SECTION 3. COUNTY PROFILE

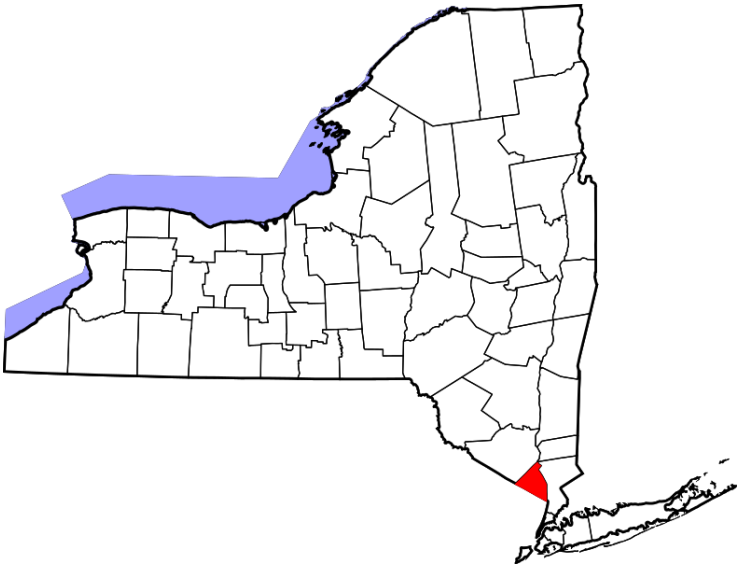
This section provides general information about Rockland County, including its physical setting, general building stock, land use, population, demographics, population trends, and community lifelines. Analyzing this information leads to an understanding of the study area, including economic, structural, and population assets at risk, and of concerns that could be related to hazards analyzed in this plan (e.g., low-lying areas prone to flooding, high percentage of vulnerable persons in an area).

3.1 GENERAL INFORMATION

3.1.1 Geography

Rockland County is located in southern New York State, approximately 30 miles northwest of Manhattan, and is bordered by the Hudson River on the east, Bergen and Passaic Counties in New Jersey to the south, and Orange County to the northwest (refer to Figure 3-1). Westchester and Putnam Counties are located across the Hudson River to the east and northeast, respectively. The County is considered the gateway to the Hudson Valley and is linked to the region by the New York State Thruway (Interstate 87/287), the Palisades Parkway, Route 9-West, and the Garden State Parkway Extension. Rockland County consists of five towns, 19 incorporated villages, and 17 unincorporated hamlets, as shown in Figure 3-2 (Rockland County 2011).

Figure 3-1. Location of Rockland County



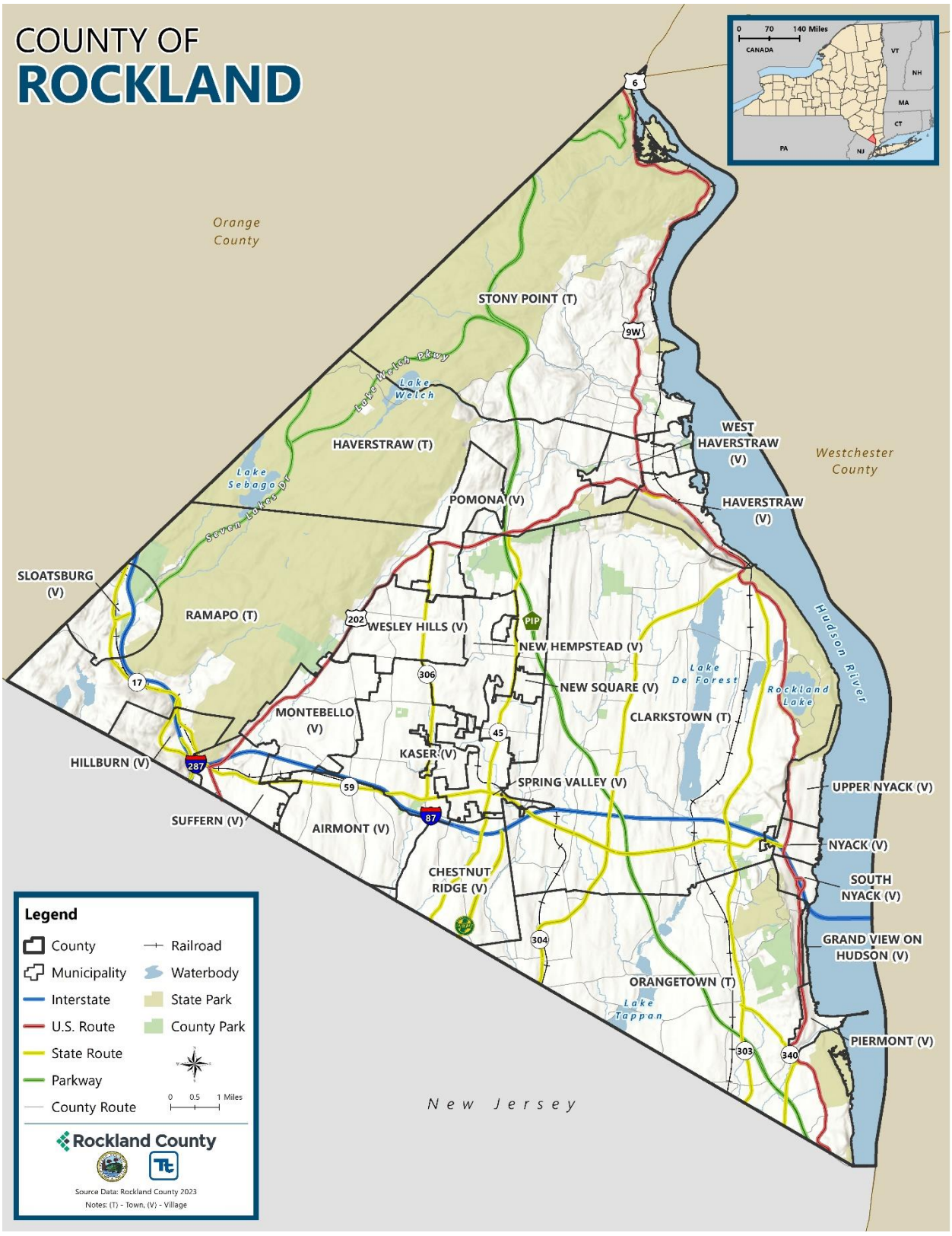
Source: Rockland County Economic Development & Tourism 2024
Note: Rockland County is shown in red.

The County is 176 square miles in size, the smallest county by area in New York State. With nearly one-third of its land area devoted to preserved parkland and approximately 40 miles of Hudson River waterfront, Rockland County is known for its natural and scenic resources. The Hudson River contains significant biodiversity areas, including endangered animals and plants, and helps contribute to the County's economic well-being. The river also acts as a transportation route for commuters to New York City and for commercial shipping (Rockland County 2011).

3.1.2 History

The first recorded residents of Rockland County were the Native Americans of the Delaware, or Lenni Lenape, nation. European settlement began after Henry Hudson, under commission by the Dutch East India Company, explored the region in 1609. The Dutch settled in the lower Hudson area until the territory was given over to the English in 1664. Dutch influence can be seen today in the form of sandstone homes in the county. The area that is Rockland County was originally part of Orange County, which was established in 1686, but Rockland separated from Orange County in 1798.

Figure 3-2. Rockland County



3.2 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. Table 3-1 shows FEMA disaster declarations that included Rockland County through 2023 (records date back to 1954).

Table 3-1. History of FEMA Declarations in Rockland County

Disaster Number	Event Date	Declaration Date	Incident Type	Title
DR-204-NY	August 18, 1965	August 18, 1965	Drought	New York Water Shortage
DR-311-NY	September 13, 1971	September 13, 1971	Flood	New York Severe Storms, Flooding
DR-338-NY	June 23, 1972	June 23, 1972	Flood	New York Tropical Storm Agnes
DR-487-NY	October 2, 1975	October 2, 1975	Flood	New York Severe Storms, Heavy Rain, Landslides, Flooding
DR-702-NY	March 28 – April 8, 1984	April 17, 1984	Flood	New York Coastal Storms, Flooding
DR-974-NY	December 10 – 14, 1992	December 21, 1992	Flood	New York Coastal Storm, High Tides, Heavy Rain, Flooding
EM-3107-NY	March 13 – 17, 1993	March 17, 1993	Snowstorm	New York Severe Blizzard
DR-1083-NY	January 6 – 12, 1996	January 12, 1996	Snowstorm	New York Blizzard
EM-3149-NY DR-1296-NY	September 16 – 18, 1999	September 18, 1999 September 19, 1999	Hurricane	New York Hurricane Floyd
EM-3155-NY	May 22 – November 1, 2000	October 11, 2000	Biological	New York Virus Threat
DR-1391-NY	September 11, 2001	September 11, 2001	Fire	New York Terrorist Attack
EM-3184-NY	February 17 – 18, 2003	March 27, 2003	Snowstorm	New York Snowstorm
EM-3186-NY	August 14 – 16, 2003	August 23, 2003	Infrastructure	New York Power Outage
DR-1534-NY	May 13 – June 17, 2004	August 3, 2004	Severe Storm	New York Severe Storms and Flooding
EM-3262-NY	August 29 – October 1, 2005	September 30, 2005	Hurricane	New York Hurricane Katrina Evacuation
DR-1692-NY	April 14 – 18, 2007	April 24, 2007	Severe Storm	Severe Storms and Inland and Coastal Flooding in New York
DR-1899-NY	March 13 – 31, 2010	April 16, 2010	Severe Storm	New York Severe Storms and Flooding
DR-1957-NY	December 26 – 27, 2010	February 18, 2011	Severe Storm	New York Severe Winter Storm and Snowstorm
EM-3328-NY DR-4020-NY	August 26 – September 5, 2011	August 26, 2011 August 31, 2011	Hurricane	Hurricane Irene in New York
EM-3351-NY DR-4085-NY	October 27 – November 8, 2012	October 28, 2012 October 30, 2012	Hurricane	Hurricane Sandy in New York
EM-3434-NY DR-4480-NY	January 20, 2020 – May 11, 2023	March 13, 2020 March 20, 2020	Biological	New York Covid-19
DR-4567-NY	August 4, 2020	October 2, 2020	Hurricane	New York Tropical Storm Isaias
EM-3565-NY	August 21 – 24, 2021	August 22, 2021	Hurricane	New York Hurricane Henri
EM-3572-NY DR-4615-NY	September 1 – 3, 2021	September 2, 2021 September 5, 2021	Hurricane	New York Remnants of Hurricane Ida
DR-4723-NY	July 9 – 10, 2023	July 22, 2023	Severe Storm	New York Severe Storms and Flooding

Source: FEMA 2023

3.3 PHYSICAL SETTING

3.3.1 Topography and Geology

Rockland County is situated in the Lower Hudson Valley, characterized by rugged terrain with steep slopes. The western part of the County features significant topographic relief, primarily attributed to the Hudson Highlands that run through Harriman and Bear Mountain State Parks. Along the southeastern portion of the County, the Palisades Ridge runs along the Hudson River, linking High Tor and Hook Mountain State Parks before turning and heading south to the southernmost tip of the county at Palisades State Park. From a high point of 1,283 feet at Rockhouse Mountain, northwest of Lake Welch in Harriman State Park, the county's elevation drops to sea level along the Hudson River (Rockland County 2011).

3.3.2 Water Resources

Rockland County's water supply comes from two sources:

- **Surface water** is water that collects on the ground or in a stream, river, lake, wetland, or ocean. Surface water is naturally replenished by precipitation and discharge from aquifers as base flow and lost through evaporation and subsurface seepage into aquifers.
- **Aquifers** are underground layers of permeable rock or other materials (gravel, sand, silt, or clay) from which groundwater can be extracted using a well.

Surface Waters

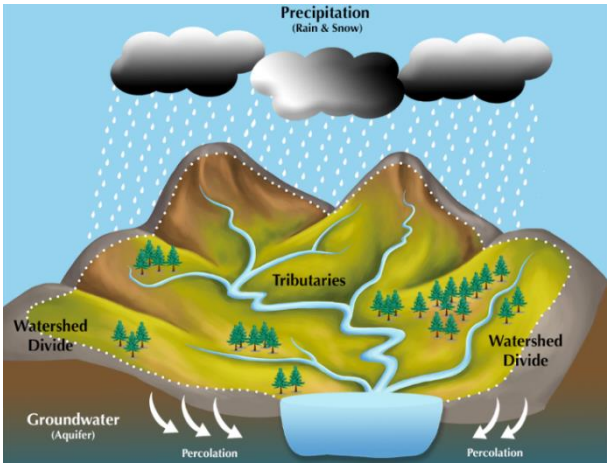
Numerous ponds, lakes, creeks, and rivers make up the waterscape of Rockland County. Major waterways in the County include the Hudson River, the Mahwah River, the Ramapo River, the Hackensack River, Cedar Pond Brook, Demarest Kill, Minisceongo Creek, Nakoma Creek, Muddy Creek, Nauraushaun Brook, Pascack Brook, the Saddle River, Sparkill Creek, West Branch Hackensack River, and Willow Tree Brook (Rockland County Fire and Emergency Services 2024). The Hudson River is a tidal estuary connected to the Atlantic Ocean.

Watersheds

A watershed is the geographic land area that is drained by a river or stream (refer to Figure 3-3). In Rockland County, there are seven watershed areas, as illustrated in Figure 3-4 (Rockland County 2011):

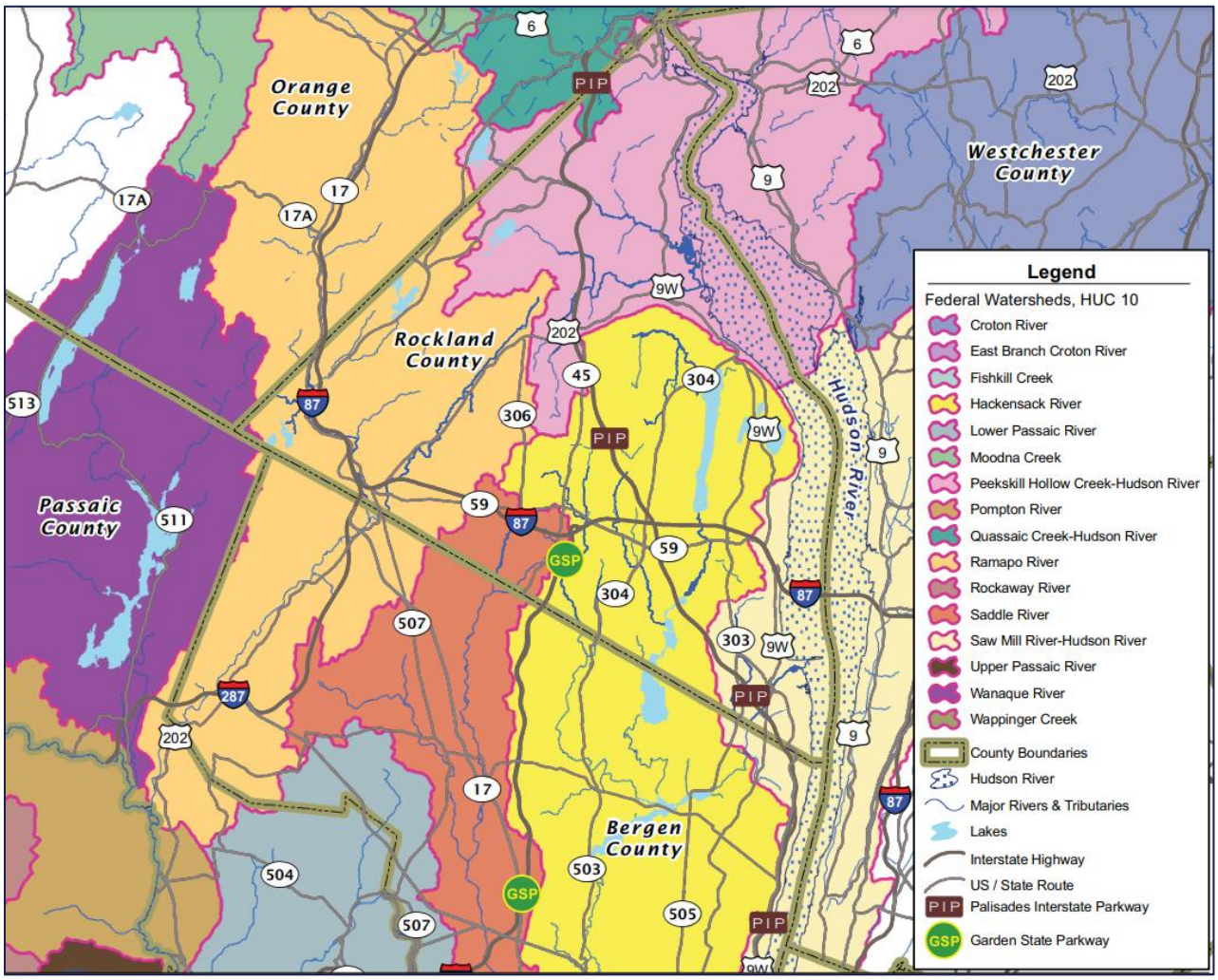
- Hackensack River
- Peekskill Hollow Creek-Hudson River
- Quassaick Creek-Hudson River
- Ramapo River
- Saddle River
- Saw Mill River-Hudson River
- Wanaque River.

Figure 3-3. Watershed Systems



Source: Hudson River Watershed Alliance 2021

Figure 3-4. Rockland County Watersheds



Source: Rockland County 2011

Aquifers

The Ramapo-Mahwah and Newark Basin aquifers are found within the County. The Ramapo-Mahwah aquifer is a highly productive stratified drift deposit located along the Ramapo and Mahwah River corridors beneath western Ramapo, including the villages of Sloatsburg and Suffern and bordering Harriman State Park. It is one of 18 principal aquifers in New York State. The Newark Basin aquifer is a fractured, sedimentary bedrock aquifer underlying southeastern Rockland County. It is another major source of public drinking water in the County. The Newark Basin stretches from Rockland County through New Jersey and Pennsylvania (Rockland County Fire and Emergency Services 2024).

3.3.3 Climate

Rockland County has a continental climate with moderate winters and summers. The County is characterized by frequent changes in the weather during spring and fall. Temperatures range from an average monthly temperature of 29 degrees Fahrenheit (°F) in January to an average monthly temperature of 74 °F in summer. The

average annual precipitation is 46 inches, distributed throughout the year. Average annual snowfall is 38 inches (FEMA 2014).

3.3.4 Land Use and Land Cover

Land use refers to the way land is developed or left in an undeveloped state. Historical land use patterns show how a community has developed over time. Zoning and related ordinances are used to guide development and largely reflect the existing and desired development patterns. Traditional zoning divides a community into various districts and permits or disallows land uses by zoning district.

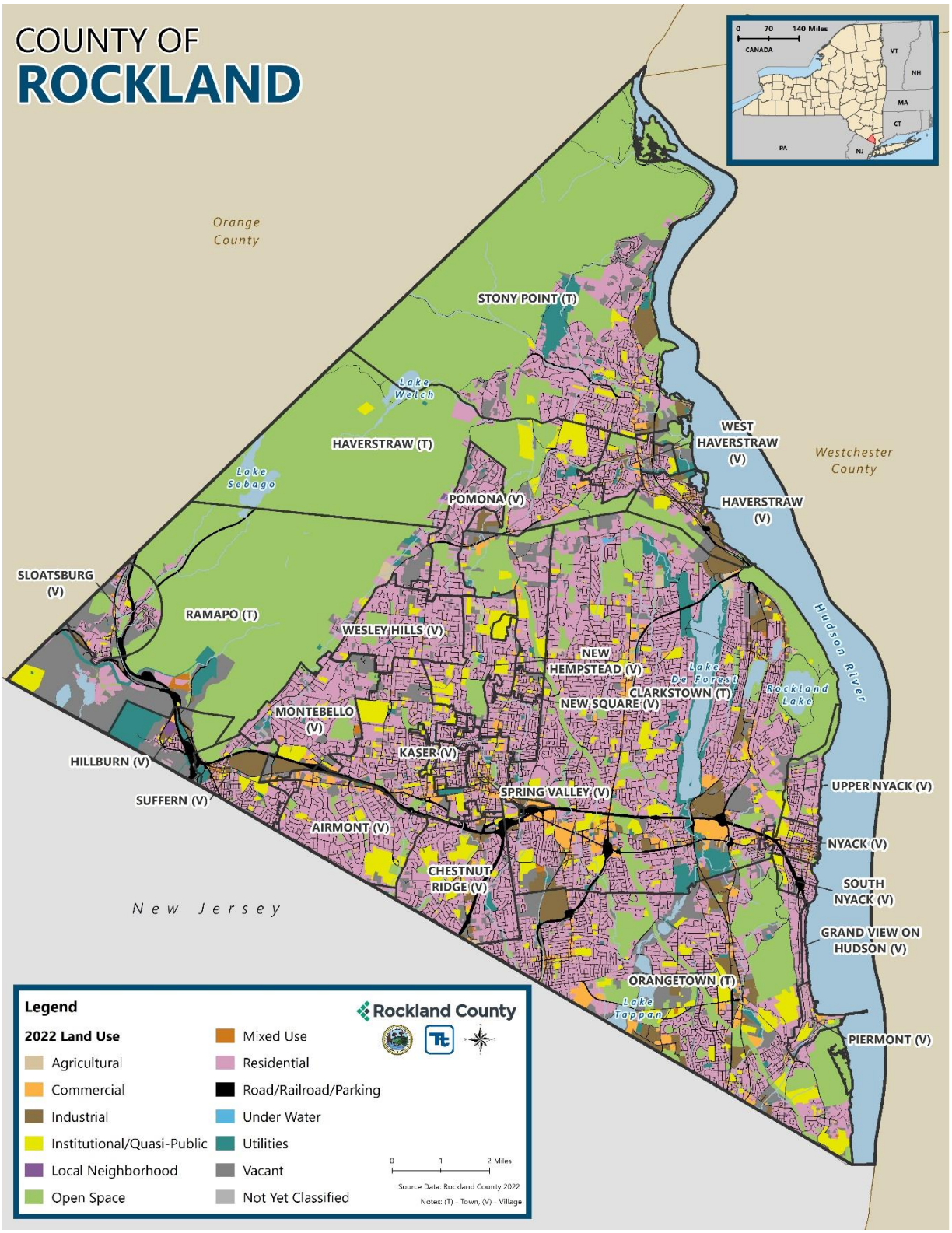
The most dominant land use in Rockland County is public park/open space (32.3 percent of the County's area). The next highest land use is one-family residential, with 27.8 percent of the land area. Commercial and industrial land uses are found in and around the villages of the County, along Interstate 87, US-9 and US-202, and along many of the roads that run through Rockland County. Industrial uses are scattered throughout the County and include manufacturing complexes, communication facilities, hazardous materials facilities, and utilities. Table 3-2 summarizes the land use in Rockland County. Figure 3-5 shows the distribution of land use throughout the County.

Table 3-2. Land Use Summary for Rockland County

Land Use Category	Acreage	Percent of County
Agricultural	237	0.2%
General Business/Community Commercial	1,339	1.2%
Heavy Industrial	1,927	1.7%
Institutional/Quasi-Public	5,927	5.1%
Light Industrial/Warehouse	1,106	1.0%
Local Neighborhood	247	0.2%
Local Park/Open Space	3,519	3.1%
Mixed Use (Residential/Commercial)	403	0.3%
Multi-Family Residential	3,594	3.1%
Multi-Family Residential - Senior Housing	168	0.1%
Not Yet Classified	98	0.1%
Office	688	0.6%
One-Family Residential	32,079	27.8%
Private Recreation/Private Open Space	2,041	1.8%
Public Park/Open Space	37,192	32.3%
Railroad	316	0.3%
Regional Commercial	160	0.1%
Road/Commuter Parking	9,036	7.8%
Three-Family Residential	146	0.1%
Two-Family Residential	1,140	1.0%
Under Water	121	0.1%
Utilities	4,345	3.8%
Vacant	9,435	8.2%
Rockland County (Total)	**115,261**	**100.0%**

Sources: Rockland County; National Land Cover Database, MRLC 2021

Figure 3-5. Land Use Land Cover for Rockland County



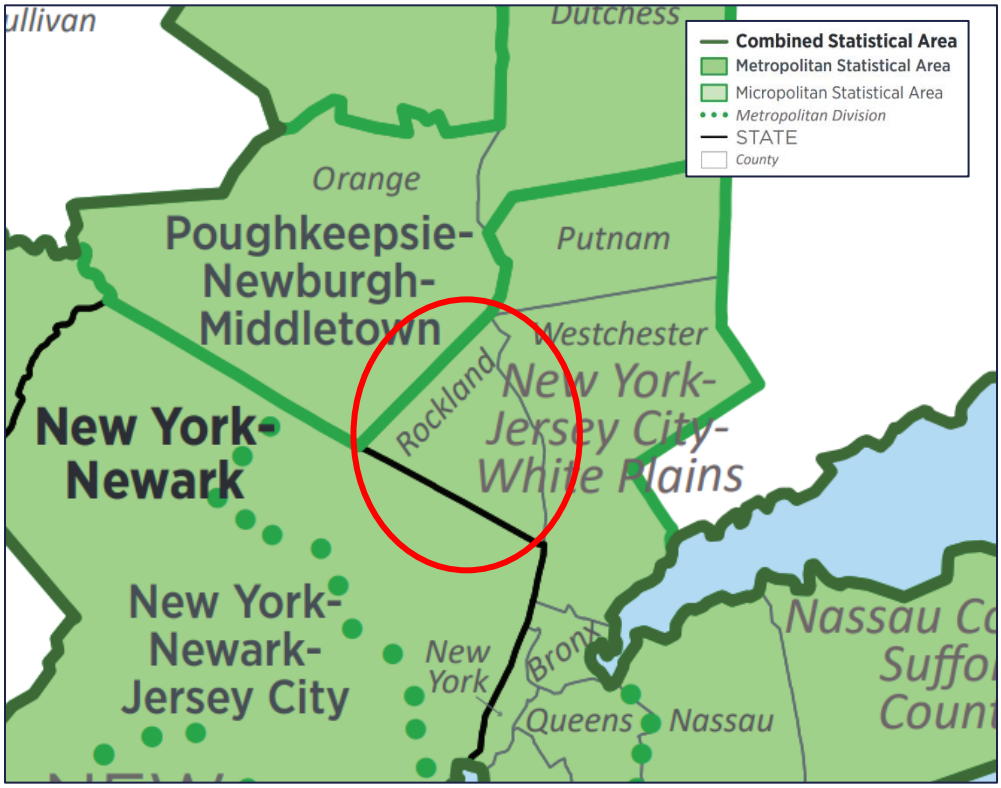
Metropolitan/Urban Area

The Census Bureau delineates urbanized area (UA) and urban cluster (UC) boundaries to encompass core census block groups or blocks that have a population density of at least 1,000 people per square mile; and surrounding census blocks that have an overall density of at least 500 people per square mile.

According to the U.S. Census, an urbanized area is a statistical geographic entity consisting of a densely settled core created from census tracts or blocks and contiguous qualifying territory that together have a population of 50,000 or more persons. An urban cluster is a statistical geographic entity consisting of a densely settled core created from census tracts or blocks and contiguous qualifying territory that together have at least 5,000 persons but fewer than 50,000 persons (US Census Bureau 2022). Rockland County has a population of over 317,000 and a population density of approximately 1,600 people per square mile, so it is considered an urban area.

Rockland County is located within the New York-Jersey City-White Plains Metropolitan Statistical Area (MSA). As of the 2020 Census, there were 12,076,970 people living in the MSA (US Census Bureau 2020). Figure 3-6 shows the location of Rockland County and the MSA.

Figure 3-6. New York-Jersey City-White Plains Metropolitan Statistical Area



Source: *US Census Bureau 2021*
Note: *Rockland County (red oval) is in the New York-Jersey City-White Plains Metropolitan Statistical Area*

3.4 POPULATION AND DEMOGRAPHICS

An understanding of the planning area population characteristics provides a foundation for assessing the impacts of natural hazards in the County. As noted in Section 4.2, modeling of the impacts of natural hazards on the population was performed using FEMA's Hazus risk simulation model. Population information in the Hazus model used for this HMP (v6.0) includes the 2010 Decennial Census which indicates a county population of 311,687. However, more current data, according to American Community Survey (ACS) 2021 Five-Year Estimate, approximates a county population of 336,485. Table 3-3 shows the ACS estimates for Rockland County and its jurisdictions. The information in this table is the best available population data for the HMP update. Figure 3-7 shows the distribution of population density (persons per square mile).

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. The American Community Survey Five-Year Estimate products were used to establish annual changes in population. American Community Survey Five-Year Estimates are used to show annual population changes but are not official population counts. The Five-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 numbers provided are not official census counts, but are official estimates provided to communities so that they may have a greater understanding of population changes within their jurisdictions.

For this plan, the default population data available in Hazus (representing 2010 data) are used to support the analysis of displaced households and number of persons seeking shelter. Population exposure results are based on the ACS 2021 Five-Year population estimates.

3.4.1 Vulnerable Populations

The federal guidelines require that HMPs consider socially vulnerable populations. These populations can be more susceptible to hazard events based on several factors, including their physical and financial ability to react or respond during a hazard and the location and construction quality of their housing. Populations with a higher level of vulnerability can be more seriously affected during an emergency or disaster. Vulnerable populations have unique needs that must be considered by public officials to ensure the safety of those with a higher level of risk.

The vulnerable populations in the 2024 HMP include persons ages 65 and over, persons under 5 years of age, individuals determined to be below the Asset Limited, Income Constrained, Employed (ALICE) threshold, those with physical or mental disabilities, and non-English speakers. Identifying concentrations of vulnerable populations can assist communities in targeting preparedness, response, and mitigation actions. Table 3-3 lists the ACS 2021 Five-Year Estimate vulnerable population statistics in Rockland County by jurisdiction.

The ALICE Threshold represents the minimum income level necessary for survival for a household. Derived from the Household Survival Budget, the ALICE Threshold is rounded to the nearest American Community Survey income category and adjusted for household size and composition for each county (United for ALICE 2024).

Table 3-3. Rockland County Population Statistics

Jurisdiction	2021 ACS 5-year Population Estimates	% of County Total	ACS 5-Year Population Estimates (2021)									
			Over 65		Under 5		Non-English Speaking		Disability		Below ALICE Threshold	
			Number	% total	Number	% total	Number	% total	Number	% total	Number	% total
Airmont (V)	9,964	3.0%	1,487	14.9%	660	6.6%	355	3.6%	727	7.3%	2,616	26.3%
Chestnut Ridge (V)	10,211	3.0%	1,587	15.5%	1,368	13.4%	617	6.0%	1,149	11.3%	1,957	19.2%
Clarkstown (T)	81,385	24.2%	16,757	20.6%	3,729	4.6%	4,251	5.2%	8,056	9.9%	22,733	27.9%
Grand View on Hudson (V)	241	0.1%	64	26.6%	13	5.4%	0	0.0%	16	6.6%	32	13.4%
Haverstraw (T)	14,028	4.2%	2,523	18.0%	1,093	7.8%	996	7.1%	1,228	8.8%	5,023	35.8%
Haverstraw (V)	12,292	3.7%	1,624	13.2%	882	7.2%	2,045	16.6%	1,500	12.2%	4,671	38.0%
Hillburn (V)	1,110	0.3%	161	14.5%	114	10.3%	48	4.3%	145	13.1%	362	32.6%
Kaser (V)	5,433	1.6%	174	3.2%	1,319	24.3%	1,350	24.8%	102	1.9%	1,182	21.8%
Montebello (V)	4,665	1.4%	563	12.1%	193	4.1%	165	3.5%	303	6.5%	588	12.6%
New Hempstead (V)	5,440	1.6%	816	15.0%	259	4.8%	65	1.2%	383	7.0%	439	8.1%
New Square (V)	9,433	2.8%	201	2.1%	1,523	16.1%	1,651	17.5%	319	3.4%	1,586	16.8%
Nyack (V)	7,303	2.2%	1,521	20.8%	347	4.8%	265	3.6%	862	11.8%	3,653	50.0%
Orangetown (T)	36,127	10.7%	6,912	19.1%	1,804	5.0%	1,056	2.9%	3,540	9.8%	12,603	34.9%
Piermont (V)	2,525	0.8%	539	21.3%	141	5.6%	142	5.6%	181	7.2%	1,214	48.1%
Pomona (V)	3,306	1.0%	613	18.5%	246	7.4%	116	3.5%	293	8.9%	520	15.7%
Ramapo (T)	48,846	14.5%	4,698	9.6%	7,183	14.7%	1,265	2.6%	2,424	5.0%	18,912	38.7%
Sloatsburg (V)	3,043	0.9%	513	16.9%	200	6.6%	68	2.2%	380	12.5%	1,437	47.2%
South Nyack (V)	2,803	0.8%	535	19.1%	59	2.1%	32	1.1%	371	13.2%	911	32.5%
Spring Valley (V)	32,953	9.8%	3,176	9.6%	3,730	11.3%	9,690	29.4%	2,751	8.3%	13,385	40.6%
Stony Point (T)	14,876	4.4%	2,653	17.8%	594	4.0%	265	1.8%	1,619	10.9%	4,393	29.5%
Suffern (V)	11,376	3.4%	2,316	20.4%	490	4.3%	866	7.6%	1,101	9.7%	5,449	47.9%
Upper Nyack (V)	2,355	0.7%	479	20.3%	88	3.7%	19	0.8%	161	6.8%	539	22.9%
Wesley Hills (V)	6,105	1.8%	862	14.1%	626	10.3%	0	0.0%	406	6.7%	1,008	16.5%
West Haverstraw (V)	10,665	3.2%	1,286	12.1%	944	8.9%	1,663	15.6%	991	9.3%	4,490	42.1%
Rockland County (Total)	**336,485**	**100%**	52,060	15.5%	27,605	8.2%	26,990	8.0%	29,008	8.6%	109,704	32.6%

Source: U.S. Census 2024; American Community Survey 2024

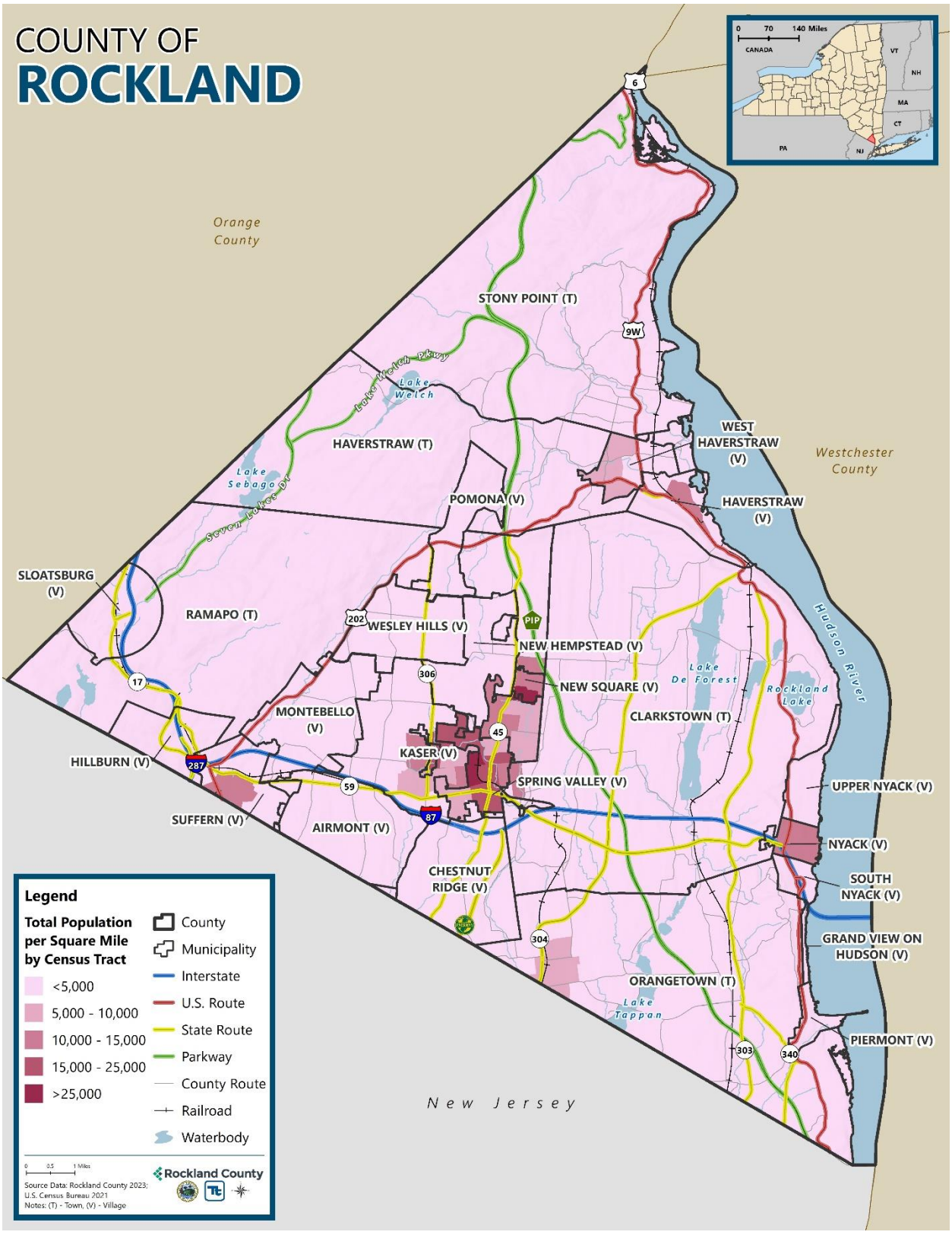
Notes: The following villages were contained with towns; the population totals were adjusted based on average population based on the count of residential structures from the general building stock data.

Village of Nyack - Part of Town of Clarkstown; Part of Town of Orangetown

Village of Pomona - Part of Town of Haverstraw; Part of Town of Ramapo

Village of Spring Valley - Part of Town of Clarkstown; Part of Town of Ramapo

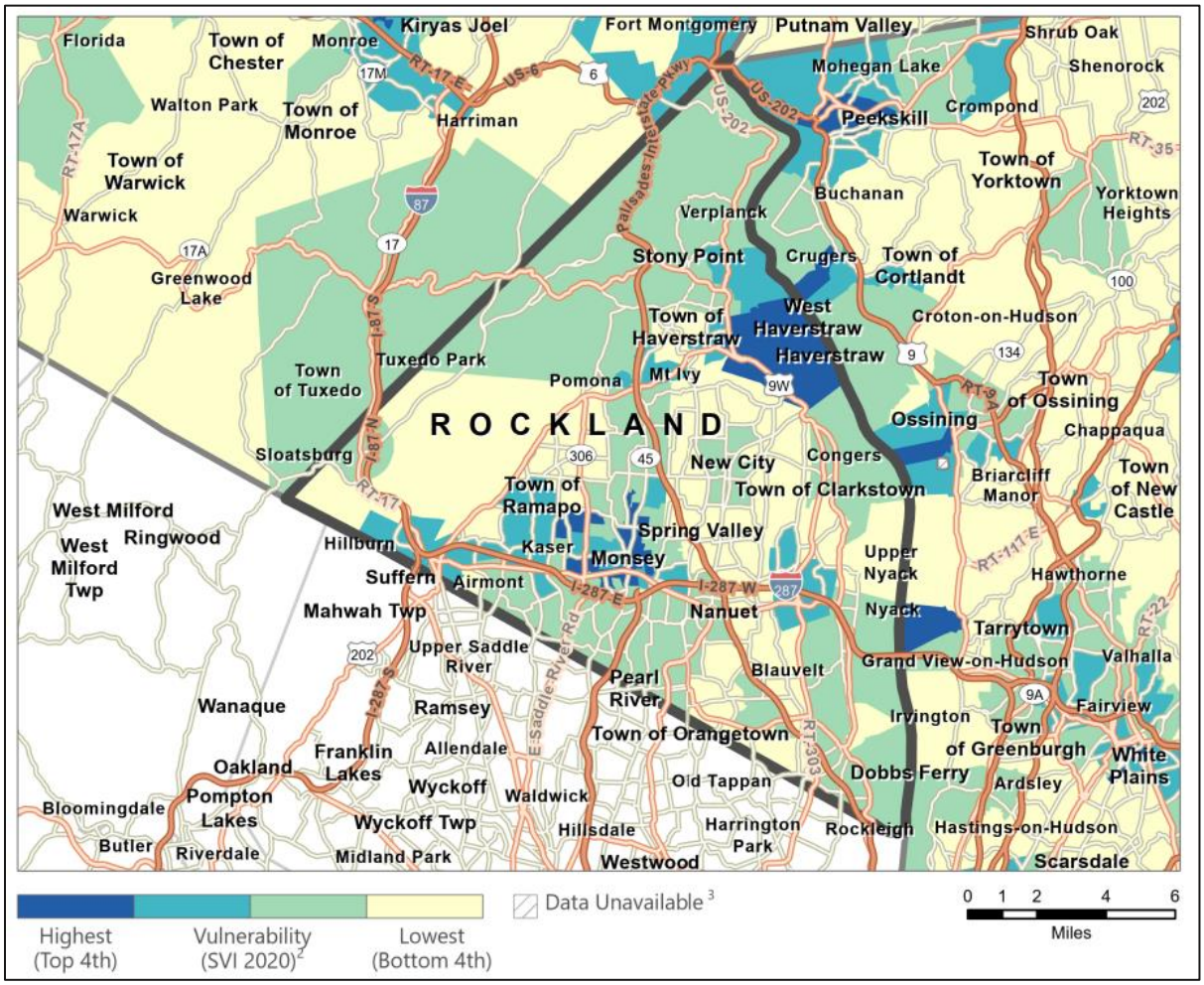
Figure 3-7. Distribution of General Population for Rockland County



Social Vulnerability Index

The Social Vulnerability Index (SVI) is a recent tool developed by the U.S. Centers for Disease Control and Prevention (CDC) to identify socially vulnerable populations. The CDC defines socially vulnerable population using factors such as poverty, lack of access to transportation, and crowded housing. These factors may weaken a community's ability to prevent human suffering and financial loss in a disaster. The SVI uses U.S. Census data to determine the social vulnerability of every Census tract. The SVI ranks each tract on 16 social factors and groups them into four related themes. Each tract receives a separate ranking for each of the four themes, as well as an overall ranking (Agency for Toxic Substances and Disease Registry 2022). Figure 3-8 illustrates the overall social vulnerability distribution in Rockland County.

Figure 3-8. Overall Social Vulnerability in Rockland County



Source: Agency for Toxic Substances and Disease Registry 2022

Age

Children are considered more vulnerable to the impacts of hazard events because they are dependent on others to safely access resources during emergencies and may experience increased health risks from hazard exposure. Older adults are more vulnerable than other age groups before and after disasters and experience more causalities

during and after disasters. Factors include a greater prevalence of chronic conditions, cognitive impairment, medication concerns, greater dependence on assistive devices (e.g., mobility and medical equipment), need for support from caregivers and others, and likelihood of social isolation (American Red Cross 2020). The 2021 ACS reports 8.2 percent of the population of Rockland County is under the age 5 and 15.5 percent is age 65 and older (Figure 3-9 and Figure 3-10).

Income

The 2021 ACS 5-Year Estimates find that the median household income in Rockland County was $99,707, and the per capita income was $41,041 (US Census Bureau 2021). The U.S. Census Bureau identifies households with two adults and two children with an annual household income below $29,678 per year as "low income" (US Census Bureau 2023). The 2021 ACS 5-Year Estimates for Rockland County indicate a total of 10.1 percent persons below the poverty level (US Census Bureau 2021).

It is noted that the spatial U.S. Census data for household income provided in Hazus includes two ranges (less than $10,000 per year and $10,000 to $20,000 per 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 2023 U.S. Census Bureau data. This difference is not significant for the purposes of this planning effort; therefore, for the exposure and loss estimations in the risk assessment, the U.S. Census data in Hazus is reported. Figure 3-11 illustrates the low-income population density in Rockland County.

Asset Limited, Income Constrained, Employed (ALICE)

The County's median and per capita incomes are significantly higher than the U.S. Census Bureau's low income designation. In recognition of this discrepancy, the Steering Committee recommended including the United Way's Asset Limited, Income Constrained, Employed (ALICE) metric in this HMP update. An ALICE household is one that earns above the federal poverty level but cannot afford the basic cost of living in their county (United Way of New York State & United for ALICE 2023). These households often do not qualify for public assistance programs and may struggle to make ends meet. In other words, the ALICE metric is relative to a county's economic composition (i.e., median income).

ALICE is determined by two factors: essential costs and income. Essential costs include a household's basic needs, such as housing, childcare, food, transportation, health care, smartphone plan, and taxes. This number is compared to the U.S. Census Bureau data on county-level income. If a household's costs exceed its income, it is said to be below the ALICE threshold. The ALICE threshold exceeds the federal poverty level, so ALICE households include these households.

In Rockland County, 27 percent of households are below the ALICE threshold (United Way of New York State & United for ALICE 2023). Compared to households meeting poverty thresholds (10 percent), this metric suggests a greater share of the County's population could be adversely affected by hazard impacts than those meeting poverty or U.S. Census Bureau low income thresholds. Refer to Figure 3-12.

Figure 3-9. Distribution of Population Under 5 Years Old in Rockland County

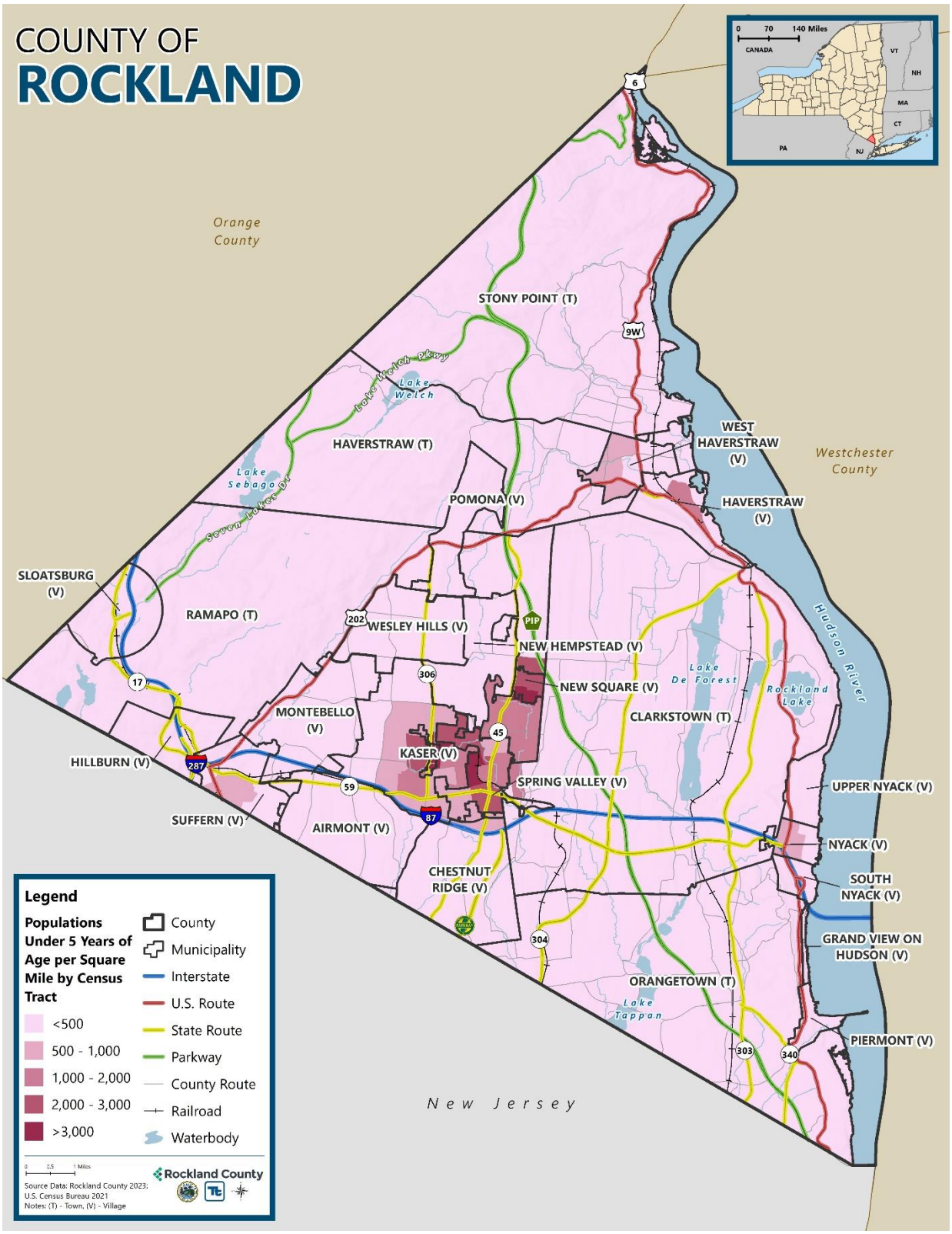


Figure 3-10. Distribution of Population Over 65 Years Old in Rockland County

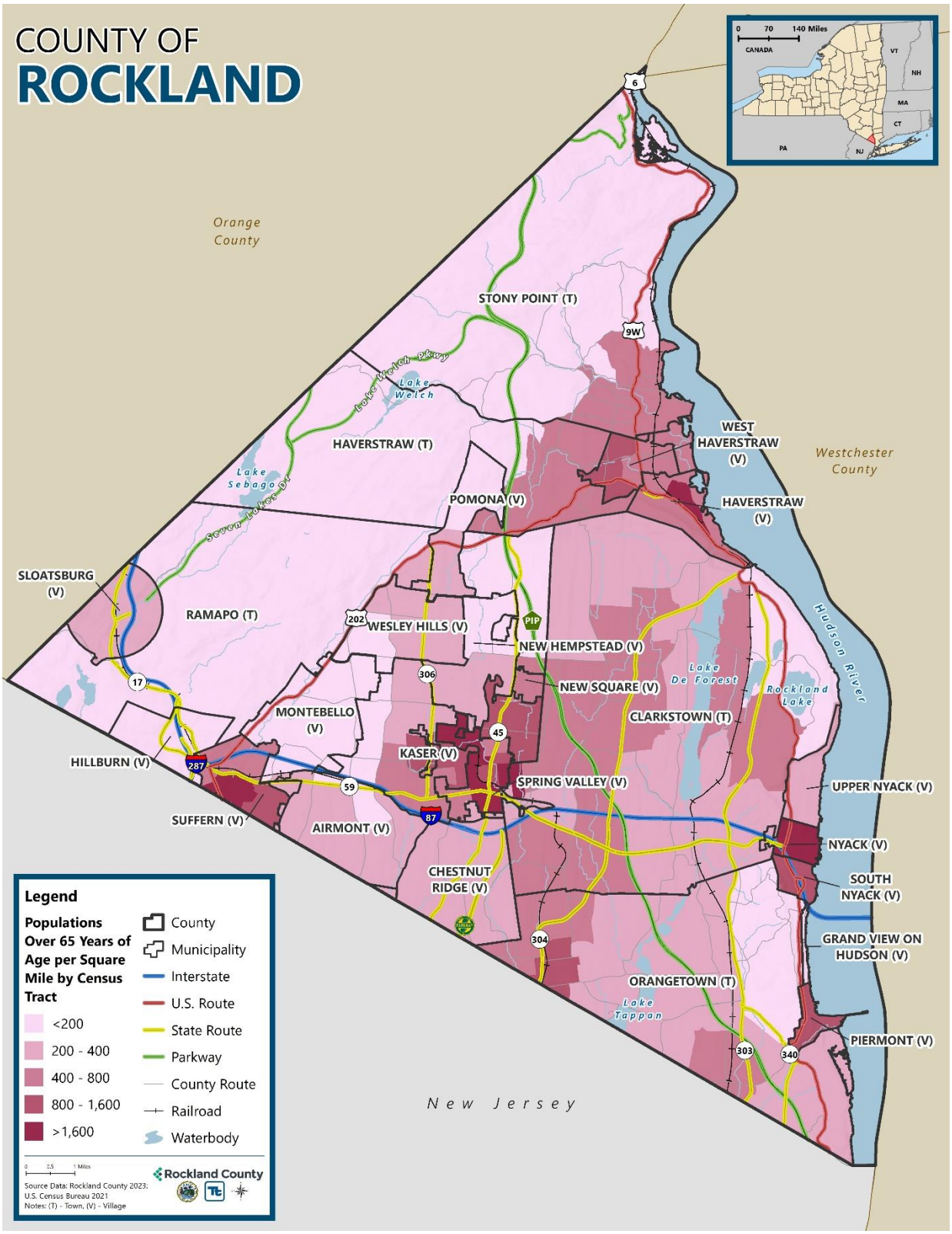


Figure 3-11. Distribution of Low-Income Population in Rockland County

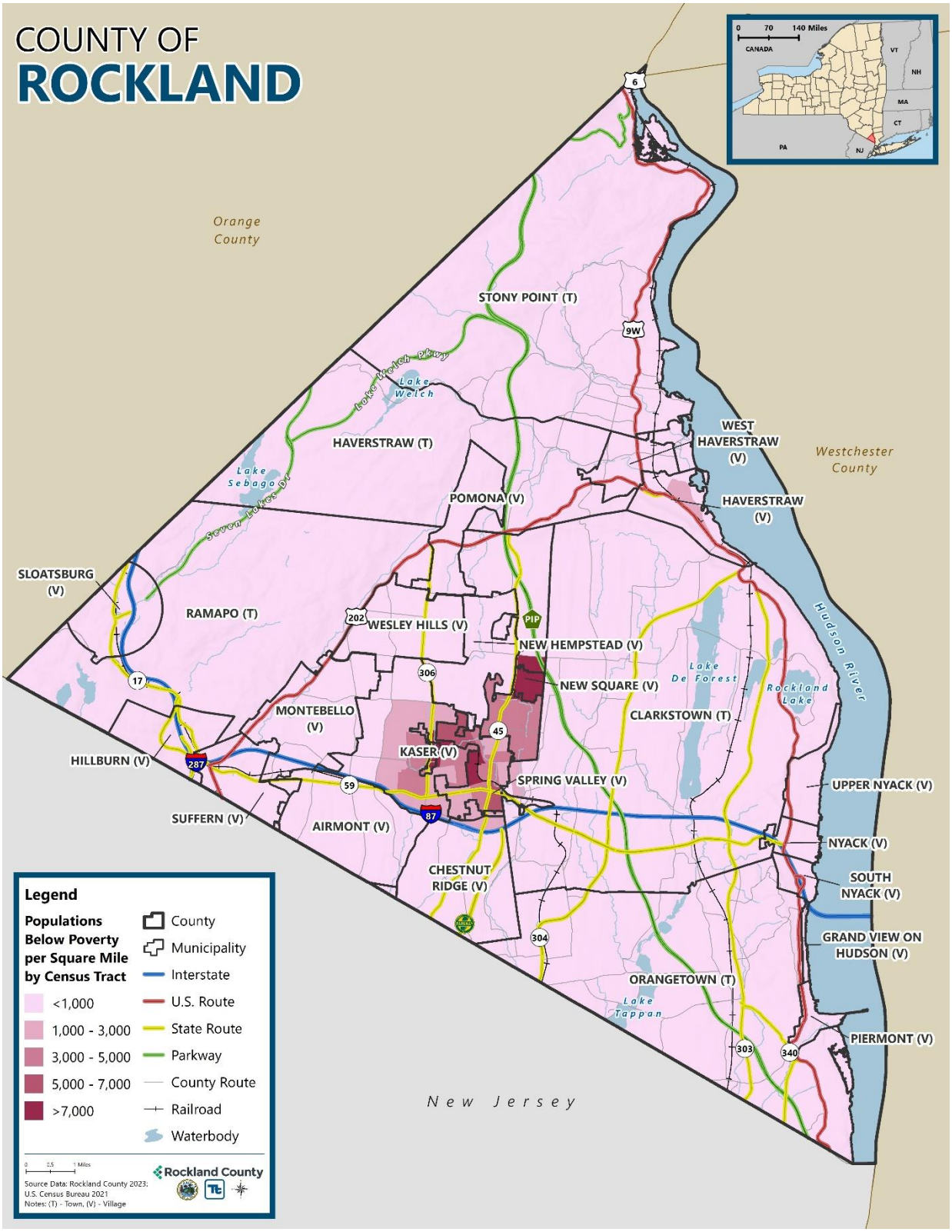
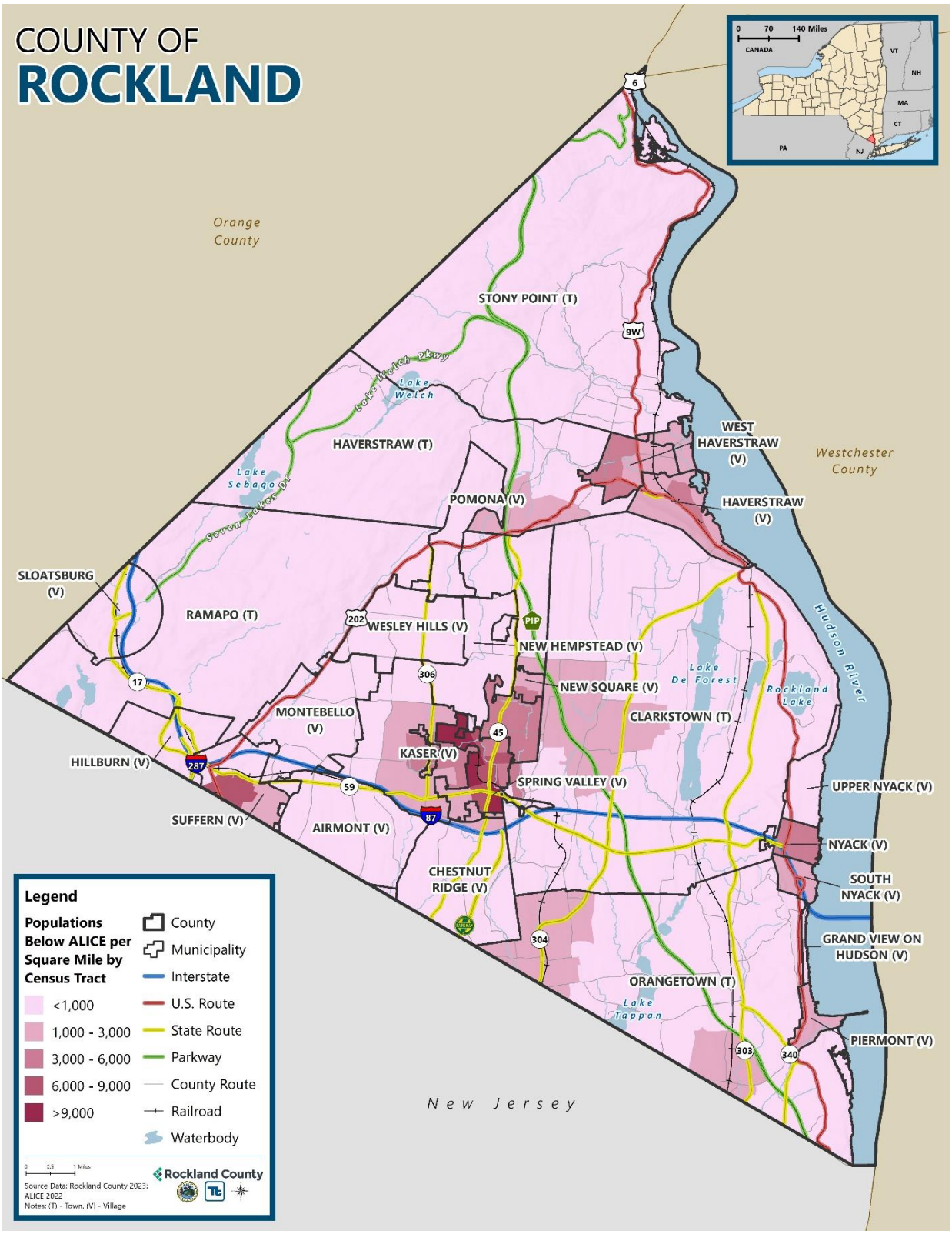


Figure 3-12. Distribution of Population Below ALICE Threshold in Rockland County



Physically or Mentally Disabled

According to the CDC, "persons with a disability include those who have physical, sensory, or cognitive impairment that might limit a major life activity" (U.S. Department of Justice 2023). 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 2021 ACS, 8.7 percent of the County's total population is identified as having a disability (refer to Figure 3-13).

Non-English Speakers

Individuals who are not fluent or proficient 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 (U.S. Department of Justice 2016). According to the 2021 ACS, 42.6 percent of the County's population over the age of five speaks a language other than English at home; this is higher than the State average of 30.5 percent. Of the County's population, 14.0 percent speak Spanish and 23 percent speak other Indo-European languages (US Census Bureau 2021) (refer to Figure 3-14).

3.4.2 Population and Demographic Trends

Population trends can provide a basis for making decisions on the type of mitigation approaches to consider and the locations in which these approaches should be applied. This information can also be used to support planning decisions regarding future development in vulnerable areas.

According to the U.S. Census Bureau, the 2020 population for Rockland County was 338,329, an 8.5 percent increase from the 2010 Census population of 311,687. From 1900 to 2010, the County has seen an overall growth in population, with the exception of from 1910 to 1920. The largest increase was seen between 1960 and 1970 when the County experienced a 68.1 percent increase (93,100 persons). The smallest increase was experienced from 1980 to 1990 when the County saw only a 2.3 percent increase in population. The only decrease in population occurred from 1910 to 1920, with the County seeing a 2.8 percent decrease. Table 3-4 displays the population and change in population from 1900 to 2020 in Rockland County.

Cornell University's Program on Applied Demographics produced population projections by county and by age and sex for New York State. The projections were completed in 2018 and are in annual intervals through 2040. The projections are based on rates of change estimated from historical data. According to this data, shown in Figure 3-15, Rockland County has a projected population increase of 8.6 percent over the next 17 years (Cornell University 2018).

Figure 3-13. Distribution of Population with a Disability in Rockland County

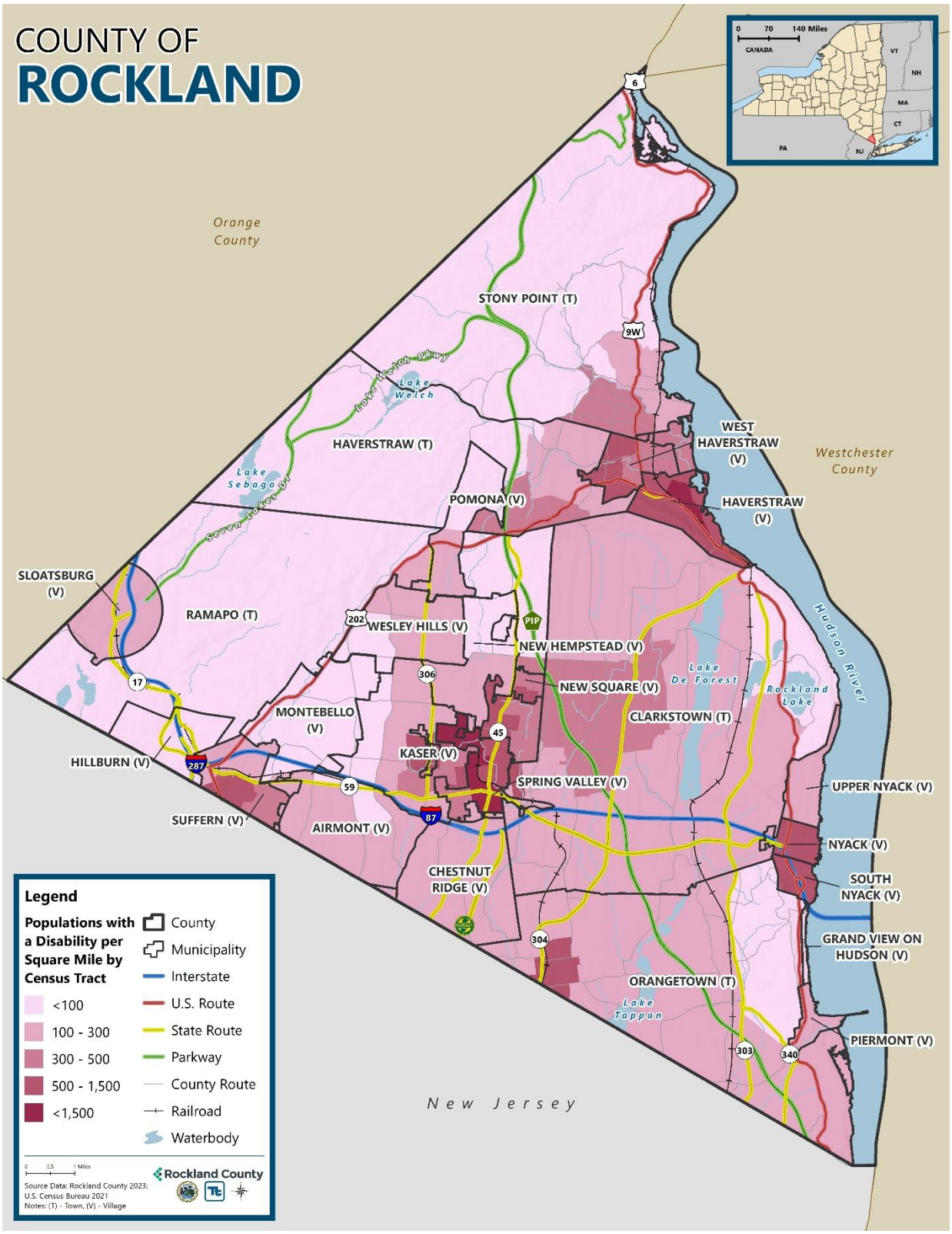


Figure 3-14. Distribution of Non-English Speaking Population in Rockland County

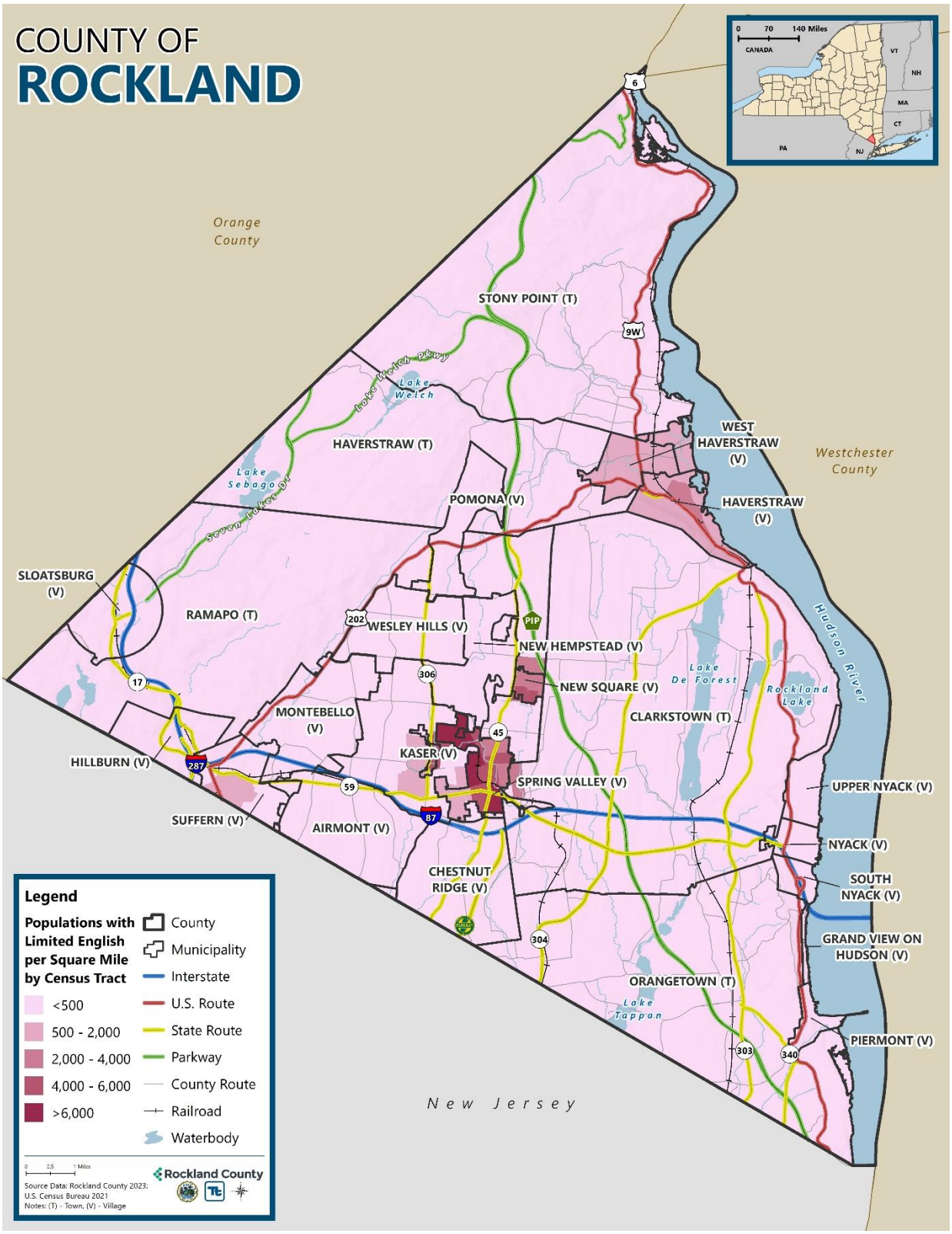
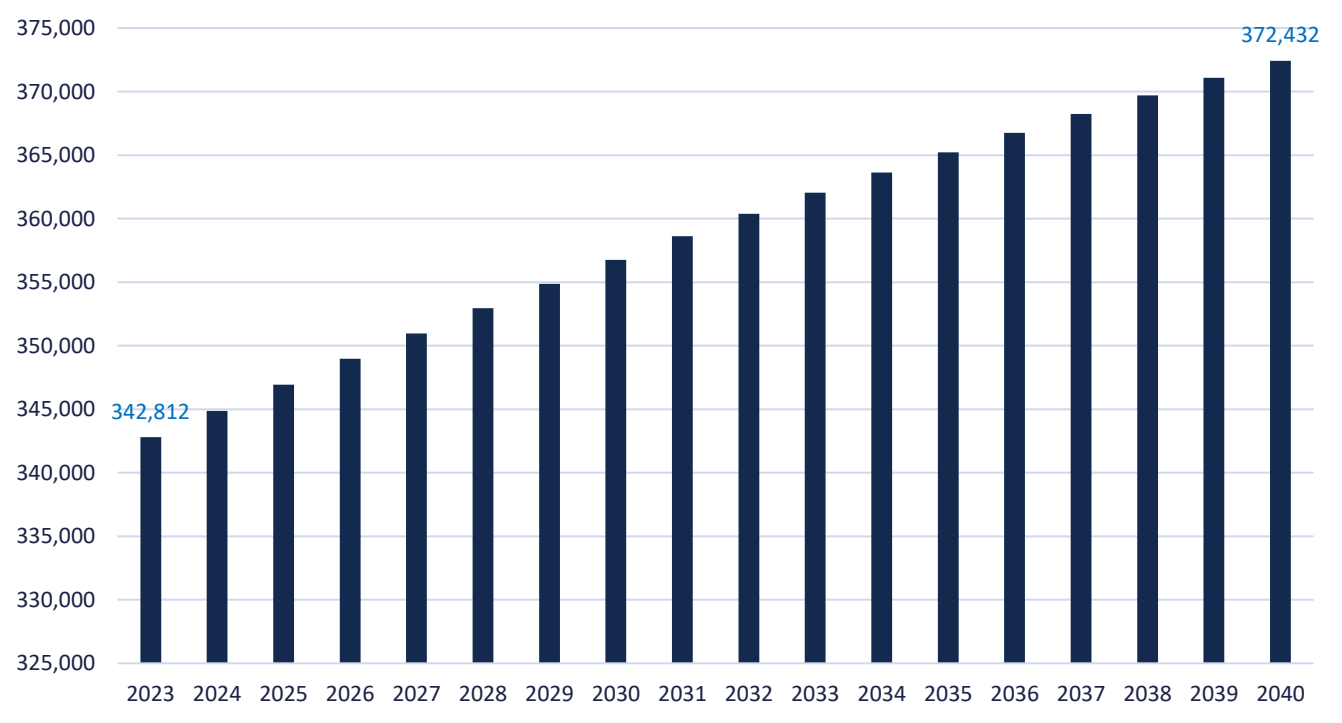


Table 3-4. Rockland County Population Trends

Year	Population	Change in Population	Population Change (%)
1900	38,298	-	-
1910	46,873	8,575	22.4%
1920	45,548	-1,325	-2.8%
1930	59,599	14,051	30.8%
1940	74,261	14,662	24.6%
1950	89,276	15,015	20.2%
1960	136,803	47,527	53.2%
1970	229,903	93,100	68.1%
1980	259,530	29,627	12.9%
1990	265,475	5,945	2.3%
2000	286,753	21,278	8.0%
2010	311,687	24,934	8.7%
2020	338,329	26,642	8.5%

Source: U.S. Census 2024
Note: Change in population and percent in population change were calculated from available data.

Figure 3-15. Rockland County Population Projections, 2023 to 2040



Source: Cornell University 2018

Table 3-5 provides population trends for the 24 municipalities of Rockland County. The Village of New Square saw the largest growth in population, a 39.4 percent increase. The Village of South Nyack saw the greatest decrease with a loss of 23.1 percent.

Table 3-5. Population Trends in Rockland County by Municipality

Jurisdiction	2010 Census	2020 Census	% Change (2010 to 2020)
Airmont (V)	8,628	10,166	17.8%
Chestnut Ridge (V)	7,916	10,505	32.7%
Clarkstown (T)	84,187	86,855	3.2%
Grand View on Hudson (V)	285	246	-13.7%
Haverstraw (T)	36,634	39,087	6.7%
Haverstraw (V)	11,910	12,323	3.5%
Hillburn (V)	951	930	-2.2%
Kaser (V)	4,724	5,491	16.2%
Montebello (V)	4,526	4,507	-0.4%
New Hempstead (V)	5,132	5,463	6.4%
New Square (V)	6,944	9,679	39.4%
Nyack (V)	6,765	7,265	7.4%
Orangetown (T)	49,212	48,655	-1.1%
Piermont (V)	2,510	2,517	0.3%
Pomona (V)	3,103	3,824	23.2%
Ramapo (T)	126,595	148,919	17.6%
Sloatsburg (V)	3,039	3,036	-0.1%
South Nyack (V)	3,510	2,699	-23.1%
Spring Valley (V)	31,347	33,066	5.5%
Stony Point (T)	15,059	14,813	-1.6%
Suffern (V)	10,723	11,441	6.7%
Upper Nyack (V)	2,063	2,015	-2.3%
Wesley Hills (V)	5,628	6,116	8.7%
West Haverstraw (V)	10,165	10,678	5.0%
Rockland County (Total)	**311,687**	**338,329**	**8.5%**

3.5 GENERAL BUILDING STOCK

For this update, a customized general building stock was created using building footprints and parcel data from the County, supplemented with other County-provided data and 2022 RSMeans replacement cost values for buildings and contents. Contents are valued at 50 percent of the building's value for residential structures and 100 percent of the building's value for non-residential facilities. The updated building inventory contains 112,485 buildings with a total building replacement value (structure and contents) of $54.1 billion. This inventory was incorporated into Hazus. The Town of Clarkstown has the greatest number of structures, at 34,094. The Village of Kaser has the fewest structures, with 197.

Residential housing accounts for 93 percent of the buildings in the inventory (104,229 buildings) and 52 percent of the building stock replacement value (approximately $48 billion). The 2021 ACS identifies 108,165 housing units in Rockland County, with a median value of $528,900 for owner-occupied housing units (US Census Bureau 2021). The Census Bureau defines a housing unit as any house, apartment, mobile home, group of rooms, or single room that is intended for occupancy as separate living quarters. Commercial buildings make up 25 percent of the total building replacement value. Replacement cost values of commercial, industrial, and residential properties in Rockland County are shown in Figure 3-16 through Figure 3-18, respectively.

Figure 3-16. Replacement Cost Value of Commercial Properties in Rockland County

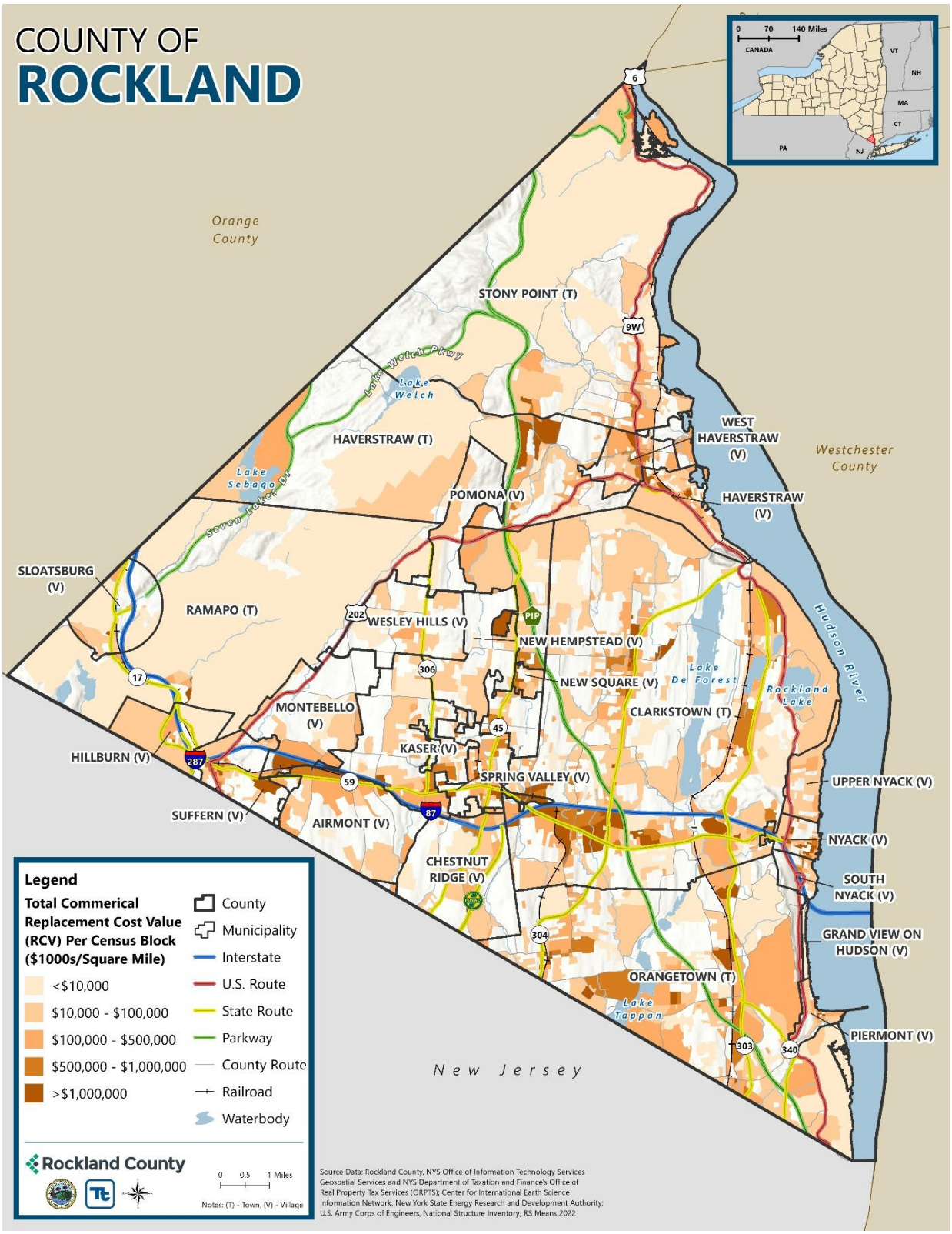


Figure 3-17. Replacement Cost Value of Industrial Properties in Rockland County

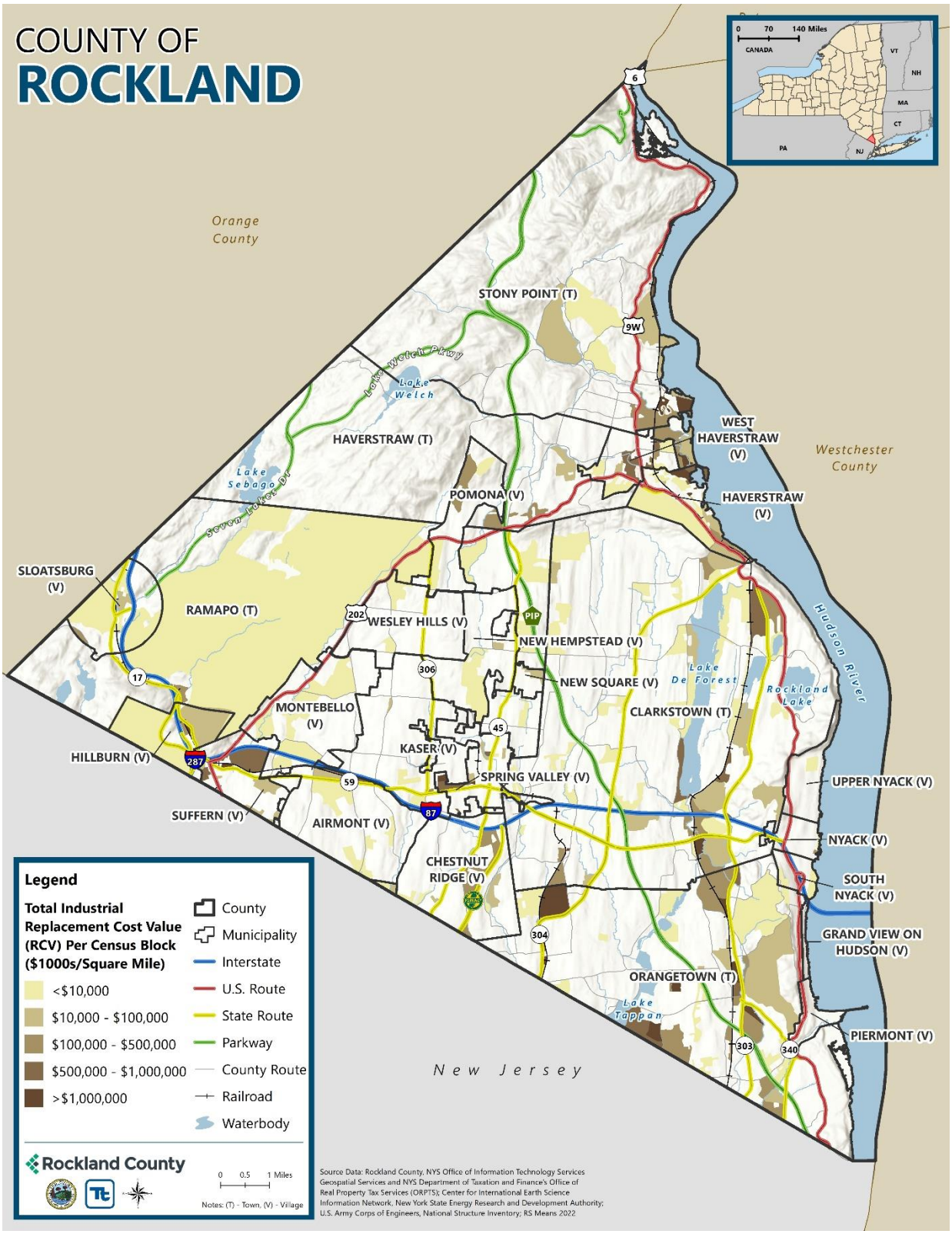
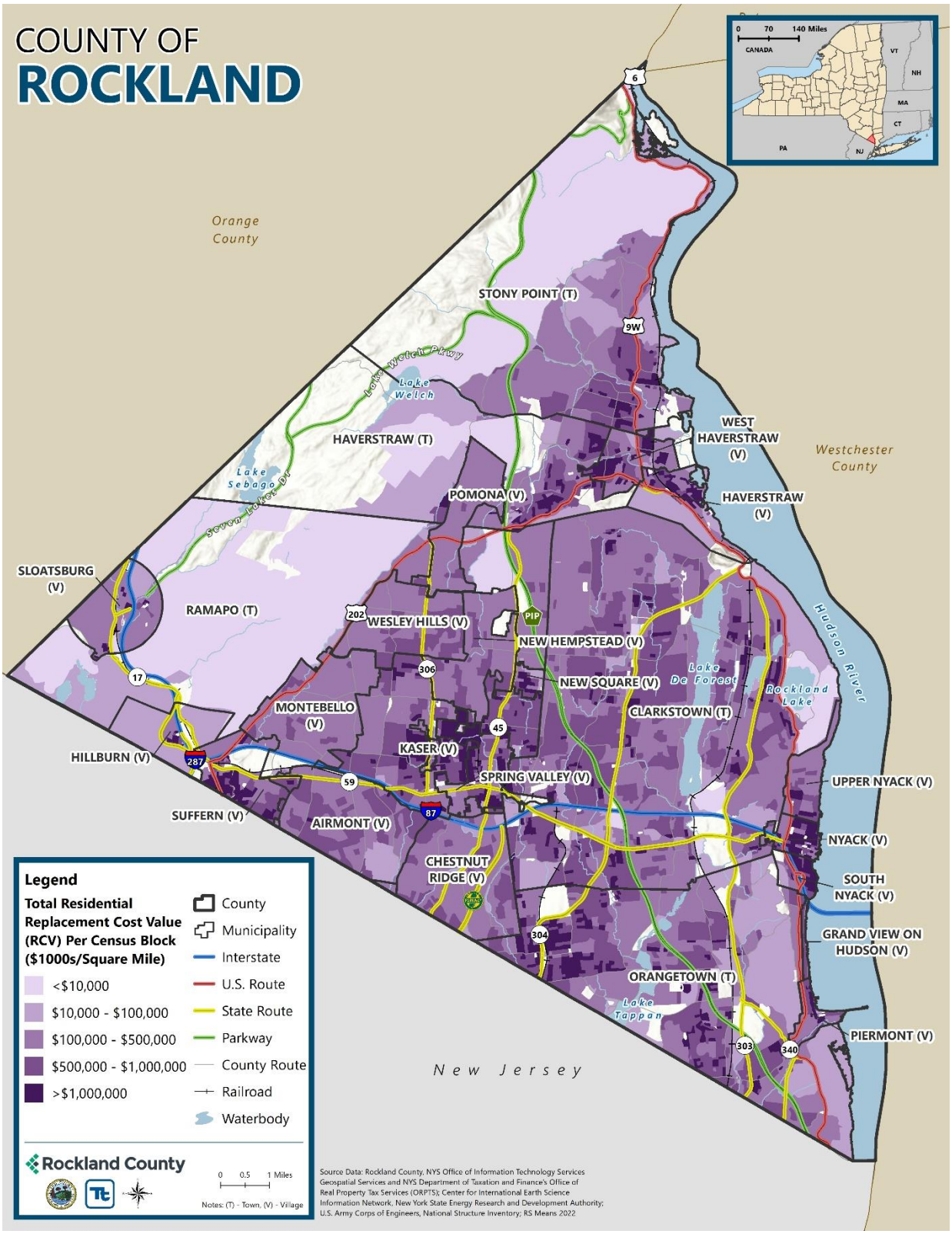


Figure 3-18. Replacement Cost Value of Residential Properties in Rockland County



3.6 DEVELOPMENT TRENDS AND NEW DEVELOPMENT

Federal guidelines for hazard mitigation require that communities consider land use trends, which can impact the need for and priority of mitigation options over time. Land use trends can also significantly impact exposure and vulnerability to various hazards. For example, significant new development in a hazard area increases the building stock and population exposed to that hazard.

The hazard profiles in this HMP provide a general overview of land use trends and types of development occurring within known hazard areas. In the jurisdictional annexes in Volume II, the County and participating municipalities have identified development that has occurred in the last five years and potential future development in the next five years, along with the development's exposure to natural hazards. An understanding of these 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 lifelines. In general, development occurring in Rockland County is outside of high hazard areas (e.g., floodplains and steep slopes).

While any development increases the risk of losses due to natural hazards, such increases can be mitigated by existing federal, state, county and local regulations, policies, and programs. In New York State, land use regulatory authority is vested in towns, villages, and cities. Each municipality in Rockland County is empowered by the Municipal Home Rule Law to plan and zone within its boundaries. However, many development and preservation issues transcend local political boundaries.

All communities have planning and regulatory mechanisms in place that control and limit the increased natural hazard risk of new development and re-development. All communities have planning boards and site plan review requirements that include review and appropriate consideration of hazard areas. The County requires that all development and construction conform with the Uniform Fire Prevention and Building Code (Uniform Code). Further all Rockland County communities participate, and are in good standing, in the National Flood Insurance Program (NFIP), which by state regulation requires 2 feet of freeboard above the FEMA 1 percent annual chance base flood elevation (BFE) for new residential construction and substantial improvement, and 1 foot for all other construction types.

Certain communities have adopted ordinances to further protect against natural hazards (e.g., steep slope ordinances) and protect natural resources that provide natural mitigation benefits (e.g., wetlands and wetland buffers, stream courses and stream banks, areas of retention/detention). County and community capabilities to manage development to minimize increases in natural hazard risk are discussed in the capability assessment subsection of Section 5 and in each jurisdictional annex in Volume II. Also identified in each annex are actions the community has taken or will take to further integrate the findings and recommendations of this plan into other planning mechanisms and programs, many of which support land use and development to minimize increases in natural hazard risk.

3.7 COMMUNITY LIFELINES AND CRITICAL FACILITIES

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

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

Critical infrastructure and facilities are those that are essential to the health and welfare of the population. These facilities are especially important after any hazard event. In 2017, FEMA created the concept of Community Lifelines. Lifelines allow for continuity of operations of critical facilities before, during, and after a disaster. Focusing on protecting lifelines, preventing and mitigating potential impacts, and building back stronger will increase the resilience of Rockland County and its jurisdictions.

Community lifelines represent the most fundamental services in the community that, when stabilized, enable all other aspects of society. Following a disaster event, intervention is required to stabilize community lifelines. Lifelines are divided into the following categories (see Figure 3-19):

- Safety and security
- Food, hydration, shelter
- Health and medical
- Water systems
- Energy (power and fuel)
- Communications
- Transportation
- Hazardous materials

Figure 3-19. FEMA Community Lifelines

Source: FEMA 2024

A comprehensive inventory of critical facilities and lifelines in Rockland County was developed from various sources, including input from the Planning Partnership. They include critical facilities and community lifelines provided and reviewed by Rockland County as well as facilities listed in Hazus v6.0. The list includes facilities owned and/or operated by County, local, or private entities. It does not include state-owned or -leased facilities. Table 3-6 summarizes the number of community lifelines identified, by jurisdiction and lifeline category.

Table 3-6. Community Lifelines in Rockland County

Jurisdiction	Safety and Security	Food, Hydration, Shelter	Health and Medical	Water Systems	Energy	Communications	Transportation	Hazardous Materials	TOTAL
Airmont (V)	13	3	13	8	-	2	-	1	**40**
Chestnut Ridge (V)	8	-	11	3	-	8	-	-	**30**
Clarkstown (T)	70	15	51	32	-	39	2	21	**230**
Grand View on Hudson (V)	1	-	-	-	-		-	-	**1**
Haverstraw (T)	25	-	3	29	-	7	-	4	**68**
Haverstraw (V)	11	9	8	-	-	1	-	1	**30**
Hillburn (V)	7	-	-	2	-	2	-	1	**12**
Kaser (V)	1	-	-	-	-		-	-	**1**
Montebello (V)	24	1	4	5	-	3	-	-	**37**
New Hempstead (V)	7	-	3	-	-	1	-	1	**12**
New Square (V)	1	-	2	1	-	-	-	-	**4**
Nyack (V)	10	9	10	1	-	4		1	**35**
Orangetown (T)	43	6	28	13	-	25	1	13	**129**
Piermont (V)	7	1	1	-	-	1	-	-	**10**
Pomona (V)	1	-	-	3	-	1	-	-	**5**
Ramapo (T)	45	-	21	12	-	28	-	3	**109**
Sloatsburg (V)	9	1	2	3	-	5	1	1	**22**
South Nyack (V)	3	2	-	-	-	2	-	-	**7**
Spring Valley (V)	10	16	20	1	-	6	2	3	**58**
Stony Point (T)	24	5	6	27	-	10	-	3	**75**
Suffern (V)	10	2	5	6	-	2	2	1	**28**
Upper Nyack (V)	5	-	-	-	-		-	-	**5**
Wesley Hills (V)	6	-	-	1	-	4	-	1	**12**
West Haverstraw (V)	8	1	7	1	-	3	-	1	**21**
Rockland County (Total)	**349**	**71**	**195**	**148**	**0**	**154**	**8**	**56**	**981**

Source: Rockland County; USDHS Sara Title 3

Note: The critical facilities and community lifelines included in the 2024 HMP were provided and reviewed by Rockland County or listed in Hazus v6.0. The list includes facilities owned and/or operated by county, local, or private entities but not state-owned or -leased facilities.

3.7.1 Community Lifelines by Category

Safety and Security

Safety and security lifelines include law enforcement, security, fire services, search and rescue services, government services, and community safety (e.g., dams). For this HMP update, 349 safety and security lifelines were identified, consisting of alternative education facilities, correctional institutions, county facilities, dams, emergency operation centers, fire stations, county-owned buildings, police stations, post offices, post-secondary education facilities, primary education facilities, public works, secondary education facilities, and town/village halls. The number of each type of safety and security facility is presented in Table 3-7 and shown in Figure 3-20.

Fire protection and emergency services are provided to Rockland County through 26 all-volunteer fire departments, some of which consist of more than one company. There are 51 fire stations operating throughout the County (Rockland County Fire and Emergency Services 2024).

Figure 3-20. Safety and Security Lifelines in Rockland County

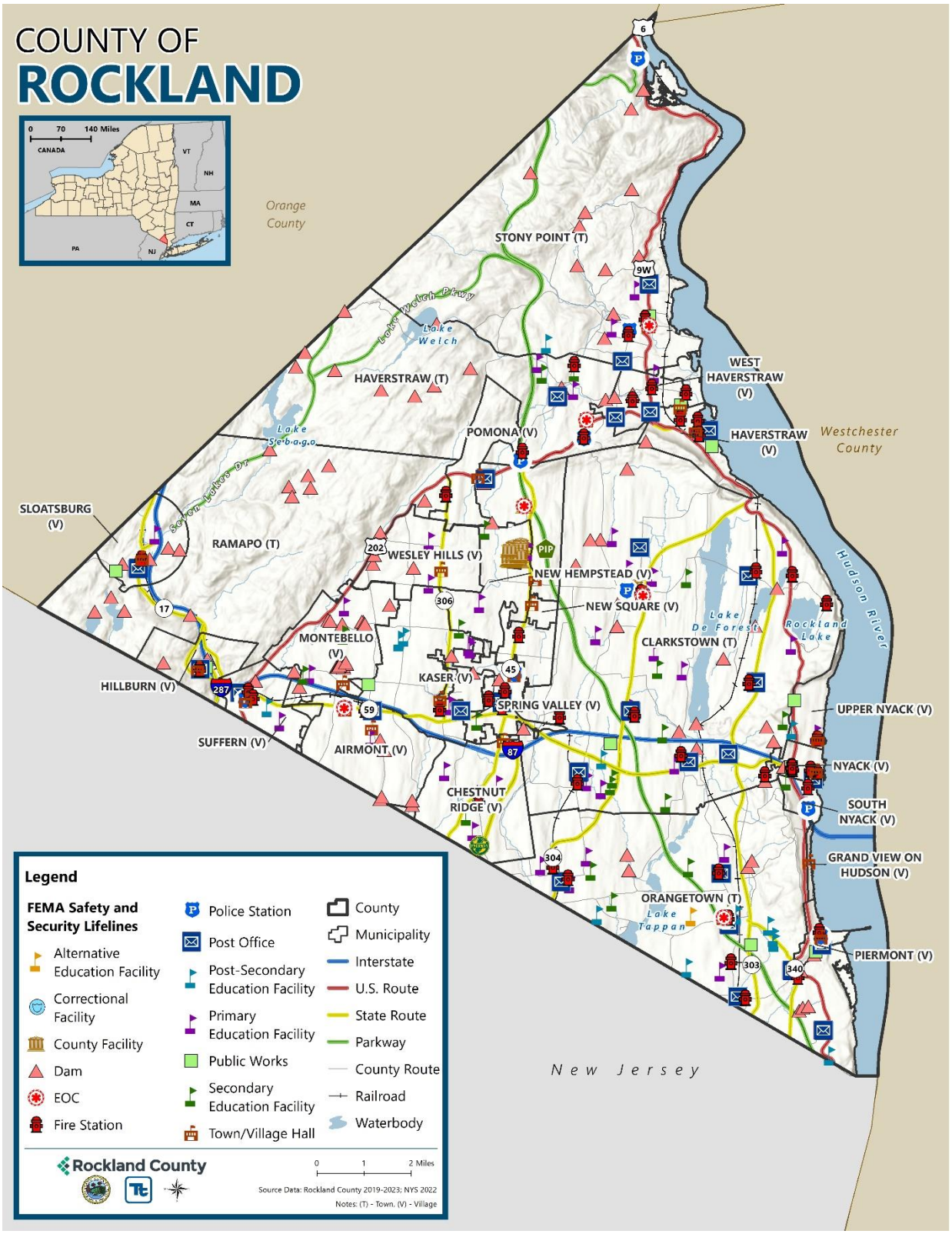


Table 3-7. Safety and Security Lifelines in Rockland County

Lifeline Type	Number of Lifelines
Alternative Education Facility	1
Correctional Facility	1
County Facility	26
Dam	107
EOC	6
Fire Station	51
Police Station	12
Post Office	28
Post-Secondary Education Facility	16
Primary Education Facility	40
Public Works	15
Secondary Education Facility	23
Town/Village Hall	23
TOTAL	**349**

Sources: Rockland County

The Rockland County public school system consists of eight school districts containing a total of 63 primary and secondary schools. Additionally, there are 16 post-secondary education facilities in the County, including six higher education institutions: Dominican University New York, New York University at Dominican College of Blauvelt, Salvation Army Collection for Officer Training, New York University – St. Thomas, Rockland Community College, and St. Thomas Aquinas College (NYSED 2024).

Food, Hydration, Shelter

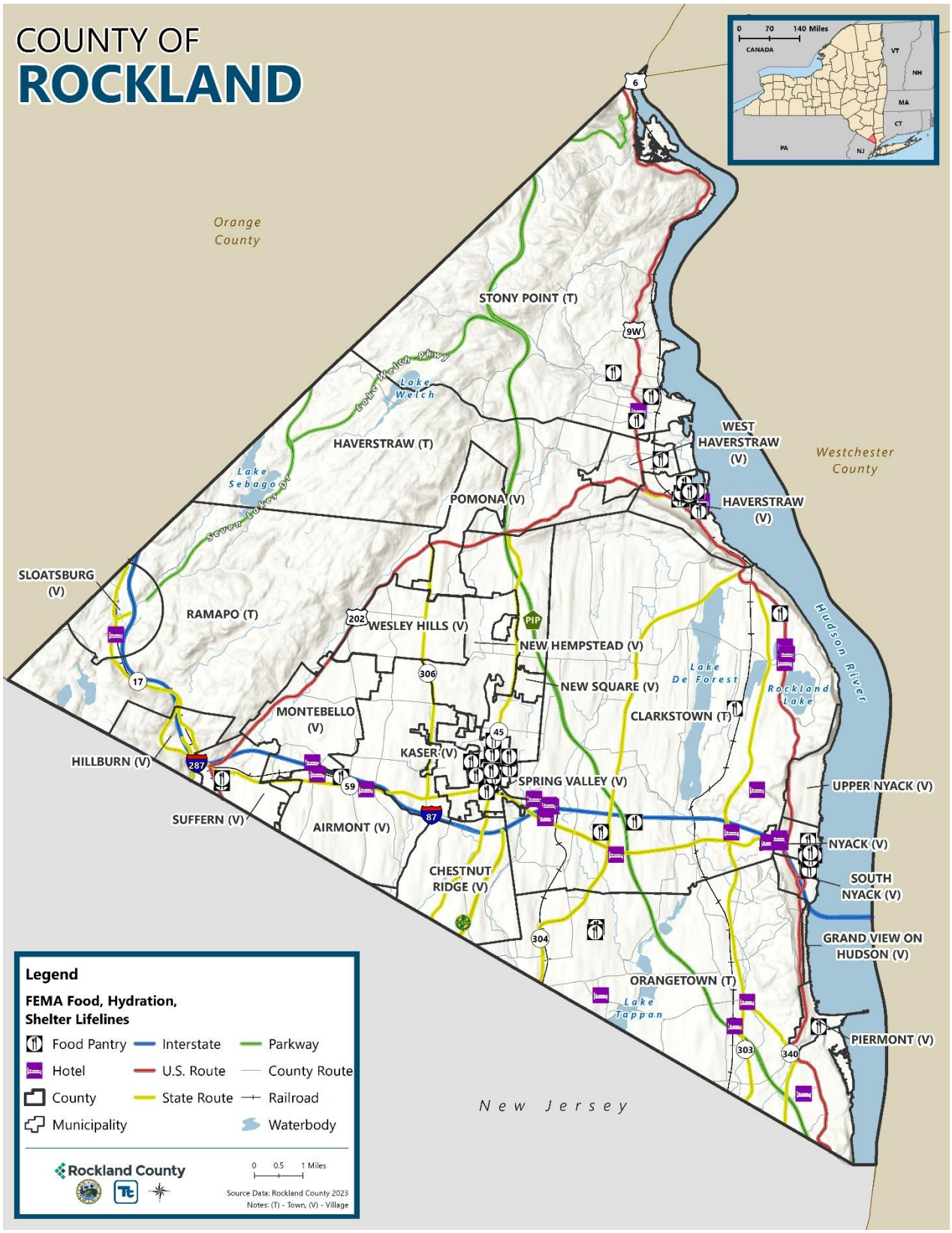
Food and hydration lifelines include facilities associated with commercial food distribution, the commercial food supply chain, food distribution programs, temporary hydration missions, the commercial water supply chain, housing, commercial facilities, animals, and agriculture. Shelter facilities includes day cares, libraries, major employers, places of worship, polling sites, and marinas. For this HMP update, the County identified food pantries and hotels to include in the plan update. This included 71 food, hydration, shelter facilities (refer to Table 3-8). Figure 3-21 shows the location of the facilities in the County. Due to the number of such lifelines across the County, they were not included in the critical facility/community lifeline total. However, these facilities provide essential services to the County before, during, and after a disaster.

Table 3-8. Food, Hydration, Shelter Lifelines in Rockland County

Lifeline Type	Number of Lifelines
Food Pantry	46
Hotel	25
TOTAL	**71**

Sources: Rockland County

Figure 3-21. Food, Hydration, Shelter Lifelines in Rockland County



Health and Medical

Health and medical lifelines include medical care (e.g., hospitals, pharmacies, long-term care facilities), patient movement, fatality management, public health, and medical supply chain. For this HMP update, 195 health and medical lifelines were identified, consisting of ambulance transportation providers, hospitals, pharmacies, senior care facilities, and urgent care. Table 3-9 summarizes the number of each type of lifeline in Rockland County and Figure 3-22 shows the location of the facilities.

Table 3-9. Health and Medical Lifelines in Rockland County

Lifeline Type	Number of Lifelines
Ambulance Transportation	23
Hospital	3
Pharmacy	90
Senior Care Facility	57
Urgent Care	22
TOTAL	**195**

Sources: Rockland County

Rockland County Emergency Medical Services (EMS), a division of the Rockland County Department of Health, is made up of 14 volunteer basic life support (BLS) and two advanced life support (ALS) agencies, an EMS coordinator, assistant EMS coordinator, and 11 deputy EMS coordinators (Rockland County Health Department 2024). Additionally, there are three hospitals in Rockland County: Good Samaritan Hospital of Suffern, Helen Hayes Hospital, and Montefiore Nyack (New York State Department of Health 2023).

Water Systems

Water system lifelines include potable water infrastructure (intake, treatment, storage, and distribution) and wastewater management (collection, storage, treatment, and discharge). For this HMP update, 148 water system lifelines were identified, consisting of wastewater treatment plants, water towers, and wells. According to New York State Department of Health's public water supply database, there are 29 community public water systems and 41 non-community public water systems in Rockland County. Table 3-10 summarizes the number of each type of lifeline in Rockland County and Figure 3-23 shows the location of the facilities.

A **community water system** is a public water system that serves the same people year-round. Most residences including homes, apartments, and condominiums in cities, towns, and mobile home parks are served by community water systems. Examples of community water systems include municipal-owned public water supplies, public water authorities, or privately owned water suppliers such as homeowner associations, apartment complexes, and mobile home parks that maintain their own drinking water systems.

A **non-community water system** is a public water system that serves the public but does not generally serve the same people year-round. There are two types of non-community water systems: transient and non-transient. A transient non-community water system provides water in a place such as a gas station or campground where people do not remain for long periods of time. A non-transient non-community system regularly supplies water to at least 25 of the same people at least six months per year. Some examples are schools, factories, office buildings, and hospitals that have their own water systems (U.S. Environmental Protection Agency 2023).

Figure 3-22. Health and Medical Lifelines in Rockland County

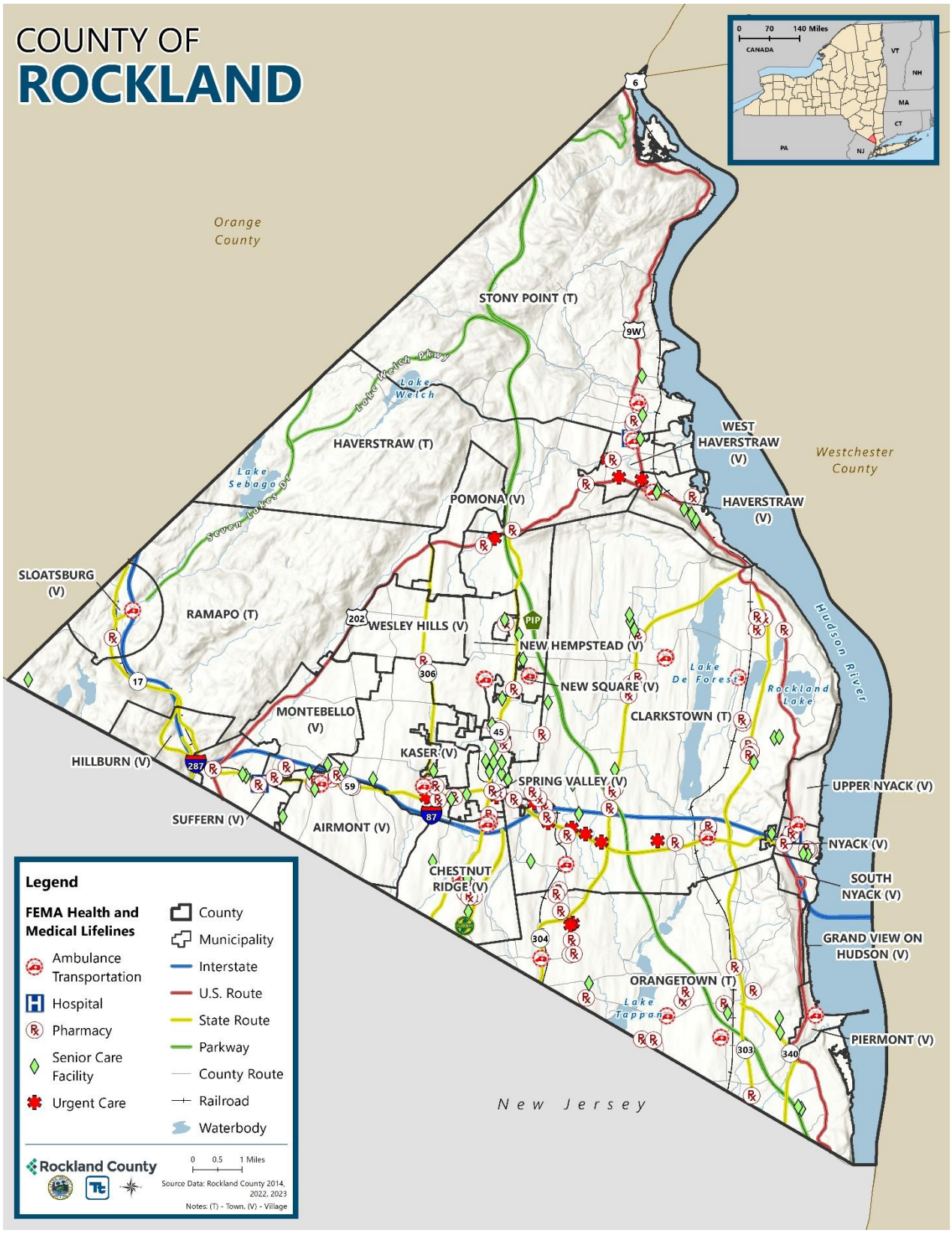


Figure 3-23. Water System Lifelines in Rockland County

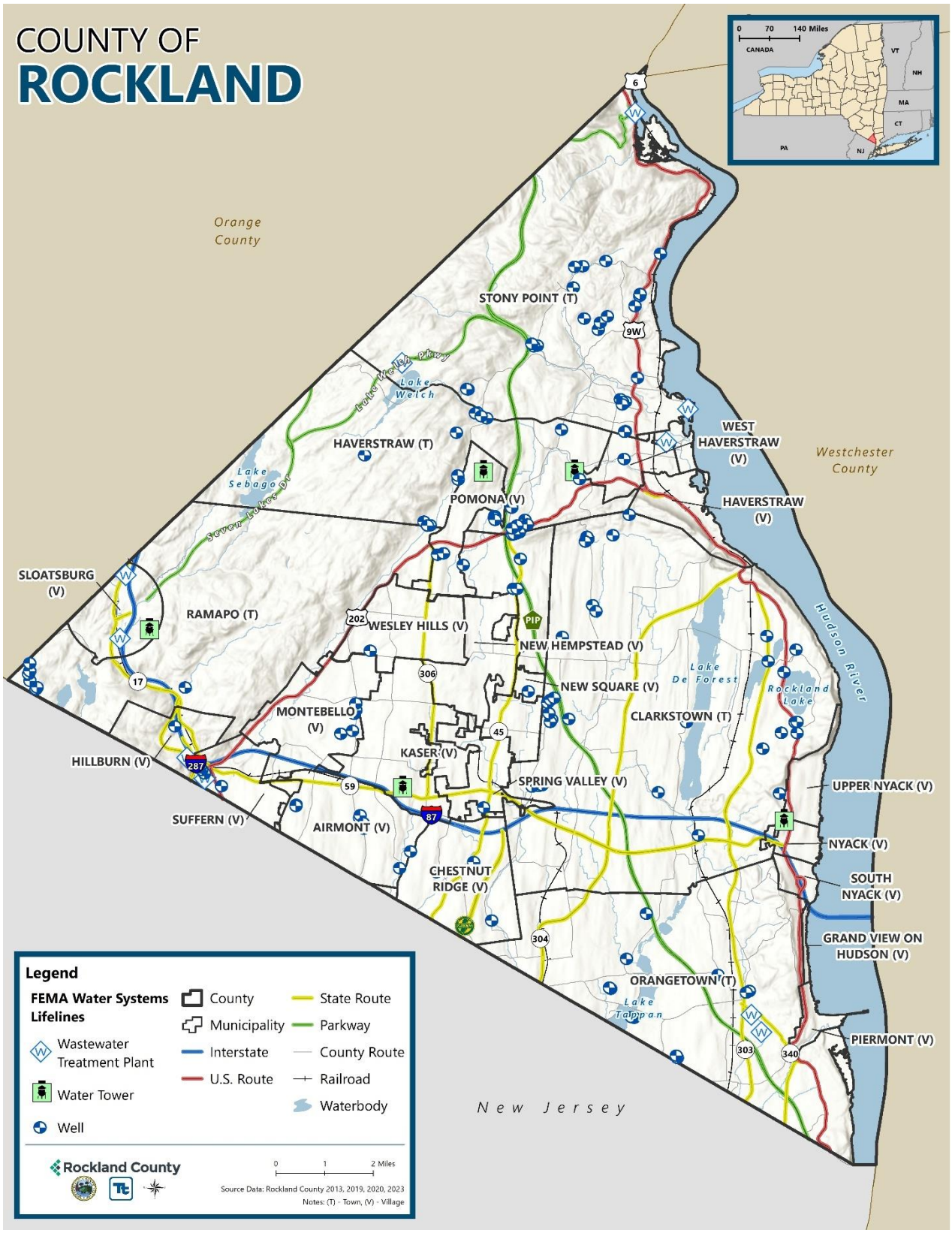


Table 3-10. Water System Lifelines in Rockland County

Lifeline Type	Number of Lifelines
Wastewater Treatment Plant	10
Water Tower	5
Well	133
TOTAL	**148**

Sources: Rockland County

Energy

Energy lifelines include power grids and fuel facilities. For this HMP update, specific energy lifelines were not identified in Rockland County. Orange and Rockland Utilities, Inc. (O&R) provides electricity and natural gas to residents of Rockland County.

Communications

Communications lifelines include infrastructure, alerts/warnings/messages, 911 and dispatch, responder communications, and finance. Overall, 154 communication facilities were identified in Rockland County for this HMP update, consisting of cellular towers and emergency response towers. Rockland County has an extensive radio communications network that is utilized by emergency services agencies, hospitals, law enforcement, public works, transportation, and other supporting organizations. Refer to Table 3-11 for a summary of communication lifelines and Figure 3-24 illustrates the location of communication lifelines in the County.

Table 3-11. Communication Lifelines in Rockland County

Lifeline Type	Number of Lifelines
Cell Tower	141
Emergency Response Tower	13
Total	**154**

Sources: Rockland County

Transportation

Transportation lifelines include highways and other roadways, mass transit, railways, aviation facilities, and maritime facilities. Overall, there are eight transportation facilities identified in Rockland County for this HMP update, consisting of rail yards and train stations. Table 3-12 summarizes the types of transportation lifelines in the County, and Figure 3-25 illustrates the location of these facilities in Rockland County.

Figure 3-24. Communications Lifelines in Rockland County

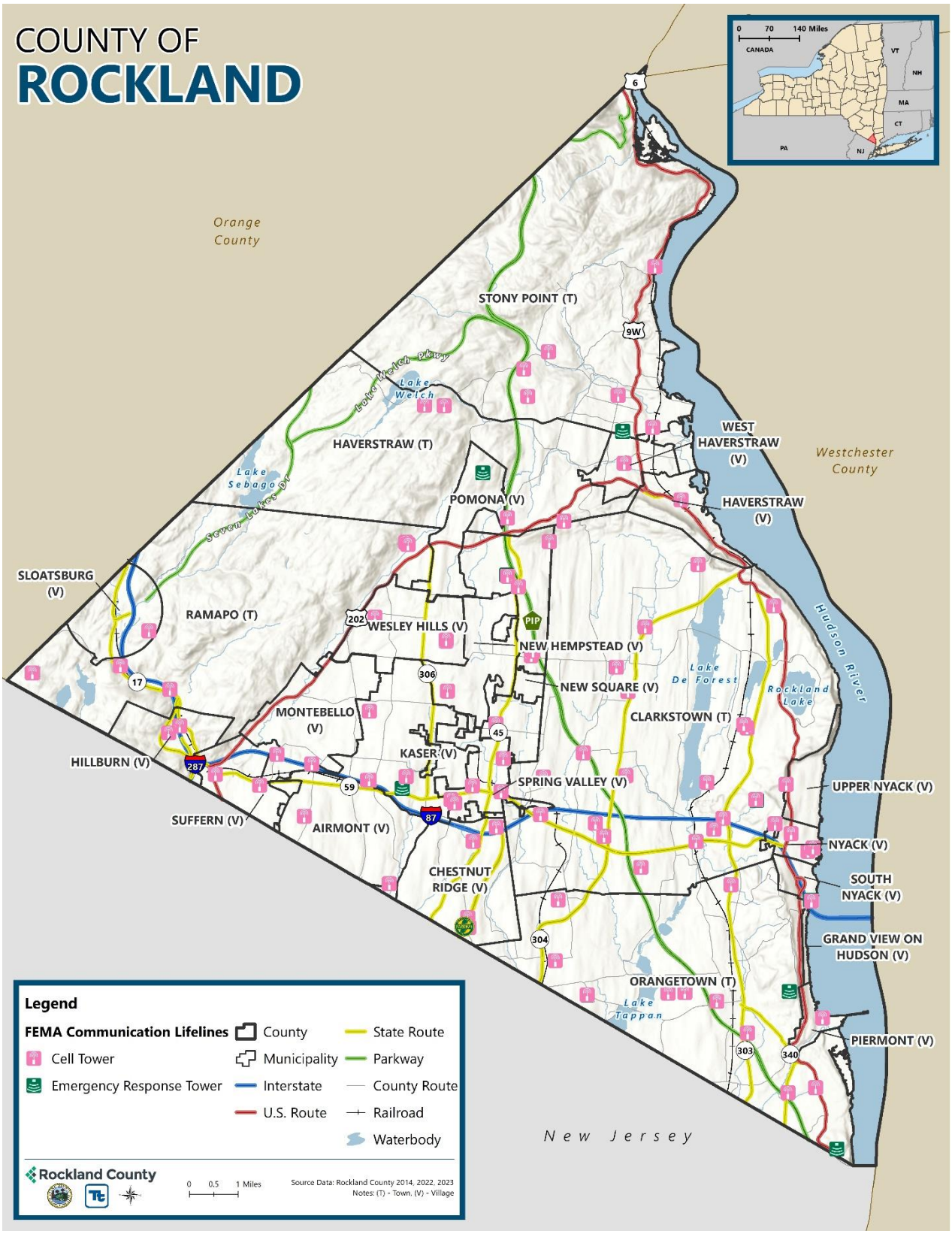


Figure 3-25. Transportation Lifelines in Rockland County

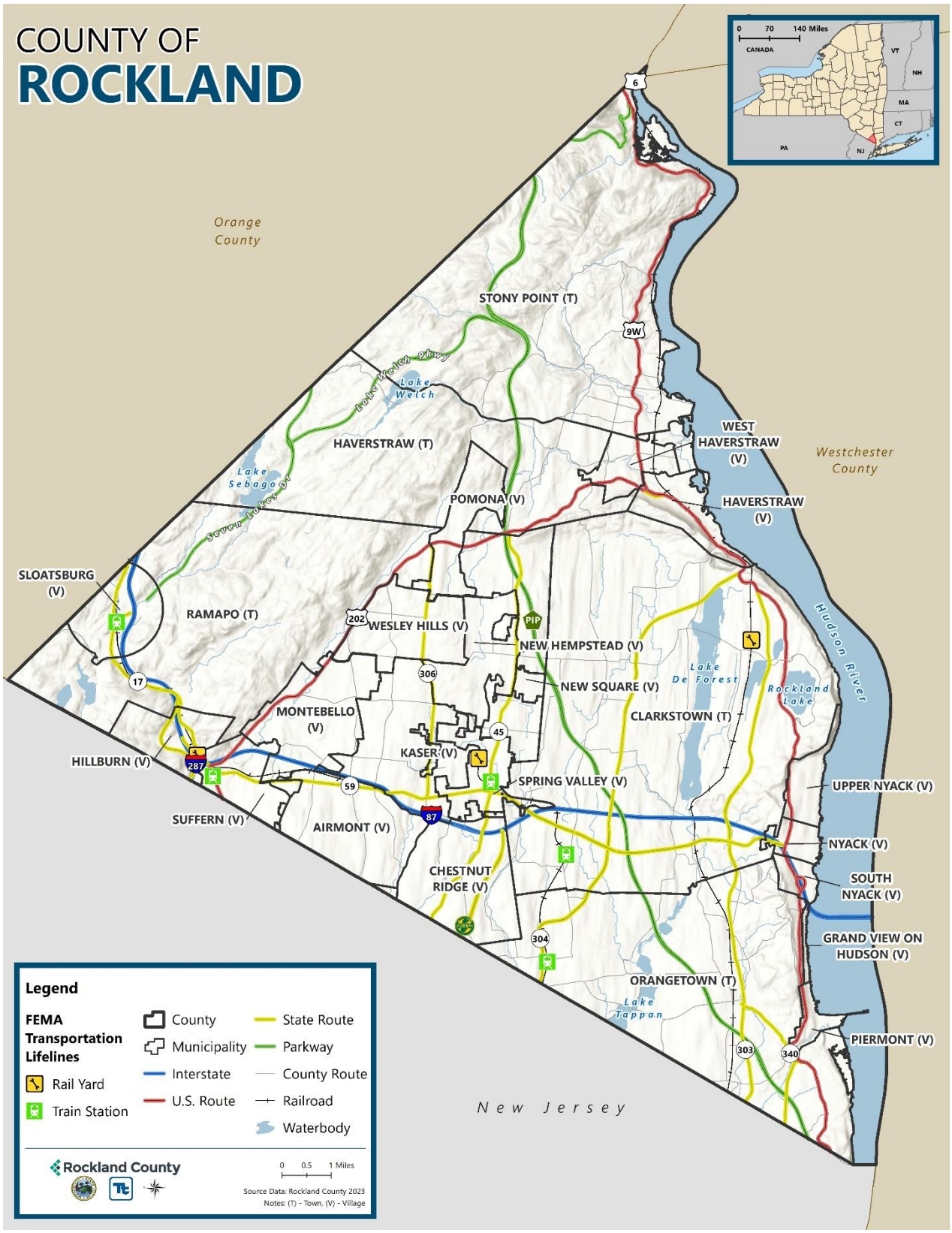


Table 3-12. Transportation Lifelines in Rockland County

Lifeline Type	Number of Lifelines
Rail Yard	3
Train Station	5
Total	**8**

Sources: Rockland County

Rockland County provides bus services to its residents. These services include Transport of Rockland (TOR) and Transportation Resources, Intra-county, for Physically disabled and Senior Citizens (TRIPS) Paratransit. TOR is Rockland County's local bus system of 10 routes, providing service along major corridors as well as with feeder loops within the County. TRIPS is Rockland County's paratransit bus service for residents with physical or mental disabilities or who are aged 60 or over. Other bus transit services in the County include Coach USA/Rockland Coaches, Monsey Trails, NJ Transit bus, Westchester Bee-Line, and Clarkstown Mini-Trans (Rockland County Department of Public Transportation 2024).

Metro-North, NJ Transit, PATH, and Amtrak all provide rail services to Rockland County residents. Metro-North provides rail service from Westchester County to Grand Central Terminal in Manhattan. The Hudson Link bus provides service from Rockland to Tarrytown Rail Station to connect with the Hudson Line and to White Plains Rail Station to connect with the Harlem Line. NJ Transit provides rail service from Rockland County under contract with Metro-North. The Main/Bergen/Port Jervis line provides service between Suffern, Sloatsburg, the Pascack Valley Line, Spring Valley, Nanuet, and Pearl River. Haverstraw-Ossining Ferry is operated by NY Waterway and travels between Haverstraw and Ossining (Westchester County) to connect with Metro-North Hudson Line train to New York City (Rockland County Department of Public Transportation 2024).

Hazardous Materials

Hazardous materials lifelines include hazardous materials, pollutants, and contaminants and the facilities that handle them. There are 56 hazardous material lifelines in Rockland County, all of which are identified as SARA (Superfund Amendments and Reauthorization Act) facilities. Figure 3-26 shows the location of hazardous material facilities in the County.

Figure 3-26. Hazardous Material Lifelines in Rockland County