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SECTION 4 TOWNSHIP PROFILE

A profile of the Township of Brick is presented below to describe existing conditions and develop an understanding of the study area, including the economic, structural, and population assets at risk and the particular concerns related to hazards analyzed later in this plan (e.g., flood-prone areas or vulnerable populations in the area). This profile provides general information for the Township of Brick (physical setting, population and demographics, general building stock, and land use and population trends) and an overview of critical facilities located within the Township.

4.1 GENERAL INFORMATION

The Township of Brick is located in northeastern Ocean County, New Jersey, and includes 26.2 square miles of land area. The Township is home to approximately 75,000 residents and 45,000 structures of which 10,000 are located within the floodplain. The Township of Brick is proximate to major transportation corridors including Route 70, Route 88, and the Garden State Parkway (Brick Township Strategic Recovery Planning Report [SRPR] 2014).

The Township was created by the New Jersey Legislature in 1850 and was named after Joseph W. Brick, one of the prominent citizens of the time. The creation of the Township of Brick was concurrent with the creation of Ocean County, whose land includes portions from Monmouth and Burlington Counties. Early growth and development in the Township was driven by natural resource production including saw mills, charcoal, turpentine, agriculture, dairy farming, and iron forges among others. Throughout the 1900s the Township transitioned to a series of rural resort communities with focuses on outdoor recreation and relaxation. Following the creation of the Garden State Parkway in the 1950s, the Township of Brick's inexpensive and beautiful land attracted residential and commercial real estate developments (Brick Township SRPR 2014; Township of Brick Website 2015).

The local development followed a traditional suburban auto-oriented pattern, with a central commercial core with relatively higher densities and additional commercial development focused primarily along major transportation corridors extending outward. Residential neighborhoods are primarily located along smaller local roads and behind commercial development in the commercial core.

4.1.1 Physical Setting

This section presents the physical setting of the Township, including: location, hydrography and hydrology, topography and geology, climate, and land use/land cover.

Location

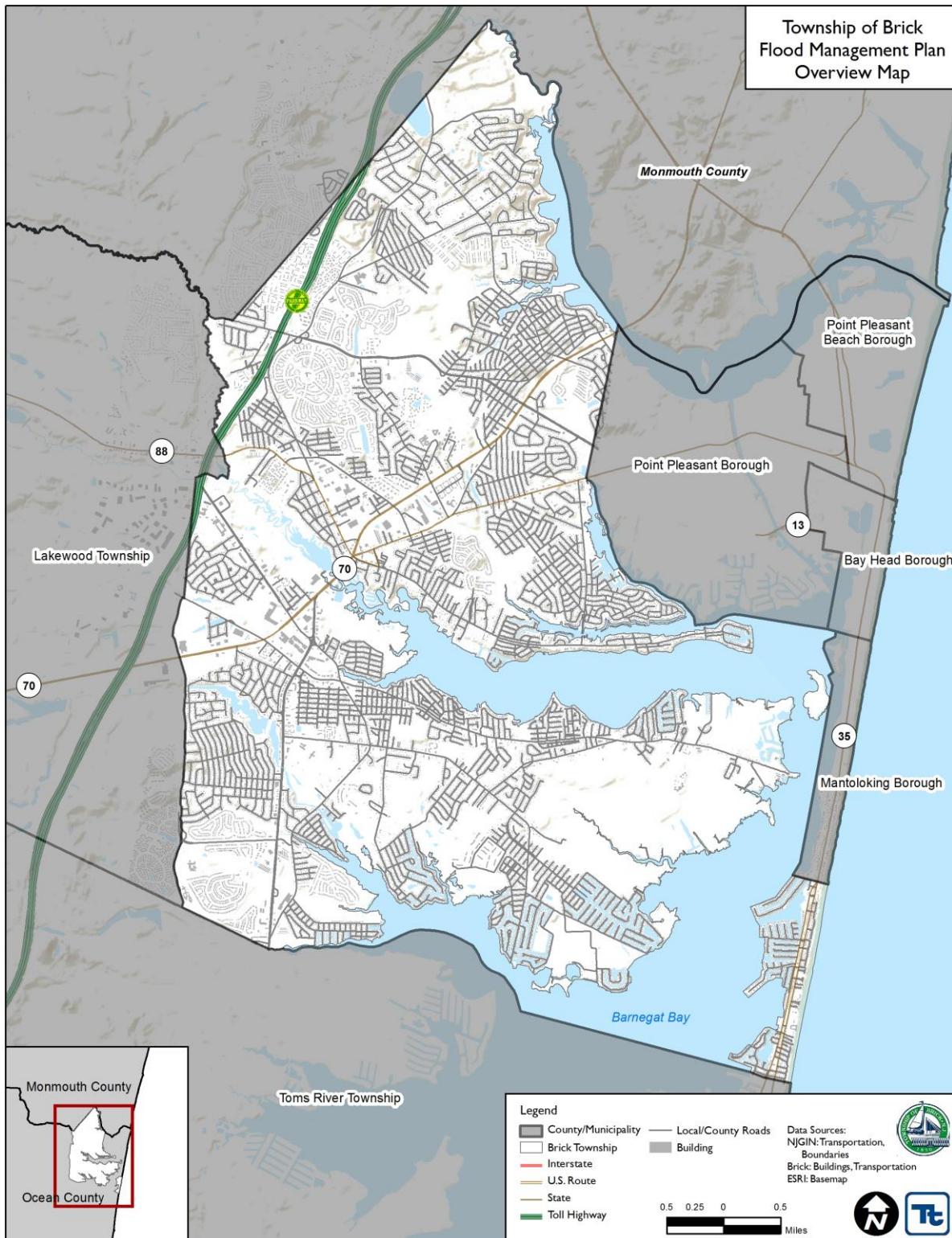
The Township of Brick is one of the 33 municipalities that make up Ocean County. Ocean County is located in central New Jersey in the Atlantic Coastal Plain and contains a total area of 636.28 square miles, making it the second-largest county in the state. Ocean County is bordered to the north by Monmouth County, to the west and south by Burlington County, to the southeast by Atlantic County, and to the east by the Atlantic Ocean.

Figure 4-1 illustrates an overview of the Township of Brick.





Figure 4-1. Overview Map of the Township of Brick, New Jersey



Source: NJGIN, Brick Township





The Township of Brick is located in the northeastern portion of Ocean County and is bordered by Point Pleasant Borough, the Township of Wall, and the Township of Howell to the north, the Borough of Mantoloking to the east, the Township of Toms River to the south, and the Township of Lakewood to the west.

Hydrography and Hydrology

Numerous ponds, lakes, creeks, and rivers make up the waterscape of Township of Brick and include: the headwaters of the Barnegat Bay, numerous tributaries to the Manasquan River Watershed and the Metedeconk Watershed, along with Beaver Dam Creek, North Branch Beaver Dam Creek, Kettle Creek, Cedar Bridge Branch, and Long Causeway Branch (Brick Township Master Plan 2007).

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.

The Township of Brick is primarily located within two large watershed areas; the northern portion of the Township drains to the Manasquan Watershed and the southern portion drains to the Barnegat Bay Watershed (Brick Township Master Plan 2007). Portions of the Township also span other watershed areas including the Metedeconk River Watershed, Beaver Dam Creek Watershed, Kettle Creek Watershed, and Reedy Creek Watershed. An additional one-mile area of the barrier island drains into the Barnegat Bay and Atlantic Ocean (Brick Township SRPR 2014). Refer to Figure 4-2 which illustrates the watersheds the Township is located within.

Manasquan River Watershed

The Manasquan River Watershed encompasses approximately 82 square miles and hosts a river that flows for nearly 23 miles to the Atlantic Ocean. It touches several jurisdictions besides the Township of Brick, including the Townships of Colts Neck, Freehold, Howell, and Wall. This watershed supports numerous rare and endangered plant and animal species, forests, and wetlands, and numerous commercial and recreational finfish and shellfish species (Manasquan Watershed Management Plan 2000). Specifically for the Township of Brick, this watershed is one of two major watersheds in the community. The extreme northern portion of the Township drains to it (Brick Township Master Plan 2007).

Metedeconk River Watershed

The Metedeconk River Watershed is approximately 90 square miles and drains the northern Barnegat Bay watershed. The Metedeconk River flows through 9 towns and 2 counties and over 40 miles of woodlands, freshwater wetlands, forested wetlands, tidal wetlands, and densely developed areas before emptying into the Barnegat Bay. The river and its watershed provide drinking water from ground and surface water sources to about 100,000 homes in Ocean and Monmouth Counties (Metedeconk Watershed 2015). In addition to the Metedeconk River, the Metedeconk River Watershed also contains the north branch of Beaver Dam Creek and the Cedar Bridge Branch (Brick Township SRPR 2014).

Kettle Creek (includes Reedy Creek)

The Kettle Creek Watershed consists of Kettle Creek, Lake Irisado, Tunes Branch, Long Causeway Branch, and Polhemus Branch, all of which drain into the Barnegat Bay (Brick Township SRPR 2014). This watershed can be found in three municipalities, specifically the Townships of Brick, Lakewood, and Toms River. The





SECTION 4: TOWNSHIP PROFILE

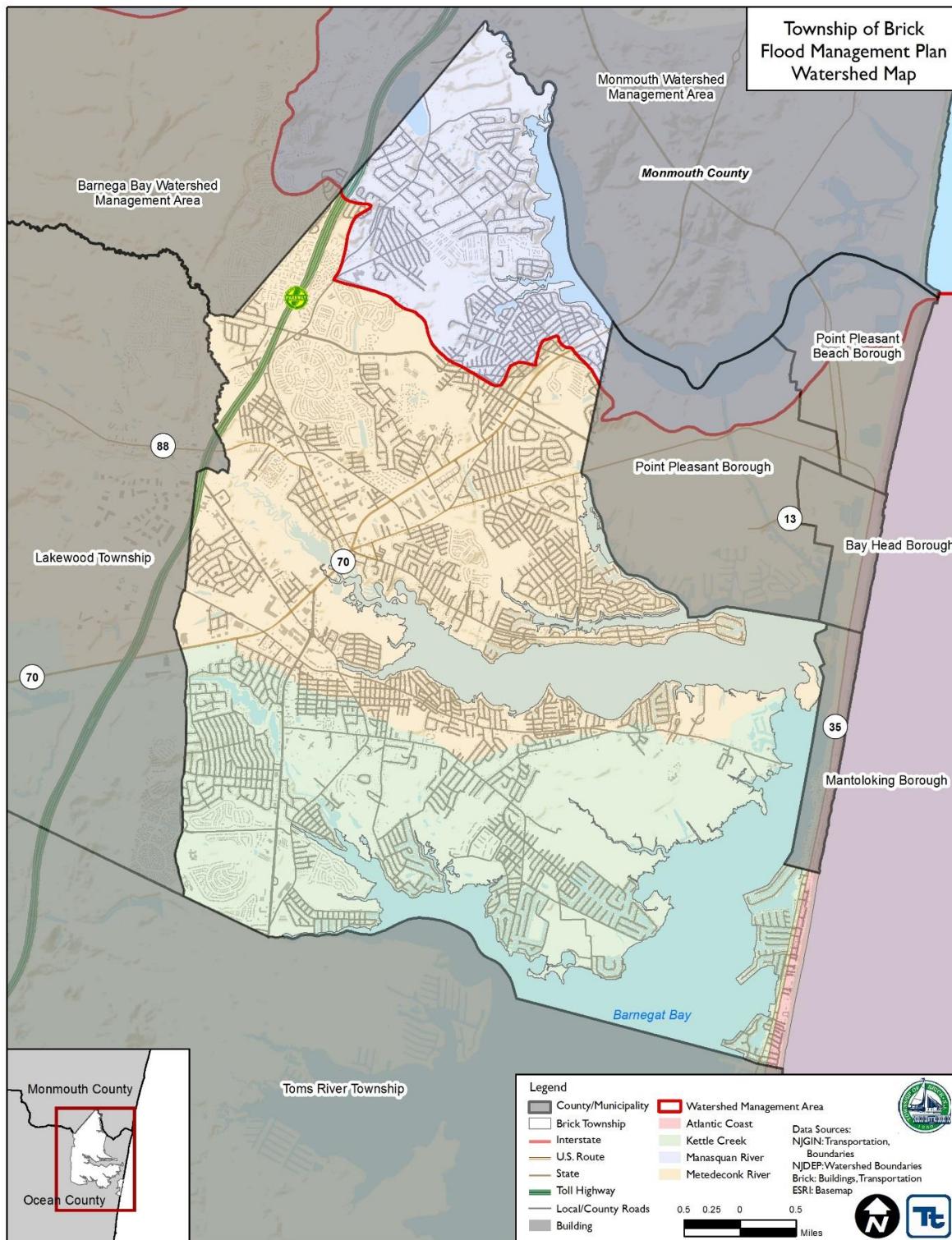
Kettle Creek Watershed is actually a subwatershed to the Barnegat Bay watershed and consists mainly of tidal salt marshes, as well as smaller amounts of upland forest, lowland forest, pine barrens, cedar swamps, and tidal wetlands. It encompasses approximately 950 acres of land, much of which has been developed for residential and urban uses (Kettle Creek Subwatershed 2015).





SECTION 4: TOWNSHIP PROFILE

Figure 4-2. Watersheds of Township of Brick, New Jersey



Source: NJDEP



**Table 4-1. Basins and Subbasins of the Township of Brick**

Watershed	Waterways
Barnegat Bay	Barnegat Bay and tributaries
Manasquan River	Sawmill Creek
	Godfrey Lake
	Multiple unnamed tributaries
Metedeconk River	Main Branch of the Metedeconk River
	North Branch of the Metedeconk River
	Beaver Dam Creek
	North Branch of the Beaver Dam Creek
	Cedar Bridge Branch
Kettle Creek	Kettle Creek
	Polhemus Branch
	Lake Irisado
	Tunes Branch
	Long Causeway Branch
Reedy Creek	Reedy Creek
	Multiple lagoons and unnamed tributaries

Source: Brick Township SRPR 2014

Water and Wastewater Systems

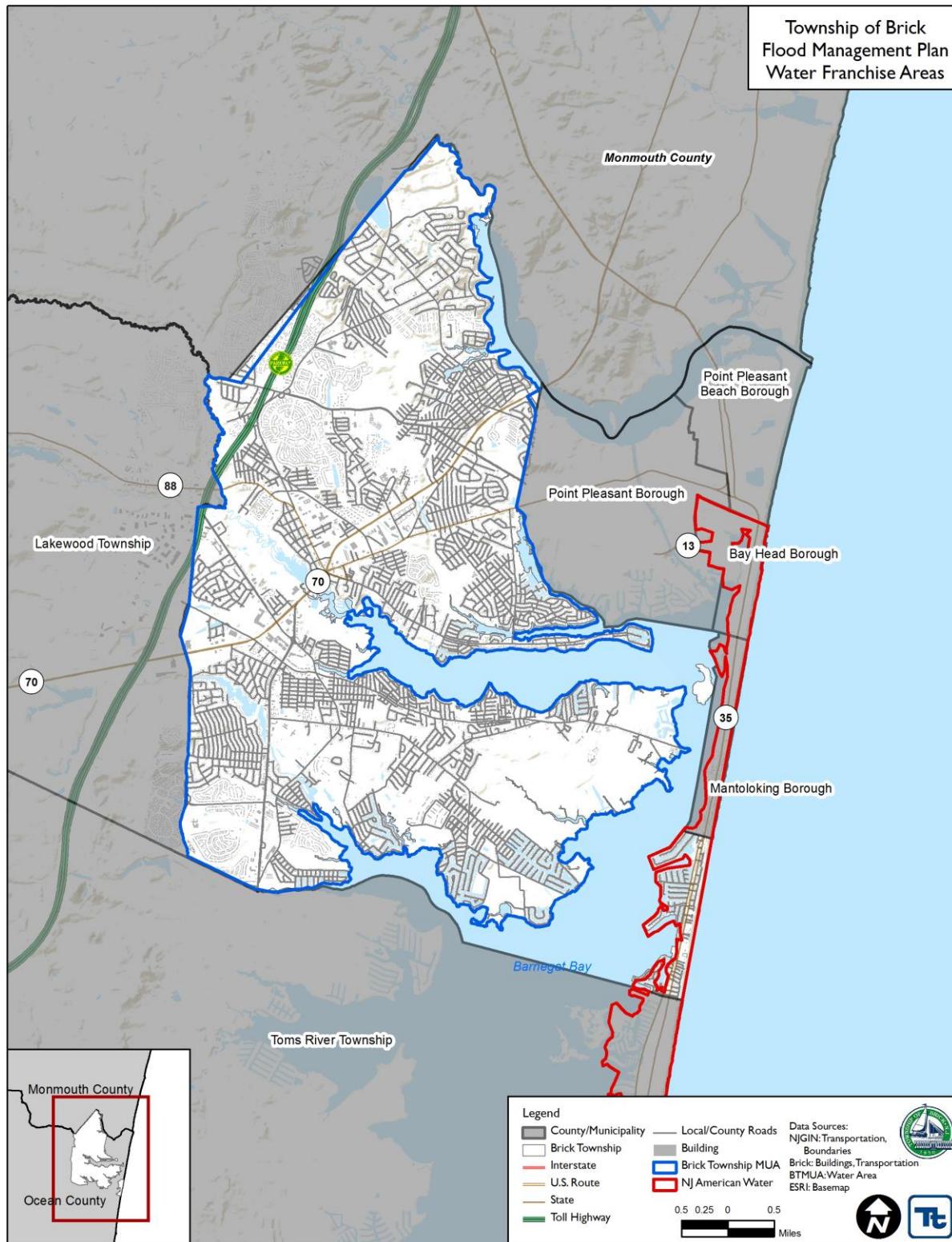
Public drinking water utility service is provided throughout Brick Township and is divided into two separate service (franchise) areas. The Brick Township Municipal Utilities Authority's (BTMUA's) service area covers the mainland portion of Brick Township and BTMUA provides drinking water to the vast majority of Brick residents. The New Jersey-American Water Company's (NJ-American's) service area covers the barrier island portion of Brick Township. The NJ-American system serving Ocean County, including Brick, is interconnected with its Monmouth County system. Both the BTMUA and New Jersey-American water systems are regulated by NJDEP's Division of Water Supply and Geoscience.

Figure 4-3 shows the BTMUA and NJ-American Water service areas.





Figure 4-3. Water Supply and Wastewater System of the Township of Brick



Source: BTMUA





BTMUA handles all wastewater collection in Brick Township, including on the barrier island. All wastewater is conveyed by BTMUA to the Ocean County Utilities Authority's Northern Water Pollution Control Facility for treatment.

Watershed Management Areas

In 1996, the New Jersey Department of Environmental Protection (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 (WMA), for a total of 20 WMAs. Each WMA encompasses a particular group of major rivers and each consists of numerous smaller watersheds (U.S. Geological Survey [USGS] 2000). The Township of Brick is located within the Monmouth and Barnegat Bay WMAs, which are described below (NJDEP 2012; 2015).

WMA 12: Monmouth

WMA 12 extends from Perth Amboy to Point Pleasant Beach. WMA 12 is comprised of an assemblage of coastal sub-watersheds, all or a portion of which fall into 56 municipalities in the Raritan Bay and Atlantic Coastal drainage basins. Although the majority of impacted municipalities are in Monmouth County, several lie within the boundaries of Middlesex and Ocean Counties (NJDEP 2012).

WMA 13: Barnegat Bay

WMA 13 includes watersheds that drain the central Atlantic drainage of New Jersey. The Barnegat Bay Watershed is a 660 square mile area encompassing all of the land and water in Ocean County, as well as parts of Monmouth County. The area lies mostly in Ocean County and includes Barnegat Bay as well as the following sub-watersheds: Metedeconk River, Toms River, Forked River, and Cedar Creek (NJDEP 2015).

Barnegat Bay is separated from the Atlantic Ocean by the barrier island. The watershed area is recognized for its important biological and natural resources. Wetland forests comprise 25% of the total watershed. The watershed's land usage is split between forested (45.9%), tidal and freshwater wetlands (25.2%), urban/residential (19.5%), agricultural/grasslands (6.6%), barren lands (1.9%), and water bodies (0.9%) (Barnegat Bay Comprehensive Conservation and Management Plan 2002).

Topography

The Township of Brick is located in the Atlantic Coastal Plain which consists of sediments that primarily include unconsolidated sands, silts, clays, and marls. The Cohansey and Kirkwood sand formations are common in the Township. The underlying geology of the Township consists of gneiss and schists which generally slope downward towards the Atlantic Ocean (Ocean County Flood Insurance Study [OC FIS] 2014).

The natural environment of the Township is defined by an interconnected landscape of forests, wetlands, fields, and coastal areas. Vegetation and forested areas of the Township can be classified into three major categories: the dry uplands, the wet lowland forest, and the pitch pine lowland forest which is a transition zone between the other two. The dry upland forests include a combination of oak and pine trees; the wet lowland forest includes cedar swamp, hardwood swamp, and marshland; and the pitch pine forest contains mostly pitch pine and vegetative transitions between the lowland and upland areas. (Brick Township Master Plan 2007).

The Township is also largely defined by its coastal and waterfront landscapes including a barrier island. The Township of Brick's 53.2 miles of privately-owned waterfront property is the most of any municipality in New





Jersey. Waterfront property in the Township includes 1.79 miles along the barrier island, 39.5 miles of riverfront property and 11.93 miles of bayfront property (Brick Township Master Plan 2007).

Climate

The Township of Brick has a temperate climate resulting in relatively warm summers and moderate winters. The average annual temperature in the Township is 53 degrees Fahrenheit ($^{\circ}\text{F}$) with temperatures rarely exceeding 100 $^{\circ}\text{F}$ and rarely falling below 0 $^{\circ}\text{F}$. Precipitation averages approximately 50 inches annually, with July and August being the wettest months. Snowfall averages nearly 25 inches each year.

Land Use, Land Cover, and Land Use Trends

Local zoning and planning authority is provided for under the New Jersey Municipal Land Use Law, which gives municipalities zoning and planning authority. This plan provides a general overview of land use and development trends occurring within the study area. Local land use significantly impacts exposure and vulnerability to various hazards and impacts the need for, and priority of, mitigation options over time. An understanding of these trends and conditions 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 land use pattern of the Township of Brick has been influenced by a combination of a historic pattern of suburban auto-oriented development and environmental limitations. Traditional resource-related industries, such as agriculture still exist but are not considered the economic driver that they were a century ago. Other factors such as floodplains, environmental regulations, and natural terrain characteristics, have influenced land use and development. As a coastal community with the most waterfront of any New Jersey municipality, Township of Brick has strict land use regulations in place to protect waterfront resources including those associated with its location in the federally regulated Coastal Areas Facility Review Act (CAFRA) Zone. The CAFRA Zone is New Jersey's coastal zone in which NJDEP has the authority to approve the location, design, and construction of major facilities to ensure the protection of coastal resources (Brick Township Master Plan 2007, Ocean County Hazard Mitigation Plan [OC HMP] 2014).

The barrier island of Township of Brick serves a unique and protective function for the community. It serves as a naturally occurring protective response against the Township's vulnerability to hurricanes, storms, and coastal flooding, and it primarily shields residential land use. Township zoning and development regulations coordinate with the State rules on Coastal Zone Management to protect the barrier island and other beach-dune areas from inappropriate development. Enforcing these regulations can occasionally be challenging to the community due to the scenic value and special attraction of the barrier island location increasing demand for property nearby (Brick Township Master Plan 2007).

According to the 2007 Brick Township Master Plan, the vast majority of the Township's developable areas are built-out and there are few large undeveloped parcels remaining. In addition, most of the developed land area has been dedicated to residential use. The Township promotes flexible residential design while limiting over development of individual lots, environmentally critical areas, and high-density single-family and multi-family residences. The Township also has several main types of commercial development, including highway commercial, general commercial, neighborhood commercial, and waterfront commercial.

The Township remains open to opportunities for development and redevelopment. New development is limited by the Township's location near two state highways and the Metedeconk River, leading to an increased focus on mixed-use design and the redevelopment of commercial properties in the Town Center. The Township has identified vacant commercial properties for potential redevelopment. These properties most typically include





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obsolete buildings or layouts, known health or safety issues, or lands not likely to be developed due to location, remoteness, or lack of access. The Township currently has four primary locations targeted for mixed-use development or redevelopment (Brick Township Master Plan 2007).

The Township is also dedicated to preserving open space for conservation and recreational purposes. As of 2007, the Township maintained approximately 3,000 acres of preserved lands, owned by federal, state, county, municipal, or private entities (Brick Township Master Plan 2007).

The Township of Brick contains approximately 13,700 acres of land, of which, approximately 87.5% is developed, including 6,471 acres of residential development (47.2% of land), 3,606 acres of public property (26.3% of land), and 1,184 acres of commercial development (8.6% of land) (Brick Township Master Plan 2007). Figure 4-4 illustrates land use throughout the Township of Brick. Table 4-2 below shows the land use categories and their total square miles and percentages in the township.

Table 4-2. Land Use (2007) in the Township of Brick

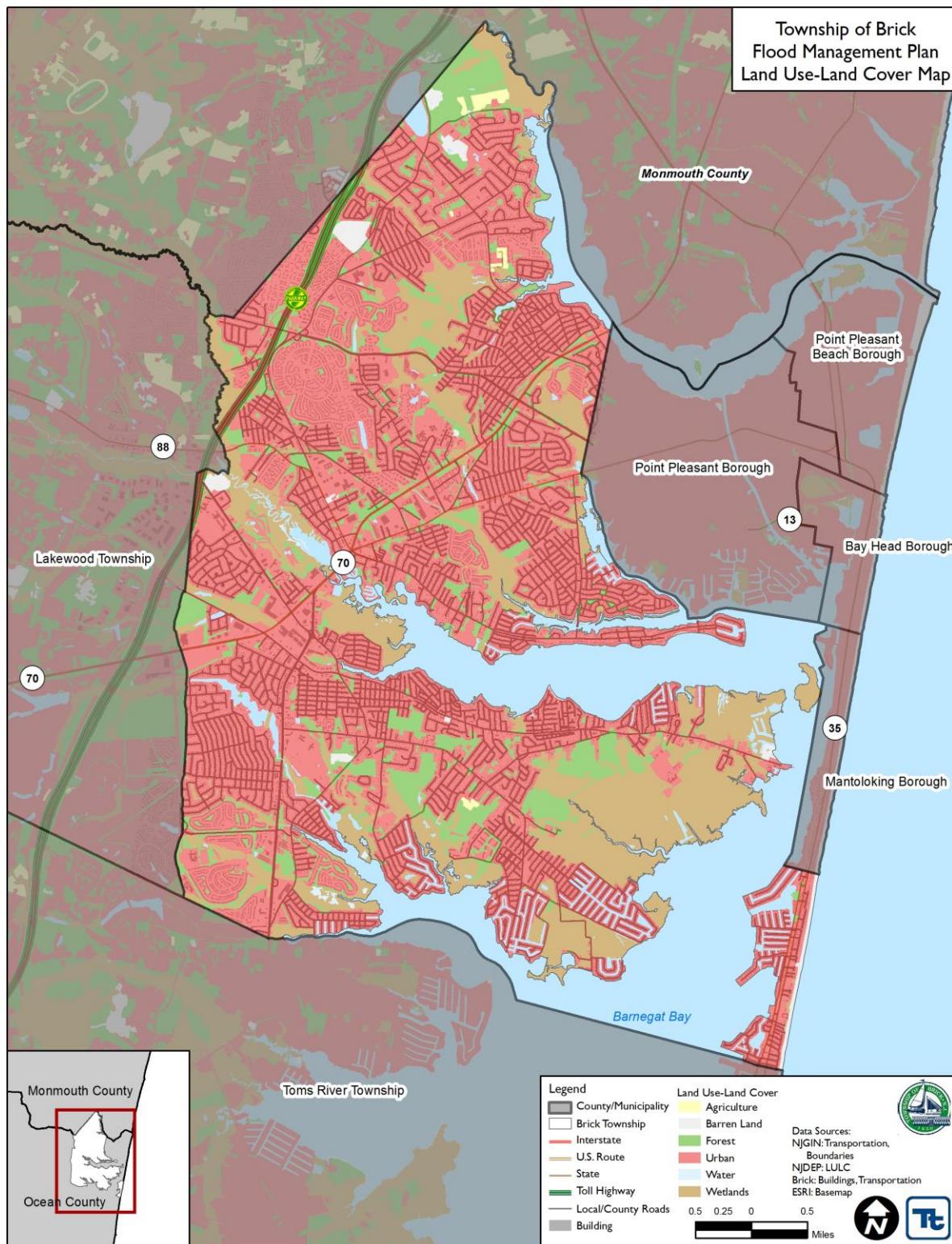
Land Use	Acres	Total Area (square miles)	Percent of Township (%)
Vacant	1717.03	2.68	12.53
Residential	6471.32	10.11	47.23
Farm	1.48	0.00	0.0
Commercial	1184.33	1.85	8.64
Industrial	38.35	.06	.27
Apartment	175.17	.27	1.27
Public School Property	290.07	.45	2.2
Other School Property	1.06	0.0	0.0
Public Property	3606.44	5.64	26.32
Church and Charitable Property	106.38	0.17	0.78
Cemeteries and Graveyards	3.05	0.00	0.02
Other Exempt	106.99	0.17	0.78
Total	13,701.68	21.4	100

Source: Brick Township Master Plan 2007





Figure 4-4. Land Use in the Township of Brick



Source: NJDEP, 2015





4.2 POPULATION AND DEMOGRAPHICS

This section discusses population trends to use as a basis for estimating future changes of the population and significant changes to the character and future needs 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.

4.2.1 Population Characteristics and Trends

According to the 2010 U.S. Census and 2013 American Community Survey (ACS), the Township of Brick had a total population of 75,072 people (U.S. Census) residing in 28,568 households and an average household size of 2.63 (2013 ACS). These numbers represent a modest 1.4% decrease in population since the 2000 U.S. Census estimate, which identified a Township population of 76,119 people. The median age of Township residents in 2010 was 43.6, which indicates a slightly aging population when compared to a median age of 39.4 in 2000. As of 2010, 20.7% of the population was under 18 and 17.9% were over the age of 65.

Table 4-3. Township of Brick Population Characteristics

Municipality	U.S. Census 2010			U.S. Census 2000*				
	Total	Pop. 65+	% Pop. 65+	Total	Pop. 65+	% Pop. 65+	Low-Income Pop.*	
Township of Brick	75,072	13,468	17.9	76,119	12,963	12.0	3,411	4.5

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

Notes:

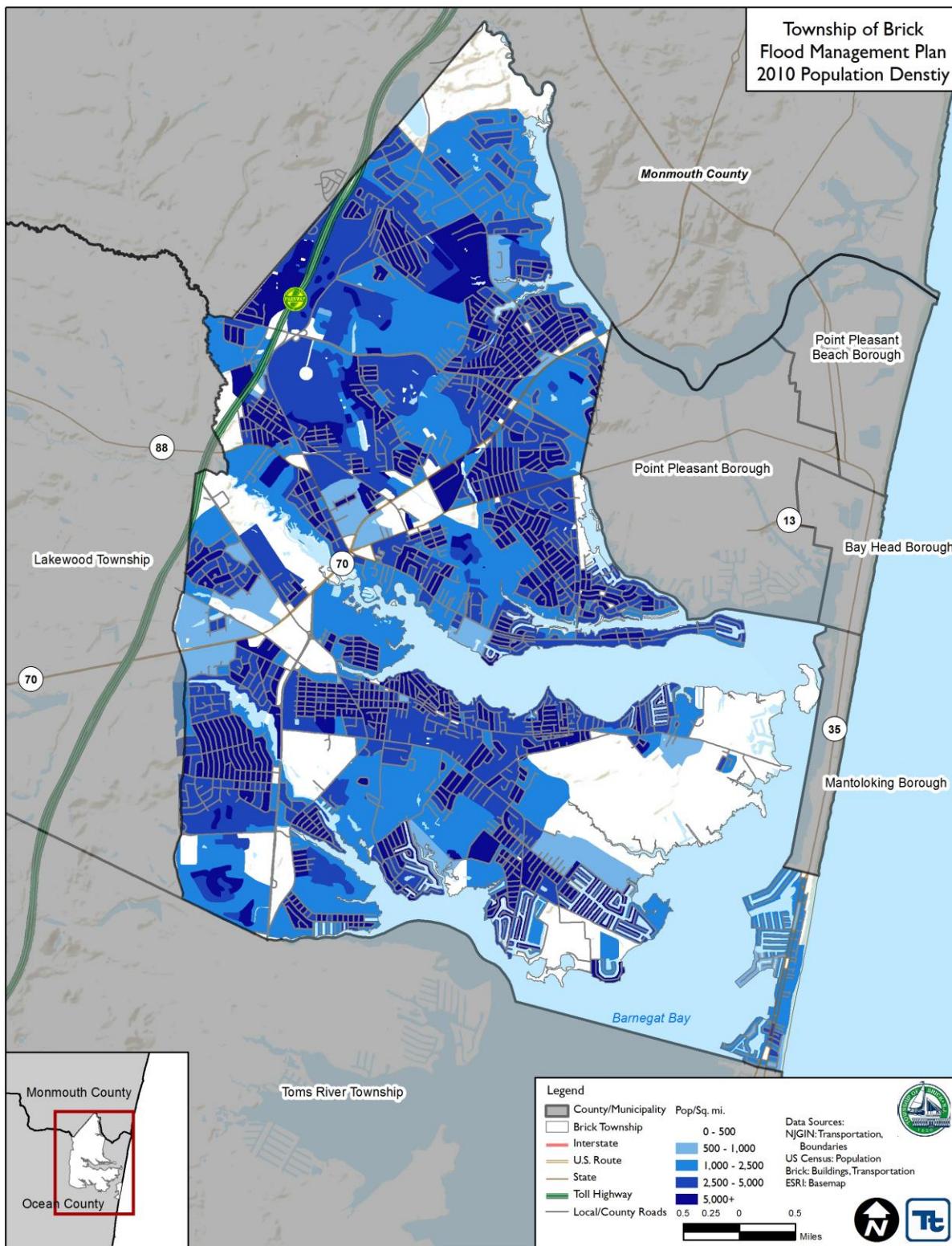
Pop = population

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





Figure 4-5. Distribution of General Population for the Township of Brick, New Jersey



Source: U.S. Census 2010





The population in the Township of Brick expanded rapidly in the latter half of the 20th century, increasing by over 275% between 1950 and 1960, and over 100% between 1960 and 1970. Steady population growth continued for 3 more decades including a 14.5% growth between 1990 and 2000. The first decade of the 21st century has seen a full stop in population growth, however, as the Township of Brick experienced a slight population decline. It is likely that the slowing of population growth is due mainly to the limited remaining developable land in the Township as well as the implementation of sustainable planning and development practices (U.S. Census Bureau 2010).

Table 4-4. Township of Brick Population Trends, 1950 to 2010

Year	Population	Change in Population	Percent (%) Population Change
1950	4,319	-	-
1960	16,299	11,980	277%
1970	35,057	18,758	115%
1980	53,629	18,572	53.0%
1990	66,473	12,844	23.9%
2000	76,119	9,646	14.5%
2010	75,072	(1,047)	(1.4%)

Source: U.S. Census Bureau 1980, 1990, 2000, 2010

Education and Employment

At the time of the 2013 American Community Survey, 92.7% of the Township of Brick's residents graduated from high school or had a higher level of education and training, and 24.3% completed a bachelor's degree or higher level of education and training.

Of the Township's total civilian workforce of 40,309 people, 4,247 are unemployed, resulting in an unemployment rate of 10.5% which represents significant opportunity to create new jobs and expand existing job opportunities for unemployed residents. Of the working population, 91.4% commute to work in a personal vehicle. This high number of commuters presents opportunities to increase resiliency by protecting and strengthening infrastructure systems including roads and bridges to maintain safe evacuation routes and protect daily commuters during a disaster (ACS 2013).

According to the American Community Survey, the largest occupation group in the Township of Brick is the educational services, health care, and social assistance sectors making up 25.1% of the labor force. Other large occupation groups include retail trade (16%), transportation, warehousing and utilities (9.6%), professional, scientific, management, and administrative (9.4%), and construction (8%). As reported in the 2007 Master Plan, the three largest employers in the Township are the municipal building, Brick High School, and the Ocean Medical Center.

Race, Ethnicity, and Language

Research shows that minorities are less likely to be involved in pre-disaster planning and experience higher mortality rates during a disaster event. Post-disaster recovery can be ineffective and is often characterized by cultural insensitivity. Since higher proportions of ethnic minorities live below the poverty line than the majority white population, poverty can compound vulnerability. According to the 2010 U.S. Census, the racial composition of the planning area is predominantly white (93.1%). The largest minority populations are black (2.0%), Asian (1.6 %), some other race (1.8%), and two or more races (1.4%). Since 2000 the Township of Brick has experienced additional diversity with minority populations increasing by 2.7%. Table 4-5 shows the racial distribution in the planning area (U.S. Census 2000, 2010).



**Table 4-5. Township of Brick Racial and Ethnic Heritage**

Year	Hispanic or Latino	White Alone	Black or African American Alone	American Indian and Alaska Native Alone	Asian Alone	Native Hawaiian and Other Pacific Islander Alone	Some Other Race Alone	Two or More Races
2010	5,301 (7.1%)	69,856 (93.1%)	1,502 (2.0%)	104 (0.1%)	1,173 (1.6%)	27	1,350 (1.8%)	1,060 (1.4%)
2000	2,930 (3.8%)	72,932 (95.8%)	751 (1%)	76 (0.1%)	904 (1.2%)	12	650 (0.09%)	794 (1.0%)

Source: U.S. Census 2000, 2010

According to the American Community Survey, 90.1% of the population in the Township of Brick speaks only English. Other than English, the most commonly spoken languages in the Township is Spanish at 4.0%. The American Community Survey estimates that 3.0% of the residents speak English “less than very well” (ACS 2013).

4.2.2 Vulnerable Populations

Identifying concentrations of vulnerable populations can assist communities in targeting preparedness, response, and mitigation actions. 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 planning process, vulnerable populations in the Township of Brick include children, elderly, low-income, the physically or mentally disabled, non-English speakers, and the medically or chemically dependent.

Age

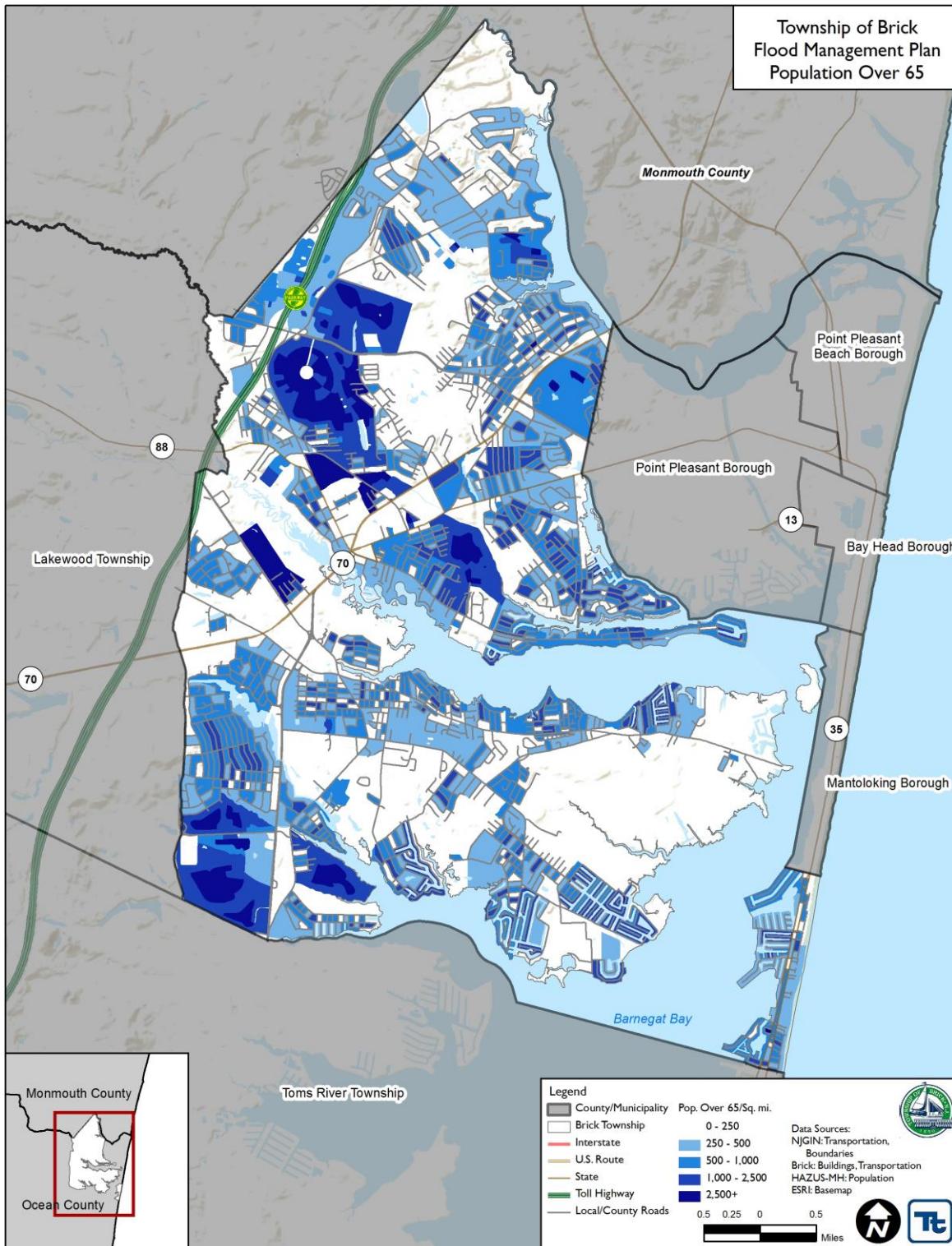
Household with children or elderly residents experience an additional level of vulnerability during disaster events. Limited mobility, necessary medicine, physical ailments or fragility all increase the safety risks for these individuals and their family members in emergency situations. Ensuring that these households have access to information, resources, and quality housing stock to allow for sheltering in place is essential for long-term public safety and resilience.

As of 2013, 29.7% of households in the Township had at least 1 child, and 35.3% included at least 1 person 65 years or older. In addition, 15.3% of households were made up of people 65 years or older living alone which creates even greater vulnerability. Figure 4-6 below provides a graphical distribution of the Township population over age 65.





Figure 4-6. Distribution of Persons over the Age of 65 in the Township of Brick, New Jersey



Source: HAZUS-MH 2.2