

Land Use & Design Baseline Topic Report

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Introduction

This report is one of a series of baseline reports that seeks to “characterize existing conditions, regional needs, patterns, trends, challenges and opportunities” with respect to a particular issue in the thirteen-county northern New Jersey region, as a resource for development of the Together North Jersey (TNJ) Regional Plan for Sustainable Development (RPSD).

This report focuses on land use and urban design and its impact on future development, including current land consumption and preservation; opportunities for future growth, including brownfield redevelopment, infill and transit-oriented development and mixed uses; the form and design of our communities, including walkability, access to transit and other amenities; as well as a review of current development trends that reflect the character and location of new development.

Organization of the Report

The report is divided into four sections. The first section describes existing conditions and key trends with respect to land use and urban design for the northern New Jersey region. It analyzes the conditions and trends for land use/consumption, including distribution of use type and how they have changed over time, the amount of publicly accessible open space and a specialized focus on brownfields and storm surge areas. It analyzes trends in urban form and design, including how walkable the region is, how close its residents are to transit, the number of historic properties and districts, which communities have adopted form based code and the programmatic involvement of communities in such programs as NJ Transit’s Transit Village Program and the NJ Main Street program, which encourage good form and design. Finally, it describes the location and character of new development, by analyzing building permit data between 2004 and 2011 to understand the proportion of new development that has taken place in more compact places, through redevelopment and with mixed-uses. It also looks at properties in various phases of redevelopment.

The second section identifies the long term desirable outcomes that relate to land use and urban design that were agreed upon with input from the TNJ project team, the Standing Committee on Livability and Environment, and public outreach workshops. This section also begins to lay out a proposed vision for implementing these outcomes, which will be built upon in further phases of this project.

The third section focuses on the policy, planning and implementation context that affects land use and urban design in the region. It compares many of the most relevant plans, programs and policies with the desired long term outcomes to highlight alignment and identify barriers to implementation. The section also summarizes a SWOT analysis carried out by the Standing Committee on Livability and Environment, focusing in depth on implementation opportunities and threats.

The fourth section considers how progress around land use and urban design will be measured as outcomes are implemented. A set of indicators – for many of which baseline numbers have been calculated – are listed, with the intention of being tracked over time to measure effectiveness of the RPSD.

Key Findings

The region has a diverse range of densities and land uses types. North Jersey has the most dense counties in the state – Hudson (13,882 people per square mile), Essex (6,221 people per square mile) and Union (5,245 people per square mile) – and some of the least dense counties in the state – Sussex (286 people per square mile), Hunterdon (299 people per square mile) and Warren (304 people per square mile). The region is a diverse landscape of farms, forests, suburbs and cities. The most predominant land use types in North Jersey are forest (30% in 2007) and residential (23% in 2007).

The region continues to urbanize with lower efficiency. Between 1986 and 2007 urbanized land use expanded at a faster rate (22%) than population growth (13%), indicating lower efficiencies in urbanization. Thirty-six percent of land cover in the region is considered urban. Between 1986 and 2007, the greatest changes in land type included loss of agriculture (-30%) and barren (-17%) and gains in utility (47%), urban open space (37%) and residential (20%). At the county level, the densest counties experienced little growth in urban acres, as they are largely built out. The more rural counties – Hunterdon, Somerset, Warren – experienced the greatest urban growth.

Residential land use growth is primarily occurring in high and rural densities. Growth in residential land use acreage increased by nearly 20% between 1986 and 2007. Growth was strongest amongst high (20%) and rural (30%+) densities, with little growth in medium/low density development.

The loss of natural lands continues, but has slowed over time. The loss of natural lands – including forest, agricultural and wetlands – continued from 1986 to 2007. Rates of loss over time have slowed, however, with wetlands slowing by 70% (when comparing loss rates from 1986-1995 versus 1995-2007) and agriculture slowing by 30%. Forested land actually increased from 1986 to 1995 but then experienced accelerated loss from 1995 to 2007.

Impervious land cover is increasing. In 1995, 10% of North Jersey's land cover was impervious, but increased to 11.1% in 2007, a growth rate of 12%.

Much of the region has generally good access to parks and open space. North Jersey has over 350,000 acres of publicly accessible parks and open space (13.1% of the total area). Over 64% of all households in the region are within a reasonable distance of a publicly accessible park or open space. Eighty-five percent of rural households are within one mile of publicly accessible parks or open spaces, while 62% of urban households are within ½ mile.

There is no known total number of brownfields in the region, but 193 sites are in the process of being remediated and redeveloped. While there is no definitive inventory of all brownfields kept for the state, it is estimated that there are over 10,000 brownfield sites total. One hundred ninety-three sites are in the Brownfield Development Area Initiative program.

Hudson, Monmouth and Ocean Counties have the greatest number of residents at risk of coastal storm surge. Approximately 173 square miles (4%) of the region's total land area are located in the surge area impacted by Superstorm Sandy. Nearly 275,000 residents live in these areas. Hudson County has the greatest share of land area in the surge area, while Hudson, Monmouth and Ocean Counties have the greatest share of population and housing units at risk of storm surge.

Walkability is greatest in more dense, urbanized counties. Walk Scores and share of population within walking distance to schools indicates that the densest counties have municipalities with the highest walk scores and the greatest share of population within ½ mile of schools. At least 50% of residents living in Essex, Hudson, Passaic and Union Counties are within ½ mile of a school.

The more dense, urbanized counties are the most transit-oriented. Across North Jersey, 7.6% of the population lives within ½ mile of a rail (commuter, light rail, subway, PATH) station. Hudson, Essex and Union have the greatest share of population living within ½ mile.

Multifamily and mixed use housing comprises less than half of all new residential development. Across the region, 44% of all residential building permits issued between 2004 and 2011 were for multifamily and mixed use types. Over 50% of permits issued in more urban counties are for multifamily or mixed use types. Municipalities with train lines tend to have a higher percentage of mixed use and multifamily permits.

1 Existing Conditions and Trends

The purpose of this section is to describe existing conditions and key trends in land use and community design for the 13-County Northern New Jersey area. In order to determine recommendations for a sustainable future, it is critical to understand the point from which we are starting. The Land Use & Urban Design Baseline Assessment will be organized around three priority subtopics, including Land Use Patterns; Urban Form and Design; and Location and Character of New Development. For each of these subtopics, existing conditions and trends will be researched and analyzed that reflect the desired long term outcomes described above while helping to inform the indicators that will be used to measure success described below. The following existing conditions and trends will be researched and analyzed according to each subtopic.

1.1 Land Use Patterns

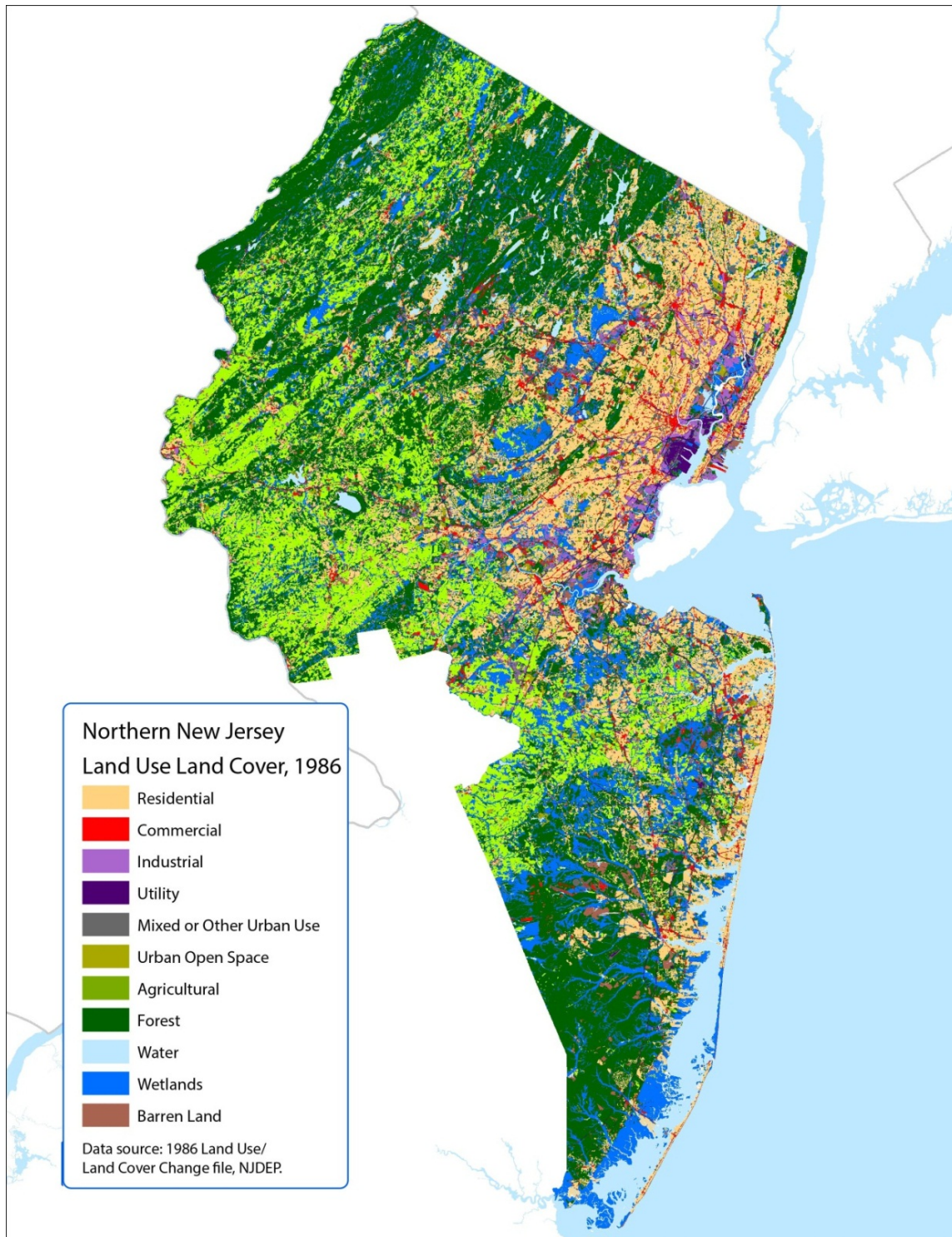
Land use patterns give a broad understanding of how land has been developed in New Jersey as well as the relationship between different land use types. These patterns help understand where developed and natural lands are located, how much of each type there is and how easy it is to access them. Tracking patterns over time can help assess how the developed and natural landscapes are changing and how land use policies have impacted development on the ground. The following discussion looks at trends and indicators in land consumption, open space and public parks, farmlands, brownfields, and storm surge/flood prone areas.

The data for this topic are derived heavily from NJDEP's Land Use Land Cover data files, which were issued in 1986, 1995, 2002, and 2007 (NJDEP, 1997, 1998, 2010). In order to keep similar time intervals, only data from 1986, 1995, and 2007 were analyzed.

1.1.1 Land Use/Consumption

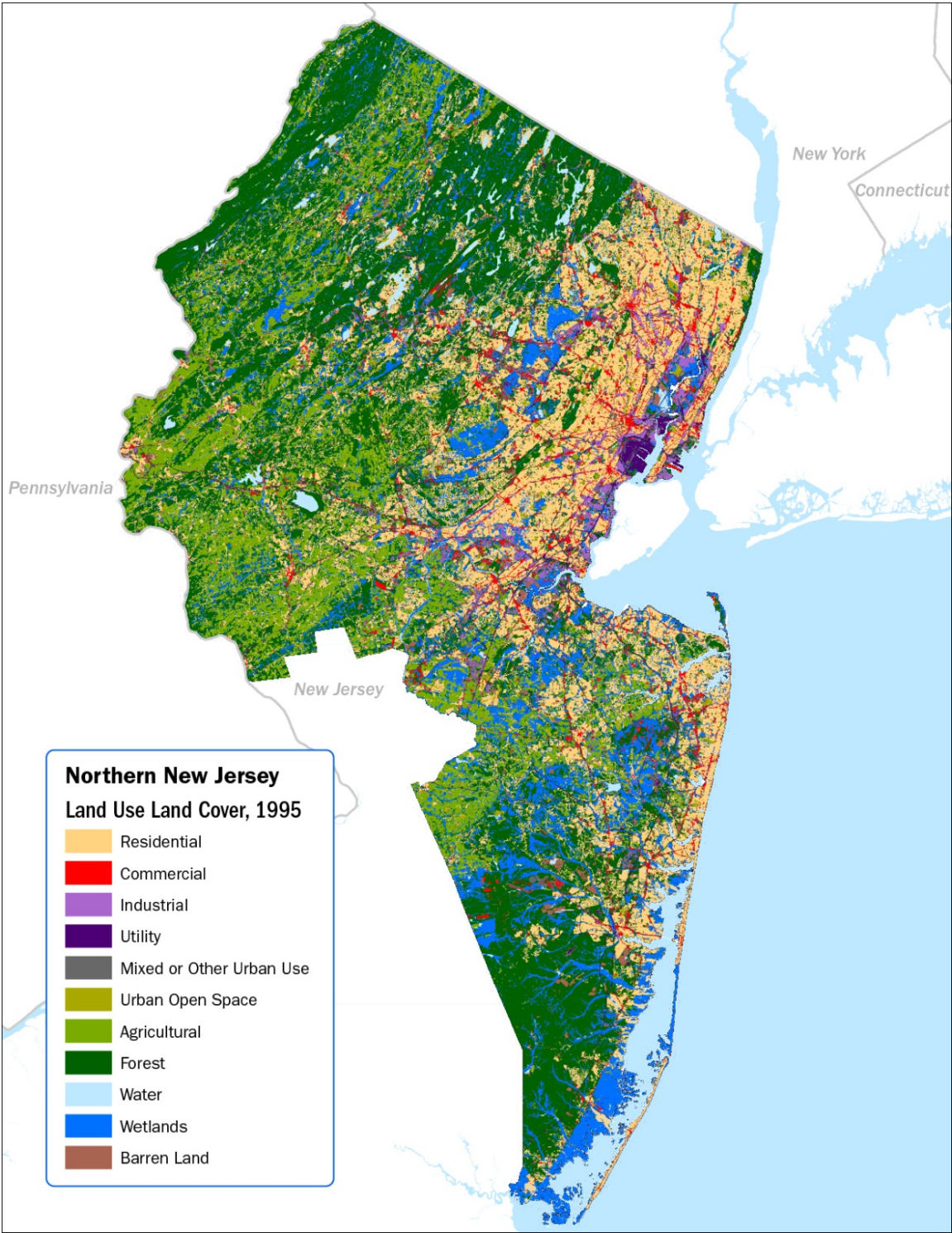
Land consumption measures how much land area has been converted from open space, forestland, or agricultural land to another, more developed use. Land consumption per capita measures how much land is consumed per person, or how efficient development is. How this ratio changes over time can help measure how well open space is being preserved and how well existing centers are attracting redevelopment.

Figure 1.1 Land Use/Land Cover in North Jersey, 1986



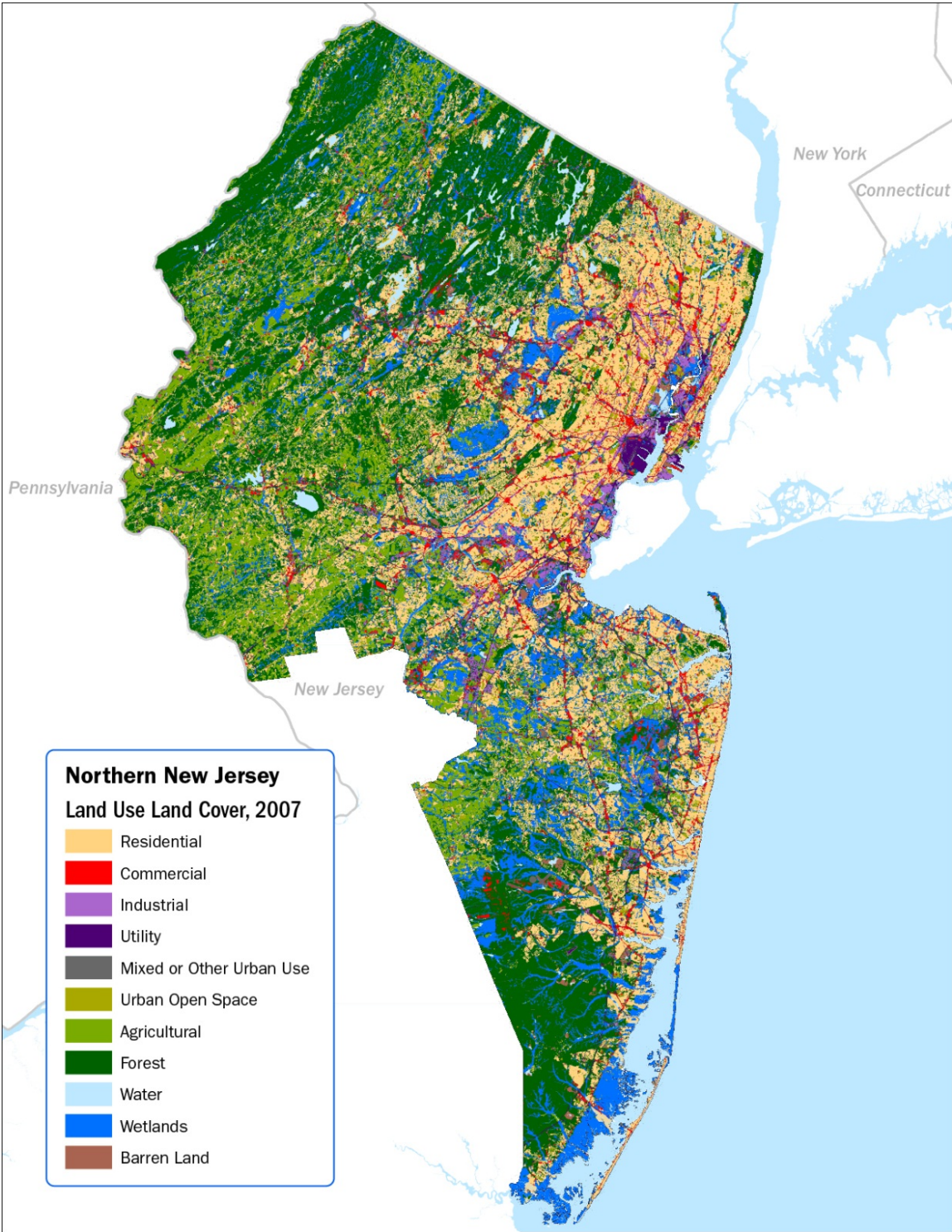
SOURCE: NJDEP Land Use/Land Cover, 1986

Figure 1.2 Land Use/Land Cover in North Jersey, 1995



SOURCE: NJDEP Land Use/Land Cover, 1995

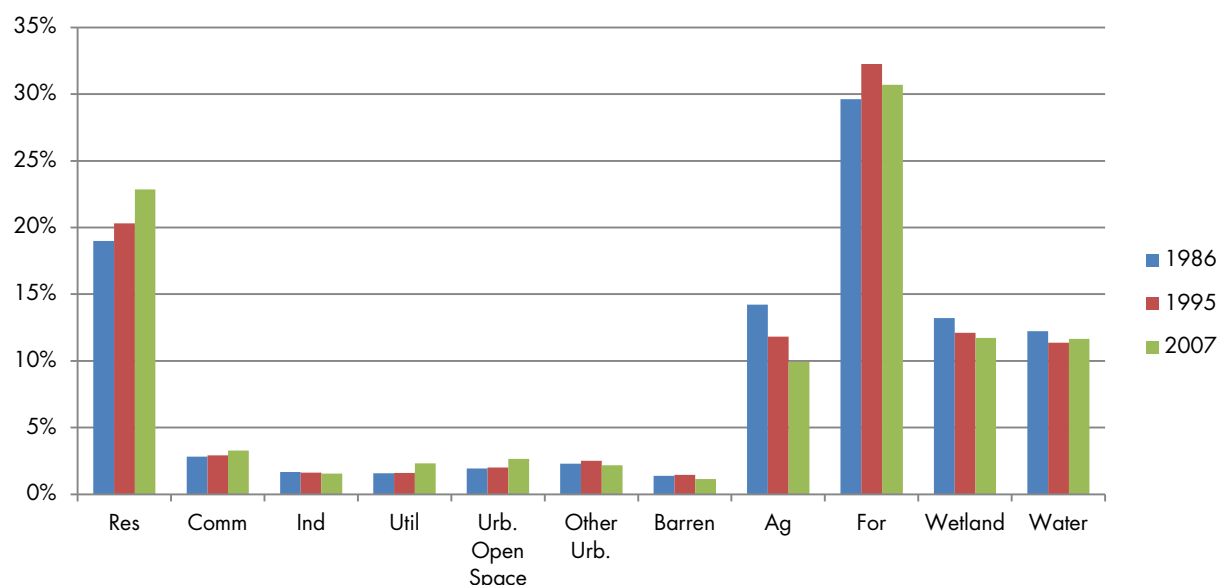
Figure 1.3 Land Use/Land Cover in North Jersey, 2007



SOURCE: NJDEP Land Use/Land Cover, 2007

North Jersey has historically been the most populous region in the Garden State. Hudson (13,882 people per square mile), Essex (6,221 people per square mile), and Union (5,245 people per square mile) Counties are the most densely populated counties. However, North Jersey also includes some of the least densely populated counties, including Sussex (286 people per square mile), Hunterdon (299 people per square mile), and Warren (304 people per square mile) (US Census, 2011). The result is a diverse landscape of farms, forests, and cities. The two land use types that are most predominant in NJ are forest (30% in 2007) and residential (23% in 2007), with forestland largely contained within the NJ Highlands and Pine Barrens Regions, as seen in Figure 1.3 and Figure 1.4.

Figure 1.4 Share of Land Use Type, 1986-2007



SOURCE: NJDEP Land Use/Land Cover 1986, 1995, 2007

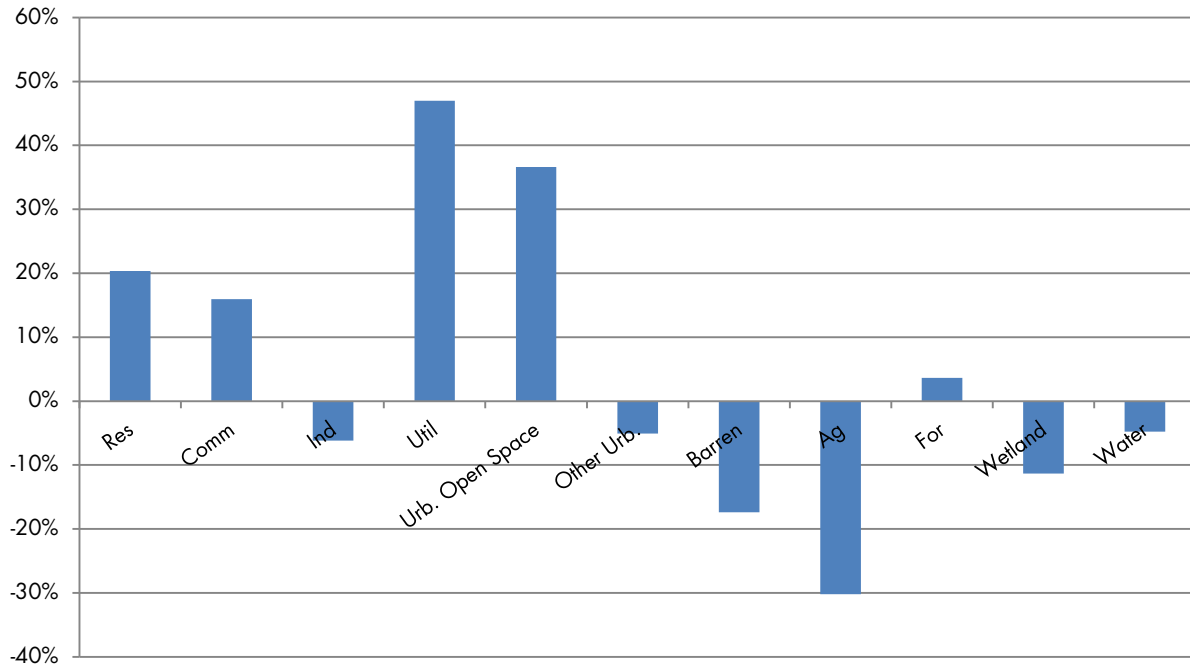
General Trends, 1986-2007

Over this 21 year period, NJ experienced steady growth. Population grew by over 13%, from 5.7 million to 6.5 million. Urbanized areas, including residential, commercial, and industrial lands use types, grew at a faster rate, by nearly 22%. This suggests that development over this period was less efficient than historic development patterns. Developed land per capita in 1986 was 0.15 acres per capita and in 2007, this figure was 0.17 acres per capita. While this is an incremental increase, when calculated as new urbanized land per new resident, the rate increases to 0.26 – an increase of nearly 75% over historic development patterns.

Figure 1.5 displays the change in share of land use type during this period. Gains in share were seen in residential, commercial, utility, urban open space, and forest land use types. Losses were seen in agricultural, industrial, other urban, barren land, wetlands, and water. The largest gains in land type share were in utility (transportation right of way) (47%) and urban open space (parks and recreational facilities) (37%). The largest losses in land type share were in agricultural (-30%) and barren lands (-17%). Gains in transportation right of way are likely due to better imagery interpretation over time. Urban

open space increases suggest that NJ residents are enjoying greater access to parks and recreational lands. Losses in agriculture suggest that farmlands are being converted to more urban uses. Barren land loss may be the result of the closure of landfills and fewer large-scale new development sites.

Figure 1.5 Change in Share of Land Use Type, 1986-2007

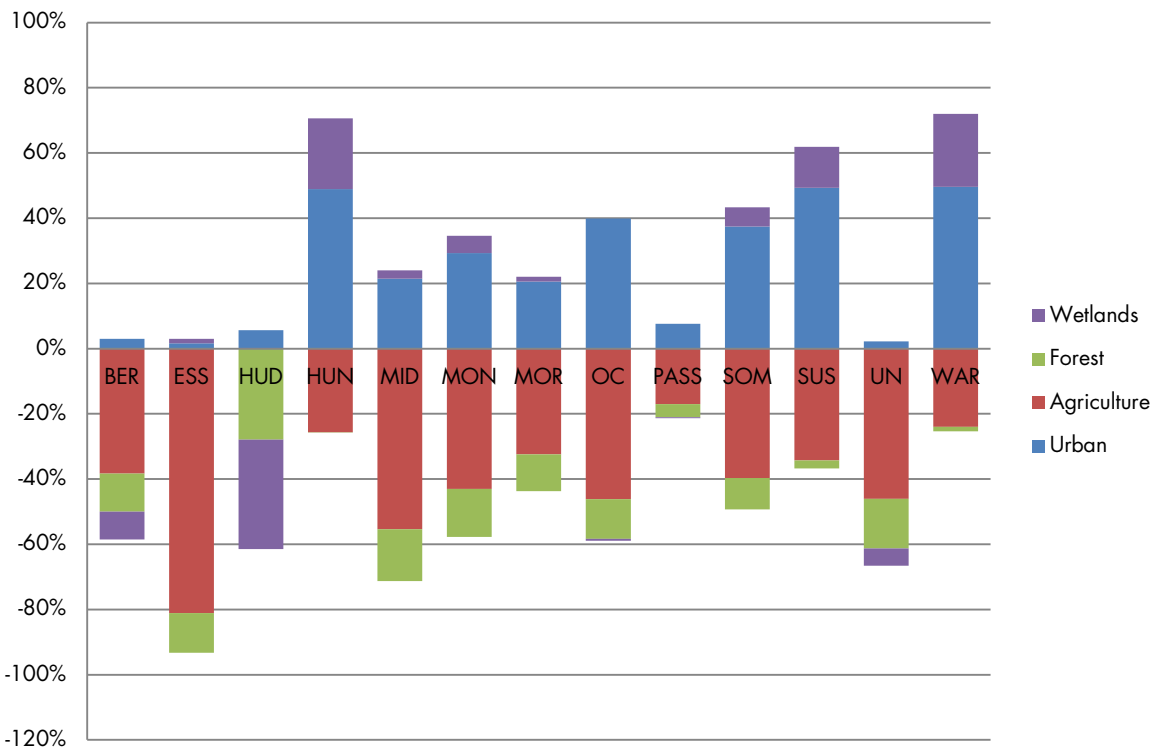


SOURCE: NJDEP Land Use/Land Cover 1986, 2007

Land use changes did not occur uniformly throughout North Jersey, however. While the above graph gives broad changes to the landscape over this period, land uses changes vary greatly between counties, as shown in Figure 1.6. Urban land increased in each of the counties, but at differing rates. The most densely populated counties (Hudson, Essex, and Union) experienced little growth in urban acres, likely because these counties are largely built out. Urban growth occurred at the greatest rate in Hunterdon, Sussex, and Warren Counties, the least densely populated counties in North Jersey. Agricultural land losses also occurred at varying rates, with the greatest rate of loss in Essex, Union, and Middlesex. Essex and Union have relatively little agricultural land, but Middlesex County lost over 14,800 acres of farmland.

Similarly, forest lands had the greatest rate of loss in Hudson, Union, and Middlesex Counties. Hudson and Union had relatively little forests in 1986, but Middlesex County lost over 4,800 acres of forests over this time period. While wetlands in North Jersey had an overall decline, Hunterdon, Middlesex, Monmouth, Morris, Somerset, Sussex, and Warren Counties all experienced an increase in acres of wetlands. The greatest rate of losses occurred in Hudson, Bergen, and Union Counties.

Figure 1.6 Change in Acres by Land Use Type, 1986-2007



SOURCE: NJDEP Land Use/Land Cover 1986, 2007

Residential land use acreage grew by nearly 20% over this period, with an average annual growth rate of 1.25% pre-1995 and 0.6% post-1995. Among residential land use, data is available for density type, including high density single family development and multi-unit structures (1/8 to 1/5 acre lots with ~65% impervious coverage), medium- and low-density single family development (1/8 to 1/2 acre lots, 20-35% impervious coverage), and rural density single family development (>1 acre lots with 15-20% impervious coverage). Table 1.7 shows growth by density of residential development.

Table 1.7 Density of Residential Development, 1986-2007

	Total Acreage (acres)	High Density (acres)	Medium-/Low- Density (acres)	Rural Density (acres)
1986	548,517	86,780	332,683	123,670
1995	609,582	95,938	358,510	154,892
2007	686,163	124,849	362,694	194,134

SOURCE: NJDEP Land Use/Land Cover 1986, 2007

Table 1.8 shows the share of each residential density land use type in each year. Growth from 1986-2007 was strongest among high-density development (over 20%) and rural-density development (over 30%). There has been little growth in the medium- and low-density development.

Table 1.8 Share of Residential Density Land Use Type, 1986-2007

	High Density	Medium-/ Low-Density	Rural Density
1986	15.8%	60.7%	22.6%
1995	15.7%	58.8%	25.4%
2007	18.2%	52.9%	28.3%

SOURCE: NJDEP Land Use/Land Cover 1986, 2007

Interval Trends, 1986-1995 and 1995-2007

While the change in land use and land cover from 1986 to 2007 show overall changes to the landscape, the land use type changes during the intervals from 1986 to 1995 and 1995 to 2007 help highlight trends in land use type over time. Table 1.9 shows the average annual rate of change by land use type for 1986-1995 and 1995-2007.

Table 1.9 Average Annual Rate of Change by Land Use Type

Land Use Type	Average Annual Rate of Change 1986-1995	Average Annual Rate of Change 1995-2007
Residential	0.8%	1.0%
Commercial	0.4%	1.0%
Industrial	-0.2%	-0.4%
Utility	0.1%	3.8%
Urban Open Space	0.4%	2.7%
Other Urban	1.0%	-1.1%
Barren Land	0.5%	-1.8%
Agricultural	-1.9%	-1.3%
Forest	1.0%	-0.4%
Wetlands	-0.9%	-0.3%
Water	-0.8%	0.2%

SOURCE: NJDEP Land Use/Land Cover 1986, 1995, 2007

While losses have continued to occur in agricultural and wetlands, the rate of loss has slowed over time, with wetlands slowing by 70% and agricultural slowing by nearly 30%. This may indicate that policies for wetland and agricultural preservation and restoration have been effective in slowing losses. The rate of industrial land use losses have accelerated, by 50% between intervals. This may reflect a continued decline of the manufacturing sector in the state. Forests show an overall acreage loss from 1986 to 2007, however, from 1986 to 1995, forest acres actually increased, with an accelerated loss of acres from 1995 to 2007 resulting in an overall loss during this period.

Land use type share has grown for residential and commercial, with an accelerated pace between 1995 and 2007. Urban open space also grew at a more rapid pace during the second interval, which may indicate better access to parks and recreational lands. Mixed urban uses grew at a much faster rate, indicating that land use has become less segregated over time.

Urbanized and Impervious Land Cover

Land use and land cover data for 1986, 1995 and 2007 was collected and analyzed for changes from natural to urban uses over time, as shown in the preceding maps. For the purposes of this discussion, land use types were divided into the land use types found in Table 1.10, below.

Table 1.10 Land Use Types

Land Use Type	Urban vs. Natural	Examples
Residential	Urban	Single family, apartments, townhouses
Commercial	Urban	Office, retail
Industrial	Urban	Manufacturing, warehousing
Utility	Urban	Roads, highways, railroad tracks
Urban Open Space	Urban	Parks, recreation areas, golf courses
Other Urban Lands	Urban	Mix of above uses, cemeteries
Barren Lands	Urban	Beaches, mining extraction, landfills, cleared land
Agricultural	Natural	Cropland, pastureland, orchards
Forest	Natural	Tree stands and plantations
Wetlands	Natural	Freshwater and tidal wetlands
Water	Natural	Streams, lakes, reservoirs, ocean

SOURCE: NJDEP Land Use/Land Cover 1986, 1995, 2007

During this period, North Jersey's population grew by 13% (US Census, 1986, 1995, 2007), while urbanized land increased by 17%. Urban land uses now total 36% of land cover in North Jersey. Land consumption per capita over this period rose 7.7%, from 0.15 to 0.17 acres per capita. While this seems like an incremental increase, looking at new urban land per new resident helps highlight the impact of new development by eliminating historic development patterns. From 1986 to 2007, this figure was 0.26 acres per new resident. From 1986 to 1995, this was 0.28 urban land use acres per new resident and post-1995, this was 0.24 acres per new resident. This indicates that while new residents are consuming natural lands at a higher rate than historic development, the rate has slowed since 1995. Residential and utility uses experienced the greatest growth in acres (76,581 and 21,883 acres, respectively). Agricultural and forest lands experienced the greatest loss in acres (56,662 and 47,307 acres, respectively).

Urban land uses refers to the dominant land use of a given area of land. However, impervious surfaces do not typically fully cover a developed parcel. Impervious coverage data is available for 1995 and 2007. In 1995, 10% of North Jersey's land cover was impervious. In 2007, this grew to 11.1%, a growth rate of 12%. Impervious land per capita was 0.050 acres per capita in 1995 and 0.052 in 2007, a growth rate of

4%. Impervious land per new resident over this period was 0.08 acres per capita, indicating that new development results in greater impervious cover than historic development patterns.

Wetlands

Wetlands are regulated in New Jersey under the Wetlands Act of 1970 and the Freshwater Wetlands Protection Act (1988). While conversion of wetlands is restricted under these programs, permits are granted each year to develop sites containing wetlands. From 1995 to 2007, 20,904 acres of wetlands were converted to urban land uses.

Agriculture

Agriculture is not specifically protected in New Jersey, but the Garden State Preservation Trust Act, Agriculture Retention and Development Act, and Farmland Preservation Program provide funding and support to working farms in the Garden State. From 1995 to 2007, 48,758 acres of agricultural lands were converted to urban uses.

Forests

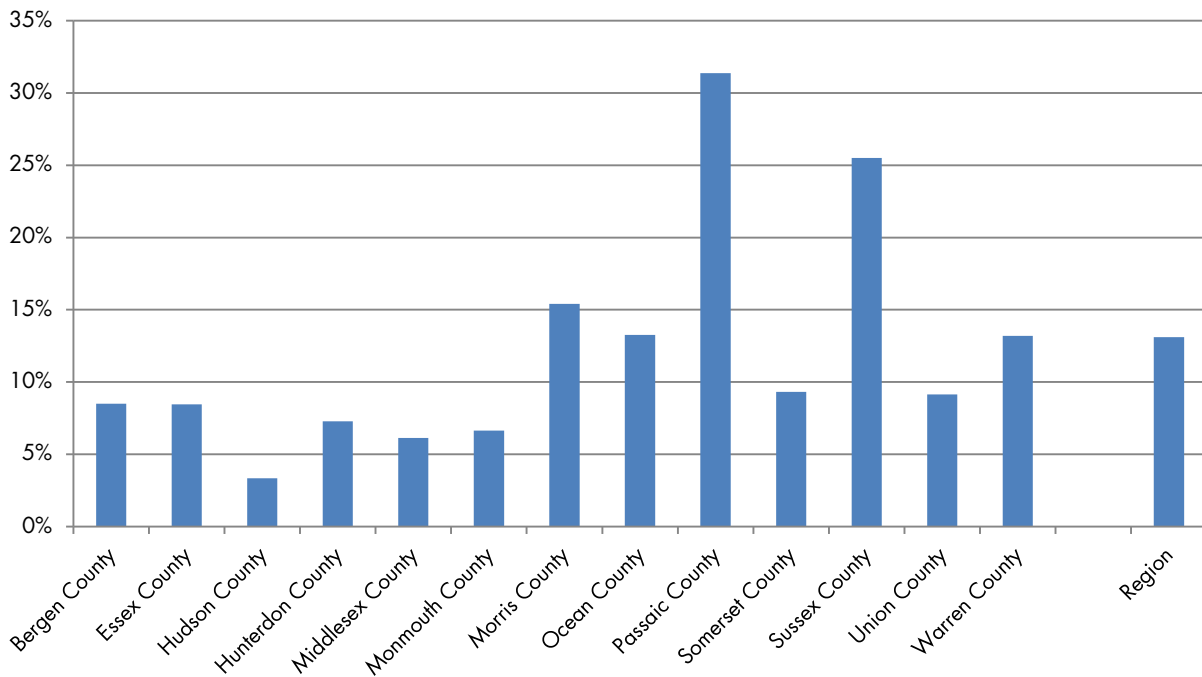
Forests are not specifically protected in New Jersey, but the Garden State Preservation Trust Act and NJ Green Acres Program help support the preservation of open space, including forestland. In addition, the NJ Highlands Protection and Planning Act and Pinelands Protection Act establish specific protections for these management areas. From 1995 to 2007, 102,819 acres of forest were converted to urban uses.

1.1.2 Open Space & Public Parks

State policies over the past few decades have allowed for the protection of significant amounts of New Jersey's remaining open space. As development decisions are made, the amount of open space statewide will continue to be a critical indicator of balanced growth. The following analysis looks at how much open space has been protected, using a methodology that combines GIS layers of federal-owned land, state-owned open space, and county and municipal-owned open space to determine the total amount of protected land. However, not all open space is accessible to the public. An indicator important to both quality of life and land use decision-making is public accessibility to parks and open space. Therefore, the below analysis also examines public access to parks and open space.

In North Jersey, there are approximately 914,609 acres of public and private protected open space, roughly 34% of the region's total area. The region contains 357,018 acres of public use parks and open space, comprising 13.1% of the region's total area (The Nature Conservancy, 2013).

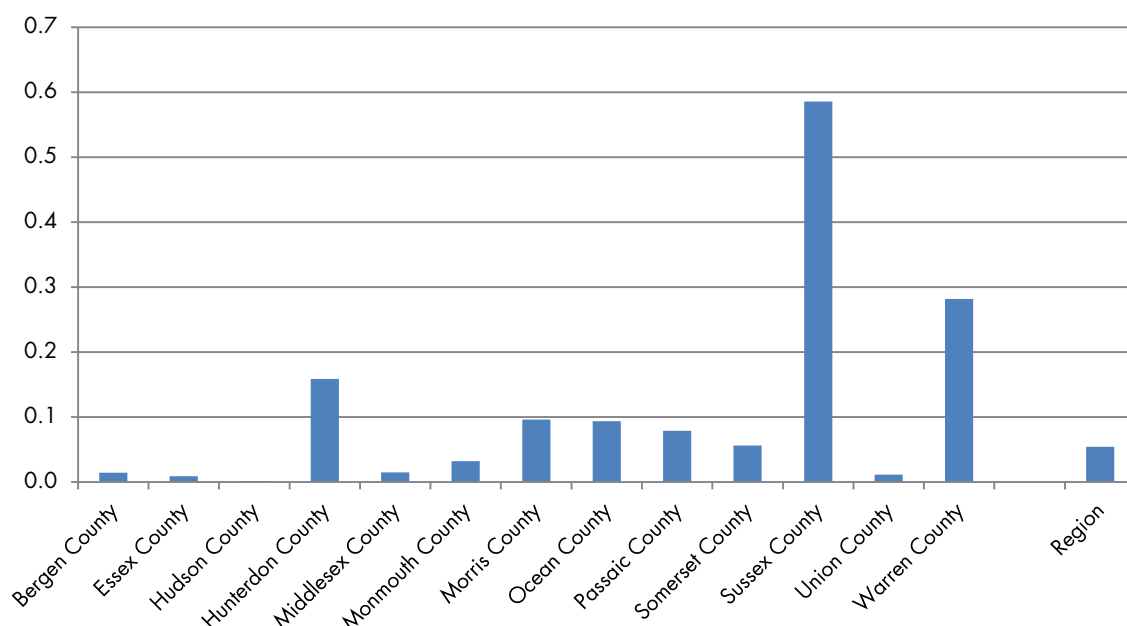
Figure 1.11 Public Use Parks and Open Space as a Share of Total County Area



SOURCE: The Nature Conservancy 2013

As Figure 1.11 illustrates, Hudson County has the lowest percentage of public use parks and open space as a share of total county area (3.3%), whereas over 31% of Passaic County's total county area is comprised of parks and open space. This is likely due to protected Highlands land within Passaic County. Less urbanized counties, such as Sussex, Morris, Warren and Ocean, have relatively higher percentages of public use parks and open space as a share of total county area.

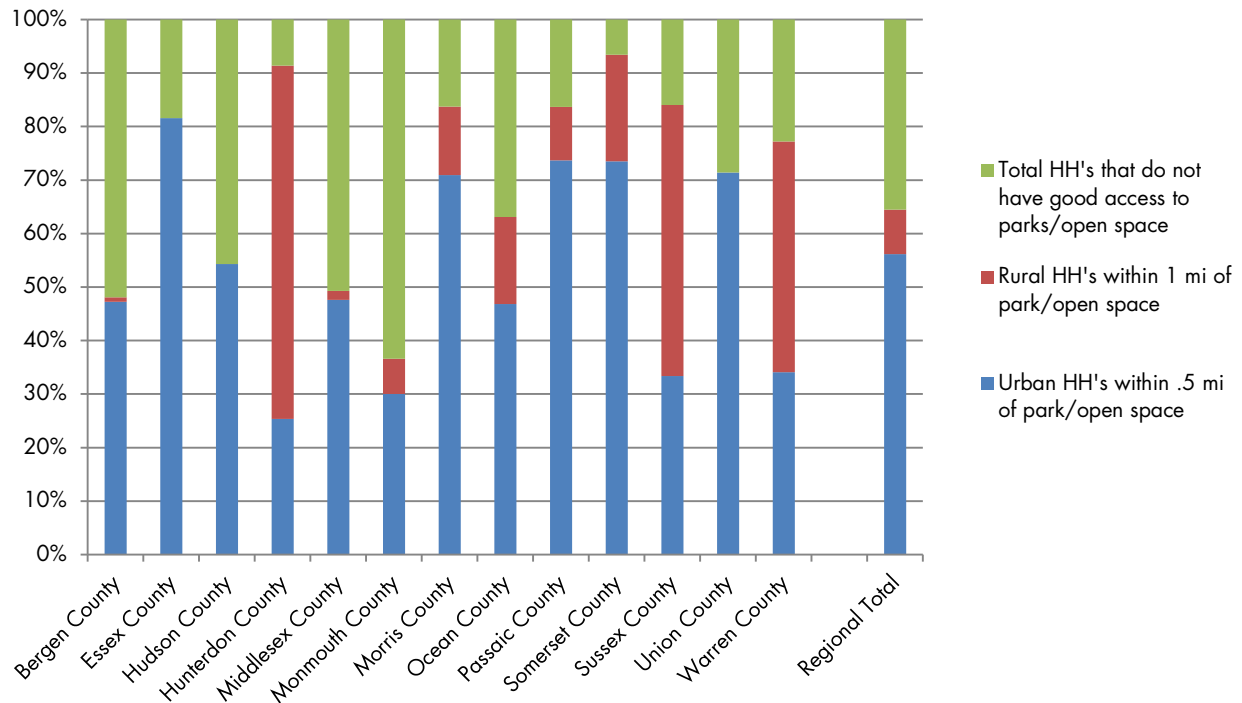
Figure 1.12 Acres of Public Use Parks and Open Space per Capita



SOURCE: The Nature Conservancy 2013; US Census 2010

A per capita analysis (Figure 1.12) can reflect the distribution of parks and open space relative to population. There are approximately 0.054 acres of public use parks and open space per capita in the region. Hudson County has the lowest per capita acres of public use parks and open space (0.002), while Sussex County has the highest per capita acres of public use parks and open space (0.586). Hudson's relatively lower per capita acres of public use parks and open space can be attributed to its urban character. Similarly, Sussex County's relatively higher per capita acres of public use parks and open space can be attributed to its rural character.

Figure 1.13 Public Access to Parks and Open Space



SOURCE: The Nature Conservancy; US Census 2010

The above two measures – public use parks and open space as a share of total county area, and acres of parks and open space per capita – do not necessarily reflect how accessible such amenities are to the public. As such, good access to parks and open space can be defined as:

- An urban household within a ½ mile of parks and open space
- A rural household within 1 mile of parks and open space

For urban households, a ½ mile buffer is considered a walkable distance, approximately ten minutes in walking time. Rural households are located in less dense, less built-up locations; therefore, a 1 mile buffer is used. Applying these parameters, urban households located more than ½ mile from parks and open space and rural households located more than 1 mile from parks and open space are characterized as having relatively poor access to open space amenities.

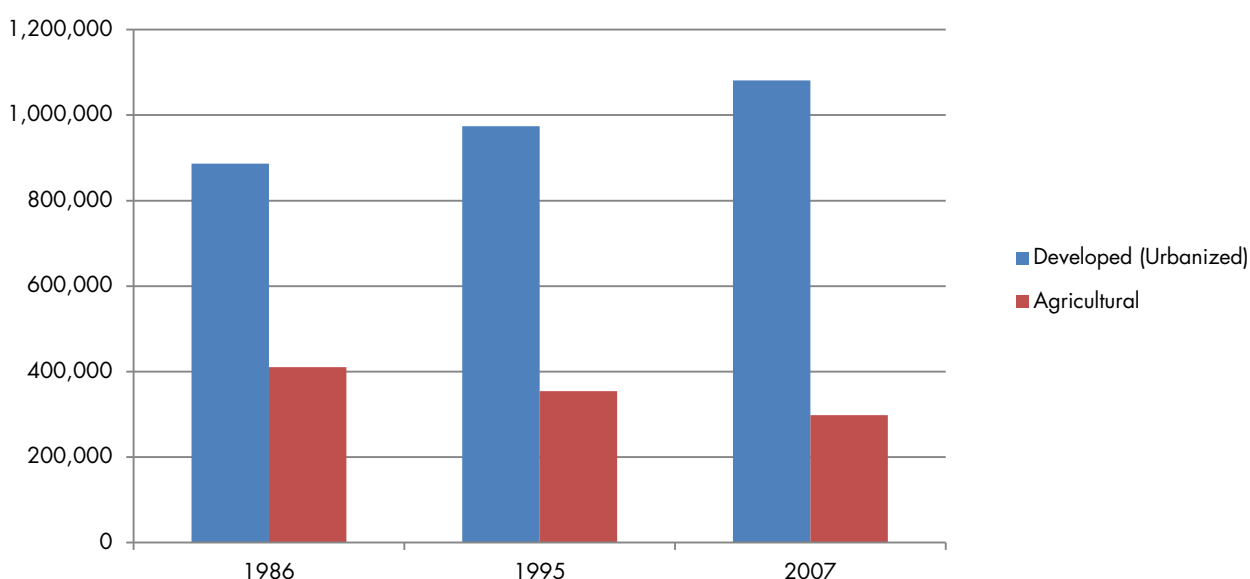
In the region, over 64% of all households have good access to parks and open space. Rural households in North Jersey have relatively better access to parks and open space than urban households; nearly 85% of rural households in the region are within a mile of parks and open space, while approximately 62% of urban households in the region are within ½ mile of parks and open space. As illustrated by Figure 1.13, Monmouth County households are least likely to have good access to parks and open space. Conversely, Somerset County households are most likely to have good access to parks and open space, with Hunterdon County following closely behind.

1.1.3 Farmland

Farmland is important both as an economic driver for the state as well as for land protection. The analysis for the existing conditions for farmland will determine the total acreage of farmland as well as the total acres of farmland considered to be protected.

Since the mid-1980s the region has become increasingly developed, losing agricultural land in the process.¹ Between 1986 and 2007, the region experienced a decrease in the acres of agricultural land and an increase in the acres of urbanized land, as illustrated in Figure 1.14. In light of these land use shifts, there is increasing pressure to preserve farmland and promote agriculture, an industry that has played a large role in the region's identity and economic livelihood.

Figure 1.14 Acres of Developed and Agricultural Land in North Jersey, 1986-2007

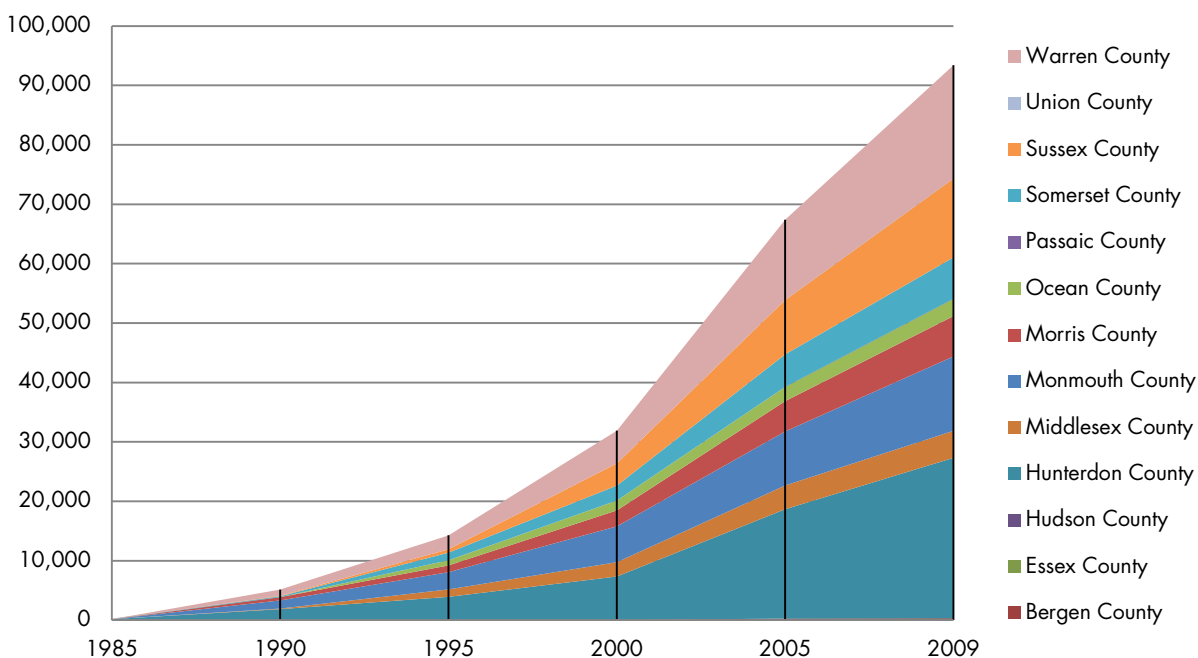


SOURCE: NJDEP Land Use/Land Cover 1986, 1995, 2007

¹ Refer to Section 1.1.1 Land Use/Consumption.

The conversion of agricultural land for urban uses since the 1980s has resulted in an overall loss in acres of agricultural land. However, since the mid-1980s, there have been concerted efforts (such as the NJ Farmland Preservation Program) to preserve high-quality agricultural land. The result has been a trend of strong growth in permanently preserved farmland.

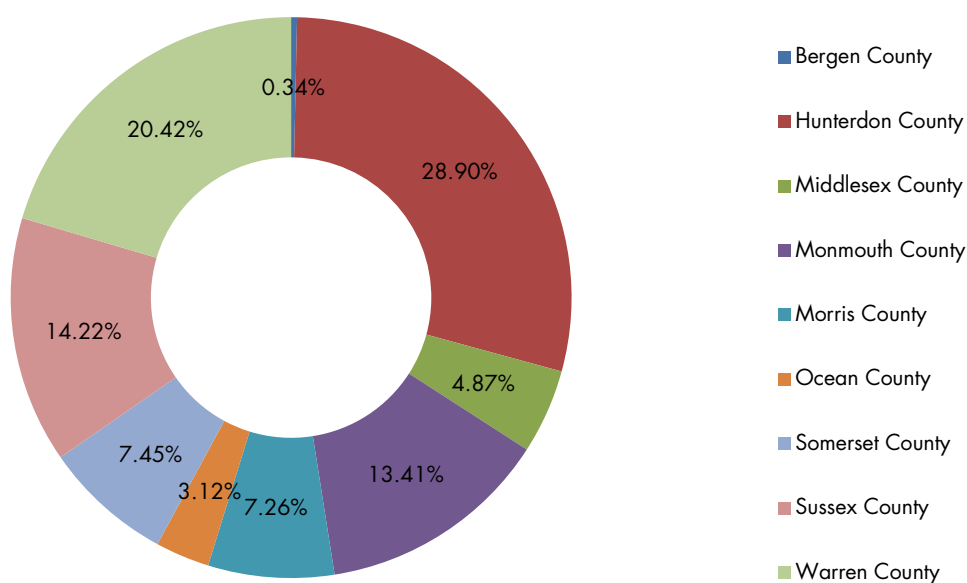
Figure 1.15 Acres of High-Quality Farmland Preservation in North , 1985-2009



SOURCE: NJDA Farmland Protection Program 2009

As demonstrated by Figure 1.15, over 93,400 acres of high-quality farmland have been preserved since the mid-1980s. Between 2000 and 2005, the amount of preserved farmland more than doubled, from 31,882 acres to 67,408 acres. Essex, Hudson, Passaic and Union Counties do not contain any high-quality preserved farmland. Hunterdon County has the highest share of high-quality preserved farmland in the region (approximately 27,000 acres), while Warren County follows closely behind (with over 19,000 acres). Figure 1.16 shows the distribution of high-quality preserved farmland by county.

Figure 1.16 County Share of Total High-Quality Preserved Farmland in North Jersey



SOURCE: NJDA Farmland Protection Program 2009

1.1.4 Brownfields

The use of brownfield sites for redevelopment will be an important element of sustainable redevelopment in New Jersey. A brownfield is defined under NJ state law (N.J.S.A. 58:10B-23.d) as "any former or current commercial or industrial site that is currently vacant or underutilized and on which there has been, or there is suspected to have been, a discharge of a contaminant." Because of the wide-ranging definition, it is difficult to pinpoint precisely how many brownfields there currently are in the region.

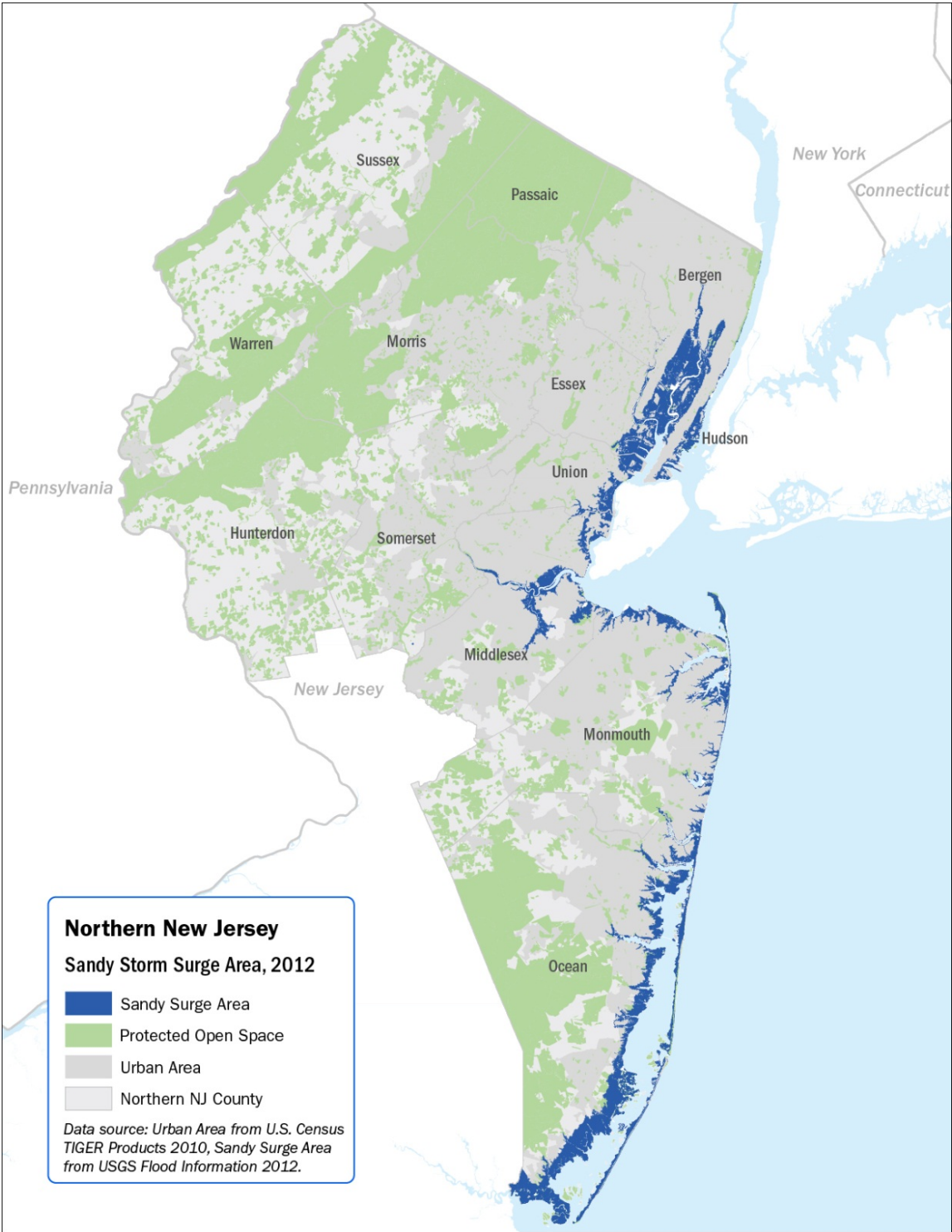
At any one time, the NJDEP oversees some 23,000 contaminated sites statewide. An estimated 10,000 of these are potential brownfield sites in various phases of activity. Many more potential brownfields may exist in the State that are not yet before the Department for review. (NJDEP, 2013)

1.1.5 Storm Surge & Flood Prone Areas

Unprecedented damage and flooding inflicted by Superstorm Sandy have prompted people to question the manner and places in which to develop within the region. As 100-year storms become more frequent, planning decisions must consider whether to locate new construction in or away from storm surge and flood prone areas; how to develop resiliently; and how to support populations impacted in such areas. Using USGS Flood Information data, this section examines the extent to which the region's land area, population, and housing units are located within the Sandy surge area currently. Future assessments can track the change in the population and number of housing units located within the

surge area as a reflection of whether new development is being located in or directed away from surge areas.

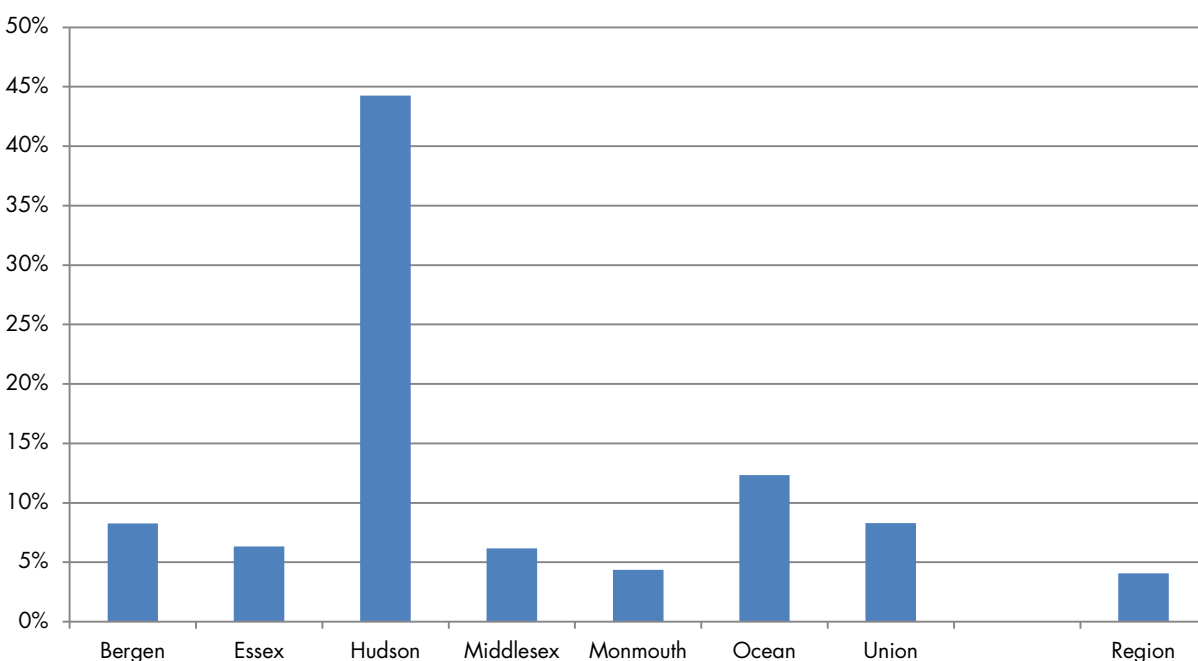
Figure 1.17 Sandy Storm Surge in North Jersey



SOURCE: US Census 2010; USGS Flood Information 2012

Figure 1.17 illustrates Sandy storm surge area within the region. Approximately 173 square miles (4.07% of the region's total land area) are located in the Sandy surge area. Roughly 4.16% of the region's total population, or 273,910 persons, live in the surge area. There are 155,538 housing units and 114,749 households in the Sandy surge area, comprising 5.96% and 4.78% of the region's total housing units and households, respectively (US Census 2010; USGS Flood Information 2012). Approximately 8.16% of the region's businesses (14,227 businesses) are located within the surge area (US Census County Business Patterns, 2010).²

Figure 1.18 Share of Land Area in Sandy Surge Area

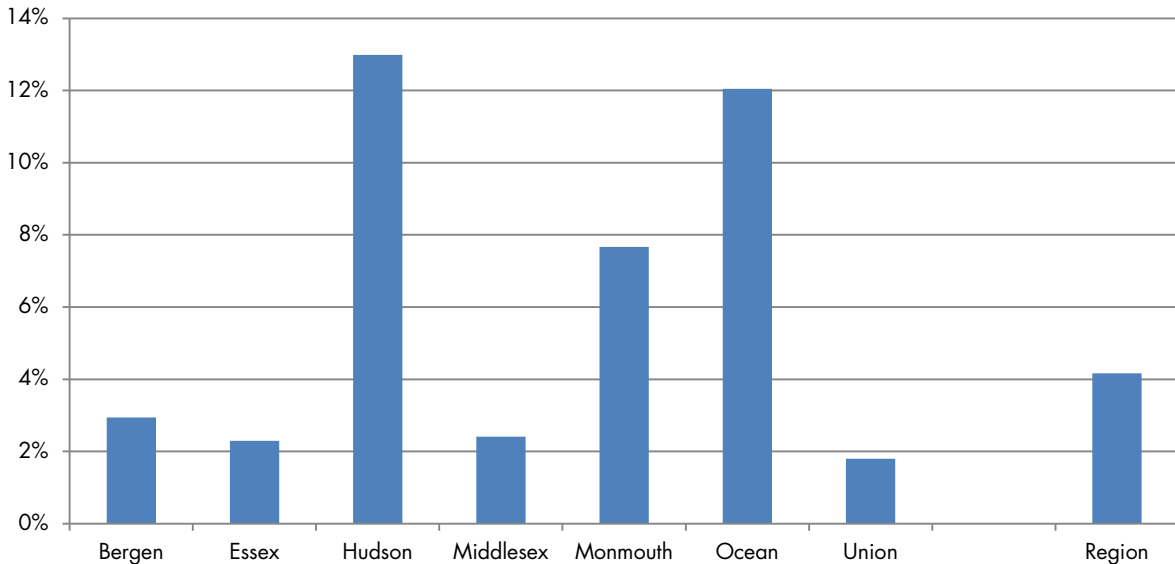


SOURCE: US Census 2010; USGS Flood Information 2012

The Sandy surge area covers 7 of the region's 13 counties, including Bergen, Essex, Hudson, Middlesex, Monmouth, Ocean and Union. Figure 1.18 above shows the share of county and regional land area in the Sandy surge area. Of the seven counties, Hudson County has the highest share of county land area (44%) within the Sandy surge area, suggesting that Hudson may be the county most vulnerable to future storm surge and flooding.

² Refer to Appendix A, Tables A.3 and A.4 for Sandy surge area data.

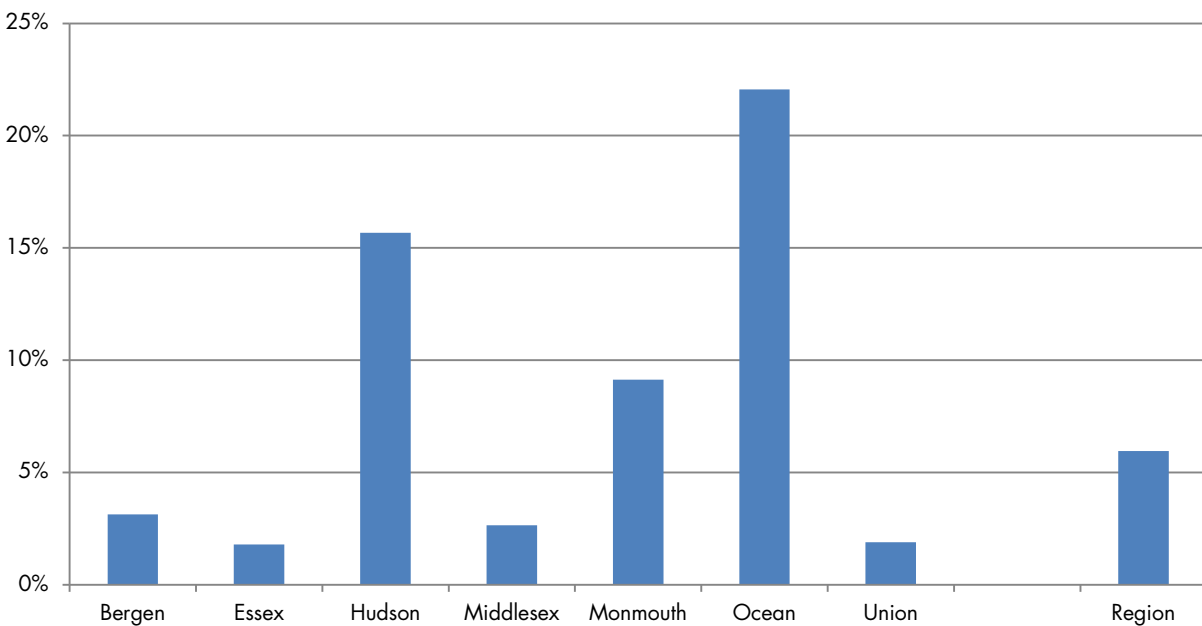
Figure 1.19 Share of Population in Sandy Surge Area



SOURCE: US Census 2010; USGS Flood Information 2012

Figure 1.19 illustrates the extent to which county populations are impacted by flooding and storm surge. Hudson and Ocean residents are most likely to live in the Sandy surge area, with over 13% of Hudson's population and 12% of Ocean's population within the surge area.

Figure 1.20 Share of Housing Units in Sandy Surge Area



SOURCE: US Census 2010; USGS Flood Information 2012

Based on Figure 1.20, over 22% of Ocean County’s housing units are located in the Sandy surge area. Hudson County follows behind Ocean, with over 15% of housing units located in the surge area. This suggests that housing units in these counties may be most vulnerable to future storm surge and flooding.

A decrease in the number or share of residents and housing units within the surge area may be indicative of decreased development in flood prone and storm surge areas. However, any such analysis should take into account the extent to which development is made more “resilient in place”³— as such, the region may not see any decrease in the number or share of residents and housing units within the surge area.

1.2 Urban Form & Design

Urban form and neighborhood design are the fundamental building blocks that comprise a place, defining character and helping to shape the quality of life for the residents who live there. Form and design include the layout and connectivity of the street network and their associated streetscapes; the physical character, development pattern and intensity of its built environment; and the structural elements that define a place, such as central business district “downtowns,” historic districts, transit systems and their station areas, and parks and open spaces, amongst others. No matter where people live – from rural communities, to suburban neighborhoods and urban centers – form and design are all around us, shaping our daily life. The following discussion examines the existing conditions and trends around urban form and design – such as walkability, transit-oriented development, form based codes, historic preservation, and programmatic involvement – and will help to provide a baseline for developing strategies to improve form and design in the region.

³ Such strategies could be to elevate structures within flood prone areas, or implement green infrastructure strategies to mitigate flooding in such areas.

1.2.1 Walkability

The walkability of a community serves as an indicator of urban form & design. Walkability measures how many amenities and services – schools, parks, grocery stores, etc. – are within a reasonable walking distance of a household. Aggregating this information across a municipality gives an average indicator of walkability, citywide. Measuring the existing condition of walkability in North Jersey communities will be important to track improvements to urban form and design as the sustainability plan is implemented. Walkability will be tracked using Walk Score®⁴ values for the 61 largest cities (by population) in New Jersey. Because WalkScore® does not consider the sidewalk/road networks, this indicator will be supplemented data from US Census 2010 and the NJ Department of Education on walkable communities around schools.

Walk Score®

Out of the 61 largest cities in New Jersey, 52 are located in North Jersey. None are located in Hunterdon, Warren or Sussex Counties. Three – Hoboken, Union City and West New York – scored above 90 and are considered to be a “Walker’s Paradise”.

All five designated Together North Jersey cities scored at least 70, implying that these cities are relatively walkable. Figure 1.21 reflects the walkability of the 52 North Jersey cities.⁵ Approximately 39% of the North Jersey cities identified by Walk Score are considered at least “very walkable”. All six of Hudson County’s municipalities on the Walk Score list (Jersey City, Hoboken, Union City, West New York, Bayonne and Kearny) rank within the top ten. Bergen County also fares well, with three cities in the top ten, and seven cities scoring above 70. Toms River, a relatively larger city within the region, ranks among the lowest with a score of 33. (Walk Score Cities in New Jersey, 2013)

⁴ Walk Score uses an algorithm to assign point values to the distance from an address to select amenities and services, like grocery stores, schools, parks, restaurants, and retail. The most points are awarded for amenities being within 0.25 miles and no points for being more than 1 mile from a given address. The data is derived from Google, Open Street Map, and Education.com. Distances are given “as the crow flies”, meaning that it does not consider the actual street network, sidewalk availability, and pedestrian streetscape amenities, like lighting (How Walk Score Works, 2013).

Scores are determined as follows:

90-100: Walker’s Paradise – Daily errands do not require a car.

70-89: Very walkable – Most errands can be accomplished on foot.

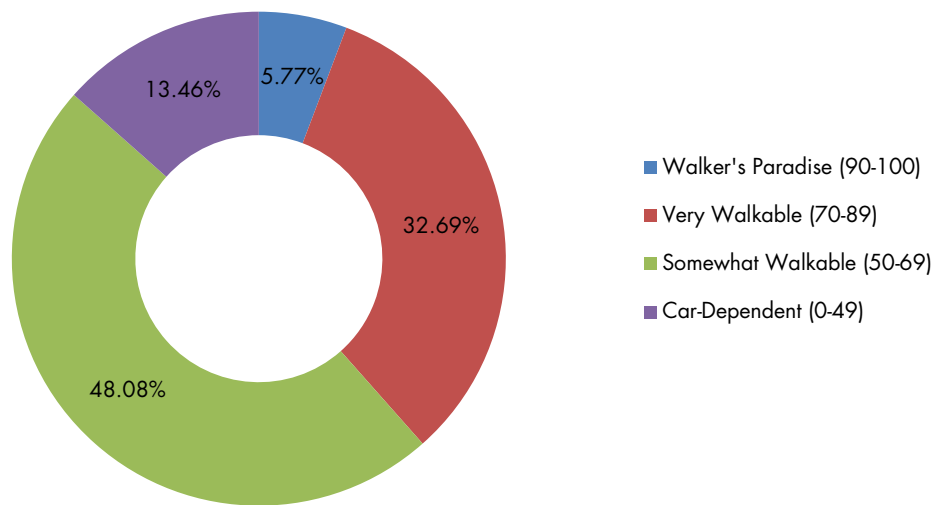
50-69: Somewhat walkable – Some errands can be accomplished on foot.

25-49: Car-Dependent – Most errands require a car.

0-24: Car-Dependent – Almost all errands require a car.

⁵ A list of 2013 scores is located in Appendix A, Table A.5.

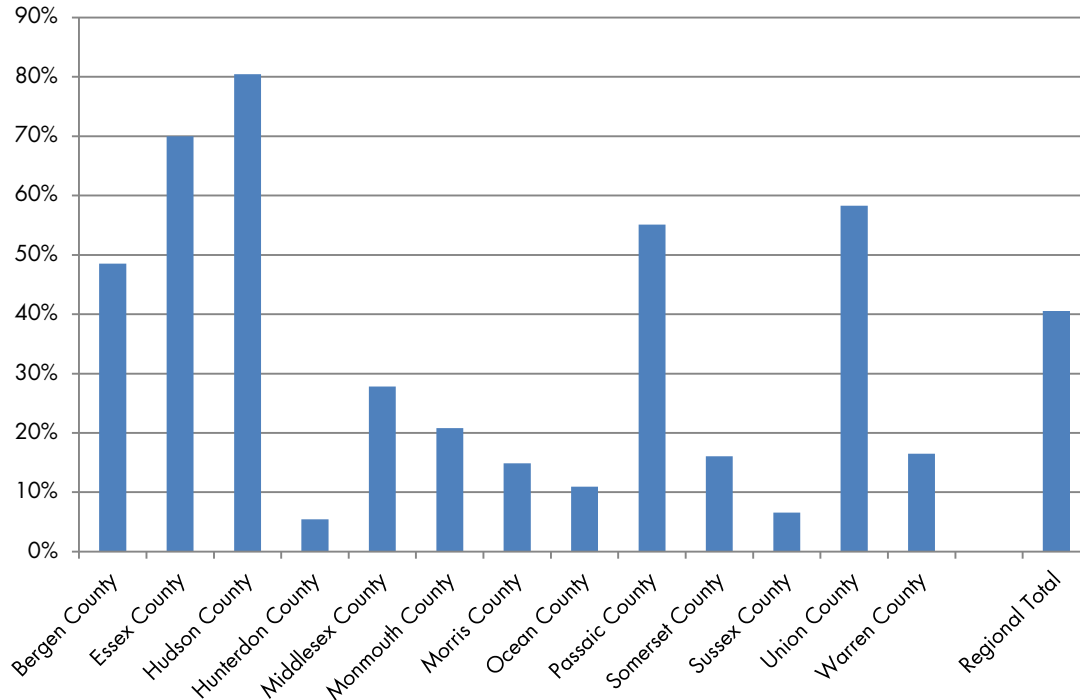
Figure 1.21 Walk Score® of North Jersey’s Largest Cities by Population



SOURCE: Walk Score 2013

Walkable Communities around Schools

Figure 2.22 Share of Population within a ½ Mile Walk of a School



SOURCE: US Census 2010; NJ Department of Education 2013

Schools are vital community amenities, as they not only provide education but also serve as gathering places within a community. Schools serve as important nodes in the transportation network because they generate a significant number of vehicular trips in the morning and the afternoon. School zones typically contain strong pedestrian infrastructure, including sidewalks, marked crosswalks, signage for drivers, and traffic calming measures. Increasing the walkability of communities around schools provides opportunities for the use of alternative modes when traveling to school, including walking and biking, thus reducing the number of bus and car trips. The share of population within a ½ mile walk of a school can be indicative of the accessibility of a school and walkability of a community.

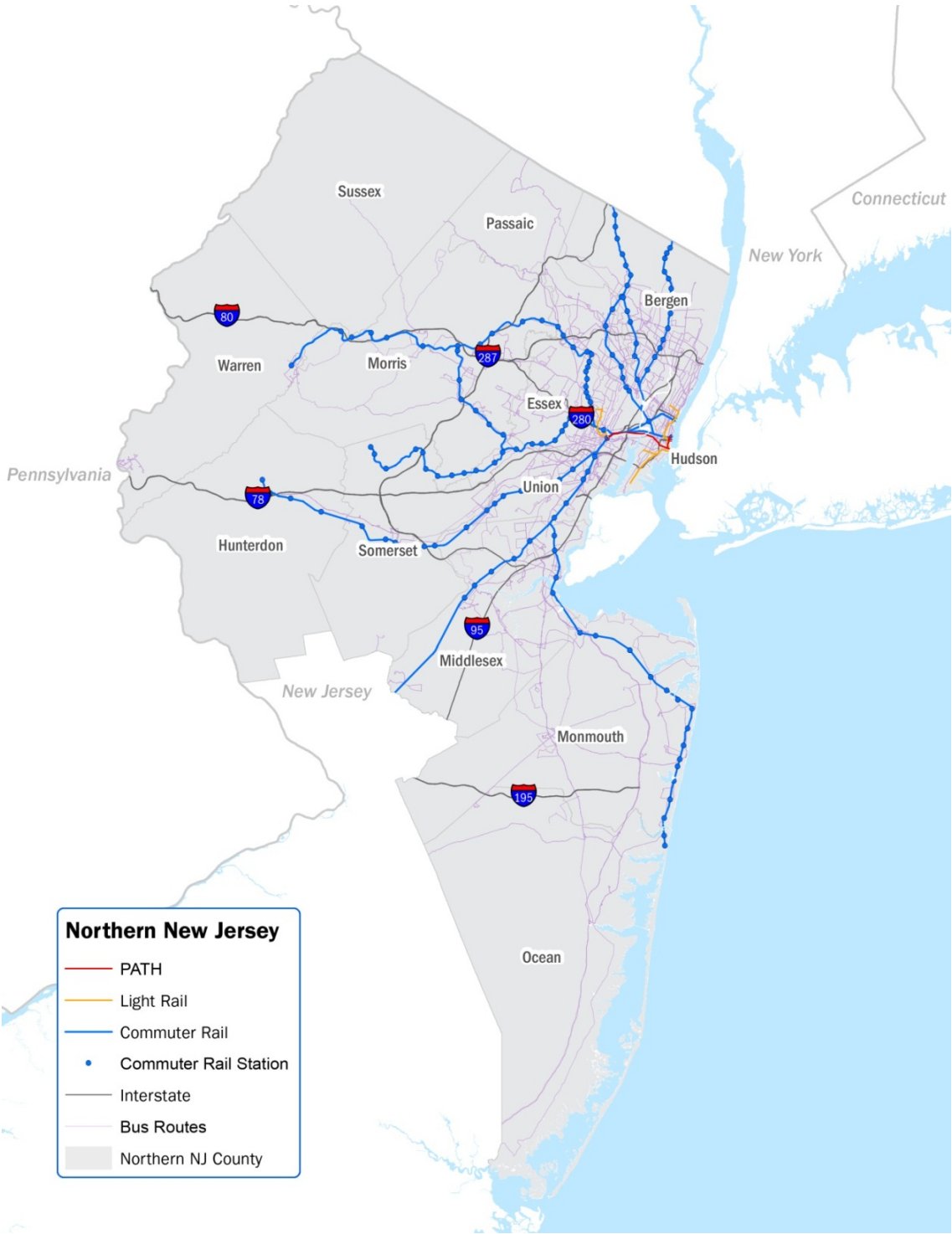
Nearly 41% of the region's population lives within a ½ mile walk of a school. As a densely populated and relatively urban county, it follows that Hudson has the highest share of population (80%) living within a ½ mile walk to a school. Hunterdon and Sussex Counties score lowest in terms of share of population within a ½ mile walk of a school. At least 50% of the residents living in four North Jersey counties – Essex, Hudson, Passaic and Union – are within a ½ mile walk of a school.

1.2.2 Transit-Oriented Development

Transit-oriented development (TOD) is a pattern of development centered around a public transit station or hub. High density development featuring a mix of residential and commercial uses within ¼ or ½ mile of a transit station connects people with retail, entertainment, and employment – both within their community and to the greater region. A strong pedestrian streetscape helps to create a vibrant, active space that allows residents to commute and run errands on-foot.

North Jersey has a strong network of passenger rail service owing to development dating back to the early 19th century (NJ Transit and State of New Jersey, 2012). In the region, there are over 150 stations serving passengers on the 10 commuter lines (Atlantic City Rail, North Jersey Coast, Main-Bergen County, Northeast Corridor, Montclair-Boonton, Pascack Valley, Morris and Essex, and Raritan Valley Lines), 2 light rail lines (Hudson-Bergen and Newark Light Rail), and 1 urban rapid transit line (PATH). NJ Transit operates the commuter and light rail lines. The Port Authority of New York and New Jersey operates the PATH (NJ Transit and State of New Jersey, 2012; NJTPA, 2009). Figure 1.23 shows the rail lines and stations in North Jersey.

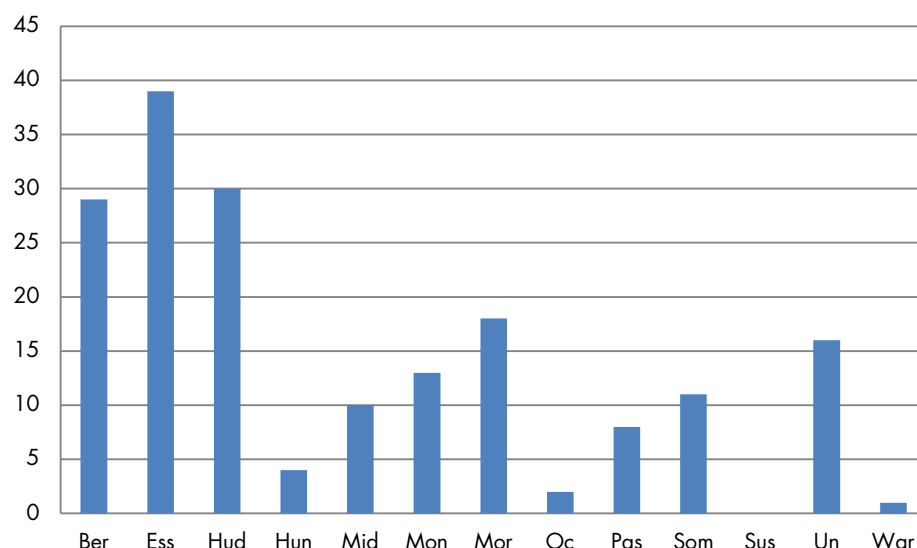
Figure 1.23 Rail Stations and Lines in North Jersey



SOURCE: NJ Transit 2013; Port Authority of New York & New Jersey 2013

The number of rail stations within each county is shown in Figure 1.24. Access to rail stations varies by county, with the greatest number of rail stations in Essex (39), Hudson (30), Bergen (29), and Morris (18) Counties.

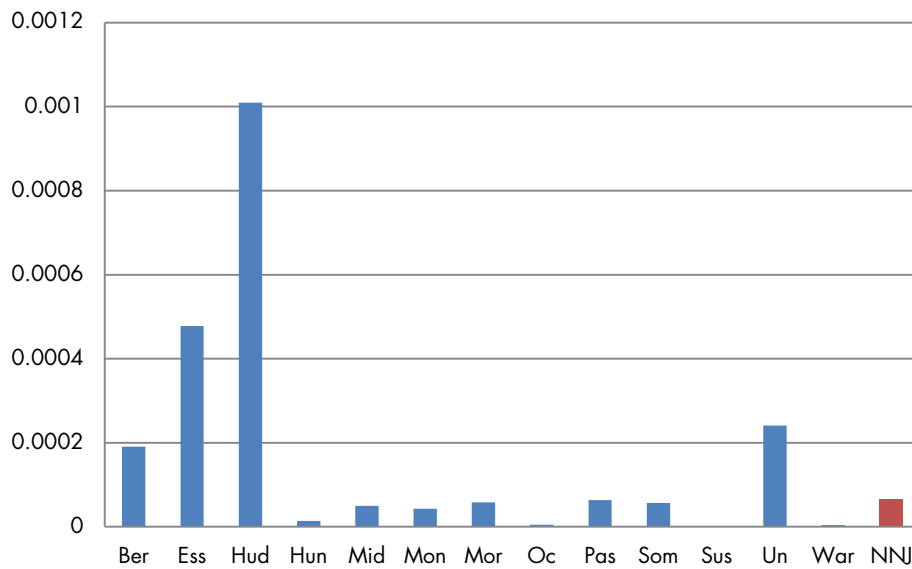
Figure 1.24 Number of Rail Stations by County



SOURCE: Regional Plan Association, 2011; NY-NJ Port Authority, 2010; NJ Transit, 2010

Because the counties range in land area, Figure 1.25 was created to show the ratio of rail stations to acres. As seen in this figure, the counties with the greatest ratio of rail stations are Hudson, Essex, Union, and Bergen – which are also the four most densely populated counties.

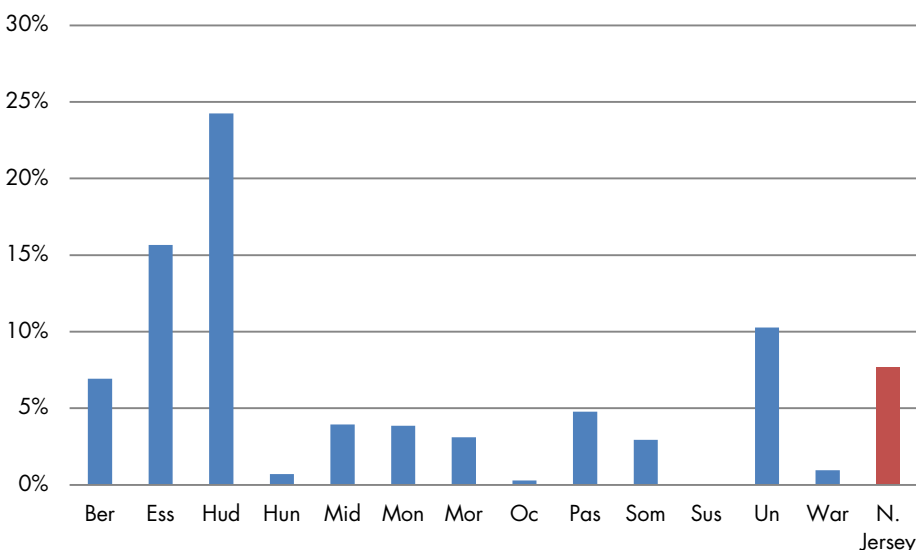
Figure 1.25 Rail Stations per Acre



SOURCE: Regional Plan Association, 2011; NY-NJ Port Authority, 2010; NJ Transit, 2010; US Census, 2010

TOD focuses on providing high-density residential and mixed-use development within a ½ mile of a railroad station, to provide easy access for residents to transit systems. Appendix C provides the methodology for this analysis. Figure 1.26 shows the percentage of the population of each county within ½ mile of a rail station, as well as for the region as a whole.

Figure 1.26 Population within a ½ Mile of a Rail Station



SOURCE: US Census 2010; NY-NJ Port Authority 2007; RPA 2011

Across North Jersey, 7.6% of the population lives within a ½ mile of a rail station, with a range from 0% in Sussex County, to 24.2% in Hudson County. The counties with the greatest share of the population living within a ½ mile of a rail station are Hudson (24.2%), Essex (15.7%), and Union (10.3%). The counties with the smallest share of the population living within a ½ mile of a rail station are Sussex (0%), Ocean (0.3%), and Hunterdon (0.7%).

Taken together, the pattern of rail stations per acre by county and population within a ½ mile of a rail station by county follows a similar trend, with the same four leading and lagging counties.

1.2.3 Form Based Code

Form Based Codes (FBCs) are an alternative to traditional zoning codes that focus on regulating the physical urban form, rather than land use. FBCs typically include provisions for form and mass of buildings, as well as the public realm. FBCs help to achieve the desired character and feel of development without focusing on permissible activities or land use. They can be useful tools in redeveloping town centers in a more desirable form that promotes a pedestrian-friendly environment, while providing flexibility of uses.

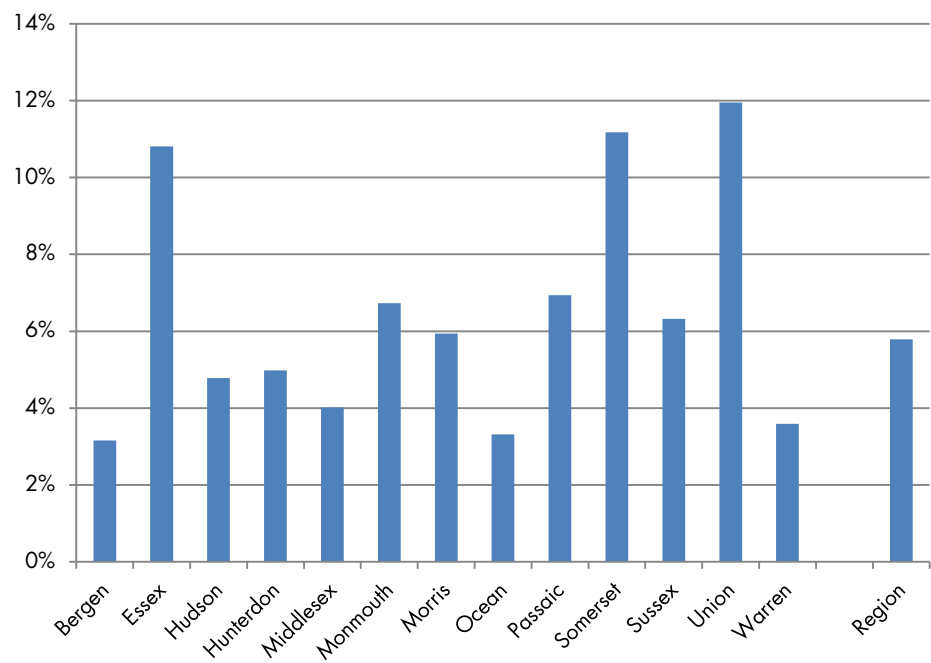
FBCs were first introduced in NJ in the early 2000s and are currently used in North Jersey in Morristown (Morris), Marlboro (Monmouth), Newton (Sussex), and Dover (Morris). Projects are currently underway in Montclair (Essex), North Arlington (Bergen), and Edison (Middlesex) to explore using form-based codes to integrate land use and transportation planning, in conjunction with NJDOT and The College of New Jersey (Brown & Keener Urban Design, 2013; DVRPC, 2012).

1.2.4 Historic Preservation

Historic preservation is a tool that provides safeguards and benefits to preserve and maintain structures that provide historic, cultural, or architectural value in a community. Many historic communities developed prior to the predominance of the automobile; thus, they were walkable communities that contained a mix of uses and were connected by transit. Protecting historic communities can help to preserve and promote a mix of uses in a walkable, TOD environment. In places where a number of historic structures remain in close proximity, the creation of a historic district can also help to preserve the character and cohesive sense of place the structures provide. Further, it can help guide future development by requiring that new development fit the form and character of the district. This can be applied to buildings, but also to elements of the public realm, including street lighting and sidewalks. Historic districts also serve as a driver for tourism and economic development (Advantages of Establishing a Historic District, 2013). The following analysis measures the acres of historic districts and properties within the region.

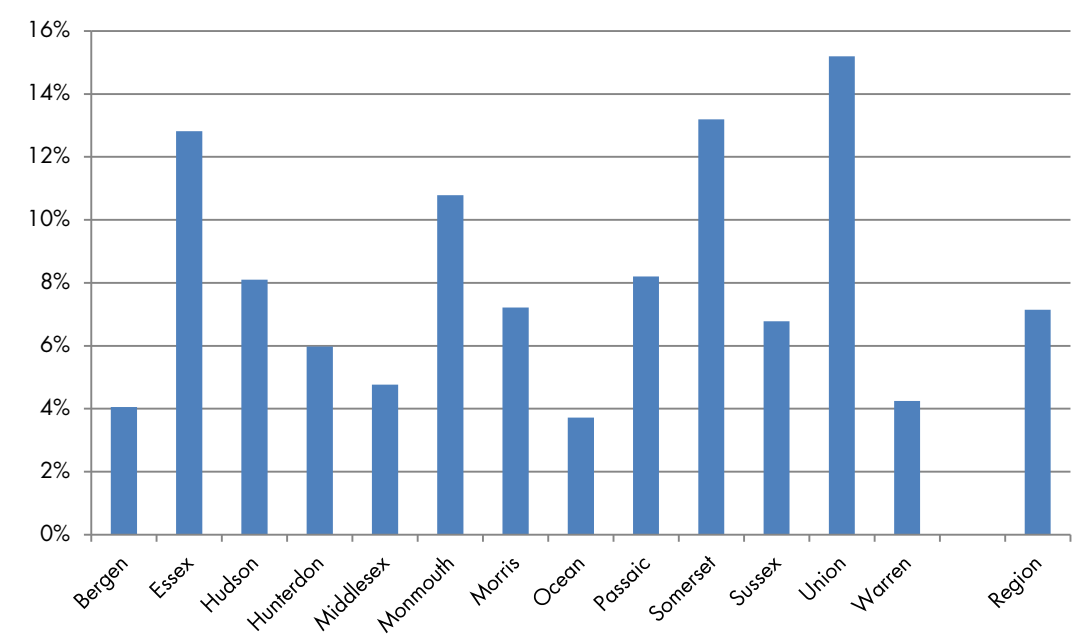
In the region, there are 157,728 acres of historic districts and 37,005 acres of historic properties located outside of historic districts, totaling 194,733 acres of historic preservation. Figure 1.27 shows that approximately 5.79% of North Jersey's land area is comprised of historic districts, while Figure 1.28 demonstrates that approximately 7.15% of North Jersey's land area is comprised of historic districts *and* properties. Union County has the highest share of land area consisting of historic districts (nearly 12%), while Bergen County has the lowest share of land area comprised of historic districts (3.15%). Figure 1.29 illustrates that historic districts and properties are distributed throughout different areas of the region, though noticeably large clusters of historic districts and properties exist in Monmouth, Somerset, Sussex and Passaic. These historic districts present an opportunity for communities to capitalize on existing features, such as walkability and TOD, to implement good urban form and design in surrounding areas.

Figure 1.27 Share of Land Area Comprised of Historic Districts Only



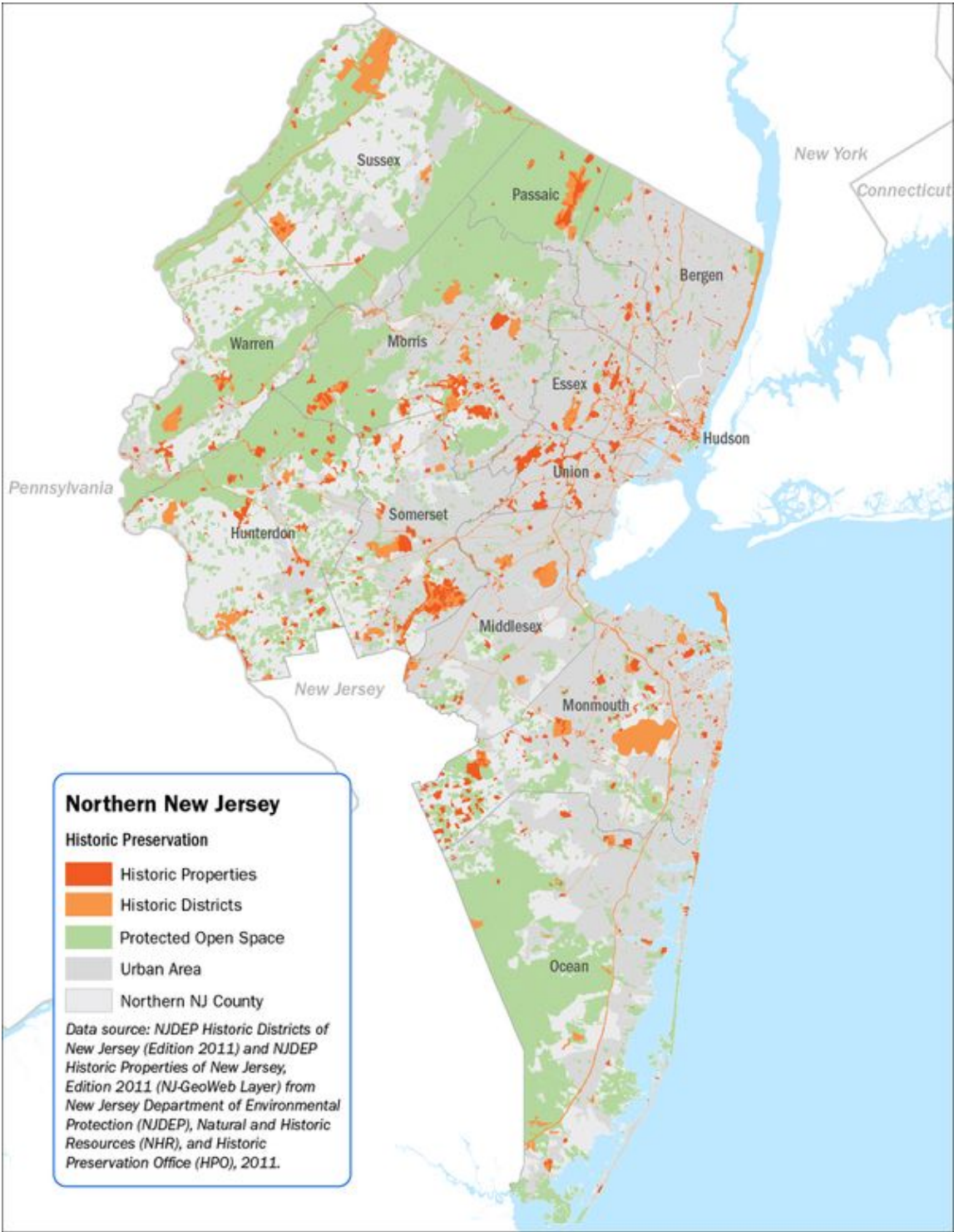
SOURCE: NJDEP Historic Districts 2011

Figure 1.28 Share of Land Area Comprised of Historic Districts and Properties



SOURCE: NJDEP Historic Districts 2011

Figure 1.29 Historic Preservation in North Jersey



SOURCE: NJDEP Historic Districts 2011

1.2.5 Programmatic Involvement

Quantifying good urban form is difficult, as it is deeply qualitative and reflective of individual community priorities and needs. However, community involvement in programs that encourage good urban form serves as a proxy indicator. The federal government and State of New Jersey support numerous such programs that encourage walkability, access to transit and amenities, and creation of complete communities. Programmatic involvement can indicate the extent to which a community actively works towards implementing good urban form and design.

Complete Streets

Complete streets promote safe access and multi-modal use for all users, including transit riders, pedestrians and bicyclists. A “complete street” can incorporate sidewalks, bike lanes, crosswalks and other public transit amenities into typical road infrastructure (Complete Streets in NJ, 2013).⁶

Three North Jersey counties have adopted complete streets policies – Essex, Hudson and Monmouth. Currently, 37 North Jersey municipalities have adopted Complete Streets policies.⁷ Each of the 13 North Jersey counties has at least one municipality with Complete Streets policies, with the exception of Passaic County. Essex County has the most municipalities demonstrating programmatic involvement – seven of 22 Essex County municipalities have adopted complete streets policies. Three of the five designated Together North Jersey cities – Newark, Jersey City and New Brunswick – have adopted Complete Streets policies (Complete Streets in NJ, 2013).

⁶ Complete street policies promote the planning and implementation of these amenities and aim to accomplish the following: promote multi-modal options (for people who do not necessarily have personal vehicles), reduce vehicular congestion, create more “complete” and livable communities, and promote healthier lifestyles.

⁷ Refer to Table A.7 in Appendix A for a list of all North Jersey municipalities that are in the Main Street New Jersey program.

Main Street

Established in 1989, Main Street New Jersey promotes and supports the revitalization of downtowns/traditional business districts throughout the state through organization, economic restructuring, design, and promotion (Main Street New Jersey, 2013)⁸. Participation in the Main Street New Jersey program could be indicative of downtown revitalization.

Currently, there are 19 North Jersey communities participating in Main Street New Jersey.⁹ Eleven of the 13 North Jersey counties have at least one municipality participating in the program; Warren and Passaic do not. Essex County has the highest level of municipal participation in the program. Jersey City is the only one of five designated Together North Jersey cities to participate in Main Street New Jersey (Main Street New Jersey, 2013).

Safe Routes to School

Safe Routes to School is a federal, state and local initiative that encourages and supports safer and more accessible environments for children to walk and bike to school. New Jersey Safe Routes to School (NJ SRTS) operates on the state level to advance this mission. Participating schools look at policies, outlooks, and infrastructure supporting walking and biking to schools and then develop and implement a plan to improve accessibility for children.¹⁰ Because schools are typically distributed throughout a community, improvements to the pedestrian and bicycle network surrounding schools have nearly community-wide benefits. (About New Jersey Safe Routes to School, 2013).

The NJ SRTS Recognition Program recognizes municipalities and schools that demonstrate commitment to the Safe Routes to School program. Participants can achieve recognition on four levels depending on

⁸ Operated through the state's Department of Community Affairs, the program builds upon the "Main Street Approach" that was developed by the National Trust's National Main Street Center and employs a four point method: organization, economic restructuring, design and promotion. Organization involves convening potential stakeholders to create a Main Street organization. Economic restructuring involves a completing a market analysis, retrofitting or redeveloping vacant/underutilized properties, and recruiting new businesses. Design encompasses activities to enhance the business district's visual appearance. Promotion, the last "point" of the approach, involves marketing the business district to residents, visitors and investors via events and campaigns

⁹ Refer to Tables A.8-A.11 in Appendix A for a list of all North Jersey municipalities that are NJ Safe Routes to School Recognition Program winners.

¹⁰ Participating schools convene and manage a team of stakeholders to examine local policies, outlooks and physical infrastructure and then develop an action plan. NJ SRTS supports participating schools by providing resources to help develop and implement plans that eliminate barriers to walking and biking and promote safety, traffic calming, and bike and pedestrian improvements. In addition to traditional design improvements, the program employs creative solutions, such as a "walking school bus", to address problems such as daytime safety. Benefits of participating in the SRTS program include bike and pedestrian enhancements, safety improvements, traffic calming, decreased vehicular usage, and healthier lifestyles

their level of commitment – first step, bronze, silver and gold.¹¹ Ultimately, the Recognition Program award signifies that there is an established SRTS program within a community (Recognition Program Levels, 2013). There are currently 45 Recognition Program winners in North Jersey. Eight out of 13 North Jersey counties – Bergen, Essex, Hudson, Hunterdon, Middlesex, Morris, Ocean and Somerset – have at least one municipality recognized by the NJ SRTS program. Hunterdon County has the most gold level recipients. Hudson County has the most silver level recipients, though most are schools located in Jersey City. When factoring the “first step” level, Hunterdon has the highest number of Recognition Program winners (14 in total). Jersey City is the only one of the five designated Together North Jersey cities to have NJ SRTS Recognition Program winners (Recognition Program Award Winners, 2013).

Transit Village

The Transit Village Initiative is a joint initiative of NJDOT and NJ Transit to create incentives for communities to implement transit-oriented development (TOD) around transit stations.¹² The Transit Village Initiative encourages transit ridership, revitalizes communities, increases pedestrian movement, and reduces congestion by reducing personal vehicle usage. Communities are designated as Transit Villages if they demonstrate commitment to supporting and implementing TOD guidelines into their redevelopment and revitalization efforts (Transit Village Initiative, 2012). Many of the Transit Village communities have received assistance from NJ Transit’s Transit-Friendly Planning program.¹³ Transit-Friendly Planning (TFP) encompasses the range of programs and transit-friendly planning assistance administered by NJ Transit’s Department of Transit-Friendly Land Use & Development. Since the program’s launch, over 70 communities have received assistance from the TFP program (Assistant Director, Transit Friendly Land Use & Development, NJ Transit, 2013).

There are currently 21 designated Transit Villages in North Jersey.¹⁴ Eight of 13 North Jersey counties contain designated Transit Villages, including Bergen, Essex, Hudson, Middlesex, Monmouth, Morris,

¹¹ First step level recipients must establish a local SRTS program. Bronze level recipients must achieve first step requirements as well as build local SRTS awareness via events and programs. Silver level recipients must achieve bronze level requirements as well as hold at least four SRTS events, create a school travel plan, or conduct an SRTS tally and parent/caregiver survey. Finally, gold level recipients must achieve silver level requirements as well as complete higher level projects and demonstrate ongoing support from the local PTA/PTO or Community Green Team.

¹² Refer to Section 1.2.2 for the benefits of transit-oriented development.

¹³ A TFP pilot program launched in 1999 offered assistance to competitively selected municipalities to develop community-based visions for transit-friendly development. The pilot program was considered highly successful. Today, TFP assistance is provided via on-call consultants to interested communities to develop visions for development and redevelopment near existing or proposed transit facilities (Transit Friendly Land Use, 2013).

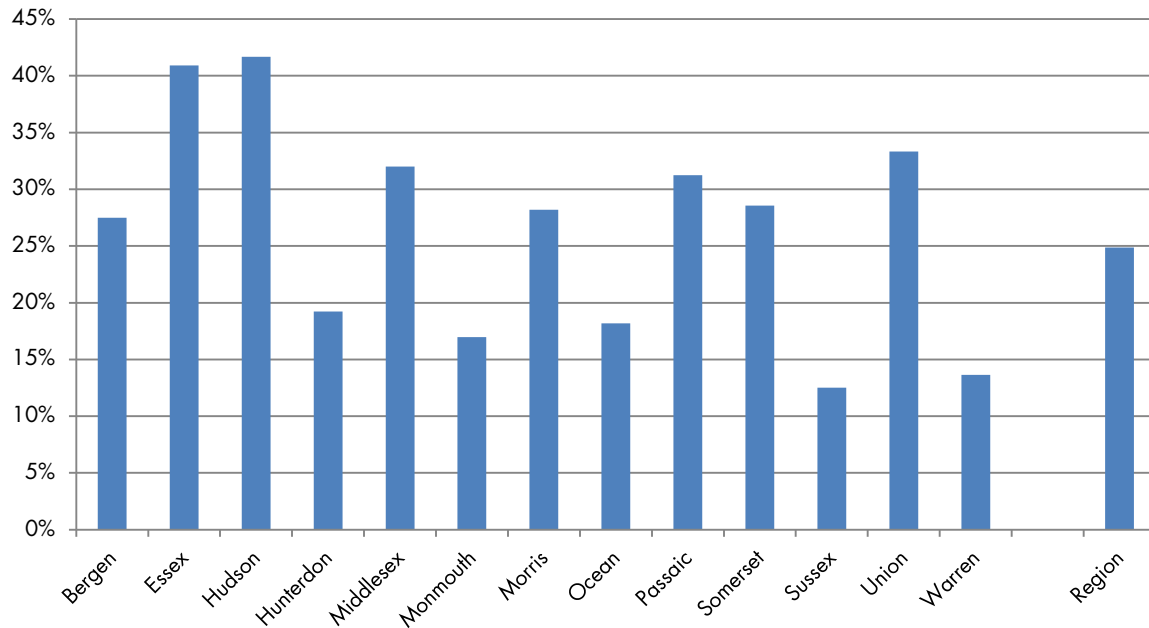
¹⁴ Refer to Table A.12 for a list of all designated Transit Villages in North Jersey.

Somerset and Union.¹⁵ Essex County has five designated Transit Villages, while both Middlesex County and Union County have four designated Transit Villages. Three of five Together North Jersey cities – Jersey City, New Brunswick and Elizabeth – are designated Transit Villages (Transit Village Initiative, 2012).

Jersey Fresh Farmers Markets

Jersey Fresh is a marketing and quality grading program that was launched in the mid-1980s to raise awareness on local and state-grown produce throughout New Jersey. Through community farmers markets, the program not only provides residents with access to local, fresh produce, but also supports local farmers and businesses (About Jersey Fresh, 2013). Farmers markets help build and sustain a sense of community and are included in this assessment as an indicator of community involvement and programming.

Figure 1.30 Share of Municipalities with Jersey Fresh Farmers Markets



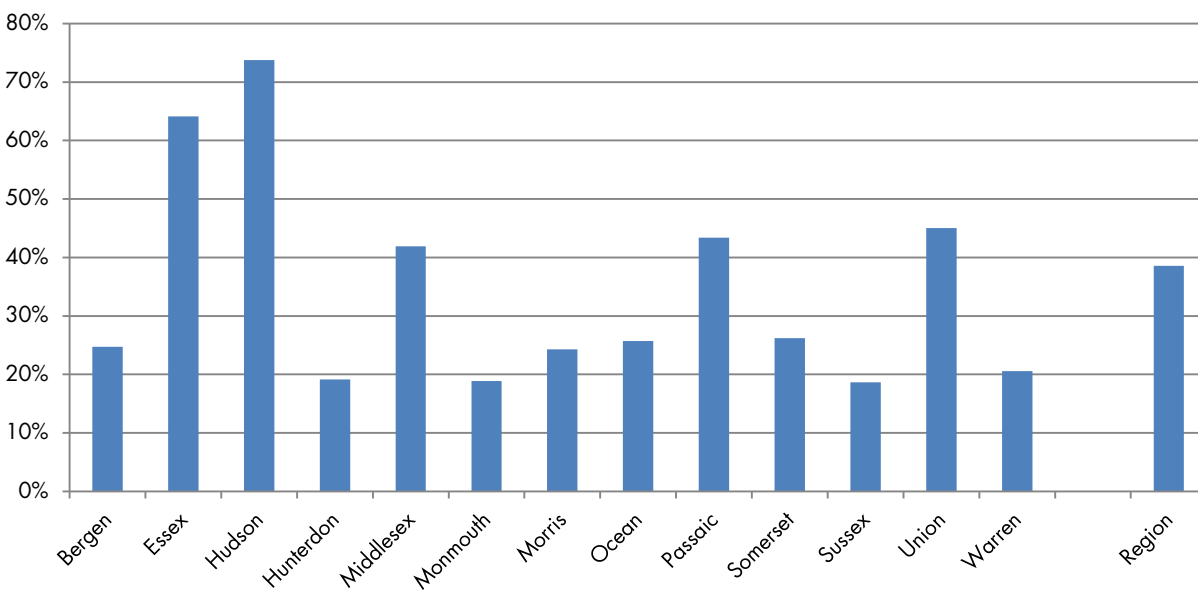
SOURCE: NJDA Jersey Fresh 2013

Approximately 88 municipalities in the region (25% of the region's total) have seasonal Jersey Fresh farmers markets. As illustrated by Figure 1.30, Hudson and Essex counties have the highest share of municipalities with Jersey Fresh farmers markets, while Sussex has the lowest share of municipalities

¹⁵ In determining level of participation in this program, it should be noted some counties (Bergen, Essex and Hudson) contain relatively more rail lines/rail stations and are therefore more likely to contain designated Transit Villages. Warren, Hunterdon and Ocean have fewer rail stations, while Sussex does not contain any rail stations.

with Jersey Fresh farmers markets. All five Together North Jersey cities have Jersey Fresh farmers markets. (Jersey Fresh, 2013)

Figure 1.31 Share of Population living in Municipalities with Farmers Markets



SOURCE: US Census 2010; NJDA Jersey Fresh 2013

Approximately 39% of the region's population lives in a municipality with a Jersey Fresh farmers market. Figure 1.31 shows that Hudson County has the highest share of people living in a municipality with a farmers market (74%). Sussex, Monmouth and Hunterdon residents are least likely to live in a municipality with a farmers market. Residents in the more urban counties – Essex, Hudson and Union – are more likely to live in a municipality with a farmers market. Conversely, residents in counties that contain more agricultural land and high-quality preserved farmland, like Warren and Hunterdon, are less likely to live in a municipality with a Jersey Fresh farmers market.¹⁶

In examining the above urban form and design related programs, it is apparent that Essex and Hudson – among the region's most urbanized and densely populated counties – have the greatest number of municipalities engaging in programmatic involvement. While Passaic County municipalities have strong participation in the Jersey Fresh program, they exhibit the least involvement in all other programs.

¹⁶ Refer to Section 1.1.3 Farmland.

1.3 Location & Character of New Development

Much of the preceding analysis has focused on the long term shifts in land use patterns and the historic development patterns that shape the region's form and design. As the region considers developing strategies to support future generations, it is important to look closely at the characteristics and trends around our region's most recent development decisions. In particular, understanding the mix of housing and the percentage built in more compact types; percentage of buildings in redevelopment and mixed-use development; and the progress being made to remediate and redevelop the region's brownfields. Each of these development types will be critical to support to ensure quality places for the next generation. The following discussion examines building permits from 2004 to 2011 (NJDC, 2013) as well as data from the Brownfields Development Area Initiative (Site Remediation Program, 2009) to provide a baseline for developing strategies around the location and character of future development.

1.3.1 Housing Mix & Compact Development

The availability of a mix of housing types is an indicator of urban form & design, as well as sustainability. Multi-family and mixed use structures reduce land consumption by accommodating greater densities on less land, which can alleviate development pressure on existing open space. A broader mix of housing types can address both housing affordability needs and recent trends towards a preference for transit-oriented and mixed-use rental units. The American Community Survey and US Census provide snapshot of the overall housing mix in 1990, 2000, and 2010. This data does not make clear, however, what the form of new construction is. To isolate that, the number of building permits by multi-unit and mixed-use residential structures will be monitored over time.

Housing mix is summarized in Table 1.32 (US Census, 1990, 2000, 2010).¹⁷ The predominant housing type in North Jersey is single-family homes. While single-family homes have gained share of housing mix from 1990 to 2010, it has declined slightly from its peak in 2000. During this time, housing with 2-4 units per structure declined slightly. Higher density housing, with five or more units per structure declined overall, but regained some share from 2000 to 2010. Marginal changes in the overall housing mix suggest that single family housing will remain the dominant housing type under "business as usual" conditions.

¹⁷ Refer to Figure A.13 in Appendix A for a breakdown of housing mix from 1990-2010 by county.

Table 1.32 Housing Mix, 1990-2010

	1990	2000	2010
Single Family	57.5%	59.4%	59.3%
2 to 4 Units	19.7%	19.2%	18.6%
5+ Units	36.1%	34.8%	36.0%

SOURCE: US Census 1990, 2000, 2010

Building permit data help refine the trend. Table 1.33 shows residential building permits by units in structure and mixed-use structure from 2004 to 2011, by county (NJDCA, 2013). For the whole region, multifamily and mixed-use structures account for 44% of all residential building permits. Across all of NJ, this figure is 37%. Bergen, Hudson, and Passaic Counties have mixed use or multifamily units comprising over 50% of new permits. In Essex, Morris, Somerset, and Union, these structures comprise at least one-third of new construction.

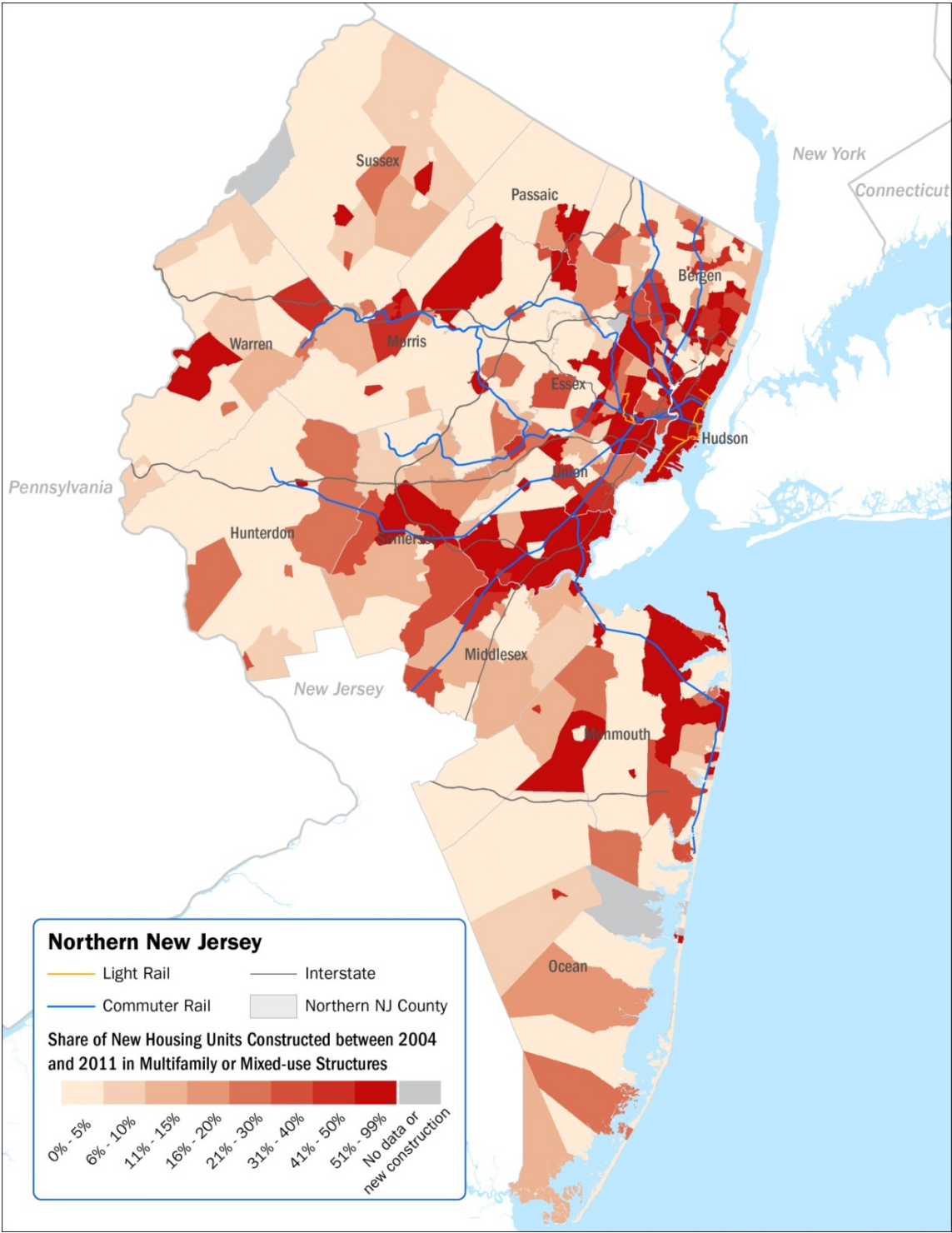
Table 1.33 Residential Building Permits, 2004-2011

County	Total	1&2 family	Multifamily	Mixed Use	% Multifamily or Mixed-use
Bergen	13,465	6,587	6,165	713	51%
Essex	12,080	6,571	5,470	39	46%
Hudson	25,480	4,169	21,291	20	84%
Hunterdon	2,214	1,821	352	41	18%
Middlesex	13,693	8,690	4,641	362	37%
Monmouth	12,483	8,801	3,605	77	29%
Morris	7,081	4,166	2,869	46	41%
Ocean	19,829	17,080	2,564	185	14%
Passaic	4,791	2,130	2,633	28	56%
Somerset	6,003	4,001	1,993	9	33%
Sussex	2,457	2,169	272	16	12%
Union	7,212	4,837	2,289	86	33%
Warren	1,715	1,361	332	22	21%
North Jersey	128,503	72,383	54,476	1,644	44%

SOURCE: NJDCA 2013

Residential building permits by municipality are mapped in Figure 1.34. Multi-family and multi-use structures comprise over half of the new construction projects from 2004 to 2011, in at least one municipality in each county in North Jersey, often along a commuter rail line.

Figure 1.34 Share of New Housing Units in Multi-Family or Mixed-Use Structures, 2004-2011



SOURCE: NJDCA 2013

1.3.2 Redevelopment

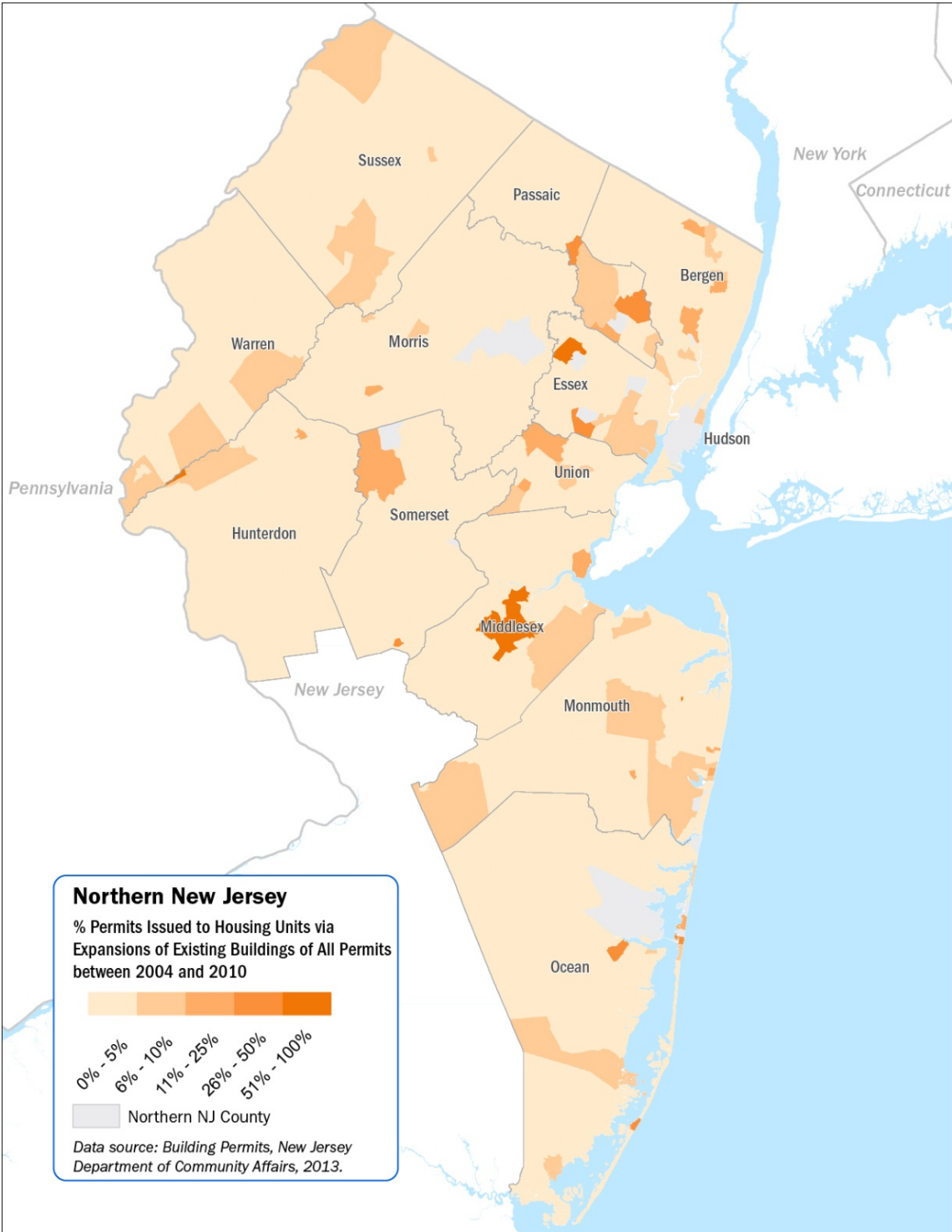
Redevelopment within existing urban centers can provide economic development and employment benefits by connecting people, employers, transportation, and infrastructure. Redevelopment is often seen as preferable to greenfield development, where undeveloped land is converted for urban uses. These projects can take a number of forms – expanding an existing structure, renovating within an existing structure, or demolishing the existing structure and constructing a new building in its place. Data for the latter two redevelopment strategies is not directly tracked in NJ. The following discussion focuses on expansion projects, for which direct data is available. Expansion projects that result in additional housing units or additional square footage in retail and office buildings and will help serve as an indicator of redevelopment in North Jersey (NJDC, 2013a,b,c).

In North Jersey, 132,725 housing units were added from 2004 to 2011. Of this, 4,222 housing units were created through expansion projects (3.2% of total new housing units). Further, 2,632 were created by expansion within a multi-family or mixed-use structure (2.0% of total new housing units). As seen in Figure 1.35, growth in housing units through expansion projects is fairly limited geographically, with little growth in most municipalities. However, housing unit increases via expansion projects accounted for over 25% of all housing unit permits in municipalities in Middlesex, Essex, Passaic, and Ocean Counties. Countywide, Passaic (15%), Essex (5%), and Union (4%) had the greatest growth in housing units via expansion.

Of the 20.4 million square feet of new retail space created in North Jersey between 2004 and 2011, 9% occurred through the expansion of existing buildings. As shown in Figure 1.36, retail expansions occurred sporadically throughout North Jersey; in municipalities with any retail expansion, it often accounted for over 25% of building permits. Retail expansions in Monmouth and Ocean Counties were focused in coastal municipalities. Countywide, Ocean (22%), Monmouth (13%), and Union (12%) had the greatest retail expansion over this period.

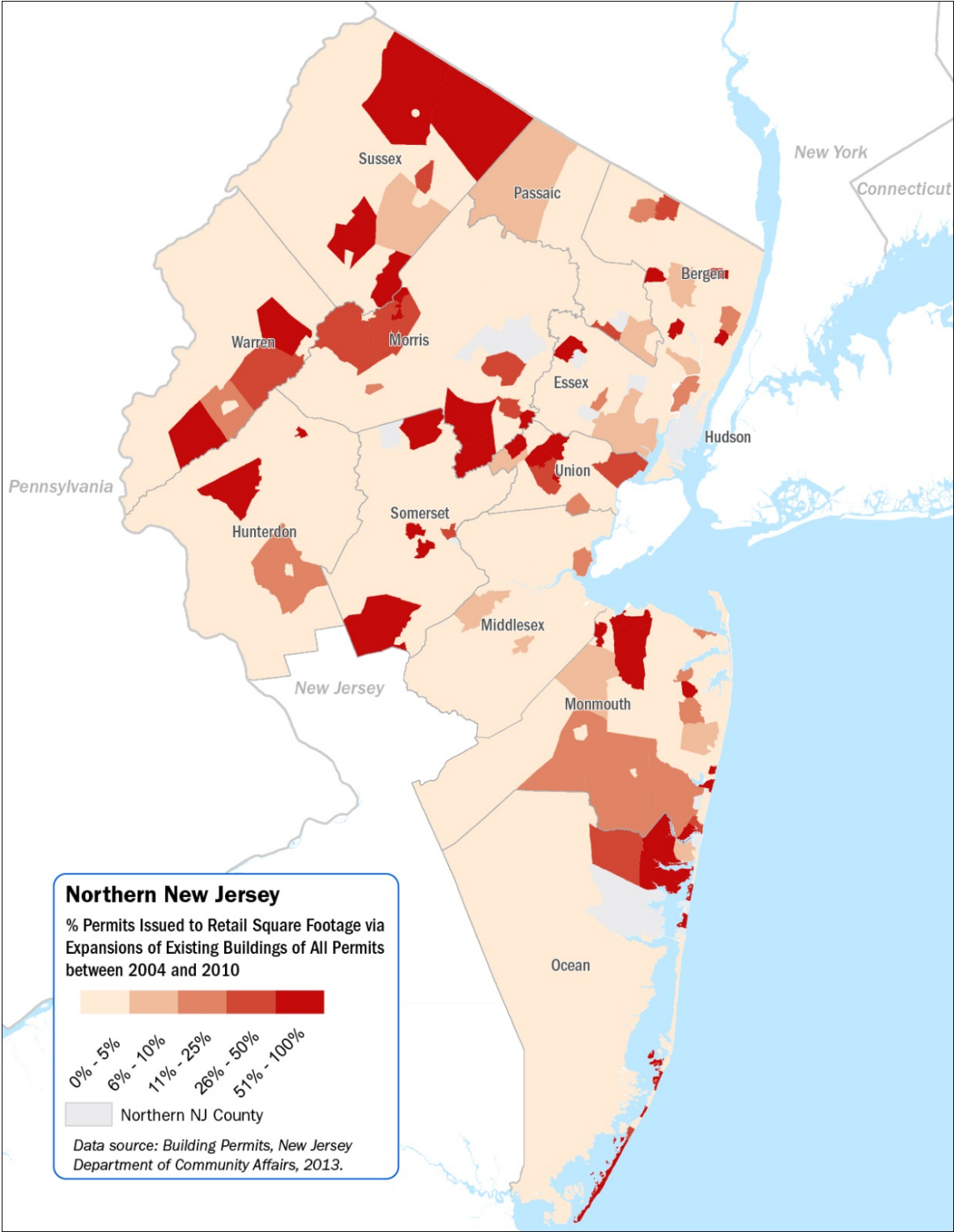
For office space, 45.3 million square feet were added from 2004 to 2011, with 17% created in existing buildings. As shown in Figure 1.37, office space expansions occurred heavily throughout North Jersey. Countywide, Union (36%), Essex (31%), and Passaic (25%) had the greatest expansion over this period.

Figure 1.35 Permits for Expansion of Existing Housing, 2004-2010



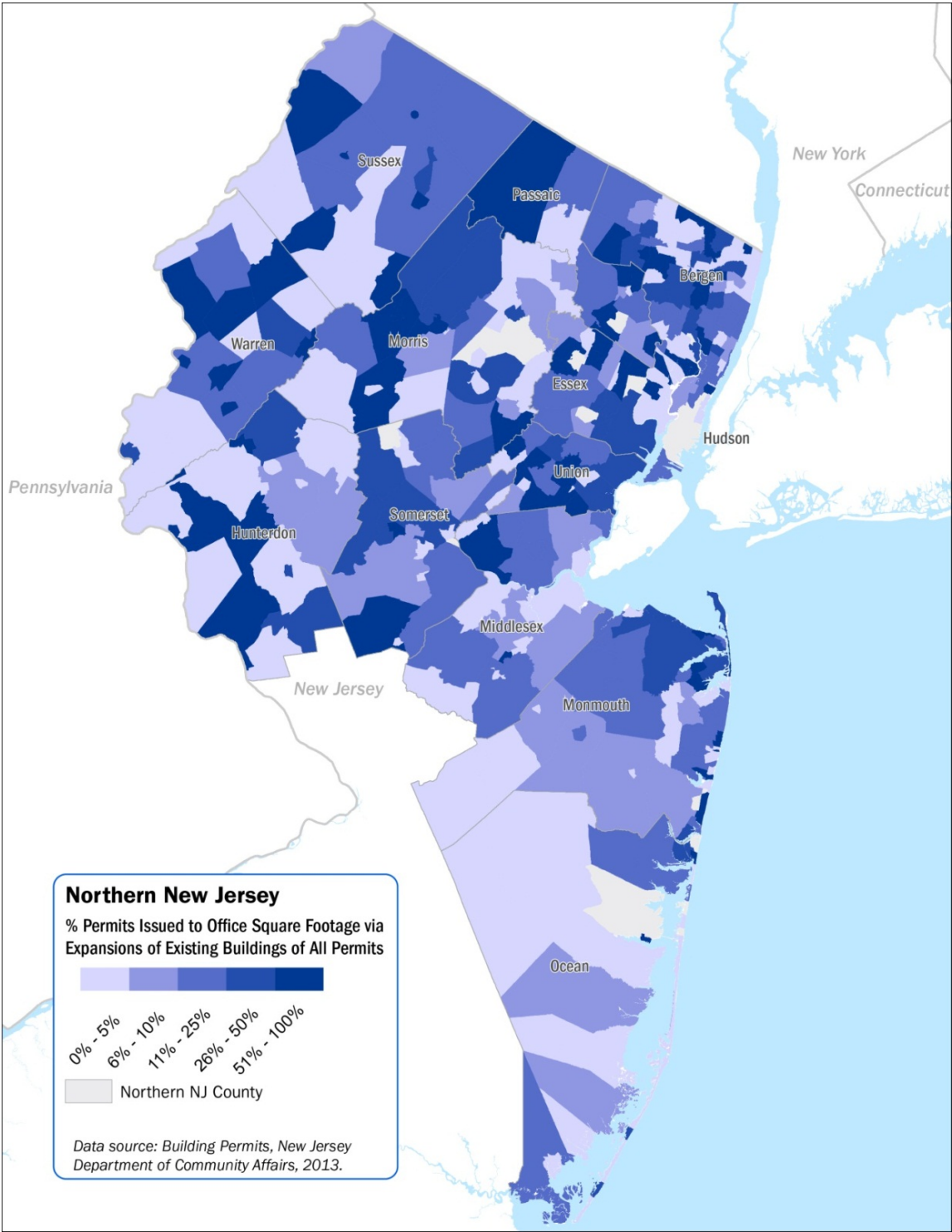
SOURCE: NJDCA 2013

Figure 1.36 Permits for Expansion of Existing Retail, 2004-2010



SOURCE: NJDCA 2013

Figure 1.37 Permits for Expansion of Existing Office, 2004-2010



SOURCE: NJDCA 2013

1.3.3 Mixed-Use Development

Mixed use developments are seen as helping to create a bustling, pedestrian-friendly urban environment. When paired with access to public transportation stations, a community can appreciate stronger connections within a municipality and the larger region. Mixed use structures can include apartments above retail or live-work setups, where artist studios and residential loft spaces are combined. From 2004 to 2011, 1,644 building permits were issued in North Jersey for residential mixed use structures, which accounts for 1.3% of new building permits over this period (NJDCA, 2013).

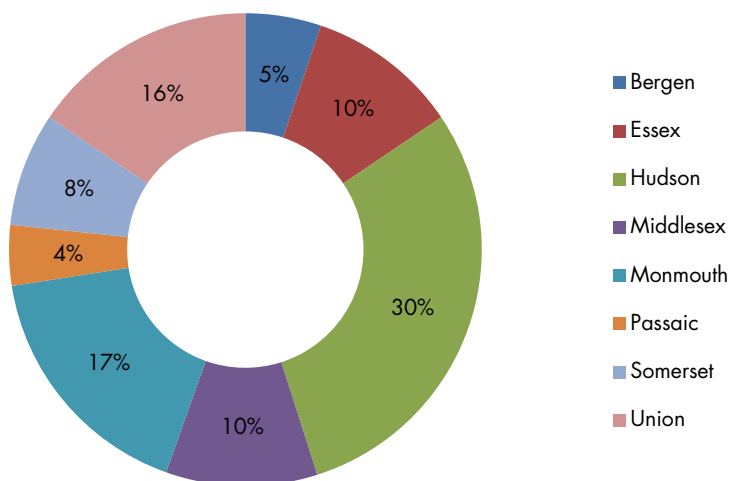
1.3.4 Brownfield Development

Given the development constraints on many greenfield sites, as well as limits to redevelopment in already developed areas, the redevelopment of brownfields will play an important role in North Jersey's future growth. The analysis below uses information from NJDEP's Brownfield Development Area Initiative to determine the number of "shovel-ready" brownfields in the region. This initiative provides assistance to communities to design and implement remediation and redevelopment plans for brownfield sites. Rather than taking a segmented and isolated approach to dealing with brownfields, the program works with communities impacted by multiple brownfield sites, allowing planning, remediation and redevelopment to occur in a cohesive fashion. This approach is especially beneficial for urban areas that may contain brownfields but are otherwise unable to secure funding (for reasons such as size or contamination level) for planning, remediation and redevelopment. (BDA Initiative, 2011)

In the region, there are 193 sites in Brownfield Development Areas (BDAs), comprising a total of 1,746 acres – approximately 0.064% of the region's total acres.¹⁸ These brownfields are located primarily in the region's more developed counties – Bergen, Essex, Hudson, Middlesex, Monmouth, Passaic, Somerset and Union. As illustrated in Figure 1.38, Hudson County contains the highest share of sites, with nearly 30% of total BDA sites.

¹⁸ Calculation based off of Census numbers

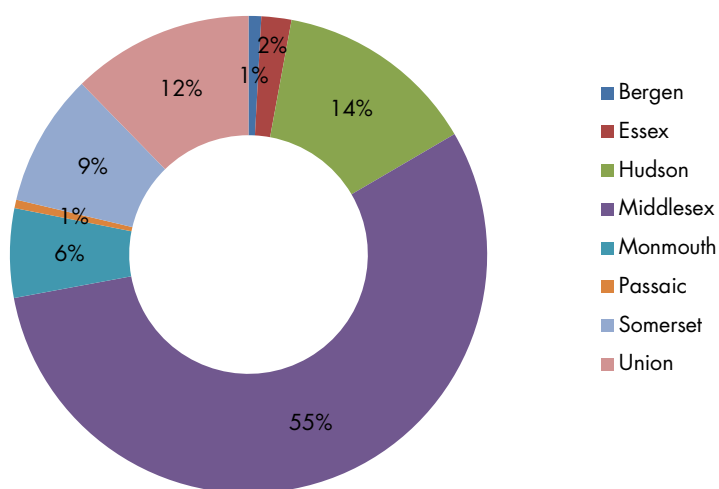
Figure 1.38 Share of Total BDA Sites by County



SOURCE: NJDEP BDA 2013

However, as shown by Figure 1.39, Middlesex County contains the highest share of BDA acreage, with nearly 55% of the initiative's total acres of brownfields.

Figure 1.39 Share of Total BDA Acreage by County

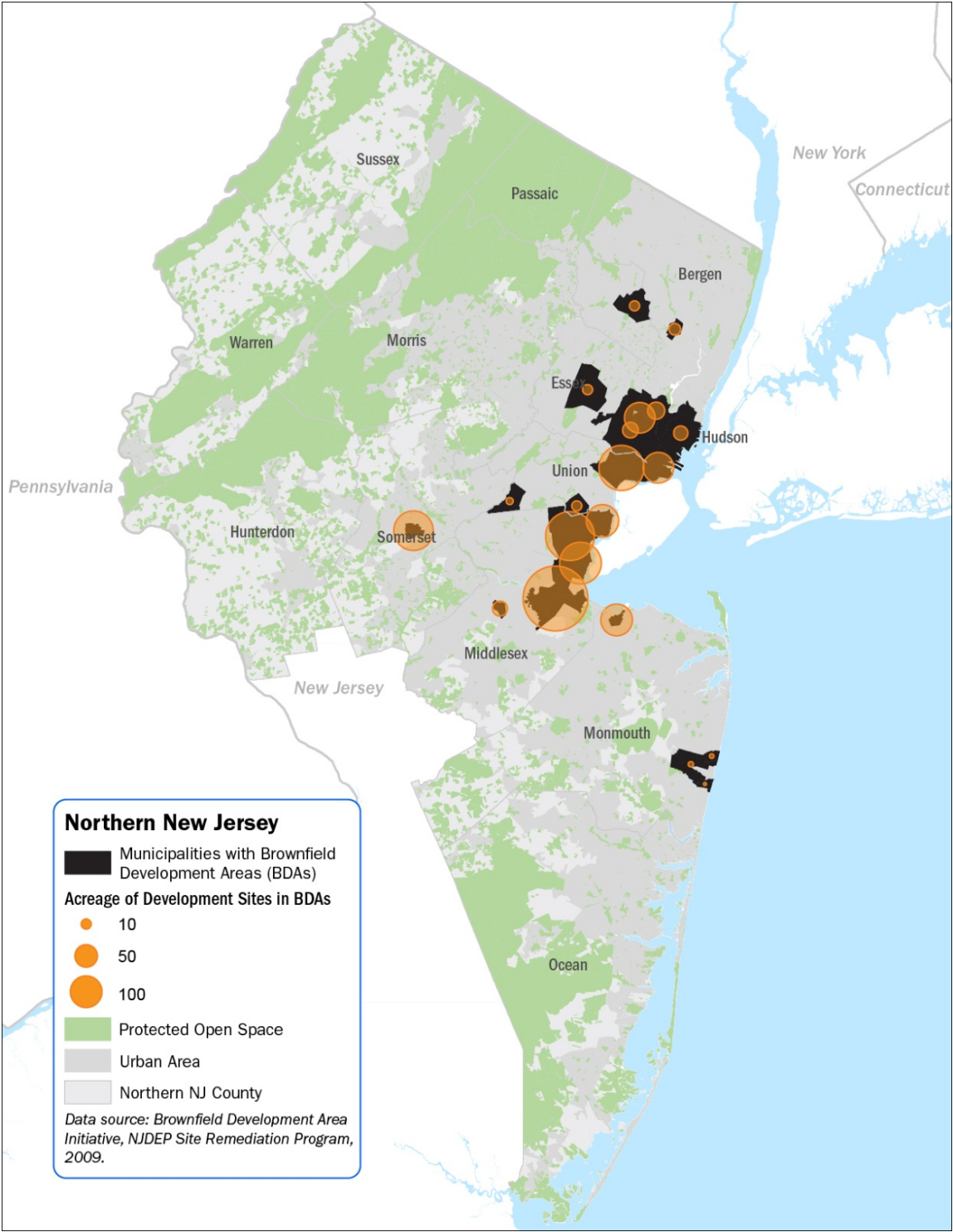


SOURCE: NJDEP BDA 2013

Figure 1.40 shows that the BDAs are concentrated near the eastern edge of the region, closer to the urban core. More isolated BDAs are located in Monmouth, Somerset, Bergen and Passaic.

Moving forward, these Brownfield Development Area sites present an opportunity to limit development on greenfields and open space, and concentrate development in areas that have already been developed, especially in these “shovel-ready” areas.

Figure 1.40 Municipalities with BDAs in North Jersey



SOURCE: NJDEP BDA 2013

2 Desired Long Term Outcomes

In order to develop a vision for sustainable community development in the region, a set of desired long term outcomes have been agreed upon and will serve as the aspirational results of the plan. These outcomes, where feasible, will be measured through a set of indicators associated with each of the topic areas (land use patterns; urban form and design; and location and character of new development).

2.1 Long Term Outcomes for Land Use and Urban Design

The HUD Partnership for Sustainable Communities (HUD) has included a list of mandatory, long-term outcomes to be included in the plan that relate to their six Livability Principles. A number of these outcomes are cross-cutting in nature and apply to the topic of land use and urban design as much as they apply to the other topics. Those mandatory, cross-cutting outcomes that apply to land use and urban design include:

- Creation of shared elements in regional transportation, housing, water and air quality plans that are deeply aligned and tied to local comprehensive land use and capital investment plans
- Aligned federal planning and investment resources that mirror the local and regional strategies for achieving sustainable communities
- Increased participation and decision-making in developing a long-range vision for the region by populations traditionally marginalized by public planning processes
- Reduced social and economic disparities for low-income, minority communities and other disadvantaged populations within the target region

HUD also identifies one mandatory long-term outcome specific to the topic of land use and urban design:

- Increased share of residential and commercial construction on underutilized infill development sites that encourage revitalization while minimizing displacement in neighborhoods with significant disadvantaged populations

Building off of HUD's recommended long-term outcomes and informed by both our research and consultation with the Standing Committee for Livability and the Environment, we have identified the following six desired long term outcomes:

- Increased proportion of job and housing growth in areas with compact development, including urban, suburban and rural centers, through infill and redevelopment
- Increased proportion of job and housing growth along rail and bus corridors through infill and redevelopment
- Increased number of mixed-uses in the region's developed areas
- Shift toward greater development on underutilized brownfield sites
- Increased number of communities and neighborhoods considered walkable and bikeable

- Increased number of communities and neighborhoods with high quality, sustainable design

2.2 Vision

Should each of these outcomes come to fruition, North Jersey in 2040 will be a place well-connected by public transportation, replete with walkable, vibrant centers of all sizes that have taken advantage of redevelopment and infill opportunities in previously developed places, while remediating and developing many of its brownfield sites to add housing, jobs and a diverse mix of uses through high quality, sustainable design for its residents. In order to implement these outcomes, prioritized focus, funding and action should be taken in key places, including centers (rural, suburban and urban); along corridors (both rail and bus); and in the state's numerous brownfields.

3 Planning, Policy and Implementation Context

This section identifies the plans, policies, programs, incentives and regulations that may support the implementation of sustainable community development in the region. Topics are divided into plans, policies and programs and are compared with the long term desired outcomes chosen for land use and urban design. Additionally, the section discusses the barriers to implementation encountered through these plans, policies and programs and also includes the results of a SWOT analysis conducted with members of the Standing Committee on Livability and the Environment, with focus on the opportunities and challenges relevant to achieving the long term desired outcomes. A summary chart describing the below plans, policies and programs can be found in Appendix B.

3.1 Plans

Table 3.1 below lists many of the most relevant plans currently involved in the management of land use and natural resources. In general, the plans that are currently in place at the regional, state and county levels are in close alignment with this effort's long-term desired outcomes.

The Highlands, Pinelands and Meadowlands plans all provide guidance for special areas in the state where growth is managed in balance with natural resources. Given that prerogative, these plans address many – if not all – of the long term desired outcomes, particularly the Highlands and Meadowlands plans.

Similarly, the New Jersey State Plans (both the current 2001 plan and the draft 2012 State Strategic Plan) are mandated by law to put forth a coordinated, integrated and comprehensive plan for the growth, development, renewal and conservation of the State and its regions. Both lay out goals and strategies that are well-aligned with the long term desired outcomes of this effort.

County Growth Management Plans provide a framework for planning at the county level, identifying trends and major issues to be addressed. Many of the plans reviewed demonstrate alignment with most of the long term desired outcomes, though it is clear that each County takes its own independent approach.

Table 3.1 Long Term Desired Outcomes of New Jersey Plans

	Infill development that minimizes displacement	Growth in areas with compact development	Growth along rail and bus corridors	Increased mixed-uses in developed areas	Greater development on brownfield sites	Increased walkable and bikeable communities	Increased high quality, sustainable design
Regional Plans							
Highlands Regional Master Plan (2008)	x	x	x	x	X	x	x
Pinelands Comprehensive Management Plan (2012)	x	x					
New Jersey Meadowlands Commission Master Plan (2002)	x	x	x	x	X	x	
State Plans							
State Development and Redevelopment Plan (2001)	x	x	x	x	X	x	x
DRAFT State Strategic Plan (2012)	x	x	x	x	X	x	x
County Growth Management Plans							
Hudson County Growth Management Plan (2002)	x	x	x	x	X	x	x
Hunterdon County Growth Management Plan (2007)	x	x	x	x	X	x	x
Monmouth County Growth Management Plan (2009)			x		X	x	
Morris County Growth Management Plan (1975)		x	x	x			
Ocean County Growth Management Plan (2011)	x	x	x	x	X	x	
Sussex County Growth Management Plan (2007)	x	x	x	x	X	x	
Union County Growth Management Plan		x	x		X	x	
Warren County Growth Management Plan (2005)	x	x	x	x	X	x	

3.2 Policies

Table 3.2 below lists the most relevant state acts, rules and regulations with land use implications and identifies where they align with long-term desired outcomes. For various reasons, the vast majority of state policies directly address the outcomes identified. In some cases, such as the State Planning Act or Highlands Water Protection Planning Act, the policy puts in place mechanisms to address long-term outcomes, but do not directly encourage or discourage these outcomes. Others, such as the Municipal Land Use law, grant the authority to make decisions about these outcomes, but again do not directly support or hinder them. Still others, such as the Freshwater Wetlands Protection Act, put in place protections and limitations on development in natural areas, thereby indirectly encouraging growth in developed areas.

Only a handful of the policies specifically encourage the outcomes listed above, such as CAFRA, the Coastal Zone Management Rules, the Flood Hazard Control Act and the Global Warming Solutions Fund Act, which actively encourage or enforce sustainable design practices, such as limiting of impervious surfaces in coastal areas. Others, such as the Brownfield and Contaminated Site Remediation Act and the Aid for Urban Environmental Concerns Act, create funding mechanisms to encourage cleanup and redevelopment of brownfield sites.

Table 3.2 Long Term Desired Outcomes of New Jersey Policies

	Infill development that minimizes displacement	Growth in areas with compact development	Growth along rail and bus corridors	Increased mixed-uses in developed areas	Greater development on brownfield sites	Increased walkable and bikeable communities	Increased high quality, sustainable design
Coastal Area Facility Review Act (CAFRA)							x
Coastal Zone Management Rules							x
NJ Municipal Land Use Law							
State Planning Act							
Pinelands Protection Act							
Highlands Water Protection and Planning Act							
Brownfield and Contaminated Site Remediation Act					x		
Freshwater Wetlands Protection Act							
Flood Hazard Area Control Act							x
Wetlands Act of 1970							
Waterfront Development Act							
NJ Water Pollution Control Act							
Tidelands Act							
Agriculture Retention and Development Act							
Act Concerning Expedited Permits		x					
Aid for Urban Environmental Concerns Act					x		
Global Warming Response Act							
Global Warming Solutions Fund Act							x
Renewable Portfolio Standard							
County Local Aid Rules							
Garden State Preservation Trust Act							

3.3 Programs

Table 3.3 below lists many of the most relevant programs currently active in the State with land use implications and identifies which programs best align with the long-term desired outcomes for this effort. In general, no single program supports all of the outcomes, but most either directly or indirectly align with at least one outcome.

The outcome most supported by current programs is that of growth in areas with compact development. The Water Quality Management Program – through its efforts to protect water quality – limits growth in less developed areas, helping to encourage growth in compact, previously developed areas. The Farmland Preservation program helps to limit the number of acres of farmland converted to developed land, further encouraging redevelopment in compact, previously developed areas. NJ EDA’s Urban Transit Hub Tax Credit (UTHTC), Grow New Jersey Assistance Program, Economic Redevelopment & Growth Program (ERG) and Fund for Community Economic Development each incentivize growth in compact, previously developed areas while also focusing more directly on those areas at or near transit stations in the UTHTC, Grow NJ and ERG programs.

The Environmental Infrastructure Financing Program incentivizes both open space protection and remediation of brownfield sites. Redevelopment of brownfields is also aided by the Hazardous Discharge Site Remediation Fund, the Municipal Landfill Closure and Remediation Reimbursement Program and Environmental Infrastructure Financing Program.

While not directly supportive of the desired long-term outcomes listed above, the Green Acres program does help to limit development of open spaces through acquisitions or easements and also helps to facilitate quality of life in communities through the creation or protection of publicly accessible open space.

Table 3.3 Long Term Desired Outcomes of New Jersey Programs

	Infill development that minimizes displacement	Growth in areas with compact development	Growth along rail and bus corridors	Increased mixed-uses in developed areas	Greater development on brownfield sites	Increased walkable and bikeable communities	Increased high quality, sustainable design
NJDEP Water Quality Management Planning Program		x					
Farmland Preservation Program		x					
NJ Green Acres Program							
Urban Enterprise Zone Program	x						
Urban Transit Hub Tax Credit		x	x			x	
Grow NJ Assistance Program		x	x				
Brownfields and Contaminated Site Remediation Program					x		
Economic Redevelopment & Growth Program		x	x				
Fund for Community Economic Development		x					
Hazardous Discharge Site Remediation Fund					x		
Municipal Landfill Closure and Remediation Reimbursement Program					x		
Environmental Infrastructure Financing Program					x		

3.4 Barriers to Implementation

In order to achieve the long term desired outcomes identified for land use and urban design, certain barriers that impede or outright prevent implementation will need to be addressed. These barriers range from conflicts in regulations and a propensity toward local decision-making to a lack of municipal funding and the resulting chase for ratables that can invite bad land use decision-making. All of the barriers to good land use decision-making will need effective collaborations between all levels of government and creativity in thinking to resolve.

3.4.1 Process: Conflicting Regulations & Burdensome Process

As evidenced in the tables above, many of the plans and programs and a number of the policies currently active in the state are supportive of implementation of various long term desired outcomes for land use and urban design. Analyzed individually, each of these policies, plans and programs are found to support varying degrees of good land use practice for a sustainable future in the state. However, no one policy, plan or program operates independently from another. Rather, at any given time and place, a multitude of state rules and regulations, regional plans and local ordinances and policies dictate what can happen at a particular place. These cumulative – and sometimes conflicting – layers of regulation and guidance can raise barriers to implementing what would otherwise be good land use practices, and cause burdensome processes that extend the timeline of projects.

As a result, a number of worthwhile development projects over time have been unreasonably stalled or terminated, while new concepts – such as green infrastructure – have been difficult to integrate into existing regulatory structures. The intentions of each of these policies, plans and programs are good, but streamlining processes and resolving conflicting regulations that limit redevelopment in the most appropriate places to grow will help to ensure that sustainable growth proceeds in the places where growth can best be accommodated, while protecting critical and natural resources.

Simply put, municipalities should know the location and degree of growth they'd like to occur in target locations (e.g. in existing downtowns, on brownfield sites, etc.); conflicts within regulations that govern these target areas should be resolved; counties and the State should work closely with municipalities to incentivize growth in these places through financial assistance and streamlined processes; and as a result, developers will have a clear sense and proper incentives of where to invest.

Executive Order Number 78 (signed by Governor Christie on October 20, 2011) – which created the State Strategic Plan Steering Committee to ensure that state departments and agencies incorporate the goals, objectives, and values of the as-yet adopted State Strategic Plan into Department Strategic Plans – could serve as an important step in the process to reduce conflicts and facilitate streamlining.

3.4.2 Lack of Regional Planning

Similarly, a number of the barriers to good land use and urban design practices arise from missed opportunities to plan for growth and development regionally. As a home rule state, most land use decisions in New Jersey are made at the local level, which helps to ensure that local officials are making choices that most directly reflect the priorities and values of their constituents. However, decisions made in one community have impacts on neighboring communities. Negative impacts include increased

traffic congestion, competition for economic development and stress on natural resources, amongst others.

A reluctance to plan regionally for growth and development has resulted in poor land use practices. Greater efforts to involve local elected officials in collaborative, regional planning efforts can produce better, more efficient land use practices with both regional and local benefits. Regional planning efforts can be most effective when established around shared interests of multiple partners. Some examples of such interests could include:

- Natural resources, such as sources of drinking water, farmland or open space
- County-wide interests, such as economic development clusters
- Roadway corridors
- Transit corridors

The Regional Center Partnership of Somerset County is one such example of municipalities working with each other across boundaries and with businesses to make decisions at the regional level that bring greater economic development opportunities home at the local level. Such regional partnerships help to overcome barriers raised by purely local interest.

3.4.3 Funding Shortfalls

Because of the complexities involved with redevelopment – including, but not limited to stabilizing neighboring developed areas; site remediation; hooking into or upgrading existing infrastructure, etc. – it can often be more costly than new, greenfield development. As a result, added costs can serve as a barrier to implementing many of the long term outcomes outlined for land use and urban design. A number of existing programs – such as the Urban Transit Hub Tax Credit, Grow New Jersey Assistance Program and Economic Redevelopment & Growth Plan – provide funding and other incentives to encourage redevelopment in centers and other developed, more compact places. Similarly, the Brownfields and Contaminated Site Remediation Program and other programs incentivize the cleanup of contaminated sites to facilitate redevelopment. But the effectiveness and reach of these programs are limited to the amount of funding available through them.

As New Jersey continues to rebound from the Great Recession, limited budgets and competition for allocations present a barrier to implementation of the land use & urban design long term desired outcomes. Success in these outcomes are directly tied to economic success in the state and thus ensuring adequate funding of programs such as these could help to lower those barriers.

3.5 SWOT Analysis

In order to identify the internal and external factors that could influence successful implementation of the long term desired outcomes for land use and urban design, a SWOT analysis was conducted with members of the Standing Committee for Livability and the Environment. The process identified a variety of strengths and weaknesses of the region and created a prioritized list of opportunities and threats. These will serve as the foundation for strategies for land use and urban design for the RPSD.

3.5.1 Strengths

The 13-County Northern New Jersey Region is gifted with a wide variety of strengths. Those particularly noted in the SWOT analysis included:

- A range of land uses
- A variety of redevelopment opportunities across different land types
- An range of urban, suburban and rural, mixed-use centers
- A growing immigrant population
- Established planning processes and relationships across state and regional planning/transportation agencies

As strategies are developed for land use and urban design, it will be important to capitalize on these and other strengths to ensure that what works in this region is supported and enhanced.

3.5.2 Weaknesses

North Jersey has a variety of challenges and deficiencies that could impede implementation of the long term desired outcomes. Those identified through the SWOT analysis include:

- Limited funds to finance redevelopment/cleanup
- Local government's reluctance to develop multifamily housing
- Aging infrastructure
- Declining retail centers
- Pockets of poverty and poor conditions in urban centers
- Inability to respond to quickly changing market conditions (e.g. consolidation of pharmaceutical companies)
- Multiplicity of municipalities fosters lack of consensus, high competition for funding
- City versus suburb mentality
- High property taxes based on school formula
- Aversion to density
- Limitations of existing rail network (radial; poor connections to outer nodes)

Ultimately, the best strategies of the RPSD will address head-on the challenges and weaknesses that impede the region's success.

3.5.3 Opportunities

Given the strengths and weaknesses identified above, there are very clear opportunities to pursue in order to implement the long term desired outcomes identified for land use and urban design. From the SWOT analysis, top opportunities rated as having the highest potential included 1) the demand for living in compact centers driven by demographic shifts; 2) redevelopment potential of different land types; and 3) existing transit networks.

Demand for living in compact centers, driven by demographic shifts

In general, populations have been migrating back to more downtown lifestyles in urban and suburban centers. But a particular confluence of demand between two generations – the younger Millennials that demand a more vibrant, car-free, cosmopolitan life and the “empty nesters” of the Baby Boom generation seeking a more convenient, walkable lifestyle offering a mix of uses – has created a unique opportunity to meet the demand of these two large generations through investment in our urban, suburban and rural centers. These more compact places can offer a diversity of housing types with a range of prices – including high and lower end rentals – as well as mixed-uses that facilitate a more walkable lifestyle. Strategies for land use and urban design should focus on the opportunities in these places through support of mixed uses, infill redevelopment, streetscape improvements that encourage walkability and bikeability, and high quality, sustainable design that reinforces the strength of these places.

Redevelopment potential of different land types

As is made clear in Chapter 1, North Jersey has a variety of land types – from rural to suburban to urban – that support a wide variety of redevelopment opportunities. Whether it’s the numerous brownfield sites found throughout the region or the many developed places that could be enhanced or transformed, a multi-faceted approach to redevelopment should be established for North Jersey’s communities. Infill development will be a key strategy for completing the existing fabric of urban, suburban and rural centers. Transformation of existing, underutilized uses – including shopping centers, corporate campuses and manufacturing facilities, amongst others – will be critical to supporting growth in the region’s suburban edges. Strategies for redevelopment that respect the character of the surrounding environs, as well as capitalize and forge connections with agricultural resources, will be critical for rural centers. Unique approaches to redevelopment tailored to the form of development will be essential to the success of the RPSD.

Existing Transit Networks

Much of North Jersey was developed around a network of commuter rail and streetcar systems. The remnants of that same network comprise the public transit system that connects North Jersey residents to each other and to major destinations, including as Newark and New York City. This system is further connected by a robust bus network that spans the reaches of the 13-County region. Strategies for the future development of this region should focus on the opportunities to develop and redevelop around the existing and future transit network. Transit Oriented Development (TOD) is a method that understands the connection between where people want to live and how they move around the region. The closer residents live to good public transit – including trains, subways, buses and light rail – the less need they have to use – and spend money on – their car, thus reducing congestion, pollution and impacts on health. TOD will be a critical tool in the strategies developed for the RPSD.

3.5.4 Threats

In addition to the barriers described above, there are a number of direct threats facing implementation of the long-term desired outcomes identified for land use and urban design. Those prioritized in the

SWOT analysis include 1) the chase for ratables at the municipal level; and 2) the region's aging infrastructure. Dealing with these threats will be necessary to achieving the goals set forth in the RPSD.

Chase for ratables

The Great Recession has also taken a great toll on municipal budgets throughout the North Jersey region. As a result, local municipalities are eager to attract new tax ratables to their communities, but without raising already high taxes on local residents. This "chase for ratables" can have significant impacts on land use decisions, as the appeal of new revenues can threaten to override smart land use decisions. In such cases, those areas with the least number of barriers to development are developed with non-controversial uses (such as retail strips). This can tend to perpetuate sprawl-type development outside of more developed centers. As was described above, redevelopment can be more complex, requiring more process and longer timelines, neither of which is conducive to getting new tax revenue flowing. Solutions must be developed that balance the need for municipal revenue with smart, long-term, sustainable decision-making around development.

The region's aging infrastructure

Whether its bridges, roadways, tracks, wastewater pipes or power lines, the North Jersey region is rich in infrastructure development. However, this infrastructure is many decades – if not more than a century – old. Old and deteriorating infrastructure poses significant risks to the region, as reliability decreases and costs to maintain and upgrade increase. As more people are projected to inhabit the region, the infrastructure that supports everyday life – from commuting to switching on the computer to turning on the faucet – will become more burdened. Thus, strategies that take into account infrastructure maintenance and upgrades will be critical, as will the consideration of alternative "green infrastructure" that uses principles from nature to manage needs such as stormwater collection. The future is only as strong as the infrastructure that supports it.

4 Measuring Success

Indicators	Source	Available Scale	Time Period	Data Constraints	Measurable Outcomes						
					Infill	Centers	Rail & Bus	Mixed-use	Brownfields	Walkable	Design
Land Use/Consumption											
Percentage of land type	NJDEP Land Use/Land Cover	State, County, Municipal	1986, 1995, 2002, 2007			x				x	
Acres of agricultural and natural lands converted to developed land annually per new resident	NJDEP Land Use/Land Cover,	State, County, Municipal	1986, 1995, 2002, 2007			x					
Impervious Cover	NJDEP Land Use/Land Cover	State, County, Municipal	1986, 1995, 2002, 2007		x	x					
Acres of preserved open space	The Nature Conservancy	State, County, Municipal									
Acres of public use parks and open space per capita	The Nature Conservancy	State, County, Municipal				x					
	US Census	State, County, Municipal	Decennial Census, American Community Estimates								
HHs within ½ mile (urban areas) and 1 mile (rural areas) of a park or public open space	The Nature Conservancy	State, County, Municipal									
	US Census	State, County, Municipal	Decennial Census, American Community Estimates								x
Acres of high-quality farmland preserved	NJ Farmland Protection Program	State, County, Municipal				x					
Number of Brownfields	NJ DEP	State		No inventory kept						x	
Proportion of housing units, population and businesses located in surge/flood prone areas	US Census	State, County, Municipal	Decennial Census, American Community Estimates								
	US Census - County Business Patterns	County	Decennial Census, American Community Estimates								
	USGS Flood Information	Regional	2012								
Urban Form & Design											
Walk Score for New Jersey Municipalities	Walk Score®	Municipality	Every few years								x
Proportion of population within reasonable walking distance of schools	NJ Department of Education	Municipality									x
	US Census	State, County, Municipal	Decennial Census, American Community Estimates								
Number of communities adopting form based code	Interviews	Municipality		No inventory kept							x
Number and distribution of communities involved in various federal and state programs	Complete Streets NJ	County, Municipality	Ongoing							x	
	NJ DCA Main Street NJ	Municipality	Ongoing								
	NJ Safe Routes to School	Municipality	Ongoing							x	x
	NJDOT Transit Village Initiative	Municipality	Ongoing				x			x	x
	NJDA Jersey Fresh	Municipality	Ongoing								
Acres of preserved historic districts/properties	NJDEP Historic Districts of NJ	State, County, Municipal								x	x
Proportion of population living within a community with a Jersey Fresh farmer’s market	NJDA Jersey Fresh	Municipality		Needs to be geocoded							
Proportion of population within ½ mile of transit	NJ Transit, PANYNJ, City of Newark	State, County, Municipal					x				
	US Census	State, County, Municipal									
Location & Character of New Development											
Density/intensity of new development	NJ DCA Building Permits	State, County, Municipal	Annually	Specific only to municipality	x	x					
Number of “shovel-ready” Brownfields in BDA program	NJDEP BDA Program	State, County, Municipal	2009	Not updated frequently						x	
Proportion of new development occurring via expansion/reuse of existing buildings	NJ DCA Building Permits	State, County, Municipal	Annually	Specific only to municipality		x					
Proportion of new development in multifamily or mixed-use structures	NJ DCA Building Permits	State, County, Municipal	Annually	Specific only to municipality					x		

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Appendix A: Tables and Reference for Chapter 1

Table A.1 Land Use Land Cover Change over Time, by Land Use Code, 1986-2007

LU Code	1986	1995	2007
1100	4,531		
1110	86,780	95,938	97,445
1120	233,152	245,328	237,845
1130	99,531	113,182	124,848
1140	123,670	154,892	194,134
1150	852	986	632
1200	77,047	83,213	91,713
1211	4,519	4,211	4,827
1214	33	492	466
1300	48,057	49,052	42,839
1400	43,517	45,975	12,813
1410			17,780
1411			65
1419			148
1420			6,484
1440			2,954
1461	2,305	2,359	3,468
1462			1,506
1463			10,362
1499			7,759
1500	285	245	502
1600	770	747	1,678
1700	65,293	74,310	61,928
1710			7,760
1711			100
1741			54
1750	3,051	3,604	2,310
1800	42,454	45,490	52,798
1804	8,870	9,220	10,154
1810			1,400
1850	1,781	2,203	2,992
2100	350,782	295,526	224,235
2140	35,653	32,444	27,977
2150		2,502	1,645
2200	10,720	14,674	16,227
2260	10		
2300	529	498	386
2400	13,144	15,150	23,868
4100	27,377		
4110	19,005	26,499	49,905
4120	562,908	583,260	518,783
4200	40,320		
4210	17,676	19,183	24,070
4220	125,709	128,054	91,967
4230	3,716	4,004	3,645
4310	1,653		
4311	1,142	2,404	6,311
4312	24,251	39,521	38,349
4320	2,505		
4321	1,722	3,341	7,999
4322	27,551	42,021	46,260
4400	54,152		
4410	27,899	48,537	21,995
4411			722
4420	30,876	34,143	23,967
4430	28,217	30,265	19,335
4440	30,069	31,403	29,395
4500		7,452	111
5100	11,743	11,593	8,688
5190			11
5200	8,836	8,868	7,235
5300	39,134	41,992	46,767
5410	120,819	120,742	1,460
5411	33,711	33,733	9
5420	2,318	2,331	785
5430	136,854	136,578	33
6110	39,242	39,131	
6111			2,156
6112			1,454
6120	290	265	58
6130	1,897	2,041	538
6141			2,295
6210	197,112	190,635	199,796
6220	14,261	13,828	18,269
6221	9,358	9,084	11,261
6231	32,767	29,991	21,502
6232	3,377	3,376	2,561
6233	3,960	3,985	4,381
6234	3,057	3,124	2,624
6240	37,994	34,612	17,821
6241			2,547
6251	22,465	21,947	14,812
6252	15,516	15,254	16,134
6290			183
6500		433	11
7100	2,049	2,161	180
7200	253	357	345
7300	18,196	14,623	9,490
7400	3,903	4,851	5,961
7430	5,803	9,586	4,073
7500	7,773	10,489	11,396
7600	2,097	1,328	195
8000	398		

SOURCE: NJDEP Land Use/Land Cove

Table A.2 Land Use Codes

LU Code	TYPE	LABEL
1110	URBAN	RESIDENTIAL, HIGH DENSITY, MULTIPLE DWELLING
1120	URBAN	RESIDENTIAL, SINGLE UNIT, MEDIUM DENSITY
1130	URBAN	RESIDENTIAL, SINGLE UNIT, LOW DENSITY
1140	URBAN	RESIDENTIAL, RURAL, SINGLE UNIT
1150	URBAN	MIXED RESIDENTIAL
1200	URBAN	COMMERCIAL/SERVICES
1211	URBAN	MILITARY RESERVATIONS
1214	URBAN	NO LONGER MILITARY, USE TO BE DETERMINED
1300	URBAN	INDUSTRIAL
1400	URBAN	TRANSPORTATION/COMMUNICATIONS/UTILITIES
1410	URBAN	MAJOR ROADWAY
1411	URBAN	MIXED TRANSPORTATION CORRIDOR OVERFLAP AREA
1419	WATER	BRIDGE OVER WATER
1420	URBAN	RAILROADS
1440	URBAN	AIRPORT FACILITIES
1461	WETLANDS	WETLAND RIGHTS-OF-WAY (MODIFIED)
1462	URBAN	UPLAND RIGHTS-OF-WAY (DEVELOPED)
1463	URBAN	UPLAND RIGHTS-OF-WAY (UNDEVELOPED)
1499	URBAN	STORMWATER BASIN
1500	URBAN	INDUSTRIAL/COMMERCIAL COMPLEXES
1600	URBAN	MIXED URBAN OR BUILT-UP LAND
1700	URBAN	OTHER URBAN OR BUILT-UP LAND
1710	URBAN	CEMETERY
1711	WETLANDS	CEMETERY ON WETLAND
1741	URBAN	PHRAGMITES DOMINATE URBAN AREAS
1750	WETLANDS	MANAGED WETLAND IN MAINTAINED LAWN GREENSPACE
1800	URBAN	RECREATIONAL LAND
1804	URBAN	ATHLETIC FIELDS (SCHOOLS)
1810	URBAN	STADIUM THEATERS CULTURAL CENTERS AND ZOOS
1850	WETLANDS	MANAGED WETLAND IN BUILT-UP MAINTAINED REC AREA
2100	AGRICULTURE	CROPLAND AND PASTURELAND
2140	WETLANDS	AGRICULTURAL WETLANDS (MODIFIED)
2150	WETLANDS	FORMER AGRICULTURAL WETLAND (BECOMING SHRUBBY, NOT BUILT-UP)
2200	AGRICULTURE	ORCHARDS/VINEYARDS/NURSERIES/HORTICULTURAL AREAS
2300	AGRICULTURE	CONFINED FEEDING OPERATIONS
2400	AGRICULTURE	OTHER AGRICULTURE
4110	FOREST	DECIDUOUS FOREST (10-50% CROWN CLOSURE)
4120	FOREST	DECIDUOUS FOREST (>50% CROWN CLOSURE)
4210	FOREST	CONIFEROUS FOREST (10-50% CROWN CLOSURE)
4220	FOREST	CONIFEROUS FOREST (>50% CROWN CLOSURE)
4230	FOREST	PLANTATION
4311	FOREST	MIXED FOREST (>50% CONIFEROUS WITH 10%-50% CROWN CLOSURE)
4312	FOREST	MIXED FOREST (>50% CONIFEROUS WITH >50% CROWN CLOSURE)
4321	FOREST	MIXED FOREST (>50% DECIDUOUS WITH 10-50% CROWN CLOSURE)
4322	FOREST	MIXED FOREST (>50% DECIDUOUS WITH >50% CROWN CLOSURE)
4410	FOREST	OLD FIELD (< 25% BRUSH COVERED)
4411	FOREST	PHRAGMITES DOMINATE OLD FIELD
4420	FOREST	DECIDUOUS BRUSH/SHRUBLAND
4430	FOREST	CONIFEROUS BRUSH/SHRUBLAND
4440	FOREST	MIXED DECIDUOUS/CONIFEROUS BRUSH/SHRUBLAND
4500	FOREST	SEVERE BURNED UPLAND VEGETATION
5100	WATER	STREAMS AND CANALS
5190	WATER	EXPOSED FLATS
5200	WATER	NATURAL LAKES

5300	WATER	ARTIFICIAL LAKES
5410	WATER	TIDAL RIVERS, INLAND BAYS, AND OTHER TIDAL WATERS
5411	WATER	OPEN TIDAL BAYS
5420	WATER	DREDGED LAGOON
5430	WATER	ATLANTIC OCEAN
6111	WETLANDS	SALINE MARSHES (LOW MARSH)
6112	WETLANDS	SALINE MARSHES (HIGH MARSH)
6120	WETLANDS	FRESHWATER TIDAL MARSHES
6130	WETLANDS	VEGETATED DUNE COMMUNITIES
6141	WETLANDS	PHRAGMITES DOMINATE COASTAL WETLANDS
6210	WETLANDS	DECIDUOUS WOODED WETLANDS
6220	WETLANDS	CONIFEROUS WOODED WETLANDS
6221	WETLANDS	ATLANTIC WHITE CEDAR SWAMP
6231	WETLANDS	DECIDUOUS SCRUB/SHRUB WETLANDS
6232	WETLANDS	CONIFEROUS SCRUB/SHRUB WETLANDS
6233	WETLANDS	MIXED SCRUB/SHRUB WETLANDS (DECIDUOUS DOM.)
6234	WETLANDS	MIXED SCRUB/SHRUB WETLANDS (CONIFEROUS DOM.)
6240	WETLANDS	HERBACEOUS WETLANDS
6241	WETLANDS	PHRAGMITES DOMINATE INTERIOR WETLANDS
6251	WETLANDS	MIXED FORESTED WETLANDS (DECIDUOUS DOM.)
6252	WETLANDS	MIXED FORESTED WETLANDS (CONIFEROUS DOM.)
6290	WETLANDS	UNVEGETATED FLATS
6500	WETLANDS	SEVERE BURNED WETLANDS
7100	BARREN LAND	BEACHES
7200	BARREN LAND	BARE EXPOSED ROCK, ROCK SLIDES, ETC.
7300	BARREN LAND	EXTRACTIVE MINING
7400	BARREN LAND	ALTERED LANDS
7430	WETLANDS	DISTURBED WETLANDS (MODIFIED)
7500	BARREN LAND	TRANSITIONAL AREAS
7600	BARREN LAND	UNDIFFERENTIATED BARREN LANDS

SOURCE: NJDEP Land Use/Land Cover

Table A.3 Sandy Surge Area for North Jersey Region

	Total	In Sandy Surge Area	% In Sandy Surge Area
Land Area (Sq. Mi.)	4,258	173	4%
Population	6,579,907	273,910	4%
Housing Units	2,611,832	155,538	6%
Households	2,398,756	114,749	5%
Businesses	174,254	14,227	8%

SOURCE: U.S. Census 2010; County Business Patterns 2010; USGS Flood Information, 2012

Table A.4 Sandy Surge Area for North Jersey Counties

	Total				In Sandy Surge Area				% in Sandy Surge Area			
	Land Area (Sq. Mi.)	Population	Housing Units	HH's	Land Area (Sq. Mi.)	Population	Housing Units	HH's	Land Area (Sq. Mi.)	Population	Housing Units	HH's
Bergen	232.9	905,116	352,388	335,730	19.25	26,640	11,039	10,466	8.27%	2.94%	3.13%	3.12%
Essex	126.2	783,969	312,954	283,712	8.00	17,980	5,602	4,972	6.34%	2.29%	1.79%	1.75%
Hudson	46.2	634,266	270,335	246,437	20.45	82,349	42,383	38,781	44.26%	12.98%	15.68%	15.74%
Middlesex	308.9	809,858	294,800	281,186	19.08	19,545	7,795	7,245	6.18%	2.41%	2.64%	2.58%
Monmouth	468.8	630,380	258,410	233,983	20.45	48,320	23,600	19,355	4.36%	7.67%	9.13%	8.27%
Ocean	628.8	576,567	278,052	221,111	77.52	69,436	61,332	30,414	12.33%	12.04%	22.06%	13.76%
Union	102.9	536,499	199,489	188,118	8.54	9,640	3,787	3,516	8.30%	1.80%	1.90%	1.87%
REGION	4257.52	6,579,907	2,611,832	2,398,756	173.29	273,910	155,538	114,749	4.07%	4.16%	5.96%	4.78%

SOURCE: U.S. Census 2010; USGS Flood Information, 2012

Table A.5 Walk Score® for New Jersey's 61 Largest Cities

City	Walk Score	Population	County
Hoboken	92	50,005	Hudson
Union City	92	66,455	Hudson
West New York	90	49,708	Hudson
Jersey City	85	247,597	Hudson
Passaic	81	69,781	Passaic
Cliffside Park	80	23,594	Bergen
Palisades Park	79	19,622	Bergen
Bayonne	77	63,024	Hudson
Fort Lee	76	35,345	Bergen
Kearny	75	40,684	Hudson
Morristown	75	18,411	Morris
Paterson	75	146,199	Passaic
Garfield	74	30,487	Bergen
Hackensack	74	43,010	Bergen
Newark	74	277,140	Essex
Elizabeth	72	124,969	Union
Perth Amboy	71	50,814	Middlesex
Rutherford	71	18,061	Bergen
Lodi	70	24,136	Bergen
New Brunswick	70	55,181	Middlesex
Rahway	69	27,346	Union
Atlantic City	68	39,558	
East Orange	68	64,270	Essex
Trenton	68	84,913	
Linden	67	40,499	Union
Clifton	65	84,136	Passaic
Fair Lawn	64	32,457	Bergen
Bergenfield	63	26,764	Bergen
Hawthorne	63	18,791	Passaic
Roselle	63	21,085	Union
North Plainfield	62	21,936	Union

City	Walk Score	Population	County
Iselin	61	18,695	Middlesex
Woodbridge	61	19,265	Middlesex
Camden	60	77,344	
Dover	60	18,157	Morris
Long Branch	60	30,719	Monmouth
Dumont	58	17,479	Bergen
Elmwood Park	58	19,403	Bergen
Carteret	57	22,844	Middlesex
Paramus	55	26,342	Bergen
Plainfield	55	49,808	Union
Summit	54	21,457	Union
Avenel	53	17,011	Middlesex
Lakewood	53	53,805	Ocean
Pleasantville	53	20,249	
Ridgewood	53	24,958	Bergen
Point Pleasant	52	18,392	Ocean
South Plainfield	50	23,385	Middlesex
Westfield	49	30,316	Union
Bridgeton	48	25,349	
Lindenwold	47	17,613	
Colonia	46	17,795	Middlesex
Glassboro	44	18,579	
Millville	39	28,400	
Sayreville	37	42,704	Middlesex
Vineland	35	60,724	
Old Bridge	34	23,753	Middlesex
Somerset	33	22,083	Somerset
Toms River	33	88,791	Ocean
Tinton Falls	25	17,892	Monmouth

SOURCE: Walk Score® 2013

Table A.6 Complete Streets Policies in North Jersey Municipalities

	Bergen	Essex	Hudson	Hunterdon	Middlesex	Monmouth	Morris	Ocean	Passaic	Somerset	Sussex	Union	Warren
Total # of Municipalities	40	22	12	26	25	53	39	33	16	21	24	21	22
	Hackensack	Newark	Jersey City	Raritan Township	Woodbridge	Red Bank	Dover	Toms River		Montgomery	Hopatcong	New Providence	Hackettstown
	Ridgewood	Irvington	Hoboken	Lambertville	New Brunswick	Freehold Borough	Morristown	Lacey Township		Raritan Borough			
	Maywood	Bloomfield		Frenchtown		Fair Haven	Denville	Point Pleasant					
	Montvale	Montclair		Califon			Chatham	Harvey Cedars					
	Emerson	Maplewood					Netcong						
		South Orange											
		Glen Ridge											

SOURCE: NJ Bike & Pedestrian Resource Center Complete Streets in NJ, 2013

Table A.7 Main Street Policies in North Jersey Municipalities

	Bergen	Essex	Hudson	Hunterdon	Middlesex	Monmouth	Morris	Ocean	Passaic	Somerset	Sussex	Union	Warren
Total # of Municipalities	40	22	12	26	25	53	39	33	16	21	24	21	22
	Tenaflly	Orange	Jersey City	Milford	Highland Park	Red Bank	Boonton	Beachwood		Somerville	Newton	Westfield	
		Millburn			Perth Amboy			New Egypt					
		South Orange											
		West Orange											
		Caldwell											
		Montclair											
		Nutley											

SOURCE: NJDCA Main Streets New Jersey, 2013

Table A.8 North Jersey Safe Routes to School Recognition Program Winners – Gold

	Bergen	Essex	Hudson	Hunterdon	Middlesex	Monmouth	Morris	Ocean	Passaic	Somerset	Sussex	Union	Warren
Total # of Municipalities	40	22	12	26	25	53	39	33	16	21	24	21	22
		Edgemont Montessori School, Montclair		Califon Borough Elementary School, Califon			Chatham Township, Chatham	Brick Township, Brick Township					
				Frenchtown Elementary School, Frenchtown			Lafayette Avenue School, Chatham						
				Lambertville Public School, Lambertville			Milton Avenue School, Chatham						
				Lebanon Borough School, Lebanon			Southern Blvd School, Chatham						
				Reading- Fleming Intermediate School, Flemington									
				Stockton Borough, Stockton									

SOURCE: NJ Safe Routes to School Recognition Program Award Winners, 2013

Table A.9 North Jersey Safe Routes to School Recognition Program Winners – Silver

	Bergen	Essex	Hudson	Hunterdon	Middlesex	Monmouth	Morris	Ocean	Passaic	Somerset	Sussex	Union	Warren
Total # of Municipalities	40	22	12	26	25	53	39	33	16	21	24	21	22
		Bradford School, Montclair	PS # 3 Robinson School, Bayonne	Clinton Public School, Clinton			Chatham Middle School, Chatham Borough			Manville Roosevelt Elementary School, Manville			
			PS # 15 Whitney M Young Jr School, Jersey City				Netcong Elementary School, Netcong			Somerset School, North Plainfield			
			PS #17 Joseph H Bresinger School, Jersey City							Stony Brook Elementary School, North Plainfield			
			PS # 25 Nicholas Copernicus School, Jersey City							Van Derveer Elementary School, Somerville			
			PS # 3 FR Conwell School, Jersey City							West End Elementary School, North Plainfield			
			PS #6 Jotham Wakeman School, Jersey City										
			PS #8 Charles E Trefurt School, Jersey City										

SOURCE: NJ Safe Routes to School Recognition Program Award Winners, 2013

Table A.10 North Jersey Safe Routes to School Recognition Program Winners – Bronze

	Bergen	Essex	Hudson	Hunterdon	Middlesex	Monmouth	Morris	Ocean	Passaic	Somerset	Sussex	Union	Warren
Total # of Municipalities	40	22	12	26	25	53	39	33	16	21	24	21	22
	Woodrow Wilson #5, Garfield	Charles Bullock School, Montclair	PS #14 O Culbreth Jr School, Jersey City		Woodbridge Township, Woodbridge								
		Montclair Township, Montclair	PS 28 Christa McAuliffe School, Jersey City										

SOURCE: NJ Safe Routes to School Recognition Program Award Winners, 2013

Table A.11 North Jersey Safe Routes to School Recognition Program Winners – First Step

	Bergen	Essex	Hudson	Hunterdon	Middlesex	Monmouth	Morris	Ocean	Passaic	Somerset	Sussex	Union	Warren
Total # of Municipalities	40	22	12	26	25	53	39	33	16	21	24	21	22
		Tuscan Elementary School, Maplewood		Conley Elementary School, Bethlehem Township			Central Ave Elementary School, Madison			Lafayette Elementary School, Bound Brook			
				Desmares Elementary School, Flemington						Robert Morris Elementary School, South Bound Brook			
				Hunter Elementary School, Flemington									
				Kingwood Township School, Frenchtown									
				Milford Public School, Milford									
				West Amwell School, Lambertville									
				Woodglen School, Califon									

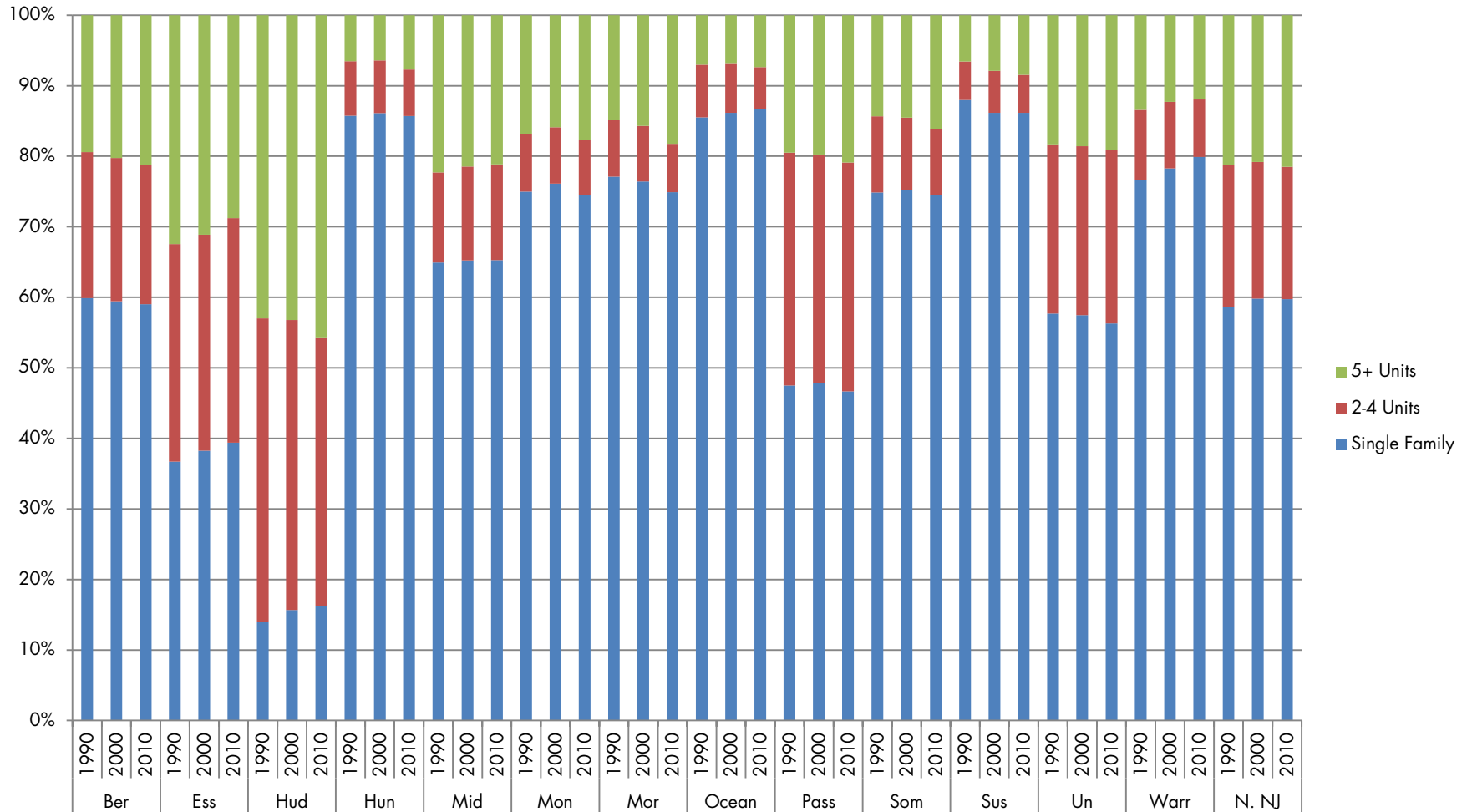
SOURCE: NJ Safe Routes to School Recognition Program Award Winners, 2013

Table A.12 Designated Transit Villages in North Jersey

	Bergen	Essex	Hudson	Hunterdon	Middlesex	Monmouth	Morris	Ocean	Passaic	Somerset	Sussex	Union	Warren
Total # of Municipalities	40	22	12	26	25	53	39	33	16	21	24	21	22
	Rutherford	South Orange	Journal Square/Jersey City		South Amboy	Belmar	Morristown			Bound Brook		Rahway	
		Bloomfield			Metuchen	Matawan	Netcong			Somerville		Cranford	
		Orange			New Brunswick							Elizabeth/Midtown	
		Montclair			Dunellen							Linden	
		East Orange											

SOURCE: NJDOT Transit Village Initiative, 2012

Figure A.13 Housing Mix and Compact Development, 1990-2010



SOURCE: US Census 1990, 2000, 2012

Appendix B: Tables and Reference for Chapter 2

Table B.1 Summary of Plans, Policies and Programs in North Jersey

Summary		Jurisdiction	Supportive, Barrier, Mixed	How it Applies
Plans				
RPA's Third Regional Plan (1996)	This plan, covering metropolitan New York, New Jersey, and Connecticut, focuses on addressing economy, environment, and equity through a regional greensward, concentrating growth in centers, improving mobility, investing in a competitive workforce, and reforming governance.	Non-profit	Supportive	This plan's first three campaigns focus on land use by proposing a regional greensward, designating growth centers, and improving mobility.
State Development and Redevelopment Plan (2001)	This plan put forth an overall vision of creating compact, ecologically-design development and redevelopment centers while protecting the natural environment. This was to be achieved through revitalizing existing cities and towns, conserve natural systems, promote equitable economic growth, prevent and cleanup pollution, provide adequate public facilities, services, and housing, preserve historic, cultural, scenic, open space, and recreational areas, and ensure integrated planning and implementation statewide.	State	Supportive	Land use and design are at the fore of this plan, by focusing on development and redevelopment of existing urban areas and preserving natural systems.

DRAFT State Strategic Plan (2012)	This plan lays out practical goals and guiding principles. The goals are economic growth, regional planning, preservation/protection/enhancement of critical state resources, and alignment of government. The principles are creating a growth environment with regulatory predictability, leveraging government assets with the private sector and higher education, incentivizing development in existing urbanized areas, institutionalizing effective programs, and using adaptive decision-making to account for community, economic, and environmental outcomes. Note the final vote on this plan was delayed in order to respond to new challenges arising from Hurricane Sandy.	State	Mixed	All of the Plan's goals have land use implications. While listed as four goals, the document presents a unified narrative to encourage redevelopment and development in urban and tier-one suburban communities, taking a regional approach to planning that promotes mixed-use neighborhoods with good transit connections to jobs and provides cultural/historic/natural areas
Hudson County Growth Management Plan (2002)	In general, this plan looks to continue the positive growth and economic development trends in Hudson County. Land Use goals are to maintain employment/education/entertainment centers modernize and expand manufacturing and industrial uses, increase the range of retail/services, redevelop waterfront areas, and promote transit-oriented development. Housing goals are to preserve well-established neighborhoods, diversify housing options, rehabilitate older stock, and provide assistance for housing affordability to vulnerable populations.	County	Mixed	Goals to promote economic growth and redevelop waterfront areas support regional land use goals. Housing goals support preservation and a diversity of housing types. Waterfront redevelopment may conflict with natural preservation goals.
Hunterdon County Growth Management Plan (2007)	This Plan notes that there has been resistance to both open space planning and in designating growth centers. The goals of the Plan related to land use include natural resource and environmental planning.	County	Mixed	The Plan's focus on natural resource protection is geared towards preserving drinking water quality. Growth centers and open space are noted to be unpopular concepts and no goals seek to do outreach and education these topics.

Monmouth County Growth Management Plan (2009)	The Plan seeks to work with municipalities on regional plans addressing land use issues of transportation, economic development, housing, and resource protection in strategic areas.	County	Mixed	The Plan does not propose any specific land use goals, but broadly supports regional planning to address larger land use issues.
Morris County Growth Management Plan (1975)	The overarching values of the Plan seek to balance economic, environmental and equity needs. The goals put forth in the plan include balancing the tax base, focusing economic growth to areas served by utilities and infrastructure, promoting residential growth areas, increasing public transportation availability, maintaining the quality of life, providing a more diverse mix of housing, preserving open space, historic, and recreation areas, and protecting freshwater resources.	County	Supportive	The Plan's land use elements are supportive of this effort.
Ocean County Growth Management Plan (2011)	This Plan has a number of goals related to land use, including connecting future office and industrial growth to existing transportation corridors, focusing redevelopment in existing downtowns with mixed-use, multistory buildings, cleanup Brownfield sites for redevelopment, redevelop large-scale retail sites to address circulation, aesthetic, and stormwater issues, and promote pedestrian and bicycle facilities.	County	Supportive	The Plan's land use elements are supportive of this effort.
Sussex County Growth Management Plan (2007)	To preserve the rural character of Sussex County, the Plan focuses on revitalizing development in existing towns and cities, with an emphasis on maintaining water quality, creating mixed-use, multi-story centers, and preserving and enhancing natural areas and recreation opportunities.	County	Supportive	The Plan's land use elements are supportive of this effort.
Union County Growth Management Plan	This Plan establishes goals of revitalizing existing urban centers, discouraging development in environmentally sensitive areas, cleanup and redevelopment of brownfield sites, preservation of open space, natural, and recreation areas, promoting transit-oriented design, and promoting industrial parks, marine terminals, and air terminal facilities.	County	Mixed	The plan is mostly supportive of this effort, but the development of industrial parks, marine terminal, and air terminal facilities could compete with preservation goals.

Warren County Growth Management Plan (2005)	This plan seeks to preserve the rural character, enhance agricultural/ natural/environmental/ historic/open space areas, focus residential and economic growth in existing centers, protect water quality, improve the road network and provide efficient transportation alternatives, improve public infrastructure like sewers and telecommunications, and promote a variety of housing types.	County	Supportive	The Plan's land use elements are supportive of this effort.
Highlands Regional Master Plan (2008)	Municipalities within the Region must conform to this Master Plan. Portions of Bergen, Hunterdon, Morris, Passaic, Somerset, Sussex, and Warren Counties. The Land Use components of this Plan focus on clustering development to make the most efficient use of land in existing centers, while protecting environmentally sensitive areas. Mixed uses, transportation alternatives, and housing variety are all encouraged.	Regional Commission	Supportive	The Plan's land use elements are supportive of this effort. This region contains portions of Bergen, Passaic, Sussex, Morris, Warren, Somerset, and Hunterdon County
Pinelands Comprehensive Management Plan (2012)	Municipalities within the Region must conform to this Master Plan. This plan guides land use by setting forth provisions for a transfer of development rights program, clustered development, watershed management, timed growth, land conservation, cultural and historic resource conservation, and farmland preservation. It requires that all development projects within the area be approved by the Commission.	Regional Commission	Supportive	The Plan's land use elements are supportive of this effort. Portions of Ocean County are within the Pinelands region, but the area primarily is beyond the extents of this project's planning area.
New Jersey Meadowlands Commission Master Plan (2002)	Municipalities within the Region must conform to this Master Plan. The overall vision for the region is to balance environmental and economic needs. This is achieved through the following goals: preserve wetlands/natural areas/open space/energy resources/history, promote land uses that encourage economic vitality and public good, prevent sprawl and land degradation, cultivate a strong sense of place, promote efficient transportation options, create a mix of housing types supported by infrastructure and community facilities, and create a collaborative environment with stakeholders and the public.	Regional Commission	Supportive	The Plan's land use elements are supportive of this effort. This region contains portions of Bergen and Hudson Counties.

Open Space Master Plan	Municipalities may create Open Space plans or have open space as part of the municipal/county master plan document. There is no statewide Open Space plan, nor are municipal master plans required to include an open space element.	State	Mixed	Requiring open space to be considered in a master plan or as a separate plan would result in greater attention to preservation and articulate community priorities. Many municipalities do consider Open Space in a plan.
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	Summary	Jurisdiction	Supportive, Barrier, Mixed	How it Applies
Policies				
Coastal Area Facility Review Act (CAFRA)	Regulates development on beaches, dunes, and development within 150 feet of the mean high water line, or the landward limit of a beach or dune, as well as any industrial and public development within the designated CAFRA Zone, in order to provide adequate environmental safeguards and encourage compatible land uses. The CAFRA Area is defined as the confluence of the Cheesquake Creek with Raritan Bay in Middlesex County, south through Monmouth, Ocean, and Atlantic Counties, a portion of Burlington and Cape May County, and along the Delaware Bay through Cumberland and Salem Counties, through Pennsville. The inland limit is typically along public roads and varies widely in distance from the shoreline. Structures subject to CAFRA must apply for a permit and follow additional building guidelines for setbacks, elevation, and permeable areas.	State	Mixed	This Act constrains land use and development potential in order to protect the coastal ecosystem.
NJ Municipal Land Use Law	The enabling legislation in NJ that permits municipal land use, development planning, zoning, and historic preservation zoning, as well as charging developers fees towards COAH. Under the law, designation on a comprehensive or master plan map (i.e. preservation, historic, etc.) provides appropriate protections for that parcel.	State	Supportive	This legislation allows municipalities to engage in land use planning.

State Planning Act	Creates the NJ State Planning Commission and the Office of State Planning, requires a State Development and Redevelopment Plan every three years, prepare a long-term infrastructure needs assessment every three years, facilitate cooperation between state agencies and local governments, provide technical assistance to local governments, introduce a bill for funding of capital projects, and periodically review State and local government relationships.	State	Supportive	This Act established the mechanism by which capital projects receive funding and allows for comprehensive planning to occur at the state level.
Pinelands Protection Act	This legislation creates the Pinelands Commission, to guide development in the Pinelands region and designate areas for preservation.	State	Supportive	This Act sets a precedent of land use planning that protects important ecological features and designates areas for growth/areas for protection.
Highlands Water Protection and Planning Act	This legislation designates the Highlands Region boundaries and establishes a preservation and a planning area in order to guide development. It also calls for the development of a regional master plan.	State	Supportive	This Act guides land use within the Highlands Region and reinforces the precedent of designating areas for growth and preservation.
Brownfield and Contaminated Site Remediation Act	Creates the Brownfield Site Reimbursement Fund, which reimburses developers for remediation costs through agreements with the NJ Economic Development Authority and the State Treasurer, with funds through tax revenue generated by the project.	State	Supportive	This Act creates a funding mechanism that significantly reduces the cost of site remediation, which encourages infill projects on brownfield sites.
Form-based Codes	Form-based codes are an alternative to traditional zoning codes that focus on regulating the physical urban form (rather than land use). FBCs typically include provisions for form and mass of buildings and the public realm.	Municipal	Supportive	FBCs help to achieve the desired character and feel of development without focusing on land uses, which can result in more flexibility for developers.

Freshwater Wetlands Protection Act	Directs NJDEP to provide protection to freshwater wetlands, transition areas, and state open waters. It also requires individuals, companies, and government to obtain permits for impacts on these areas from DEP.	State	Mixed	This Act constrains permissible land use in preserving wetlands and transition areas. It is supportive by preserving vital ecosystem services and habitat. The Act pre-empts municipalities.
Flood Hazard Area Control Act	Establishes standards for development within flood hazard areas, including building elevation, restricting obstructions to flow, and preserving riparian corridors.	State	Mixed	This Act constrains permissible land use in preserving riparian areas and may require higher building elevations. It is supportive by protecting health and safety during flood events and preserving vital ecosystem services and habitat.
Wetlands Act of 1970	This Act mapped coastal wetlands and requires permits for activities proposed on mapped wetlands.	State	Mixed	This Act constrains permissible land use in preserving wetlands and transition areas. It is supportive by preserving vital ecosystem services and habitat.
Waterfront Development Act	This Act requires a permit for dredging or construction over a waterway or within 500' of the mean high water line of that waterway. This includes docks/piers and buildings. This does not apply to areas regulated under CAFRA or within the Hackensack Meadowlands Development District.	State	Mixed	This Act constrains permissible land use in Wetland Areas. It is supportive by preserving vital ecosystem services and habitat.
NJ Water Pollution Control Act	Requires point source dischargers to surface waters to obtain a NJPDES Discharge to Surface Waters permit, and dischargers of pollutants that may enter ground waters are required to obtain a NJPDES Discharge to Ground Water permit.	State	Supportive	This Act helps NJDEP understand, monitor, and control water pollution.

Tidelands Act	States that NJ holds in trust for the public all tidelands, or riparian lands that now or formerly flowed by the tide in a natural waterway, including filled lands. The State does allow individuals to purchase or lease these lands.	State	Mixed	This Act constrains permissible land use in Tidelands. It is supportive by preserving vital ecosystem services and habitat.
Agriculture Retention and Development Act	Establishes a grant program for conservation easements to preserve farmland.	State	Supportive	Preserving farm land protects open space, rural character, and working lands.
Act Concerning Expedited Permits	Allows expedition of permits for construction related to the provision of services (roadways, water, sewer, communications, etc.) in designated Smart Growth Areas	State	Supportive	Expedited permits reduce the time it takes to get projects built, which can help steer development toward growth areas (and away from other areas)
Aid for Urban Environmental Concerns Act	Authorizes DEP to provide grant assistance for projects addressing environmental concerns in urban communities and Depressed Rural Centers	State	Supportive	Provides grant funds to address environmental concerns, which could be useful in redevelopment/infill projects
Global Warming Response Act	Limits statewide GHG emissions to 1990 levels by 2020 and to 80 percent below 2006 levels by 2050	State	Supportive	This sets a goal of GHG emissions in NJ, but does not specify methods or provide funding.
Global Warming Solutions Fund Act	Authorizes the auction of carbon cap-and-trade credits, with the proceeds going to fund renewable energy, energy efficiency, and habitat preservation/restoration projects.	State	Supportive	Funds generated by this auction can help fund efficiency and habitat projects throughout the state. Renewable energy systems are also encouraged, which have land use implications.

Renewable Portfolio Standard	Requires electric power suppliers to include renewable energy sources in its portfolio, with 4% being required by 2012.	State	Supportive	Renewable energy infrastructure has land use implications. Solar power and biofuels may require large land areas. Wind turbines may require tall structures. Aesthetic and compatible use concerns impact all.
County Local Aid Rules	Requires Annual Transportation Program to be consistent with the State Plan, County Plan, and other planning documents.	State	Supportive	The State Plan and other planning documents must be considered in the Annual Transportation Program, which is how state funds are allocated for transportation projects.
Garden State Preservation Trust Act	This act establishes the Garden State Preservation Trust, outlines its administrative structure, provides designated funding through the state budget, and allows for bonding for additional funds. Funds are to use for the Historic Preservation Trust, Green Acres Preservation Trust, and Farmland Preservation Trust. A set proportion of Green Acres funds must be used in counties with population density of >1,000 people per square mile.	State	Supportive	This Act establishes funding for preservation of open space, historic places, and farmland. It prioritizes open space in densely populated counties.

	Summary	Jurisdiction	Supportive, Barrier, Mixed	How it Applies
Programs				
NJDEP Water Quality Management Planning Program	This Program of NJDEP consolidates the statewide programs for wastewater, basin planning, and areawide planning, required by the US EPA. Through the Program, NJDEP establishes and implements Total Maximum Daily Loads (TMDLs) for impaired waterways, projects future land use impacts on water quality and quantity, prevents sewer service from being extended to environmentally sensitive areas, and implements water quality best management practices.	State	Supportive	This Program helps ensure that there is adequate drinking water supply and address water quality impairments.
Farmland Preservation Program	This Program provides grant funds to farmers for expanding existing operations, reducing debt, estate/retirement planning, and cost-sharing for soil and water conservation projects. It encourages Counties and Municipalities to engage in farmland preservation and TDR planning by providing grant funds. It administers a Transfer of Development Rights program for farms. It also engages in direct development easement acquisitions.	State	Supportive	This Program helps farmers continue to maintain working lands and resist development pressure. It helps municipalities fund planning work to encourage farmland preservation.
NJ Green Acres Program	This Program seeks to create a network of interconnected open spaces to preserve and enhance the natural environment and historic, scenic, and recreational resources for public use. It provides grant funding for projects that further this goal.	State	Supportive	This Program provides grant funds to municipalities to protect and enhance open space.
Urban Enterprise Zone Program	This Program of the NJ Dept. of Community Affairs seeks to revitalize urban communities by encouraging businesses to open in designated Urban Enterprise Zones. New businesses generate jobs and economic activity. UEZ Businesses charge customers half of the state sales tax, may make tax-free purchases, and receive certain financial assistance, energy sales tax exemption, unemployment insurance subsidies, and tax credits. Statewide, there are 32 UEZs statewide and 24 in the study area.	State	Supportive	This Program has cities in Warren, Passaic, Bergen, Essex, Hudson, Union, Middlesex, Monmouth, and Ocean Counties. It provides financial incentives to designated UEZs to promote economic revitalization in existing urban centers.

Urban Transit Hub Tax Credit	This Program of the Economic Development Authority provides tax credits to businesses making a capital investment due to relocating to or expansion within a half mile of a transit station in a "transit hub city". The capital investment must meet some green building requirements. There are 9 cities statewide and 7 in the study area.	State	Supportive	This Program is intended to attract and retain businesses in existing urban centers, spurring job growth and economic activity through financial incentives.
Grow NJ Assistance Program	This Program of the Economic Development Authority provides tax credits to businesses creating jobs and making a capital investment in target areas. At least \$20 million in capital investment must be made and 100 full-time jobs must be created. The job site must be in a qualifying existing urban or suburban area/military base/vacant commercial property/development area.	State	Supportive	This Program is intended to attract and retain businesses in targeted development areas, spurring job growth and economic activity through financial incentives.
Environmental Infrastructure Financing Program	This Program of NJDEP provides low interest loans for projects that improve water quality, including open space and land acquisition and remedial action activities, including brownfields.	State	Supportive	This Program provides financial assistance to municipalities seeking to fund open space acquisition and brownfield remediation.
Economic Redevelopment & Growth Program	This NJEDA program provides a grant to developers pursuing redevelopment in State Plan-identified growth areas.	State	Supportive	Supports growth in compact, previously developed places.
Fund for Community Economic Development	This NJEDA program provides loans to developers pursuing development in Smart Growth locations to encourage urban revitalization.	State	Supportive	Supports growth in compact, previously developed places.
Hazardous Discharge Site Remediation Fund	This NJEDA program provides loans and grants to municipalities, businesses and individuals to help remediate contaminated and underutilized sites.	State	Supportive	Supports remediation of contaminated sites to make them ready for redevelopment.
Municipal Landfill Closure and Remediation Reimbursement Program	This NJEDA program provides reimbursements to developers for closing, remediating and redeveloping municipal landfill sites.	State	Supportive	Supports opportunities for redevelopment on the state's closed landfills.

Environmental Infrastructure Financing Program	This NJDEP program provides low-interest loans for activities such as the construction water quality protection measures, purchase and conservation of open space, and remediation of sites (including brownfields).	State	Supportive	Protects open spaces while supporting the remediation of brownfield sites.
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Appendix C: GIS Analysis Methodology

Farmland

- Used New Jersey Farmland protection program data
- Calculated area of each farm in acres
- Intersected farm shapefile with the 13 county region shapefile
- Recalculated area of farms
- Exported to Excel and summed by county and then to region
- For farms that had no preservation date, the year of the funding round to preserve the farm was used as a proxy (for the parcel in Hunterdon County with a preservation date in 2020, this same rule was applied as 2020 was assumed to be a typo)
- Last year in preserved column is 2009

Open Space

- Used The Nature Conservancy data
- Exported to new shapefile that did not contain military use open spaces
- Intersected farm shapefile with the 13 county region shapefile
- Recalculated areas of parks
- Exported to Excel and summed by county and then to region
- Divided by 2010 population for per capita number

School Walkshed

- Created new road shapefile from 160bufferCTAclass roads with no limited access roads
- Made new network database
- Cleared all adult and vocational schools from school file, left in all public/private/charter pre-school through HS
- Ran network analysis
- Intersected 2010 tracts with Northern NJ region and recalculated area
- Intersected 2010 tracts with walksheds and recalculated area. The new area was divided by the old area. The total 2010 tract population was then multiplied by this ratio to find the proportion of the tract's population that lived within walking distance of a school. Assumes tract populations are evenly distributed throughout the tract

Urban/Rural Households near Open Space

- Converted 2010 tracts into centroids. Selected centroids in urban area shapefile and labeled as such, did the same for rural.
- Converted park shapefile to raster with Euclidian distance tool
- Associated each tract centroid with the distance to the nearest park in meters
- Converted to miles

- Exported to Excel and summed up all the households in each tract that had its centroid within .5 mi of a park for urban households and 1 mi for rural

Rail Walkshed

- Convert PATH and Light Rail shapefiles to point from multipoint
 - Took River Line out of LR
- Merge with NJT CR station file
- Create new name and mode fields and fill in
- Open up network analysis
 - Use the 150bufferCTroadsAclass_ND network database for the analysis
 - Set .5 mi non-overlapping buffers
 - Set detailed polygons
 - Run analysis
- Intersect resulting buffers with Northern NJ tracts
- Calculate area of intersected tracts and buffers
- Multiply tract population by the ratio of the original tract area to the new area to obtain population in areas where buffers and tracts overlap
- Bring into Excel and sum by county and region