

## SECTION 4 COUNTY PROFILE

This profile describes the general information of the County (physical setting, population and demographics, general building stock, and land use and population trends) and critical facilities located within Westchester County. More specific information can be found in the most recent Flood Insurance Study for Westchester County prepared by FEMA and from the County Databook at [www.westchestergov.com/databook](http://www.westchestergov.com/databook). In Section 5, specific profile information is presented and analyzed to develop an understanding of the county, including the economic, structural, and population assets at risk and the particular concerns that may be present related to hazards analyzed (for example, a high percentage of vulnerable persons in an area).

### 4.1 GENERAL INFORMATION

Westchester County covers an area of approximately 450 square miles and is home to nearly one million people living in 45 municipalities (six cities, 23 villages, and 16 towns). Bounded by the Long Island Sound to the southeast and the Hudson River to the west, the terrain throughout the county is largely rolling hills with many rivers, streams and waterbodies of various sizes. Located just north of New York City, major transportation networks are located throughout the county.

#### 4.1.1 Physical Setting

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

##### Location

Westchester County is located in the southeastern portion of New York State. It is 450 square miles in size and is bordered to the north by Putnam County; to the east by Fairfield County, Connecticut; to the south by New York City, and to the west by the Hudson River. The Long Island Sound makes up the southeastern border of the County (FEMA 2007). See Figure 4-1, following page.

##### Hydrography and Hydrology

Numerous ponds, lakes, creeks, and rivers make up the waterscape of Westchester County. The major waterways within the County include, but not limited to: West Branch Croton River, East Branch Croton River, Titicus Reservoir, Amawalk Reservoir, Croton River, New Croton Reservoir, Cross River Reservoir, Saw Mill River, Sprain Brook, Pocantico River, Caney Brook, Hutchinson River, Wickers Creek, Knollwood Brook, Troublesome Brook Reach 1, Hartsdale Brook, Blind Brook, Beaver Swamp Brook, Brentwood Brook, Mamaroneck River, East Branch Mamaroneck River, Barney Brook, Sunnyside Brook, Riverview Road Brook, Sheldrake River, Nanny Hagen Brook, Fly Kill Brook, Clove Brook, Laurel Brook, Kisco River, Burling Brook, Stephenson Brook, Bear Gutter Creek, Byran River, Wampus River, Kil Brook, Annsville Creek, Hudson River, Kensico Reservoir, Bronx River and the Long Island Sound (FEMA FIS 2007).

The Long Island Sound shoreline in the county is generally rocky. Tidal mud flats and marshes, as well as several natural and artificially-maintained sand beaches, are interspersed on the coast. Several islands can be found offshore. The islands include: Glen Island which is a County park and used for passive and active recreation; Huckleberry Island which is largely undeveloped and has one of the largest rookeries for some shore bird species in western Long Island Sound; Hen Island which contains a residential community; and David's Island, the former location of the U.S. Army's Fort Slocum, which is undergoing an environmental cleanup and is slated to be used as passive parkland.

Figure 4-1. Westchester County, New York Mitigation Plan Area



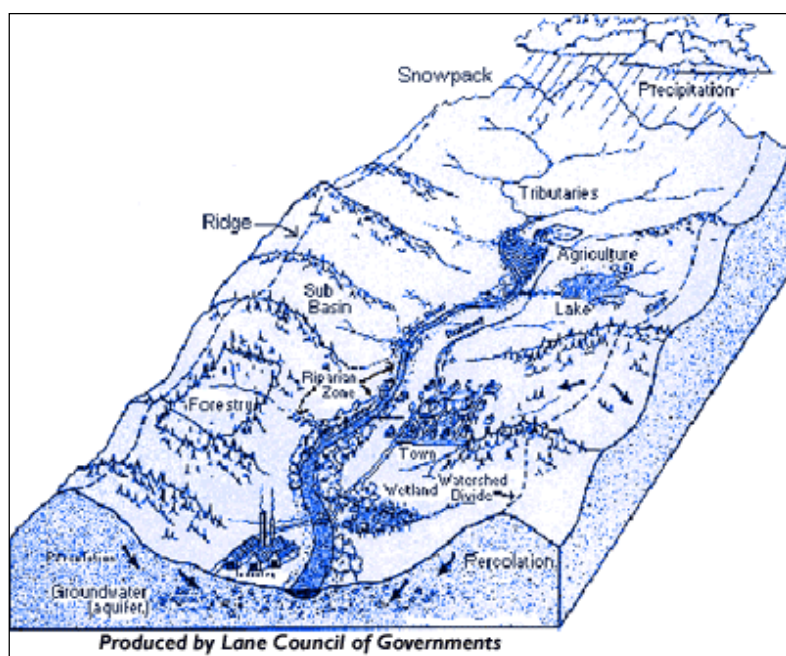
Source: Westchester County Department of Planning

The widest section across the Hudson River is 3.6 miles and is found between the Westchester and Rockland County shorelines immediately north of Croton Point in Croton-on-Hudson. The Hudson River is tidal and brackish through the County and contains a small number of estuarine marshes. Two bridges span the River in Westchester County; the Bear Mountain Bridge crosses at Cortlandt and the Tappan Zee Bridge at Tarrytown. Municipal, County and state-owned parks provide access to waterfront landmarks and sites throughout Westchester County.

### Watersheds

A watershed is the area of land that drains into a body of water such as a river, lake, stream, or bay. It is separated from other systems by high points in the area such as hills or slopes. It includes not only the waterway itself but also the entire land area that drains to it. For example, the watershed of a lake would include not only the streams entering the lake but also the land area that drains into those streams and eventually the lake. Drainage basins generally refer to large watersheds that encompass the watersheds of many smaller rivers and streams. Figure 4-2 depicts the hydrologic system of a watershed.

**Figure 4-2. Watershed**



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

Watersheds come in all shapes and sizes and can cross municipal and county boundaries. New York State's waters (lakes, rivers, and streams) fall within one of 17 major watersheds (or drainage basins). Westchester County is divided into six primary drainage basins (watersheds): Coastal Long Island Sound, Inland Long Island Sound, Bronx River, Peekskill and Haverstraw Bays, Saw Mill and Pocantico Rivers, and Croton River. Within these six primary drainage basins, there are approximately 60 smaller basins (subwatersheds). The principal streams draining the southern part of the County include Beaver Swamp Brook, Blind Brook, Bronx River, Hutchinson River, Mamaroneck River, Saw Mill River, Sheldrake River, Stephenson Brook, and Tibbetts Brook. The primary streams draining the central portion of the County include: Byram River, Kisco River, Mianus River, Mill River, Pocantico River, and Silvermine River. The northern part of the County is drained primarily by the following: Dickey Brook, Furnance Brook, Hallocks Mill Brook, Hunter Brook, Muscoot River, Peekskill Hollow Brook, and Titicus River. Figure 4-3 shows the watersheds in Westchester County.

Figure 4-3. Watersheds of Westchester County



Source: Westchester County

### New York City Watershed

The Croton Watershed makes up a portion of the watershed for the New York City drinking water supply system. The Kensico Reservoir, located in the central portion of Westchester, is a component of the Catskill/Delaware System. The combined New York City Water Supply System – the Croton, Delaware and Catskill components – provides drinking water to 85% of Westchester County residents. More detailed information on the New York City water supply system can be obtained from the New York City Department of Environmental Protection at [http://www.nyc.gov/html/dep/html/watershed\\_protection/reservoirs.shtml](http://www.nyc.gov/html/dep/html/watershed_protection/reservoirs.shtml) and from the *Comprehensive Croton Watershed Water Quality Protection Plan* at [www.westchestergov.com/crotonplan](http://www.westchestergov.com/crotonplan). Figure 4-4 illustrates the location of the Croton Watershed.

**Figure 4-4. Croton Watershed**



Source: New York City Environmental Protection 2007

## **Topography and Geology**

---

Westchester County is more hilly north of Interstate 287, which bisects the county. The highest point is Bailey Mountain located in Mountain Lakes County Park in the Town of North Salem. It has an elevation of 976 feet (Westchester County Databook, [www.westchestergov.com/databook](http://www.westchestergov.com/databook)).

The portion of Westchester County south of I-287 is part of the Piedmont Province, which is a transition between the Atlantic Coastal Plain to the southeast and the Hudson Highlands to the northwest. The ridges, valleys, and streams trend north to northeast. The eastern side of the county rests on the upper edge of the unsubmerged portion of the continental shelf of the U.S. Outcroppings of bedrock are frequent throughout each side of glacial origin (FEMA 2007).

## **Climate**

---

The climate of New York State is very similar to most of the Northeast U.S. and is classified as Humid Continental. Differences in latitude, character of topography, and proximity to large bodies of water all have an effect on the climate across New York State. Precipitation during the warm, growing season (April through September) is characterized by convective storms that generally form in advance of an eastward moving cold front or during periods of local atmospheric instability. Occasionally, tropical cyclones will move up from southern coastal areas and produce large quantities of rain. Both types of storms typically are characterized by relatively short periods of intense precipitation that produce large amounts of surface runoff and little recharge (Cornell, Date Unknown).

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

Westchester County generally experiences short winters and long summers. Temperature extremes between the seasons are from -34°F to 106°F. The County's received precipitation is consistent throughout the year with no stark variations between months; however, the summer months can be slightly higher. The average amount of precipitation yearly is approximately 45 inches (FEMA, 2007).

## **Land Use and Land Cover**

---

Total land area in Westchester County is nearly 450 square miles, of which, 43% is occupied by residential land use, with single-family residential properties making up 35% of the County. The densest residential areas include cities and villages in the southern portion of the County, while the northern municipalities remain the least dense. Dedicated open space and recreation lands occupy over 64,000 acres (22% of the County's total land area). The largest portions of protected open space are in the northern areas of Westchester County. Vacant and undeveloped land consume over 22,000 acres (9% total land area) and transportation right-of-ways make up 8.5% of the County's area.

The distribution of land use in Westchester County varies throughout. The County's urban and village centers in the south are dominated by medium- and high-density residential, commercial, and industrial uses, while open space, low-density residential, and some institutional uses are more prominent in the northern section of the County. During the 20<sup>th</sup> Century, the County experienced rapid growth and development, leaving less than one-tenth of the County's total land area vacant or undeveloped.

The southern portion of Westchester County, along the Long Island Sound and the lower portion of the Hudson River, is more densely developed and populated than the northern portion. Development in the northern part is largely comprised of low- to medium-density residential development with small amounts of commercial development located in 12 small hamlets. The southern portion of the county is home to five cities and densely populated villages. The historical development of the county is based on three primary components: centers, corridors, and open space.

### County Centers

Westchester County's centers are the focal points in the county's pattern of development. Centers consist of commercial or mixed use cores and surrounding residential and industrial areas. Centers are likely to have the principal services on which most communities depend. They can be categorized into four types based on their size and function. Hamlets are the smallest centers, mostly found at the crossroads of historic transportation routes, and have basic retail, religious, and government facilities. Local centers are served by major road, train, and transit corridors. Intermediate centers have well-developed infrastructure systems and have a distinct urban character, with mid- and high-rise buildings, large-scale retail, and some industrial uses. Major centers are the county's largest places of economic activity, with high-density development and extensive infrastructure.

### County Corridors

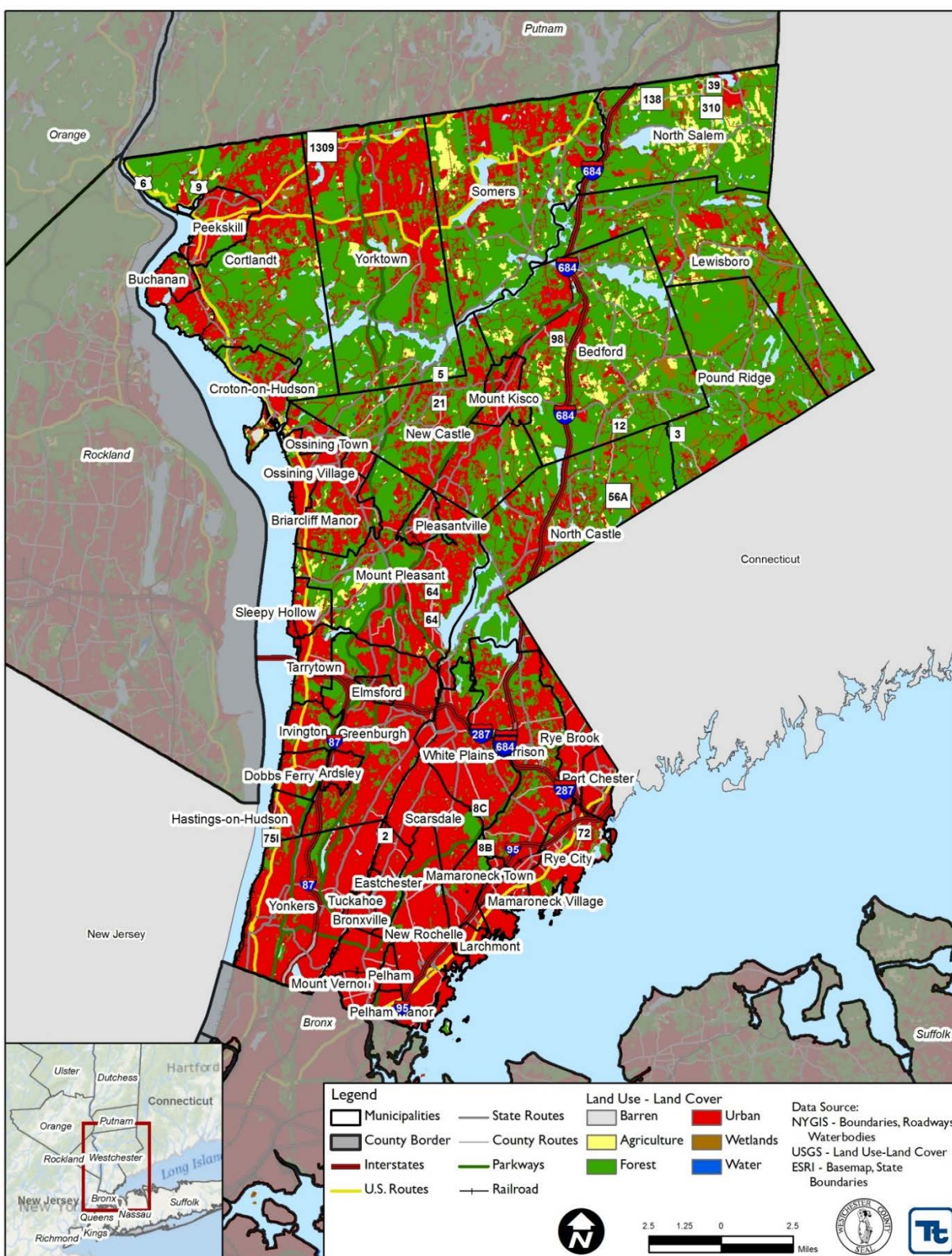
The corridors in Westchester County are the historic paths of movement and development, connecting the County's centers to each other and to places outside of the County. These corridors serve an important transportation role but also have important functions beyond transportation. Housing, commercial, and industrial development has occurred along corridors due to the access that they provide to places of employment and markets for goods. Other corridors have developed based on their scenic qualities and the access they provide to major open spaces and recreational opportunities. Table 4-1 provides information on the distribution of land use in Westchester County. Figure 4-5 displays the land use and land cover of the County.

**Table 4-1. Land Use in Westchester County**

Land Use Type	Acres	Percent of Total Acreage
Residential – Single Family	112,802.75	39.24%
Residential – Two/Three Family	4,163.68	1.45%
Residential – Multi-Family	5,903.95	2.05%
Commercial and Retail	4,785.5	1.66%
Office and Research	4,148.36	1.44%
Manufacturing, Industrial, and Warehouses	2,296.55	0.8%
Institutional and Public Assembly	15,644.66	5.44%
Transportation, Communication and Utilities	5,569.09	1.94%
Mixed Use	837.60	0.29%
Agricultural	4,808.86	1.67%
Private Recreation	8,688.00	3.02%
Cemeteries	1,888.09	0.66%
Common Land Homeowners Association	2,658.36	0.92%
Nature Preserves	7,319.28	2.55%
Public Parks and Parkway Lands	33,099.26	11.51%
Water Supply Lands	11,406.68	3.97%
Vacant/Undeveloped	25,741.91	8.95%
Rights-of-Way	24,737.77	8.61%
Interior Waterbodies	10,960.33	3.81%
<b>TOTAL</b>	<b>287,467.04</b>	<b>100%</b>

Source: Westchester County Department of Planning 2010

Figure 4-5. Westchester County Land Use and Land Cover



Source: USGS National Land Cover Database, 2011

The following provides information on the general land use types in Westchester County.

### **Residential**

Residential land use continues to make up the largest share of land use in Westchester County, occupying 43% of the County's total land area. The Villages of Bronxville, Larchmont, and Scarsdale, and the Towns of Bedford and New Castle have the largest percentage of land in residential use. The municipalities with the lowest percentage of residential land use are the Villages of Buchanan, Elmsford, Mount Kisco, and Sleepy Hollow, which all have significant amounts of commercial and industrial uses. The Town of Mount Pleasant also has a small percentage of residential land due to the many institutional uses located throughout the Town.

### **Non-Residential**

Commercial, non-residential land uses occupy less than 3% of Westchester County's land area, with 4,360 acres dedicated to commercial and retail uses and 4,120 acres devoted to office and research uses. Mixed-use land use account for only 845 acres of land in the County (0.3% of the total land area). Industrial land use occupies less than 2,400 acres (0.8% of the total land area). This is evidence that there is a decline in manufacturing in the County's economy. The City of Yonkers has the largest amount of industrial land (over 335 acres). Scarsdale and Rye Brook are the only two municipalities in the County that do not have any industrial land. Agriculture remains a small presence in Westchester County's economy. It occupies 5,400 acres in the County (1.9% of total land area). North Salem and Somers are the County's municipalities with the largest amount of agricultural land.

### **Transportation, Communication and Utilities**

Transportation, communication and utilities occupy 30,000 acres (11% of total land) in Westchester County. Transportation right-of-ways account for 24,531 acres (8.5%). This includes the Westchester County Airport which has a total land area of 2,000 acres.

### **Open Space**

Open space in Westchester County includes public parks, parkway lands, nature preserves, private recreation lands, cemeteries, common land homeowners' association lands, and water supply lands. Combined, open space occupies nearly 64,000 acres (over 22%) of the County's land area. The County has over 32,000 acres of city, village, town, county, and state parks, preserves, and parkways, as well as 7,700 acres of privately-owned and operated nature preserves.

The largest portion of open space in the County is located in the northern portion. Yorktown, Pound Ridge and Somers have the largest amounts of open space. Pound Ridge also has the largest percentage of its land dedicated as open space (36%). Bronxville, Buchanan, and Port Chester all have less than 5% of their total municipal area dedicated to open space.

Westchester County is a major source for the region's drinking water. A substantial amount of protected lands surround the major reservoirs in the County. Water supply lands account for nearly 11,400 acres in the County (4%); a majority of which are owned by the New York City Department of Environmental Protection (NYCDEP). The NYCDEP maintains a program to purchase lands surrounding the water supply reservoirs for permanent protection.

### **Vacant and Undeveloped Land**

Approximately 9.4% of the County's total land area (27,000 acres) is vacant and undeveloped. Almost 26,000 acres is undeveloped and 1,251 acres is vacant land with improvements. The County's northern municipalities have the largest amount of vacant land, including over 3,100 acres in North Salem and over 2,700 acres in

Bedford and Cortlandt. North Salem has the largest percentage (21%) of its area remaining as vacant or undeveloped. Bronxville and Pelham Manor have less than four acres of vacant or undeveloped land, with both having less than 1% of their total land area remaining as vacant or undeveloped.

## 4.2 POPULATION AND DEMOGRAPHICS

According to the 2010 U.S. Census, Westchester County had a population of 949,113 people which represents approximately a 3% increase from the 2000 U.S. Census population of 923,459 people. HAZUS-MH demographic data will be used in the loss estimation analyses in Section 5 of this plan. All demographic data in HAZUS corresponds to the 2000 U.S. Census data. Table 4-2 presents the population statistics for Westchester County based on the 2000 and 2010 U.S. Census data. For the purposes of this plan, the 2010 Census was used where the data was available and supplemented with HAZUS-MH data (representing 2000 data). Table 4-2 show the distribution of the general population density (persons per square mile) by 2010 Census block, and persons over the age of 65 and low income by 2000 Census block.

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

**Table 4-2. Westchester County Population Statistics**

Municipality	U.S. Census 2010			U.S. Census 2000*				
	Total	Pop. 65+	% Pop. 65+	Total	Pop. 65+	Percent Pop. 65+	Low-Income Pop. **	% Low-Income Pop. of Total
Ardsley (V)	4,452	806	18.1%	4,269	626	14.7%	40	0.9%
Bedford (T)	17,335	2,166	12.5%	18,133	1,861	10.3%	441	2.4%
Briarcliff Manor (V)	7,867	1,213	15.4%	7,696	1,094	14.2%	189	2.5%
Bronxville (V)	6,323	881	13.9%	6,543	799	12.2%	153	2.3%
Buchanan (V)	2,230	331	14.8%	2,189	280	12.8%	62	2.8%
Cortlandt (T)	31,292	4,836	15.5%	28,672	3,617	12.6%	977	3.4%
Croton-on-Hudson (V)	8,070	1,160	14.4%	7,606	1,029	13.5%	213	2.8%
Dobbs Ferry (V)	10,875	1,652	15.2%	10,622	1,582	14.9%	416	3.9%
Eastchester (T)	19,554	3,656	18.7%	18,564	3,650	19.7%	730	3.9%
Elmsford (V)	4,664	510	10.9%	4,676	572	12.2%	187	4.0%
Greenburgh (T)	42,863	7,466	17.4%	41,828	6,116	14.6%	1,294	3.1%
Harrison (T)	27,472	3,525	12.8%	24,154	3,460	14.3%	877	3.6%
Hastings-on-Hudson (V)	7,849	1,360	17.3%	7,648	1,183	15.5%	284	3.7%
Irvington (V)	6,420	968	15.1%	6,631	900	13.6%	187	2.8%
Larchmont (V)	5,864	740	12.6%	6,485	845	13.0%	194	3.0%
Lewisboro (T)	12,411	1,439	11.6%	12,324	871	7.1%	141	1.1%
Mamaroneck (T)	11,977	1,819	15.2%	11,429	1,539	13.5%	301	2.6%
Mamaroneck (V)	18,929	2,867	15.1%	18,464	3,052	16.5%	989	5.4%
Mount Kisco (T)	10,877	1,460	13.4%	9,983	1,205	12.1%	629	6.3%
Mount Pleasant (T)	26,176	3,412	13.0%	26,151	3,678	14.1%	458	1.8%
Mount Vernon (C)	67,292	9,318	13.8%	68,381	8,812	12.9%	6,236	9.1%
New Castle (T)	17,569	1,999	11.4%	17,491	1,610	9.2%	224	1.3%
New Rochelle (C)	77,062	11,711	15.2%	72,182	11,303	15.7%	5,037	7.0%
North Castle (T)	11,841	1,565	13.2%	10,849	1,135	10.5%	1,83	1.7%
North Salem (T)	5,104	913	17.9%	5,173	728	14.1%	77	1.5%
Ossining (T)	5,406	1,270	23.5%	5,514	1,012	18.4%	83	1.5%
Ossining (V)	25,060	2,614	10.4%	24,010	2,663	11.1%	1,346	5.6%
Peekskill (C)	23,583	2,786	11.85%	22,441	2,566	11.4%	1,762	7.9%

Table 4-2. Westchester County Population Statistics

Municipality	U.S. Census 2010			U.S. Census 2000*				
	Total	Pop. 65+	% Pop. 65+	Total	Pop. 65+	Percent Pop. 65+	Low-Income Pop. **	% Low-Income Pop. of Total
Pelham (V)	6,910	797	11.5%	6,400	737	11.5%	211	3.3%
Pelham Manor (V)	5,486	769	14.0%	5,466	746	13.6%	100	1.8%
Pleasantville (V)	7,019	930	13.2%	7,172	950	13.2%	222	3.1%
Port Chester (V)	28,967	3,082	10.6%	27,867	3,648	13.1%	2,038	7.3%
Pound Ridge (T)	5,104	772	15.1%	4,726	568	12.0%	38	0.8%
Rye (C)	15,720	2,358	15.0%	14,955	1,977	13.2%	366	2.4%
Rye Brook (V)	9,347	1,841	19.7%	8,602	1,525	17.7%	213	2.5%
Scarsdale (T)	17,166	2,390	13.9%	17,823	2,075	11.6%	191	1.1%
Sleepy Hollow (V)	9,870	1,263	12.8%	9,212	973	10.6%	516	5.6%
Somers (T)	20,434	4,581	22.4%	18,346	3,524	19.2%	426	2.3%
Tarrytown (V)	11,277	1,642	14.6%	11,090	1,631	14.7%	459	4.1%
Tuckahoe (V)	6,486	995	15.3%	6,211	785	12.6%	474	7.6%
White Plains (C)	56,853	8,672	15.3%	53,077	7,936	15.0%	3,689	7.0%
Yonkers (C)	195,976	28,776	14.7%	196,086	29,703	15.1%	18,045	9.2%
Yorktown (T)	36,081	5,831	16.2%	36,318	4,816	13.3%	1,176	3.2%
<b>Westchester County (TOTAL)</b>	<b>949,113</b>	<b>139,122</b>	<b>14.7%</b>	<b>923,459</b>	<b>129,382</b>	<b>14.0%</b>	<b>51,874</b>	<b>5.6%</b>

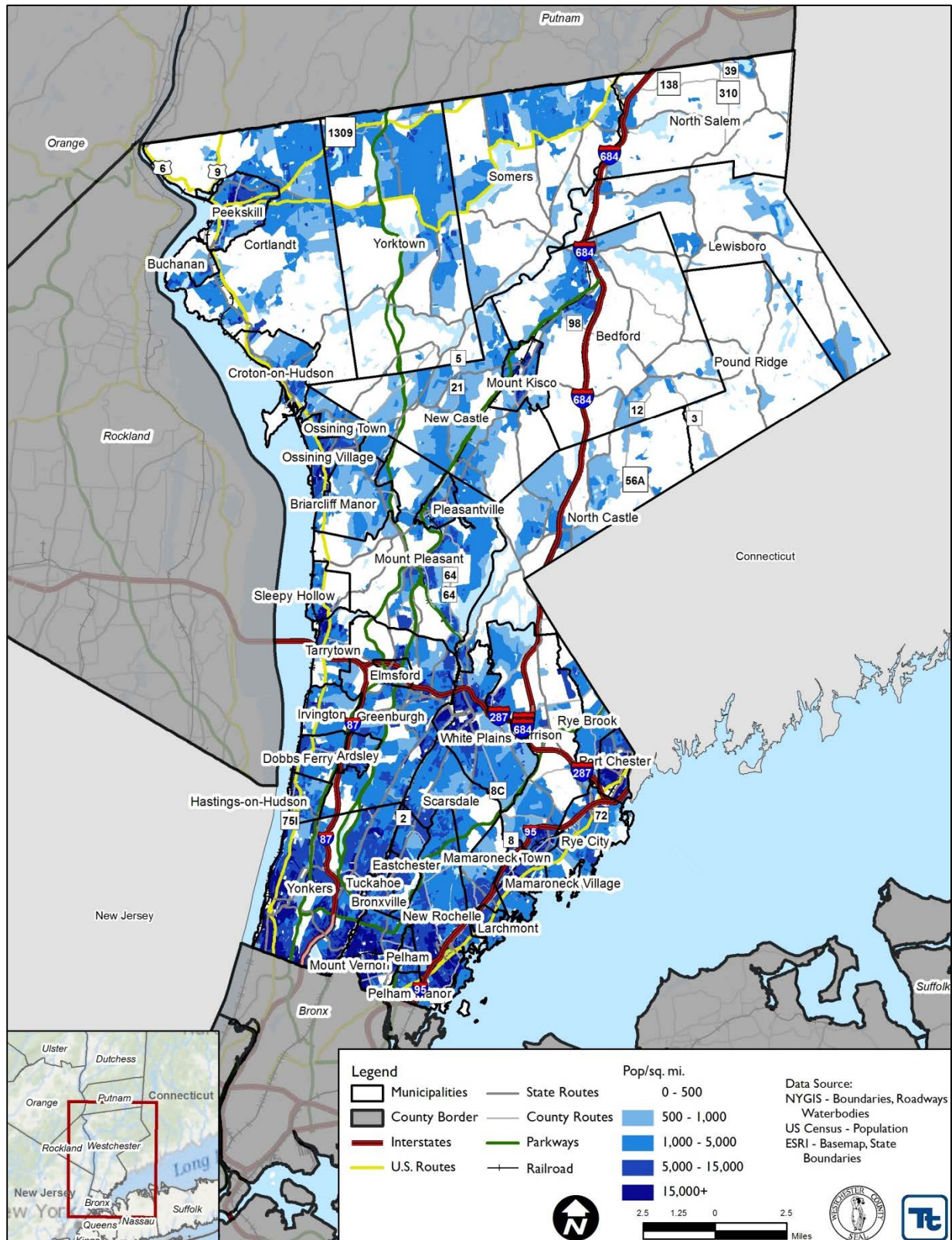
Source: Census 2010 (U.S. Census Bureau); HAZUS-MH (for 2000 U.S. Census data)

Note: Pop. = population

\* Individuals below poverty level (Census poverty threshold for a 3-person family unit is approximately \$18,500)

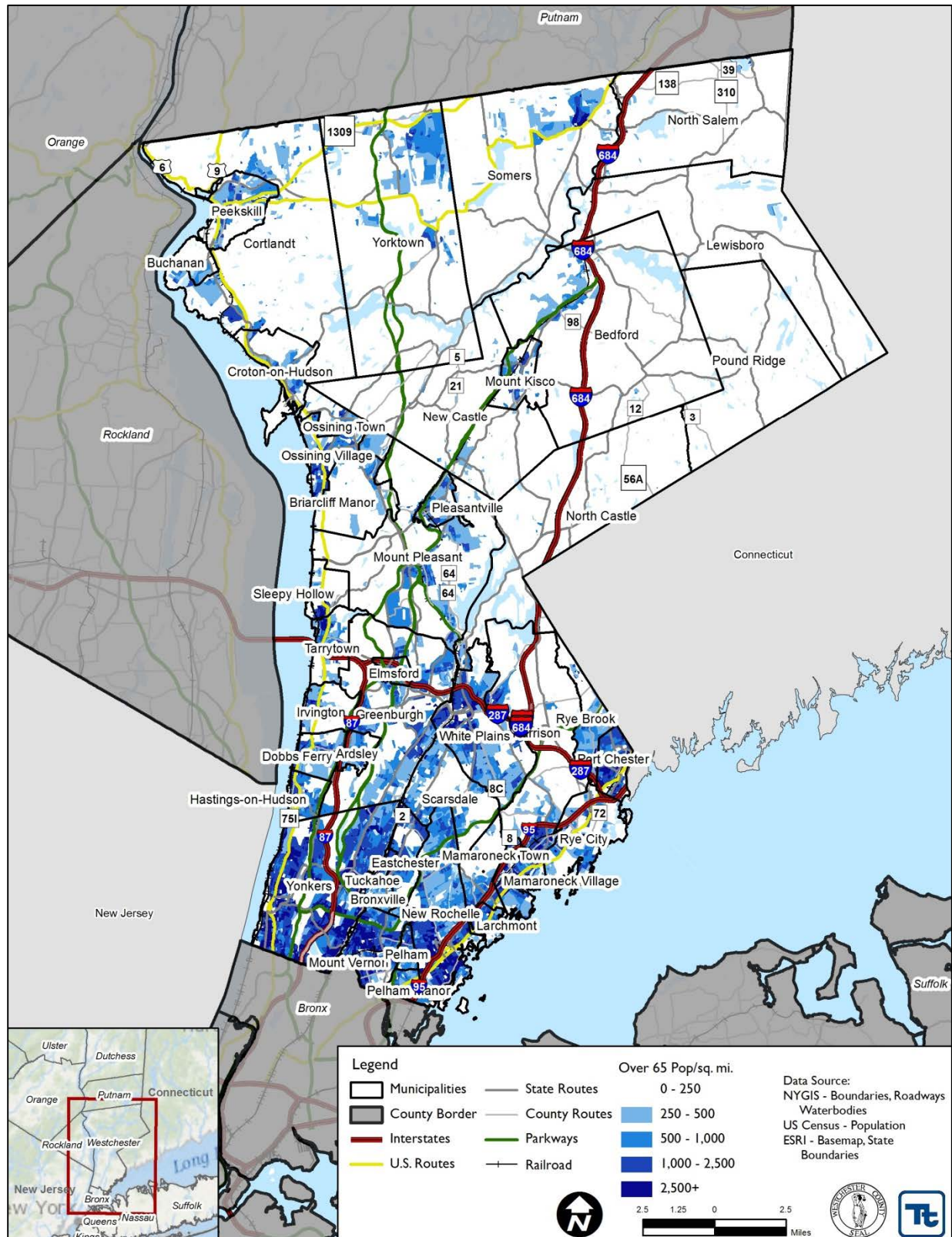
It is noted that the Census data for household income provided in HAZUS-MH includes two ranges (\$0-10,000 and \$10,000-\$20,000/year) that were totaled to provide the “low-income” data used in this study. This does not correspond exactly with the “poverty” thresholds established by the 2013 U.S. Census Bureau, which identifies households with three adults and no children with an annual household income below \$18,222 per year, or households with one adult and two children with an annual household income below \$18,769 per year as “low income” for this region. This difference is not believed to be significant for the purposes of this planning effort. Figure 4-7 shows the distribution of persons over age 65 in Westchester County, while Figure 4-8 shows the distribution of low income persons.

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



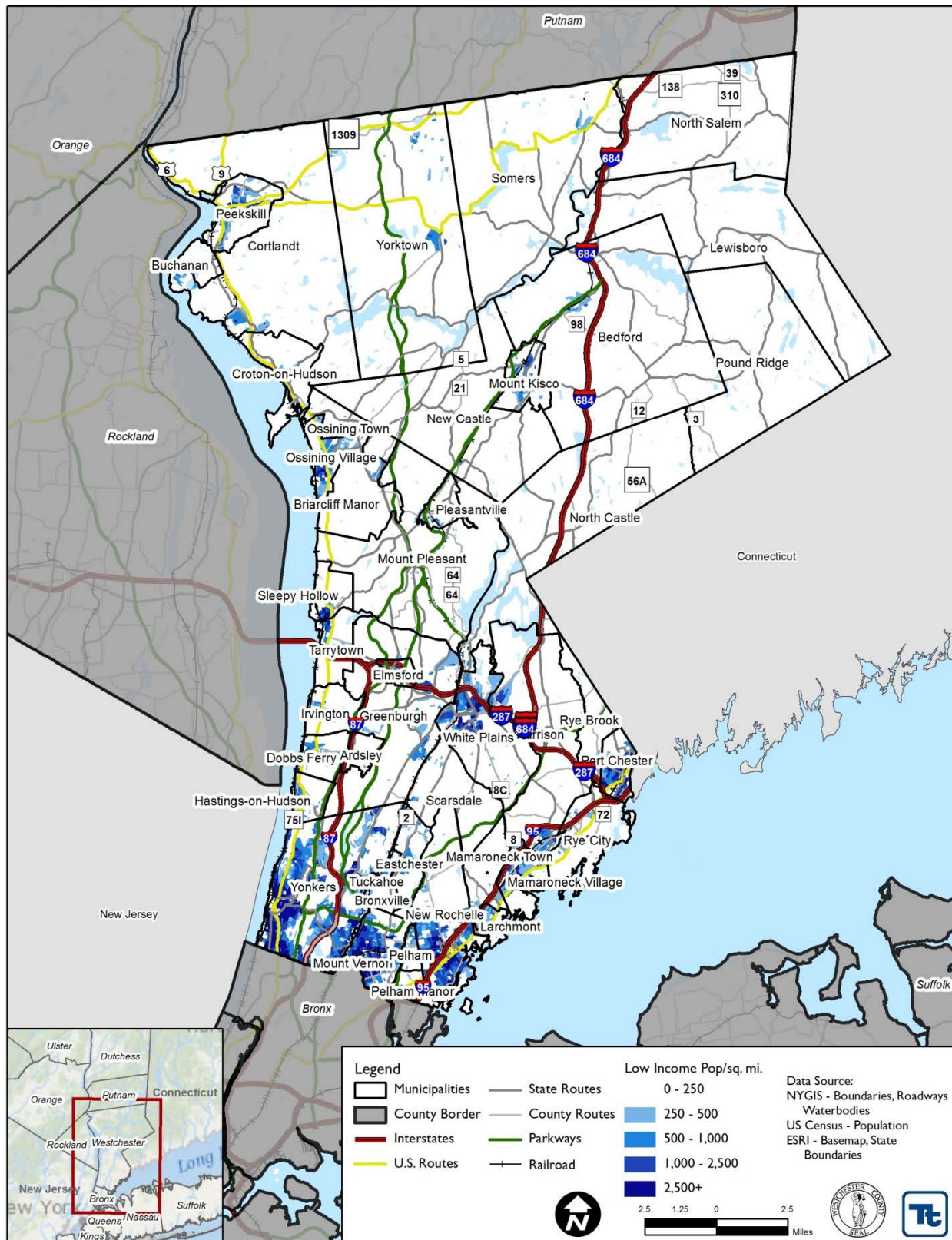
Source: U.S. Census 2010

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



Source: HAZUS-MH

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



Source: HAZUS-MH

### 4.3 GENERAL BUILDING STOCK

The 2000 U.S. Census data identified 337,142 households (349,445 housing units) in Westchester County. The 2010 U.S. Census reported 347,232 households (370,821 housing units) in Westchester County. The County experienced an increase in both households and housing units from 2000 to 2010. As for households, between 2000 and 2010, the County saw a 3.0% increase. As for housing units, the County experienced an increase of 6.1% between 2000 and 2010. The U.S. Census defines household as all the persons who occupy a housing unit, and a housing unit as a house, an apartment, a mobile home, a group of rooms, or a single room that is occupied (or if vacant, is intended for occupancy) as separate living quarters. Therefore, you may have more than one household per housing unit. The median price of an owner-occupied housing unit in Westchester County was estimated at \$533,300 (U.S. Census, 2014).

For this update, the default general building stock in HAZUS-MH was updated and replaced with a custom building inventory for Westchester County both at the aggregate and structure level. The building stock update was performed using the most current parcel and the New York State Department of Taxation and Finance tax assessment data provided by Westchester County. The replacement cost value was calculated using the square footage value of each building and RS Means 2014 data.

For the purposes of this plan, there are approximately 274,395 structures identified by the tax data and spatial data available. These structures account for a replacement cost value of approximately \$363 billion. Estimated content value was calculated by using 50-percent of the residential replacement cost value, and 100-percent of the non-residential replacement values. Using this methodology, there is approximately \$148 billion in contents within these properties. Approximately 92% of the total buildings in the County are residential, which make up approximately 55% of the total building stock structural. Table 4-3 presents building stock statistics by occupancy class for Westchester County.

**Table 4-3. Number of Buildings and Improvement Value by Municipality**

Municipality	All Occupancies			
	Count	Estimated Structure RCV	Estimated Contents RCV	Total (Structure + Contents)
Ardsley (V)	1,625	\$1,004,645,830	\$668,391,704	\$1,673,037,534
Bedford (T)	8,715	\$5,451,464,008	\$3,553,892,595	\$9,005,356,603
Briarcliff Manor (V)	2,757	\$2,194,162,224	\$1,423,209,912	\$3,617,372,136
Bronxville (V)	1,601	\$1,694,686,839	\$1,133,798,515	\$2,828,485,354
Buchanan (V)	1,157	\$1,944,545,818	\$1,814,903,534	\$3,759,449,352
Cortlandt (T)	12,791	\$6,989,473,890	\$4,724,517,316	\$11,713,991,206
Croton-on-Hudson (V)	3,480	\$2,119,932,123	\$1,551,074,857	\$3,671,006,980
Dobbs Ferry (V)	3,063	\$2,194,515,432	\$1,465,771,766	\$3,660,287,199
Eastchester (T)	6,051	\$3,609,064,266	\$2,233,574,900	\$5,842,639,167
Elmsford (V)	1,530	\$1,011,898,477	\$741,527,281	\$1,753,425,758
Greenburgh (T)	13,622	\$12,729,170,899	\$9,164,746,258	\$21,893,917,157
Harrison (T)	8,101	\$9,147,880,385	\$6,828,853,273	\$15,976,733,658
Hastings-on-Hudson (V)	2,792	\$1,527,655,704	\$977,873,668	\$2,505,529,372
Irvington (V)	2,126	\$1,660,776,222	\$1,056,714,326	\$2,717,490,548
Larchmont (V)	2,246	\$1,352,506,748	\$830,289,492	\$2,182,796,240

Municipality	All Occupancies			
	Count	Estimated Structure RCV	Estimated Contents RCV	Total (Structure + Contents)
Lewisboro (T)	6,515	\$3,243,450,518	\$1,908,841,328	\$5,152,291,846
Mamaroneck (T)	3,820	\$2,505,216,282	\$1,486,941,344	\$3,992,157,626
Mamaroneck (V)	5,367	\$3,761,418,986	\$2,589,431,656	\$6,350,850,642
Mount Kisco (T)	2,894	\$3,021,776,949	\$2,374,261,158	\$5,396,038,106
Mount Pleasant (T)	10,270	\$9,223,489,016	\$7,121,723,902	\$16,345,212,918
Mount Vernon (C)	14,088	\$10,513,643,877	\$7,282,453,802	\$17,796,097,679
New Castle (T)	7,520	\$5,730,848,942	\$3,556,502,900	\$9,287,351,842
New Rochelle (C)	18,114	\$14,173,804,740	\$9,783,771,825	\$23,957,576,566
North Castle (T)	5,718	\$5,688,857,022	\$3,897,348,778	\$9,586,205,800
North Salem (T)	3,191	\$1,600,118,414	\$1,026,595,491	\$2,626,713,905
Ossining (T)	2,144	\$1,395,190,504	\$970,655,862	\$2,365,846,366
Ossining (V)	5,978	\$3,475,001,257	\$2,365,979,890	\$5,840,981,147
Peekskill (C)	6,123	\$4,197,700,345	\$3,044,049,544	\$7,241,749,890
Pelham (V)	2,303	\$1,128,604,342	\$733,358,180	\$1,861,962,522
Pelham Manor (V)	2,239	\$1,313,019,752	\$860,690,923	\$2,173,710,675
Pleasantville (V)	2,671	\$1,538,985,095	\$980,341,739	\$2,519,326,833
Port Chester (V)	6,328	\$4,704,483,378	\$3,486,852,167	\$8,191,335,545
Pound Ridge (T)	3,106	\$1,678,304,487	\$903,313,441	\$2,581,617,927
Rye (C)	5,722	\$4,349,710,315	\$2,829,062,861	\$7,178,773,176
Rye Brook (V)	3,354	\$2,903,600,321	\$1,960,246,092	\$4,863,846,413
Scarsdale (T)	6,882	\$4,500,173,896	\$2,660,443,937	\$7,160,617,833
Sleepy Hollow (V)	2,060	\$1,761,996,250	\$1,319,319,544	\$3,081,315,794
Somers (T)	9,478	\$6,068,992,967	\$3,975,643,967	\$10,044,636,934
Tarrytown (V)	3,042	\$2,783,030,922	\$1,946,401,719	\$4,729,432,641
Tuckahoe (V)	1,521	\$1,006,691,887	\$628,617,835	\$1,635,309,722
White Plains (C)	12,298	\$16,704,710,777	\$12,847,488,721	\$29,552,199,498
Yonkers (C)	36,288	\$32,794,059,885	\$22,442,413,107	\$55,236,472,993
Yorktown (T)	13,704	\$8,358,614,593	\$5,481,319,019	\$13,839,933,612
<b>Westchester County (Total)</b>	<b>274,395</b>	<b>\$214,757,874,586</b>	<b>\$148,633,210,129</b>	<b>\$363,391,084,715</b>

Source: Westchester County, 2014

Notes: RCV = Replacement cost value.

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

Municipality	Residential		Commercial		Industrial	
	Count	Total (Structure + Contents)	Count	Total (Structure + Contents)	Count	Total (Structure + Contents)
Ardsley (V)	1,521	\$1,008,762,377	79	\$330,002,147	7	\$10,850,107
Bedford (T)	7,848	\$5,692,714,238	448	\$1,488,384,398	41	\$102,422,778
Briarcliff Manor (V)	2,563	\$2,312,856,935	124	\$754,066,887	14	\$106,807,410
Bronxville (V)	1,462	\$1,682,664,971	59	\$493,189,685	1	\$135,936
Buchanan (V)	965	\$388,926,855	45	\$760,221,462	126	\$2,535,970,779
Cortlandt (T)	11,857	\$6,794,869,721	544	\$2,408,254,113	69	\$124,006,009
Croton-on-Hudson (V)	3,079	\$1,706,571,797	202	\$516,803,993	132	\$1,026,931,026
Dobbs Ferry (V)	2,776	\$2,186,230,999	96	\$432,808,062	8	\$23,235,251
Eastchester (T)	5,675	\$4,126,468,099	292	\$1,140,432,078	15	\$35,556,490
Elmsford (V)	1,328	\$811,113,587	143	\$639,720,517	41	\$118,642,297
Greenburgh (T)	12,415	\$10,693,273,925	763	\$7,790,275,416	79	\$475,630,776
Harrison (T)	7,406	\$6,957,081,335	337	\$4,870,383,245	58	\$700,974,763
Hastings-on-Hudson (V)	2,614	\$1,649,346,107	63	\$164,131,405	7	\$101,670,387
Irvington (V)	1,971	\$1,812,185,690	44	\$103,129,028	12	\$174,072,910
Larchmont (V)	2,116	\$1,566,651,766	101	\$372,253,093	5	\$5,985,734
Lewisboro (T)	6,098	\$4,003,827,569	284	\$493,530,982	20	\$26,708,777
Mamaroneck (T)	3,657	\$3,054,824,815	116	\$482,195,600	15	\$24,410,620
Mamaroneck (V)	4,901	\$3,515,961,990	359	\$1,548,819,193	46	\$406,962,232
Mount Kisco (T)	2,409	\$1,942,547,373	383	\$2,741,410,389	30	\$275,087,667
Mount Pleasant (T)	9,098	\$6,305,295,343	451	\$4,015,805,930	136	\$1,049,643,103
Mount Vernon (C)	12,424	\$9,693,570,228	694	\$3,383,456,070	685	\$2,685,759,867
New Castle (T)	6,968	\$6,523,038,128	289	\$1,056,744,509	54	\$211,728,006
New Rochelle (C)	16,673	\$13,170,098,745	967	\$6,466,586,286	127	\$1,009,407,239
North Castle (T)	5,095	\$5,374,524,733	365	\$2,303,865,798	101	\$1,052,268,514
North Salem (T)	2,832	\$1,720,568,769	232	\$460,644,251	16	\$34,900,139
Ossining (T)	1,960	\$1,273,603,927	127	\$598,582,607	8	\$18,829,641
Ossining (V)	5,450	\$3,327,064,099	291	\$807,427,166	93	\$430,967,277
Peekskill (C)	5,507	\$3,460,952,403	391	\$1,554,962,576	108	\$1,101,701,518
Pelham (V)	2,185	\$1,185,738,487	100	\$323,520,838	3	\$50,570,958
Pelham Manor (V)	2,096	\$1,356,986,488	94	\$654,364,358	17	\$37,420,800
Pleasantville (V)	2,451	\$1,675,930,067	120	\$336,837,628	28	\$137,594,502
Port Chester (V)	5,806	\$3,652,893,634	405	\$3,787,416,972	38	\$158,696,544
Pound Ridge (T)	2,950	\$2,324,973,139	107	\$163,358,992	3	\$1,972,951
Rye (C)	5,297	\$4,561,942,361	326	\$1,561,981,553	33	\$111,000,269
Rye Brook (V)	3,190	\$2,830,062,684	92	\$1,054,199,430	18	\$422,407,776
Scarsdale (T)	6,675	\$5,519,189,875	93	\$396,475,534	9	\$53,031,282

Municipality	Residential		Commercial		Industrial	
	Count	Total (Structure + Contents)	Count	Total (Structure + Contents)	Count	Total (Structure + Contents)
Sleepy Hollow (V)	1,865	\$1,328,030,120	99	\$1,274,451,270	14	\$22,216,630
Somers (T)	8,946	\$6,280,047,000	306	\$2,397,400,368	25	\$47,404,100
Tarrytown (V)	2,742	\$2,509,887,609	167	\$1,343,854,112	11	\$33,326,513
Tuckahoe (V)	1,399	\$1,134,222,158	77	\$315,649,082	14	\$47,102,370
White Plains (C)	11,325	\$11,571,666,166	693	\$13,209,679,687	51	\$518,200,931
Yonkers (C)	33,210	\$31,054,940,335	1,661	\$10,781,622,831	611	\$6,181,766,732
Yorktown (T)	12,767	\$8,631,886,721	560	\$3,009,819,645	72	\$226,329,738
<b>Westchester County (Total)</b>	<b>251,572</b>	<b>\$198,373,993,368</b>	<b>13,189</b>	<b>\$88,788,719,187</b>	<b>3,001</b>	<b>\$21,920,309,350</b>

Source: Westchester County, 2014

Notes: Industrial includes buildings associated with public utilities parcels (categorized as IND5) - 50.1% of total

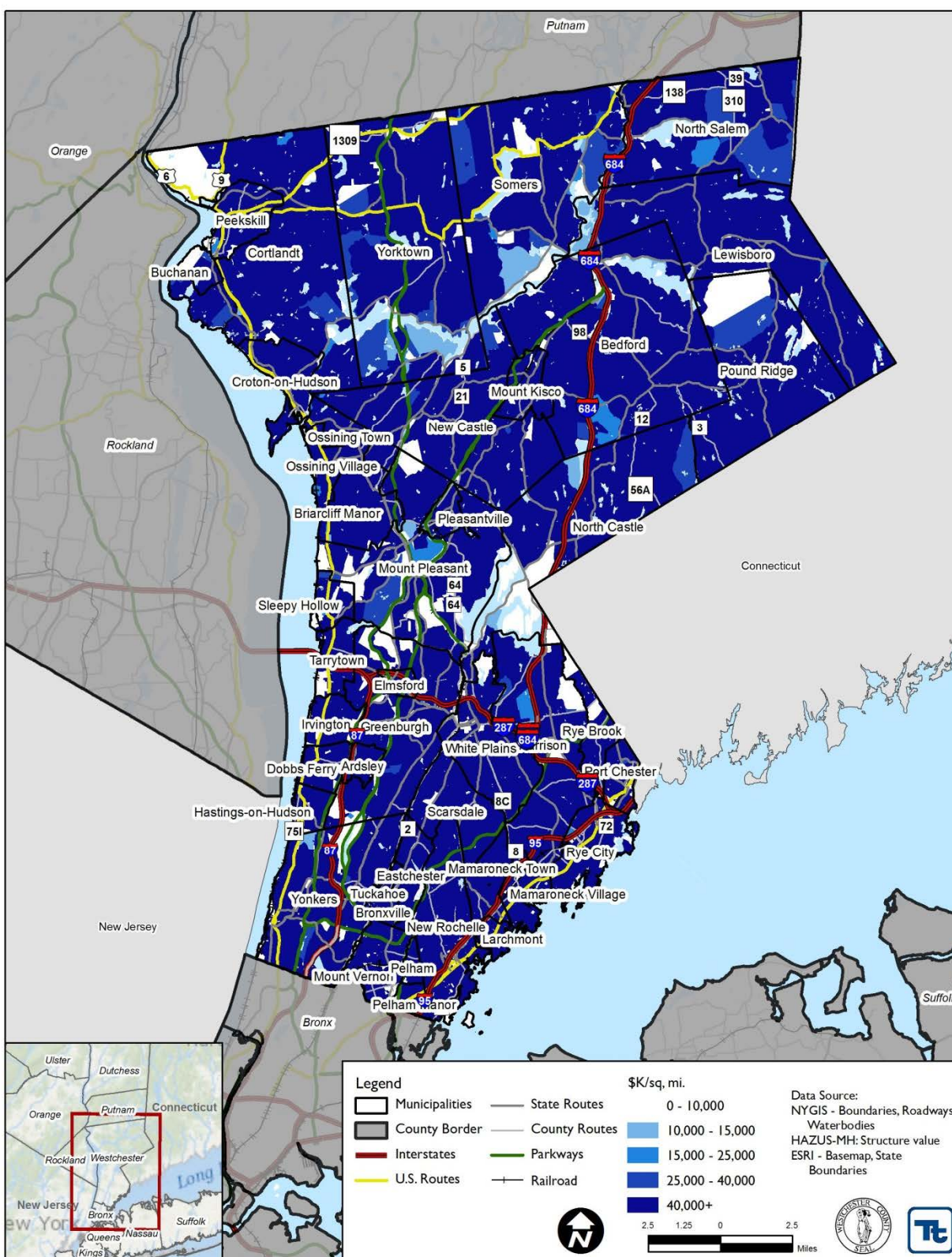
Commercial includes residential garages (categorized as COM10) – 0.005% of total value

The 2012 American Community Survey data identified that the majority of housing units (45.6% or 168,877 units) in Westchester County are single-family detached units. The 2012 U.S. Census Bureau's County Business Patterns data identified 31,469 business establishments employing 378,508 people in Westchester County. The professional, scientific, and technical services industry has the most number of establishments in the County, with 4,233 establishments. This is followed by the construction industry with 3,288 establishments and the other services industry with 3,270 establishments (U.S. Census, 2012).

Figure 4-8 through Figure 4-10 show the distribution and exposure density of residential, commercial and industrial buildings in Westchester County based on the New York State Department of Taxation and Finance Property Class Code. Exposure density is the dollar value of structures per unit area, including building content value. Generally, contents for residential structures are valued at about 50 percent of the building's value. For commercial facilities, the value of the content is generally about equal to the building's structural value. Actual content value varies widely depending on the usage of the structure. The densities are shown in units of \$1,000 (\$K) per square mile.

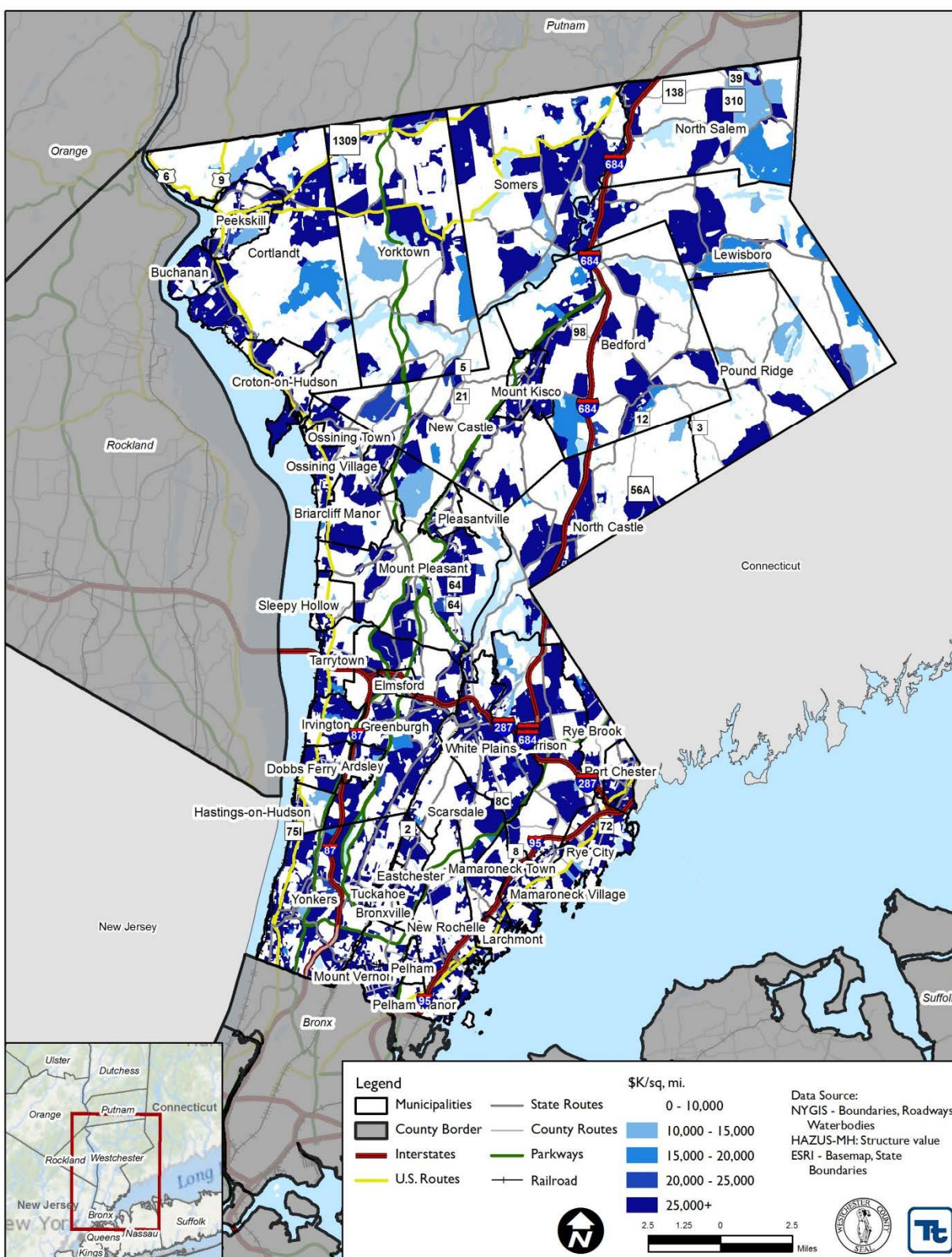
Viewing exposure distribution maps, such as Figure 4-9 through Figure 4-11 can assist communities in visualizing areas of high exposure and in evaluating aspects of the study area in relation to the specific hazard risks.

**Figure 4-9. Distribution of Residential Building Stock and Value Density in Westchester County**



Source: HAZUS-MH 2.1

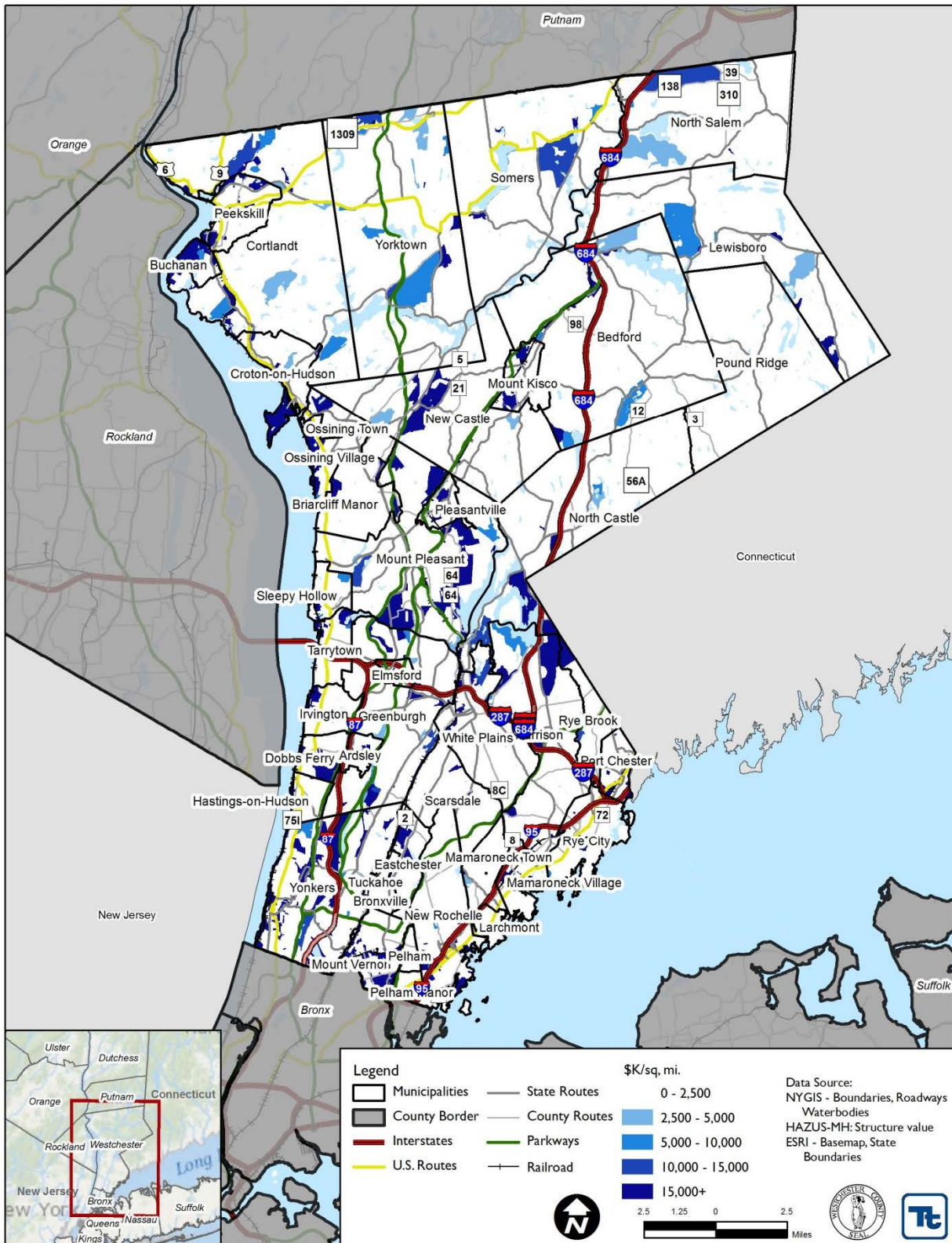
Figure 4-10. Distribution of Commercial Building Stock and Exposure Density in Westchester County



Source: HAZUS-MH 2.1

Note: Residential parking garages listed as COM10 – 0.005% of total value

Figure 4-11. Distribution of Industrial Building Stock and Value Density in Westchester County



Source: HAZUS-MH 2.1

Note: Buildings associated with public utilities are listed as IND5 - 50.1% of total value

## 4.4 LAND USE AND POPULATION TRENDS

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

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

### 4.4.1 Land Use Trends

A report prepared by the Westchester County Department of Planning titled *Land Use in Westchester* dated 2010, is a comprehensive resource for land use planners, policymakers, researchers, business communities, and residents. The report presents data and information on the present state of land use in Westchester County. Following is a summary of land use trends as presented in the report. For more information regarding land use trends in the County, see *Land Use in Westchester* found here: <http://planning.westchestergov.com/images/stories/reports/LandUseReport1.pdf> or visit the Westchester 2025 Web site at <http://westchester2025.westchestergov.com/>.

Over the past ten years, land use trends in Westchester County have had both positive and negative impacts on the county. New development and redevelopment have strengthened the county's municipal centers, as well as waterfront areas. Open space protection has preserved important natural resources and scenic features in the county as well. Major subdivisions, big box stores, and generic retail developments have been constructed on previously vacant lands and have changed the character of some Westchester County communities.

Eight major land trends over the past 14 years have been identified in the county. Their effect on the county's communities has been apparent in recent years. Some of these trends have had positive effects on a community's function and character, while others have had a more negative impact. Communities lacking the necessary zoning and land use regulations to avoid low-quality development were more negatively affected by these trends than those that planned comprehensively and produced zoning frameworks protective of community character and focused on efficient growth and development.

These eight trends are as follows:

- Redevelopment in central cities
- Development and redevelopment in small centers
- Riverfront redevelopment
- Preservation of open space
- Build-out of large subdivisions
- Growth of generic retail developments
- Development of big box stores
- Reuse of corporate campuses and office parks

The cities of White Plains, New Rochelle, and Yonkers are three of the largest cities in Westchester County. The downtown areas of these cities benefited from the real estate and construction boom that occurred between 1995 and the early 2000s. The urban environments and transit accessibility of these three cities made them

particularly attractive to commuters and residents desiring an urban lifestyle without the costs associated with living in New York City.

Many of the county's smaller municipalities are rediscovering historic strengths as convenient and walkable community centers near transit. The central business districts of communities, such as Tuckahoe, Pelham, and Scarsdale, have seen infill development on under-utilized or vacant properties and adaptive reuse of former industrial and commercial buildings. These communities have increased their mix of uses, from residential apartments to offices, stores, and restaurants.

The communities along the Hudson River have encouraged the construction of industrial and commercial buildings along large portions of the waterfront during the 19<sup>th</sup> and early 20<sup>th</sup> centuries. As the region's economy shifted from manufacturing and transportation shifted to cars and trucks, the need for large industrial sites and shipping of goods was reduced. This left many of the old waterfront industrial buildings empty, leaving many communities large underutilized buildings and polluted sites along the waterfront. Many communities have recognized the economic, environmental, and aesthetic value of their waterfront areas and been involved in finding new uses for these properties.

Westchester County has a history of preserving open space for its environmental, scenic, and recreational quality. Since the late 1990s, the County has worked to fund and acquire over 1,900 acres of open space. This includes privately-held open spaces. Westchester County has over 51,000 acres of open space, occupying 18% of the total land area. Some of the areas include: Taxter Ridge Park Preserve in the Town of Greenburgh (199 acre site), Leon Levy Preserve in the Town of Lewisboro (383 acre site), and Angle Fly Preserve in the Town of Somers (654 acre site).

The growth of the County's suburbs occurred after World War II in single-family subdivisions. By the end of the 20<sup>th</sup> century, the area of single-family subdivision development moved north of Westchester County as land available for large subdivisions became scarcer. Developers in the County realized that they must turn to other means to continue to build housing and to do business in the County. In the 1990s, the County started experiencing a trend toward tearing down old homes and replacing with new, larger residences. Today, many municipalities have passed ordinances banning the teardown practice, and others have used site layout and design regulations to make certain that new homes positively impact neighborhood character.

Westchester County communities have experienced a large growth in the number of generic commercial developments, especially banks, retail pharmacies, and convenience stores. The presence of these businesses provides convenient access to import services; however, the rapid increase in the number of chain businesses has garnered community opposition in many places since these businesses hurt small, local ones that provide the same services.

Big box stores are large chain retail businesses that provide a variety of goods and services. With the convenience of these stores, many smaller, independent businesses that have less diverse product offerings have been replaced. The development of the big box stores requires large tracts of land, but the presence of available land for commercial development in the County has been limited by commercial areas that are more restricted and confined than in many other areas. In order to develop in Westchester County, many big box stores have readapted previously developed commercial sites or have changed their standard architectural and site design approaches.

Many corporate office parks and corporate campuses are found in Westchester County. Corporate campuses are large tracts of land owned and occupied by single corporate tenants and which often include substantial reservations of open space and park-like landscape design. Office parks typically include one or more buildings, sometimes with multiple tenants, on large landscaped properties. Today, the region's economy has shifted

toward smaller firms, reducing the demand for these facilities; thus, creating redevelopment challenges to corporate campuses and office parks. Many of these office areas were approved with the understanding that large areas of their sites would be maintained or protected as permanent open space. Identifying the best opportunities for reusing corporate campuses and office parks will ensure that communities have a vision in place should these businesses relocate and require reuse of the properties.

#### 4.4.2 Population Trends

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

According to the U.S. Census Bureau Westchester County's 2010 population was 949,113 persons, which is 2.8% increase from the 2000 Census population of 923,459. From 1900 to 1970, the County experienced a constant growth. The only decrease in population was seen between 1970 and 1980, when the County had a 3.1% decrease in population. The largest increase was seen between 1900 and 1910 when the population of the County grew by 53.6% (98,798 persons). The smallest increase was seen between 1980 and 1990 when the County only had a 1% increase in population (8,267 persons). Table 4-5 displays the population and change in population from 1900 to 2013 in Westchester County.

**Table 4-5. Westchester County Population Trends, 1900 to 2013**

Year	Population	Change in Population	Percent (%) Population Change
1900	184,257	N/A	N/A
1910	283,055	98,798	53.6
1920	344,436	61,381	21.7
1930	520,947	176,511	51.2
1940	573,558	52,611	10.1
1950	625,816	52,258	9.1
1960	808,891	183,075	29.3
1970	894,104	85,213	10.5
1980	866,599	-27,505	-3.1
1990	874,866	8,267	1.0
2000	923,459	48,593	5.6
2010	949,113	25,654	2.8
2013	968,802	19,689	2.1

Source: U.S. Census Bureau, 2014

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

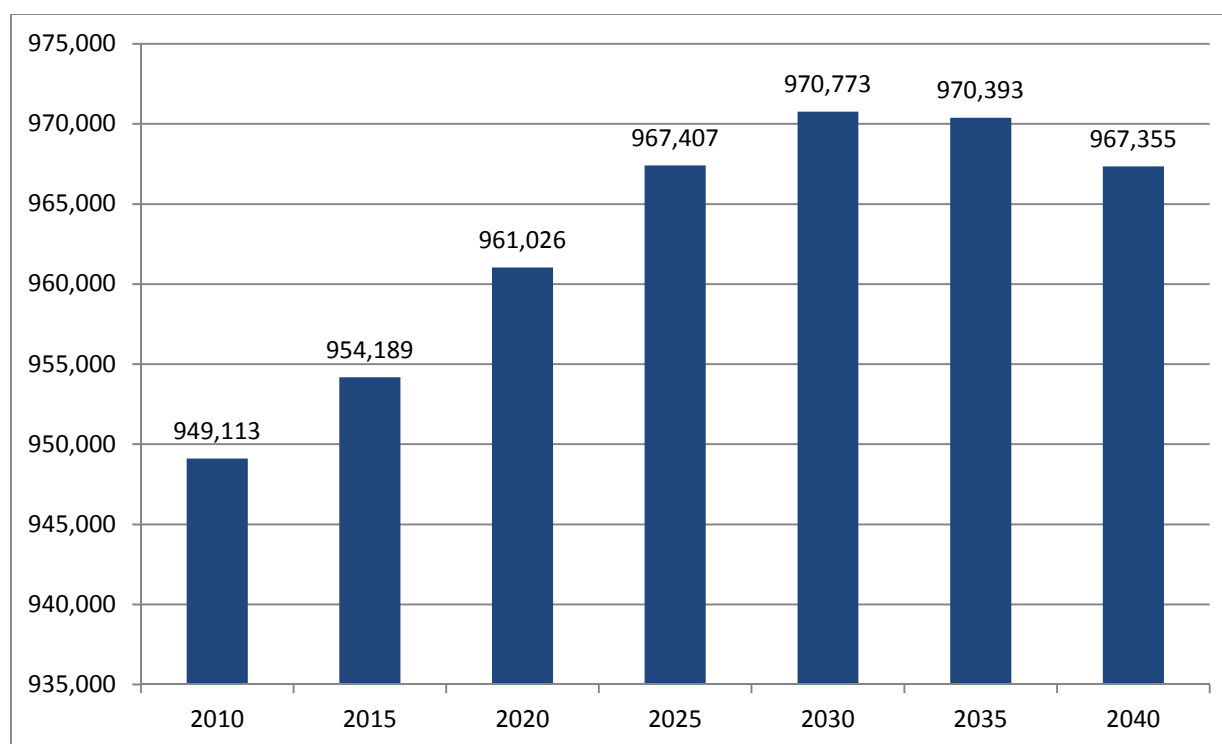
Over the next 25 years, from 2015 to 2040, Westchester County has a projected population growth of 1.4% percent. Based on projections from the Cornell University Program on Applied Demographics, the County population is expected to reach 954,189 by 2015 and 967,355 by 2040 (Table 4-6).

**Table 4-6. Westchester County Population Projections, 2015 to 2040**

Year	Projected Population	Change in Population	Percent (%) Population Change
2010*	949,113	N/A	N/A
2015	954,189	5,076	0.53
2020	961,026	6,837	0.72
2025	967,407	6,381	0.66
2030	970,773	3,366	0.35
2035	970,393	-380	-0.04
2040	967,355	-3,038	-0.31

Source: U.S. Census 2010; Cornell University 2014

\* Actual population from 2010 Census

**Figure 4-12. Westchester County Population Projections, 2010 to 2040**

Source: U.S. Census 2010; Cornell University 2014

Note: Population for 2010 is the actual 2010 Census population

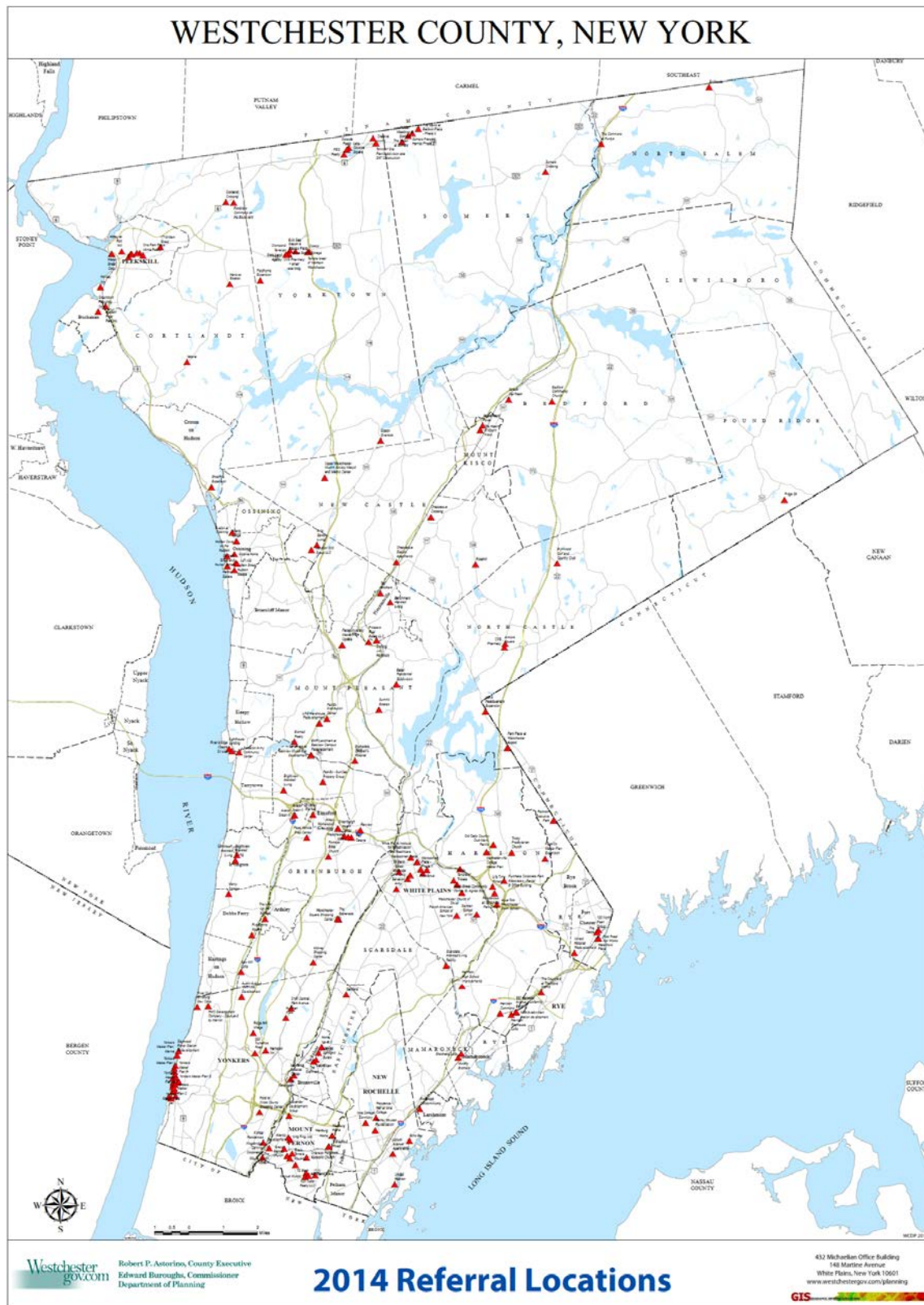
### 4.4.3 Future Growth and Development

An understanding of population and development trends can assist in planning for future development and ensuring that appropriate mitigation, planning, and preparedness measures are in place to protect human health and community infrastructure. DMA 2000 requires that communities consider land use trends, which can impact the need for, and priority of, mitigation options over time. Land use and development 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.

Local zoning and planning authority is provided for under the New York State General Municipal Law, which gives municipalities zoning and planning authority. Refer to Sections 6 and 9 for further details on the planning and regulatory capabilities for the County and each municipality.

New development that has occurred in the last five years within the County, and potential future development in the next five years as identified by the county and each municipality, is included in the jurisdictional annexes in Section 9, along with an indication of proximity to known hazard zones. Recent, ongoing, and known/anticipated future development identified by the municipalities has been cross-checked and augmented with a county-level development inventory (2014) provided by the Westchester County Department of Planning, illustrated in Figure 4-13. The county-level inventory includes major development projects referred to the County as part of the mandatory site plan review referral process, and does not include all development in the County.

Figure 4-13. New Development in Westchester County (2014 County Referral Locations)



Source: Westchester County Department of Planning, 2015

## 4.5 CRITICAL FACILITIES

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

Various municipal and County departments and agencies have included mitigation actions to address vulnerable critical facilities. These actions have been proposed in consideration of protection against 500-year events, or worst-case scenarios. These actions have been proposed in consideration of protection against 500-year events, or worst-case scenarios. When determined to be feasible and practical, mitigation planning for critical facilities identified as previously sustaining flooding and/or being located in a FEMA floodplain will be developed to achieve protection to the 500-year flood event or the actual worst-damage scenario, whichever is greater.

It is recognized, however, that in the case of projects being funded through Federal mitigation programs, the level of protection may be influenced by cost-effectiveness as determined through a formal benefit-cost analysis. In the case of “self-funded” projects, local government authority must be recognized. Further, it must be recognized that the County and municipalities have limited authority over privately-owned critical facility owners with regard to mitigation at any level of protection.

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

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

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

### 4.5.1 Essential Facilities

This section provides information on emergency facilities, hospital and medical facilities, schools, shelters and senior care and living facilities. For the purposes of this Plan, emergency facilities include police, fire, emergency medical services (EMS) and emergency operations centers (EOC). Figure 4-14 displays the location of the essential facilities in Westchester County.

#### Emergency Facilities

The Westchester County Department of Emergency Services is composed of four separate divisions, the Emergency Communications Division, the Fire Services Coordination-Training Division, the Emergency Medical Services Coordination-Training Division and the Office of Emergency Management. The Department is responsible for aiding communities in emergency planning and response, as well as providing the training and equipment for the County’s first responders and volunteers. Additionally, the Department operates a 24-hour Emergency Communications Center.

Almost all of the County’s municipalities are serviced by their own fire department, with the exception of Rye Brook, which is primarily serviced by departments located in Port Chester. Police enforcement and public safety is maintained by the New York State Police Department, Westchester County Police and local departments. There are 138 fire facilities, 41 EMS facilities, 53 police facilities, and six EOCs located in Westchester County.

### Hospitals and Medical Facilities

---

The County also has multiple hospitals and health care facilities; these facilities range in size and primary function that include smaller psychiatric and children's hospitals and the larger, regional Westchester Medical Center. There are 129 healthcare facilities in the County.

### Schools

---

There are 386 primary educational facilities (elementary, middle and high schools) and 30 secondary educational facilities (colleges and universities) located in Westchester County. In times of need, schools can function as shelters and are an important resource to the community. For information regarding shelters, see the Shelters subsection of this document.

### Senior Care and Living Facilities

---

The County has an extensive system of programs and services for the senior population. This includes 39 nursing homes 120 senior centers, and 18 senior housing facilities. These facilities are highly vulnerable to potential impacts from disasters, and knowing the location and numbers of these types of facilities will be effective in managing a response plan pre- and post-disaster.

### Shelters

---

With support and cooperation of the American Red Cross and local jurisdictions, the County references an inventory of suitable shelter locations and can assist with the coordination and communication of shelter availability as necessitated by the execution of local municipal emergency operation plans. There are 35 shelter facilities in the County. County-wide sheltering policies and procedures are documented in the following plans:

- Westchester County *Comprehensive Emergency Management Plan, Coastal Storm Emergency Response Annex (Evacuation Centers/Shelters)* – June, 2009
- Westchester County *Comprehensive Emergency Management Plan, Hazardous Materials Emergency Response Annex (In-Place Sheltering/Evacuation)* – September, 2014
- Westchester County Radiological Emergency Response Plan (*Reception/Congregate Care Centers*) – August, 2014
- Specific shelter locations are identified on the Westchester County Website at:  
<http://giswww.westchestergov.com/gismap/default.aspx?ovmap=hurricane>

### Evacuation Routes

---

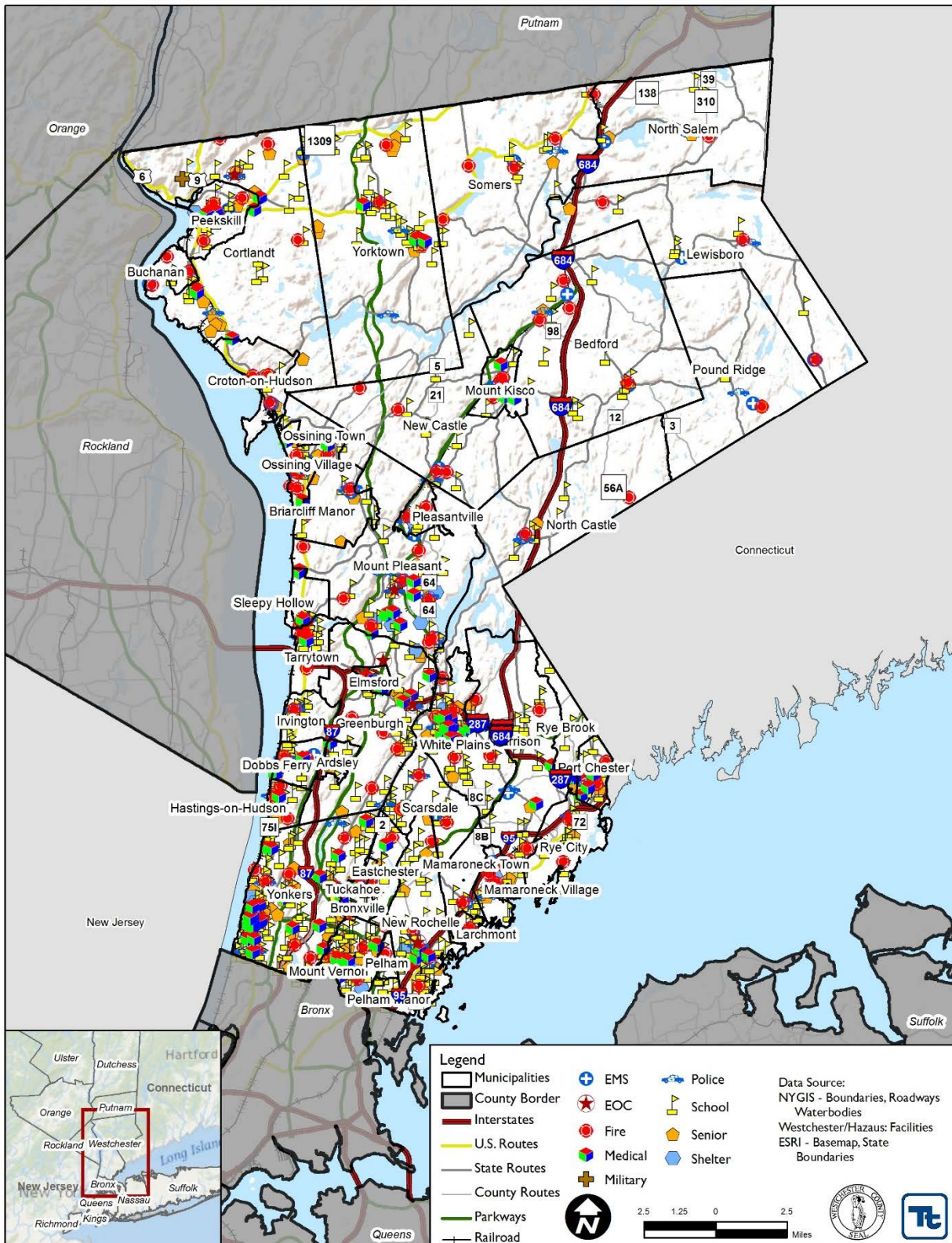
The County has identified evacuation zones for hurricanes, maintains specific evacuation plans for radiological emergencies associated with Indian Point Energy Center, and can assist with the coordination and communication of evacuation routing as necessitated by the execution of local municipal emergency operation plans.

- Hurricane Emergency Evacuation Zones are identified at:  
<http://giswww.westchestergov.com/gismap/default.aspx?ovmap=hurricane>
- Specific evacuation routes are identified in the *Westchester County Radiological Emergency Response Plan – August, 2014*
- Westchester County Evacuation Bus Routes are also posted for residents who lack their own transportation, and can be found at:  
<http://keepingsafe.westchestergov.com/images/stories/pdfs/IPEmergencyGuide2014-15.pdf>

The County has identified a number of mitigation actions within their County annex (Section 9.1) that will improve county-wide emergency management capabilities, including evacuation and sheltering, as follows:

- WCDES-1: *County-Wide Evacuation Route and Sheltering Plan Initiative*
- WCDES-2: *County-Wide Disaster Housing Location/Relocation Planning Initiative*
- WCDES-4: *Develop Comprehensive County-Wide Critical Facility Database*
- WCDES-5: *Create a Multi-Jurisdictional Access and Functional Needs Preparedness Committee*

Figure 4-14. Emergency Facilities in Westchester County



Source: Westchester County, HAZUS-MH

### **4.5.2 Transportation Systems**

---

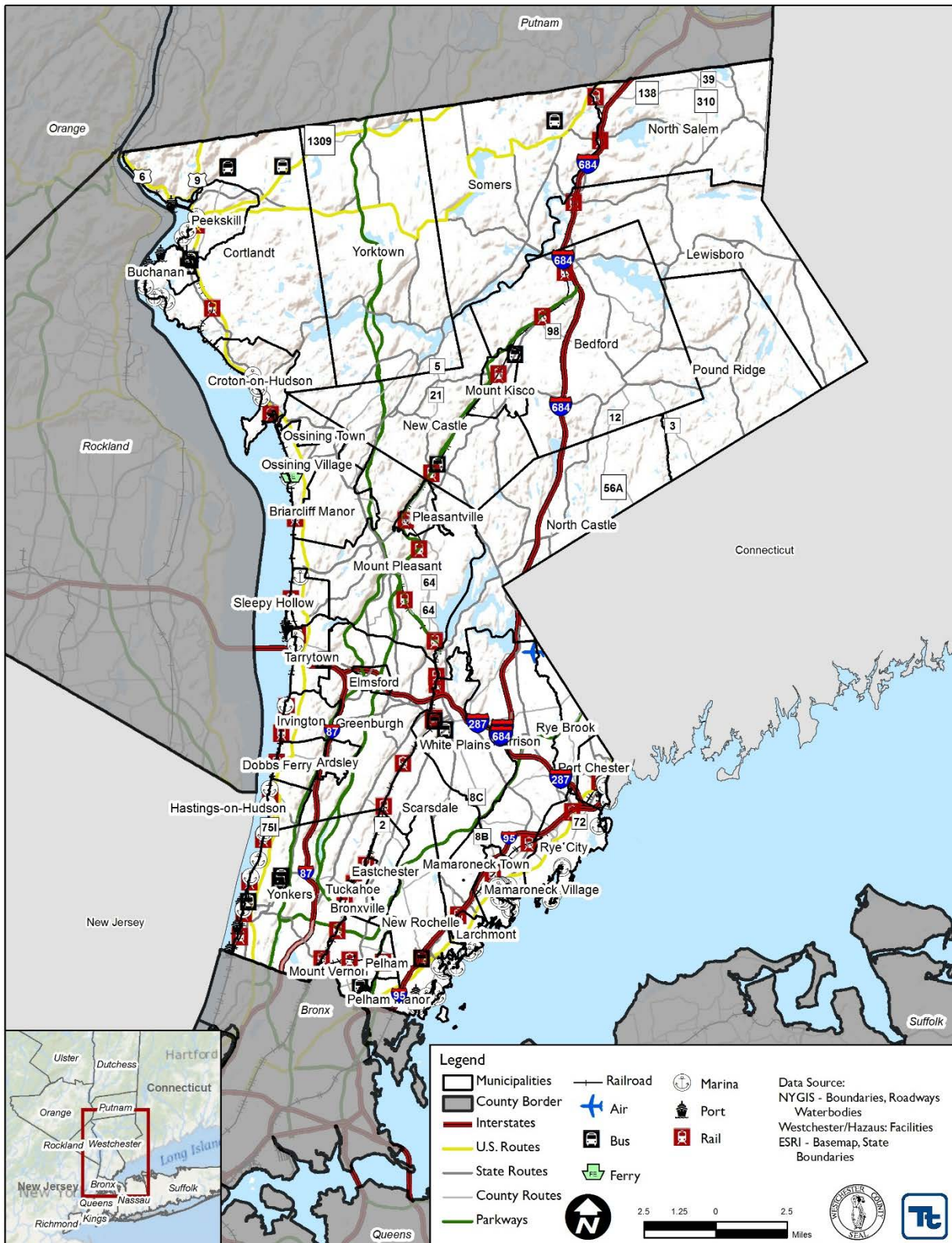
Westchester County's location and extensive transportation network offer residents and employees various options for transportation throughout the County and the region. The County's location within the New York City metropolitan region is one of its most important assets. Westchester County's transportation system includes an extensive network of roads, access to national and commuter rail, countywide bus service, an airport providing domestic services, regional ferry service, and a pedestrian and bicycle network. Figure 4-15 shows the regional transportation systems found in Westchester County.

The County has over 3,200 miles of public roadways. County roads total 154 miles and State road make up approximately 760 miles of Westchester County's road network. Interstate (I)-95 is the east coast's major interstate highway. It is known as the New England Thruway in New York State and runs through southern Westchester County parallel to the Long Island Sound and gives residents and commuters access to New York City and New England. I-87 (New York State Thruway) runs north-south on the western side of the County and links Westchester with New York City and upstate New York and Canada. The Cross Westchester Expressway, I-287, runs east-west across the center of the County and connects I-87, the Tappan Zee Bridge, and I-95. It also passes through the City of White Plains. I-684 runs north from White Plains into Putnam County through the central and northern suburbs and provides a connection to I-84.

In addition to the major interstates found in Westchester County, there is a network of six scenic parkways that facilitate travel within the County and beyond. These parkways include the following: Bronx River, Hutchinson River, Cross County, Saw Mill River, Taconic State, and the Sprain Brook.

Residents of Westchester County have the highest rate of public transportation usage for commuting to work among all suburban counties in the New York City metropolitan area. Over 20% of County resident workers use railroad, subway or bus travel to work. Metro-North Railroad riders are a large portion of the public transportation users, with over 55,000 County residents reporting travel via railroad as their primary mode of transportation to work. The different modes of transportation provided in the County are discussed below.

Figure 4-15. Transportation Facilities in Westchester County



Source: Westchester County, HAZUS-MH

### Bus and Other Transit Facilities

Numerous bus services are available in Westchester County. The Bee-Line System is run by the County's Department of Public Works and Transportation and provides an extensive network of local, express, and railroad feeder bus services to customers throughout the county. It is one of the 40 largest bus systems in North America. The Bee-Line operates between Westchester County and Manhattan, the Bronx and Putnam County with 89 routes in the system. The Bee-Line also provides express routes for White Plains, an express service to Manhattan and an Airlink service between White Plains and the Westchester County Airport. Many of the System's routes are designed to provide connecting service to Metro-North trains, New York City transit bus and subway lines, and other transit systems. In addition to the Bee-Line system, other bus services are available between Westchester and surrounding areas. There are 17 bus and other transit facilities located in Westchester County, including: Transportation of Rockland, I-Bus Transit (CT), The Leprechaun Connection, Orange-Westchester Line, Putnam Area Rapid Transit, and Greyhound and Trailways.

### Railroad Facilities

There are two types of rail systems in Westchester County: interstate rail and commuter rail. Amtrak connects three stations in Westchester County with points throughout the national rail system. The New Rochelle station is located along Amtrak's Northeast Corridor and provides regional service to Boston, Springfield, New York City, and Washington D.C. The Croton-Harmon and Yonkers stations are served daily by five Amtrak lines: the Lakeshore Limited, the Adirondack, the Ethan Allen Express, the Maple Leaf, and Empire Service. Connecting rail service is available to many other points throughout the U.S. and Canada.

The Metropolitan Transportation Authority (MTA) Metro-North Railroad (Metro-North) provides commuter rail service to 44 stations and to 75% of all communities in Westchester County. Three branches, the Hudson, Harlem, and New Haven Lines, connect County communities to New York City's Grand Central Terminal. The Hudson Lines serves the portion of Westchester County along the Hudson River. The Harlem Line serves the central part of the County and the New Haven Line serves areas along Long Island Sound. There are 45 rail facilities located in Westchester County.

### Airports

The Westchester County Airport is located five miles northeast of the City of White Plains' downtown area. This central location serves as the gateway to Westchester County and puts in close proximity to one of the largest concentrations of company headquarters in the U.S. It has been cited that the Airport's accessibility and its ability to accommodate both corporate and commercial aircraft are benefits to many businesses in the County. Additionally, New York-Kennedy, New York-LaGuardia, Newark-Liberty, Hartford-Bradley, and Newburgh-Stewart Airports are within 100 miles of most points in Westchester County. The Westchester County Airport handles all types of aircraft ranging from single engine aircraft to large corporate jets and commercial airliners.

### Ferry Service and Ports

Passenger ferries connecting Westchester County locations with Rockland County and New York City are available for commuters, residents, and visitors. The major ferry service providers include: NY Waterway and New York Water Taxi with the ferry terminal located in the Village of Ossining. There are 32 port facilities, 64 marinas and one ferry facility in Westchester County.

### 4.5.3 Lifeline Utility Systems

This section presents potable water, wastewater, energy resource, and communication utility system data. Due to heightened security concerns, local utility lifeline data sufficient to complete the analysis have only partially

been obtained. Westchester County is served by a variety of communications systems, including traditional land line, fiber optic, and cellular provided by multiple companies, such as Verizon, Direct TV, and Cablevision and Optimum Online. There is one communication facility in Westchester County identified as a critical facility. Each carrier has individual plans for emergency situations during hazard events and post disaster recovery efforts. In addition to land line, fiber optic and cellular communications systems, Westchester County has an extensive radio communications network that is utilized by emergency services agencies, hospitals, law enforcement, public works, transportation and other supporting organizations.

Figure 4-16 shows the locations of the facilities for these various lifeline utility systems.

### **Potable Water**

---

In Westchester County, water is provided from various facilities as a public service or through private supplies, such as wells. Community water suppliers serve 95% of the county's land area while the remaining area of the county is served by on-site wells. Municipal suppliers are the local governments which have service areas corresponding to the boundaries of the municipality.

The principal water source for both municipal and private suppliers is the New York City water supply system which serves approximately 85% of the county's total population. Details regarding the New York City reservoir and aqueduct system are described earlier in this section.

There are two inter-municipal water suppliers, the Westchester Joint Water Works (WJWW) and the Northern Westchester Joint Water Works (NWJWW), established under inter-municipal agreements. The WJWW serves the Town of Mamaroneck, the villages of Mamaroneck and Larchmont, and portions of Harrison and the City of Rye. The NWJWW serves the towns of Yorktown and Cortlandt and the Montrose Improvement District. Private suppliers vary greatly in size, from homeowner associations serving a small area to the larger private water companies serving several municipalities.

Four County water districts, each covering several municipalities or portions thereof, have been established to distribute water and/or to provide benefits (treatment, maintenances, or administration of the water supply).

1. County Water District (CWD) 1 – serves the cities of White Plains, Yonkers, Mount Vernon, and the Village of Scarsdale
2. CWD 2 – serves portions of the towns of Yorktown, Cortlandt, and Somers
3. CWD 3 – serves the Westchester Medical Center
4. CWD 4 – serves the City of Rye, and the villages of Rye Brook and Port Chester, which are currently serviced by United Water of New Rochelle

There are 651 potable water facilities, 13 water towers, 388 potable wells, 66 potable pumps, and five potable tanks in Westchester County.

### **Wastewater Facilities**

---

Municipal wastewater collection systems connect with Westchester County trunk sewers which serve 13 separate sewer districts. However, not all areas within districts are served by public sewers. The southern and central portions of Westchester County are served by the County's seven wastewater treatment plants: Blind Brook, Mamaroneck, Port Chester, and New Rochelle plants on the Long Island Sound shore and Yonkers, Ossining, and Peekskill plants on the Hudson River shore. These plants are located where 90% of the County's population resides. The plants are fed by 194 miles of trunk sewers and 40 pump stations.

Most areas in northern Westchester County are dependent on subsurface sewage disposal systems (septic systems) located on each lot or are served by a few locally-based central sewage collection and treatment

districts. By land area, approximately one-third of the county is dependent on septic systems. Most of this land is located within the Croton watershed which encompasses five reservoirs that are part of the New York City water supply systems (discussed earlier in this profile). There are also 28 privately and municipally-owned wastewater collection, treatment and disposal systems located in the Croton watershed. These facilities discharge four million gallons of treated effluent daily. . There are 64 wastewater pump facilities and 147 wastewater facilities located in the County.

### **Energy Resources**

---

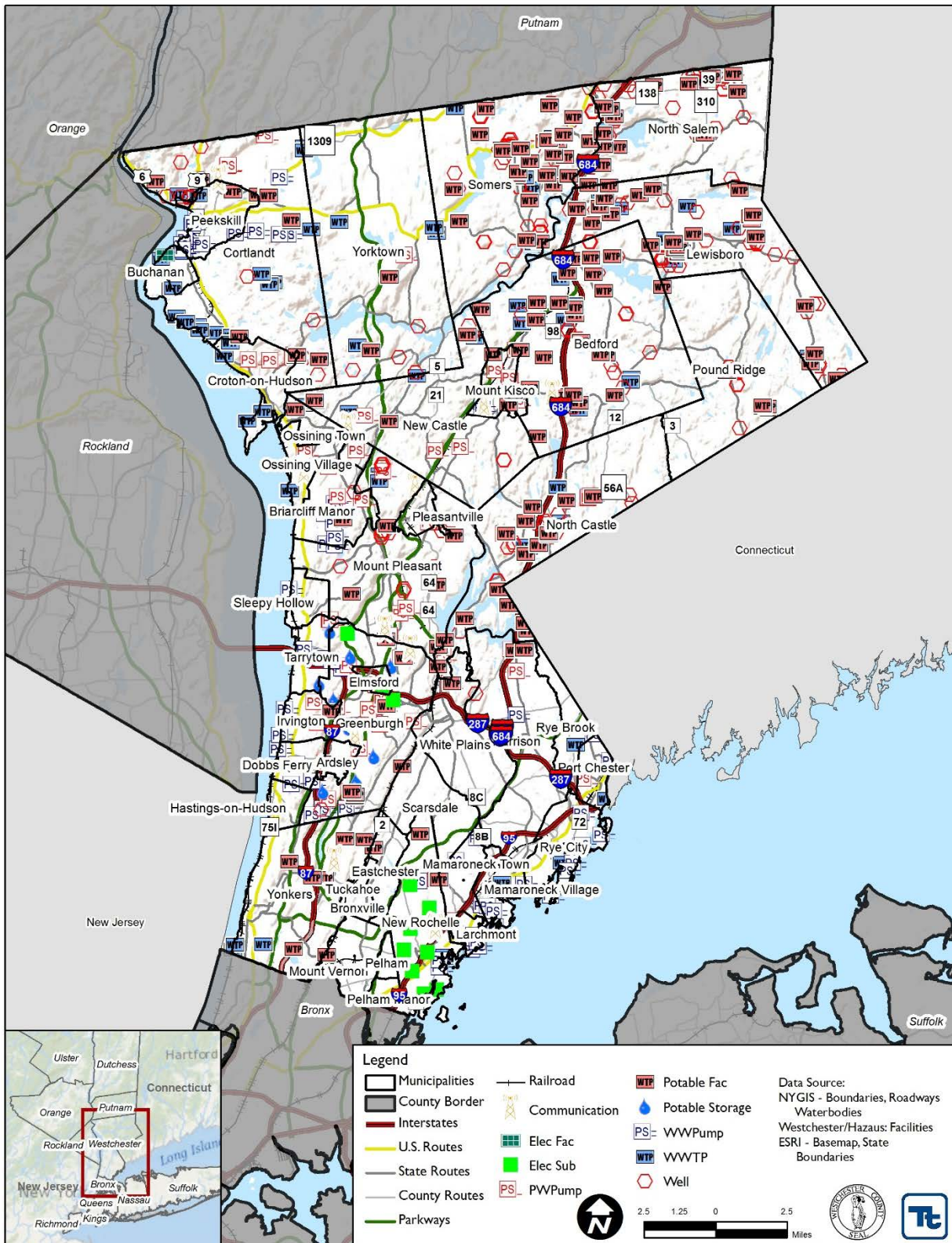
Power in Westchester County is transmitted and distributed by two companies: Consolidated Edison Company of New York (Con Ed) and New York State Electric and Gas (NYSEG). Homes in the county are heated by many different sources, with a majority using utility gas or fuel oil. There are 12 electric power facilities and 11 electric substations in Westchester County.

### **Communications**

---

Westchester County is served by a variety of communications systems, including traditional land line, fiber optic, and cellular provided by multiple companies, such as Verizon, Direct TV, and Cablevision and Optimum Online. There is one communication facility in Westchester County identified as a critical facility. Each carrier has individual plans for emergency situations during hazard events and post disaster recovery efforts. In addition to land line, fiber optic and cellular communications systems, Westchester County has an extensive radio communications network that is utilized by emergency services agencies, hospitals, law enforcement, public works, transportation and other supporting organizations.

Figure 4-16. Utility Lifelines in Westchester County



Source: Westchester County

#### 4.5.4 High-Potential Loss Facilities

High-potential loss facilities include dams, levees, hazardous materials facilities (HAZMAT), nuclear power plants and military installations. There is one nuclear power plant, Indian Point located in the Village of Buchanan, and one military installation, Camp Smith in the Town of Cortlandt. Dams are discussed below. Figure 4-17 shows the locations of the High-Potential Loss Facilities in the county.

##### Dams and Levees

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

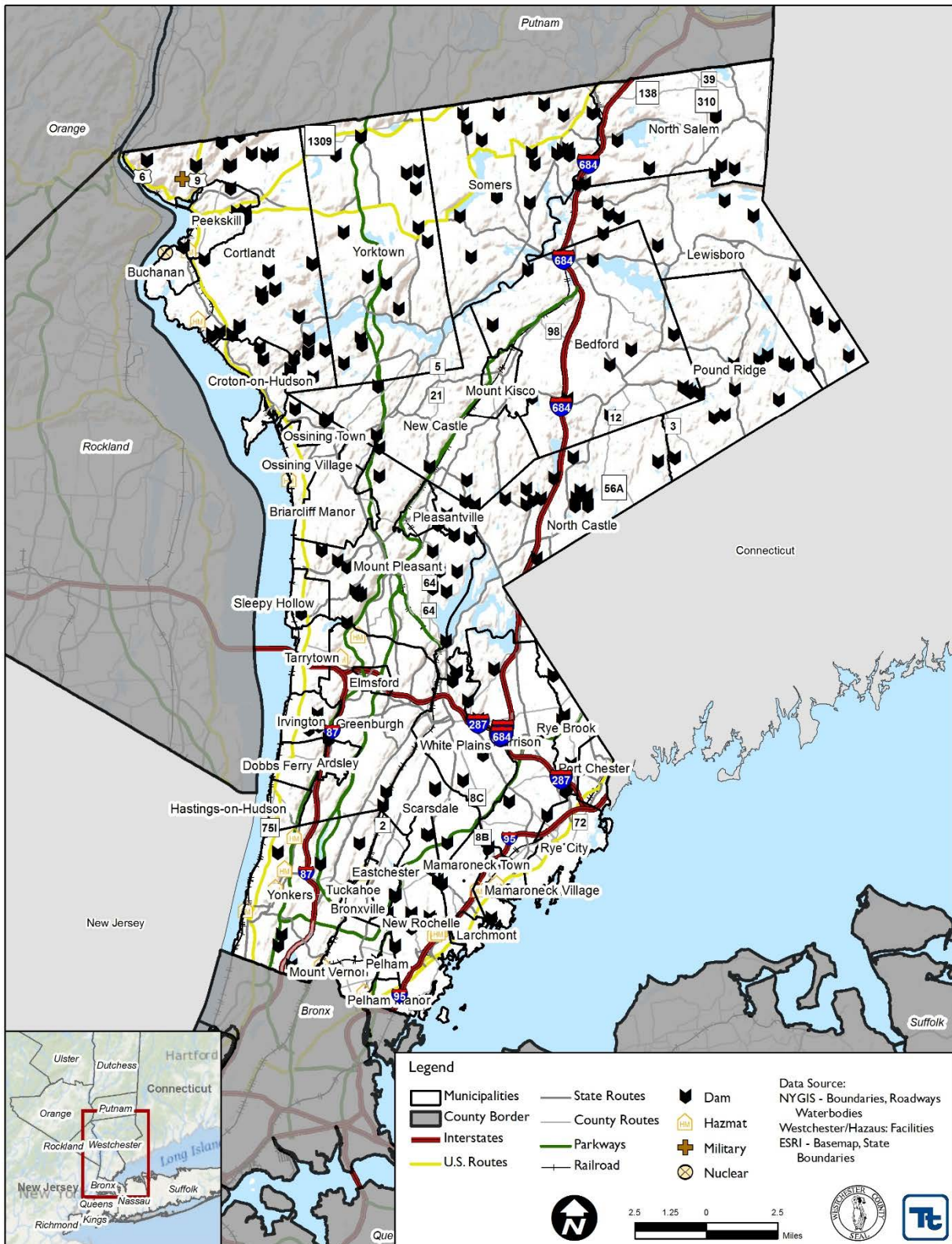
- *Low Hazard (Class A)* is a dam located in an area where failure will damage nothing more than isolated buildings, undeveloped lands, or township or county roads and/or will cause no significant economic loss or serious environmental damage. Failure or mis-operation would result in no probable loss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

According to the U.S. Army Corps of Engineers National Inventory of Dams (NID), there are 87 dams located within Westchester County. These numbers differ from the National Performance of Dam Program (NPDP) which indicates that there are 86 dams in Westchester County (31 high hazard, 48 significant hazard and seven low hazard). For the purpose of this plan, the NYSDEC data from the New York State GIS Clearinghouse will be used. According to the GIS data, there are 199 dams located in Westchester County (105 Class A, 45 Class B, 32 Class C, six Class D and 11 unclassified). Refer to Appendix G for the names and locations of the dams found in the county.

#### 4.5.5 Other Facilities

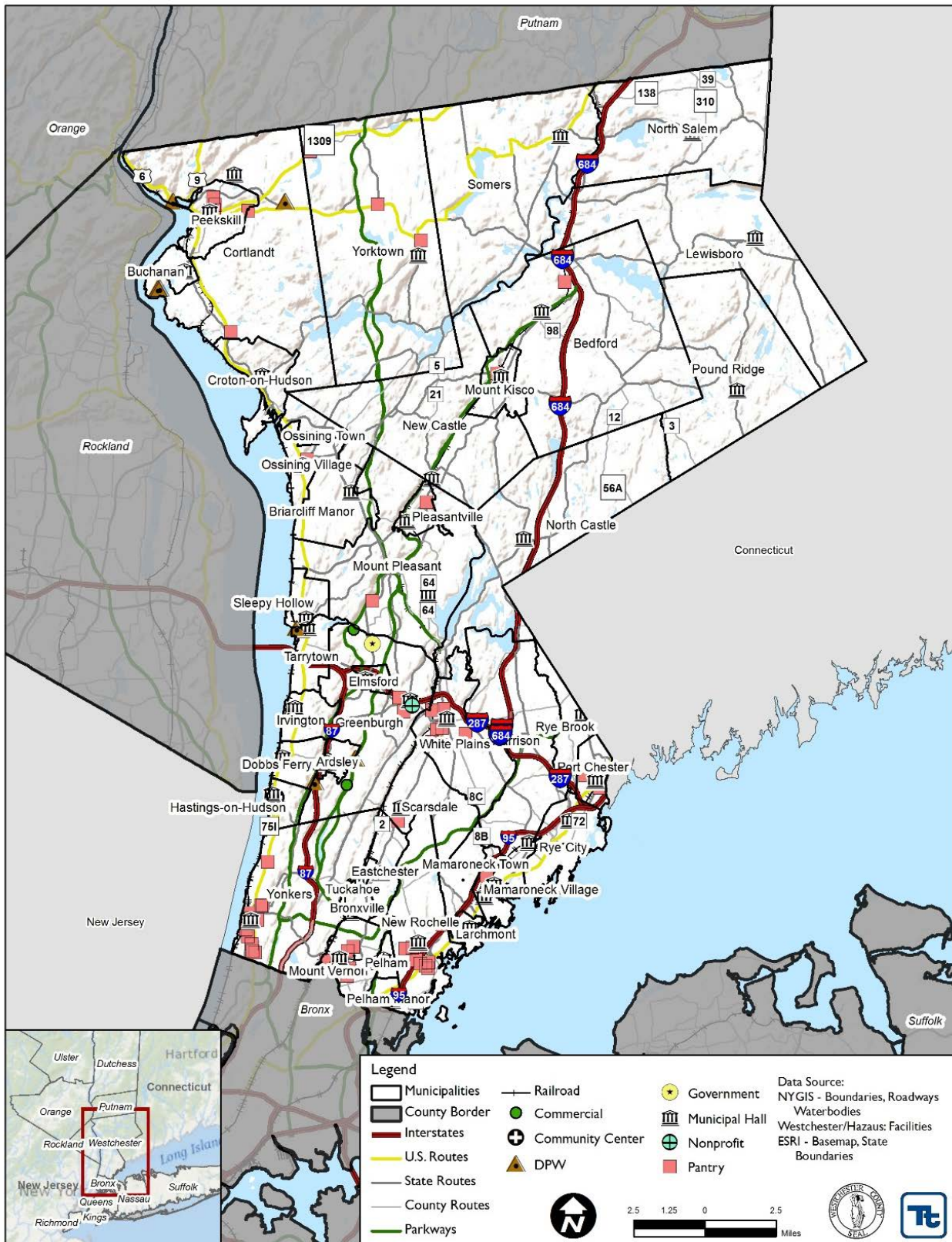
The Planning Committee identified 129 additional facilities (user-defined facilities) as critical including municipal buildings and other government facilities. These facilities were included in the risk assessment conducted for the county. Figure 4-18 shows the locations of these facilities in the county.

Figure 4-17. High-Potential Loss Facilities in Westchester County



Source: Westchester County

Figure 4-18. Other Facilities in Westchester County



Source: Westchester County