



SECTION 3. COUNTY PROFILE

This profile describes the general information of the County (physical setting, population and demographics, general building stock, and land use and population trends) and critical facilities located within Morris County. In Section 3, 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).

2020 HMP Changes

- The “County Profile” is now located in Section 3; previously located in Section 4. It contains updated information regarding the County's physical setting, population and demographics and trends, general building stock, land use and trends, potential new development and critical facilities. This includes U.S. Census ACS 2017 data and additional information regarding the New Jersey Highlands Region in the Development Trends/Future Development subsection.
- Critical facilities identified as community lifelines using FEMA’s lifeline definition and seven categories were added to the inventory and described in this section.

3.1 GENERAL INFORMATION

Morris County is one of the fastest growing counties in the New York-New Jersey-Connecticut metropolitan region. It is located amid rolling hills, broad valleys, and lakes approximately 30 miles northwest of New York City. The County was created by an Act of the State Legislature on March 15, 1738, separating it from Hunterdon County. Morris County was named after Colonel Lewis Morris, then Governor of the Province of New Jersey (the area that now includes Morris, Sussex, and Warren Counties). During the Revolutionary War, the County was known as the military capital of the American Revolution due to its strategic location. General George Washington and his army made their winter camp near Morristown. Much of this area is now preserved today in the Morristown National Historical Park (Morris County 2015).

The Morris Canal was completed in 1831. It crossed the State from Phillipsburg to Newark, a distance of 90 miles, and played a major role in the movement of iron ore, coal and freight up until the 1920s when it was dismantled when it fell into disuse. In 1838, the tracks of the Morris & Essex Railroad reached Morristown and 10 years later, extended to Dover (Morris County 2015).

Since the turn of the century, the industry of Morris County changed from iron mining to research, pharmaceuticals and light manufacturing. The character of the land also changed from agricultural to residential. Today, Morris County is the seventh largest county in New Jersey and home to major shopping centers, large residential areas, and colleges and universities. Thirty-nine municipalities are found in the 477.8 square miles of the County (Morris County 2015).

3.1.1 Physical Setting

This section presents the physical setting of the County, including location, hydrography and hydrology, topography and geology, and climate.



Location

Morris County is located in the north-central section of New Jersey and encompasses a total area of approximately 481 square miles. The County is bordered by Passaic County to the northeast, Essex County to the east, Union County to the southeast, Somerset County to the south, Hunterdon County to the southwest, Warren County to the west, and Sussex County to the north/northwest. Most of the County's borders are riverine borders. The northern boundary is characterized by the Pequannock River. The Pompton River and the eastern branch of the Passaic River serves as the eastern border for the County. The western border is characterized by the Musconetcong River. Refer to Figure 3-1 which depicts Morris County.

Hydrography and Hydrology

Numerous ponds, lakes, creeks, and rivers make up the waterscape of Morris County and include: Musconetcong River, North and South Branch Raritan River, Northern and Southern Tributary, Passaic River, Peapack River, Pequannock River, Pinch Brook, Pompton River, Primrose Brook, Ramapo River, Rockaway River, Silver Brook, Spring Garden Brook, Stephensburg Brook, Stonehouse Brook, Stony Brook, Susquehanna Brook, Tanglewood Brook, Tanners Brook, Troy Brook, Watnong Brook, Weldon Brook, West Brook, West Ditch, Western Tributary, Whippany River, White Meadow Brook, and Wills Brook (FEMA FIS 2010).

The rivers and streams within Morris County flow generally southwestward, following the trends of the Highlands. Exceptions to this are the east flowing Pequannock River, the Rockaway River which flows south out of Berkshire Valley and then east through a gap in the eastern Highlands, and the Passaic River which rises in southern Mendham Township, flows north through the Watchung Valley and turns eastward at Montville towards the Great Notch, Little Falls and Paterson (Morris County NRI 2000).

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. Watersheds come in all shapes and sizes and can cross municipal and county boundaries.

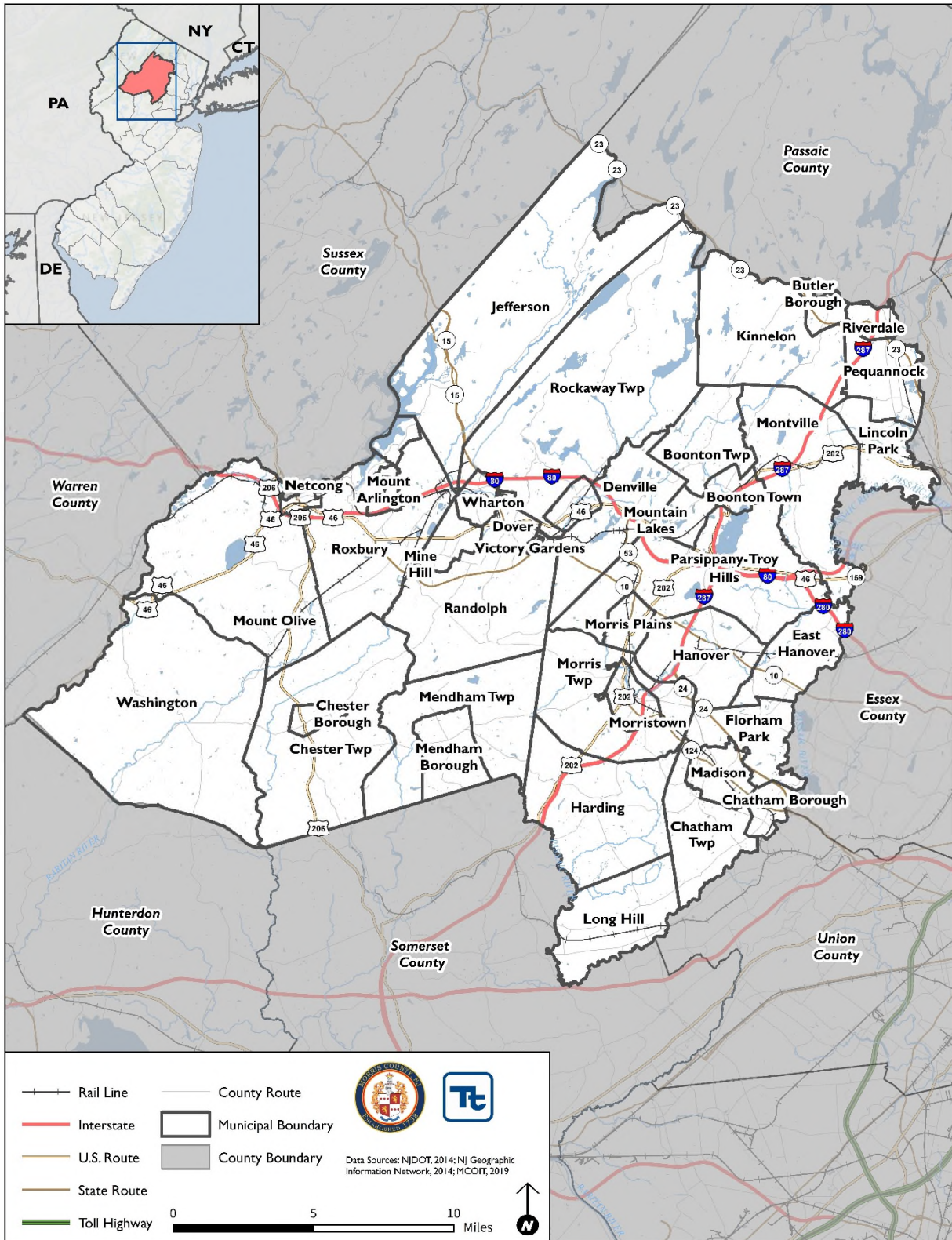
Drainage basins generally refer to large watersheds that encompass the watersheds of many smaller rivers and streams. Morris County is encompassed by three major watershed basins: Delaware, Raritan and Passaic. Each of which are made up of smaller watersheds. Details regarding these water basins and watersheds are described below.

Delaware River Basin

The Delaware River Basin rises in the Catskill Mountains in New York State and travels 330 miles through 13,500 square miles of rural and urban landscapes and empties into the Atlantic Ocean. In Morris County, this Basin only has a small percentage of area. The Musconetcong Watershed is the only watershed in Morris County that is part of this Basin.



Figure 3-1. Overview Map of Morris County, New Jersey





The Musconetcong River watershed includes portions of Hunterdon, Morris, Warren, and Sussex Counties. The watershed is 157.6 square miles in size and drains the Musconetcong River. It includes Lake Hopatcong and several smaller lakes that drain to the River. The River forms the western boundary of the County and its watershed encompasses Jefferson Township, Mount Arlington Borough, Mount Olive Township, Netcong Borough, Roxbury Township, and Washington Township (Musconetcong Watershed Association 2015). In addition to the River and Lake Hopatcong, the Willis Brook, Mine Brook, Bungalow Brook and Stephensburg Brook are located within this watershed (Morris County NRI 2000).

Passaic River Basin

The Passaic River Basin drains approximately 935 square miles of northern New Jersey and southern New York State. The Basin is divided into three regions, Highlands, Central Basin, and Lower Valley due to the amount and character of flooding within the Basin. The Highlands section of the Passaic River Basin drains approximately 489 square miles and most of the major tributaries to the Passaic River drain from the Highlands. These tributaries include the Whippany, Rockaway, Pequannock, Wanaque, Ramapo, and Pompton Rivers. These waterbodies are characterized by flash floods due to narrow and steep sided valleys. Flooding is common in the established municipalities of this section of the Basin (Passaic River Coalition 2015).

The Central Basin of the Passaic River Basin is made up of large areas of meadows and swamps. It extends from Long Hill Township into the south to Pequannock Township in the north. Flooding has occurred primarily in Wayne, Lincoln Park (Morris County), Pequannock (Morris County), Pompton Lakes, and Fairfield. Lastly, the Lower Valley of the Basin extends from Little Falls to Newark Bay. It is 173 square miles in size and is the most extensively developed area of the Basin (Passaic River Coalition 2015).

Several watersheds make up the Passaic River Basin in Morris County, including the Upper Passaic, Whippany, Rockaway, and Pequannock River watersheds. The Upper Passaic River watershed is the most extensive of the County's major watersheds. The Passaic River provides riverine, open water and wetland habitats for wildlife and drinking water, fishing and recreational opportunities for those that live within the watershed. Waterbodies in the Upper Passaic include Primrose Brook, the Great Swamp, Great Brook, Black Brook, Loantaka Brook, Upper Passaic River, and Jersey Brook's (Morris County NRI 2000).

The Rockaway River watershed emanates in Sussex County and travels through Morris County. Prior to 1700, there were only four natural impoundments in Morris County: Green Pond, Split Rock Reservoir, Cranberry Pond, and one unnamed pond below Oak Ridge Lake. When the iron industry was booming in the County, the need for water impoundments, water supply, recreation, and real estate development resulted in the current number of water impoundments in the County, with a total of 23 lakes and 275 ponds. Today, the major waterbodies in the County include Mountain Lake, Upper Longwood Lake, Boonton Reservoir, Taylortown Reservoir, Splitrock Reservoir, White Meadow Lake, and Lake Denmark (Morris County NRI 2000).

The Whippany River watershed is an area of 69.3 square miles in Morris County. It is made up of small streams and tributaries that drain into the Whippany River. The River is 16 miles long and is one of the sources of drinking water for more than one million people in northern New Jersey. The watershed encompasses numerous municipalities in Morris County, including: Boonton Township, Boonton Town, Denville Township, Mountain Lakes Borough, Parsippany-Troy Hills Township, Randolph Township, Mendham Township and Borough, Harding Township, Morris Township, Morristown, Hanover Township, East Hanover Township, Florham Park Borough and Madison Borough (Whippany River Watershed Action Committee 2014). The major waterbodies of the Whippany River watershed include Troy Brook, Watnong Brook, Clyde Potts Reservoir, Speedwell Lake, and Pocahontas Lake (Morris County NRI 2000).



The Pequannock River watershed drains 90 square miles and travels 30 miles before joining with the Wanaque River. Its headwaters are in the highlands of Sussex County and the River serves as the political boundary between Morris and Passaic Counties. Most of the land in this watershed is forested and protected. The Newark Watershed Conservation and Development Corporation holds 35,200 acres to protect a supply of water that is stored in five major reservoirs: Canistear, Charlotteburg, Clinton, Oak Ridge Reservoirs and Echo Lake (New Jersey Audubon Society 2013). Numerous lakes, ponds and reservoirs make up the Pequannock River watershed, with the major waterbodies including Lake Kinnelon, Lake Kakeout, Charlottesburg Reservoir and Oak Ridge Reservoir (Morris County NRI 2000).

Raritan River Basin

The Raritan River basin is the largest drainage area located entirely in New Jersey. The Basin contains portions of Morris, Hunterdon, Somerset, Mercer, Union, Middlesex, and Monmouth Counties. Approximately 1,100 square miles of the State's land drain into the Raritan Bay via the Raritan River and its tributaries while an additional 122 square miles is drained by the Shrewsbury and Navesink Rivers which empty into Sandy Hook Bay (New Jersey Audubon Society 2013). The South Branch Raritan River makes up the Basin and Morris County is located within its watershed. The South Branch drains almost 280 square miles as it winds 51 miles from western Morris County through central Hunterdon County and into western Somerset County, before combining with the North Branch. The South Branch begins in Morris County as the outflow of Budd Lake. Major tributaries include the Neshanic River, Spruce Run creek, Mullhockaway Creek, and Cakepoulin Creek. Major impoundments are the Spruce Run Reservoir and Round Valley Reservoir (NJDEP Date Unknown).

Watershed Management Areas

In 1996, the NJDEP began implementing a watershed management approach to maintaining the physical, chemical, and biological integrity of the State's waters. This approach concentrates on managing individual watershed areas by defining the physical geographic boundaries of the watersheds, basing water policy on sound scientific principles, and developing partnerships with the public. The NJDEP divided New Jersey into five water regions: the Northeast, Raritan, Northwest, Lower Delaware and Atlantic Coastal. Each water region is then divided into three to five watershed management areas (WMAs), for a total of 20 WMAs. Each WMA encompasses a particular group of major rivers and each consists of numerous smaller watersheds (USGS 2000). Morris County is located within the Raritan, Northwest and Northeast water regions. Additionally, the County is located in five of the 20 WMAs, which are described below (NJDEP 2007).

WMA 1: Upper Delaware

WMA 1 is also known as the Upper Delaware River Watershed and encompasses 746 square miles in the mountainous northwestern corner of the State. WMA 1 includes portions of Sussex, Morris, Hunterdon Counties and all of Warren County. In total, it contains 54 municipalities in New Jersey. Within WMA 1, there are six major drainage basins: Delaware River, Flat Brook, Paulins Kill, Pequest River, Lopatcong and Pohatcong River Drainage, and the Musconetcong River. These drainage basins flow in a southeasterly direction to the Delaware River, providing an outstanding recreational resource for trout production and maintenance, as well as habitat for an abundance of wildlife including threatened and endangered species (NJDEP 2014).

WMA 3: Pompton, Pequannock, Wanaque, Ramapo

WMA 3 is located within the water-rich Highlands Province of New Jersey. The Pequannock, Wanaque and Ramapo Rivers all flow into the Pompton River. The Pompton River is, in turn, a major tributary to the Upper Passaic River. WMA 3 contains some of the State's major water supply reservoir systems including the Wanaque Reservoir, the largest surface water reservoir in New Jersey. There are four watersheds in WMA 3: Pompton,



Ramapo, Pequannock and Wanaque River Watersheds. WMA 3 lies mostly in Passaic County but also includes parts of Bergen, Morris and Sussex Counties (NJDEP 2014).

WMA 4: Lower Passaic, Saddle River

WMA 4 includes the Lower Passaic River (from the Pompton River confluence downstream to the Newark Bay) and its tributaries, including the Saddle River. The WMA 4 drainage area is approximately 180 square miles and lies within portions of Passaic, Essex, Hudson, Morris and Bergen Counties. Two watersheds makeup WMA 4: the Lower Passaic River Watershed and Saddle River Watershed. The Lower Passaic River Watershed originates from the confluence of the Pompton River downstream to the Newark Bay. This 33-mile section meanders through Bergen, Hudson, Passaic and Essex Counties and includes a number of falls, culminating with the Great Falls in Paterson. This watershed has a drainage area of approximately 129 square miles. The major tributaries to this section of the Passaic River are the Saddle River, Preakness Brook, Second River and Third River. The Saddle River is one of the larger tributaries to the Lower Passaic River. The Saddle River Watershed has a drainage area of approximately 51 square miles. Land in this watershed is extensively developed and contains many older cities and industrial centers including Newark, Paterson, Clifton and East Orange (NJDEP 2014).

WMA 6: Upper and Mid Passaic, Whippany, Rockaway

WMA 6 represents the area drained by waters from the upper reaches of the Passaic River Basin including the Passaic River from its headwaters in Morris County to its confluence with the Pompton River. WMA 6 is characterized by extensive suburban development and reliance upon groundwater sources for water supply. It lies within portions of Morris, Somerset, Sussex and Essex Counties and includes the Upper and Middle Passaic River, Whippany River and Rockaway River Watersheds (NJDEP 2014).

WMA 8: North and South Branch Raritan

WMA 8 includes the North and South Branches of the Raritan River and their tributaries. Large portions of Somerset, Hunterdon, and Morris Counties are included in this land area. The North Branch of the Raritan River is 23 miles long and flows from northwestern Morris County through Somerset County to the confluence with the South Branch between the towns of Branchburg and Raritan (Somerset County). Major tributaries include the Peapack Brook, Rockaway Creek and Lamington River and the only major impoundment is Ravine Lake. Land use in the North Branch Raritan River Watershed is primarily rural, woodland and agricultural with scattered areas of commercial and residential but there is intense development along the major road corridors. There are over 20 NJPDES permitted discharges and 51 biological monitoring stations in this watershed (NJDEP 2014).

The South Branch of the Raritan River is 51 miles long and flows from western Morris County through central Hunterdon County into western Somerset County before joining the North Branch. Major tributaries include the Neshanic River, Spruce Run Creek, Mulhockaway Creek and Cakepoulin Creek and major impoundments are the Spruce Run and Round Valley Reservoirs. Land use in the South Branch Raritan River Watershed is mostly agricultural, but suburban-industrial development is increasing at a rapid rate. There are approximately 23 NJPDES permitted discharges and 51 biological monitoring stations in this watershed (NJDEP 2014).

Topography and Geology

Hills and valleys run east-west, with rocky out-croppings as high as 1,000 feet above sea level in the County. Morris County is located within two physiographic provinces: the Highlands Province from to the north and west and the Piedmont Province to the east and southeast.



The Highlands portion of the county is characterized by a series of discontinuous rounded ridges separated by deep and narrow valleys. In general, this area of the County is located high above sea level. Landforms within the Highlands include generally northeast trending ridges and valleys gradually dropping in elevation from west to east. A 200 to 400-foot border escarpment on the eastern edge, traversing the County from the Borough of Kinnelon through Morristown and separates the Highlands from the adjacent Piedmont. Morris County is mostly encompassed by the Highlands Province and consists mainly of Precambrian gneissic bedrock underlain by limestone, sandstone, or shale bedrock in the area's valley regions (USDA 1976; Morris County NRI 2000).

The Piedmont portions of Morris County are characterized by low rolling plains divided by higher ridges. In the area of the County where the Highlands Province meets the Piedmont Province, the land is approximately 300 to 400 feet above sea level. The land then slopes downward towards the south and eastern portions of the county (NJDEP 2006). In the Piedmont Province area of the County, the ground mainly consists of soft red shale also known as Brunswick shale or sandstone bedrock.

Climate

The climate of Morris County is mostly a temperate continental climate with some moderate maritime influences. Winter climate is controlled by polar continental air masses; summer climate by tropical air masses moving up over the United States from the Gulf of Mexico. The average annual precipitation is 48.34 inches. The average annual snowfall is 36.54 inches. The average temperature is 48.9°F, which is lower than the New Jersey average temperature of 51.9°F (FEMA FIS 2017).

Land Use, Land Cover, and Land Use Trends

Local zoning and planning authority are provided for under the New Jersey Municipal Land Use Law, which gives municipalities zoning and planning authority. The 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 significantly impact exposure and vulnerability to various hazards. For example, significant development in a hazard area increases the building stock and population exposed to that hazard.

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

Morris County is one of the largest counties in the State and has a diverse landscape; the majority of the County is either forested or developed. Since 1986, the County has experienced a decrease in agricultural, barren, forest and wetlands. Refer to Table 3-1 and Figure 3-2 below.

Table 3-1. Land Use Summary for Morris County, 2002, 2007 and 2015

	1986	1995	2002	2007	2012	2015
Total Acreage	308,085.6	308,117.5	308,117.5	308,117.5	308,117.5	308,117.5
Agriculture	18,318.6	14,831.8	13,303.3	13,353.8	11,748.5	11,752.2
Barren Land	2,986.1	3,000.6	3,425.0	3,237.8	2,539.8	2,550.6
Forest	129,856.4	126,294.3	124,011.3	122,566.3	118,818.8	118,857.4
Urban	103,557.1	108,652.0	113,061.0	114,487.2	120,748.0	120,747.8
Water	10,143.4	10,277.6	10,501.7	11,018.9	11,346.2	11,195.1



	1986	1995	2002	2007	2012	2015
Wetlands	43,224.0	45,061.2	43,815.2	43,453.6	42,916.2	43,014.3

Source: Morris County 2020 – data from the draft Land Use Element using the 2015 NJDEP Land Use Land Cover data.

Highlands Region of New Jersey

The New Jersey Highlands is a 1,343 square mile area (over 800,000 acres) in the northwest portion of New Jersey. It is noted for its scenic beauty, environmental significance and serves as a vital source of drinking water for over half of New Jersey residents. The Highlands stretches from Phillipsburg (Warren County) in southwest New Jersey to Ringwood (Passaic County) in the northeast. The Highlands Region lies within portions of seven counties, Hunterdon, Somerset, Sussex, Warren, Morris, Passaic and Bergen, and includes 88 municipalities. The Highlands Act designates approximately 398,000 acres as the Highlands Preservation Area which is identified as an area of exceptional natural resource value. The remainder of the Highlands Region that is not located within the Preservation Area lies within the Highlands Planning Area. The distinction between the Preservation and Planning Area is that municipal and county conformance with the Highlands Regional Master Plan is required in the Preservation Area, and voluntary in the Planning Area.

Morris County is located within the New Jersey Highlands (Figure 3-3). Northern and southwestern Morris County are located in the Highlands Preservation Area and the remainder of the County is located within the Highlands Planning Area.

Agriculture

In 2017, there were 418 farms in Morris County, an increase of 14% from 2012 which had 366 farms. The farms in the County cover 14,514 acres, which is only a slight increase since 2012 (14,458 acres) (USDA 2017). Forage (hay/haylage) is the top crop in acres (3,001 acres), making crops rather than livestock the most prominent agricultural output in Morris County. Many farms in Morris County operate seasonal and/or year-round farm markets or farm stands which provide the farms direct links to their customers. Nearly every municipality in Morris County contains several acres of farmland, with Washington Township having the largest area of land used for farmland (10,815 acres or 37.7% of the Township's total land area) (Morris County Planning 2014).

Open Space and Parkland

The Morris County Park Commission includes 38 facilities: historic sites, golf courses, outdoor educational and recreational facilities, arboreta, conservation areas, 150 miles of trails, and ice-skating arena. The Commission is the largest park system in New Jersey (based on acreage) with more than 18,900 acres of passive and active recreational opportunities throughout the County. This includes golf, hiking, ice skating, sledding, ice fishing, fishing, boating, swimming, cross-country skiing, snowshoeing, biking, recreational fields, environmental education and special programming throughout the year. The largest wildlife preserves in the County are the Mahlon Dickerson Reserve in Jefferson Township and Silas Condict Park in Kinnelon. Table 3-2 identifies the Morris County and New Jersey State parks located throughout the County.



Figure 3-2. 2015 Land Use Land Cover for Morris County

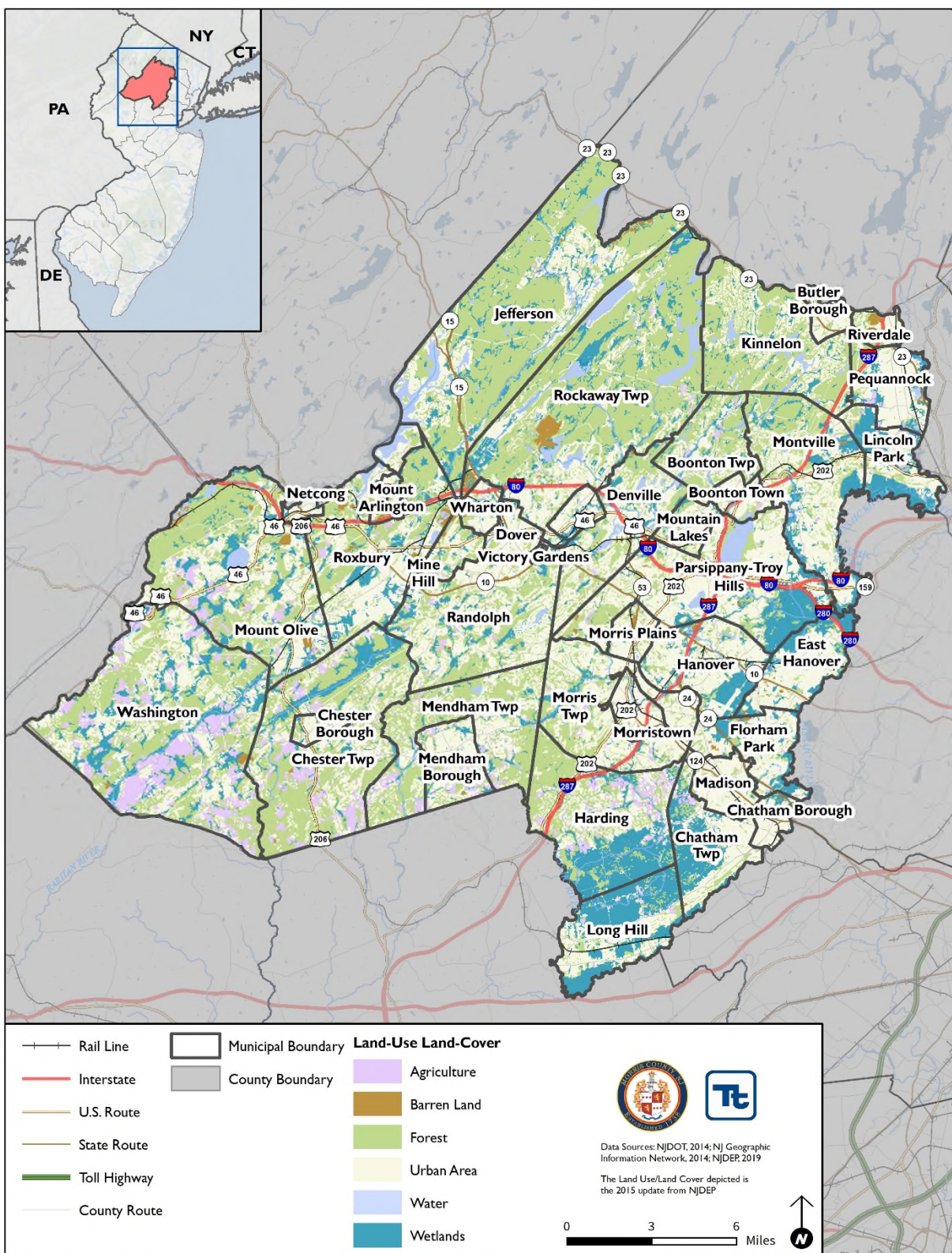
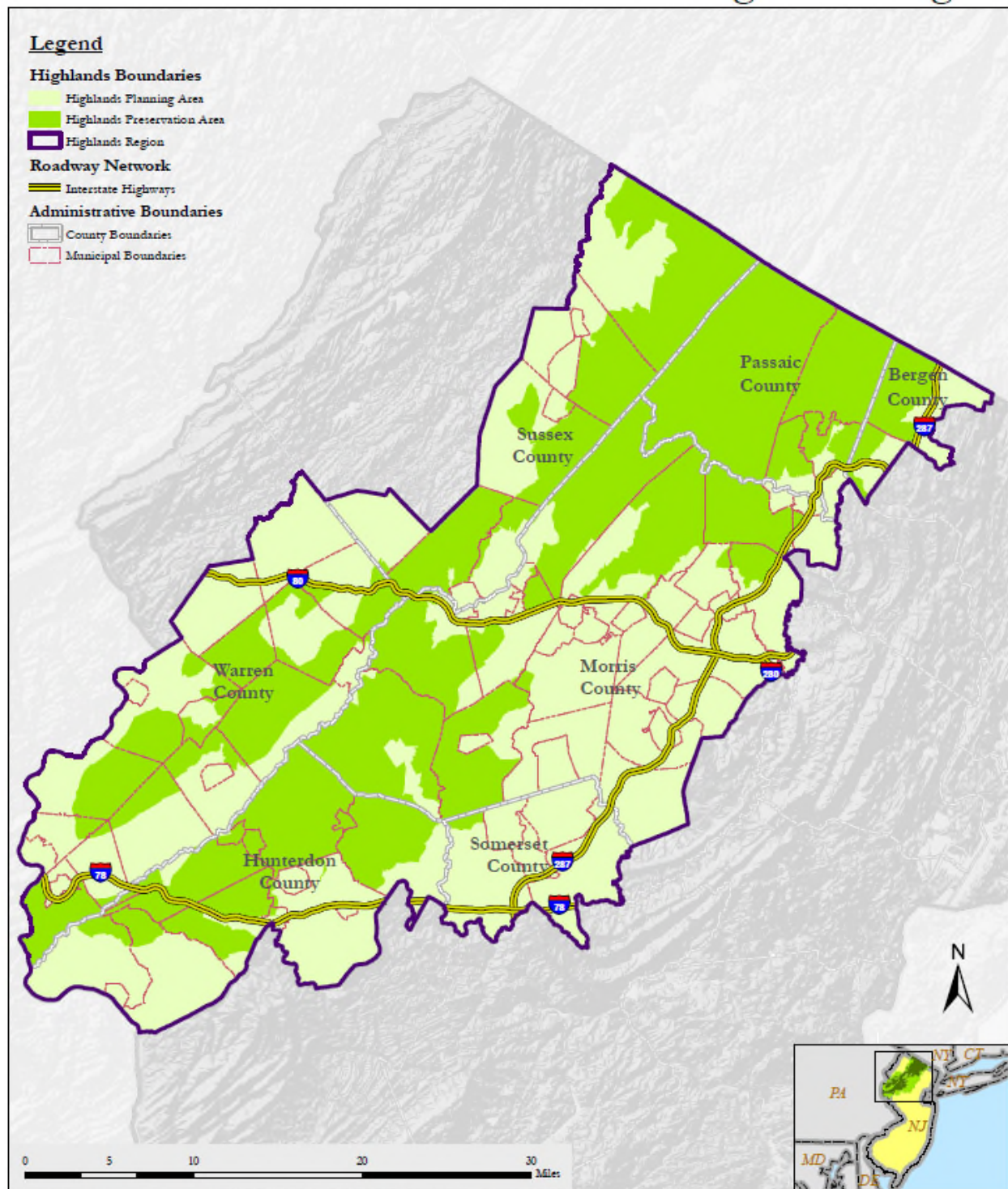




Figure 3-3. Highlands Region



Source: New Jersey Highlands Council 2006



Table 3-2. County, State and Federal Parks in Morris County

Park	Acreage	Municipality
Allamuchy Mountain and Stephens State Park	2,440	Mount Olive Township
Bamboo Brook Outdoor Education Center	100	Chester Township
Cooper Gristmill	N/A	Chester Township
Craigmeur Recreation Complex	130	Jefferson Township and Rockaway Township
Elizabeth D. Kay Environmental Center	223	Chester Township
Fosterfields Living Historical Farm	200	Morris Township
Frelinghuysen Arboretum	127	Morris Township
Federal Great Swamp and County Outdoor Education Center	7,811	Chatham Township
Hacklebarney State Park	978	Chester Township
Hedden Park	380	Dover, Mine Hill, and Randolph
Historic Speedwell	7.5	Morristown
James Andrews Memorial Park	75	Randolph Township
Lee's Park Marina	N/A	Mount Arlington Borough
Lewis Morris Park	1,154	Harding, Mendham and Morris Townships
Loantaka Brook Reservation	570	Morristown
Mahlon Dickerson Reservation	3,200	Jefferson Township
Mennen Sports Arena	N/A	Morris Township
Morristown National Historic Park	1,676	Morristown
Mount Hope Historical Park	391	Rockaway Township
Mount Paul Memorial Park	285	Chester Township
Old Troy Park	96	Parsippany-Troy Hills Township
Passaic River Park	769	Chatham and Long Hill Townships
Patriots' Path	35 miles	Throughout the County
Pyramid Mountain Natural Historic Area	1,500	Kinnelon Borough and Montville Township
Schooley's Mountain Park	797	Washington Township
Seaton Hackney Farm	38	Morris Township
Silas Condict Park	1,508.75	Kinnelon Borough
Tourne Park	546.9	Denville Township
Traction Line Recreation Trail	2 miles	Madison Borough, Morristown and Morris Township
Willowood Arboretum	130	Chester Township

Source: Morris County Park Commission

N/A

Not Available

Urban Land

Urban land includes most of what normally would be considered developed land. Residential areas, commercial areas, services and institutions, industrial areas, and those developed for transportation and utilities are the primary land uses included in urban land. There are several other open land categories that are included with urban land. Developed recreation areas, whether a part of a park, educational facility, or private concern (e.g. golf course), are also considered a part of urban land. Also included are areas such as large, landscaped lawns in corporate businesses and service centers, parks, and residential areas (NJDEP 2014). The following table identifies the urbanized municipalities in Morris County, based on NJDEP 2002 land use/land cover data, with



populations from the 2017 ACS estimates. Urbanized municipalities in Morris County are those communities where 90% or more of the total land is categorized as urban.

Table 3-3. Urban Municipalities in Morris County

Municipality	Population (2017 ACS)	Land Area (Square Miles)	Population per Square Mile
Boonton Town	8,405	2.34	3,592
Butler	7,802	2.04	3,825
Chatham Borough	9,003	2.37	3,799
Dover	18,307	2.68	6,831
Madison	16,066	4.21	3,816
Morristown	18,787	2.93	6,412
Rockaway Borough	6,458	2.07	3,120
Victory Gardens	1,685	0.15	11,233
Wharton	6,601	2.15	3,070

Source: U.S. Census, 2013-2017 American Community Survey

3.2 POPULATION AND DEMOGRAPHICS

Knowledge of the composition of the population, how it has changed in the past and how it may change in the future is needed to make informed decisions. Information about population is a critical part of planning because it directly relates to needs such as housing, industry, stores, public facilities and services, and transportation.

The population of Morris County was estimated at 498,847 in 2017 according to the ACS 5-year estimates. According to the 2010 U.S. Census, Morris County had a population of 492,276 people which represents an increase from the 2000 U.S. Census population of 470,212 people. According to the 2013-2017 ACS data, the Township of Parsippany-Troy Hills is the most populous municipality in Morris County, comprising 10.7% of the County's total population. Table 3-4 lists the 10 municipalities with the greatest population in Morris County. Table 3-5 presents the population statistics for Morris County based on the 2010 decennial census and 2013-2017 American Community Survey 5-Year Estimates. Figure 3-4 shows the distribution of the general population density (persons per square mile) in 2010 by Census block.

Table 3-4. Ten Largest Municipalities in Morris County

Rank	Municipality	2013-2017 ACS
1	Township of Parsippany-Troy Hills	53,443
2	Township of Mount Olive	29,017
3	Township of Randolph	25,885
4	Township of Rockaway	24,773
5	Township of Roxbury	23,459
6	Township of Morris	22,542
7	Township of Montville	21,742
8	Township of Jefferson	21,440
9	Town of Morristown	18,787
10	Township of Washington	18,713

Source: U.S. Census, 2013-2017 American Community Survey



Table 3-5. General Population Statistics for Morris County

Municipality	2000 Census Total	2010 Census Total	2013-2017 ACS						
			Total	Pop. 65+	% Pop. 65+	Pop Under 5	% Under 5	Below Poverty Level*	% Below Poverty Level
Town of Boonton	8,496	8,347	8,405	1,088	12.9%	689	8.2%	582	6.9%
Township of Boonton	4,287	4,263	4,356	670	15.4%	160	3.7%	100	2.3%
Borough of Butler	7,420	7,539	7,802	1,182	15.1%	478	6.1%	294	3.8%
Chatham Borough	8,460	8,962	9,003	954	10.6%	561	6.2%	132	1.5%
Chatham Township	10,086	10,452	10,521	1,692	16.1%	489	4.7%	279	2.7%
Chester Borough	1,635	1,649	1,540	324	21.0%	70	4.5%	108	7.0%
Chester Township	7,282	7,838	7,931	1,092	13.8%	335	4.2%	262	3.3%
Denville Township	15,824	16,635	16,815	3,004	17.9%	913	5.4%	515	3.1%
Town of Dover	18,188	18,157	18,307	1,801	9.8%	890	4.9%	2,067	11.3%
Township of East Hanover	11,393	11,157	11,241	2,388	21.2%	837	7.4%	497	4.4%
Borough of Florham Park	8,857	11,696	11,792	2,393	20.3%	579	4.9%	968	8.2%
Township of Hanover	12,898	13,712	14,428	2,549	17.7%	800	5.5%	338	2.3%
Township of Harding	3,180	3,838	3,886	980	25.2%	162	4.2%	101	2.6%
Township of Jefferson	19,717	21,314	21,440	3,038	14.2%	862	4.0%	1,122	5.2%
Borough of Kinnelon	9,365	10,248	10,240	1,571	15.3%	583	5.7%	270	2.6%
Borough of Lincoln Park	10,930	10,521	10,457	1,908	18.2%	549	5.2%	339	3.2%
Township of Long Hill	8,777	8,702	8,763	1,409	16.1%	398	4.5%	253	2.9%
Borough of Madison	16,530	15,845	16,066	2,255	14.0%	844	5.3%	1,028	6.4%
Borough of Mendham	5,097	4,981	4,997	1,101	22.0%	231	4.6%	185	3.7%
Township of Mendham	5,400	5,869	5,875	737	12.5%	304	5.2%	147	2.5%
Township of Mine Hill	3,679	3,651	3,599	502	13.9%	265	7.4%	234	6.5%
Township of Montville	20,839	21,528	21,742	3,522	16.2%	1,002	4.6%	727	3.3%
Borough of Morris Plains	5,236	5,532	5,623	935	16.6%	329	5.9%	61	1.1%



Municipality	2000 Census Total	2010 Census Total	2013-2017 ACS						
			Total	Pop. 65+	% Pop. 65+	Pop Under 5	% Under 5	Below Poverty Level*	% Below Poverty Level
Township of Morris	21,796	22,306	22,542	4,559	20.2%	986	4.4%	1,238	5.5%
Town of Morristown	18,544	18,411	18,787	2,392	12.7%	842	4.5%	1,395	7.4%
Borough of Mount Arlington	4,663	5,050	5,404	1,299	24.0%	71	1.3%	45	0.8%
Township of Mount Olive	24,193	28,117	29,017	3,331	11.5%	1,530	5.3%	1,841	6.3%
Borough of Mountain Lakes	4,256	4,160	4,292	523	12.2%	178	4.2%	150	3.5%
Netcong Borough	2,580	3,232	3,238	564	17.4%	111	3.4%	372	11.5%
Township of Parsippany-Troy Hills	50,649	53,238	53,443	8,300	15.5%	2,661	5.0%	2,344	4.4%
Township of Pequannock	13,888	15,540	15,503	3,869	25.0%	445	2.9%	747	4.8%
Township of Randolph	24,847	25,736	25,885	3,269	12.6%	1,433	5.5%	741	2.9%
Borough of Riverdale	2,498	3,559	4,218	736	17.5%	284	6.7%	312	7.4%
Borough of Rockaway	6,473	6,438	6,458	1,255	19.4%	226	3.5%	220	3.4%
Township of Rockaway	22,930	24,156	24,773	4,148	16.7%	1,343	5.4%	791	3.2%
Township of Roxbury	23,883	23,324	23,459	4,072	17.4%	1,213	5.2%	1,269	5.4%
Borough of Victory Gardens	1,546	1,520	1,685	111	6.6%	117	7.0%	415	24.6%
Township of Washington	17,592	18,533	18,713	2,647	14.1%	806	4.3%	526	2.8%
Borough of Wharton	6,298	6,522	6,601	874	13.2%	373	5.6%	271	4.1%
Morris County (Total)	470,212	492,276	498,847	79,042	16%	24,949	5%	23,287	5%

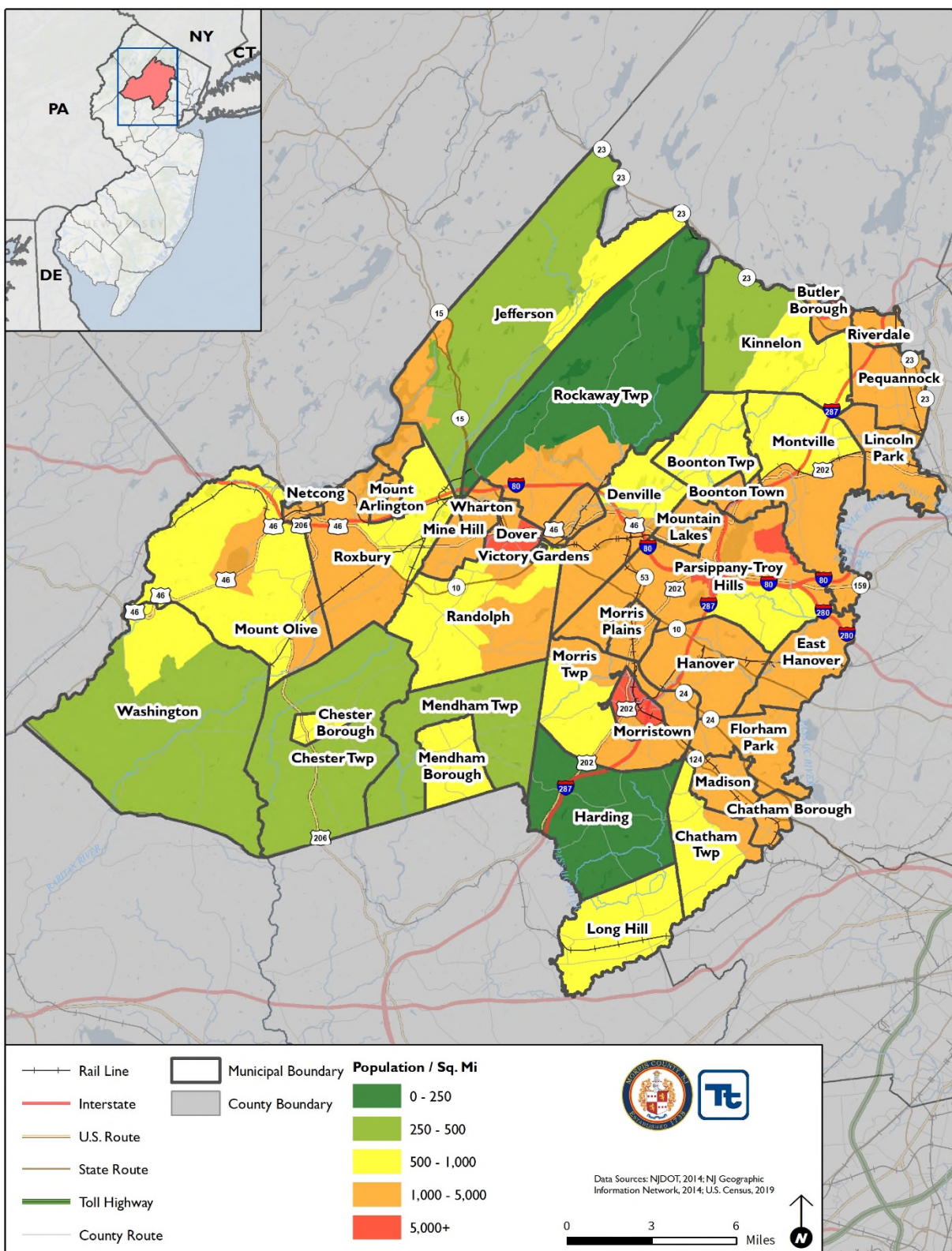
Source: U.S. Census Bureau: Census 2010, 2013-2017 ACS, QuickFacts

Note: Pop. = population

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



Figure 3-4. Distribution of General Population in Morris County by Census Tract





3.2.1 Vulnerable Populations

Research has shown that some populations, while they may not have more hazard exposure, may experience exacerbated impacts and prolonged recovery if/when impacted. This is due to many factors including their physical and financial ability to react or respond during a hazard. Identifying concentrations of vulnerable populations can assist communities in targeting preparedness, response and mitigation actions. For the purposes of this planning process, vulnerable populations in Morris County include children, elderly, low-income, the physically or mentally disabled, non-English speakers and the medically or chemically dependent.

Age

Children are considered vulnerable because they are dependent on others to safely access resources during emergencies. The elderly are more apt to lack the physical and economic resources necessary for response to hazard events and are more likely to suffer health-related consequences making recovery slower. Those living on their own may have more difficulty evacuating their homes. The elderly are also more likely to live in senior care and living facilities where emergency preparedness occurs at the discretion of facility operators. Senior care and living facilities are also most vulnerable to hazards like pandemics in light of the close living arrangements combined with older populations with potentially weakened immune systems or pre-existing health issues that may be accentuated during this type of hazard event.

According to the 2013-2017 ACS 5-Year Estimates, 24,949 (5.0%) of the County's population is under the age of 5 and 79,042 people (11.2%) of the County's total population were age 65 and older. Figure 3-5 shows the distribution of persons under the age of 5 and over 65 in Morris County.

Income

Of the total population, economically disadvantaged populations are more vulnerable because they are likely to evaluate their risk and make decisions based on the major economic impact to their family (e.g., evacuation). Based on the 2014-2018 American Community Survey, per capita income in Morris County was estimated at \$55,826 and the median household income for Morris County is \$111,316. Greater than 12% of households receive an income between \$50,000 and \$74,999 per year and 23.4% of households receive over \$200,000 annually.

According to the Census' 2019 poverty thresholds, the weighted average thresholds for a family of four in 2019 was \$26,167; for a family of three, \$20,347; for a family of two, \$16,541, and for unrelated individuals, \$13,016. The 2014-2018 American Community Survey data identified approximately 15,961 households as having an annual income of less than \$25,100 and are therefore below the poverty level in Morris County (household = family of 4). Figure 3-5 shows the distribution of low-income persons.

Physically or Mentally Disabled

"Persons with a disability include those who have physical, sensory, or cognitive impairment that might limit a major life activity" (Center for Disease Control, 2015). These impairments may increase the level of difficulty that individuals face during an emergency. Cognitive impairments may reduce an individual's capacity to receive, process, and respond to emergency information or warnings. Individuals with a physical or sensory disability may face issues of mobility, sight, hearing, or reliance on specialized medical equipment. According to the 2014-2018 American Community Survey, 4.6% percent residents of Morris County are living with a disability. Figure 3-5 shows the geographic distribution of disabled individuals throughout Morris County, including individuals with hearing, vision, cognitive, ambulatory, self-care, and independent living difficulties.



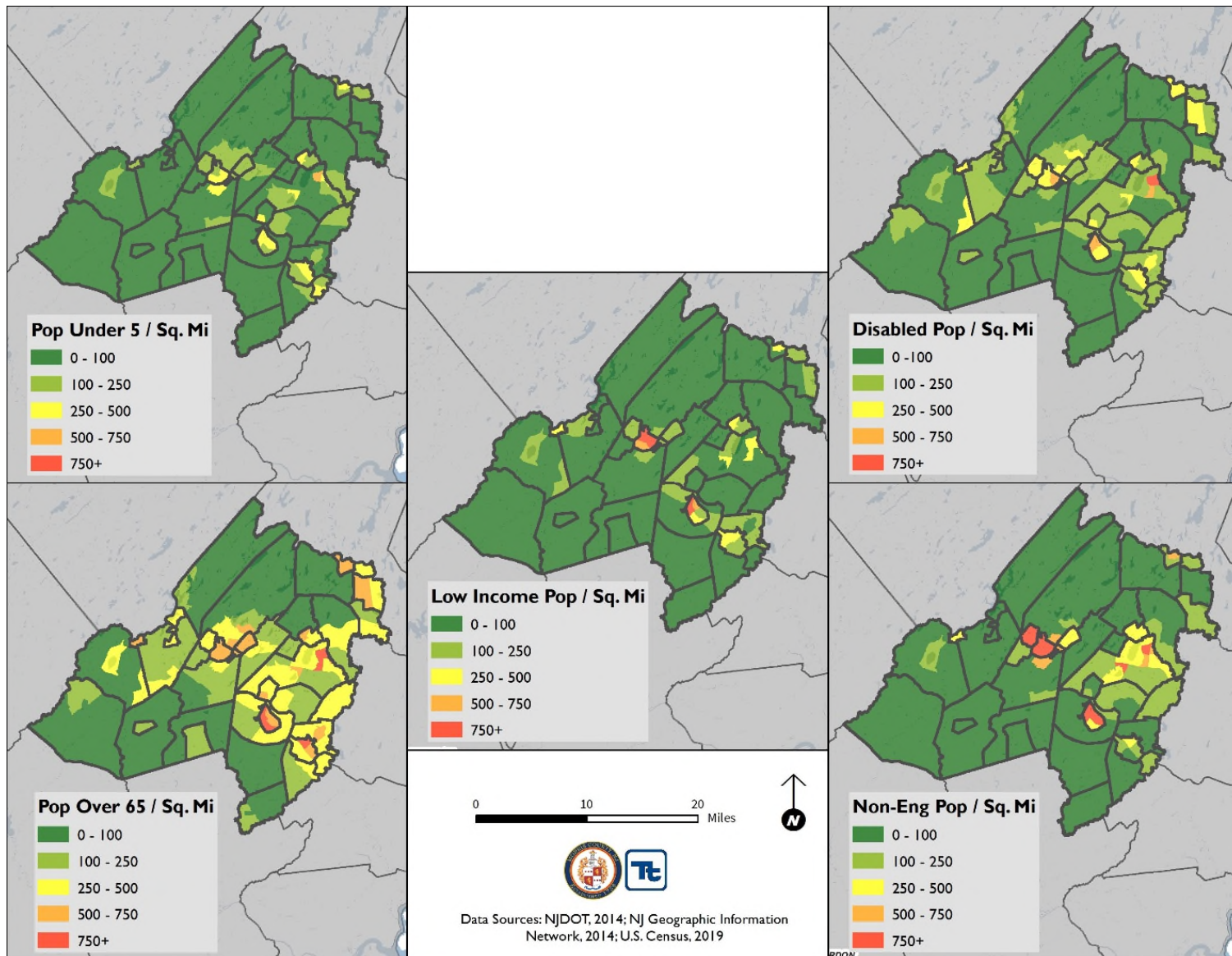
Non-English Speakers

Individuals who are not fluent or have a working proficiency in English may have difficulty understanding hazard-related information. Cultural differences can also add complexity to how information is being conveyed to populations with limited English proficiency (Centers for Disease Control, 2015). According to the 2018 American Community Survey, 24.3% of County residents over the age of 5 primarily speak a language other than English at home. This is up from 10.4% reported in the 2012-2016 ACS. Of the County's population, 10.8% percent speak Spanish, 7.7% speak other Indo-European languages, 5% speak Asian and Pacific Island Languages, and 0.8% speak other languages. Figure 3-5 below shows the geographic distribution of individuals who speak English less than "very well."

The Towns of Dover (68.8%) and Morristown (39.4%) and the Borough of Wharton (56.3%) have the largest proportion of households that speak a language other than English at home. The primary non-English language spoken in these homes is Spanish; this is most prevalent in the Town of Dover, where 65.6% of the population primarily speaks Spanish at home.



Figure 3-5. Distribution of Socially Vulnerable Populations in Morris County by Census Tract





3.2.2 Population Trends

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

From 1880 to 2017, the County has experienced a constant growth in population. The largest increase was seen between the years 1950 to 1960, when the County experienced a 59.2% (97,249 persons) population increase. The smallest increase was seen between the years 1980 and 1990, when Morris County experienced a 3.4% (13,723 persons) population increase. Table 3-6 displays the change in population from 1880 to 2017 in Morris County.

Table 3-6. Morris County Population Trends, 1880 to 2017

Year	Population	Change in Population	Percent (%) Population Change
1880	50,861	NA	NA
1890	54,101	3,240	6.4%
1900	65,156	11,055	20.4%
1910	74,704	9,548	14.7%
1920	82,694	7,990	10.7%
1930	110,445	27,751	33.6%
1940	125,732	15,287	13.8%
1950	164,371	38,639	30.7%
1960	261,620	97,249	59.2%
1970	383,454	121,834	46.6%
1980	407,630	24,176	6.3%
1990	421,353	13,723	3.4%
2000	470,212	48,859	11.6%
2010	492,276	22,064	4.7%
2017	498,847	6,571	1.3%

Source: NJ Department of Labor 2001; U.S. Census Bureau, 2013-2017 ACS

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

Taking a closer look at changes from 1970 to 2011, almost two-thirds of Morris County's population growth occurred in seven of the 39 municipalities: Township of Mount Olive, Township of Randolph, Township of Roxbury, Township of Washington, Township of Jefferson, and Township of Rockaway. Over this time, the Township of Mount Olive experienced the greatest percentage increase of 172%. As shown in Table 3-7, a majority of the County's municipalities experienced an increase in population between 2010 and the 2013-2017 ACS estimates, with the Borough of Riverdale experiencing the greatest increase in population during this time (18.5%). Chester Borough experienced the largest decrease in population (6.6% decrease).



Table 3-7. Changes in Population by Municipality (2000 to 2017)

Municipality	2013-2017 ACS	2010 Census	2000 Census	Change in Population (2010 to 2013-2017 ACS)	Percent (%) Population Change
Town of Boonton	8,405	8,347	8,496	58	0.69%
Township of Boonton	4,356	4,263	4,287	93	2.18%
Borough of Butler	7,802	7,539	7,420	263	3.49%
Chatham Borough	9,003	8,962	8,460	41	0.46%
Chatham Township	10,521	10,452	10,086	69	0.66%
Chester Borough	1,540	1,649	1,635	-109	-6.61%
Chester Township	7,931	7,838	7,282	93	1.19%
Denville Township	16,815	16,635	15,824	180	1.08%
Town of Dover	18,307	18,157	18,188	150	0.83%
Township of East Hanover	11,241	11,157	11,393	84	0.75%
Borough of Florham Park	11,792	11,696	8,857	96	0.82%
Township of Hanover	14,428	13,712	12,898	716	5.22%
Township of Harding	3,886	3,838	3,180	48	1.25%
Township of Jefferson	21,440	21,314	19,717	126	0.59%
Borough of Kinnelon	10,240	10,248	9,365	-8	-0.08%
Borough of Lincoln Park	10,457	10,521	10,930	-64	-0.61%
Township of Long Hill	8,763	8,702	8,777	61	0.70%
Borough of Madison	16,066	15,845	16,530	221	1.39%
Borough of Mendham	4,997	4,981	5,097	16	0.32%
Township of Mendham	5,875	5,869	5,400	6	0.10%
Township of Mine Hill	3,599	3,651	3,679	-52	-1.42%
Township of Montville	21,742	21,528	20,839	214	0.99%
Borough of Morris Plains	5,623	5,532	5,236	91	1.64%
Township of Morris	22,542	22,306	21,796	236	1.06%
Town of Morristown	18,787	18,411	18,544	376	2.04%
Borough of Mount Arlington	5,404	5,050	4,663	354	7.01%
Township of Mount Olive	29,017	28,117	24,193	900	3.20%
Borough of Mountain Lakes	4,292	4,160	4,256	132	3.17%
Netcong Borough	3,238	3,232	2,580	6	0.19%
Township of Parsippany-Troy Hills	53,443	53,238	50,649	205	0.39%
Township of Pequannock	15,503	15,540	13,888	-37	-0.24%
Township of Randolph	25,885	25,736	24,847	149	0.58%
Borough of Riverdale	4,218	3,559	2,498	659	18.52%
Borough of Rockaway	6,458	6,438	6,473	20	0.31%
Township of Rockaway	24,773	24,156	22,930	617	2.55%
Township of Roxbury	23,459	23,324	23,883	135	0.58%
Borough of Victory Gardens	1,685	1,520	1,546	165	10.86%
Township of Washington	18,713	18,533	17,592	180	0.97%



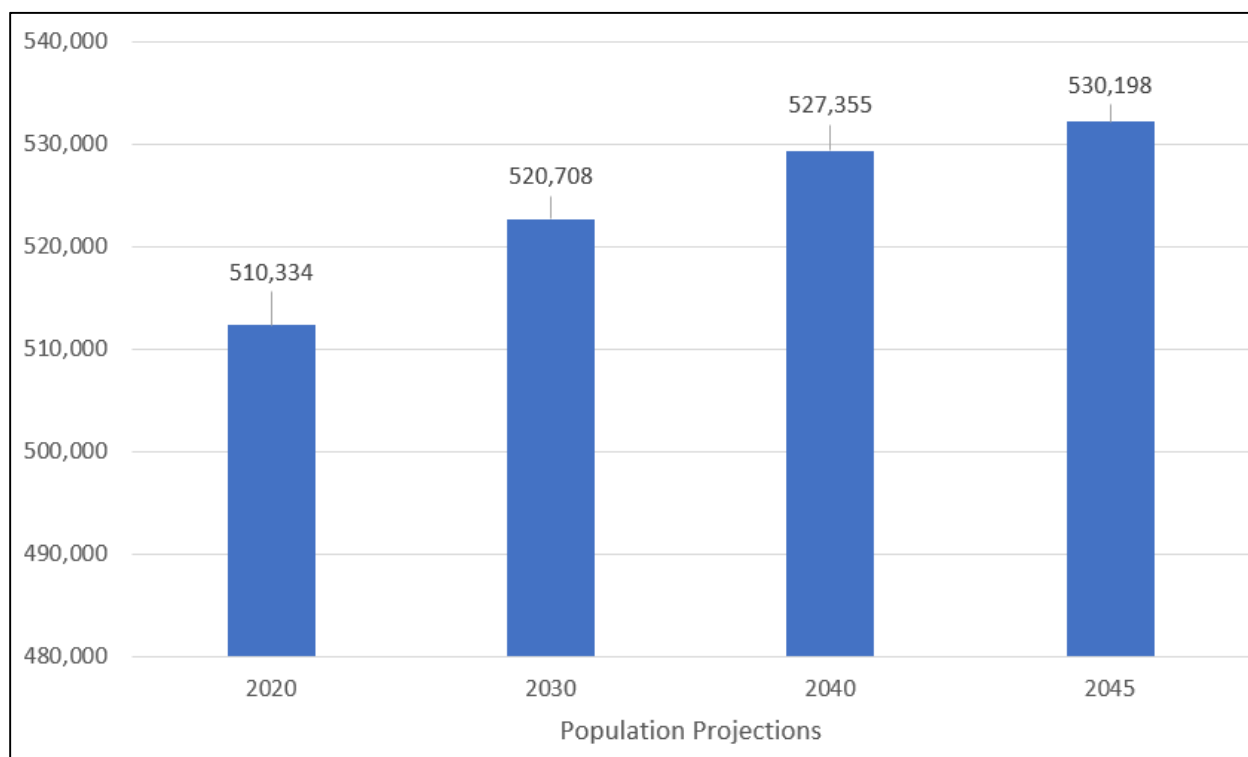
Municipality	2013-2017 ACS	2010 Census	2000 Census	Change in Population (2010 to 2013-2017 ACS)	Percent (%) Population Change
Borough of Wharton	6,601	6,522	6,298	79	1.21%

Source: U.S. Census Bureau: Census 2010, 2013-2017 ACS

Over the last 15 years, new regulations, new economic realities and changing conditions influenced the rate of population growth in Morris County and will continue to influence population growth moving forward. Enactment of the Highlands Act in 2004 and subsequent adoption of related NJDEP regulations is one of the reasons for the modest rate of population growth, although nearly half of New Jersey's counties have been experiencing population decline. Within Morris County most jurisdictions experienced only modest population increases from 2010 to 2017, with the exception of a couple jurisdictions like Riverdale (68.8% increase) in the north and the Township of Mount Olive (19.9% increase) in the central part of the County.

Over time, the Act has reduced the development capacity in most of Morris County. The addition of Highlands-specific environmental restrictions further reduces the development potential in the County, particularly in the Preservation Area. Continued support for open space and farmland preservation programs also reduces the availability of land for residential development and subsequent population growth (New Jersey Highlands Council, 2018). Demographic trends tend to influence overall population growth in the County. The number of households with children is declining; however, the number of non-family and one-two person households has been rising. Additionally, the local population continues to age. A continuation of these trends may suppress future rates of population growth (Janus Solutions, 2017). At the same time, however, there is some evidence of larger income families relocating from New York City to Morris County and some qualitative data suggesting that the recent openings of trendy local businesses in Morristown like yoga studios and wine shops are attracting millennials from neighboring big cities like Manhattan and Philadelphia who are perhaps moving back to Morris County (their hometown). Lastly, the amount of available land for residential development is shrinking (Vittekk, 2020). Population growth projections are discussed later in this section.

Over the next 15 years (2019 to 2034), Morris County has a projected population growth of 9.3% percent. Based on New Jersey Department of Labor population projections, the County population was estimated at 509,100 in 2019 and is expected to reach 523,700 by 2024; 535,600 by 2029; and 548,000 by 2034 (Figure 3-6).

**Figure 3-6. Morris County Population Projections, 2020 to 2045**

Source: NJTPA 2017

3.3 GENERAL BUILDING STOCK

The 2018 U.S. Census data identified an estimated 180,896 households (189,129 housing units) in Morris County. This is a small increase in households from 2010 (0.2%), but a decrease in housing units (decrease of 0.03%). 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.

For this update, the default general building stock in HAZUS-MH was updated and replaced with a custom-building inventory for Morris County both at the aggregate (2010 Census block and tract) and structure level. The building stock update was performed using the most current parcel and tax assessment data provided by the Morris County Geographic Information System (GIS) Services. For the purposes of this plan, building footprints were also received from the Morris County Office of Information Technology (MCOIT), and supplemented with Microsoft Bing 2018 footprints where gaps were identified as per guidance from MCOIT GIS Services. The tax data associated to the parcels was spatially joined to the building footprints to use in the risk assessment. This resulted in approximately 189,129 structures with an estimated replacement cost total of \$127 billion using 2019 RS Means values. Estimated content value was calculated by using 50% of the residential improvement value, and 100% of the non-residential improvement values. It is recognized that actual content value varies widely depending on the usage of the structure; however, this information was not available for use in this plan. Approximately 85% of the total buildings in the County are residential, which make up approximately 56% of the total building replacement cost value associated with residential housing. Table 3-8 presents building stock statistics by occupancy class for Morris County used for this HMP.



The majority of housing units in Morris County are single-family detached units (66.9% or 128,208 units) (ACS 2018). The 2016 U.S. Census Bureau's County Business Patterns data identified 16,704 business establishments employing 296,580 people in Morris County. The professional, scientific, and technical services industry has the greatest number of establishments in the County (2,590). This is followed by the retail trade industry with 1,809 establishments and the healthcare and social assistance trade with 1,724 establishments (U.S. Census, 2016).

Figure 3-7 through Figure 3-9 show the density distribution of residential, commercial and industrial buildings in Morris County by Census block; replacement cost value of structures per unit area, including building contents. The densities are shown in units of \$1,000 (\$K) per square mile. Viewing exposure distribution maps can assist communities in visualizing areas of high exposure and in evaluating aspects of the study area in relation to the specific hazard risks.



Table 3-8. Number of Buildings and Improvement Value by Occupancy Class

Municipality	All Occupancies				Residential		Commercial		Industrial	
	Count	RCV (Structure Only)	RCV (Contents Only)	Total RCV (Structure + Contents)	Count	Total RCV (Structure + Contents)	Count	Total RCV (Structure + Contents)	Count	Total RCV (Structure + Contents)
Town of Boonton	3,262	\$1,093,745,634	\$738,879,904	\$1,832,625,537	2,820	\$1,064,597,190	211	\$220,654,163	54	\$286,129,035
Township of Boonton	1,898	\$853,584,654	\$535,195,481	\$1,388,780,135	1,696	\$955,167,521	46	\$110,651,686	15	\$100,845,578
Borough of Butler	2,701	\$887,484,127	\$602,201,944	\$1,489,686,071	2,346	\$855,846,547	150	\$255,030,792	26	\$132,978,319
Chatham Borough	3,286	\$1,017,492,180	\$656,468,288	\$1,673,960,469	2,938	\$1,083,071,676	194	\$284,158,948	30	\$45,673,647
Chatham Township	4,080	\$1,457,186,108	\$843,051,505	\$2,300,237,613	3,856	\$1,842,403,806	50	\$111,076,232	0	\$0
Chester Borough	853	\$393,013,456	\$301,654,954	\$694,668,411	590	\$274,075,506	174	\$312,838,631	0	\$0
Chester Township	3,680	\$1,710,403,205	\$1,072,228,069	\$2,782,631,274	2,952	\$1,914,525,406	135	\$134,842,588	9	\$24,474,361
Denville Township	7,198	\$2,601,694,326	\$1,796,151,178	\$4,397,845,504	5,694	\$2,416,629,445	302	\$540,103,675	52	\$400,146,652
Town of Dover	4,514	\$1,533,960,380	\$1,106,827,598	\$2,640,787,978	3,960	\$1,281,398,346	333	\$475,033,731	59	\$511,022,911
Township of East Hanover	4,848	\$2,703,147,977	\$2,036,924,327	\$4,740,072,304	4,312	\$1,998,670,950	255	\$1,425,230,003	137	\$900,582,595
Borough of Florham Park	3,805	\$2,196,716,450	\$1,571,705,532	\$3,768,421,982	3,414	\$1,875,032,753	140	\$848,315,858	15	\$414,692,768
Township of Hanover	7,090	\$3,143,302,066	\$2,466,166,961	\$5,609,469,027	5,827	\$2,031,405,315	260	\$974,350,419	126	\$1,129,236,223
Township of Harding	2,230	\$1,120,809,326	\$687,446,646	\$1,808,255,972	1,767	\$1,300,088,040	78	\$107,530,500	0	\$0
Township of Jefferson	9,625	\$2,747,734,314	\$1,673,340,644	\$4,421,074,958	8,352	\$3,223,181,010	370	\$446,346,305	23	\$26,218,499
Borough of Kinnelon	4,093	\$1,837,182,525	\$1,021,583,725	\$2,858,766,250	3,895	\$2,446,796,400	63	\$127,590,052	1	\$187,754
Borough of Lincoln Park	4,166	\$1,258,119,722	\$867,252,176	\$2,125,371,898	3,227	\$1,172,602,636	79	\$175,035,430	30	\$286,800,224
Township of Long Hill	3,643	\$1,372,166,834	\$881,294,260	\$2,253,461,094	3,026	\$1,472,617,721	189	\$292,040,903	42	\$129,920,656
Borough of Madison	6,301	\$1,852,724,744	\$1,213,596,192	\$3,066,320,935	5,557	\$1,917,385,657	248	\$445,721,141	10	\$10,789,070
Borough of Mendham	2,139	\$904,095,083	\$575,082,961	\$1,479,178,043	1,837	\$987,036,366	114	\$155,741,122	0	\$0
Township of Mendham	2,667	\$1,328,123,548	\$770,918,335	\$2,099,041,883	2,340	\$1,671,615,639	34	\$28,010,142	0	\$0
Township of Mine Hill	1,590	\$468,137,015	\$298,834,471	\$766,971,485	1,420	\$507,907,631	69	\$74,987,543	8	\$105,773,541
Township of Montville	8,179	\$4,074,234,793	\$2,639,799,242	\$6,714,034,036	7,479	\$4,303,306,652	223	\$389,049,153	109	\$1,286,712,682
Borough of Morris Plains	2,378	\$1,013,799,201	\$724,975,833	\$1,738,775,034	1,970	\$866,470,102	94	\$334,831,370	3	\$53,810,950
Township of Morris	9,713	\$3,652,272,035	\$2,438,805,619	\$6,091,077,654	7,882	\$3,640,399,247	261	\$788,624,516	247	\$246,014,221



Municipality	All Occupancies				Residential		Commercial		Industrial	
	Count	RCV (Structure Only)	RCV (Contents Only)	Total RCV (Structure + Contents)	Count	Total RCV (Structure + Contents)	Count	Total RCV (Structure + Contents)	Count	Total RCV (Structure + Contents)
Town of Morristown	4,413	\$1,696,879,293	\$1,248,632,379	\$2,945,511,672	3,743	\$1,344,740,743	419	\$829,931,601	16	\$40,931,544
Borough of Mount Arlington	2,333	\$652,413,436	\$413,011,526	\$1,065,424,961	1,958	\$718,205,729	41	\$83,965,061	2	\$1,935,212
Township of Mount Olive	9,115	\$4,199,211,915	\$2,982,188,505	\$7,181,400,421	7,863	\$3,651,070,230	276	\$654,479,186	90	\$1,486,552,304
Borough of Mountain Lakes	1,642	\$721,160,770	\$462,244,728	\$1,183,405,498	1,478	\$776,748,127	61	\$159,598,215	3	\$11,262,292
Netcong Borough	1,100	\$406,279,678	\$288,802,301	\$695,081,980	957	\$352,432,130	87	\$114,468,828	9	\$110,666,389
Township of Parsippany-Troy Hills	17,064	\$6,818,254,204	\$4,929,296,996	\$11,747,551,200	14,573	\$5,666,871,622	849	\$2,795,020,655	105	\$1,384,033,881
Township of Pequannock	5,642	\$2,303,901,155	\$1,607,138,787	\$3,911,039,941	5,130	\$2,090,287,104	251	\$626,403,612	26	\$237,599,006
Township of Randolph	8,600	\$4,047,479,247	\$2,662,007,269	\$6,709,486,516	7,491	\$4,156,415,934	259	\$1,005,345,141	70	\$511,326,809
Borough of Riverdale	1,183	\$649,499,009	\$515,583,658	\$1,165,082,666	944	\$401,746,054	129	\$363,534,102	44	\$143,498,608
Borough of Rockaway	2,617	\$936,652,515	\$676,097,436	\$1,612,749,951	2,189	\$781,665,236	286	\$425,423,494	45	\$159,431,111
Township of Rockaway	11,485	\$4,165,665,323	\$3,059,393,422	\$7,225,058,745	9,333	\$3,318,815,702	312	\$983,176,257	141	\$826,427,334
Township of Roxbury	9,544	\$3,515,221,553	\$2,402,947,578	\$5,918,169,131	7,743	\$3,336,821,925	504	\$1,218,958,296	90	\$384,400,096
Borough of Victory Gardens	339	\$95,947,479	\$67,087,620	\$163,035,099	222	\$86,579,577	5	\$12,961,970	0	\$0
Township of Washington	8,062	\$3,213,143,299	\$2,051,889,010	\$5,265,032,309	6,653	\$3,483,762,866	238	\$240,001,011	36	\$187,951,919
Borough of Wharton	2,051	\$866,789,280	\$672,546,221	\$1,539,335,501	1,673	\$582,729,178	94	\$202,230,317	17	\$577,409,385
Morris County (Total)	189,129	\$75,509,627,854	\$51,559,253,282	\$127,068,881,137	161,107	\$71,851,123,717	7,883	\$18,773,292,648	1,690	\$12,155,435,573

Source: Microsoft 2018; NJOIT 2018; MCOIT 2019; RS Means 2019



Figure 3-7. Distribution of Residential Building Stock and Value Density in Morris County by Census Block

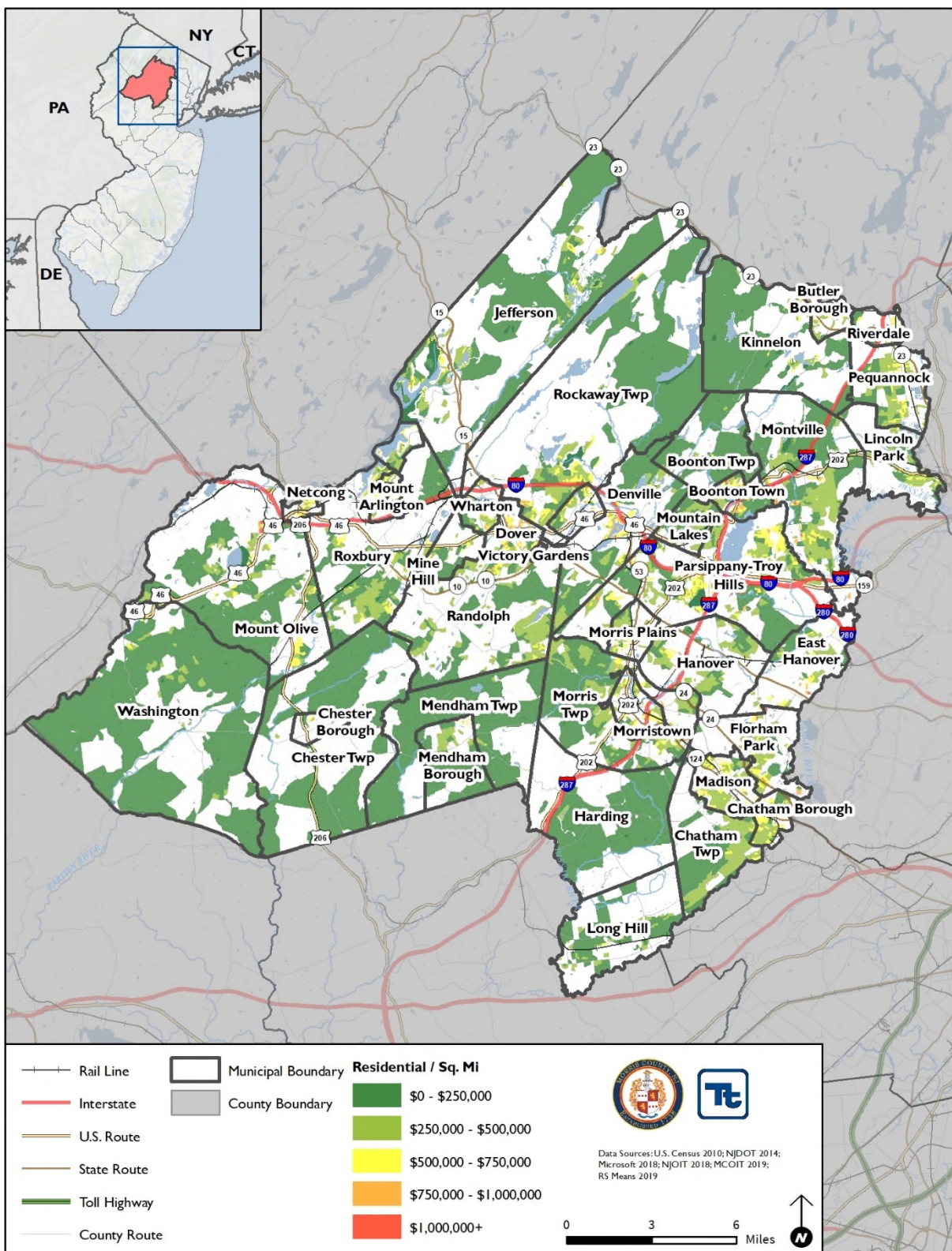




Figure 3-8. Distribution of Commercial Building Stock and Exposure Density in Morris County by Census Block

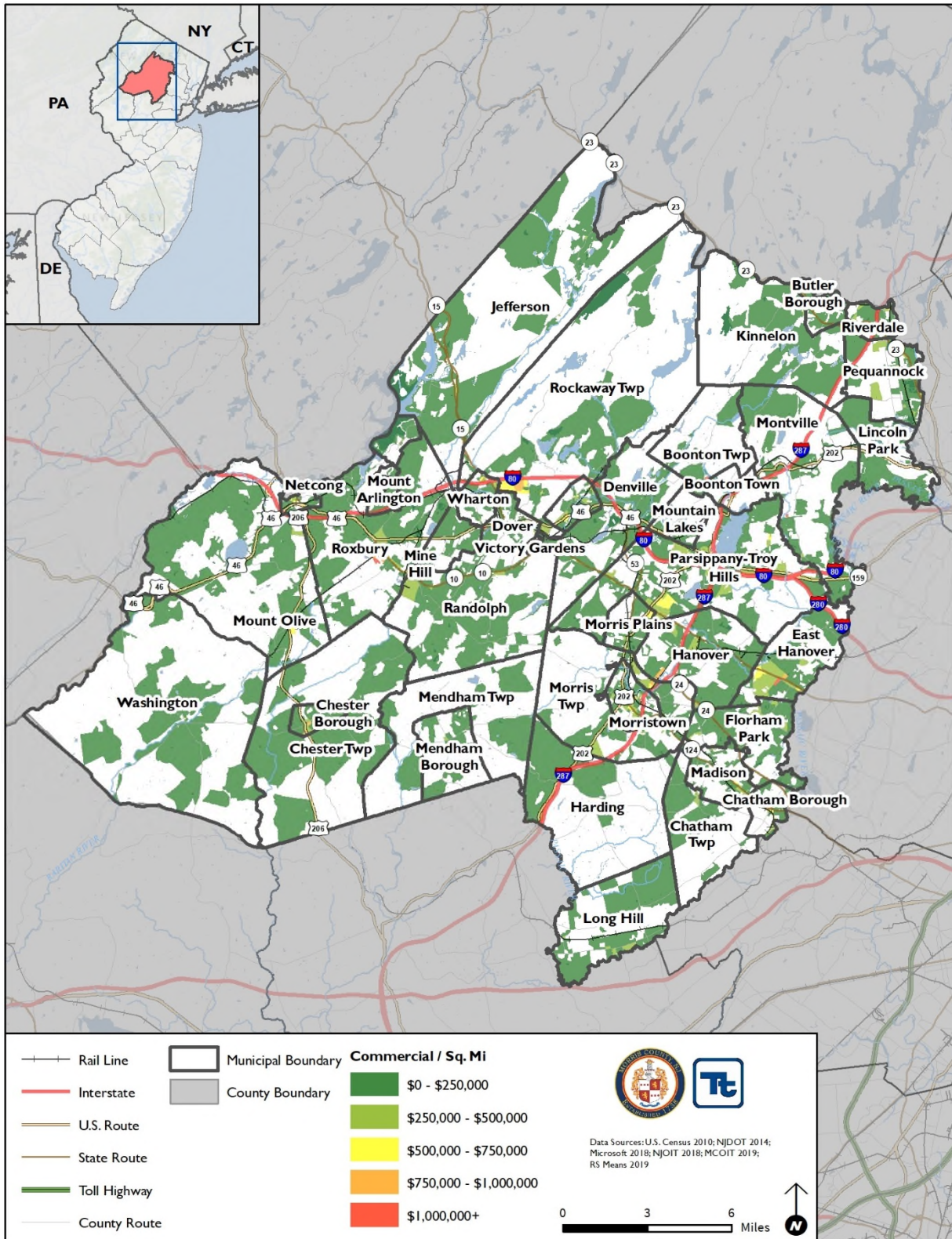
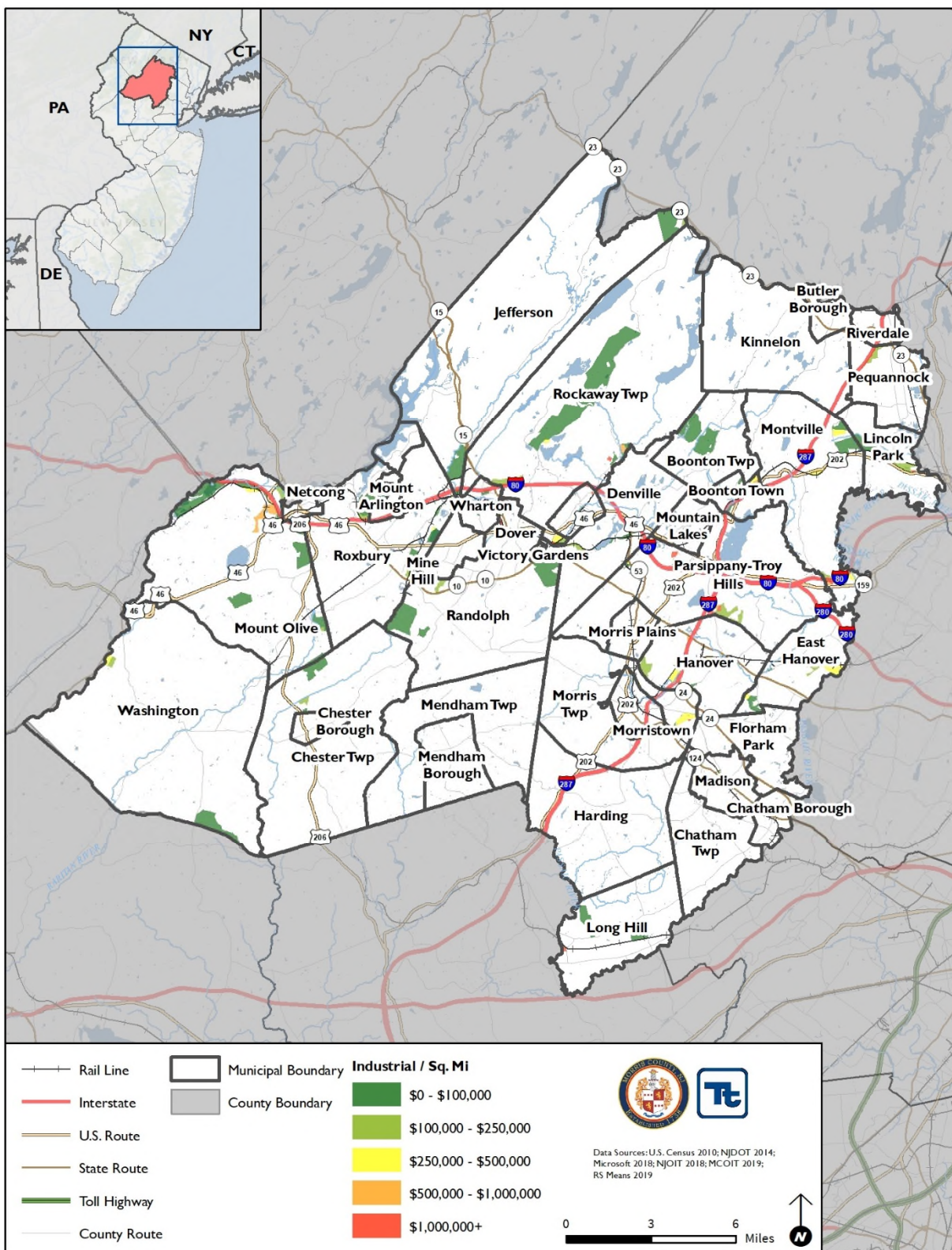




Figure 3-9. Distribution of Industrial Building Stock and Value Density in Morris County by Census Block





3.4 ECONOMY

As discussed in the FEMA Local Mitigation Handbook, after a natural hazard event, economic resiliency drives recovery. An understanding of the major employers and economic sectors in the County whose losses or inoperability would impact the community and its ability to recover from a disaster is essential. The following provides information regarding the economy in Morris County.

Business

According to the Morris County Economic Development Corporation's (MCEDC) 2017 data, Morris County has a diverse economy with a \$50 billion GDP. Major industries include: life sciences, aerospace, and defense industry research; manufacturing; technology; and healthcare. Morris County's top private sector industry, Professional and Technical Services, employs nearly 40,000 people and has an average annual salary over \$135,000. The history of Morris County's economic development is rooted in agriculture, but since the 1950s and the passage of the National Highway Act of 1956, the County became a home for many corporate headquarters who had moved out of New York City or added satellite offices in Morris County due to an expansion of population growth following World War II. Since then, Morris County's economy can be classified as a mix between growing business and technology sectors and a slowly shrinking agricultural sector.

In addition, the U.S. Military Picatinny Arsenal, located in northern Morris County is one of the County's major employers.

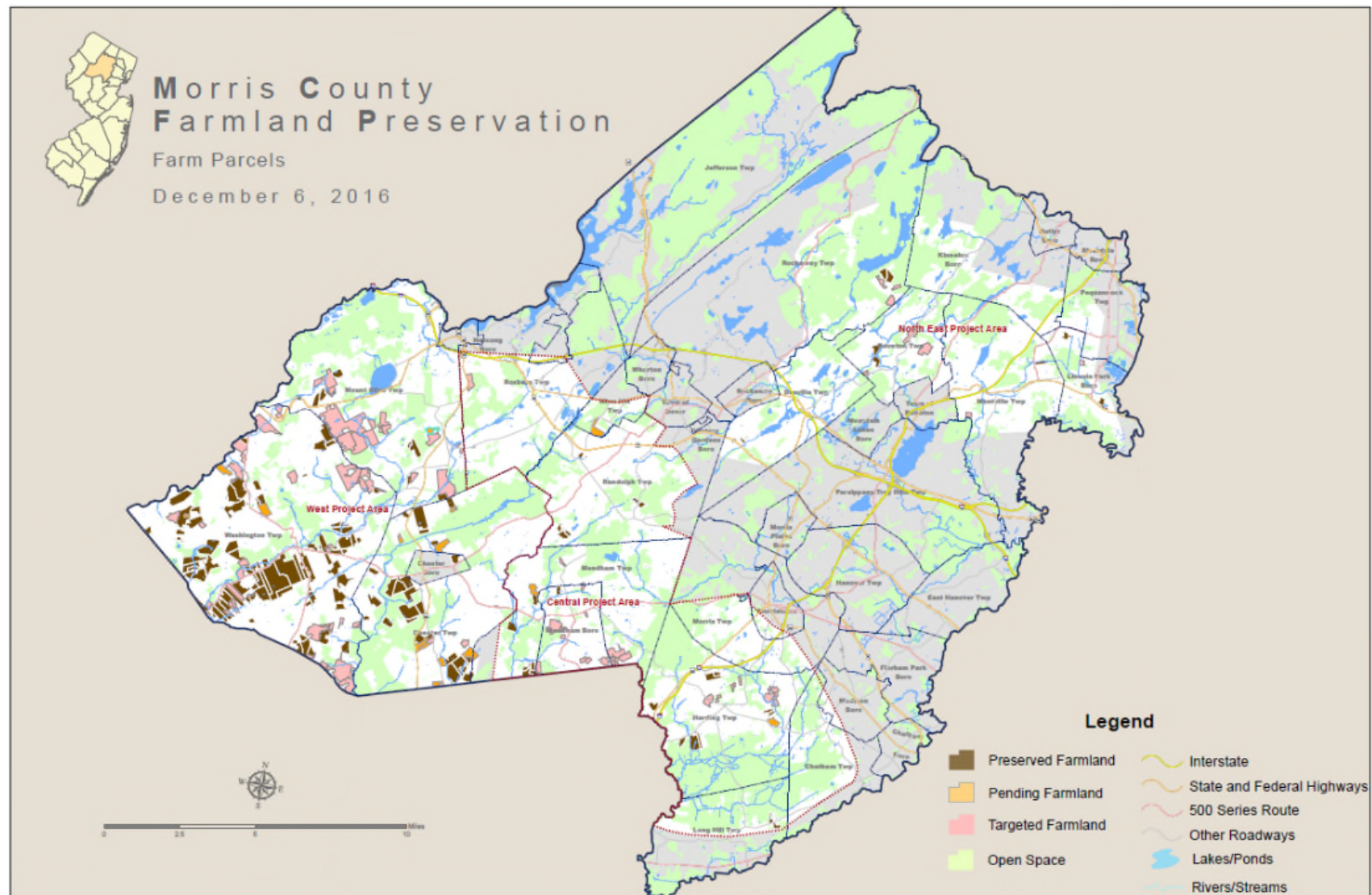
Agriculture

Agriculture is an important part of Morris County's economy and a major contributor to New Jersey's and the United States' farming industry. The 2017 U.S. Census of Agriculture indicates that Morris County ranked 11th in the State for total market value of agricultural products sold with over \$24 million in sales. This is a 15.2% decrease from 2012 (\$28.3 million in sales). The 2017 average sales per farm was \$59,389, a 23% decrease from the 2012 Census which was an average of \$77,560. The top commodities, by sales, in Morris County for 2017 include: nursery, greenhouse, floriculture, and sod at \$13.8 million in sales; vegetables, melons, potatoes, and sweet potatoes at \$4.8 million sales; and fruits, tree nuts, and berries at \$2.9 million in sales (USDA 2017). For details regarding agriculture and land use, refer to Section 3.1.1.

The Morris County Agriculture Development Board (MCADB) was formed in 1987 and focuses on farmland preservation and creating a positive climate for the farming business. Since its founding, MCADB has permanently preserved over 8,000 acres of farmland (out of a County total of nearly 30,000 acres). Refer to Figure 3-10 which illustrates the preserved farmland in Morris County.



Figure 3-10. Morris County Farmland Preservation



Source: Morris County 2016



Other Economic Trends

According to the Morris County 2020 Demographics and Trends report, the majority of Morris County's future projected job growth is in lower salary occupations like Home Health Aides, Food Prep Workers, and Laborers. The only exception is the Software Developers category, which happens to be the number one net new jobs by occupation category (2016-2026) with an average salary of over \$100,000.

3.5 DEVELOPMENT TRENDS AND NEW DEVELOPMENT

An understanding of population and development trends can assist in planning for future development and ensuring that appropriate mitigation, planning, and preparedness measures are in place to protect human health and community infrastructure. The DMA 2000 requires that communities consider land use trends, which can impact the need for, and priority of, mitigation options over time. Land use and development trends significantly impact exposure and vulnerability to various hazards. For example, significant development in a hazard area increases the building stock and population exposed to that hazard.

Local zoning and planning authority are provided for under the New Jersey Municipal Land Use Law, which gives municipalities zoning and planning authority. The Morris County Planning Board conducts site plan review for land development along County roads or areas affecting county drainage facilities. For these types of projects, the County Planning Board must approve for development. The site plan review process is done at the municipal level for all other development. Refer to Sections 6 and 9 for further details on the planning and regulatory capabilities for the County and each municipality.

The New Jersey Highlands Region covers 89% of Morris County (except for the easternmost seven municipalities), a little less than 15% of the State, but provides drinking water for 70% of the State's residents. The Highlands Region was officially formed in 2004 to support more regional approaches to land and water conservation, preservation, and management. The Region is found in New Jersey but also neighboring states of New York, Pennsylvania, and Connecticut. The presence of the New Jersey Highlands Region in the majority of Morris County is unique and has significant implications on future County development trends and new development. The most obvious impact is concentration of majority future development in designated urban areas (inside the Highlands Region) like Morristown and additional less-regulated development outside of the Highlands in the easternmost parts of the County like parts of Harding Township and Parsippany-Troy Hills Township. The three westernmost Townships, Mount Olive, Washington, and Chester are almost exclusively located in the Highlands' Preservation Area. The Preservation Area in the Highlands is where development is most strictly regulated. The remainder of the Highlands Region in Morris County is located in the Planning Area where development potential is greater and provides an avenue for enhanced development through Transfer of Development Rights (TDR) and smart growth programs.

The New Jersey Highlands Council has identified areas of existing development as well as areas of potential growth that may provide insight as to where potential new development may occur in Morris County. These areas include the Existing Community Zone (both in-fill of new development and re-development) and Designated Centers refer to Figure 3-11. The New Jersey Highlands Council assists with planning and considers hazard areas such as floodplains when evaluating new and re-development in the region. In addition, the NJDEP Sewer Service Areas are also shown. These areas show the planned method of wastewater disposal for specific areas, i.e. whether the wastewater will be collected to a regional treatment facility or treated on site and disposed of through a surface water discharge or groundwater discharge.

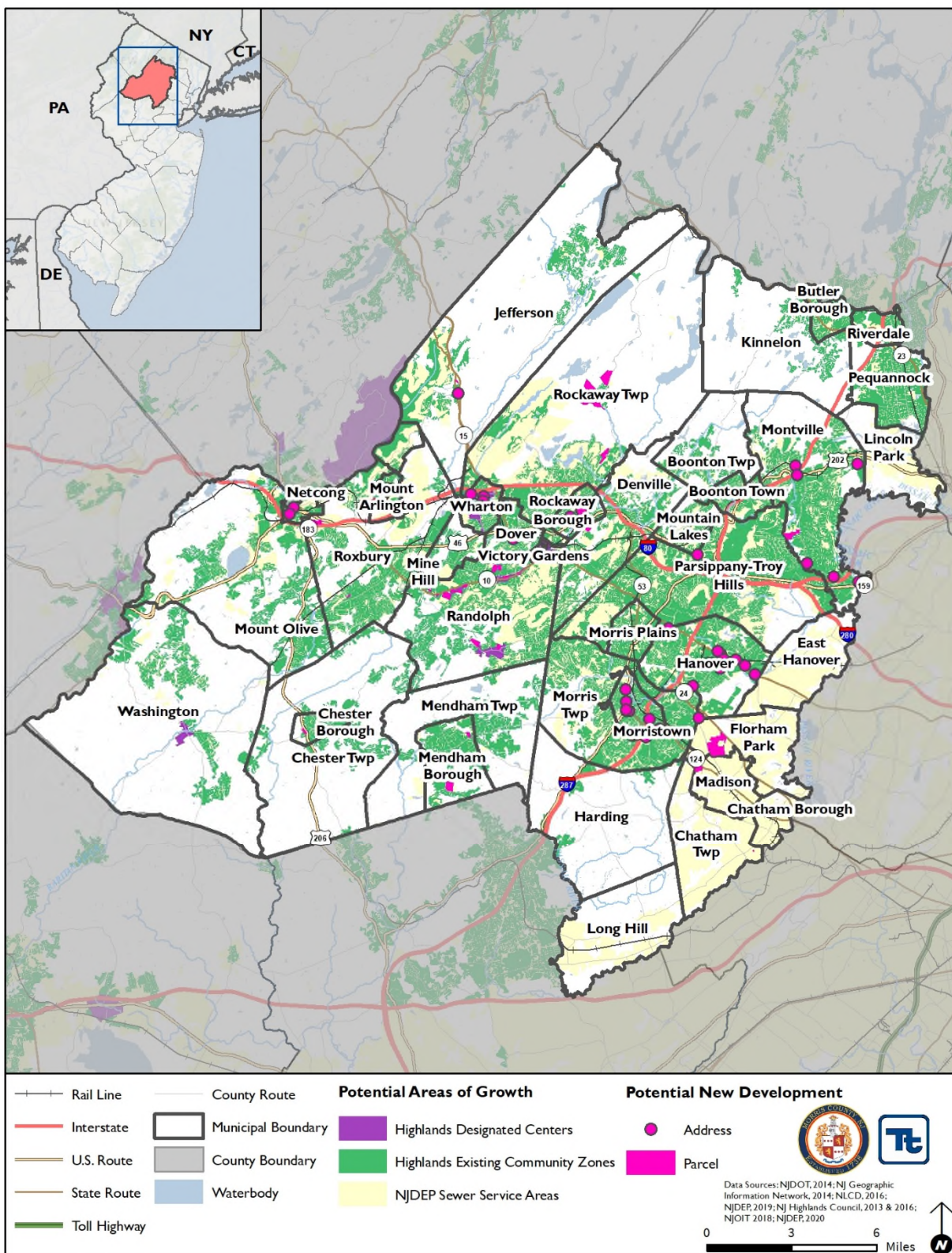
New development that has occurred in the last five years within the County and potential future development in the next five years has been identified by each municipality. An exposure analysis was conducted to determine the relationship between the identified potential new development and natural hazard areas evaluated in the HMP



update. The results of this spatial analysis have been reviewed with each jurisdiction and are documented in Table 9.X-2 in each jurisdiction annex. In addition, the summary of this analysis and hazard-specific maps are included at the end of each vulnerability assessment (Section 4 – Risk Assessment). Figure 3-11 illustrates the potential new development identified by each jurisdiction, as well as Highlands Existing Community Zones, Designated Centers and Sewer Service Areas which are areas of potential future growth in Morris County.



Figure 3-11. Areas of Potential Growth and Potential New Development Identified by each Jurisdiction





3.6 CRITICAL FACILITIES

Critical facilities and infrastructure provide services and functions essential to a community, especially during and after a disaster. Critical facilities include essential facilities, transportation systems, lifeline utility systems, high potential loss facilities and hazardous material facilities. Transportation systems include roadways, bridges, airways, and waterways. Utility systems include potable water, wastewater, oil, natural gas, electric power facilities, and emergency communication systems.

An enhancement to the 2020 HMP was the identification of community lifelines across Morris County. Morris County's definition for a lifeline aligns with FEMA: "a type of critical facility that provides indispensable service that enables the continuous operation of critical business and government functions, and is critical to human health and safety, or economic security." Identifying community lifelines will help government officials and stakeholders to prioritize, sequence, and focus response efforts towards maintaining or restoring the most critical services and infrastructure within their respective jurisdiction(s). Identifying potential impacts to lifelines can help to inform the planning process and determining priorities in the event an emergency occurs; refer to Appendix E for the FEMA fact sheet on lifelines. Overall, of the 1,139 critical facilities in Morris County, 1,096 were identified as community lifelines.

Critical facilities and infrastructure

provide services and functions essential to a community, especially during and after a disaster. As defined for this HMP, critical facilities include essential facilities, transportation systems, lifeline utility systems, high-potential loss facilities and hazardous material facilities.

A **community lifeline**, a type of critical facility, enables the continuous operation of government functions and critical business and is essential to human health and safety or economic security.

A comprehensive inventory of critical facilities in Morris County was developed from various sources including HAZUS-MH provided data, municipal representatives, and input from the Steering and Planning Committees. The inventory of critical facilities presented in this section represents the current state of this effort at the time of publication of the draft HMP and used for the risk assessment in Section 4.

The inventory of critical facilities identified for the HMP is considered sensitive information. It is protected by the Protected Critical Infrastructure Information (PCII) program and under New Jersey Executive Order 21. Therefore, individual facility names and addresses are not provided in this HMP update. A summary of the facility types used for the risk assessment are presented further in this section.



3.6.1 Essential Facilities

This section provides information regarding Morris County's emergency facilities, hospital and medical facilities, schools, shelters, senior care and living facilities and government facilities. As stated above, these assets provide indispensable services that need to remain in operation before, during and after natural hazard events. Refer to Section 9 (Jurisdictional Annexes) for mitigation strategies identified by plan participants to reduce future impacts to vulnerable essential facilities and lifelines.

Emergency Facilities

For the purposes of this HMP, emergency facilities include police, fire, emergency medical services (EMS) and emergency operations centers (EOC). The County has a highly coordinated and interconnected network of emergency facilities and services at the county and municipal level. The Morris County Office of Emergency Management (MCOEM) serves as the primary coordinating agency between local, state and federal agencies. In response to an emergency event, MCOEM will work with County and municipal health agencies and healthcare providers, emergency facilities and the County Sheriff's Office to provide aid to residents of the County.

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

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

Each municipality is responsible for maintaining its own police department, fire department and emergency operation center. There are 37 enforcement facilities, 99 fire stations, 36 emergency medical services facilities and 39 emergency operation centers. Refer to Figure 3-12.

Correctional Facilities

The Morris County Correctional Facility is located in Morris Township.

Hospital and Medical Facilities

There are 13 major medical and hospital centers located within the County.

Schools

There are 241 schools ranging from pre-kindergarten to higher education learning establishments in the County. During an emergency event, schools can be used as a shelter for residents.

Shelters

There are 36 shelters identified within the County; many schools, community centers and municipal buildings could serve as a shelter during an emergency.

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. There are 46 senior facilities located in the County.



Government Buildings

In addition to the facilities discussed, county and municipal buildings, department of public works facilities and public health departments are essential to the continuity of operations pre-, during and post-disasters. These facilities are included in the risk assessment.

3.6.2 Transportation Systems

The County is bisected by a network of approximately 2,000 miles of federal interstate freeways, and state, county and municipal roads. Major interstate highways in Morris County included Interstate 80, 280, and 287, and State Routes 10 and 46. In addition to the roadways, the County is served by rail, bus and air, which are described below. Figure 3-13 illustrates the regional transportation lifelines serving the County. The transportation inventory included as part of this HMP includes airports, major bus stations, and major rail facilities.

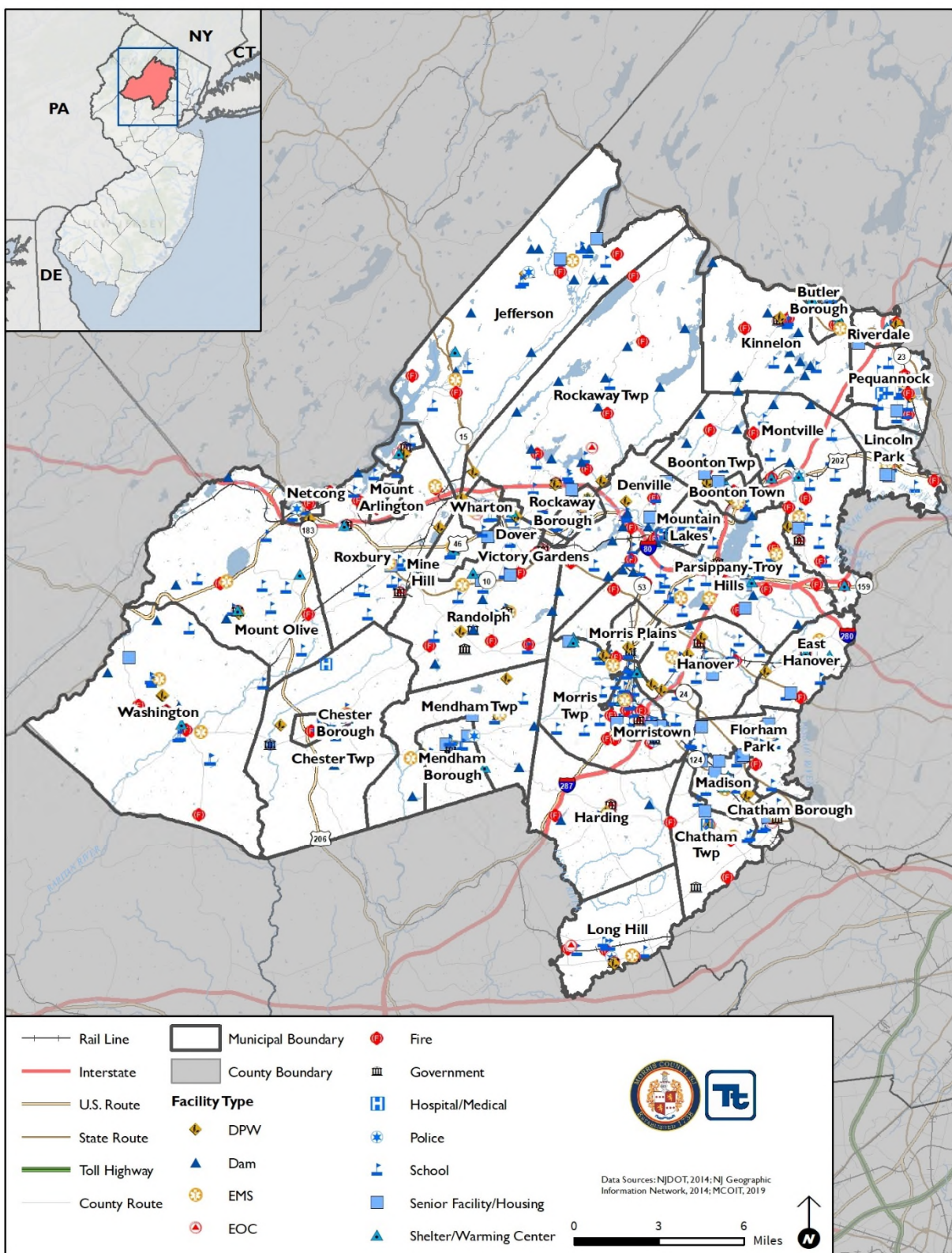
Rail Service

New Jersey Transit (NJ Transit), formerly Erie Lackawanna Railroad, serves thousands of County commuters each day. NJ Transit operates an extensive commuter rail network and offers connections with other rail service. NJ Transit service in Morris County include: Morris & Essex (Morristown Line), Morris & Essex (Gladstone Branch), and Montclair-Boonton Line. The Morristown Line and Gladstone Branch both have service to New York Penn Station, Newark-Broad Street Station, and Hoboken. The Montclair-Boonton Line provides service to Hoboken with connections to New York City (Morris County Transportation 2015).

Additionally, the Central Railroad of New Jersey, the Morristown & Erie Railroad, and the New York, Susquehanna & Western Railroad cross the County. There are 21 rail facilities located in the County.



Figure 3-12. Essentials Facilities in Morris County





Bus Service

Bus service links the 39 municipalities in the County to the metropolitan region. NJ Transit operates a statewide bus system that includes service from Morris County to New York City Port Authority, local service within Morris County, and local service between Morris, Essex, and Passaic Counties (Morris County Transportation 2015).

Lakeland Bus Lines, Inc. provides service between Morris and Sussex Counties and New York City, including service to the Port Authority Bus Terminal, Midtown Manhattan, and Lower Manhattan. Lakeland Bus also provides local service within Morris County and between Morris and Sussex Counties. In addition, Community Coach, a member of Coach USA, provides bus service from Morris and Essex Counties to the New York City Port Authority Bus Terminal (Morris County Transportation 2015).

Other bus services in Morris County include the following:

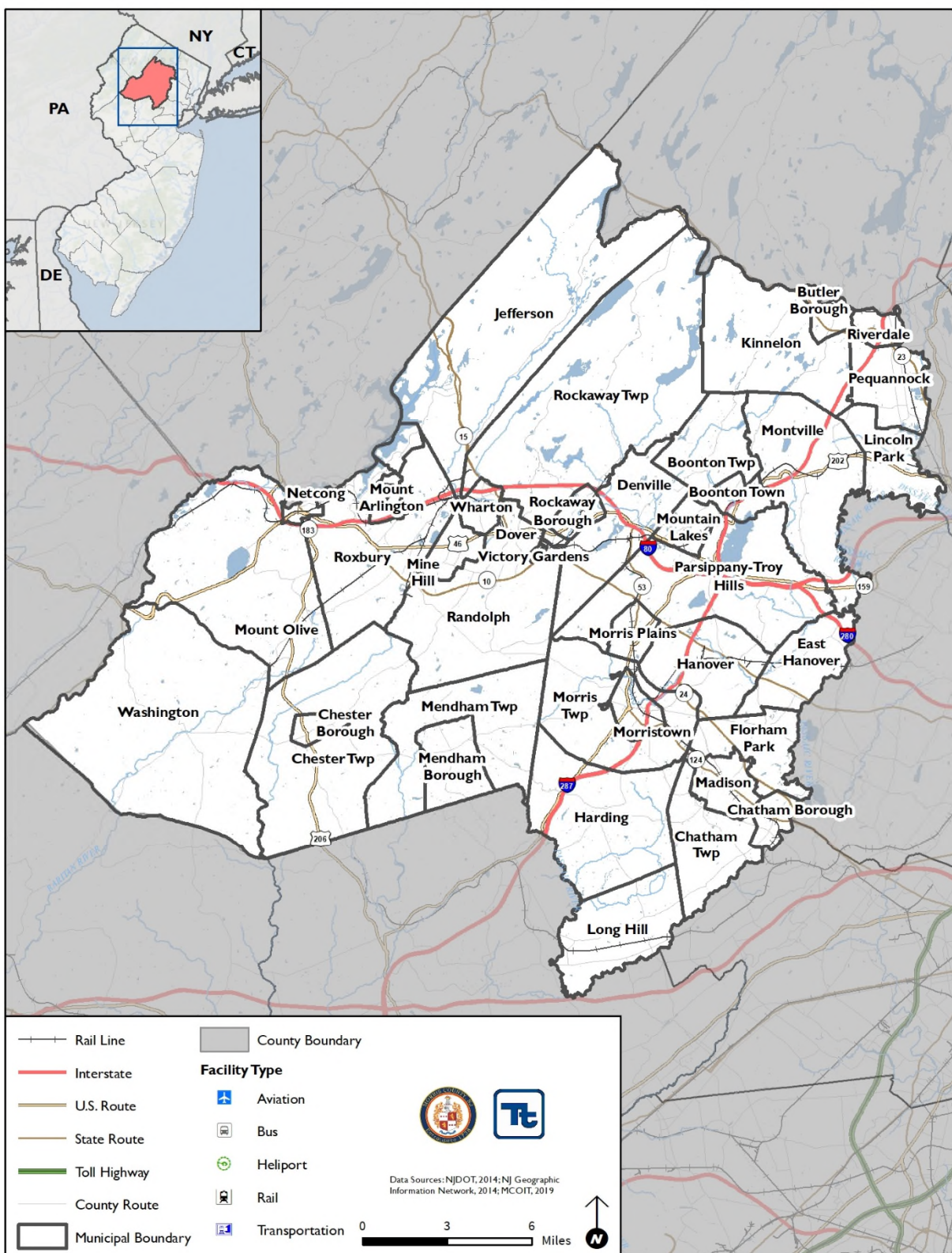
- The Township of Parsippany-Troy Hills operates the Parsippany Free Transit System. This system provides two free bus routes within the Township and serves its residents. Both routes begin at the Morris Hills Shopping Center.
- The Town of Morristown provides Colonial Coach to its residents. This free service consists of one route operating in and around Morristown on Mondays, Wednesdays and Fridays.
- Morris on the Move (M.O.M.) is a community transportation service for low-income individuals running between the Town of Dover and the Township of Mount Olive. The service is sponsored by the Morris County Department of Human Services.
- TransOperations manages the Morris Avenue Direct Shuttle on the Madison Avenue (NJ-124) corridor in the Borough of Madison and the Township of Morris. The shuttle is funded through a Congestion Management Air Quality grant and the three colleges it services. It primarily serves the campuses but is open to residents and employees.
- The Morris Area Paratransit System (MAPS) is operated by the Morris County Department of Human Services and provides curb-to-curb transportation to County residents age 60 and older and to residents age 18 and older who have a physical or mental disability that includes functional limitations. In order for residents to use MAPS, the Department of Human Services needs to be contacted (Morris County Transportation 2015).

Airports

There are two airports located in Morris County. The Morristown Municipal Airport is located in the Township of Hanover and is used as a private airport for corporate and personal aircraft. The Lincoln Park Airport is located in the Borough of Lincoln Park and is privately owned airport with a flight school (Morris County Transportation 2015).



Figure 3-13. Transportation Facilities in Morris County





3.6.3 Lifeline Utility Systems

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

Communication

Morris County has a network of both public and private communication facilities and towers. Telecommunication services are provided by multiple organizations, including Verizon, Sprint International, and TRANSCOM. There were nine essential communication facilities identified in the County.

Potable Water

Public community water supply systems in Morris County serve approximately 55% of the total County area and approximately 85% of the County's population. The water supply infrastructure generally serves areas that are also served by sewers. Individual onsite wells typically serve the more rural and less densely populated areas in the County. There are 121 potable water pumps, tanks, and facilities identified in the County for the purposes of this analysis. The following table provides the water supply utilities in the County and the municipalities each serve.

Table 3-9. Potable Water Supply Systems in Morris County

Municipality	Major Water Systems ^{1, 2}
Boonton Town	Boonton WD
Boonton Twp.	Denville WD, Boonton Twp. WD, Mt. Lakes WD
Butler Boro.	Butler WD
Chatham Boro.	Southeast Morris County MUA, Chatham Boro. WD
Chatham Twp.	NJ American Water Co. (Passaic Basin), Southeast Morris County MUA
Chester Boro.	NJ American Water Co. (Raritan and Passaic Basin), Washington Twp. MUA-Hager
Chester Twp.	NJ American Water Co. (Passaic Basin), AWM Four Seasons at Chester
Denville Twp.	Denville WD, Mt. Lakes WD, Rockaway Boro. WD
Dover Town	Dover Water Commission
East Hanover Twp.	East Hanover WD
Florham Park Boro.	NJ American Water Co. (Passaic Basin), Florham Park WD
Hanover Twp.	Southeast Morris County MUA
Harding Twp.	Southeast Morris County MUA, NJ American Water Co. (Passaic Basin), Lake Shore Water Co.
Jefferson Twp.	Sparta Twp. Water Utility, Jefferson Twp. Water Utility (Lake Hopatcong, Milton & Vassar Road), Sun Valley Park
Kinnelon Boro.	Kinnelon WD, Butler WD, Fayson Lakes Water Co.
Lincoln Park Boro.	Lincoln Park WD, Lincoln Park Jacksonville System, Pequannock WD, Pequannock Twp. WD-Cedar Crest
Madison Boro.	Madison WD
Mendham Boro.	NJ American Water Co. (Passaic Basin)
Mendham Twp.	Southeast Morris County MUA, NJ American Water Co. (Passaic Basin)
Mine Hill Twp.	Mine Hill WD, Dover Water Commission, Wharton WD
Montville Twp.	Montville MUA, Jersey City MUA, Green Briar Res Health, Signature Care Home@Montville

**Table 3-9. Potable Water Supply Systems in Morris County**

Municipality	Major Water Systems ^{1, 2}
Morris Twp.	Southeast Morris County MUA, Sisters of Charity South Elizabeth
Morris Plains Boro.	Southeast Morris County MUA
Morristown Town	Southeast Morris County MUA
Mt. Lakes Boro.	Mt. Lakes WD, Denville WD, Parsippany-Troy Hills WD
Mt. Arlington Boro.	Mt. Arlington WD (Kadel & Main System), Roxbury WD (Shore), Suez Water (Arlington Hills)
Mount Olive Twp.	Mt. Olive WD (Goldmine, Sand, Pinecrest, Lynwood, , Tinc Farm, Carlton Hills, Village and Main Systems (Flanders), AWM Country Oaks, Mt. Olive Villages WD, NJ American Water Co. (West Jersey, Passaic Basin and ITC) NJ Vasa Home Water, Hackettstown MUA, Morris Chase/Morris Hunt Water System, Netcong WD, Mount Olive Twp.-Flanders, NJ American Water-Mount Olive/West Jersey
Netcong Boro.	Netcong WD
Parsippany Troy Hills Twp.	Parsippany Troy Hills WD, Denville WD, Mt. Lakes WD,
Long Hill Twp.	NJ American Water Co. (Passaic Basin)
Pequannock Twp.	Pequannock WD (Main and Cedar Crest)
Randolph Twp.	Randolph WD, Denville WD, Morris County MUA, Dover Water Commission
Riverdale Boro.	Riverdale WD
Rockaway Boro.	Rockaway Boro WD, Denville Twp. WD
Rockaway Twp.	Rockaway Twp. WD, Denville WD, Wharton WD, Picatinny Arsenal, Hoffman Homes Community LLC, Rockaway Boro WD, Dover WD
Roxbury Twp.	Roxbury WD (Evergreen, Sky View, Shore), Netcong WD, NJ American Water-Roxbury
Victory Gardens Boro.	Dover Water Commission
Washington Twp.	Washington MUA (Hager and Schooley's Mountain), Hackettstown MUA, Sherwood Village, Aqua, Cliffside Park Assoc. Inc.
Wharton Boro.	Dover Water Commission, Wharton WD

Source:

¹ NJDEP Data Miner, http://datamine2.state.nj.us/DEP_OPRA/OpraMain/categories?category=Safe+Drinking+Water, last accessed on September 24, 2019.

² Mobile Home Parks Excluded

Wastewater Facilities

Current Sewer Service Areas and Facilities

Approximately 36% of the area within Morris County is currently in a sewer service area, i.e. an area that is or can be sewered as per current NJDEP regulations. There are 24 regional and municipal sewage treatment plants (STPs) providing service in Morris County. This is based on an assessment of the approved Morris County Future Wastewater Service Area Map dated May 2019. These plants may serve a single municipality or multiple municipalities, and in some instances, a single municipality may be served by multiple STPs. Refer to Table 3-10 and Figure 3-14.



Table 3-10. Current Sewer Service Facilities and Municipalities Served (May 2019)

Wastewater Utility	Municipalities Served in Morris County
Ajax Terrace Water Pollution Control Plant	Roxbury Twp.
Butterworth Sewage Treatment Plant	Morris Plains Boro., Parsippany-Troy Hills Twp., Randolph Twp.
Chatham Twp. WPCP #1 (Chatham Main)	Chatham Twp.
Chester Boro. Wastewater Treatment Plant	Chester Boro.
Clover Hill Sewage Treatment Plant	Mount Olive Twp.
Florham Park Sewerage Utility	Florham Park Boro., East Hanover Twp., Morris Twp.
Greystone Park Psychiatric Hospital	Parsippany-Troy Hills Twp.
Hackettstown Municipal Utilities Authority Sewage Treatment Plant	Mount Olive Twp., Washington Twp.
Hanover Municipal Utilities Authority Sewage Treatment Plant	East Hanover Twp. Hanover Twp., Morris Plains Boro., Morris Twp., Parsippany-Troy Hills Twp.
Hercules Company WPCP	Roxbury Twp.
Long Hill Twp. Sewage Treatment Plant	Long Hill Twp.
Long Valley Wastewater Treatment Plant	Washington Twp.
Mendham Boro. Sewage Treatment Plant	Mendham Boro.
Molitor Water Pollution Control Facility (Madison-Chatham Joint Meeting)	Chatham Boro., Chatham Twp., Madison Boro.
Morristown Sewer Utility Sewage Treatment Plant	Hanover Twp., Morris Twp. Morristown
Mount Olive Villages Sewer Company Sewage Treatment Plant	Mount Olive Twp.
Musconetcong Sewerage Authority Sewage Treatment Plant (MSA)	Mount Arlington Boro., Mount Olive Twp., Netcong Boro., Roxbury Twp., Jefferson Twp.
Parsippany-Troy Hills Sewage Treatment Plant	Denville Twp., East Hanover Twp., Montville twp., Mountain Lakes Boro., Parsippany-Troy Hills Twp.
Rockaway Valley Regional Sewerage Authority Sewage Treatment Plan (RVRSA)	Boonton Town, Boonton Twp., Denville Twp., Dover Town, Mine Hill Twp. Montville Twp., Parsippany-Troy Hills Twp., Randolph Twp., Rockaway Boro., Rockaway Twp. Victory Gardens Boro., Wharton Boro.
Two Bridges Wastewater Treatment Plant	Butler Boro., Kinnelon Boro., Lincoln Park Boro., Pequannock Twp., Riverdale Boro.
United Water (Suez) Mid-Atlantic (Arlington Hills) Sewage Treatment Plant	Mount Arlington Boro., Roxbury Twp.
Schooley's Mountain Wastewater Treatment Plant	Washington Twp.
White Rock Lake Sewage Treatment Plant	Jefferson Twp.
Woodland Sewage Treatment Plant	Florham Park Boro., Madison Boro., Harding Twp., Morris Twp., Morristown Town

Source: NJDEP Office of Water Resource Management Coordination

Package Plants

Despite the existence of regional facilities, many areas of the County remain outside sewer service areas. As a result, many commercial and housing developments are served by small on-site discharge to groundwater (DGWs) and discharge to surface water (DSWs) systems that provide treatment for individual or small sites. Typically identified as “package plants,” these small, dedicated treatment systems are designed to serve specific users that typically generate over 2,000 gallons per day (gpd), with some older package treatment systems treating less than 2,000 gpd; they are not part of a regional system capable of addressing multiple users. These facilities provide a level of sewage treatment, which may be less rigorous than the treatment provided by the



regional systems, but more effective than that provided by individual septic systems. According to analysis conducted by the Morris County Office of Planning and Preservation in October 2019, there are approximately 110 of these sites located throughout the County. Figure 3-14 displays the sewer service facilities as well as pump stations/ lift stations and other wastewater infrastructure.

Energy Resources

Jersey Central Power & Light (JCP&L) is the primary energy service provider for Morris County. Other service providers include Public Service Electricity & Gas (PSE&G), New Jersey Natural Gas, Transco Gas Transmission, Madison Electric Department, Elizabethtown Gas, Duke Energy, Columbia Gas Transmission, Butler Electric Company and Algonquin Pipeline Company. There are 7 electric generation facilities, 8 electric substations, 7 natural gas facilities, 3 nuclear facilities, and 3 oil facilities identified in the County for the purposes of the risk assessment (Section 4).

3.6.4 High-Potential Loss Facilities

High-potential loss facilities include dams/levees, chemical storage facilities and military installations. Figure 3-15 displays the general locations of these facilities in the County.

Dams and Levees

According to the New Jersey Department of Environmental Protection (NJDEP), there are four hazard classifications of dams in New Jersey. The classifications relate to the potential for property damage and/or loss of life should the dam fail:

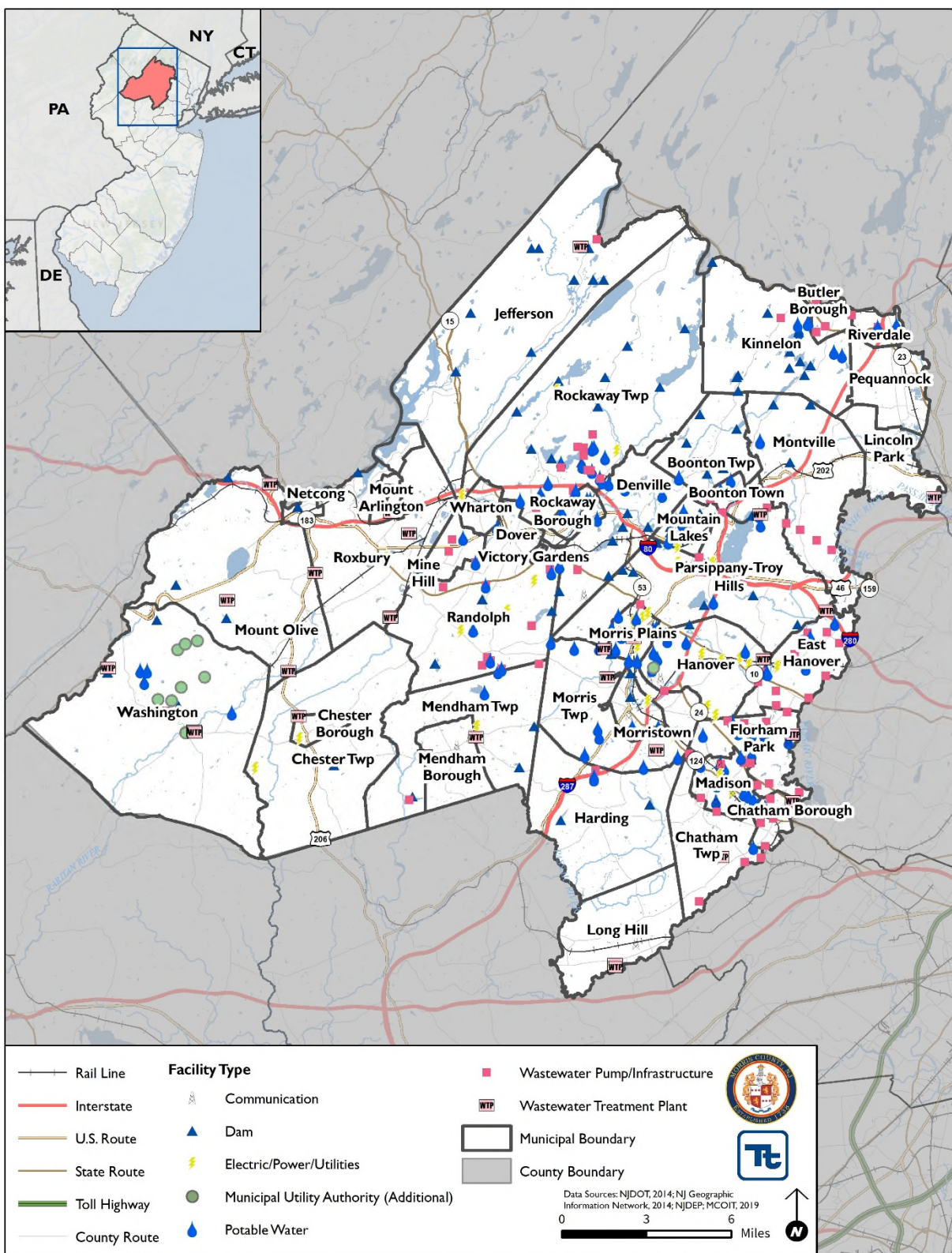
- Class I (High-Hazard Potential) - Failure of the dam may result in probable loss of life and/or extensive property damage
- Class II (Significant-Hazard Potential) - Failure of the dam may result in significant property damage; however, loss of life is not envisioned.
- Class III (Low-Hazard Potential) - Failure of the dam is not expected to result in loss of life and/or significant property damage.
- Class IV (Small-Dam Low-Hazard Potential) - Failure of the dam is not expected to result in loss of life or significant property damage.

According to the NJDEP Bureau of Dam Safety, there are 224 dams located in Morris County, 40 of which are classified with a high-hazard potential. The high-hazard potential dams are located in the following municipalities:

- | | |
|----------------------------|-----------------------------|
| ▪ Town of Boonton | ▪ Township of Mount Olive |
| ▪ Township of Denville | ▪ Borough of Mountain Lakes |
| ▪ Township of Jefferson | ▪ Borough of Netcong |
| ▪ Borough of Kinnelon | ▪ Township of Parsippany |
| ▪ Township of Mendham | ▪ Township of Randolph |
| ▪ Township of Montville | ▪ Borough of Rockaway |
| ▪ Borough of Morris Plains | ▪ Township of Rockaway |
| ▪ Town of Morristown | |



Figure 3-14. Utility Lifelines in Morris County





HAZMAT Facilities

There are 26 identified hazardous materials facilities within Morris County for the purposes of this assessment. This data is used to determine their potential for damage and release due to natural hazard events, including floods, hurricanes or earthquakes.

Military

Picatinny Arsenal is the Joint Center of Excellence for Guns and Ammunition, providing products and services to all branches of the U.S. military. Nestled in the northern New Jersey Highlands, there are more than 6,000 personnel which includes Soldiers, Sailors, Airmen, Marines, U.S. Federal employees and contractor personnel who lead in the research, development, acquisition and lifecycle management of advanced conventional weapon systems and ammunition (U.S. Army 2020).

3.6.5 Additional Facilities

The Planning Partnership identified additional facilities (user-defined facilities) as critical. Figure 3-16 illustrates the general locations of these facilities in the County.



Figure 3-15. High-Potential Loss Facilities in Morris County

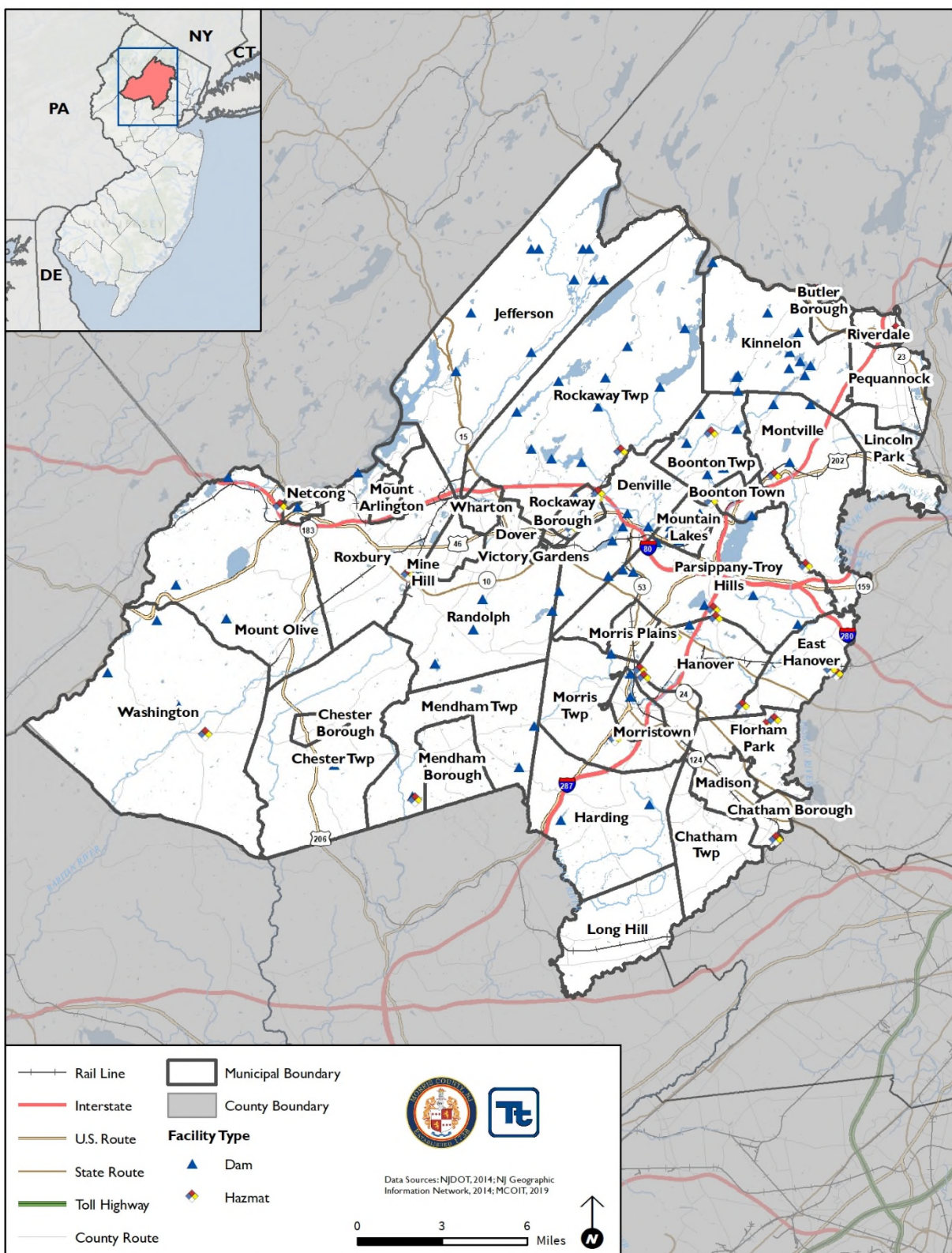




Figure 3-16. Additional Critical Facilities in Morris County

