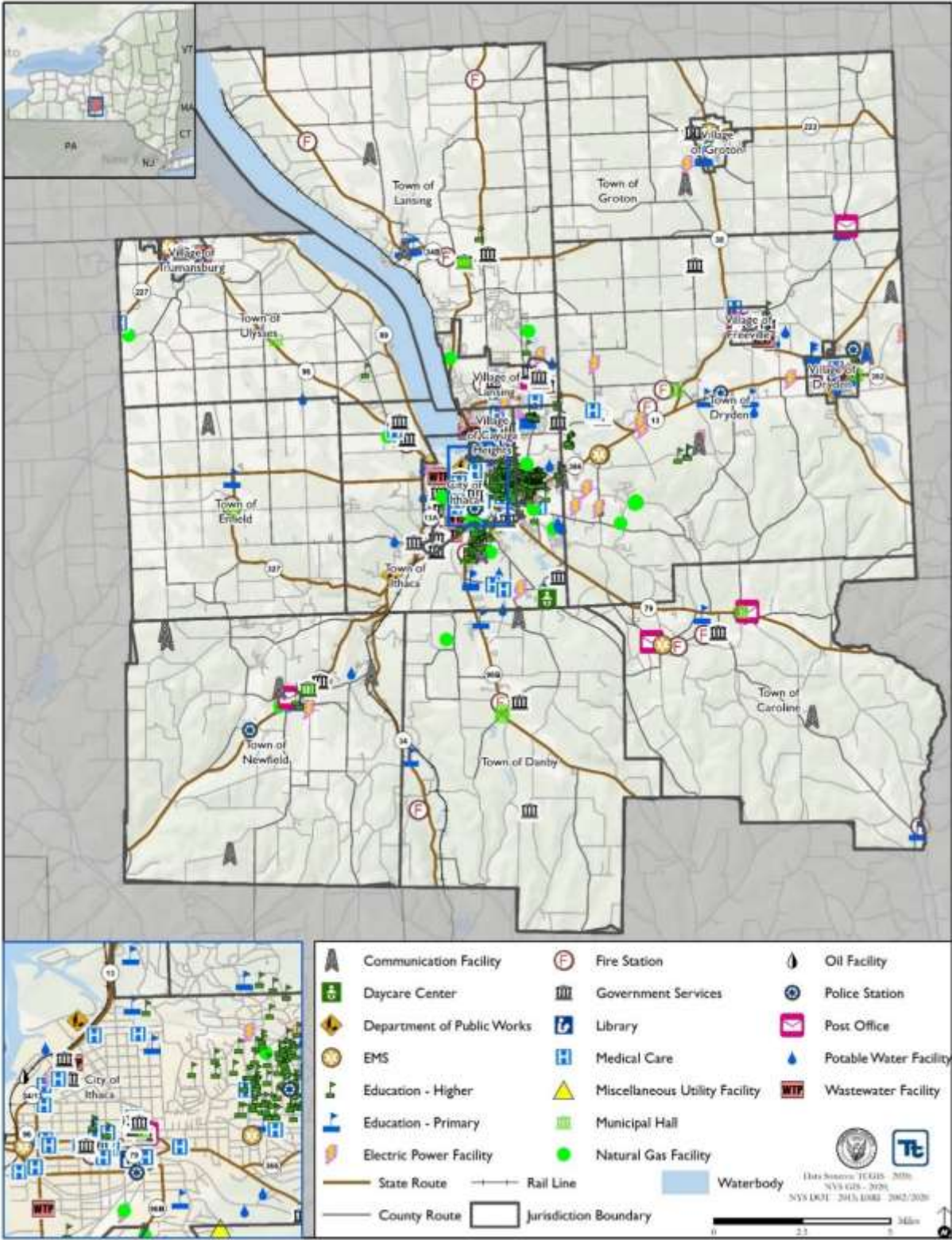


The inventory of community lifelines and critical facilities presented in this section represents the current state of this effort at the time of publication of the HMP and used for the risk assessment in Section 5 (Risk Assessment). The number and type of community lifelines and critical facilities identified for this plan are indicated in Figure 4-17 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).





Figure 4-17. Tompkins County Community Lifelines



## 4.5.1 Safety and Security

This section provides information on Safety and Security lifelines. Critical facilities in this lifeline category include law enforcement/security, fire service, search and rescue, government services (e.g. EOCs, government offices, schools), and community safety (e.g. dams).

### 4.5.1.1 Emergency Facilities

Emergency facilities in Tompkins County includes police, fire, EMS, and medical care facilities. Figure 4-18 shows the location of the different emergency facilities located in Tompkins County. The figure shows police, fire, EMS, and medical care facilities.

The Tompkins County Department of Emergency Response is responsible for the following countywide services:

- Oversees emergency dispatch and communications system that allows residents to dial 911 to receive emergency medical, fire, police, or other emergency help from any phone in the County;
- Implements County Mutual Aid and Disaster Plans, which provide fire, emergency medical, and other agency assistance when local services have exceeded their local equipment and personnel resources; and
- Provides emergency medical personnel training in coordination with Tompkins-Cortland Community College and fire training with the NYS Office of Fire Prevention and Control.

Tompkins County emergency information is posted on the TompkinsREADY website ([www.tompkinsready.org](http://www.tompkinsready.org)). Disaster and emergency information is also broadcast from local radio stations: 870AM WHCU, 97.3FM WYXL, and 91.7FM WICB. Tompkins County utilizes a mass notification system, Swift911. Residents can register online to receive important information and announcements (Tompkins County Department of Emergency Response 2020).



Figure 4-18. Emergency Facilities in Tompkins County, New York





### 4.5.1.2 Schools

Tompkins County is home to seven public school districts, a public charter school, several smaller private schools, and three institutions of higher education, including Cornell University and Ithaca College (NYSED 2020). As of the 2018-2019 school year, the County had 10,484 public school students. This represents a slight decrease from 2012-2013, when there were 10,988 students enrolled in the district. Figure 4-19 shows the locations of public primary schools and schools of higher education throughout the County.



Figure 4-19. Public School Owned Properties in Tompkins County, New York





### 4.5.1.3 Dams and Levees

#### Dams

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 and how flood hazards impact these resources. For the purposes of this hazard mitigation plan, dams are not considered critical facilities, as the Steering and Planning Committees recognize that these facilities are covered by other regulatory instruments. These may be further addressed in other components of the Tompkins County Resiliency and Recovery Plan.

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 96 dams in Tompkins County: 26 low hazard, 4 Class B intermediate hazard dams, 5 Class C high hazard<sup>ii</sup>, 11 negligible or no hazard classification, and 51 with an unknown classification (NYS DEC 2021). Figure 4-20 shows the location of dams in the County. Table 4-8 provides the list of dams located in Tompkins County and associated information.

Each of the regularly updated Emergency Action Plans (EAPs) for the High Hazard Dams are filed in the office of the Tompkins County Department of Emergency Response. Each of 5 High Hazard dams have similar concerns, regular tracking of maintenance needs to ensure they operate as intended. Regular maintenance issues are identified and addressed through the New York State Department of Environmental Conservation's [Inspection and Maintenance](#) requirements. An issue of recent concern relates to the historic silt build up at dams and their related infrastructure. The City of Ithaca's dams most notably now require a significant amount



of dredging to return them to their intended function. The City most likely will need to seek outside funding to help dredge the Silt Dam that feeds the 60' dam and the City's drinking water. Due to the importance of this critical infrastructure and the heavy financial burden associated with their operation and maintenance the City, County and Town of Danby (Jennings Pond) to integrate policies to support maintenance and upkeep of dams into both the mitigation plan and connected community planning efforts. The Inundation Maps associated with each of the High Hazard Dam EAPs are a part of confidential Appendix K.



Figure 4-20 Location of Dams within Tompkins County

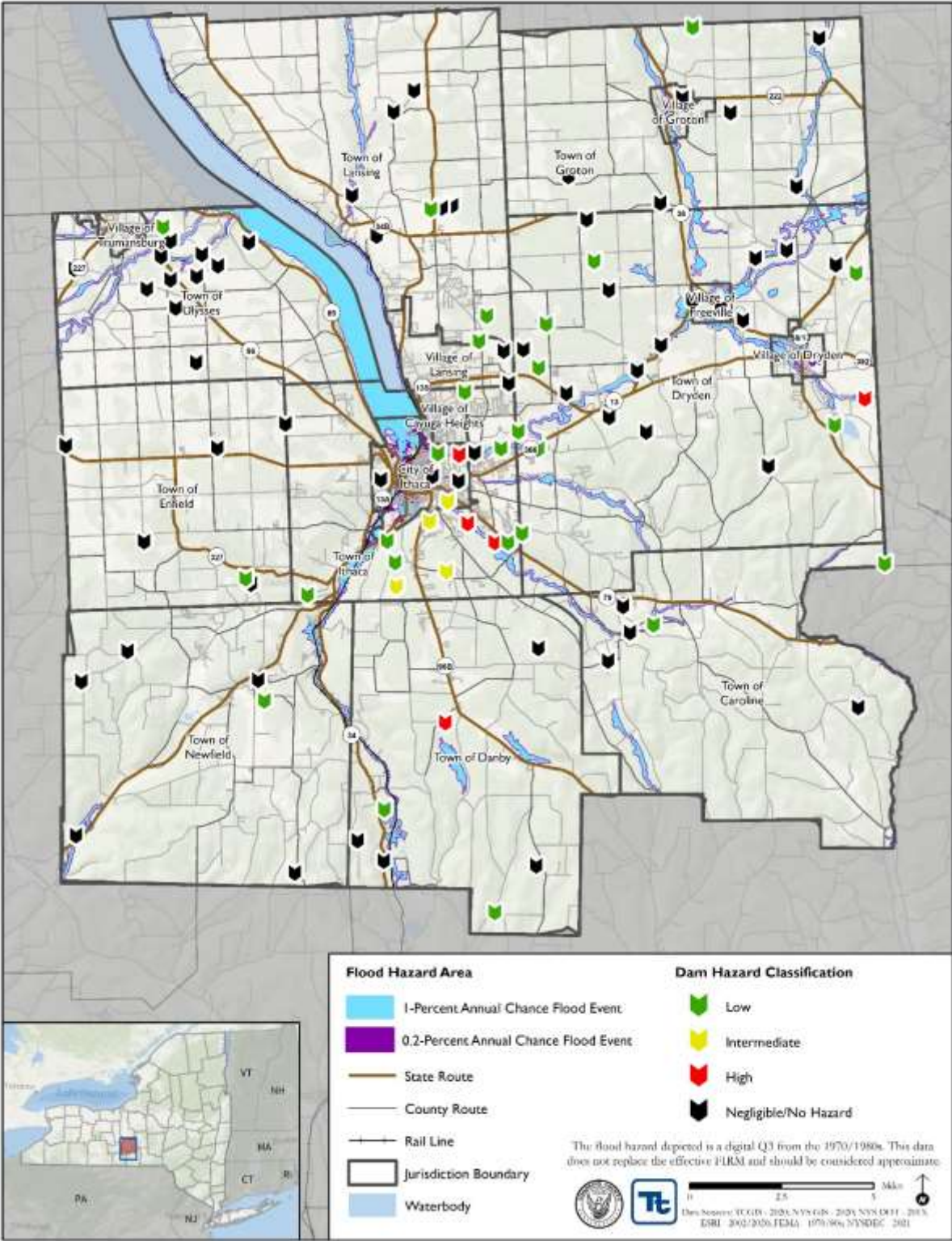


Table 4-8. Dams in Tompkins County

Dam Name	Location	Owner	Purpose	Classification	EAP?	Last Inspected	Condition
R C Swartwood Pond Dam	Town of Danby	D JACKSON COLEMAN	Recreation	Class A - Low Hazard	None	9/21/1987	Not Rated
R.h. Tremans Dam	Not Found	NYS PARKS & RECREATION FINGER LAKES	Recreation	Class A - Low Hazard	None	10/4/1995	Not Rated
Dave Austin Pond Dam	Not Found	DAVID AUSTIN	Recreation	Class A - Low Hazard	None	4/27/1999	Not Rated
Lower Buttermilk Dam	Not Found	MRS N VANORMAN	Other	Class A - Low Hazard	None	12/31/1901	Not Rated
Buttermilk Falls State Park Dam	Not Found	NYS PARKS & RECREATION FINGER LAKES	Recreation	Class A - Low Hazard	None	11/18/1976	Not Rated
Enfield Glen Dam	Town of Enfield	NYS PARKS & RECREATION FINGER LAKES	Recreation	Class A - Low Hazard	None	10/19/1989	Not Rated
Groton Water Supply Dam	Not Found	VILLAGE OF GROTON	Water Supply - Secondary	Class A - Low Hazard	None	5/9/1984	Not Rated
Moseley Cider Press Dam	Not Found	OTTIS MOSELEY	Hydroelectric	Class A - Low Hazard	None	11/19/1976	Not Rated
Cornell University Wildlife Pond #1 Dam	Not Found	CORNELL UNIVERSITY	Other	Class A - Low Hazard	None	7/31/1980	Not Rated
Halseyville Road Pond Dam	Village of Trumansburg	ROBERT BROWN	Recreation	Class A - Low Hazard	None		Not Rated
Camp Badger Dam	Town of Danby	EMPIRE STATE SPEECH & HEARING CLINIC	Recreation	Class A - Low Hazard	None	7/23/1991	Not Rated
College Of Agriculture Cornell Dam	Not Found	CORNELL UNIVERSITY	Other	Class A - Low Hazard	None	9/19/1969	Not Rated
Tompkins County Dam	Not Found	TOMPKINS COUNTY	Recreation	Class A - Low Hazard	None	12/31/1901	Not Rated
Fall Creek Dam	City of Ithaca	CITY OF ITHACA	Other	Class A - Low Hazard	None	11/27/2019	Not Rated
Dryden Lake Outlet Dam	Not Found	NYS DEC - DIVISION OF FISH AND WILDLIFE	Recreation	Class A - Low Hazard	None	8/13/2020	Not Rated
Dwyer Dam	Not Found	CORNELL UNIVERSITY	Other	Class A - Low Hazard	None	7/31/1980	Not Rated
Ithaca Dam	Not Found	CITY OF ITHACA	Other	Class A - Low Hazard	None	10/16/2001	Not Rated
Fred A Annis Dam	Town of Caroline	FRED A ANNIS	Hydroelectric	Class A - Low Hazard	None	11/19/1976	Not Rated





Dam Name	Location	Owner	Purpose	Classification	EAP?	Last Inspected	Condition
Roger A Morse Dam	Not Found	ROGER A MORSE	Other	Class A - Low Hazard	None	12/31/1901	Not Rated
Cornell University Dam	Not Found	CORNELL UNIVERSITY	Water Supply - Primary	Class A - Low Hazard	None	12/31/1901	Not Rated
Arthur Prince Dam	Not Found	ARTHUR PRINCE	Recreation	Class A - Low Hazard	None	10/29/1968	Not Rated
Varna Pond Dam	Not Found	Not Found	Other	Class A - Low Hazard	None	6/23/1998	Not Rated
Cornell University Pond #2 Dam	Not Found	CORNELL UNIVERSITY	Other	Class A - Low Hazard	None	11/19/1976	Not Rated
Robert Carrier Dam	Not Found	ROBERT CARRIER	Recreation	Class A - Low Hazard	None	12/31/1901	Not Rated
Lansing Residential Facility Dam	Not Found	NY State Dam Limited Partnership	Other	Class A - Low Hazard	None		Not Rated
Tri-County Pond Dam	Town of Caroline	NYS DEC DIVISION OF LANDS & FORESTS	Recreation	Class A - Low Hazard	None	7/3/2009	Not Rated
Treman Lake Dam	Town of Ithaca	NYS PARKS & RECREATION FINGER LAKES	Recreation	Class B - Intermediate Hazard	On File	11/26/2018	Unsound - More Analysis needed
Van Natta Dam	Town of Ithaca	CITY OF ITHACA	Other	Class B - Intermediate Hazard	None	7/13/2017	Unsound - More Analysis needed
Beacon Hills Village Dam	Town of Ithaca	HOSPICARE FOUNDATION	Recreation	Class B - Intermediate Hazard	On File	7/13/2017	Not Rated
South Hill Pond Dam	Town of Ithaca	ITHACA COLLEGE	Flood Control and Storm Water Management	Class B - Intermediate Hazard	On File	7/13/2017	No deficiencies noted
Jennings Pond Dam	Town of Danby	NYS PARKS & RECREATION FINGER LAKES	Recreation	Class C - High Hazard	On File	11/26/2018	Unsound - Fair
Beebe Lake Dam	Town of Ithaca	CORNELL UNIVERSITY	Hydroelectric, Recreation	Class C - High Hazard	On File	9/1/1983	Not Rated
30 Foot Dam	Town of Ithaca	CITY OF ITHACA	Recreation	Class C - High Hazard	On File	11/26/2018	Unsound - More Analysis needed
60 Foot Dam	Town of Ithaca	CITY OF ITHACA	Water Supply - Primary	Class C - High Hazard	On File	11/26/2018	Unsound - Deficiency Recognized
Virgil Creek Watershed Floodwater Dam	Town of Dryden	TOMPKINS COUNTY DEPARTMENT OF PLANNING, Town of Dryden, Village of Dryden	Flood Control and Storm Water Management	Class C - High Hazard	On File	11/26/2018	No deficiencies noted



Dam Name	Location	Owner	Purpose	Classification	EAP?	Last Inspected	Condition
Newfield Mills Dam	Town of Newfield	JENNIE DOANE	Other	Class D - Negligible or No Hazard	None	11/16/1976	Not Rated
Owasco Inlet Dam	Not Found	OTTO PETERMANN	Recreation	Class D - Negligible or No Hazard	None	12/31/1901	Not Rated
McClean Mill Dam	Not Found	MCLEAN MILLING COMPANY	Other	Class D - Negligible or No Hazard	None	11/18/1976	Not Rated
Red Mill Dam	Not Found	WILLIAM REYNOLDS	Other	Class D - Negligible or No Hazard	None	11/18/1976	Not Rated
Howser Dam	Not Found	Not Found	Other	Class D - Negligible or No Hazard	None	11/18/1976	Not Rated
Cayuga Rock Salt Company Inc Dam	Not Found	CAYUGA ROCK SALT COMPANY INC	Hydroelectric	Class D - Negligible or No Hazard	None	1/7/2003	Not Rated
Halseyville Dam	Not Found	W W STEBBINS	Irrigation	Class D - Negligible or No Hazard	None	10/1/1976	Not Rated
Saw Mill Dam	Town of Newfield	CHARLES SWARTWOOD	Other	Class D - Negligible or No Hazard	None	11/16/1976	Not Rated
White Mill Dam	Town of Caroline	JOHN M WHITE	Hydroelectric	Class D - Negligible or No Hazard	None	11/19/1976	Not Rated
C W Vohris Dam	Town of Caroline	Not Found	Other	Class D - Negligible or No Hazard	None	11/19/1976	Not Rated
Upper Brookton Dam	Not Found	Not Found	Other	Class D - Negligible or No Hazard	None	11/18/1976	Not Rated
Henry Welch Pond Dam	Town of Enfield	HENRY WELCH	Other	Unknown	None	12/31/1901	Not Rated
Artificial Breeders Assoc Dam	Not Found	ARTIFICIAL BREEDERS ASSOCIATION	Other	Unknown	None	12/31/1901	Not Rated
Delmar Hammond Pond Dam	Town of Ulysses	DELMAR HAMMOND	Other	Unknown	None	12/31/1901	Not Rated
Connecticut Hill Pond #2 Dam	Town of Newfield	NYS DEC	Recreation	Unknown	None	12/31/1901	Not Rated
Art Manninen Pond Dam	Town of Newfield	ART MANNINEN	Recreation	Unknown	None	12/31/1901	Not Rated



Dam Name	Location	Owner	Purpose	Classification	EAP?	Last Inspected	Condition
Connecticut Hill Pond #3 Dam	Town of Newfield	NYS DEC	Recreation	Unknown	None	12/31/1901	Not Rated
R C Bald Pond Dam	Town of Enfield	R C BALD	Recreation	Unknown	None	12/31/1901	Not Rated
Don Makie #5 Pond #2 Dam	Town of Danby	DON MAKIE	Recreation	Unknown	None	12/31/1901	Not Rated
Campfire Girls Dam	Town of Enfield	CAMPFIRE GIRLS	Recreation	Unknown	None	12/31/1901	Not Rated
Enfield Falls Dam	Town of Enfield	NYS PARKS & RECREATION FINGER LAKES	Other	Unknown	None	11/17/1976	Not Rated
Ithaca Flood Control Dam	Not Found	CITY OF ITHACA	Flood Control and Storm Water Management	Unknown	None	12/31/1901	Not Rated
Clarence Becker Dam	Town of Danby	CLARENCE BECKER	Other	Unknown	None	12/31/1901	Not Rated
Langdon & Son Dam	Not Found	M LANGDON & SON	Hydroelectric	Unknown	None	12/31/1901	Not Rated
Groton Reservoir Dam	Not Found	VILLAGE OF GROTON	Water Supply - Secondary	Unknown	None	12/31/1901	Not Rated
Ray L Teeter Dam	Not Found	RAY L TEETER	Hydroelectric	Unknown	None	12/31/1901	Not Rated
Freeville Dam	Not Found	VILLAGE OF FREEVILLE	Other	Unknown	None	12/31/1901	Not Rated
Martin Beck Pond Dam	Not Found	MARTIN BECK	Recreation	Unknown	None	12/31/1901	Not Rated
Robert Burbridge Pond Dam	Not Found	ROBERT BURBRIDGE	Other	Unknown	None	12/31/1901	Not Rated
Howard Adams Pond Dam	Not Found	HOWARD ADAMS	Recreation	Unknown	None	12/31/1901	Not Rated
Kingdom Pond Dam	Not Found	Not Found	Other	Unknown	None	12/31/1901	Not Rated
Gira Mill Dam	Not Found	SAM LANE	Other	Unknown	None	12/31/1901	Not Rated
Nys Electric & Gas Company Dam	Town of Ulysses	NEW YORK STATE ELECTRIC & GAS CORPORATION	Other	Unknown	None	12/31/1901	Not Rated
Halsey Farms Pond Dam #2	Town of Ulysses	HALSEY FARMS	Other	Unknown	None	12/31/1901	Not Rated
R D Murphey Pond Dam	Town of Ulysses	R D MURPHEY	Other	Unknown	None	12/31/1901	Not Rated



Dam Name	Location	Owner	Purpose	Classification	EAP?	Last Inspected	Condition
Rolf Holtkamp Pond Dam	Town of Ulysses	ROLF A HOLTkamp	Other	Unknown	None	12/31/1901	Not Rated
Halsey Farms Pond Dam #1	Town of Ulysses	HALSEY FARMS	Other	Unknown	None	12/31/1901	Not Rated
Halsey Farms Pond Dam #3	Town of Ulysses	HALSEY FARMS	Other	Unknown	None	12/31/1901	Not Rated
Arthur Millspaugh Pond Dam	Town of Ulysses	ARTHUR MILLSPAUGH	Recreation	Unknown	None	12/31/1901	Not Rated
H D Besemer Dam	Not Found	H D BESEMER	Other	Unknown	None	12/31/1901	Not Rated
James Stevenson Pond Dam	Town of Ulysses	JAMES STEVENSON	Other	Unknown	None	12/31/1901	Not Rated
Max Furman Pond Dam	Town of Ulysses	MAX FURMAN	Recreation	Unknown	None	12/31/1901	Not Rated
B W Bloom Pond Dam	Not Found	B W BLOOM	Recreation	Unknown	None	12/31/1901	Not Rated
College Of Agriculture Cornell Dam	Not Found	CORNELL UNIVERSITY	Other	Unknown	None	12/31/1901	Not Rated
Dr Joseph Frost Dam	Not Found	THOMAS B KEANE	Other	Unknown	None	12/31/1901	Not Rated
Cornell University Pond #4 Dam	Not Found	CORNELL UNIVERSITY	Other	Unknown	None	12/31/1901	Not Rated
Cornell University Pond #5 Dam	Not Found	CORNELL UNIVERSITY	Other	Unknown	None	12/31/1901	Not Rated
State Land Tompkins #4 Dam	Town of Caroline	NYS DEC	Other	Unknown	None	12/31/1901	Not Rated
Walter Arsenault Pond Dam	Town of Caroline	WALTER ARSENAULT	Recreation	Unknown	None	12/31/1901	Not Rated
Margaret Baker Dam	Not Found	MARGARET BAKER	Fire Protection, Stock, Or Small Farm Pond	Unknown	None	12/31/1901	Not Rated
Barton Miller Farms Dam	Not Found	D W BARTON	Other	Unknown	None	12/31/1901	Not Rated
Etna Dam	Not Found	ROLLER MILLS	Hydroelectric	Unknown	None	12/31/1901	Not Rated
H J Bool Co Dam	Not Found	H J BOOL COMPANY	Water Supply - Primary	Unknown	None	12/31/1901	Not Rated
William Hazlett Smith Dam	Not Found	WILLIAM HAZLETT SMITH	Other	Unknown	None	12/31/1901	Not Rated





Dam Name	Location	Owner	Purpose	Classification	EAP?	Last Inspected	Condition
Sapsucker Woods Pond Dam	Not Found	CORNELL UNIVERSITY	Other	Unknown	None	12/31/1901	Not Rated
Hemmo Huttunen Dam	Town of Danby	HEMO HUTTUNEN	Recreation	Unknown	None	12/31/1901	Not Rated
James E Johnson Jr Dam	Town of Danby	JAMES E JOHNSON	Recreation	Unknown	None	12/31/1901	Not Rated
John Lopinto Pond Dam	Not Found	JOHN LOPINTO	Recreation	Unknown	None	12/31/1901	Not Rated
Groton Rod & Gun Club Pond Dam	Not Found	GROTON ROD & GUN CLUB	Recreation	Unknown	None	12/31/1901	Not Rated
George Junior Republic Dam	Not Found	GEORGE JUNIOR REPUBLIC	Recreation	Unknown	None	12/31/1901	Not Rated
Ben Gebhart Pond Dam	Not Found	BEN GEBHART	Recreation	Unknown	None	12/31/1901	Not Rated
Kingdom Farm Dam	Not Found	Not Found	Other	Unknown	None	12/31/1901	Not Rated

Source: NYS DEC 2021



## Levees

Within Tompkins County, there is one NYSDEC levee and floodwall system in place intended to reduce flood risk in historically flood vulnerable areas. Basic information on the systems in the County was gathered to integrate components of the levee accreditation process with this HMP and identify ways the hazard mitigation process can help to establish a path forward for the levee accreditation process. The system in Ithaca County is the City of Ithaca’s Ithaca Flood Damage Reduction Project located on the Cayuga Inlet. The system provides three miles of improved channel and was constructed in the late-1960s. The project was then rectified in 1977-1978 and rehabilitated in 1997. Dredging is currently planned in the flood control channel and Inlet in order to maintain the levee’s accreditation that it performs its flood control function as is designed.

Information from a combination of the National Levee Database (NLD), FEMA Flood Mapping Products website, NYSDEC Region 7 project details and maps website, and the United States Geological Survey StreamStats website was compiled and presented in the following tables that present summaries of the levee system features and associated risks. Table 4-8 through Table 4-10 data about levee systems collected from the NLD and FEMA. Figure 4-21 shows levee locations as well as the area which benefits from some degree of protection from the system, or the levee area.

*Table 4-9. Levee System Feature Information from the NLD in Tompkins County, New York*

System	Year Complete	Levee (miles)	Floodwall (miles)	Pump Stations (#)	Gravity Drains (#)	Closures (#)
Ithaca Flood Damage Reduction Project	1970	0.86	0	N/A	N/A	2 (Left bank) N/A

Source: U.S. Army Corps of Engineers, 2020

*Table 4-10. Levee System Risk Information from the NLD in Tompkins County, New York*

System	LSAC*	Overtopping ACE**	People at Risk	Structures at Risk	Property Value
Ithaca Flood Damage Reduction Project	Low	0.0002	621	132	\$57.5M

Source: U.S. Army Corps of Engineers, 2020. Includes both left and right bank projects.

\*LSAC - Levee Safety Action Classification Rating by the U.S. Army Corps of Engineers

\*\*ACE - Annual Chance Exceedance

*Table 4-11. Levee System FEMA Accreditation in Tompkins County, New York*

Levee System Name	Effective FIS ID	Total Length (miles)	Leveed Area (sq. miles)	Levee System Summary in NLD	Levee System Accreditation Status*
Ithaca Flood Damage Reduction Project	360851V000	0.86	0.34	YES	Accredited

\* Based on data from the National Levee Database



Figure 4-21. Levees in the City and Town of Ithaca



## 4.5.2 Food, Water, and Shelter

This section provides information on Food, Water, and Shelter lifelines. Critical facilities of this lifeline category include food (e.g. commercial food distribution and supply chain, food distribution programs), water (e.g. water utilities, wastewater systems), shelter, and agriculture.

### 4.5.2.1 Potable Water

Potable water in Tompkins County is derived from the County's surface and ground water resources. Figure 4-21 shows the distribution of potable water supplies across Tompkins County.

#### Surface Water

More than half of County residents obtain water from three facilities that draw from the surface waterways of Cayuga Lake, Fall Creek, and Six Mile Creek. Drinking water for approximately 55 percent of Tompkins County residents comes from the three water treatment facilities that rely on surface water: Bolton Point, which draws its water from Cayuga Lake; the Cornell Water Filtration Plant, which draws from Fall Creek; and the City of Ithaca Water Treatment Plant, which uses water from Six Mile Creek. Many homes also withdraw their drinking water directly from Cayuga Lake for their personal use. Private wells number in the thousands and are found throughout the County. There are eight municipal water supply systems in the County—three of which supply water to municipalities outside of the respective municipal boundary. The Southern Cayuga Lake Intermunicipal Water Commission manages Bolton Point and is owned by a five-municipality consortium of the Towns of Lansing, Ithaca, Dryden, and the Villages of Cayuga Heights and Lansing (Tompkins County Comprehensive Plan 2015).

#### Ground Water

While more than half of County residents rely on surface water sources, about 45 percent of County residents rely on groundwater sources. The Villages of Dryden, Groton, Trumansburg and hamlets of Newfield and West Danby utilize groundwater sources and have municipal water systems (Tompkins County Comprehensive Plan 2015). There are approximately 150 public water systems that use groundwater. Note that some of these water systems are cross jurisdictional and are not necessarily owned by each individual municipality.





### 4.5.2.2 Wastewater Facilities

Households and businesses in Tompkins County are served by both municipal sewer and, privately-owned septic systems. As of 2015, approximately 60%– percent of households are served by municipal sewer and 40 percent are served by privately-owned septic systems. The County is home to seven municipal wastewater treatment facilities serving 11 municipalities. Three systems serve customers outside of municipal boundaries. One system, the Ithaca Area Wastewater Treatment Facility, is owned, operated, and serves the City and Town of Ithaca and the Town of Dryden. Treatment wastewater is discharged to the various waterways in the County, including Trumansburg Creek, Owasco Inlet, Fall Creek, Six Mile Creek and Cayuga Lake. All discharges are regulated by the New York State Pollutant Discharge Elimination System. Table 4-11 includes the different sewer service areas located in the County and Figure 4-22 shows the location of potable water facilities in the County and Figure 4-23 shows the location of wastewater facilities in the County.



*Table 4-12. Sewer Service Areas in Tompkins County, New York*

Area Name	Wastewater Treatment Plant	Area (Acres)
City of Ithaca/ Town of Ithaca/ Town of Dryden	Ithaca Waste Water Treatment	NA
Cayuga Heights	Cayuga Heights Sewage Plant	NA
Trumansburg	Trumansburg Sewage Treatment	NA
Dryden (V)	Dryden Village Sewage Treatment	NA
Groton (V)	Groton Sewer Treatment Plant	NA
Newfield	Newfield Sewage Treatment Plant	NA

Source: Tompkins County Comprehensive Plan



Figure 4-22. Potable Water Facilities in Tompkins County



Figure 4-23. Wastewater Facilities in Tompkins County





### 4.5.2.3 Shelters

Due to the variable nature of hazard events and associated sheltering needs within the County, Tompkins County relies on real-time outreach methods to inform the public of pending and active evacuations, and available sheltering resources. Outreach methods include variable message sign boards, media (radio, television, and newspapers), social media, and Swift911 emergency mass notification system. The American Red Cross is responsible for emergency shelter operations in Tompkins County and maintains a list of potential shelter facilities. What facility is used as a shelter will depend on the type of event and sheltering needs. To prevent confusion during a disaster event, a list of American Red Cross shelters is not provided in the plan, however an updated list is maintained by the Department of Emergency Response and as updated is shared with the Hazard Mitigation Coordinator. As FEMA FIRMs are updated in 2021-22 and floodplain boundaries are identified this shelter list will be examined against those boundaries. If appropriate changes to shelter locations or mitigations to specific buildings may be proposed. Furthermore, each shelter will be examined in detail with the American Red Cross to ensure the space is accessible to a broad range of users, in particular those most vulnerable.

In addition to the American Red Cross shelters, each municipality specified designated areas that would provide temporary shelter in the case of an emergency. Many of these include heating and cooling centers. Please refer to each municipality's capability assessment (Section 9 – Jurisdictional Annexes) for further information on detailed sheltering provisions within Tompkins County.

## 4.5.3 Health and Medical

This section provides information on Health and Medical community lifelines. Critical facilities included in this lifeline include medical care (e.g. hospitals, pharmacies, long-term care facilities), patient movement (e.g. EMS), fatality management, public health, and medical supply chain.

Tompkins County's public health preparedness vision is to be a community resilient to the health impacts of emergencies and disasters.

### 4.5.3.1 Hospitals and Medical Centers

There is a broad base of hospitals and medical centers located throughout Tompkins County to serve the needs of our residents. In addition to two primary emergency receiving hospitals, there are multiple local walk-in urgent care centers and satellite hospital facilities that provide services in a more regionally based approach to medical care. In today's changing medical services environment, large health care networks and group medical practices provide the majority of services needed by our population of nearly 102,000 residents, plus Tompkins County is home to three institutions of higher education: Cornell University, Ithaca College and Tompkins Cortland Community College with a combined population of just over 27,000 students.

Cayuga Medical Center, 101 Dates Dr, Ithaca, NY 14850, is an acute-care medical center housing 212 beds. Cayuga Medical Center at Ithaca, 2333 N Triphammer Rd # 302, Ithaca, NY 14850, is an acute-care medical center.





Cayuga Medical Center is a New York State Department of Health certified Stroke Center. They are designated as a Comprehensive Community Cancer Center by the National Cancer Institute and have received the prestigious Patient Safety Award from the NYS Department of Health. Their corporate membership includes representatives from over 100 community organizations and is affiliated with 24 teaching institutions.

#### 4.5.3.2 Emergency Medical Services

Bangs Ambulance is an Advanced Life Support Service responding to emergency calls in Ithaca and many other communities within Tompkins County. They provide emergency inter-facility transports, non-emergency ambulance calls, paramedic "Fly Car" intercept, EMS coverage for events, and public education. They operate as a fee-for-service practice.

#### 4.5.3.3 Volunteer Ambulance Services

Some towns within Tompkins County have their own ambulance services to better serve the emergent medical needs of their community. They are, Groton Fire & Ambulance Dept; Dryden Ambulance; and Trumansburg Ambulance who provides EMS protection services to Village of Trumansburg, the Town of Ulysses, the Town of Covert, and parts of the towns of Hector. These volunteers are trained as Basic Life Support (BLS) or Advanced Life Support (ALS) through New York State protocols. Mutual aid and air ambulance services are also available through our 911 system, when needed.

#### 4.5.3.4 Mental Health

Tompkins County offers an extensive range of Mental Health Services, with two Behavioral Services units at Cayuga Medical Center. The Tompkins County Health Department will coordinate the response to community mental health needs during emergencies and disasters.

#### 4.5.3.5 Emergency Support Function (ESF) #8

Public Health and Medical Services Core Capabilities in the Emergency Operations Center (EOC): Public Health, Healthcare, and Emergency Medical Services, Fatality Management Services, Mass Care Services, Critical Transportation, Public Information and Warning, Environmental Response/Health and Safety, Logistics and Supply Chain Management Coordinates the mechanisms for assistance in response to an actual or potential public health and medical disaster or incident. Functions include but are not limited to: • Public health • Medical surge support including patient movement • Behavioral health services • Mass fatality management.

#### 4.5.3.6 Fatality Management Services

Cayuga Medical Center (CMC) has a morgue capacity of eight, plus there are forty-one funeral homes, each with cooler capacity. Other options, such as refrigerated trailers, would be considered if necessary. Tompkins County has two medical examiners, Beth Plocharczyk, MD, MPH, FCAP, and Daniel Sudilovsky, MD, FCAP. Currently, a Mass Fatality Plan for Tompkins County is being created.



### 4.5.3.7 Medical Supply Chain

During day-to-day normal activities, EMS, hospitals, and other departments and agencies have their own medical supplier to fill their requests. During times of great need, such as a pandemic, departments and agencies may need to request Personal protective equipment (PPE) and other supplies from logistics in the Tompkins County EOC.

## 4.5.4 Energy (Power and Fuel)

This section provides information on Energy community lifelines. Critical facilities included in this lifeline include power grid (e.g. generation systems, transmission systems) and fuel (e.g. fuel storage, pipelines). Figure 4-24 shows the energy lifelines throughout Tompkins County.

### 4.5.4.1 Energy Resources

Electric power for Tompkins County is primarily provided by New York State Electric & Gas (NYSEG), however, NYSEG electric service is provided via overhead transmission lines with minimal undergrounding of lines. Cornell University's Combined Heat and Power (CHP) and Cooling Plant provides Cornell's Ithaca campus with efficient heating, cooling, and electricity. A 7.5 MW campus CHP plant has delivered heating and electricity to campus buildings since 1922. In 2000, Cornell's Lake Source Cooling system draws water from Cayuga Lake through a closed loop system and provide cooling options to many campus facilities. In 2008, the campus completed an expansion of its existing CHP facility, adding 30 MW of additional capacity and replacing coal with natural gas as the primary fuel. Beyond the CHP plant at Cornell, there are no in-county electricity generating plants beyond those that produce renewable energy, such as solar installations. Groton is served by a Municipal Utility for electric service. New York State Electric & Gas provides natural gas service throughout the entirety of the County.

NYSEG provides natural gas service throughout the entirety of the County, where pipelines exist. In rural areas where there are no pipelines, residents rely on propane and fuel oil for space and water heating. Safe, reliable access to these fuels is important to maintain for much of the population during hazard events. Figure 4-24 shows the location of electric power facilities within Tompkins County

There are a total of 175 pipeline stream crossings in Tompkins County that carry either combustible gas, combustible liquids, or non-hazardous liquids. Reduced integrity of these pipelines can sometimes result in water supply contamination. This concern was identified in the 2014 HMP, and as such, the 2016 Tompkins County Inventory of Erosion Hazards at Pipeline Crossings, was developed with funding from the US Department of Transportation Pipeline and Hazardous Material Safety Administration (PHMSA). 19 of the pipelines of greatest concern have been reviewed and 5 crossings were selected for active tracking and mitigation solutions. Based on subsequent field visits in 2020, pipeline owners constructed the recommended



mitigation solution on one those crossings. The remaining 4 crossings appear stable and will continue to be monitored for exposure.

In addition, Dominion Energy owns and operates a natural gas network with a natural gas main traversing the Town of Dryden.



Figure 4-24. Electric Power Facilities within Tompkins County





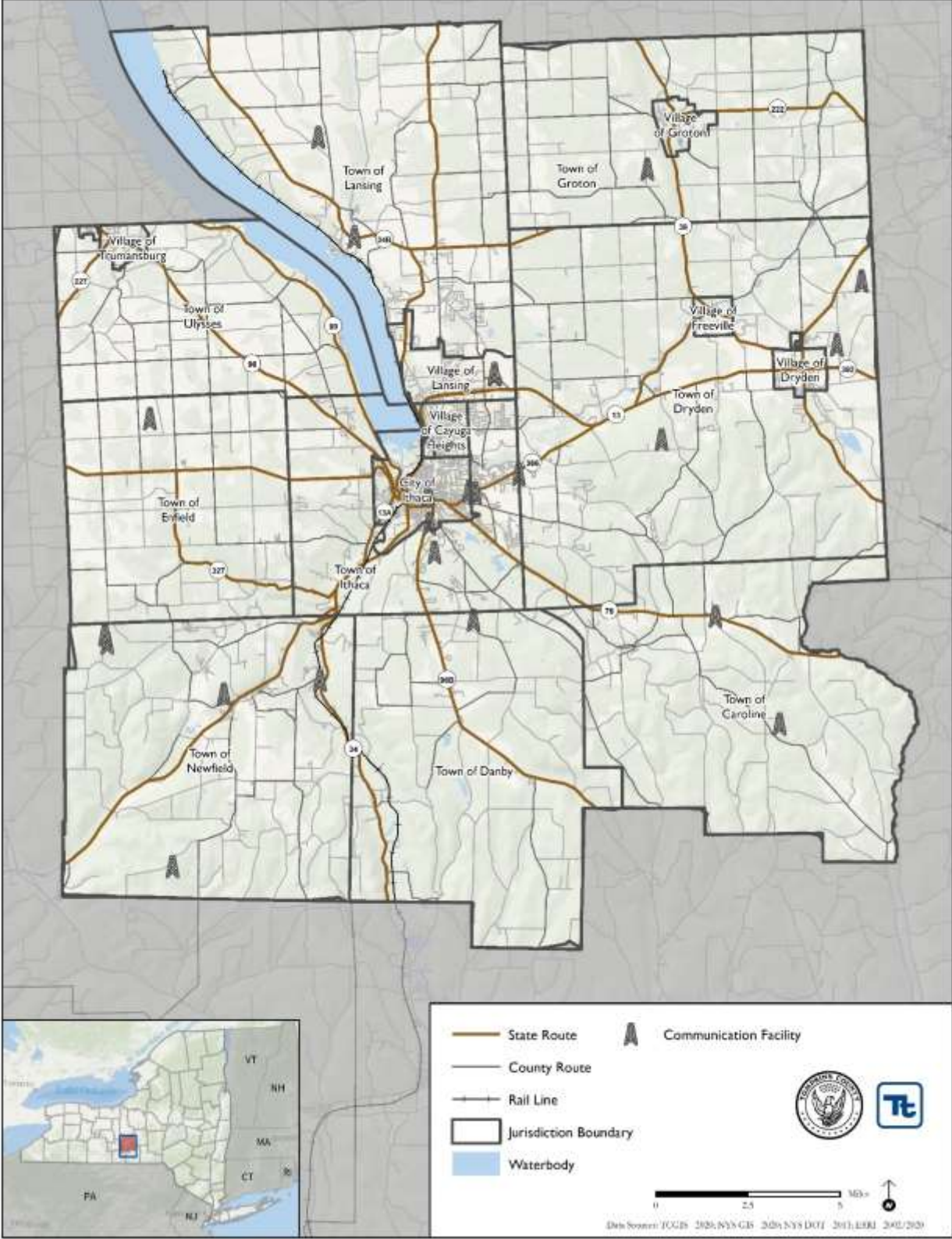
## 4.5.5 Communications

This section provides information on Communication lifelines. Critical facilities that fall under this lifeline include infrastructure (e.g. wireless, broadcast, cable systems); alerts, warnings and messages (e.g. local alert/warning ability, access to IPAWS); finance; and 911 and dispatch. Figure 4-25 shows the location of communication lifelines throughout Tompkins County.

Access to telecommunications services vary widely throughout Tompkins County. Existing density requirements for broadband, set by the New York State Public Service Commission, complicate efforts to provide extensions of telecommunication services to less-populated areas of the County. In particular, the southern and northern sections of the County (including large sections of Newfield, Danby, and Caroline) lack broadband altogether. A 2012 survey of underserved households in the County found that nearly 43% of households lack broadband. A current County study is underway to further clarify broadband coverage in Tompkins County. Where broadband is available, it is typically provided by Charter Spectrum, Haefele. Fiber is available in the vicinity of the City of Ithaca. The Ontario & Trumansburg Telephone Companies also provide internet and fiber service to portions of the County, including Trumansburg.



Figure 4-25. Communication Facilities within Tompkins County



## 4.5.6 Transportation Systems

This section provides information on Transportation lifelines. Critical facilities under this category include: highway/roadway/motor vehicle; mass transit; railway; aviation; and maritime. Tompkins County has a robust transportation network consisting of 1,400 miles of roadways, 200 bridges, and various services to connect destinations within the County as well as those outside the County. Figure 4-26 shows the transportation facilities in Tompkins County.

### 4.5.6.1 Highway, Roadways and Associated Systems

The New York State Department of Transportation maintains 15 state highways that pass through the County. The County does not have U.S. highways or interstates that pass through the County. Major routes include Route 13 (which roughly bisects the County diagonally and connects Ithaca to Cortland), Route 79 which traverses the County to Trumansburg via Route 96, and Route 34 (which travels the boundary in a north-south direction, connecting south to Spencer and north to Auburn). The closest interstate is Interstate 81, which passes just outside of the County boundary through adjacent Cortland County. The Tompkins County Department of Public Works is responsible for maintaining more than 300 miles of County roads.

### 4.5.6.2 Airports and Heliports

Tompkins County has six public and private airports as of March 2020. The County's major public airport is the Ithaca Tompkins (ITH) International Airport. In 2020, the airport is anticipated to begin receiving international general aviation flights following a \$34.8 million upgrade. The airport receives flights from American Airlines, United Airlines, and Delta Airlines. American Airlines provides non-stop service to Philadelphia, United Airlines provides nonstop service to Washington-Dulles International Airport, and Delta Airlines provides service to Detroit.

### 4.5.6.3 Bus and Other Transit Facilities

Greyhound, Shortline, Ourbus, Cornell's Campus-to-Campus (Ithaca-NYC) service and other regional transit partners provide bus service to and from the County. According to the 2040 Long Range Transportation Plan, W, Tompkins Consolidated Area Transit (TCAT) provides robust bus service for 4.1 million riders as of 2013 and operates in every town in Tompkins County. TCAT contracts with GADABOUT Transportation Services, Inc. for demand responsive paratransit service required by the Americans with Disabilities Act (ADA paratransit). Nearly 62% of Tompkins County residents live within one quarter (1/4) mile of a bus route, with 88% for urban and 31% for rural populations. TCAT uses approximately 53 buses to operate service on 33 routes (including one summer-only route and one 'demand and response' route) with a diverse range of schedules for academic year, summer, and yearlong service. TCAT changes its service three times per year and continually analyzes ridership, route timings and service change requests. The principal activity nodes are Downtown Ithaca, Collegetown, Cornell University, and the Shops at Ithaca Mall. TCAT continues to face funding shortfalls for timely bus replacement and operations.



#### 4.5.6.4 Railroad Facilities

The Ithaca Central Railroad is a 48.8-mile long (78.5 km) shortline railroad operating in New York and Pennsylvania that is owned by Norfolk Southern Railway and leased for operations to Watco Transportation Services. The Ithaca Central Railroad extends from Sayre, PA (Norfolk Southern interchange), to Ludlowville, NY (Town of Lansing). Watco began railroad operations on the Ithaca Central Railroad on December 8, 2018, serving its primary customer, the Cargill Cayuga Rock Salt Mine, in Lansing, NY. Watco expects this rail line to handle about 12,000 carloads of freight annually. The railroad has the capability to haul various commodities such as salt, coal, plastics, and magnesium chloride (<https://www.watco.com/service/rail/ithaca-central-railroad-ithr/>).





Figure 4-26. Transportation Features in Tompkins County, New York



## 4.5.7 Hazardous Materials

This section provides information on Hazardous Materials lifelines. Critical facilities under this category include: facilities and HAZMAT, pollutants and contaminants. For this 2021 update, hazardous material facilities in Tompkins County includes Superfund, Toxic Release Inventory (TRI) facilities, and NYSDEC bulk storage facilities. Figure 4-27 shows the bulk storage facilities in Tompkins County.

### 4.5.7.1 HAZMAT Facilities

Superfund is a program administered by the U.S. Environmental Protection Agency (EPA) to locate, investigate, and clean-up hazardous waste sites in the United States. According to EPA, there are no Superfund locations in Tompkins County.

TRI tracks the management of over 650 toxic chemicals that pose a threat to human health and the environment. Facilities in the United States in certain industry sectors that manufacture, process, or otherwise use these chemicals in amounts above established levels must report how each chemical is managed through recycling, energy recovery, treatment, and releases to the environment. A “release” of a chemical means that it is emitted to the air or water or placed in some type of land disposal. The information submitted by facilities to the EPA and states is compiled annually as the Toxics Release Inventory or TRI, and is stored in a publicly accessible database in Envirofacts (<https://enviro.epa.gov/enviro/em4ef.home>). There are five TRI facilities in Tompkins County.

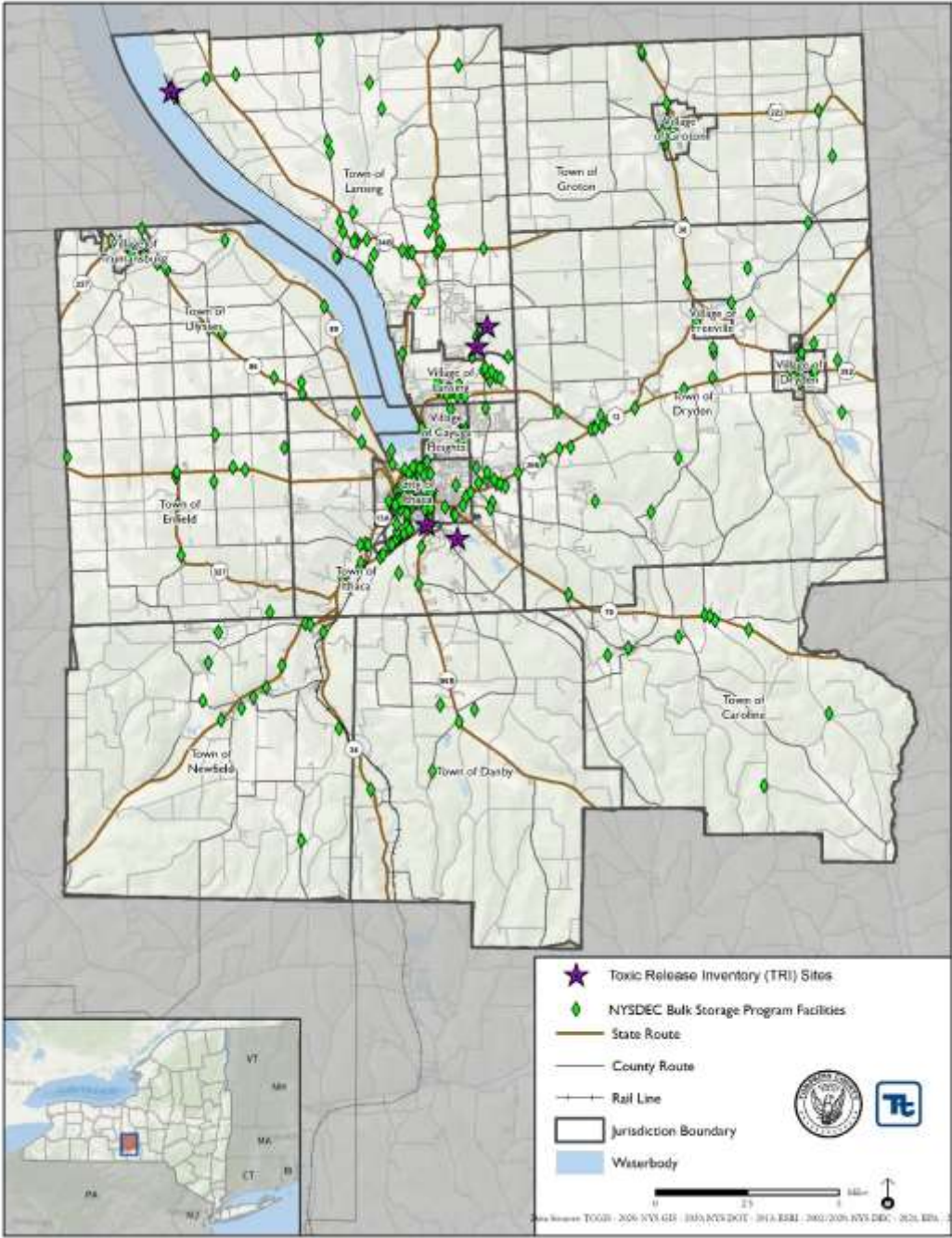
In addition to the hazardous waste sites listed by the EPA, there are hazardous facilities throughout Tompkins County cataloged by the NYSDEC’s Bulk Storage Program Database. The Bulk Storage Program includes three types of facilities; Petroleum Bulk Storage), Major Oil Storage Facilities, and Chemical Bulk Storage that require registration with NYSDEC for all facilities with a total storage capacity of petroleum products of the following:

- Petroleum Bulk Storage One or more tank systems that are designed to store a combined capacity of more than 1,100 gallons or more of petroleum in aboveground and/or underground storage tanks; or
- One or more underground tank systems that are designed to store 110 or more gallons of petroleum.
- Chemical Bulk Storage An aboveground storage tank larger than 185 gallons;
- Any size underground storage tank; or
- In a container that can store 1,000 kg or more for a period of 90 consecutive days or more.
- Major Oil Storage Facilities Applies to facilities that store a total of 400,000 gallons or more of petroleum in aboveground and underground storage tanks.

As of January 2021, there are 71,270 sites listed in the NYSDEC’s Bulk Storage Program Database, of which, 333 are located in Tompkins County, New York (NYSDEC 2021). This includes 25 chemical bulk storage sites, 2 major oil storage facilities, and 306 petroleum bulk storage sites. A listing of these facility by locality is shown in the figure below.



Figure 4-27. Bulk Storage Facilities in Tompkins County, New York



<sup>i</sup> As required by Section 312(g), EPA has published two emergency and hazardous chemical inventory forms, Tier I and Tier II, for facilities to report information on hazardous chemicals. The Tier I form contains general information on hazardous chemicals at the facility. The Tier II form contains specific information on hazardous chemicals present at the facility. (NYS DHSES 2021)



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ii Although the NYDEC database notes that there are 5 high hazard dams in Tompkins County, including the Lake Beebe Dam, according to the Army Corps of Engineers database accessed on June 3, 2021, the Lake Beebe Dam is considered a significant, not high hazard dam. For the purposes of this plan, that dam is included in the inventory as a high hazard dam.

