



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) as well as critical facilities located within Putnam County. In Section 5, specific profile information is presented and analyzed to develop an understanding of the study area, 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

Putnam County was formed in 1812 from Dutchess County. The County is included in the New York-Newark-Jersey City, NY-NJ-PA Metropolitan Statistical Area. It is one of the most affluent counties in the U.S., ranked 7th by median household income. Putnam County consists of nine municipalities, covering over 240 square miles and 2013 estimated population of 99,645. The County is one of the 62 counties in New York State and is comprised of six towns and three incorporated villages. Putnam County is the 29th most populated County in the State and ranks 55 in total land area.

Putnam County is located in the Mid-Hudson Region of New York State. It is approximately 50 miles north of New York City and is on the outer ring of the New York City metropolitan area. The County is bordered to the west by the Hudson River, to the north by Dutchess County, to the east by the State of Connecticut, and to the south by Westchester County.

The County contains six town governments, three village governments, and the County government. State and federal government statutes and regulations control how the local governments operate. The town and village governments include the towns of Carmel, Kent, Patterson, Philipstown, Putnam Valley and Southeast, and the villages of Brewster, Cold Spring and Nelsonville. The County and each municipality operate under the limits prescribed by various rules and laws of New York State. Each government entity has various responsibilities, funding sources, staffing levels, elected positions, and administrative capacities (Putnam County Division of Planning and Development 2010).

4.1.1 Physical Setting

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

Hydrography and Hydrology

Numerous ponds, lakes, creeks, and rivers make up the waterscape of Putnam County. The major waterways within the County include: West Branch Reservoir, Croton Falls Reservoir, East Branch Reservoir, East Branch Croton River, West Branch Croton River, Canopus Creek, and the Hudson River.

The eastern half of Putnam County is drained by tributaries of the Croton River. The western half is drained by streams flowing directly into the Hudson River or by tributaries of Canopus and Peekskill Hollow Creeks. The major streams in the County generally follow pre-glacial stream valleys, whose alignment was determined by the structure or hardness of the underlying bedrock (NRCS 1994).

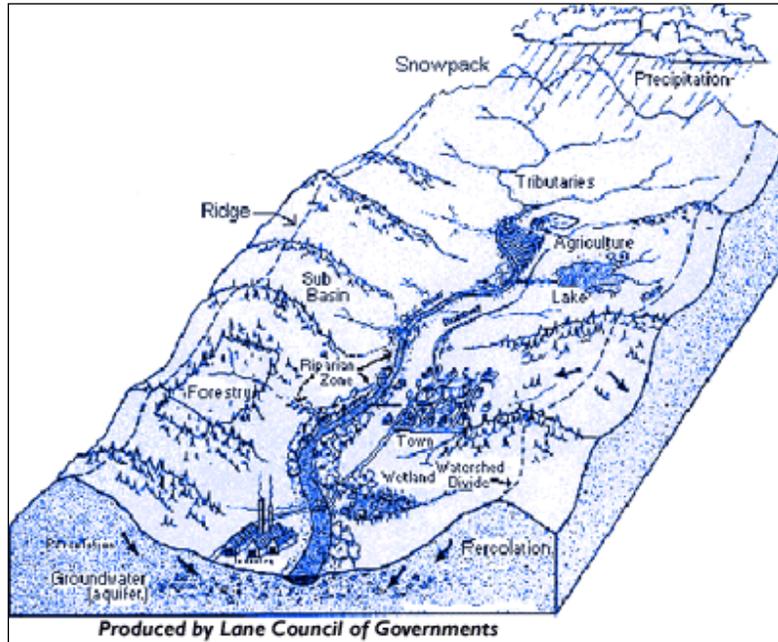
Watersheds

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 4-1 depicts the hydrologic system of a watershed.

Figure 4-1. Watershed

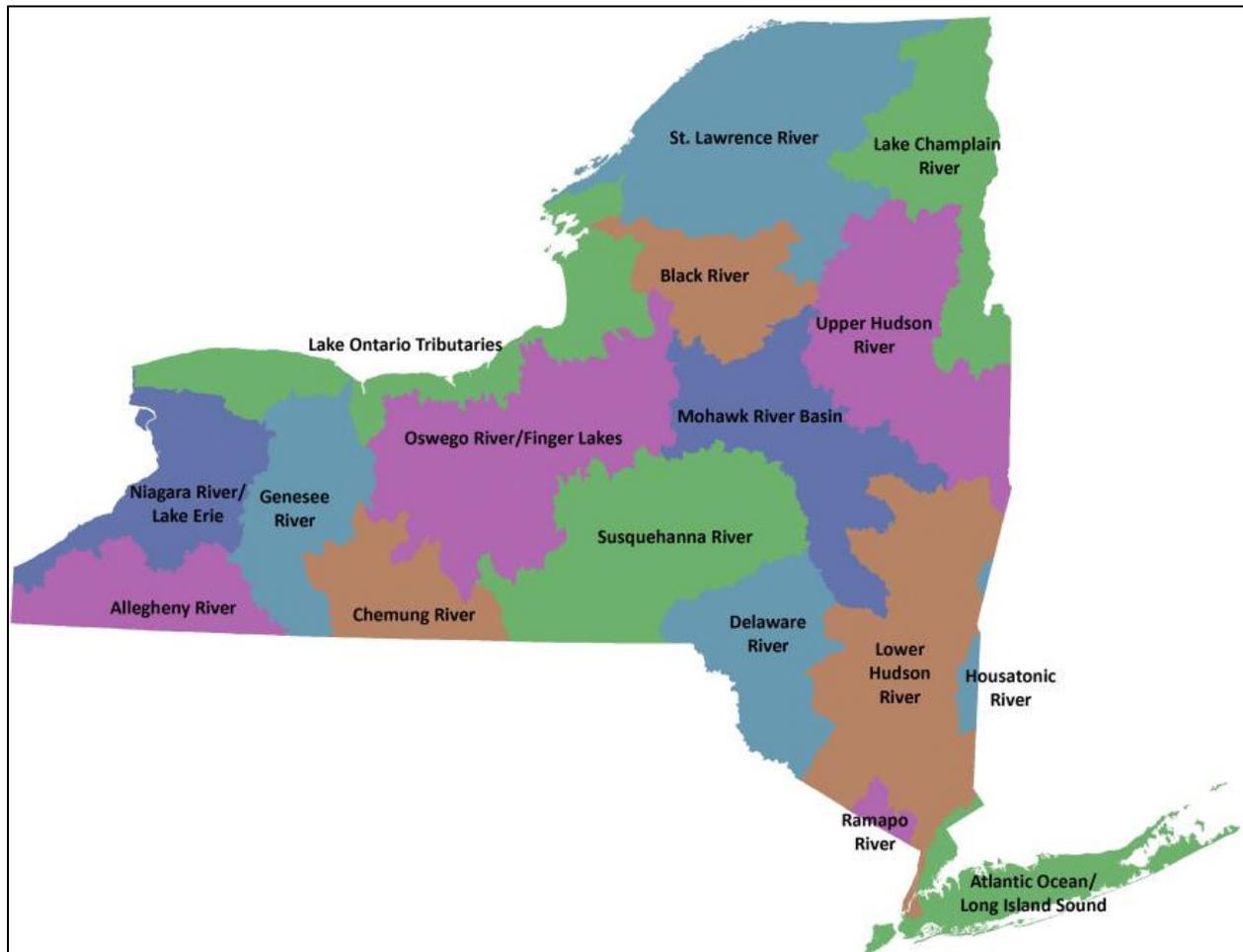


Source: U.S. Environmental Protection Agency (EPA) 2012

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). Figure 4-2 shows the watersheds located in New York State.



Figure 4-2. Watersheds of New York State

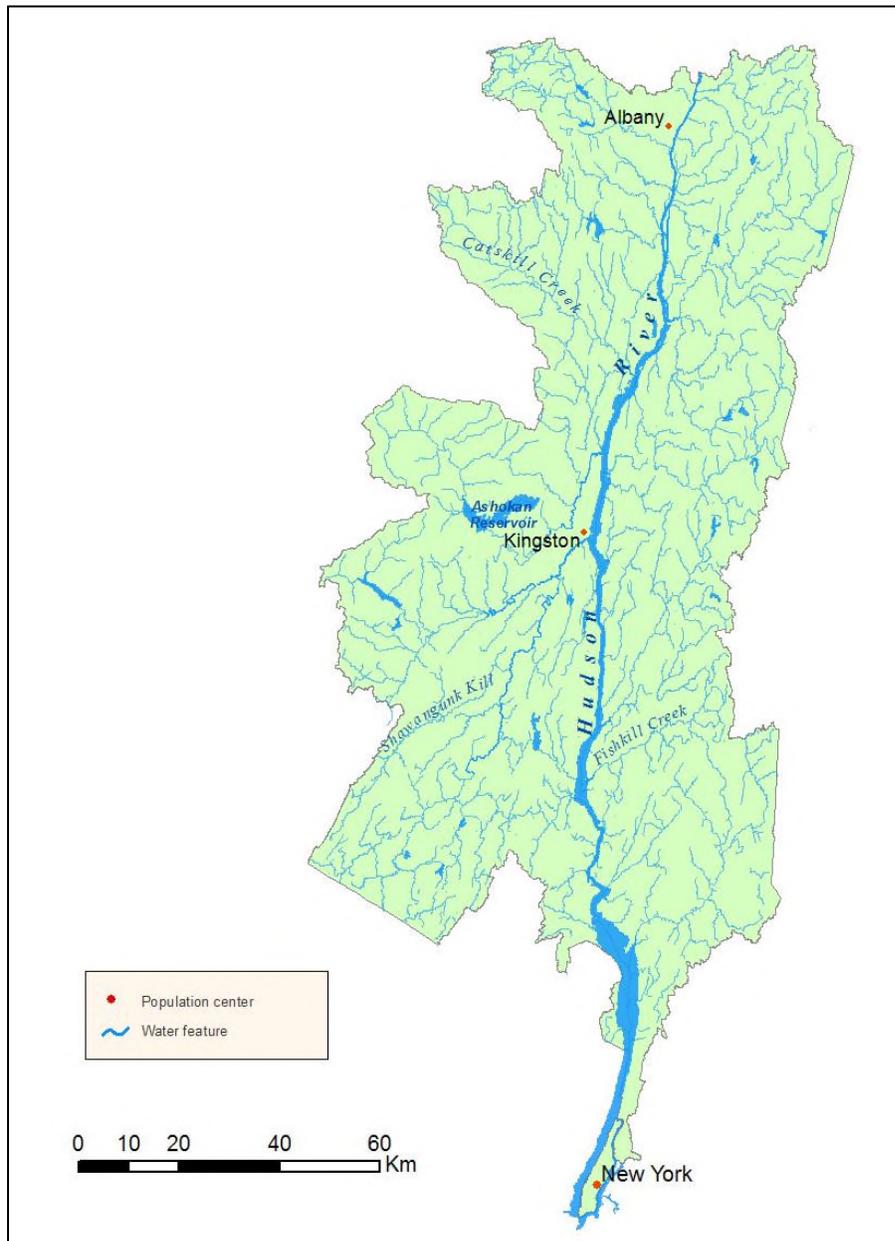


Source: NYSDEC 2014

Putnam County is located in the Lower Hudson Watershed (Figure 4-3). The Lower Hudson Watershed makes up approximately 40% of the larger Hudson/Mohawk River Basin, which is one of the largest drainage areas on the eastern seaboard of the U.S. The Lower Hudson Watershed extends from the Battery at the southern end of Manhattan to the Troy Dam at the confluence of the Mohawk River. This watershed covers 4,982 square miles of land and contains 8,861 miles of freshwater rivers and streams. There are 324 significant freshwater lakes, ponds and reservoirs located within the Watershed that include: Ashokan Reservoir, Rondout Reservoir, New Croton Reservoir, Alcove Reservoir, Cross River Reservoir, and Muscoot/Upper New Croton Reservoir (NYSDEC 2014).



Figure 4-3. Lower Hudson Watershed



Source: NYSDEC 2014

New York City Watershed

According to Riverkeeper, Putnam County is located in the Croton Watershed (Figure 4-5) which makes up a portion of the New York City Watershed (Figure 4-4). Over 9 million people live in New York City, Westchester, Putnam, Orange, and Ulster Counties and most get their drinking water from the Croton, Catskill and Delaware watersheds. The 6,000-mile network of pipes, shafts, and subterranean aqueducts carry an average of 1.2 billion gallons of water each day from 19 upstate reservoirs (Riverkeeper 2014). Most of the waterbodies (Croton Falls Reservoir, Diverting Reservoir, Bog Brook Reservoir, East Branch Reservoir, Middle Branch Reservoir, and Kirk Lake) within the Croton Watershed are located within the Croton System;



the remainder (Boyd's Corner Reservoir, West Branch Reservoir, and Lake Gleneida) are part of the Catskill/Delaware System in Putnam County.

Croton System

The New York City Croton System includes 12 major reservoirs and four controlled lakes that supply drinking water via aqueduct to New York City. The Croton River begins where the east and west branches of the River meet downstream from the Croton Falls Reservoir. Excess water leaves the spillway at the New Croton Dam and the Croton River empties into the Hudson River at Croton-on-Hudson (Westchester County) (Dutchess Watersheds 2009).

Bog Brook Reservoir is located in the Town of Southeast in Putnam County and is one of the 12 reservoirs in New York City's water supply system. The Reservoir has a drainage area of four square miles, all of which lie within the Town. It was formed by damming Bog Brook, a small tributary of the East Branch of the Croton River, which continues southwest to the Diverting Reservoir. Bog Brook Reservoir holds 4.4 billion gallons when at full capacity and was placed into service in 1892. The Reservoir is connected to the East Branch Reservoir by an underground tunnel. Its main function is to serve as a storage reservoir for the larger East Branch Reservoir (NYC Environmental Protection 2014).

Croton Falls Reservoir is located in the Towns of Carmel and Southeast in Putnam County. It was formed by damming the West and Middle Branches of the Croton River, which continue south and drain into the Muscoot Reservoir. The Croton Falls Reservoir consists of three basins, separated by the Route 35 and Route 36 causeways. Water flows between the basins through culverts under the roadways. Basin 1 is the largest of the three and holds 70% of the reservoir's total volume. It receives water from the West Branch of the Croton River. It also receives water from a smaller tributary which brings water from Lake Gilead. Basin 2 holds 26% of the reservoir's volume and receives water from the City's Middle Branch Reservoir. Basin 3 receives most of its water from a single stream, Michaels Brook. Water leaves all three basins by way of the continuation of the West Branch of the Croton River, which joins the East Branch, flows into the Muscoot Reservoir, and then to the New Croton Reservoir. After moving through the New Croton Aqueduct, the water reaches the Jerome Park Reservoir in the Bronx, where it enters New York City's distribution system. The Croton Falls Reservoir is also connected to the nearby Diverting Reservoir via a channel and dividing weir. Water usually passes freely between the two reservoirs. The total drainage basin of the Croton Falls Reservoir is 16 square miles which includes portions of the Towns of Carmel and Southeast. The Reservoir holds 14.2 billion gallons at full capacity and was placed into service in 1911 (NYC Environmental Protection 2014).

Diverting Reservoir is located in the Town of Southeast in Putnam County. It was formed by damming the East Branch of the Croton Reservoir which continues southwest to the Muscoot Reservoir. When at full capacity, the Reservoir holds 900 million gallons, making it the smallest reservoir in the City's system. It was placed into service in 1911. The Diverting Reservoir receives most of its water from the East Branch River, which extends from the East Branch and Bog Brook Reservoirs. It is connected to the Croton Falls Reservoir by a channel and dividing weir. Water from the Diverting Reservoir flows into the continuation of the East Branch of the Croton River, into the Muscoot Reservoir and then into the New Croton Reservoir. After moving through the 24-mile New Croton Aqueduct, the water enters the Jerome Park Reservoir in the Bronx and goes into New York City's distribution system. The drainage basin of the Diverting Reservoir is eight square miles which lie entirely within the Town of Southeast (NYC Environmental Protection 2014).

The East Branch Reservoir is located east of the Village of Brewster and the interchange of I-84 and I-684. It was formed by the damming of the East Branch of the Croton River, which continues southwest into the Diverting Reservoir. The Reservoir holds 5.2 billion gallons at full capacity and was placed into service in 1891. The East Branch Reservoir receives its water from the Bog Brook Reservoir, as well as the East Branch



of the Croton River. East Branch water flows into the continuation of the East Branch of the Croton River, then into the Diverting Reservoir and eventually into the New Croton River in Westchester County, New York. The Reservoir has a drainage basin of 75 square miles that includes portions of the Towns of Patterson and Southeast in Putnam County and Pawling in Dutchess County (NYC Environmental Protection 2014).

The Middle Branch Reservoir is located in the Town of Southeast in Putnam County and was formed by damming the Middle Branch of the Croton River which flows south from Lake Carmel. The Reservoir holds 4.1 billion gallons at full capacity and was placed into service in 1878. Water from the Reservoir flows into the Croton Falls Reservoir and eventually into the New Croton Reservoir. From there, it passes through the New Croton Aqueduct into the Jerome Park Reservoir and enters the New York City distribution system. The Middle Branch Reservoir drainage basin is 21 square miles and includes portions of the Towns of Kent, Patterson, and Southeast in Putnam County and Beekman and East Fishkill in Dutchess County (NYC Environmental Protection 2014).

Kirk Lake is a controlled lake located in the Town of Kent in Putnam County. The Lake is located on a tributary of the Muscoot River and used for recreation and drinking water purposes. Kirk Lake is owned by the NYCDEP. The construction of the lake was completed in 1881. It has a height of 28 feet with a length of 220 feet. Maximum discharge is 439 cubic feet per second and its capacity is 1,822 acre feet. Normal storage for Kirk Lake is 920 acre feet and drains an area of 2.95 square miles (Findlakes 2014).

Catskill / Delaware System

Boyd's Corner Reservoir is located in the Town of Kent in Putnam County. It was formed by damming the West Branch of the Croton River which continues southeast to the West Branch Reservoir. The Reservoir consists of one basin that is 1.5 miles in length and holds 1.7 billion gallons when at full capacity. It was placed into service in 1873; with the dam, spillway and outlet works being rebuilt in 1990. The Reservoir was originally constructed as part of the City's Croton System; however, today, it serves mainly as part of the Delaware System. Water from Boyd's Corner Reservoir flows briefly into the Croton River and then enters the City's West Branch Reservoir where it mixes with water carried from the Rondout Reservoir. From the West Branch, it typically flows into the Kensico Reservoir which also receives its water from the Catskill System through the Catskill Aqueduct. After reaching the Kensico Reservoir, water flows through two aqueducts to the Hillview Reservoir in Yonkers (Westchester County) where it enters the City's distribution system. The Boyd's Corner Reservoir has a drainage basin of 22 square miles and includes portions of the Towns of Carmel and Putnam Valley in Putnam County and East Fishkill in Dutchess County (NYC Environmental Protection 2014).

West Branch Reservoir is located in the Towns of Kent and Carmel in Putnam County. It was formed by damming the West Branch of the Croton River which continues south to the Croton Falls Reservoir. This Reservoir consists of two basins, separated by Route 301. It holds eight billion gallons at full capacity. The Reservoir was placed into service in 1895 as part of the City's Croton Water Supply System. Today, the West Branch Reservoir functions primarily as part of the Delaware Water System, serving as a supplementary settling basin for the water which arrives from the Rondout Reservoir via the Delaware Aqueduct. The West Branch Reservoir also receives water from its own small watershed and the Boyd's Corner Reservoir. In addition, the West Branch is connected to adjacent Lake Gleneida, one of the three controlled lakes that are part of the City's water supply. Another function of the West Branch Reservoir is to receive water pumped in from the Hudson River during drought periods. This water enters the West Branch from the City's Chelsea Pumping Station in Dutchess County, 65 miles up the Hudson from New York City. The West Branch was used very briefly for this purpose during May of 1989 and during the 1965-66 and 1985 droughts. Water withdrawn from the West Branch ordinarily flows via the Delaware Aqueduct into the Kensico Reservoir in Westchester County for further settling. There it mixes with Catskill system water before entering aqueducts



that carry it to the Hillview Reservoir in Yonkers, at the City's northern boundary, where it enters the water supply distribution system. The West Branch has a drainage area of 20 square miles that includes parts of the Towns of Carmel and Kent (NYC Environmental Protection 2014).

Lake Gleneida is located off of Route 52 in the Town of Carmel and part of the Catskill/Delaware System. It covers a surface area of 168 acres and has a maximum depth of 108 feet. It is a controlled lake and part of the New York City's water supply system and the Croton Watershed. The NYCDEP owns the lake and is considered one of the three controlled lakes in the City's water system. Recreational use of the lakes also falls under NYCDEP regulations. Fishing, ice fishing, and boating are allowed.



Figure 4-4. New York City Watershed



Source: New York City Environmental Protection 2007



Figure 4-5. Croton Watershed



Source: New York City Environmental Protection 2007



Topography and Geology

Putnam County is situated in the southeastern part of New York State, between the Hudson River on its western border and the New York State-Connecticut border on its east. The County lies mainly within the New England uplands physiographic province. The New England uplands area is geologically complex and exhibits moderate relief. Landforms in this area show a strong correlation to the relative hardness of the underlying bedrock. Elevation ranges from 200 to 500 feet above mean sea level in southern Westchester County and is more than 1,000 feet in the Hudson Highlands. The Highlands extend from the southwest corner of Rockland County, which is west of the Hudson River, through northern Westchester County and into Putnam County (Putnam County Division of Planning and Development 2010).

The County is largely underlain by heavily metamorphosed complex of Precambrian and Paleozoic sedimentary and igneous rocks. For the most part, the dominant outcrops are gneiss, schist, and granite (NRCS 2004).

Approximately three-quarters of Putnam County lie within the New York City Watershed, which is described below. More than nine-tenths of the County's land area is part of the Hudson Highlands, which extend from the northern Housatonic Valley of Connecticut into New Jersey and Pennsylvania. The remainder of the County consists of a geological formation known as the Manhattan Prong. This area is found in the northeast and southeast corners of the County (Putnam County Division of Planning and Development 2010).

Putnam County's highest elevations are in the Town of Philipstown. The Towns of Philipstown and Putnam Valley and the western part of the Town of Kent have the most rugged terrain, with many high peaks having elevations of over 1,000 feet. There are several ranges in these municipalities which are significant because they form a natural east-west barrier. These ranges are separated by Peekskill Hollow Creek. The first range is known as Granite Mountain and is located west of the Creek. Moving towards the north, elevations increase up to 1,100 feet above sea level (Putnam County Division of Planning and Development 2010).

The northern border of the County is similar to the west due to its number of high peaks. These peaks range from Mount Ninham in the Town of Kent (elevation of 1,270 feet above sea level) to Birch Hill in the Town of Patterson which reaches 1,260 feet above sea level (Putnam County Division of Planning and Development 2010).

The Towns of Carmel, Southeast, Patterson and the eastern portion of the Town of Kent, while all retaining still relatively high peaks and variable relief, maintain more of a consistent terrain characterized by a greater number of more level parcels (Putnam County Division of Planning and Development 2010).

Climate

Putnam County has a continental climate. Airflow and weather systems that affect the area are primarily of continental origin. The climate also is designated as humid because the major circulation patterns of the atmosphere carry generous quantities of moisture toward the northeastern U.S. (NRCS 2004). The climate of Putnam County is one of long summers and short winters. The average annual temperature is approximately 50°F, with extremes varying from -24°F to 106°F. The average annual precipitation for the County is approximately 45 inches with observed annual extremes ranging from 29.54 to 68.31 inches. The distribution of precipitation throughout the year is fairly uniform with slightly higher amounts during the summer months (FEMA FIS 2013).



Land Use and Land Cover

The most dominant land uses in Putnam County are forested land, wetlands, undeveloped vacant land, and waterbodies. Residential is the next largest land use in the County (Putnam County Division of Planning and Development 2010).

Residential land uses are typically represented by single-family, detached homes in Putnam County. More concentrated areas of residential development occur in the County’s three villages, lake communities, and several condominium complexes (Putnam County Division of Planning and Development 2010).

Forested land, wetlands, vacant land and waterbodies are found throughout Putnam County. Large blocks of forested and vacant land are typically found in the western and northwestern portions of the County, while major lakes and reservoirs are found in the eastern part of the County (Putnam County Division of Planning and Development 2010).

Commercial and industrial land uses are found in and around the villages of the County and along State Routes 6, 9, 22, and 52. Commercial uses are also found at the intersections of Interstate 84 (I-84) and Route 312 and I-84 and Ludingtonville Road. Industrial uses are scattered throughout the County and include the hospital, government buildings, non-profit affiliated facilities, and schools. Significant blocks of land occupied by institutional uses are found in the Towns of Philipstown, Patterson, Kent, Putnam Valley, and Carmel (Putnam County Division of Planning and Development 2010).

Wetlands have a dramatic influence on Putnam County’s past growth patterns; they are found throughout the County. New York State delineated wetlands of 12.4 acres or more are found in all municipalities of Putnam County. Smaller local wetland areas have been regulated in all the municipalities, at varying degrees. The most significant wetland in the County is the Great Swamp. The Great Swamp is a 4,200 acre wetland located in a 62,300 acre watershed that covers portions of New York State (specifically the Town of Patterson in Putnam County) and Connecticut (Putnam County Division of Planning and Development 2010).

Table 4-1 summarizes the land use for Putnam County. Figure 4-6 shows the distribution of land use throughout the County.

Table 4-1. Land Use Summary for Putnam County, 2006 & 20011

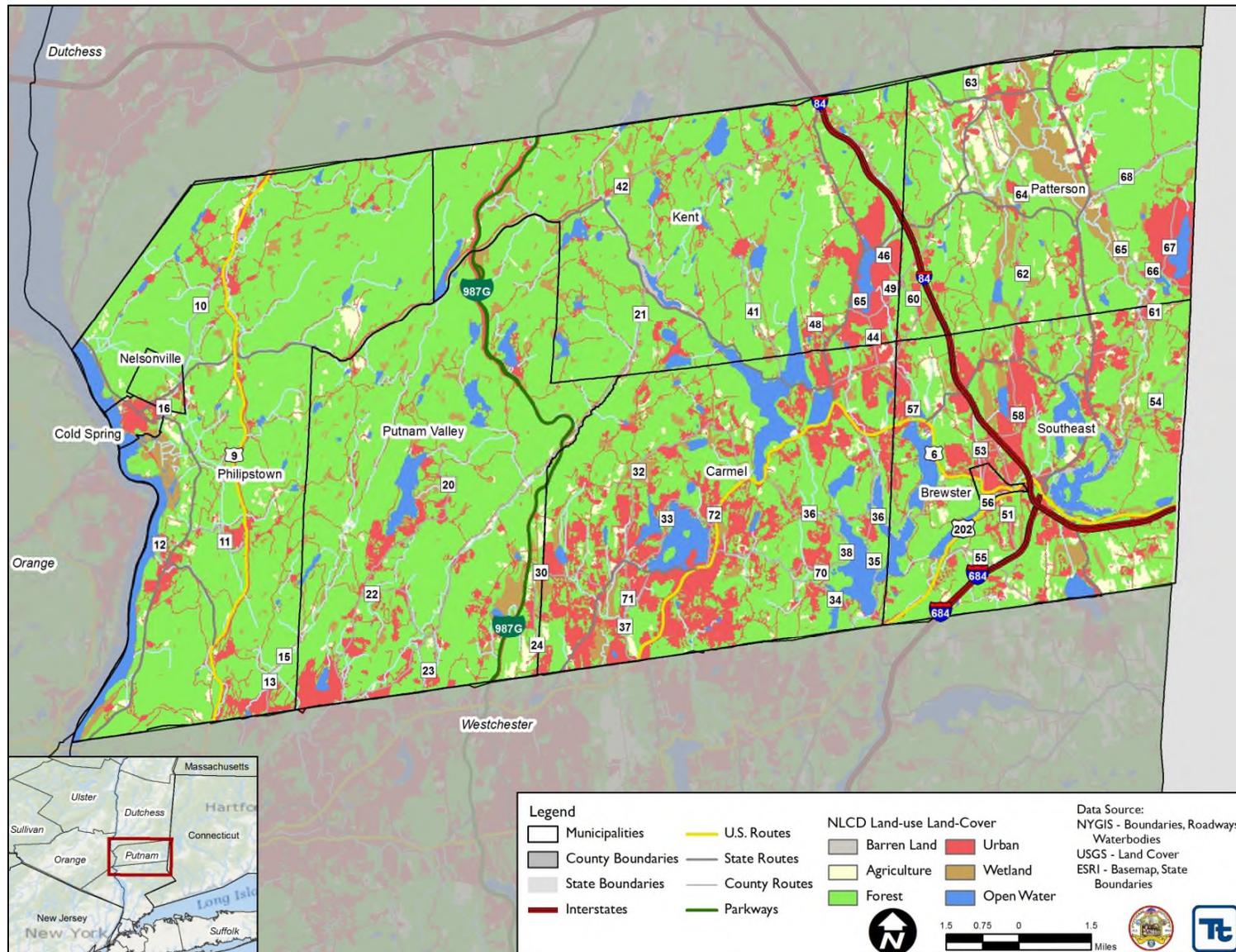
Land Use Category	2006 Data		2011 Data	
	Acreage	Percent of County	Acreage	Percent of County
Agriculture	5306.8	3.4%	5073.6	3.2%
Barren	360.7	0.2%	342.1	0.2%
Forest	106959.0	67.9%	105295.2	66.9%
Urban	26403.1	16.8%	28005.8	17.8%
Wetlands	9366.5	5.9%	9623.9	6.1%

Source: National Land Cover Database – USGS

Note: Urban land includes residential, industrial, transportation, and recreational land. Water is excluded from the table above.



Figure 4-6. 2011 Land Use Land Cover for Putnam County



Source: USGS National Land Cover Database, 2011





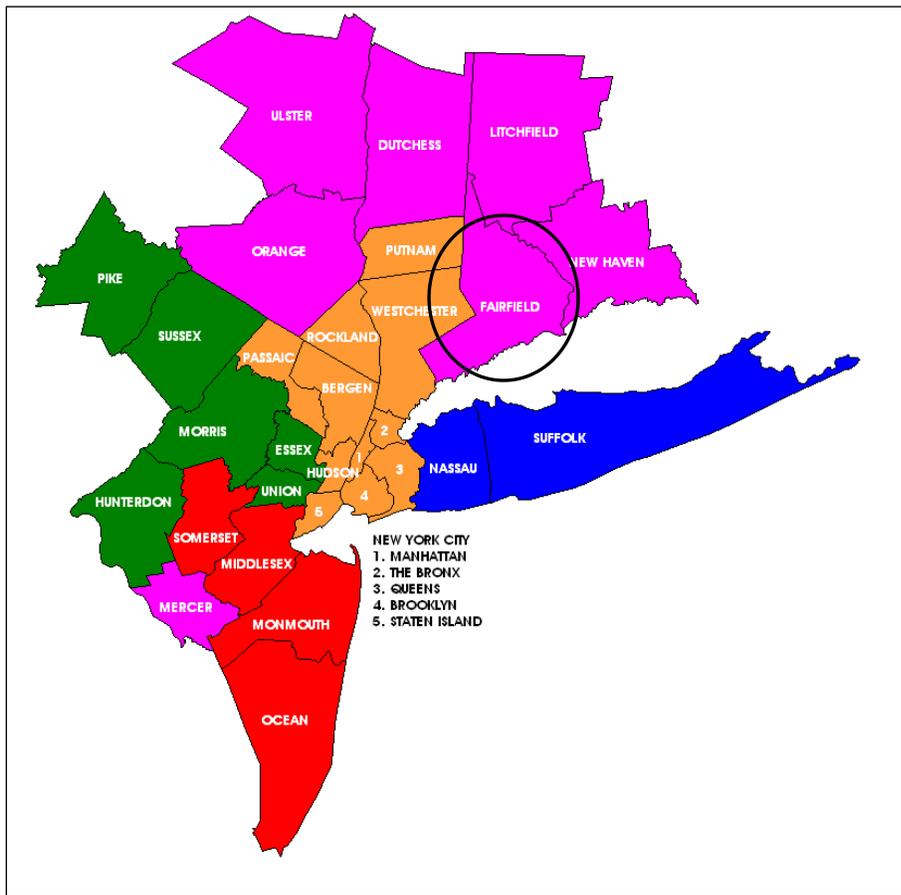
Metropolitan/Urban Area

The Census Bureau classifies ‘urban’ as all territory, population, and housing units located within an urbanized area (UA) or an urban cluster (UC). It delineates UA and UC boundaries to encompass densely settled territory, which consist of 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 over an overall density of at least 500 people per square mile. An urbanized area is a densely populated area with a population density of more than 1,000 people per square mile and a population of more than 50,000 (Demographia, 2001). Urban clusters are defined in the same manner as urbanized areas; however, an urban cluster has a population density of 2,500 people per square mile and a population of more than 50,000 (Center for Information Development and Service, Date Unknown). With a population of 99,710 and a population density of 432.9 people per square mile, Putnam County is not considered an urban area; however, it is located in the New York-White Plains-Wayne, NY-NJ Metropolitan Division.

Putnam County is one of the 23 counties within the New York–Northern New Jersey–Long Island NY-NJ-PA Metropolitan Statistical Area, which is the most populous metropolitan area in the United States and the fourth most populous in the world. The largest urbanized area in the United States is at the heart of the metropolitan area, the New York-Newark, NY-NJ-CT Urbanized Area (with a 2010 population of 18,897,109 by the U.S. Census). With approximately 3,353 square miles of land, it is the largest urbanized area in the United States. It is also the fourth most densely populated urbanized area in the country, with 5,635 persons per square mile (as of the 2010 Census) (U.S. Census Bureau). Based on commuting patterns, the Census Bureau also defines a wider functional metropolitan area, the *New York-Newark-Bridgeport, NY-NJ-CT-PA* Combined Statistical Area with an estimated population of 22,085, (as of 2012). This metropolitan area is made up of five divisions as indicated in Figure 4-7.



Figure 4-7. New York-Northern New Jersey-Long Island, NY-NJ-PA Metropolitan Statistical Area



Source: U.S. Census, 2007

Note: Putnam County is located in the New York-White Plains-Wayne, NY-NJ Metropolitan Division (circle)

New York-White Plains-Wayne, NY-NJ Metropolitan Division

Nassau-Suffolk, NY Metropolitan Division

Newark-Union, NJ-PA Metropolitan Division

Edison, NJ Metropolitan Division

Rest of the New York-Newark-Bridgeport, NY-NJ-CT Combined Statistical Area



4.2 POPULATION AND DEMOGRAPHICS

According to the 2010 U.S. Census, Putnam County had a population of 99,710 people which represents a slight increase from the 2000 U.S. Census population of 95,745 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 Putnam County based on the 2000 and 2010 U.S. Census data. Figure 4-7 shows the distribution of the general population density (persons per square mile) in 2010 by Census block. 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).

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. Putnam 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
Village of Brewster	2,390	182	7.62%	2,162	211	9.76%	200	9.25%
Town of Carmel	34,305	4,263	12.43%	33,006	3,151	9.55%	808	2.45%
Village of Cold Spring	2,013	342	16.99%	1,983	368	18.56%	179	9.03%
Town of Kent	13,507	1,716	12.70%	14,009	1,381	9.86%	391	2.79%
Village of Nelsonville	628	79	12.58%	565	63	11.15%	23	4.07%
Town of Patterson	12,023	1,205	10.02%	11,306	784	6.93%	241	2.13%
Town of Philipstown	7,021	1,076	15.33%	6,874	788	11.46%	171	2.49%
Town of Putnam Valley	11,809	1,374	11.64%	10,686	907	8.49%	301	2.82%
Town of Southeast	16,014	2,180	13.61%	15,154	1,477	9.75%	367	2.42%
Putnam County (TOTAL)	99,710	12,417	12.45%	95,745	9,130	9.54%	2,681	2.80%

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

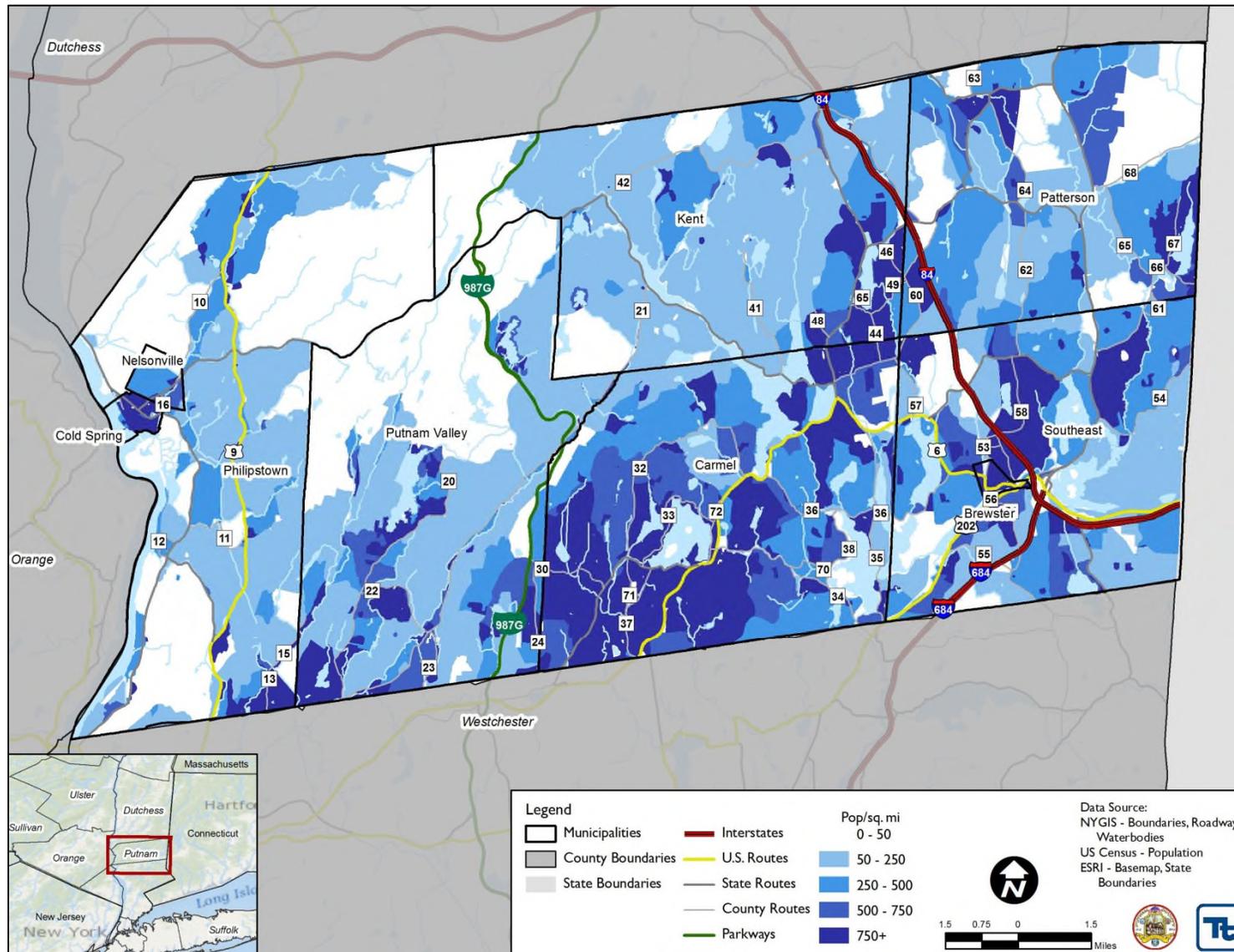
Note: Pop. = population; * Individuals below poverty level (Census poverty threshold for a 3-person family unit is approximately \$18,500)

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.

The 2012 U.S. Census American Community Survey data identified approximately 3,600 households as having an annual income of less than \$25,000. Figure 4-9 shows the distribution of persons over age 65 in Putnam County, while Figure 4-10 shows the distribution of low income persons. The following maps indicate distribution based on Census Block designations.



Figure 4-8. Distribution of General Population for Putnam County, New York

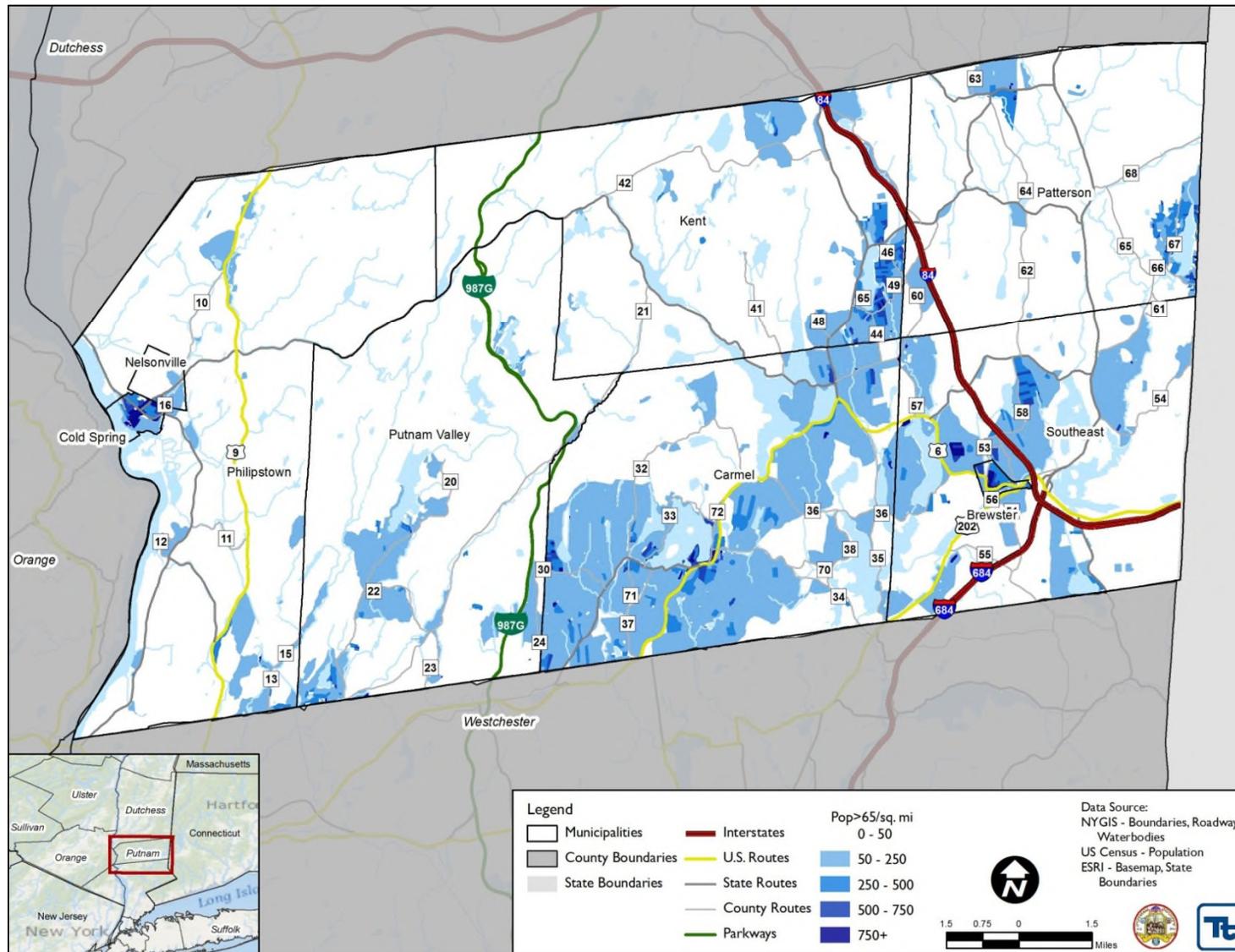


Source: U.S. Census 2010





Figure 4-9. Distribution of Persons over the Age of 65 in Putnam County, New York

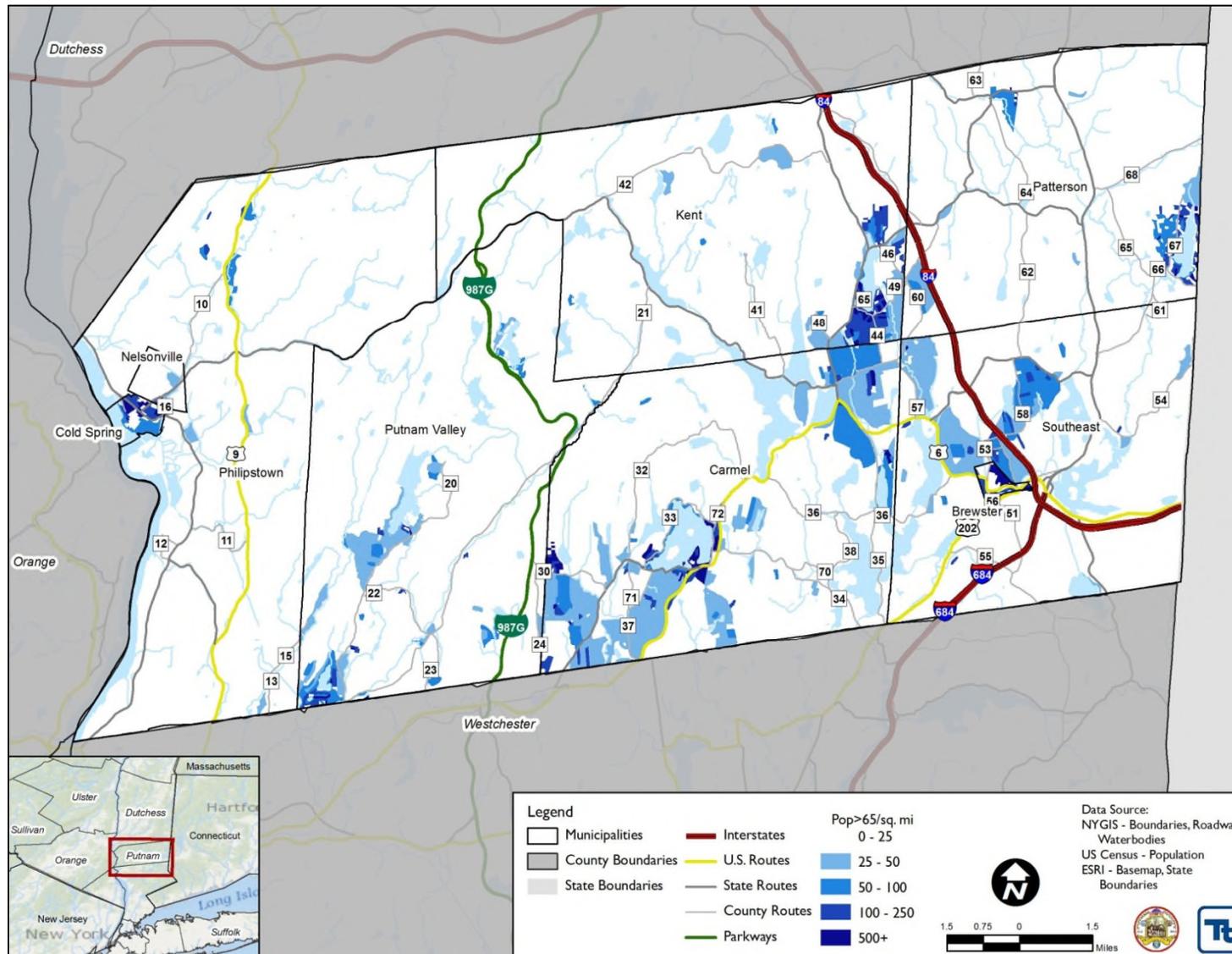


Source: HAZUS-MH





Figure 4-10. Distribution of Low-Income Population in Putnam County, New York



Source: HAZUS-MH





Population and Demographic Trends

This section discusses population trends to use as a basis for estimating future changes that could result from the seasonal character 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, the 2010 population for Putnam County was 99,710 persons, which is a 4.0% increase from the 2000 Census population of 95,745. Over the last 110 years, from 1900 to 2010, the County has seen an overall growth in population, with the exception of 1920. The largest increase was seen between 1960 and 1970 when the County experienced a 78.7% increase (24,974 persons). The smallest increase was experienced from 2000 to 2010 when the County saw only a 4.1% increase in population. The largest decrease in population occurred from 1910 to 1920, with the County seeing a 26.3% decrease. The smallest decrease was recently seen from 2010 to 2013 with only a 0.1% decrease. Table 4-3 displays the population and change in population from 1900 to 2013 in Putnam County.

Table 4-3. Putnam County Population Trends, 1900 to 2013

Year	Population	Change in Population	Percent (%) Population Change
1900	13,787	N/A	N/A
1910	14,665	878	6.4
1920	10,802	-3,863	-26.3
1930	13,744	2,942	27.2
1940	16,555	2,811	20.5
1950	20,307	3,752	22.7
1960	31,722	11,415	56.2
1970	56,696	24,974	78.7
1980	77,193	20,497	36.2
1990	83,941	6,748	8.7
2000	95,745	11,804	14.1
2010	99,710	3,965	4.1
2013	99,645	-65	-0.1

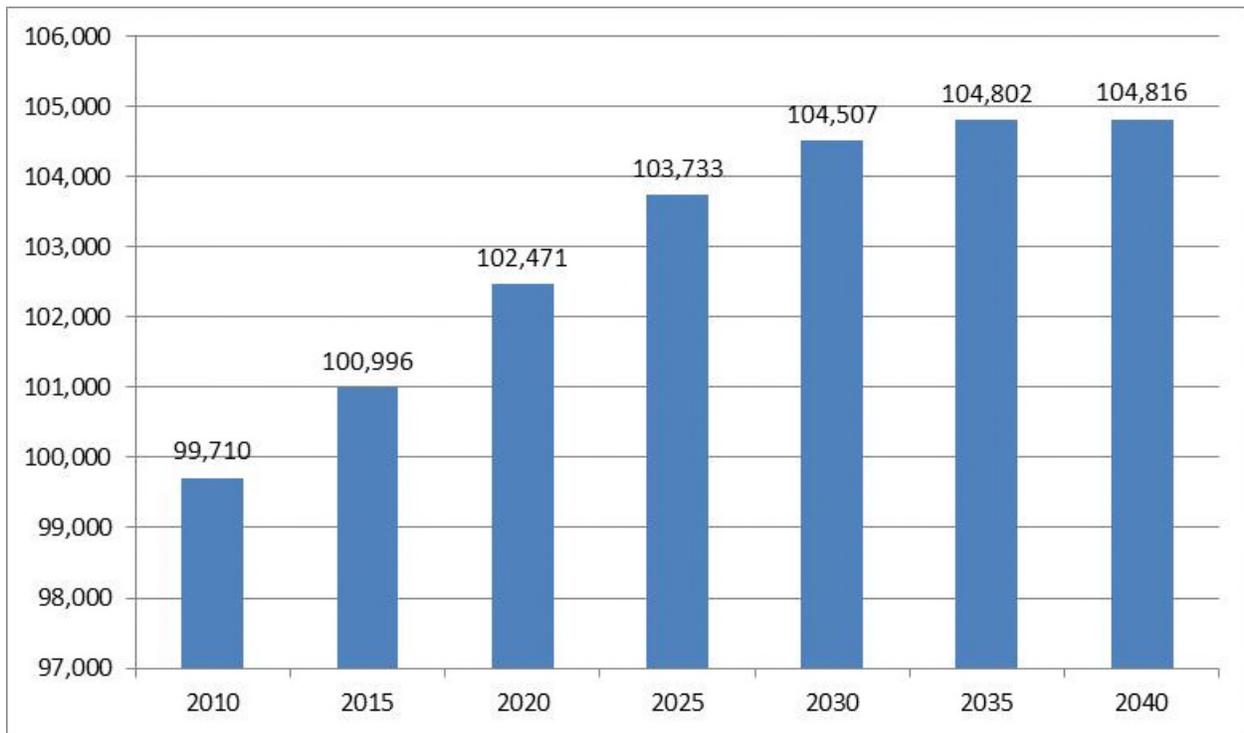
Source: U.S. Census 1995; U.S. Census 2010; U.S. Census 2014

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

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 2011 and are in five year intervals up to the year 2040. The projections are based upon rates of change estimated from historic data. According to this data, over the next 25 years, Putnam County has a projected population growth of 3.8%. By 2015, the County’s total population is projected to reach 100,996 persons and by 2040, 104,816 persons (Figure 4-10).



Figure 4-11. Putnam County Population Projections, 2010 to 2040



Source: Cornell University 2014

The following table provides population trends for the nine municipalities of Putnam County. Between 2000 and 2010, all but the Town of Kent experienced a positive growth in population. The Village of Nelsonville saw the largest growth in population, an 11.2% increase. The Town of Putnam Valley and the Village of Brewster both saw an increase of over 10%. The Village of Cold Spring saw the smallest increase in population of just 1.5%.

Table 4-4. Population Trends in Putnam County by Municipality

Municipality	2000 Census	2010 Census	Change in Population	Percent Change
Village of Brewster	2,162	2,390	228	10.5
Town of Carmel	33,006	34,305	1,299	3.9
Village of Cold Spring	1,983	2,013	30	1.5
Town of Kent	14,009	13,507	-502	-3.6
Village of Nelsonville	565	628	63	11.2
Town of Patterson	11,306	12,023	717	6.3
Town of Philipstown	6,874	7,021	147	2.1
Town of Putnam Valley	10,686	11,809	1,123	10.5
Town of Southeast	15,154	16,014	860	5.7
Putnam County (TOTAL)	95,745	99,710	3,965	4.1

Source: U.S. Census 2014

Note: Change in population and population change were calculated from available data.



4.3 GENERAL BUILDING STOCK

The 2000 U.S. Census data identified 32,742 households (35,030 housing units) in Putnam County. The 2010 U.S. Census reported 35,041 households (38,224 housing units) in Putnam 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 7% increase. As for housing units, the County experienced an increase of 8.9% 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 Putnam County was estimated at \$385,600 (U.S. Census, 2012).

For this Plan, the default general building stock in HAZUS-MH was updated and replaced with a custom building inventory for Putnam 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 Putnam 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 31,346 parcels with structures identified through data provided by the County (Real Property tax data). These parcels with structures account for a replacement cost value of approximately \$17.9 billion (structure and contents). 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 \$6.7 billion in contents within these properties. Approximately 96% of the total buildings in the County are residential, which make up approximately 76.3% of the building stock structural value associated with residential housing. Tables 4-3 and 4-4 present building stock statistics by occupancy class for Putnam County.

Table 4-5. Number of Buildings and Improvement Value by Municipality

Municipality	All Occupancies			
	Count	Estimated Structure RCV	Estimated Contents RCV	Total (Structure + Contents)
Village of Brewster	406	\$201,581,179	\$131,586,452	\$333,167,631
Town of Carmel	10,170	\$3,847,178,692	\$2,250,459,565	\$6,097,638,257
Village of Cold Spring	679	\$269,493,110	\$173,376,530	\$442,869,640
Town of Kent	5,021	\$1,329,512,766	\$737,018,110	\$2,066,530,876
Village of Nelsonville	261	\$75,570,251	\$45,560,707	\$121,130,957
Town of Patterson	3,393	\$1,180,896,788	\$717,047,385	\$1,897,944,173
Town of Philipstown	2,768	\$1,048,614,861	\$620,677,281	\$1,669,292,142
Town of Putnam Valley	4,520	\$1,352,509,644	\$738,870,207	\$2,091,379,851
Town of Southeast	4,128	\$1,905,798,783	\$1,249,328,164	\$3,155,126,947
Putnam County (Total)	31,346	\$11,211,156,075	\$6,663,924,400	\$17,875,080,474

Source: Putnam Count Real Property tax data, 2014

Notes: RCV = Replacement cost value.



Table 4-6. 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)
Village of Brewster	347	\$209,984,181	39	\$57,270,009	1	\$1,278,893
Town of Carmel	9,793	\$4,790,157,382	278	\$774,853,838	3	\$40,015,436
Village of Cold Spring	625	\$288,349,740	31	\$60,829,030	7	\$15,435,840
Town of Kent	4,891	\$1,777,483,970	96	\$178,027,590	1	\$4,190,150
Village of Nelsonville	244	\$90,028,632	8	\$13,514,996	8	\$47,706,444
Town of Patterson	3,231	\$1,391,548,208	114	\$320,332,773	3	\$12,277,685
Town of Philipstown	2,628	\$1,283,812,741	107	\$281,145,554	1	\$4,440,600
Town of Putnam Valley	4,411	\$1,840,918,312	77	\$156,157,569	15	\$70,124,641
Town of Southeast	3,829	\$1,969,411,858	194	\$810,692,048	1	\$1,278,893
Putnam County (Total)	29,999	\$13,641,695,025	944	\$2,652,823,409	39	\$195,469,689

Source: Putnam Count Real Property tax data, 2014

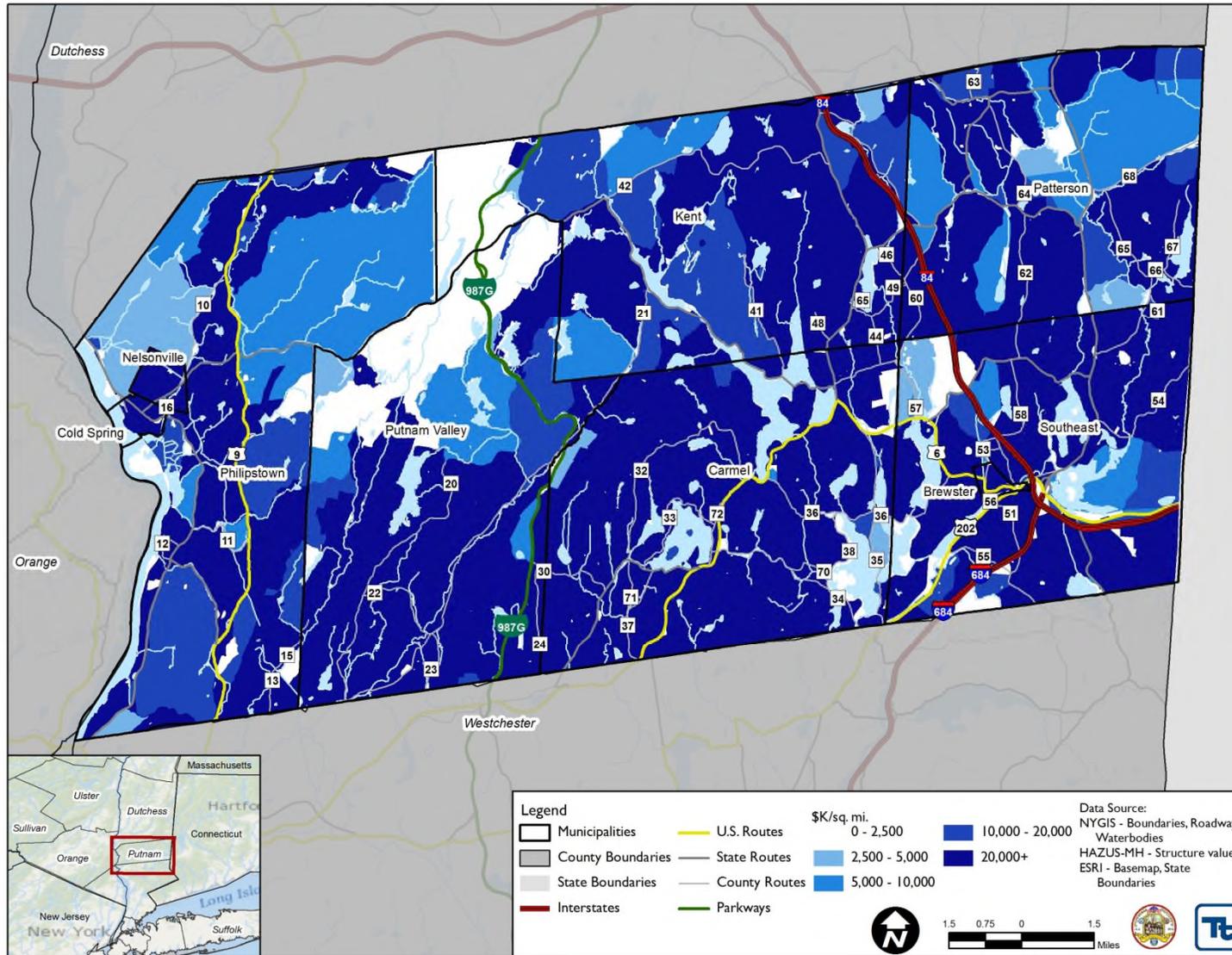
The 2012 American Community Survey data identified that the majority of housing units (79.2% or 30,215 units) in Putnam County are single-family detached units. The 2012 U.S. Census Bureau’s County Business Patterns data identified 2,829 business establishments employing 20,519 people in Putnam County. The construction industry has the most number of establishments in the County, with 582 establishments. This is followed by the retail trade industry with 332 establishments and the professional, scientific, and technical services industry with 312 establishments (U.S. Census, 2012).

Figure 4-9 and Figure 4-10 show the distribution and exposure density of residential and commercial buildings, respectively, in Putnam 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 4-10 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 4-12. Distribution of Residential Building Stock and Value Density in Putnam County

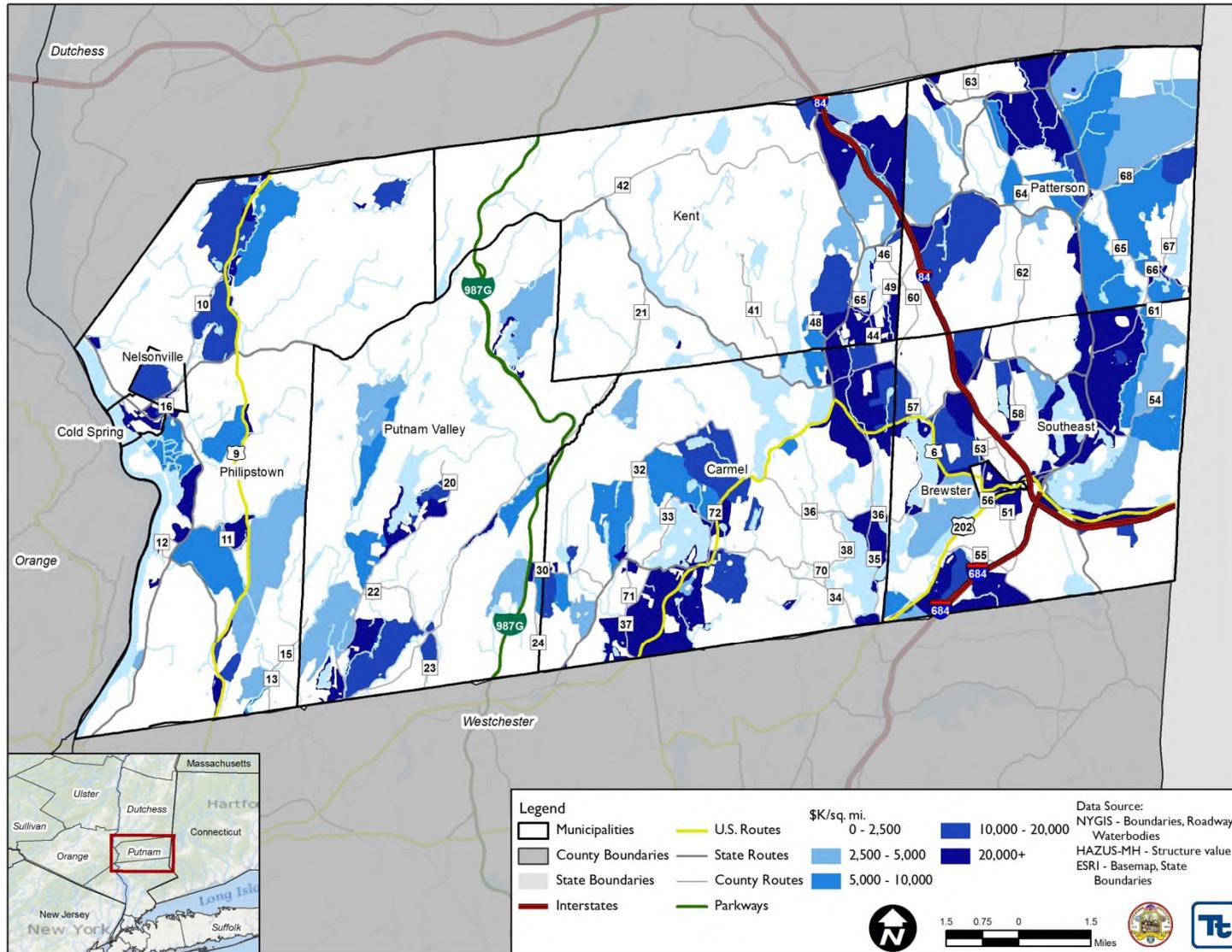


Source: Putnam County, 2014





Figure 4-13. Distribution of Commercial Building Stock and Exposure Density in Putnam County



Source: Putnam County, 2014





4.3.1 Development Trends and New Development

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. In Putnam County, each town and village is empowered by the Municipal Home Rule Law to plan and zone within its 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 land use trends and types of development occurring within the study area. An understanding of these development trends can assist in planning for further development and ensuring that appropriate mitigation, planning, and preparedness measures are in place to protect human health and community infrastructure.

According to the “Report of the Task Force on Vision 2010, Guiding Putnam into the Next Decade” prepared by the Putnam County Division of Planning and Development, “despite the historical trend in development (suburbanization), the most dominant land uses in the County continue to be forested land, wetlands, undeveloped vacant land, and water bodies. Residential land use would be the next largest land use. Generally speaking, residential land use occurs throughout the County on large lot subdivisions or in rural areas.”

Table 4-6 identifies known and anticipated new development in Putnam County as of June 2014.

While any development increases the risk of damage and loss to natural hazards, a number of factors indicate that this increase in risk is low and mitigated by existing Federal, State, County and local regulations, policies and programs. In general, development occurring in the County is outside of high hazard areas (e.g. floodplains and steep slopes). 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. All development and construction in the County requires conformance with NYS Building Code. Further all Putnam County communities participate, and are in good standing, in the National Flood Insurance Program which by State regulation requires two-feet of freeboard above the FEMA 1% chance base flood elevation (BFE+2) for all new residential construction and substantial improvement, and BFE+1 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). Most of the Putnam municipalities are MS4 communities, and have adopted and enforce Stormwater Management Plans that minimize the impacts of stormwater resulting from both existing and new development, with respect to both stormwater quality and quantity.

County and community capabilities to manage development so as to minimize increased natural hazard risk are discussed in the capability assessment subsection of Chapter 6, as well as within each jurisdictional annex in Section 9. Also identified within each annex are actions the community has 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 so as to minimize the increase of natural hazard risk.



Table 4-7. Known and Anticipated New Development in Putnam County

Municipality	Property Name	Project Type	Address	Tax Parcel Reference #	Acreage	Status with Planning Board	Building Description/Units	Known Hazard Zone*
Carmel (T)	Carmel Center Senior Housing - Lot 3	Residential	Terrace Dr.	55.14-1-11.3	13.91	Approved	23 units	
Carmel (T)	Carmel Center Senior Housing - Lot 5	Residential	Terrace Dr.	55.14-1-11.1	27.37	Approved	81 units of senior housing	Wildfire: Intermix
Carmel (T)	CVS	Commercial				Broke ground		
Carmel (T)	Gateway Summit - Lot 6	Residential	Rt. 6	55.-2-24.6	29.35	Approved	150 units of senior housing	Wildfire: Intermix
Carmel (T)	Gateway Summit - Staybridge Suites Hotel	Non-Residential	2054 Rt. 6	55.-2-24.1	11.81	Approved	10,304 sq. ft. 123 room, 4-story hotel	
Carmel (T)	Guidepost Facility Redevelopment	Private				Broke ground		
Carmel (T)	Hickley Holdings LLC/ Paladin Group	Non-Residential	39 Seminary Hill Rd.	55.10-1-1 & 3	49.9	Approved	50,000 sq. ft. office building	Wildfire: Intermix
Carmel (T)	Hillcrest Commons	Residential	Rt. 52	44.10-1-4 & 44.9-1-51	37.29	Approved	74 units of senior housing	Wildfire: Intermix
Carmel (T)	Lakeview Development at Carmel	Non-Residential	1611 Rt. 6	55.9-1-17	1.64	Approved	12,656 sq. ft. 2-story commercial building	Wildfire: Interface
Carmel (T)	MacDonald Marine	Non-Residential	681 Union Valley Rd.	76.20-1-13	23.62	Approved	20,000 sq. ft. boat storage building	Wildfire: Intermix
Carmel (T)	McDonald's	Commercial				Broke ground		
Carmel (T)	Meadowlands Car Dealership	Commercial				Broke ground		
Carmel (T)	Nejame & Sons	Non-Residential	133 Gleneida Ave.	44.9-1-16	1.32	Approved	10,200 sq. ft. 2-story commercial building	Wildfire: Interface
Carmel (T)	Old Forge Estates	Residential	Baldwin Place Rd., opposite Mahopac Schools Campus	75.15-1-19	39.92	Approved	10 lot residential subdivision	Wildfire: Intermix
Carmel (T)	Old Forge Estates	Residential				Approved	14	
Carmel (T)	One Hundred Twelve Crossroads, L.P.	Residential	1828 Rt. 6	55.6-1-42	1.42	Approved but not built	22 units of senior housing	Wildfire: Intermix
Carmel (T)	P2 build out Hillcrest Commons	Residential				Implementing P2		



Table 4-7. Known and Anticipated New Development in Putnam County

Municipality	Property Name	Project Type	Address	Tax Parcel Reference #	Acreage	Status with Planning Board	Building Description/Units	Known Hazard Zone*
Carmel (T)	Parakesh Redevelopment	Commercial				Approved		
Carmel (T)	Parkash Estates, LLC	Non-Residential	870 Rt. 6	65.13-1-54	0.74	Approved	10,304 sq. ft. commercial building	Wildfire: Interface
Carmel (T)	RPK Precision Homes	Residential	Seminary Hill Rd. & Mechanic St.	55.14-1-5.1, 5.2, 5.3, 5.4, 5.5 & 55.10-1-23, 24 & 25	5.98	Approved	50 attached senior units	Wildfire: Intermix
Carmel (T)	Swan Cove	Residential	628 Rt. 6	76.5-1-49	6.74	Approved	10 residential units	100-yr Flood; 500-yr Flood; Wildfire: Interface
Carmel (T)	The Fairways - Lot 7	Residential	Rt. 6	44.-2-1.1 & 1.2		Approved	150 units of senior housing	Wildfire: Intermix
Carmel (T)	Tompkins Recycling	Non-Residential	60 Old Rt. 6	55.11-1-15	2.58	Approved	20,000 sq. ft. building	100-yr Flood; 500-yr Flood
Carmel (T)	Union Place	Mixed Use	Rt. 6	86.6-1-4, 86.11-1-1 & 75.19-1-1.12	300	Approved - 2010	575,000 sq. ft. of retail, 480 housing units, 350,000 sq. ft. office space, and 90 room hotel	Wildfire: Intermix
Carmel (T)	Union Square Redevelopment Zipkin Farm	Commercial				Approved		
Carmel (T)	Yankee Land Development	Residential	Bayberry Hill Rd. & Owen Dr.	76.15-1-12	112.7	Approved	14 lot residential subdivision	Wildfire: Intermix
Cold Spring (V)	Butterfield Redevelopment	Mixed Use	NYS Rt. 9D and Paulding Ave.	49.5-3-45	7.21	Pending Approval, Under Review	Redevelopment of site incl. 15,000 sq. ft. office/retail building, 55 market-rate condo-units (senior housing) with 1 superintendent unit, and construction of resident community center. Lahey Pavillion, 11,500 sq. ft. building, to continue use as medical	Wildfire: Interface; Landslide: High
Kent (T)	Frangle Realty Corp. - Sewer Installation	Non-Residential	NYS Rt. 52	33.48-1-6		Pending Approval, Under Review	10,000 sq. ft. sewer lateral installation	Wildfire: Intermix
Kent (T)	Hilltop Estates Subdivision	Mixed Use	Peckslip Rd.	12.-1-38 & 42	48.46	Pending Approval, Under Review	10 lot residential subdivision, with 1 commercial lot, for a 2 story, 20,000 sq. ft. office/commercial building	Wildfire: Intermix
Kent (T)	Patterson Crossing	Non-Residential	NYS Rt. 311 & I-84	22.-2-47 & 48	16.3 (of 90.46 bal in	Approved but not built	382,560 sq. ft. retail center, with management and meeting space, a	Wildfire: Intermix;



Table 4-7. Known and Anticipated New Development in Putnam County

Municipality	Property Name	Project Type	Address	Tax Parcel Reference #	Acreage	Status with Planning Board	Building Description/Units	Known Hazard Zone*
					Patterson)		substation for the Putnam County Sheriff's Department. and 28,000 sq. ft. garden center	Karst: Long 1
Kent (T)	Route 311 Plaza	Non-Residential	NYS Rt. 311 & Old Ludingtonville Rd.	22.-2-17	2.72	Approved but not built	15,200 sq. ft. retail center	Wildfire: Intermix; Karst: Long 2
Patterson (T)	Flex Building	Non-Residential	2160 Rt. 22	35.-5-31	17.02	Approved but not built	68,900 sq. ft. flex building suitable for professional, office, warehouse, light manufacturing, R&D	Wildfire: Intermix; Karst: Long 6
Patterson (T)	Fox Run Estates	Residential	215 Bullet Hole Rd.	34.-3-22	44.1	Pending Approval, Under Review	Proposed 80 unit "Active Adult" residential community	Wildfire: Intermix; Karst: Long 4
Patterson (T)	Ice Pond Estates	Residential	272 - 372 Ice Pond Rd.	34.-5-9 & 12	136.89	Preliminary Approval received	21 lot residential subdivision	Wildfire: Intermix; Karst: Long 5
Patterson (T)	Patterson Crossing	Non-Residential	NYS Rt. 311 & I-84	22.-2-47 & 48	74.1 (of 90.46 bal in Kent)	Approved but not built	382,560 sq. ft. retail center, with management and meeting space, a substation for the Putnam County Sheriff's Department. and 28,000 sq. ft. garden center	Wildfire: Intermix; Karst: Long 3
Philipstown (T)	20 Hudson Highlands Reserve	Residential	NYS Rt. 9 & East Mountain Rd. North		136.57	Pending Approval, Under Review	25 lot residential subdivision	Wildfire: Intermix; Landslide: High
Philipstown (T)	ENTERGY	Non-Residential	Horsemen's Trail	16.-1-5	6.77	Approved	20,000 sq. ft. Emergency Operations Building with associated access, parking and on-site utilities	Landslide: High; Karst: Short 3
Philipstown (T)	Glassbury Court (aka Quarry Pond)	Residential	NYS Rt. 9	16.-1-38	38.91	Approved, Under Construction	54 single-family homes in Adult Active community	Wildfire: Interface; NEHRP: D; Landslide: High
Philipstown (T)	Graymoor - New Friary	Residential	NYS Rt. 9	82.-2-41	112.8	Approved	Remove existing 21,750 sq. ft. friary, construct new 29,270 sq. ft. friary & related infrastructure improvements	Landslide: High
Philipstown (T)	Olspan, LLC	Non-Residential	NYS Rt. 9	38.-3-24.2	5	Pending Approval, Under Review	Renovation of existing 10,800 sq. ft. light manufacturing / office building & Construction of 8,700 sq. ft. addition for personal property storage	Wildfire: Intermix; NEHRP: D; Landslide: High



Table 4-7. Known and Anticipated New Development in Putnam County

Municipality	Property Name	Project Type	Address	Tax Parcel Reference #	Acreage	Status with Planning Board	Building Description/Units	Known Hazard Zone*
Putnam Valley (T)	HYH Subdivision	Residential	Pudding St.	41.-2-13 & 41.15-1-3	236.5	Pending Approval, Under Review	15 lot residential subdivision	Wildfire: Intermix
Putnam Valley (T)	Rose Hill Cemetery	Non-Residential	NYS Rt. 9	84.-2-35	59.7	Pending Approval, Under Review	Develop 4.84 ac. of 59.7 ac. parcel to create 1,888 grave sites, access driveway, modify existing drainage, construct a stormwater management pond and create a meditation area	Wildfire: Intermix
Southeast (T)	Crossroads 312	Non-Residential	NYS Rt. 312 & I-84	45.-2-52, 53, 54, 55 & 56	51.9	Pending Approval, Under Review	Construction of 186,000 sq. ft. mixed-use commercial, bank, restaurants, personal & professional services	Wildfire: Intermix; Karst: Long 2
Southeast (T)	Fortune Ridge (aka Meadows at Dean's Corners)	Residential	150 Deans Corner Rd.	67.-3-79, 78.-3-28, 29, 78.-4-77 & 78	198.39	Approved but not built	162 single family homes	Wildfire: Intermix; Karst: Long 1
Southeast (T)	Lyons Development	Non-Residential	Rt. 6 & Starr Ridge Rd.	68.-2-2	3.19	Pending Approval, Under Review	Construction of 14,000 2-story office/retail building	Karst: Long 1
Southeast (T)	Opportunity Park	Non-Residential	20 Mount Ebo Rd. South	46.-2-26, 30.21, 30.22 & 3	16.73	Pending Approval, Under Review	Site plan for public recreation area	Wildfire: Intermix; Karst: Long 1
Southeast (T)	Southeast Plaza, LLC	Non-Residential	3601 Rt. 6	68.-2-58	3.8	Pending Approval, Under Review	Construction of 2-story 10,000 sq. ft. business/retail building	Wildfire: Interface; Karst: Long 1
Southeast (T)	Stateline Retail Center	Non-Residential	US Rt. 6/202 to the east of Old Nichols Rd. to the west of Dingle Rd. and immediately north of I-84	68.-2-48	44	Approved, not built Approvals extended by PN as of 4/10/2014	184,800 sq. ft. retail center and 14,800 sq. ft. 2-story office building	Wildfire: Interface; NEHRP: D; Karst: Long 1

* Only location-specific hazard zones or vulnerabilities identified

Source: June 2014 "Large Development Projects Report", Putnam County Department of Planning, Development and Transportation



4.3.2 Potential Sites for Temporary Housing and Relocation

Putnam County has identified the following locations for the placement of temporary housing units to house residents displaced by disaster:

- Philipstown: Grounds of the Town Recreation Center – 107 Glencllyffe Drive, Garrison
Grounds of the Philipstown Highway Center – Fishkill Road, Cold Spring NY
Open area’s designated by T/ Philipstown
- Putnam Valley: Grounds of the Town Park - Town Park Lane (off) Oscawana Lake Road, Putnam Valley
Grounds of the Putnam lake VFW – 154 Oscawana Lake Road, Putnam Valley
Grounds of the Clarence Fahnestock State Park (Putnam Valley NY) Route 301
Open area’s designated by T/ Putnam Valley
- Kent: Grounds of the Huestis Field Town Park Farmers Mills Road, Kent
Clarence Fahnestock State Park (Putnam Valley NY) Route 301
Open area’s designated by T/ Kent
- Carmel: Grounds of the Sycamore Lake Town Park, Long Pond Road, Mahopac
Putnam County Highways / Facilities Stock Pile – Route 6N, Mahopac
Open area’s designated by T/ Carmel
- Patterson: Location of the Old Town Hall (Route 311 & 164)
– Community Service Property (open Space)
West Street Open Lot – West Street and South Street, Patterson
The Putnam Lake VFW Hall – Parking area – Fairfield Drive, Brewster
The Green Chimney School, 400 Doansburg Road, Brewster
Open area’s designated by T/ Carmel
- Southeast The Green Chimney School, 400 Doansburg Road, Brewster
Grounds of the Putnam County Highways / Facilities Stock Pile
– Doansburg and Gage Road, Brewster
The Southeast Ball Fields, Zimmer Road, Brewster

**The Villages of Brewster, Cold Spring and Nelsonville will partner with the towns in which they reside.

Further, the County has included a high-priority action, to be implemented in 2015, to work with all Putnam County municipalities to identify sites within the community suitable for relocation of houses out of the floodplain, or building new houses once properties in the floodplain are razed. It is noted that while a community may identify suitable sites, the use (including transfer of ownership) of suitable private property would be at the discretion of the property owner.



4.4 CRITICAL FACILITIES

A comprehensive inventory of critical facilities in Putnam 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.

4.4.1 Essential Facilities

This section provides information on emergency facilities, hospital and medical facilities, schools, shelters and senior care and living facilities.

Emergency Facilities

For the purposes of this Plan, emergency facilities include police, fire, emergency medical services (EMS) and emergency operations centers (EOC).

Police Departments

Table 4-8 identifies County and local police stations within Putnam County. Figure 4-13 identifies the location of these facilities.

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

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

Table 4-8. Police Stations in Putnam County

Name	Address	Municipality	Backup Power
Brewster Police Department	208 Main St	Village of Brewster	
Carmel Police Department	60 McAlpin Av	Town of Carmel	Yes
Carmel Police Department Substation	85 Gleneida Av	Town of Carmel	Yes
Putnam County Sheriff	3 County Ctr	Town of Carmel	Yes
Cold Spring Police Department	83 Main St	Village of Cold Spring	Yes
Kent Police Department	40 Sybils Crsng	Town of Kent	Yes
Putnam County Sheriff Substation	276 Main	Village of Nelsonville	Yes
NY State Police	1672 Route 22	Town of Southeast	Yes

Sources: Putnam County
Notes: PD = Police Department

Fire Departments and Emergency Medical Service Facilities

Table 4-9 identifies fire stations and rescue squads/emergency medical service facilities within Putnam County. Figure 4-13 identifies the location of these facilities.

Table 4-9. Fire Stations and Rescue Squads in Putnam County

Name	Address	Municipality	Backup Power
Brewster FD	501 N Main St	Village of Brewster	Yes
Brewster FD - Station 2	515 Route 312	Town of Southeast	Yes



Table 4-9. Fire Stations and Rescue Squads in Putnam County

Name	Address	Municipality	Backup Power
Carmel Fire Department	94 Gleneida Av	Town of Carmel	Yes
Mahopac Fall FD - Station 1	17 Luccaro Ln	Town of Carmel	Yes
Mahopac Falls FD Station 2	319 Bullet Hole Rd	Town of Carmel	Yes
Mahopac FD Station 1	741 Route 6	Town of Carmel	Yes
Mahopac FD Station 2	311 Crane Rd	Town of Carmel	Yes
Mahopac FD Station 3	12 Buckshollow Rd	Town of Carmel	Yes
Carmel Ambulance	6 Garrett Pl	Town of Carmel	
Cold Spring Fire Department	154 Main St	Village of Cold Spring	Yes
Kent FD	2490 Route 301	Town of Kent	Yes
Lake Carmel FD	851 Route 52	Town of Kent	Yes
Lake Carmel FD Station 2	849 Farmers Mills Rd	Town of Kent	Yes
PC Fire Training Center	200 Lt Michael Neuner Ct	Town of Kent	No
Patterson FD & Ambulance	13 Burdick Rd	Town of Patterson	Yes
Patterson Fire Department. Station 2	161 Bullet Hole Rd	Town of Patterson	Yes
Putnam Lake Fire Department	72 Fairfield Dr	Town of Patterson	Yes
Continental Village FD	12 Spy Pond Rd	Town of Philipstown	Yes
Garrison VFD - Station #1	1616 Route 9	Town of Philipstown	Yes
Garrison VFD - Station 2	71 Upper Station Rd	Town of Philipstown	Yes
Garrison VAC		Town of Philipstown	
North Highlands FD	504 Fishkill Rd	Town of Philipstown	Yes
Philipstown Ambulance	14 Cedar St	Village of Cold Spring	Yes
Putnam Valley FD - Station 2	710 Peekskill Hollow Rd	Town of Putnam Valley	Yes
Putnam Valley VFD	12 Canopus Hollow Rd	Town of Putnam Valley	Yes
Putnam Valley VAC		Town of Putnam Valley	

Sources: Putnam County BES

Notes: FD= Fire Department;; EMS = Emergency Medical Service; VAC = Volunteer Ambulance Corps

Emergency Operations Centers

Table 4-10 identifies Emergency Operations Centers (EOCs) in Putnam County. The Bureau of Emergency Services, located in the Town of Carmel, is responsible for maintaining the County EOC, a county-wide communications system, as well as the Enhanced 911 system.

Table 4-10. Emergency Operation Centers in Putnam County

Name	Address	Municipality	Backup Power
Bureau of Emergency Services	122 Old Route 6	Town Of Carmel	Yes

Sources: Putnam County BES

Hospitals and Medical Facilities

Table 4-11 identifies hospitals and medical facilities in Putnam County. One major hospital is located within the County in the Town of Carmel.



Table 4-11. Hospital and Medical Facilities in Putnam County

Name	Address	Municipality	Backup Power
Camarda Care Center	672 Stoneleigh Ave	Town of Carmel	
PHC Ambulatory Care Offices	664 Stoneleigh Ave	Town of Carmel	
PHC- Emergency Room	670 Stoneleigh Ave	Town of Carmel	
Cecil Dill Dialysis Facility			
Open Doors Clinic		Village of Brewster	
Putnam Nursing and Rehab		Town of Kent	

Sources: Putnam County

Schools

There are six public school districts in Putnam County - Brewster, Carmel, Garrison, Haldane, Mahopac and Putnam Valley. Enrollment in these district schools totaled 16,815 students during the 2002-2003 school year. Within these districts, there are four parochial elementary schools. Additionally, there are several regional private high schools, a number of nursery and daycare facilities, and several facilities to accommodate special needs education (Putnam County Division of Planning and Development 2010). Table 4-11 identifies the school facilities in Putnam County.

Table 4-12. Schools in Putnam County

Name	Municipality	Type of Facility	Back Up Power
Austin Rd Elementary School	Town of Carmel	School	
Carmel Central School District	Town of Carmel	School	
Carmel High School	Town of Carmel	School	
Fulmar Rd Elementary School	Town of Carmel	School	
Lakeview Elementary School	Town of Carmel	School	
Mahopac Central School District	Town of Carmel	School	
Mahopac High School	Town of Carmel	School	
Mahopac Middle School	Town of Carmel	School	
Myrtle Ave Elementary School	Town of Carmel	School	
St. James The Apostle School	Town of Carmel	School	
St. John School	Town of Carmel	School	
Haldane Jr/Sr HS	Village of Cold Spring	School	
Kent Schools & Trans	Town of Kent	School	
George Fisher Middle School	Town of Patterson	School	Partial
Green Chimneys School For Little People	Town of Patterson	School	Yes
Matthew Paterson Elementary School	Town of Patterson	School	
Garrison Elementary/Middle School	Town of Philipstown	School	
Garrison School Dist.	Town of Philipstown	School	
Garrison Union Free School District	Town of Philipstown	School	
Putnam Valley High School	Town of Putnam Valley	School	



Table 4-12. Schools in Putnam County

Name	Municipality	Type of Facility	Back Up Power
Putnam Valley Middle School	Town of Putnam Valley	School	
Putnam Valley Elementary School	Town of Putnam Valley	School	
Brewster High School	Town of Southeast	School	Partial
Brewster School Admin Bldg	Town of Southeast	Administrative	Yes
Brewster School Bus Garage	Town of Southeast	Administrative	Partial
CV Starr School	Town of Southeast	School	
HH Wells Middle School	Town of Southeast	School	
JFK Elementary School	Town of Southeast	School	
SE Schoolhouse	Town of Southeast	School	

Sources: Putnam County BES

Shelters

With support and cooperation of the American Red Cross, the County has identified shelters with policies and procedures as documented in the following sheltering plans:

- Putnam County Non-Medical Shelter Operations – Purpose, Policy, Procedures
- Putnam County Comfort Station – Purpose, Policy, Procedures

Senior Care and Living Facilities

It is important to identify and account for senior facilities, as they are highly vulnerable to the potential impacts of disasters. Understanding the location and numbers of these types of facilities can help manage effective response plan post disaster. Table 4-13 identifies senior living and senior care facilities in the County.

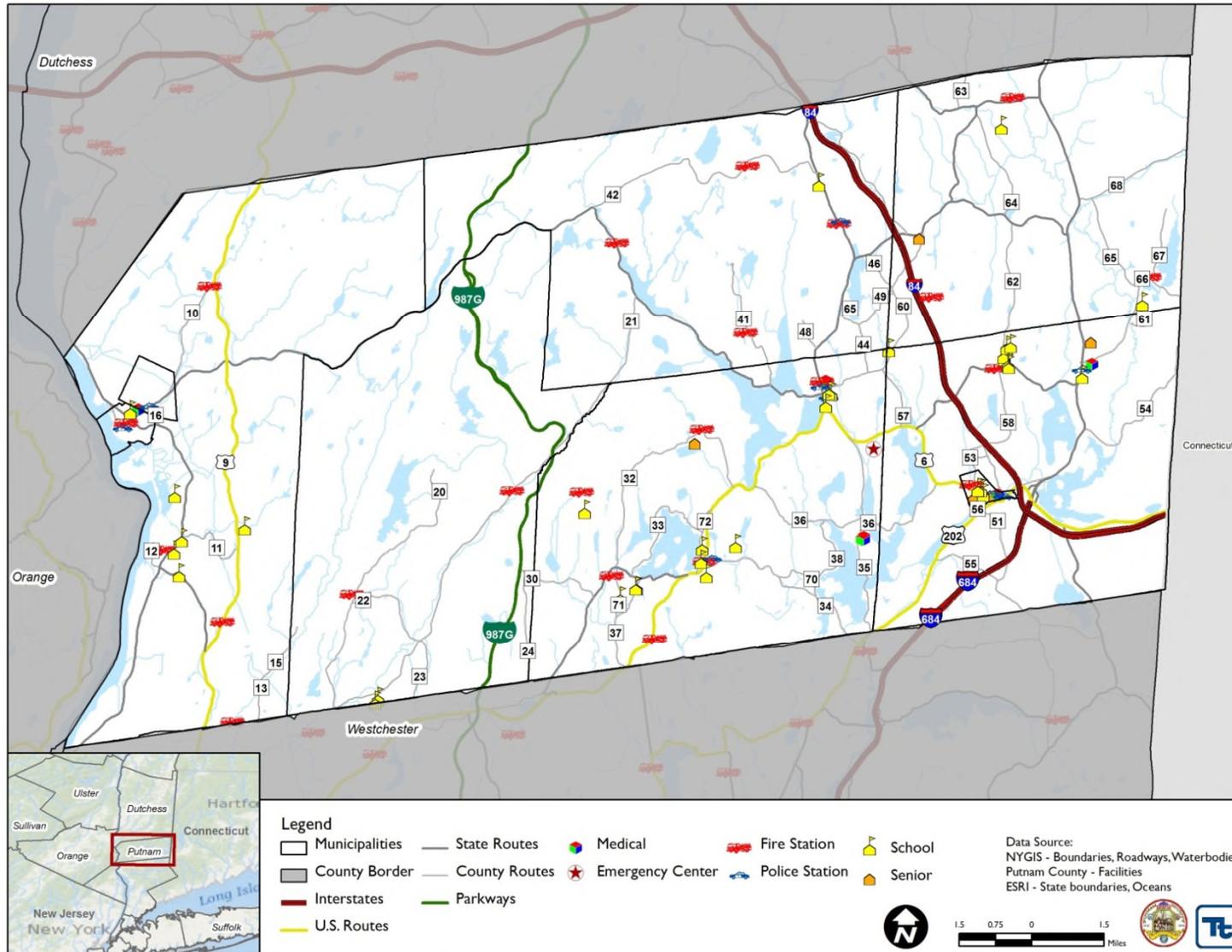
Table 4-13. Senior Facilities in Putnam County

Name	Address	Municipality	Backup Power
Senior Housing	Mayor Mitchell Court	Village of Brewster	
Senior Housing	50 Main St.	Village of Brewster	
Senior Citizen Building	790 Long Pond Road	Town of Carmel	
The Plaza at Clover Lake	838 Fair Street	Town of Patterson	
Putnam Ridge Nursing Home	46 Mount Ebo Rd N	Town of Southeast	
Putnam Valley Senior Center			
William Kohler Senior Center			

Sources: Putnam County BES



Figure 4-14. Emergency Facilities in Putnam County



Source: Putnam County





4.4.2 Transportation Systems

The transportation system of Putnam County is a network of roadways, highways, and rail lines that provide for travel within the County and to major centers in surrounding counties and states. Though the public transit system is not as extensive as systems of major surrounding transit regions, it is still a critical lifeline for travel to and from the County.

Many of New York State’s major highways and roadways pass through the County. While Interstate 84 runs generally east-west through New York to Connecticut, it runs diagonally through the eastern part of Putnam County. Route 684 runs in a general north and south direction, connecting the eastern half of the County to surrounding counties, as well as New Jersey and Connecticut. The Taconic Parkway, which also runs in a north and south direction, connects the western half of the County to most of these same regions as the Interstates. U.S. Routes 6 and 9 also serve as important roadways for intra- and inter-county travel.

Tables 4-13 through 4-15 and Figure 4-14 identify the transportation systems found in Putnam County.

Bus and Transit

Public bus service in Putnam County consists of the County’s bus system, Putnam Area Rapid Transit (PART), several Westchester County Bee Line routes, and a Housatonic Area Regional Transit (HART) route that operates between Danbury, Connecticut and Brewster (Putnam County Division of Planning and Development 2010).

PART service is generally concentrated in the eastern part of the County, where service can be provided to more densely populated areas and where linkages can be made to other buses and train services. The Westchester Bee Line provides commuter service through the Town of Carmel, along Route 6 from the hamlet of Carmel to White Plains, and a Croton Falls commuter run between the Croton Falls train station and the Mahopac area, along Croton Falls Road. The HART service provides commuter and midday service (Putnam County Division of Planning and Development 2010).

Table 4-13 identify bus and other transit facilities in Putnam County.

Table 4-14. Bus and Other Transit Facilities in Putnam County

Name	Municipality	Use	Backup Power
Putnam County Bus Garage	Town of Patterson	Bus	
Local and Suburban Transit	Town of Southeast		

Sources: Putnam County

Railroad Facilities

Two Metro-North rail lines run north and south through both the eastern and western halves of the County. The Harlem Line in the east and the Hudson Line in the west connect the County to Albany to the north, and New York City and farther regions via Grand Central Terminal. There are seven railroad stops in Putnam County including Brewster Village, Brewster North, Patterson, Cold Spring, Garrison, Breakneck, and Mantiou. Ridership on the rail service is operated by Metro North and has increased between 1980 and 2002, from 669,031 rides per year to over 1.6 million rides per year. The busiest stations are Brewster Village, Southeast, Cold Spring and Garrison (Putnam County Division of Planning and Development 2010).



Table 4-15. Railroad Facilities in Putnam County

Name	Municipality	Back Up Power
Metro-North – Manitou Station (Hudson Line)	Town of Philipstown	
Metro North – Garrison Station (Hudson Line)	Town of Philipstown	
Metro North - Cold Spring Station (Hudson Line)	Village of Cold Spring	
Metro North – Breakneck Ridge Station (Hudson Line)	Village of Cold Spring	
Metro North - Brewster Station (Harlem Line)	Village of Brewster	
Metro North - Southeast Station (Harlem Line)	Town of Southeast	
Metro North – Patterson Station (Harlem Line)	Town of Patterson	
MTA Brewster Yard	Town of Southeast	

Sources: Putnam County

Bridges

Of the highway bridges in the County, those identified in Table 4-15 are listed as critical. There were also five railroad bridges that were listed as critical that include Mooney Hill Bridge in the Town of Patterson and four bridges located along NYS Route 164 in the Town of Patterson.

Table 4-16. Critical Highway Bridges in Putnam County

Name	Municipality
Carmel Ave. Bridge	Village of Brewster
Deans Road	Town of Kent
East Boyds Road 1	Town of Kent
East Boyds Road 2	Town of Kent
Ludington Court 1	Town of Kent
Ludington Court 2	Town of Kent
Mooney Hill	Town of Kent
Ninham Road	Town of Kent
Ninham Road	Town of Kent
Sagamore Road	Town of Kent
Schrade Road	Town of Kent
Whangtown Road	Town of Kent
Brimstone Road	Town of Patterson
Route 22 Bridge	Town of Patterson
Route 311 Bridge	Town of Patterson

Sources: Putnam County

Evacuation Routes

The County has identified evacuation routes for all hazards, and maintains specific evacuation plans for hurricanes and radiological emergencies associated with Indian Point Energy Center in Buchanan, Westchester County.



- All-hazard evacuation routes are: Route 9D / Route 9 / Sprout Brook Rd. / Oscawana Lake Road / Peekskill Hollow Road / Taconic State Parkway / Route 301 / Route 84 / Route 311 / Route 6 / Route 22 / Route 684
- Specific evacuation routes are identified in the following plans:
 - Hurricane Emergency Action Plan- Revised 2/2014
 - Putnam County Radiological Emergency Response Plan – July, 2014

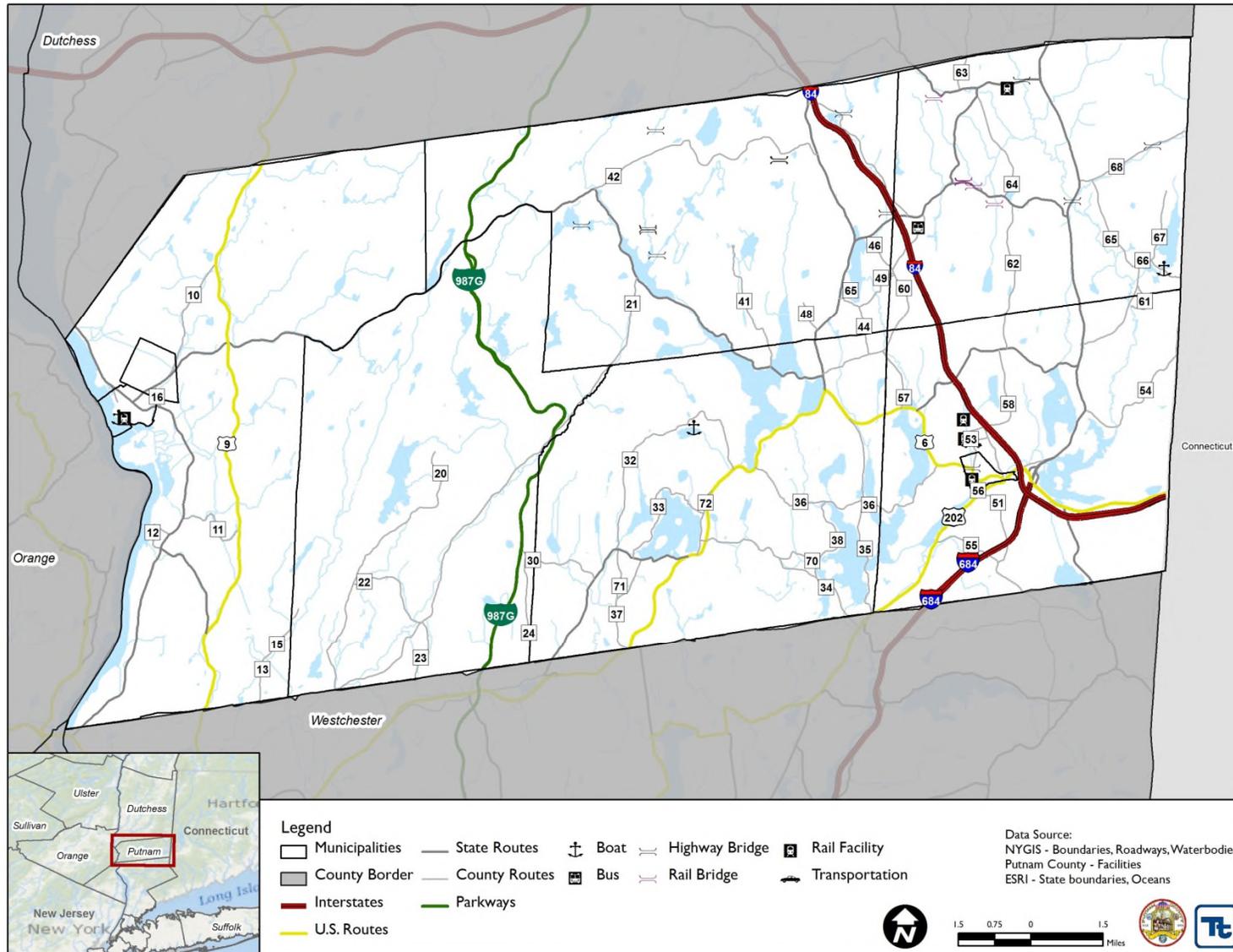
Further, Putnam County Evacuation Bus Routes are also posted for residents who lack their own transportation, and can be found at: <http://www.putnamcountyny.com/pcbcs/oem/4292-2/>.

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:

- PCBES-1: Re-Establish Local Emergency Planning Committees
- PCBES-2: County Incident Command Systems Training
- PCBES-3: County Electrical Live Line Training Capabilities / Preparedness
- PCBES-5: Putnam County Emergency Operations Center (EOC) - Incident & Resource Management
- PCBES-6: Putnam County Animal Emergency Response Site
- PCBES-7: Transportation Hardening & Evacuation Upgrades



Figure 4-15. Transportation Facilities in Putnam County



Source: Putnam County





4.4.3 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.

Potable Water

In Putnam County, water is provided from various facilities as a public service or through private supplies, such as wells. The County has 114 community water supplies. Many of these systems rely on deep wells, while a few systems rely on surface water supplies. All of the community supplies have a distribution system. A majority of County water users obtain their water from deep wells which tap groundwater resources (Putnam County Division of Planning and Development 2010). Table 4-16 lists the facilities associated the treatment, storage, and transport of potable water to the County.

Table 4-17. Potable Water Facilities in Putnam County

Name	Municipality	Type	Backup Power
Lake Gleneida Pump Station	Town of Carmel	Pump	
Rainbow Water Co., Inc	Town of Carmel		
Tennis Court/Swing Set/2 Pumphouses	Town of Carmel	Pump	
Town Of Carmel Pump Station	Town of Carmel	Pump	
Water Pump Hse Ver	Town of Carmel	Pump	
Water Tank	Town of Carmel	Tank	
WD 2 Shoprite Water Tank	Town of Carmel	Tank	
WD 2 Water Tank	Town of Carmel	Tank	
WD2 Water Tank	Town of Carmel	Tank	
WD3 Water Tank	Town of Carmel	Tank	
Pump House	Town of Kent	Pump	
Pump House	Town of Kent	Pump	
Alpine Acres Water Treatment Plant	Town of Patterson	Treatment	Yes
Dorsett Hollow Water Treatment Plant	Town of Patterson	Treatment	Yes
Fox Run Water Treatment	Town of Patterson	Treatment	Yes
Lower Pump House	Town of Philipstown	Pump	
Water Supply- Pump House	Town of Southeast	Pump	
Water Supply- Well Field	Town of Southeast	Well	
Water Tank	Town of Southeast	Tank	
Water Tank, Pumphouse	Town of Southeast	Pump	
Water Treatment	Town of Southeast	Treatment	
Well And Clubhouse	Town of Southeast	Well	
Well Site	Town of Southeast	Well	

Sources: Putnam County Department of Health

Wastewater Facilities

There are 49 wastewater treatment plants in Putnam County that discharge effluent to surface waters. All but seven of the treatment plants are located in the New York City Watershed. There are a combination of public



and privately owned treatment plants and collection systems. The Town of Carmel has the most public sewer districts. Other public districts are found in the Villages of Cold Spring and Brewster, and the Town of Southeast. In addition to wastewater treatment plants, there are many residents and businesses that rely on individual septic systems (Putnam County Division of Planning and Development 2010).

Table 4-17 lists both the wastewater treatment facilities and pump stations located in Putnam County. According to the table, the wastewater treatment system for the County appears to be mainly located within the Town of Carmel with other facilities and pump stations located around the County.

Table 4-18. Putnam County Wastewater Treatment Facilities and Pump Stations

Name	Municipality	Type	Backup Power
<Null>	Village of Brewster		
<Null>	Village of Brewster		
<Null>	Village of Brewster		
Carmel Avenue Pump Station	Village of Brewster	Pump	Yes
DEP Laboratory	Village of Brewster		
Par Street Pump Station	Village of Brewster	Pump	
Route 22 Pump Station	Village of Brewster	Pump	Yes
Waste Water Head Works	Village of Brewster		
WWTP	Town of Carmel	Treatment	
<Null>	Town of Carmel		
Aerobic Digester	Town of Carmel	Treatment	
Carmel Waste Water	Town of Carmel		
Microfilter Building- Sewer #4	Town of Carmel		
Primary Clarifier	Town of Carmel	Treatment	
Pump Station	Town of Carmel	Pump	
Pump Station	Town of Carmel	Pump	
RBC Building	Town of Carmel		
RBD Tanks	Town of Carmel		
SD 1 Lift Station (White Sail)	Town of Carmel	Lift	
SD 2 Belden N Pump	Town of Carmel	Pump	Yes
SD 2 Belden S Pump	Town of Carmel	Pump	
SD 2 Hughson N Pump	Town of Carmel	Pump	
SD 2 Mechanic Street Pump	Town of Carmel	Pump	
SD2 301 Pump	Town of Carmel	Pump	
SD2 Centennial Ridge Pump	Town of Carmel	Pump	Yes
SD2 Hughson S Pump	Town of Carmel	Pump	
SD2 Kelly Road Pump	Town of Carmel	Pump	Yes
SD2 Laurel Frams Pump Station	Town of Carmel	Pump	Yes
SD2 Little Pond Manor	Town of Carmel	Pump	Yes
SD2 Putnam Plaza Pump Station	Town of Carmel	Pump	Yes
SD2 Willowridge Pump	Town of Carmel	Pump	Yes
SD4 Pumphouse	Town of Carmel	Pump	Yes
SD4 Pumphouse	Town of Carmel	Pump	



Table 4-18. Putnam County Wastewater Treatment Facilities and Pump Stations

Name	Municipality	Type	Backup Power
SD4 Pumpstation	Town of Carmel	Pump	
SD4 Sewer Treatment Plant #4	Town of Carmel	Treatment	
SD6 Lift Station	Town of Carmel	Lift	Yes
SD7 Sewer Tx #1 Control Building	Town of Carmel		
SD8 Pumpstation	Town of Carmel	Pump	
Secondary Settle	Town of Carmel	Treatment	
Sewage Treatment	Town of Carmel	Treatment	
Sewer Plant - Long Driveway	Town of Carmel	Treatment	
Sewer Plant #5	Town of Carmel	Treatment	
Sewer Plant #6	Town of Carmel	Treatment	
Sewer Plant 2 Primary Setting Tank	Town of Carmel	Treatment	Yes
Sewer Plant-Long Driveway	Town of Carmel	Treatment	
Sewer Tx #1 Tank/ Sew 7 Sand Fltr	Town of Carmel		
Storage Building	Town of Carmel		
Wastewater Treatment Plant	Town of Carmel	Treatment	Yes
WD 14 Pump House #2	Town of Carmel	Pump	
WD 14 Pump House #2	Town of Carmel	Pump	
WD 2 Lake Shore Pump Station	Town of Carmel	Pump	
WD 2 Water Treatment Plant	Town of Carmel	Treatment	
WD 5 Pumphouse	Town of Carmel	Pump	Yes
WD 8 Tank	Town of Carmel		
WD3 Well Building 1	Town of Carmel		Yes
WD3 Well Building 2	Town of Carmel		
WD4 Pumphouse	Town of Carmel	Pump	
WD6 Water Plant & Tanks	Village of Cold Spring	Treatment	
Cold Spring WWTP	Village of Cold Spring	Treatment	
Market Street Pump Station	Village of Cold Spring	Pump	No
Sewage Pump 3	Village of Cold Spring	Pump	No
West Street Pump Station	Town of Kent	Pump	Yes
Kent Sewer District	Town of Kent		No
Pump House	Town of Patterson	Pump	
Cornwall Meadows Pump Station	Town of Patterson	Pump	Yes
Covington Greens Pump Station	Town of Patterson	Pump	Yes
Education Alliance Camp	Town of Patterson		Yes
Fox Run Condominiums	Town of Patterson		Yes
Front Street Pump Station	Town of Patterson	Pump	Yes
George Fisher Middle School	Town of Patterson		Yes
Patterson Commons Pump Station	Town of Patterson	Pump	Yes
Patterson Hamlet WWTP	Town of Patterson	Treatment	Yes
Patterson Village Pump Station	Town of Patterson	Pump	Yes
Pump House	Town of Patterson	Pump	



Table 4-18. Putnam County Wastewater Treatment Facilities and Pump Stations

Name	Municipality	Type	Backup Power
South Street Pump Station	Town of Patterson	Pump	Yes
Thunder Ridge Ski Area	Town of Patterson		
Watchtower Education Center	Town of Southeast		Yes
Sewage Lift Station	Town of Southeast	Lift	Yes
Sewage Lift Station	Town of Southeast	Lift	Yes
Sewage Lift Station	Town of Southeast	Lift	Yes
Sewage Lift Station	Town of Southeast	Lift	Yes
Sewage Lift Station	Town of Southeast	Lift	Yes
Sewage Lift Station	Town of Southeast	Lift	Yes
Sewerage Systems	Town of Southeast	Lift	Yes
Wastewater Treatment Plant	Town of Southeast	Treatment	
WW Treatment Plant	Village of Brewster	Treatment	

Sources: Putnam County Health Department

Energy Resources

New York State Electric and Gas Corporation (NYSEG) is the primary electric and gas utility company in Putnam County. Natural gas services are also provided by smaller, private companies. Table 4-19 lists the natural gas facilities in Putnam County, and Table 4-20 lists the electric generating facilities and electric substations in the County.

Table 4-19. Putnam County Natural Gas Facilities

Name	Municipality	Backup Power
Cen Hud - Stillwater Road	Town of Carmel	
Algonquin - Tulip Road	Town of Southeast	
NYSEG - Brewster City Gate	Town of Southeast	

Sources: NYSEG and Central Hudson

Table 4-20. Electric Substations and Transfer Facilities in Putnam County

Name	Municipality	Type	Backup Power
NYSEG - Carmel	Town of Carmel	Power	
NYSEG - Wood Street	Town of Carmel	Power	
NYSEG - Kent Cliffs	Town of Kent	Power	
NYSEG - Haviland Hollow Substation	Town of Patterson	Substation	
NYSEG - Kent Substation	Town of Patterson	Substation	
NYSEG - West Patterson Substation	Town of Patterson	Substation	
CENHUD - Indian Brook Road	Town of Philipstown	Power	
NYSEG - Adams Corners	Town of Putnam Valley	Power	
NYSEG - Dingle Ridge	Town of Southeast	Power	
NYSEG - Putnam Lake	Town of Southeast	Power	
NYSEG - Tilly Foster	Town of Southeast	Power	

Sources: NYSEG and Central Hudson



Communications

Communications systems in the County are provided by multiple companies, such as Verizon. Table 4-21 lists the communication towers and facilities located in the County. Figure 4-15 shows the locations of the facilities for these various lifeline utility systems.

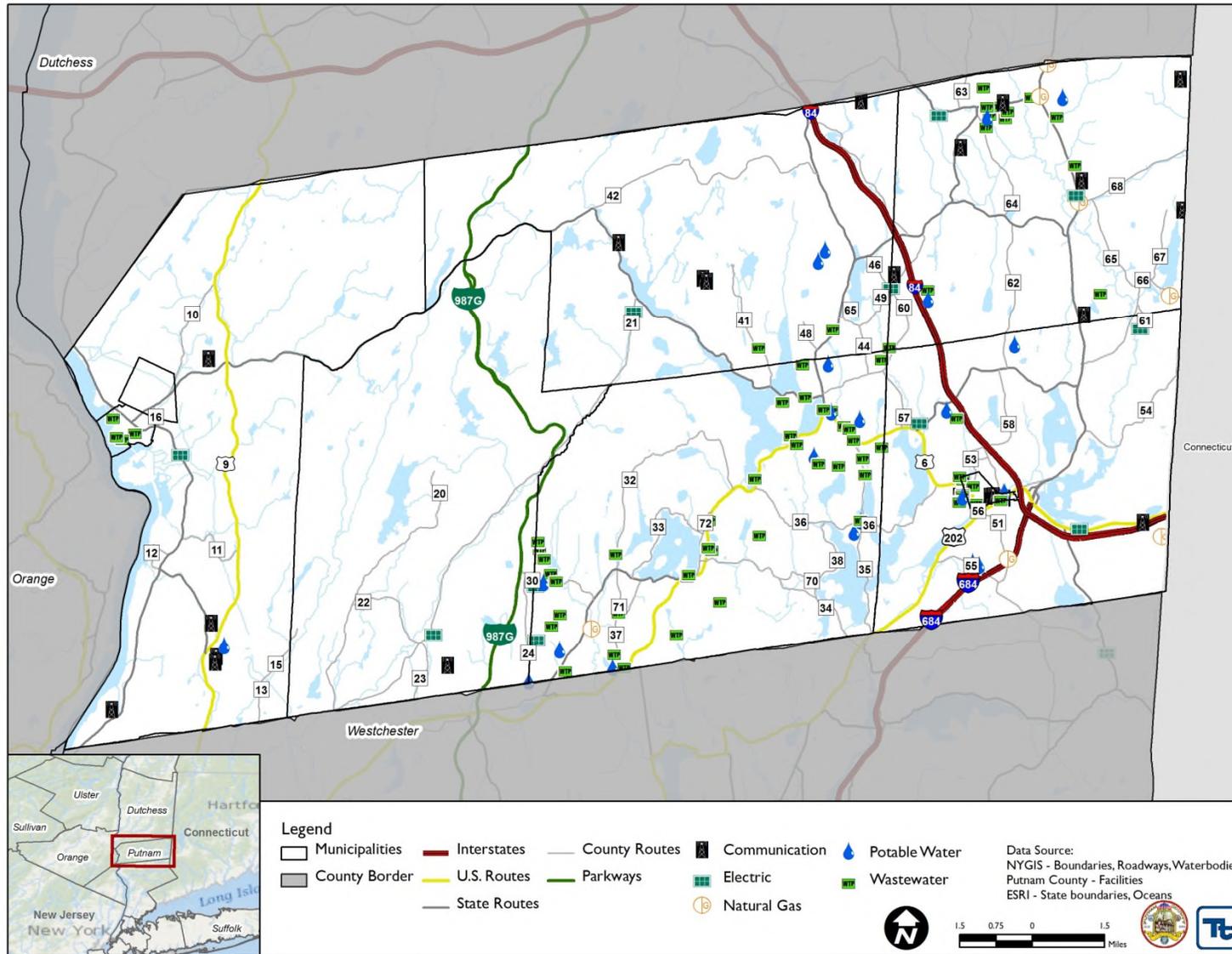
Table 4-21. Communication Facilities in Putnam County

Name	Municipality	Backup Power
DPW- Telephone Communications	Village of Brewster	
Telephone Communications	Village of Brewster	
Verizon Comm.	Village of Brewster	
Not Provided	Town of Kent	Yes
Communications Tower	Town of Kent	
Communications Tower	Town of Kent	
Communications Tower	Town of Kent	
Cell Tower In Silo	Town of Patterson	
Echo Road Telecommunications Tower	Town of Patterson	Yes
Maldunn Telecommunications Tower	Town of Patterson	Yes
Noletti Telecommunications Tower	Town of Patterson	Yes
Tower Hill	Town of Patterson	
Verizon	Town of Patterson	
Wireless Edge Telecommunications Tower	Town of Patterson	
Cell Tower	Town of Philipstown	
Cell Tower	Town of Philipstown	
Communications Tower	Town of Philipstown	
Communications Tower	Town of Philipstown	
Crown Atlantic Tower	Town of Philipstown	
Cell Tower/Power Lines	Town of Putnam Valley	
Verizon Cell Tower	Town of Putnam Valley	
Cell Tower	Town of Southeast	
Cell Tower	Town of Southeast	

Sources: Putnam County



Figure 4-16. Utility Lifelines in Putnam County



Source: Putnam County





4.4.4 High-Potential Loss Facilities

High-potential loss facilities generally include dams, levees, hazardous materials facilities (HAZMAT), nuclear power plants and military installations; however, of these only dams are located within Putnam County. Figure 4-16 shows the locations of the High-Potential Loss Facilities in the County.

Dams and Levees

According to the U.S. Army Corps of Engineers National Inventory of Dams (NID), NYSGIS, and input from the Planning Committee, there are 130 dams in Putnam County. A dam is included in the NID if: (1) it is a “high” or “significant” hazard potential class dam or, (2) it is a “low” hazard potential class dam that exceeds 25 feet in height and 15 acre-feet storage or, (3) it is a “low” hazard potential class dam that exceeds 50 acre-feet storage and six feet height. Table 4-22 defines the hazard potential classification, as accepted by the NID Interagency Committee on Dam Safety.

Table 4-22. Dam Hazard Potential Classifications

Hazard Potential Classification	Loss of Human Life	Economic, Environmental, and Lifeline Losses
Low	None	Low and generally limited to owner
Significant	Possible	Yes
High	Loss of one human life is likely if dam fails	Yes (but not necessary for this classification)

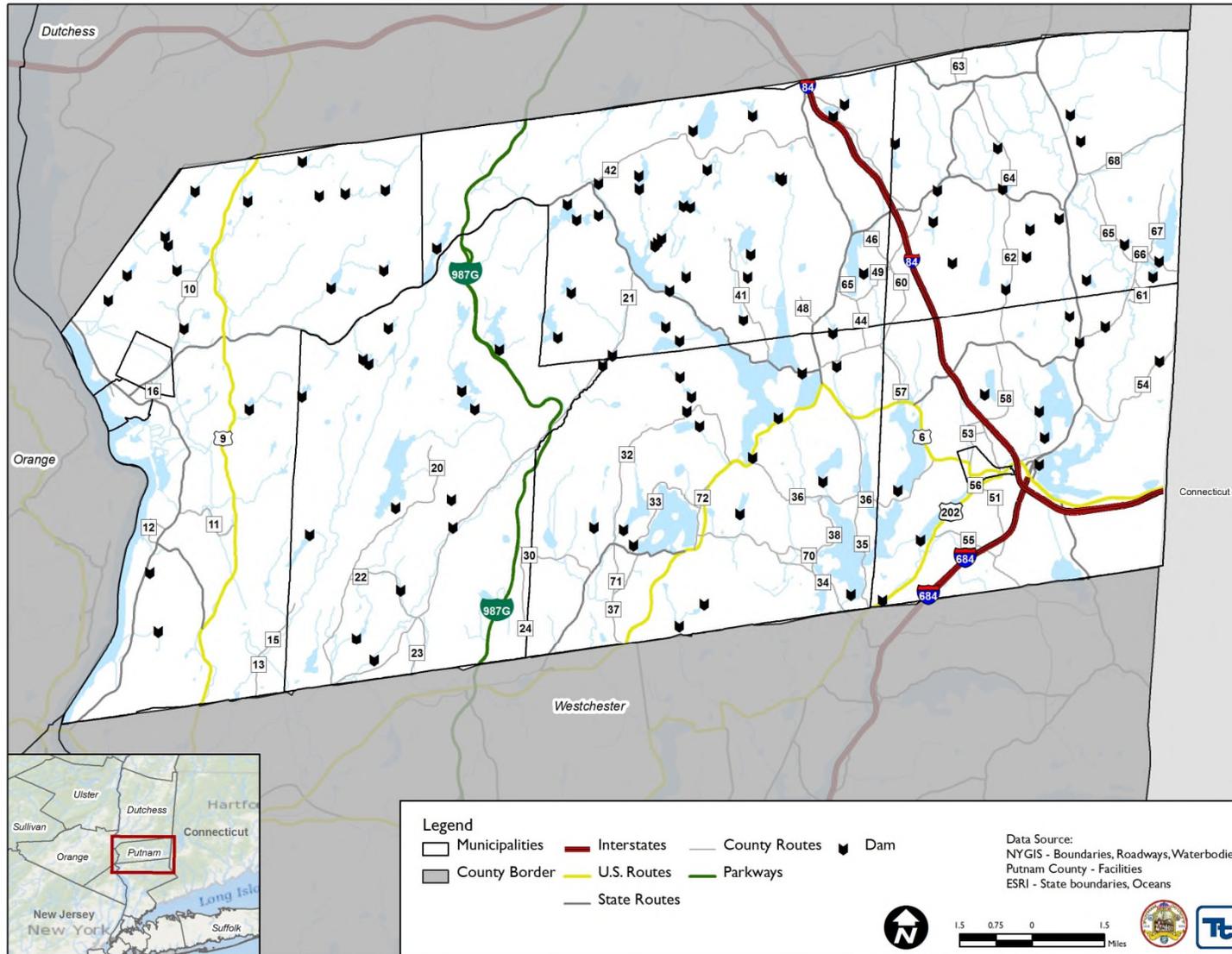
Source: NID, 2007

However, the data from NID does not indicate the hazard classification for the dams. In Table 4-23, the hazard classification listed in the table is how the NYSDEC classified the dams.

- Class A – Low Hazard - A dam failure is unlikely to result in damage to anything more than isolated or unoccupied buildings, undeveloped lands, minor roads such as town or county roads; is unlikely to result in the interruption of important utilities, including water supply, sewage treatment, fuel, power, cable or telephone infrastructure; and/or is otherwise unlikely to pose the threat of personal injury, substantial economic loss or substantial environmental damage.
- Class B – Intermediate Hazard - A dam failure may result in damage to isolated homes, main highways, and minor railroads; may result in the interruption of important utilities, including water supply, sewage treatment, fuel, power, cable or telephone infrastructure; and/or is otherwise likely to pose the threat of personal injury and/or substantial economic loss or substantial environmental damage. Loss of human life is not expected.
- Class C – High Hazard - A dam failure may result in widespread or serious damage to home(s); damage to main highways, industrial or commercial buildings, railroads, and/or important utilities, including water supply, sewage treatment, fuel, power, cable or telephone infrastructure; or substantial environmental damage; such that the loss of human life or widespread substantial economic loss is likely.
- Class D - Negligible or No Hazard - A dam that has been breached or removed, or has failed or otherwise no longer materially impounds waters, or a dam that was planned but never constructed. Class "D" dams are considered to be defunct dams posing negligible or no hazard. The department may retain pertinent records regarding such dams.
- 0 – hazard code has not been assigned



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



Source: Putnam County





Table 4-23. Dams in Putnam County

Dam Name	Municipality	River/Waterbody	Hazard Class
Dixon Lake Road Dam	Town of Carmel		Low
Glencoma Lake Dam	Town of Carmel	PLUM BROOK	Low
Lake Gilead Dam	Town of Carmel	TR-W BRANCH CROTON RIVER	Low
Long Pond Dam	Town of Carmel	TR-WEST BRANCH RESERVOIR	Low
Long Pond Dam	Town of Carmel		Low
Palmer Lake Dam	Town of Carmel	MICHAEL BROOK	Low
Upper Lake Road Dam	Town of Carmel	TR-WEST BRANCH RESERVOIR	Low
Willow Pond Subdivision Dam	Town of Carmel	TR-W BRANCH WEST RESERVOIR	Low
Kirk Lake Dam	Town of Carmel	TR-MUSCOOT RIVER	Intermediate
Lake Casse Dam	Town of Carmel	TR-CROTON FALLS RESERVOIR	Intermediate
Lake Gleneida Dam	Town of Carmel	TR-W BRANCH CROTON RIVER	Intermediate
Lake Macgregor Dam	Town of Carmel	TR-MUSCOOT RIVER	Intermediate
Teakettle Spout Lake Dam	Town of Carmel	PLUM BROOK	Intermediate
Upper Teakettle Spout Lake Dam	Town of Carmel	TR-PLUM BROOK	Intermediate
Carmel Auxiliary Dike	Town of Carmel	WEST BRANCH CROTON RIVER	High
Croton Falls Dam	Town of Carmel	WEST BRANCH CROTON RIVER	High
Lake Mahopac Dam	Town of Carmel	MUSCOOT RIVER	High
West Branch Dam (Carmel Dam)	Town of Carmel	WEST BRANCH CROTON RIVER	High
Hefferman Dam	Town of Carmel	MICHAEL BROOK	Negligible/No Hazard
Adam Pond Dam	Town of Kent		Low
Barrett Pond Dam	Town of Kent	TR-WEST BRANCH RESERVOIR	Low
Barrett Pond Dam	Town of Kent		Low
Blue Spruce Dam	Town of Kent	TR-BOYD CORNERS RESERVOIR	Low
Browns Pond Dam	Town of Kent	TR-MIDDLE BR CROTON RIVER	Low
Canopus Lake North End Dam	Town of Kent	CANOPUS CREEK	Low
Clear Pool Dam	Town of Kent	CLEAR POOL LAKE	Low
Drew Lake Dam	Town of Kent	STUMP POND STREAM	Low



Table 4-23. Dams in Putnam County

Dam Name	Municipality	River/Waterbody	Hazard Class
Ivan Bennett Dam	Town of Kent	TR-BOYD CORNERS RESERVOIR	Low
Lake Tibet Dam	Town of Kent	PEEKSKILL HOLLOW CREEK	Low
Leland Ryder Lake Dam	Town of Kent	BLACK POND BROOK	Low
Levine Lake Dam A	Town of Kent	TR-HORSE POND BROOK	Low
Levine Lake Dam B (dike)	Town of Kent	TR-HORSE POND BROOK	Low
Little Buck Mountain Pond Dam	Town of Kent	BAILEY BROOK	Low
Merritt Ryder Lake Dam	Town of Kent	TR-BLACK POND BROOK	Low
Pine Pond Dam	Town of Kent	TR-WEST BRANCH CROTON RIVER	Low
Rohener Pond Dam	Town of Kent	TR-WEST BRANCH RESERVOIR	Low
Turner Mill Pond Dam	Town of Kent	TR-MIDDLE BR CROTON RIVER	Low
Twin Brooks Dam	Town of Kent	BLACK POND BROOK	Low
Upper Lake Ninham Dam	Town of Kent	TR-BOYD CORNERS RESERVOIR	Low
Veterans Park Dam	Town of Kent	TR-PINE POND	Low
Lower Lake Ninham Dam	Town of Kent	BAILEY BROOK	Intermediate
Ryder Lake Dam	Town of Kent	WEST BRANCH CROTON RIVER	Intermediate
Sagamore Lake Dam	Town of Kent	WEST BRANCH CROTON RIVER	Intermediate
Seven Hills Realty Co Inc Dam	Town of Kent	TR-W BRANCH CROTON RIVER	Intermediate
South Lake Dam (lower)	Town of Kent	TR-STUMP POND STREAM	Intermediate
South Lake Dam (middle)	Town of Kent	TR-STUMP POND STREAM	Intermediate
South Lake Dam (upper)	Town of Kent	TR-STUMP POND STREAM	Intermediate
White Pond Dam	Town of Kent	TR-BOYD CORNERS RESERVOIR	Intermediate
Boyds Corner Dam	Town of Kent	WEST BRANCH CROTON RIVER	High
Lake Carmel Dam	Town of Kent	MIDDLE BRANCH CROTON RIVER	High
Marcell Roth Lake Dam	Town of Kent	TR-PEEKSKILL HOLLOW CREEK	High
Fried Pond Dam	Town of Kent	TR-BOYDS RESERVOIR	Negligible/No Hazard
Louis Enten Pond Dam #2	Town of Kent	PEEKSKILL HOLLOW BROOK	Negligible/No Hazard
South Lake Dam	Town of Kent		Unknown



Table 4-23. Dams in Putnam County

Dam Name	Municipality	River/Waterbody	Hazard Class
Amos Noach Dam	Town of Patterson	TR-ICE POND	Low
China Pond Dam	Town of Patterson	TR-W BRANCH CROTON RIVER	Low
Clover Lake Estates Dam	Town of Patterson	TR-MUDDY BROOK	Low
Lost Lake Dam & Dike	Town of Patterson	TR-E BRANCH CROTON RIVER	Low
Peppers Mill Lower Dam	Town of Patterson	WEST BRANCH MUDDY BROOK	Low
Peppers Mill Upper Dam	Town of Patterson	WEST BRANCH MUDDY BROOK	Low
Pond View Dam	Town of Patterson	TR-CROTON RIVER	Low
Rihm & Kittel Dam	Town of Patterson	TR-EAST BRANCH CROTON RIVER	Low
Watchtower Dam	Town of Patterson		Low
Watchtower Dam	Town of Patterson	TR-E BRANCH CROTON RIVER	Low
Wonder Lake Dam	Town of Patterson	TR-MUDDY BROOK	Low
Burman Pond Dam	Town of Patterson	TR-MUDDY BROOK	Intermediate
Camp Herrlich Dam	Town of Patterson	TR-MIDDLE BR CROTON RIVER	Intermediate
Mountain Brook Dam	Town of Patterson	MOUNTAIN BROOK	High
Putnam Lake Dam	Town of Patterson	BOG BROOK	High
Boutin Mill Dam	Town of Patterson	HAVILAND HOLLOW BROOK	Negligible/No Hazard
Cornwall Hill Estates Dam	Town of Patterson	MUDDY BROOK	Negligible/No Hazard
Cornwall Hill Estates Dam	Town of Patterson		Negligible/No Hazard
Camp Brady Dam	Town of Patterson		Unknown
Griffin's Pond	Town of Patterson		Unknown
Mendel Pond Dam	Town of Patterson	TR-MUDDY BROOK	None Assigned
Waterfield Farms Dam	Town of Patterson		Unknown
David Ulmar Pond Dam	Town of Philipstown	TR-CLOVE CREEK	Low
Evelina Perkins Pond Dam	Town of Philipstown	TR-CLOVE CREEK	Low
Foundry Brook Dam (Cold Spring Reservoir Dam)	Town of Philipstown	FOUNDRY BROOK	Low
Sloan Dam	Town of Philipstown	TR-HUDSON RIVER	Low
Trout Brook Lake Dam	Town of Philipstown		Low



Table 4-23. Dams in Putnam County

Dam Name	Municipality	River/Waterbody	Hazard Class
Weise Pond Dam	Town of Philipstown	TR-SAND SPRING BROOK	Low
Colt Estate Dam	Town of Philipstown	TR-HUDSON RIVER	Intermediate
Continental Village Dam	Town of Philipstown		Intermediate
East Mountain Lake Dam	Town of Philipstown	TROUT CREEK	Intermediate
Jordan Pond Dam	Town of Philipstown	CLOVE CREEK	Intermediate
Lake Surprise Dam	Town of Philipstown	BREAKNECK BROOK TR-HUDSON	Intermediate
Lake Valhalla Dam	Town of Philipstown	TR-CLOVE CREEK	Intermediate
Loch Lyall Dam	Town of Philipstown	INDIAN BROOK	Intermediate
Perkins Estate Pond Dam	Town of Philipstown	CLOVE CREEK	Intermediate
Cargill Reservoir Dam	Town of Philipstown	CARGILL BROOK	High
Cold Spring Dam (lower)	Town of Philipstown	FOUNDRY BROOK	High
Cold Spring Dam (upper)	Town of Philipstown	FOUNDRY BROOK	High
Breakneck Brook Dam	Town of Philipstown	BREAKNECK BROOK	Negligible/No Hazard
Camp Wiccopee Dam	Town of Philipstown	TROUT CREEK	Negligible/No Hazard
Diamond Pond Dam	Town of Philipstown	FOUNDRY BROOK	Negligible/No Hazard
Duck Pond Dam A & B	Town of Putnam Valley	TR-INDIAN BROOK	Low
Frank & Cooper Pond Dam	Town of Putnam Valley	TR-TROUT CREEK	Low
G L Lloyd Pond Dam	Town of Putnam Valley	PEEKSKILL HOLLOW CREEK	Low
Hidden Lake Dam	Town of Putnam Valley		Low
Hollow Brook Dam	Town of Putnam Valley	TR-PEEKSKILL HOLLOW BROOK	Low
Indian Lake Dam	Town of Putnam Valley	TR-CANOPUS CREEK	Low
John Allen Pond Dam	Town of Putnam Valley	TR-CANOPUS CREEK	Low
L Berman Pond Dam	Town of Putnam Valley	TR-PEEKSKILL HOLLOW CREEK	Low
Oscawana Lake Dam	Town of Putnam Valley	OSCAWANA BROOK	Low
Stillwater Pond Dam	Town of Putnam Valley	STILLWATER BROOK	Low
Williams Pond Dam	Town of Putnam Valley	TR-CANOPUS CREEK	Low
Floradan Estates Dam	Town of Putnam Valley	OSCAWANA CREEK	Intermediate



Table 4-23. Dams in Putnam County

Dam Name	Municipality	River/Waterbody	Hazard Class
Louis Enten Pond Dam #1	Town of Putnam Valley	PEEKSKILL HOLLOW CREEK	Intermediate
Pelton Pond Dam	Town of Putnam Valley	CANOPUS CREEK	Intermediate
Lake Peekskill Dam	Town of Putnam Valley	HOLLOWBROOK	High
Lower (south) Wiccopee Dam	Town of Putnam Valley	WICCOPEE BROOK	High
Roaring Brook Dam	Town of Putnam Valley	ROARING BROOK	High
Upper (north) Wiccopee Dam	Town of Putnam Valley	WICCOPEE BROOK	High
Bog Brook Water Control Dam	Town of Southeast	BOG BROOK	Low
Juengst Dam	Town of Southeast	EAST BRANCH CROTON RIVER	Low
Lake Tonetta Dam	Town of Southeast	TONETTA BROOK	Low
Lounsbury Wildlife Pond #1 Dam	Town of Southeast	TR-E BR CROTON RIVER	Low
Lounsbury Wildlife Pond #2 Dam	Town of Southeast	TR-E BR CROTON RIVER	Low
Milltown Estates Dam	Town of Southeast	SALMON'S DAILY BROOK	Low
Mt Ebo Corporate Center Dam	Town of Southeast	TR-EAST BR CROTON RIVER	Low
Bog Brook Dam #1	Town of Southeast	TR-E BRANCH CROTON RIVER	High
Bog Brook Dam #2	Town of Southeast	TR-EAST BRANCH CROTON RIVER	High
Diverting Reservoir Dam	Town of Southeast	EAST BRANCH CROTON RIVER	High
Middle Branch Dam	Town of Southeast	MIDDLE BRANCH CROTON RIVER	High
Sodom Dam (East Branch Reservoir)	Town of Southeast	EAST BRANCH CROTON RIVER	High
Sussmeier Pond Dam	Unknown	TR-BEACON RESERVOIR	Low
(213-0477)	Unknown	TR-PEEKSKILL HOLLOW CREEK	Negligible/No Hazard
Lake Charles Dam	Village of Brewster	TR-E BR CROTON RIVER	Intermediate
West Point Foundry Dam	Village of Cold Spring		Low

Sources: Input from Planning Committee, NYSGIS, USACE

Notes:

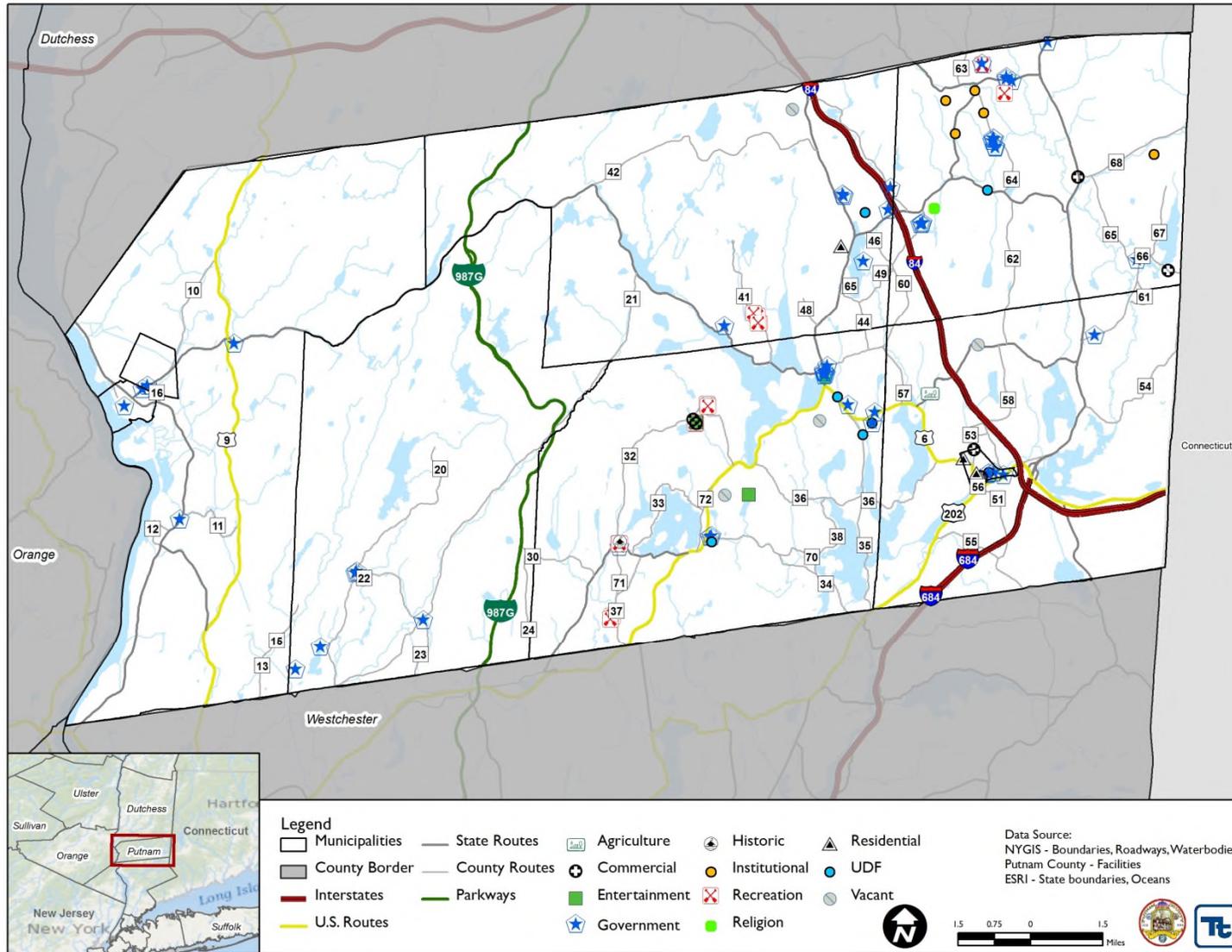


4.4.5 Other Facilities

The Planning Committee identified 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 4-17 shows the locations of these facilities in the County. Table 4-23 lists the other critical facilities, which were identified by Putnam County.



Figure 4-18. Other Facilities in Putnam County



Source: Putnam County





Table 4-24. Other Facilities in Putnam County

Name	Municipality	Type	Backup Power
Tilly Foster Farm	Town of Southeast	Agriculture	No
Brewster Village Hall	Village of Brewster	Government – Municipal	No
Cap/County Office Building	Village of Brewster	Government – County	No
Village Hall	Village of Brewster	Government	No
Highway Department	Village of Brewster	Government	Yes
Carmel Post Office	Town of Carmel	Government – Municipal	No
County Court House	Town of Carmel	Government – County	Yes
Historic Court House	Town of Carmel	Government	No
County Office Building	Town of Carmel	Government - County	No
Donald B. Smith Gov't Campus	Town of Carmel	Government	No
Government	Town of Carmel	Government	
Highway 6N Garage & Storage	Town of Carmel	Government	No
Putnam County Law Offices	Town of Carmel	Government - County	No
Salt Shed (Old Route 6)	Town of Carmel	Government	No
Salt Shed & Town Garage	Town of Carmel	Government	No
Town Hall	Town of Carmel	Government – Municipal	Yes
VFW Hall	Town of Carmel	Government	No
Philipstown Town Hall	Village of Cold Spring	Government – Municipal	No
Village Hall	Village of Cold Spring	Government – Municipal	Yes
Police	Town of Kent	Government	Yes
Town Hall	Town of Kent	Government	Yes
Kent Public Library	Town of Kent	Government - Municipal	Yes
Kent Town Hall	Town of Kent	Government - Municipal	Yes
Lake Carmel Community Center	Town of Kent	Government	No
Town Of Kent Highway Department.	Town of Kent	Government - Municipal	Yes
Nelsonville Village Hall	Village of Nelsonville	Government - Municipal	No
Courthouse	Town of Patterson	Government	Yes
Fair St. Garage	Town of Patterson	Government - County	Yes
Highway Department	Town of Patterson	Government - Municipal	Yes
Patterson Highway Salt Shed	Town of Patterson	Government	Yes
Patterson Library	Town of Patterson	Government - Municipal	Yes
Patterson Town Hall	Town of Patterson	Government - Municipal	Yes
PVMP Pavilion	Town of Patterson	Government	No
Recreation Center	Town of Patterson	Government	Yes
Recycling Center	Town of Patterson	Government	No
Storage	Town of Patterson	Government	No
Government	Town of Philipstown	Government	



Table 4-24. Other Facilities in Putnam County

Name	Municipality	Type	Backup Power
Government	Town of Philipstown	Government	
Government	Town of Putnam Valley	Government	
Government	Town of Putnam Valley	Government	
Government	Town of Putnam Valley	Government	
Government	Town of Putnam Valley	Government	
Putnam Valley Town Hall	Town of Putnam Valley	Government - Municipal	
Government- Post Office	Town of Southeast	Government - Municipal	
Historical Building	Town of Carmel	Historic	
Group Home	Town of Patterson	Institutional	
Group Home	Town of Patterson	Institutional	
Group Home	Town of Patterson	Institutional	
Group Home	Town of Patterson	Institutional	
NYSARC Group Home	Town of Patterson	Institutional	Yes
Basketball Courts	Town of Carmel	Recreation	
Crane Park Restrooms	Town of Carmel	Recreation	
Open Pavilion	Town of Carmel	Recreation	
Recreation Building	Town of Carmel	Recreation	Yes
Recreation/Park Building Camp Sycamore	Town of Carmel	Recreation	
Red Mills Park	Town of Carmel	Recreation	
Red Mills Park Gazebo	Town of Carmel	Recreation	
Skate Park	Town of Carmel	Recreation	
Barn In Park	Town of Kent	Recreation	
County Park	Town of Kent	Recreation	
Farm House In Park	Town of Kent	Recreation	
Pavilion	Town of Kent	Recreation	
Bath House	Town of Patterson	Recreation	
Rec Building	Town of Patterson	Recreation	
St James Church	Town of Carmel	Religion	No
Camp Wilbur Herrlich	Town of Patterson	Religion	
Apartments	Village of Brewster	Residential	
Apartments	Village of Brewster	Residential	
Apartments	Village of Brewster	Residential	
<Null>	Town of Kent	Residential	



Table 4-24. Other Facilities in Putnam County

Name	Municipality	Type	Backup Power
Dwelling	Town of Patterson	Residential	
<Null>	Village of Brewster	UDF	
<Null>	Town of Carmel	UDF	
<Null>	Town of Carmel	UDF	
<Null>	Town of Carmel	UDF	
<Null>	Town of Carmel	UDF	
<Null>	Town of Carmel	UDF	
<Null>	Town of Carmel	UDF	
<Null>	Town of Carmel	UDF	
Othmer House	Town of Carmel	UDF	
Personnel	Town of Carmel	UDF	
Kern Building	Town of Kent	UDF	
Maybrook E1 Route 164	Town of Patterson	UDF	

Sources: Putnam County