

3

# Regional Context

Englewood, Bergen County



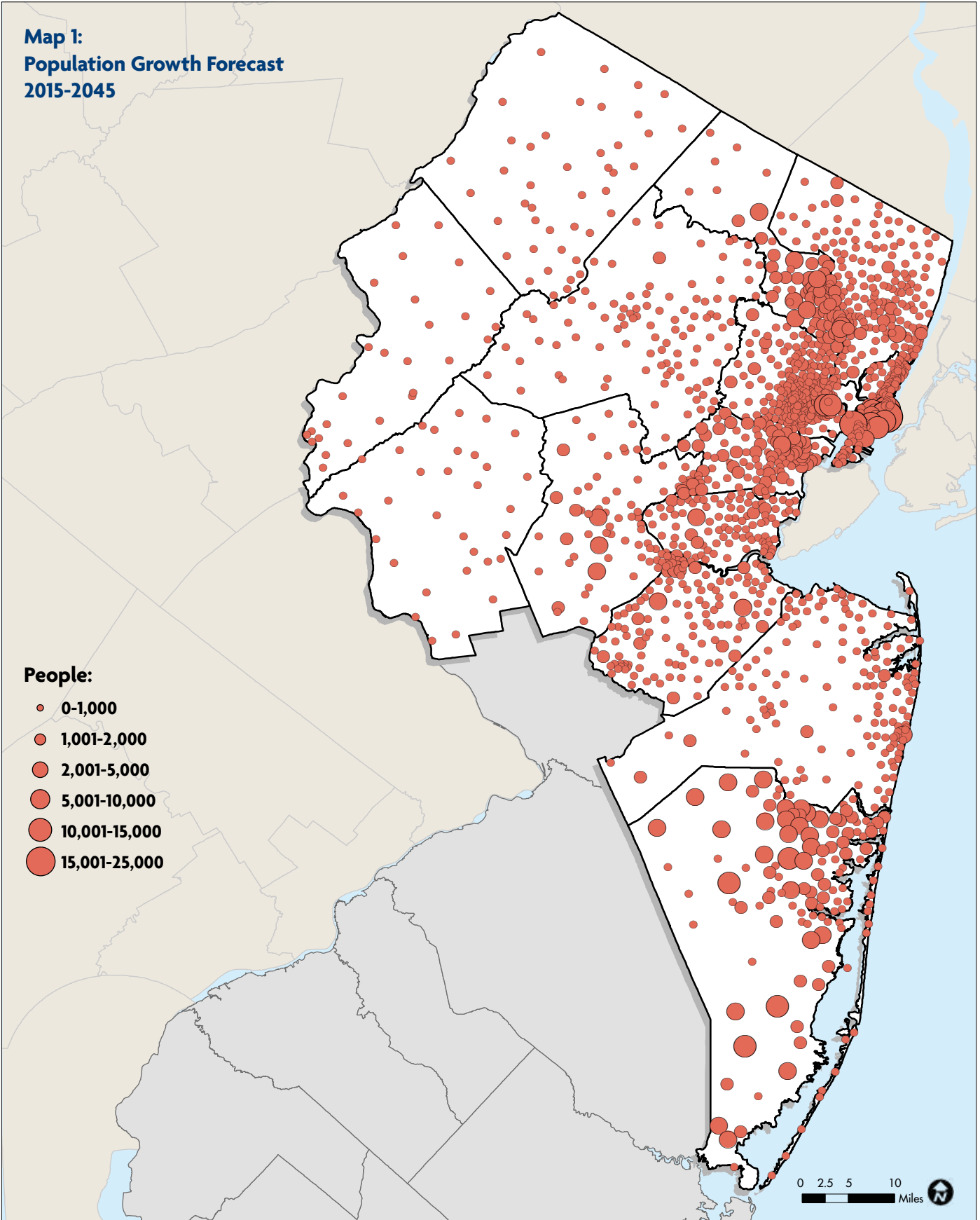
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lan 2045 seeks to continue the work started under Together North Jersey to make the region more competitive, efficient, livable and resilient. Realizing these ambitious goals while responding to the public's call for expanded and improved transportation options begins with a careful assessment of the current condition and performance of the transportation system and an in-depth evaluation of trends that will affect it over the next 30 years. ● This chapter provides that assessment and evaluation. It sets the foundation and context for informed decision making to address the region's many challenges,

which include severe road congestion and unreliable travel times in many locations; the need to repair aging or outmoded facilities; a bus and rail transit network carrying many commuters but with limited reach to many destinations; lack of facilities for safe walking and biking in many locations; and a host of others. ● The chapter also explores possible "game changers" that could dramatically alter life and transportation in the future. Some of these are already on the horizon—including the deployment of self-driving cars and trucks. ● But this plan aims to do more than simply react to current and emerging challenges. It takes an active hand in helping shape the future of the region. Here the NJTPA's partnership with organizations in Together North Jersey is vital. ● By coordinating transportation investments with other aspects of community life—economic development, education, the arts, social services, among them—the NJTPA and its partners can help strengthen communities with the involvement of all residents.

# & Trends

**Map 1:  
Population Growth Forecast  
2015-2045**



Source: NJTPA, 2016; Esri, 2017

As highlighted in the Together North Jersey section (p. 14), strategies for accomplishing this include promoting transit-oriented development near bus and rail terminals; developing corridor-wide economic development plans; and reconfiguring streets and intersections to work more efficiently and safely for all users.

This chapter identifies several current trends—including changes in household composition, technology and lifestyles—that provide opportunities to guide regional growth in directions that will meet the goals of Plan 2045. Specific strategies and their impacts are explored in later chapters.

### Demographics

Key demographic trends and their implications for transportation include the following:

**A growing population** From 2010 to 2015, the region’s population grew from 6.6 million people to 6.7 million people. By 2045, population is expected to increase by 17 percent to approximately 7.7 million (Map 1). This growth could increase travel demand across the transportation system, adding to congestion and other problems if the region does not effectively prepare for it.

But where and how this growth occurs will affect the region’s possible responses. In the past several years growth patterns have undergone a dramatic shift. The long trend of suburbanization that dominated the post-World War II era—in which population and jobs shifted steadily outward from the state’s northeastern urban core—is weakening and in some respects reversing. Map 2 tells the story. Suburban and rural counties like Ocean, Monmouth and Hunterdon, which captured the most growth in the 1970s and 1980s, have seen flat or declining growth in recent years. The top growing counties are now the relatively dense urban core counties of Bergen and Hudson.

These trends are also visible at the municipal level with three of

New Jersey’s four largest cities—Newark, Jersey City and Elizabeth—showing significant population gains from 2010-2016. Eight of the top 13 municipalities in absolute growth and four of the top seven municipalities in percentage growth were in Hudson County, the region’s most urbanized county. Places like Harrison and Jersey City are seeing major redevelopment that is helping to attract residents interested in easy access to New York and the major cities in North Jersey. This redevelopment often features walkable, mixed-use environments that allow residents to walk, bike or take transit to meet most of their travel needs.

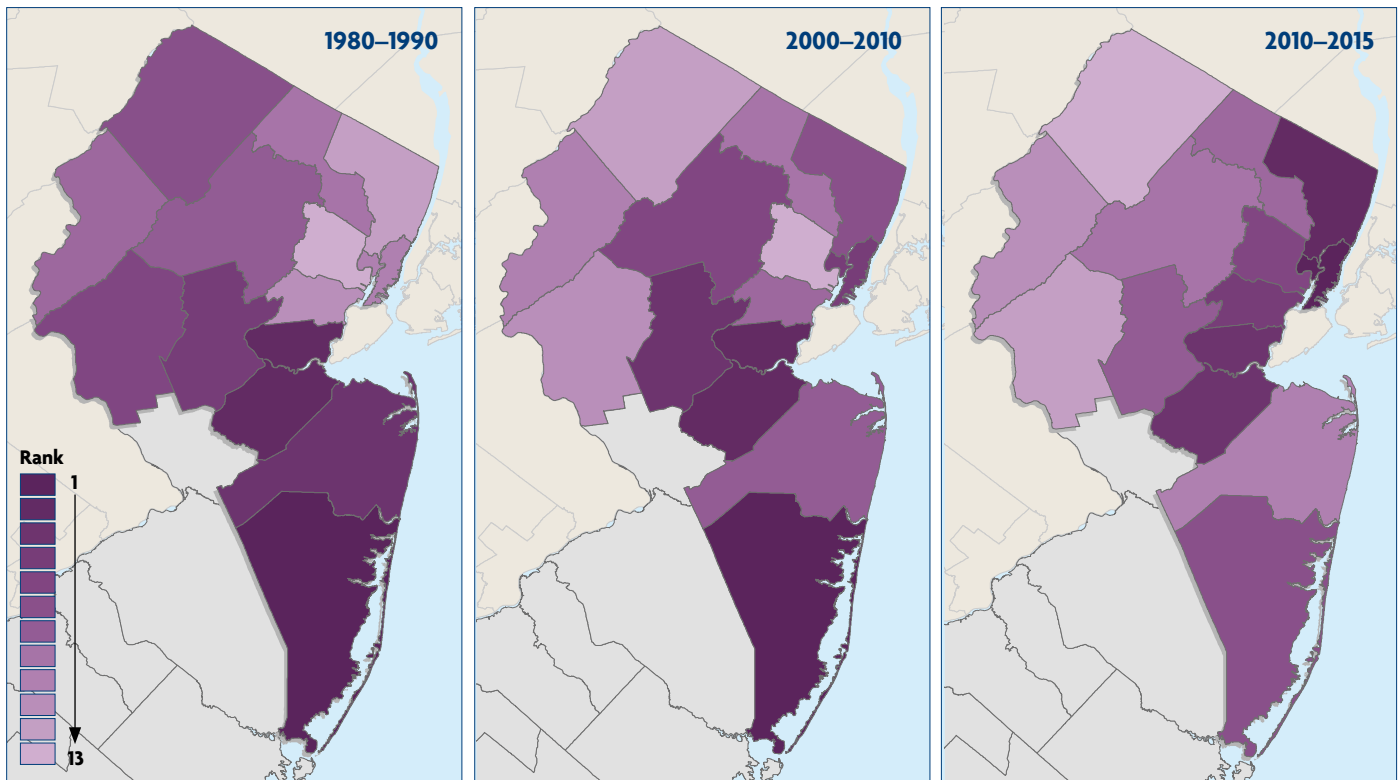
The renewed attractiveness of these areas, as well as older suburbs in and around the northeast urban core, provides opportunities to realize transit-oriented development and other approaches to greater transportation efficiency, improved quality of life and other related goals.

**Millennials** Roughly defined as the generation born in the early 1980s through early 2000s, millennials have overtaken the baby boom generation as the largest living generation—totaling about 75 million nationwide. The lifestyle choices of a large share of millennials are helping drive urban resurgence and land use changes. This includes greater preference for living in urban and walkable neighborhoods, and openness to non-driving forms of transportation.



Red Bank, Monmouth County

**Map 2: Absolute Population Growth by County-Rank**



Source: U.S. Census, 1980-2015, NJTPA, 2017

People 16 to 34 years old drove 23 percent fewer miles in 2009 than they did in 2001—the largest decline in any age group, according to “A New Direction,” the 2013 report by US Public Interest Research Group.

Real estate developers, retailers and others seeking to tap the spending power of millennials moving into their prime earning years have responded by investing in the urban core and in other denser, walkable areas. But the question remains: will these changes endure? This generation has delayed having children in comparison to previous generations, possibly due to financial difficulties from the Great Recession, stricter mortgage requirements, or the higher cost of living today compared to decades past. Will having children motivate many millennial families to move to the suburbs or rural areas as their parents did? It is still too early to tell.

This plan takes a balanced approach to these uncertainties, supporting redevelopment of urban areas and downtowns while continuing to strengthen less dense suburban and rural communities. The NJTPA seeks to work with these communities to improve the efficiency of their transportation networks, preserve

open space and enhance transit options.

**An aging population** The region is home to an increasing number of households with people age 65 and older, as seen in Figure 3-1 at right. Based on the 2011-2015 Census Bureau’s American Community Survey (ACS), the highest concentrations of people over age 65 were found in Ocean (22 percent), Bergen (16 percent) and Warren (15 percent) counties, each exceeding the New Jersey statewide average of 14 percent.

Approximately 27 percent of those over 65 live alone, and this population is projected to increase by nearly 50 percent over the next 30 years as baby boomers age and as average life expectancy increases.

An older population means more elderly drivers and more people who do not drive. Making roads easier to navigate through modified design and signage and providing attractive transportation alternatives such as transit, paratransit and walkable streets supports senior mobility and helps maintain quality of life. Seniors and empty-nesters are tending to downsize and relocate to smaller homes and older adult communities. This trend also supports transit-oriented

development and the creation of walkable areas.

**Migration** Population growth is impacted by migration from other states and other countries. From 2010 to 2015, 90 percent of New Jersey’s population had not moved during any given year, and of those who did about three-quarters moved within the state. But there is also significant movement of people to and from the state. ACS indicates that nearly 76,000 people left from 2011-2015. A national survey of moving companies placed New Jersey as the state with the highest number of people moving to other states, largely for jobs or retirement. The state’s relatively high taxes and cost of living likely contributed to many such moves.

The state continues to attract immigrants from other countries. The foreign-born population more than doubled between 1980 and 2010. According to one estimate, New Jersey had the fifth largest immigrant population among states in 2015. About 62,000 foreigners moved into the state that year, according to ACS. From 2010-2015 two-thirds of total international immigration to the state settled in four counties: Hudson, Middlesex, Bergen and Essex, according to Census data. Many of these immigrants have low incomes and depend on transit for daily travel needs.

**Racial composition** Following national trends, the region’s population is increasingly composed of racial and ethnic minorities (principally African-Americans and Latinos). Together, these groups comprised 44 percent of the population from 2010-2014 as compared to 36 percent in 2000. Ethnic and racial minorities comprise more than half of the populations of five counties: Hudson (70 percent), Essex (68 percent), Union (57 percent), Passaic (56 percent) and Middlesex (53 percent). Like immigrant populations, minority populations historically have had lower incomes and have been concentrated in urban centers, relying more on transit for day-to-day mobility, raising equity concerns, as discussed below.

## Employment

New Jersey and the NJTPA region have realized considerable progress in recovering from the Great Recession of 2007-2009. Looking at only payroll jobs—excluding workers who are self-employed, which is approximately 8 to 9 percent of the total

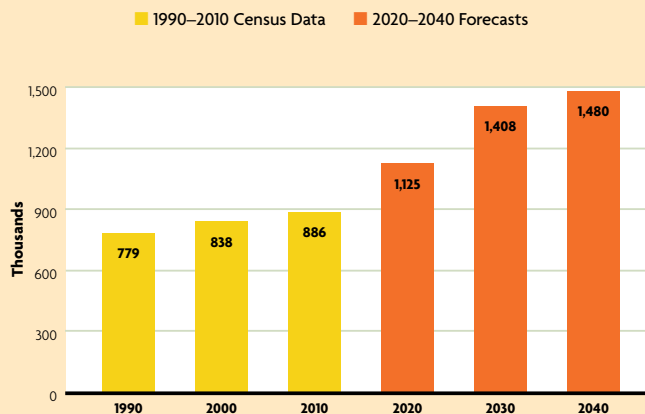
—employment peaked at 3.1 million jobs in 2007 before declining to 2.8 million during the lowest point of the recession early in 2010.

The region recovered most of these jobs by the end of 2015 and appeared to have recovered all of its pre-recession payroll jobs by the end of 2016. Unemployment rates reflect this recovery: the rate stood at 4.2 percent in July 2017. Payroll employment is projected to continue to increase to 3.4 million by 2045, a 14 percent increase from 2015, as shown in Map 3. Like population growth, job growth will put more demand on all aspects of the transportation system.

Also mirroring population growth, the long-standing trend of outward movement of jobs from the urban core is reversing. Companies that favored corporate campuses in suburban or rural areas in the 1980s are moving jobs back to the urban core and downtown areas, particularly walkable locations with transit access. In part this is to attract and retain younger workers who also favor these locations. Corporate leaders also are seeking greater opportunities for creative collaboration, proximity to customers and business partners and centralization of operations.

Left behind are large office campuses with too much square footage for a single tenant in the current real estate market. Examples include the sprawling former Merck campus in Whitehouse Station in Hunterdon County and the former Sanofi Research

**Figure 3-1:**  
**NJTPA Region: Population Age 65 and Over**



Source: U.S. Census, 1990-2010; NJTPA, 2017



## Game Changer— The Future Workplace

**C**hanges in the nature of work, brought about by new technologies and business practices, could drastically change commuting and travel patterns—although it is difficult to predict exactly how this would occur. While traditional commutes between home and a centralized workplace may decline, travel to other destinations, for other purposes and at different times of day may increase. Among the diving forces:

**Gig economy**—Companies are increasingly using contingent workers—freelancers or contractors—tapping into a marketplaces served by specialized apps.

**Remote work**—Telecommuting and teleconferencing—possibly augmented by virtual reality—are breaking the proximity requirements for companies and workers.

**AI, Robotics**—Computer systems and robots will increasingly perform both physical and intellectual work. While jobs will be lost, new ones will be created in designing, building and maintaining the systems. Future workers will have to be better trained and adaptable. High tech jobs sites may provide redevelopment opportunities.

facility in Bridgewater in Somerset County. Both are undergoing repurposing with a mix of uses—including offices, retail, businesses and apartments—giving them more of the features of favored downtown areas. Merck shifted its operations to a more urban setting in Union County. Meanwhile, in Monmouth County, Bell Labs in Holmdel has transformed to Bell Works, a mixed-use development that dubs itself a “metro-burb” and is attracting a range of startup and established businesses. Efforts are underway to establish a shuttle bus linking Bell Works and the Hazlet station on NJ TRANSIT’s North Jersey Coast Line. This is an example of the type of transit access that will need to be considered as former corporate campuses are transformed into mixed-use developments. In keeping with the priorities of Together North Jersey, this plan supports effective reuse and redevelopment of older facilities in ways that will strengthen communities, enhance the economy and protect the environment.

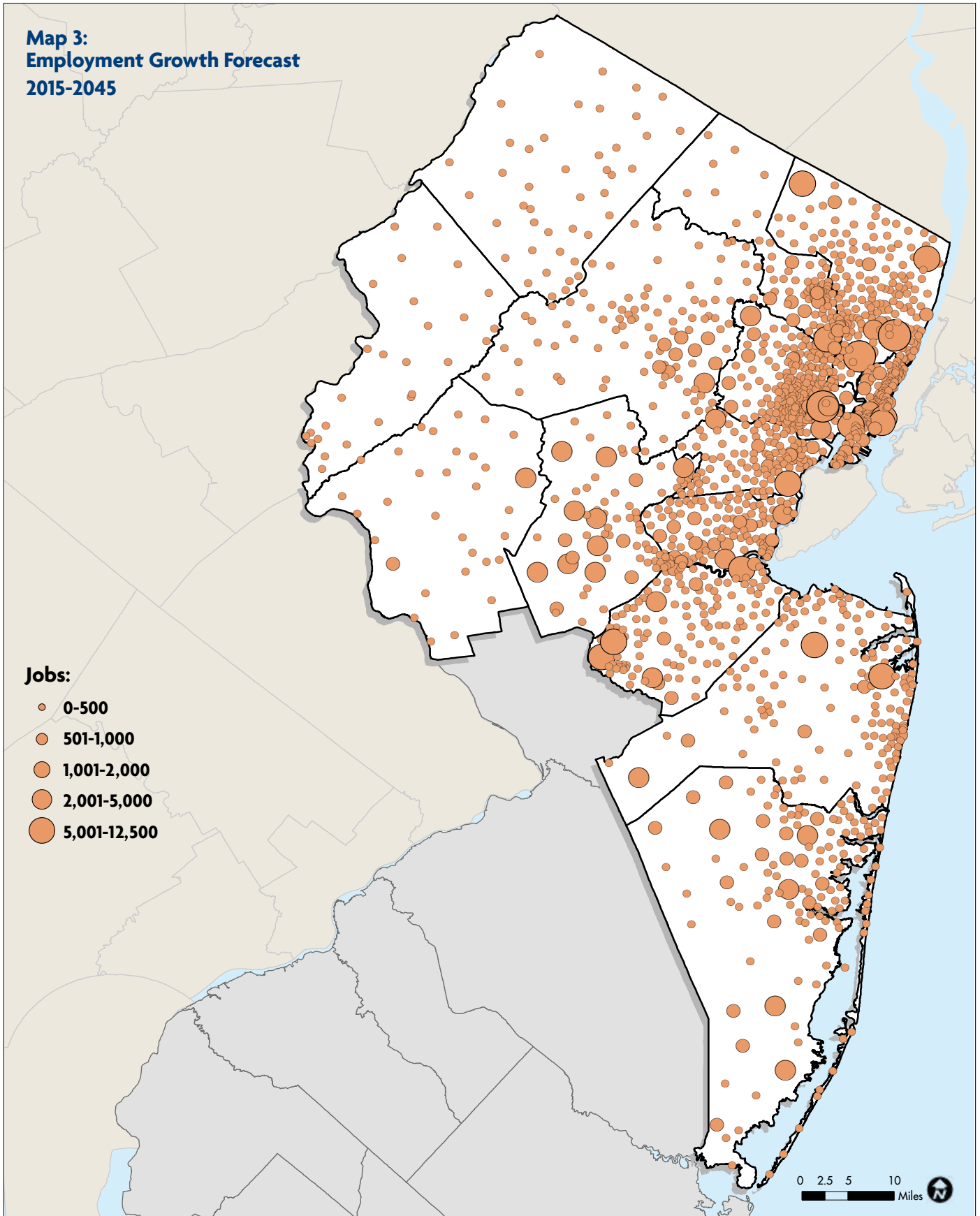
Meanwhile, jobs will continue to shift to the service sector, which now makes up 45 percent or more of the workforce. Manufacturing employment fell from 9 percent of total nonagricultural employment in 2000 to just under 5 percent in 2015. In coming decades, however, employment could expand in specialized high-tech manufacturing, such as robotics or 3-D printing, and undergo other technology-driven changes (see Game Changer—The Future Workplace, at left). Burgeoning services sector jobs will continue to be split between low-wage, fast food type jobs and well-paid jobs requiring specialized training, such as teachers, nurses and managers. In the latter category, financial sector jobs also grew from 9.6 percent in 2000 to 12 percent in 2010, partially due to the attractiveness of Jersey City for firms in the sector.

Projected forward, these trends point to the importance of improving education and training for workers. The NJTPA, through Together North Jersey, is coordinating with Workforce Investment Boards and other agencies to help workers adapt to new job markets, including improving transportation access to training programs and job sites.

**Map 3:  
Employment Growth Forecast  
2015-2045**

**Jobs:**

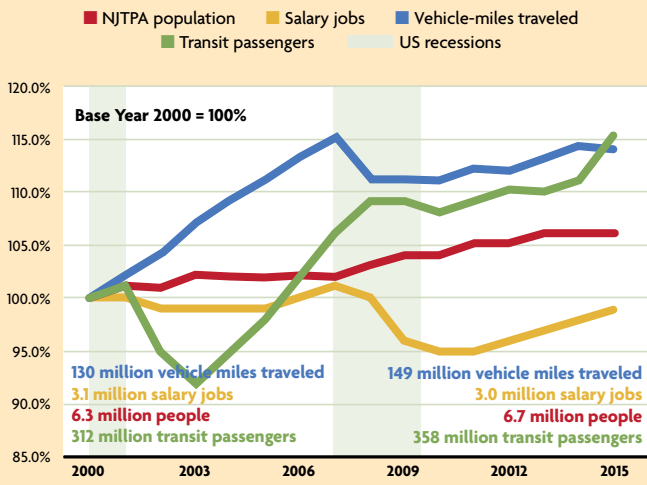
- 0-500
- 501-1,000
- 1,001-2,000
- 2,001-5,000
- 5,001-12,500



Source: NJOIT, 2008; NJTPA, 2016; Esri, 2017

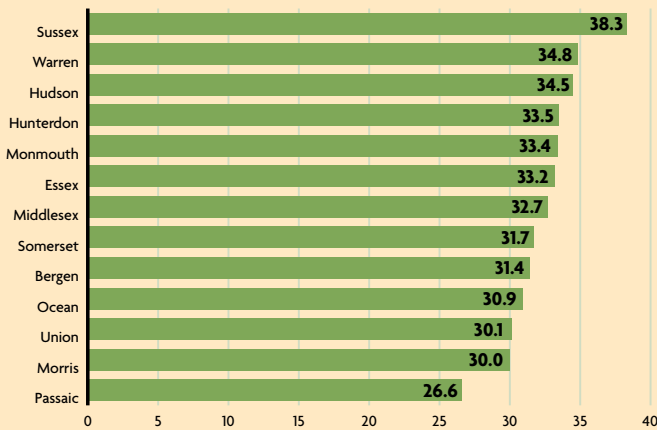


**Figure 3-2:**  
**Change in Population, Jobs, VMT and Transit Use,**  
**NJTPA Region (Compared to 2000)**



Source: U.S. Census, U.S. Bureau of Economic Analysis, NJDOT, NJ TRANSIT, PANYNJ

**Figure 3-3:**  
**Travel Time to Work, NJTPA Region, ACS 2010-2014**  
**(in minutes)**



Source: Census 2010-2014 ACS 5-Year Estimates

### Income

New Jersey’s median household income of \$70,000 in 2010 was the second highest in the nation, with the national median income at \$52,000. The benefits to residents, however, are somewhat offset by a higher cost of living, estimated in 2014 to be 25 percent greater than the national average.

Even with a higher than average median income, about one-tenth of the residents in the region live in poverty. In 2010, the counties whose poverty rate exceeded the statewide average of 10.3 percent

were Essex (16.7 percent), Hudson (16.5 percent), Passaic (15.7 percent), Ocean (11.2 percent) and Union (11.1 percent). As noted, low-income residents—including a significant share of minority and immigrant communities—are more likely to depend on transit, particularly buses, for essential travel. NJ TRANSIT’s extensive bus network serves communities across income levels, connecting lower income areas with critical employment and educational opportunities, services and recreation.

This plan seeks to address the needs of low-income, minority and other underserved communities with equitable transportation investments. This includes supporting community redevelopment that accommodates affordable housing, enhances transportation options and is inclusive of the region’s diverse population. Improving transportation options can make communities more “location efficient,” lowering residents daily travel expenses while allowing them to afford better housing and an improved quality of life. This and other approaches to achieving equity for all communities are being advanced through the NJTPA’s cooperation on Together North Jersey initiatives.

### Transportation Trends

As economic conditions improve and the region continues to grow, investments must be made to ensure the network can accommodate a significant increase in both local and regional trips being made by residents and businesses.

Figure 3-2 shows the previously discussed relationship between population and employment trends and the key transportation measures of vehicle miles traveled (VMT)—a standard measure of the amount of driving—and transit ridership. While VMT increased at a faster rate than population before the Great Recession, the rate of growth has decreased since the recession, partly due to slow recovery in payroll jobs. Over the life of this plan, VMT is expected to grow moderately, by about 16 percent, roughly mirroring population growth (17 percent). Maintaining this modest rate of growth will depend on the success of efforts to expand transit availability and reduce the number and length of auto trips through more efficient land use, in keeping with the priorities of Together North Jersey.

Auto use will remain the dominant mode of travel

in the region, though autonomous vehicles and ride hailing may one day significantly alter how this travel occurs (see Game Changers p. 37 and p. 40). A majority of commuters—70 percent—drive alone to work, while 8 percent travel by auto with other people.

At the same time, transit ridership grew fairly steadily post-recession, reflecting the continuing economic importance of the transit system. New Jersey has the second largest transit network in the nation (behind New York). However, access to frequent bus and rail transit is limited to a relatively small geographic area of the region and is directly influenced by the land use development decisions discussed earlier.

Data from ACS and a 2011 Household Travel Survey conducted by the NJTPA provide additional insight into the commuting trends across the region (Figure 3-4):

- The percentage of commuters using public transportation increased from 11 percent in 2000 to 13 percent in 2010. Hudson County had the highest rate at 40 percent, followed by Essex County at 20 percent.
- Over 290,000 (or more than 9 percent) of the region’s residents commute to Manhattan for work. Hudson had by far the highest percentage of resident work trips going to Manhattan at 26 percent (Bergen was second at 15 percent).
- Over 75 percent of Manhattan-bound commuters use transit, highlighting an ongoing need to improve trans-Hudson capacity.
- 70 percent of commuters drove alone, a rate lower than most major metropolitan areas across the country.
- 34 percent of NJTPA residents work outside their county of residence but within New Jersey, and an additional 14 percent work outside the state.
- The mean travel time to work has remained approximately the same since 2000 at between 31-32 minutes, six minutes higher than the national average (see Figure 3-3).

- Passaic County has the shortest average commute time of 26.6 minutes, and Sussex County has the longest average commute time of 38.3 minutes.
- 3 percent of work trips were made by foot. In the region’s densest urban neighborhoods, such as Hoboken, upwards of 30 percent of trips for all purposes are walking trips. In large-lot suburban, exurban and rural areas, like portions of Monmouth, Hunterdon and Warren counties, auto shares are over 90 percent.
- About 12 percent of NJTPA households did not own a vehicle. Hudson (32 percent) and Essex (23 percent) counties contain the highest concentration of households without vehicles. The reasons for this may be due to better transit options and more compact, pedestrian-friendly land uses (especially in the primary cities of Jersey City and Newark), as

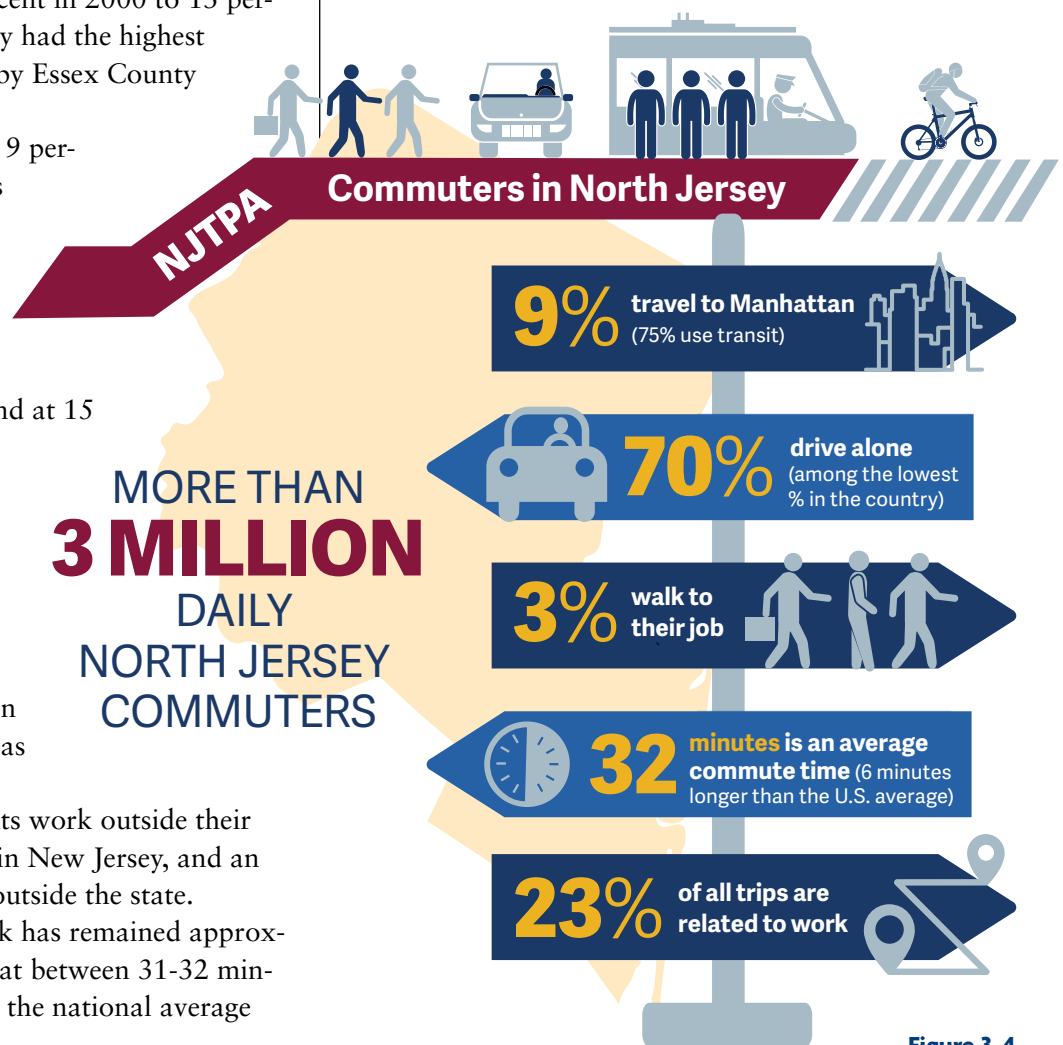


Figure 3-4

## Game Changer—Transportation Tech

**I**n coming decades technology advances will transform the transportation system along with other aspects of daily life—just as the internet and smart phones did over the past two decades. Beyond autonomous vehicles (see related sidebar), there are a host of emerging and possible technologies that must be considered:



**Connected vehicles**—Whether autonomous or human driven, future vehicles will incorporate technologies to communicate with one another and with the landscape they move through, improving efficiency, responsiveness to users and eliminating up to 80 percent of non-impaired vehicle crashes, according to one estimate.

**Wired Roads**—Networks of computerized traffic signals are already being deployed. Roadside technologies will also relay information and data to connected vehicles and aid centralized management.



**Beyond Gasoline**—All car companies are investing in electric and hybrid vehicles, with hydrogen power systems a distinct prospect. The vehicles will require investments in fueling and other infrastructure.

**Drones**—They are already being used for surveillance, surveying, inspection and monitoring. Their use will expand, with adaptation for deliveries, and even flying cars being explored.

**Real time data**—Data gathered from cell phones, roadside monitors and other sources are used to help manage systems, provide travel info and increasingly to predict travel patterns and guide planning.

**Transit tech**—Connected and automated vehicle technologies will extend to buses and shuttles. NJ TRANSIT buses are already utilizing signal pre-emption technology, and crash avoidance/detection technology is becoming common around the country. Train systems will get faster and more energy efficient. The future may include game changing technologies such as maglev and hyperloop systems. An

upgraded Northeast Corridor, including the implementation of the Gateway Program, could underpin wide economic expansion. Future transit tech may include automated, off-board fare collection and further creative use of mobile apps and real-time data.



- well as higher rates of poverty and the inability to afford a private vehicle and the associated costs of insurance, registration, maintenance and other fees.
- 54 percent of all trips are between home and destinations other than work (e.g., social/recreation, shopping, school, etc.); on weekdays, 23 percent of trips involve the workplace.
- Household composition plays a large role in determining how much people travel. Women in two-parent families with children make 1.5 more trips than men.

### Accessibility and Connectivity

When transportation works well, it puts travelers' desired destinations within reasonable reach, making them accessible—a key concept guiding informed transportation decision making. Accessibility varies greatly throughout North Jersey. By their nature, denser areas offer greater accessibility and support a wider mix of transportation modes. Yet, in all areas residents need to be able to accomplish essential activities within reasonable times and at reasonable costs.

A key obstacle to accessibility is congestion. Crashes, weather events, roadway construction and capacity limitations are frequent causes of congestion. Of increasing importance, however, is how predictable or reliable travel times are. Travelers recognize that to some degree traffic congestion is an intrinsic part of life in a dynamic and active metropolitan area. What can be more frustrating is when travel times vary greatly from day to day, making it necessary to budget significant extra time to ensure on-time arrival. New traffic measurement technologies enable the NJTPA to assess congestion and the predictability of travel. The NJTPA applies such data within its federally mandated Congestion Management Process (see CMP Appendix) to systematically identify suitable strategies to address needs.

As seen on Map 4, many of the region's interstate highways and state and county arterial roads have sections with unreliable travel times. The map highlights road segments that exhibit the most unpredictable conditions, where speeds regularly drop far below normal. Those segments shown take into account the type of place and class of road. For instance, the levels of unreliability are greatest on major corridors leading to bridge and tunnel crossings into New York City



KRISTIAN BATHY / FLICKR.COM

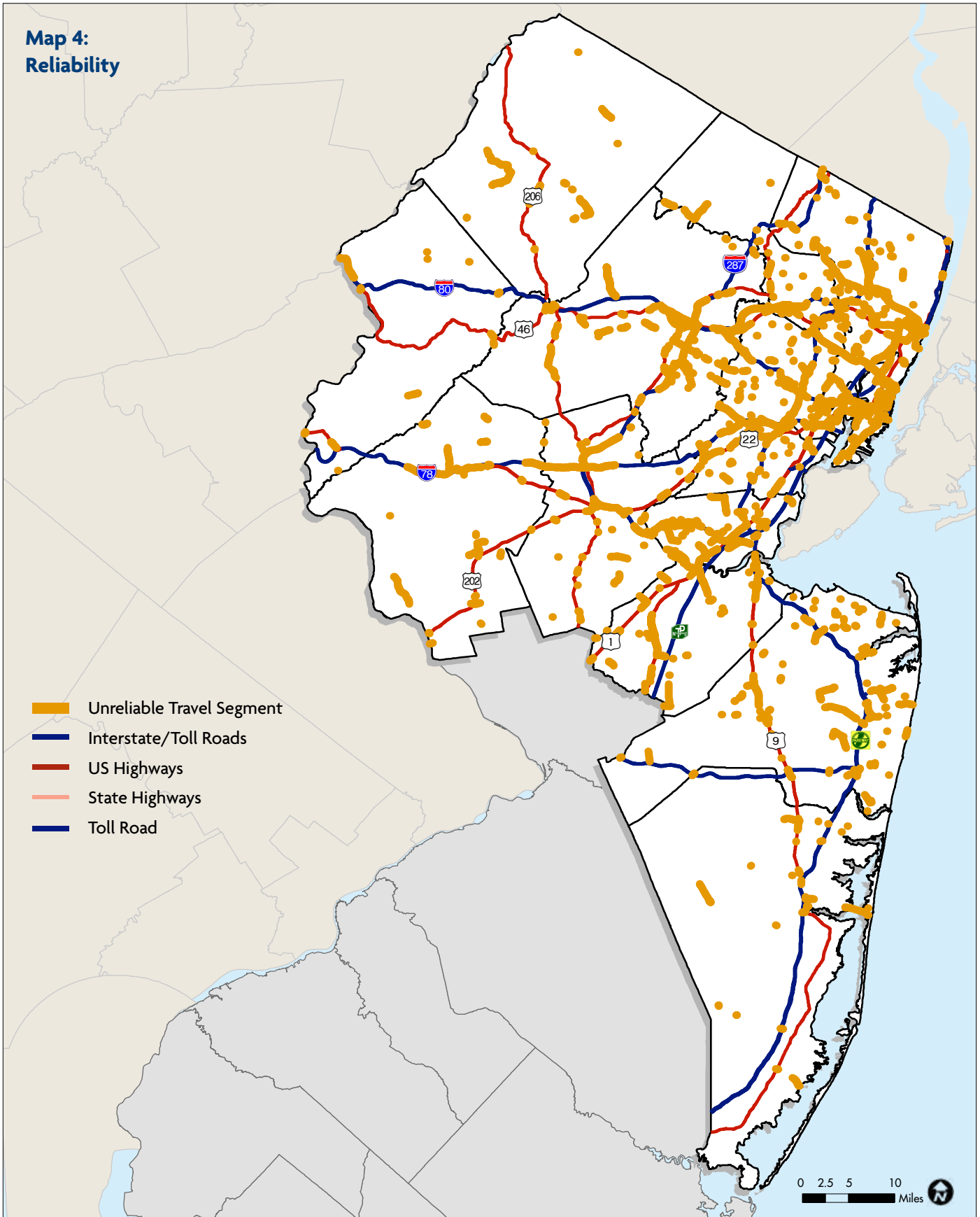
### Game Changer—Autonomous Vehicles on the Cusp

**B**y 2020, major car companies will begin rolling out their autonomous vehicles for selective use around the United States. It may take years for them to be perfected. But through 2045, many experts say, they will be fully integrated into the transportation system and in widespread use.

Their impacts on the transportation system are likely to be profound, though there are many questions:

- Will they encourage people to take more auto trips, enhancing personal mobility but further clogging roadways and undermining transit?
- Will they provide new forms of transit—such as on-call shuttles and buses—improving efficient use of roads?
- Will they enhance the existing transit system by providing more convenient access to stations and transit hubs?
- Will they lead to further suburban sprawl or support circulation in growing downtown areas?
- Will automated rides be affordable to all people?
- Will they be able to operate safely around all travelers—pedestrians, bicyclists, motorcyclists, wheelchair users?

**Map 4:  
Reliability**



Source: NJOIT, 2008; NJ TRANSIT, 2013; NJDOT, 2014; NJTPA, 2016; Esri, 2014

and those that serve important New Jersey business districts including those in Newark and Jersey City. (The highlighted roads in rural areas are relatively unpredictable compared to other roads in rural areas, but are more reliable than urban roads.)

Maps 5 and 6 show a key measure of accessibility, the percentage of commute trips that are accomplished within 45 minutes by car and 60 minutes by transit. Overall, about 80 percent of auto commutes in the region are less than 45 minutes, falling slightly from 84 percent in 1990 (implying more long trips now and slightly lower overall accessibility). Commutes are longest for parts of Hunterdon, Warren and Sussex counties, and shortest in older, denser suburbs in Passaic, Union and Bergen counties.

Transit commute trips tend to be longer than auto trips, but time spent on public transit is generally more acceptable to travelers who can work, read or socialize while traveling. About 50 percent of the region’s commuters who use public transit have work trips under an hour. But in the urban core that number is much higher, topping 70 percent in transit-rich areas of Hudson and Essex counties.

A more detailed examination of accessibility highlights how the transportation system connects people to where they want to go. In 2016, the NJTPA assessed the system’s connectivity by analyzing 60 origins and destinations, identifying accessibility needs, many of which focused on the need for more transit alternatives. The findings, organized by place type and travel markets, include:

### CONNECTIVITY TO NEW YORK CITY

- On many direct bus and rail transit routes to New York City, travel times are competitive with auto. In some suburbs and rural areas, access to existing bus and rail lines might be improved. Commuters in these areas rely on park and ride lots, shuttles and other options

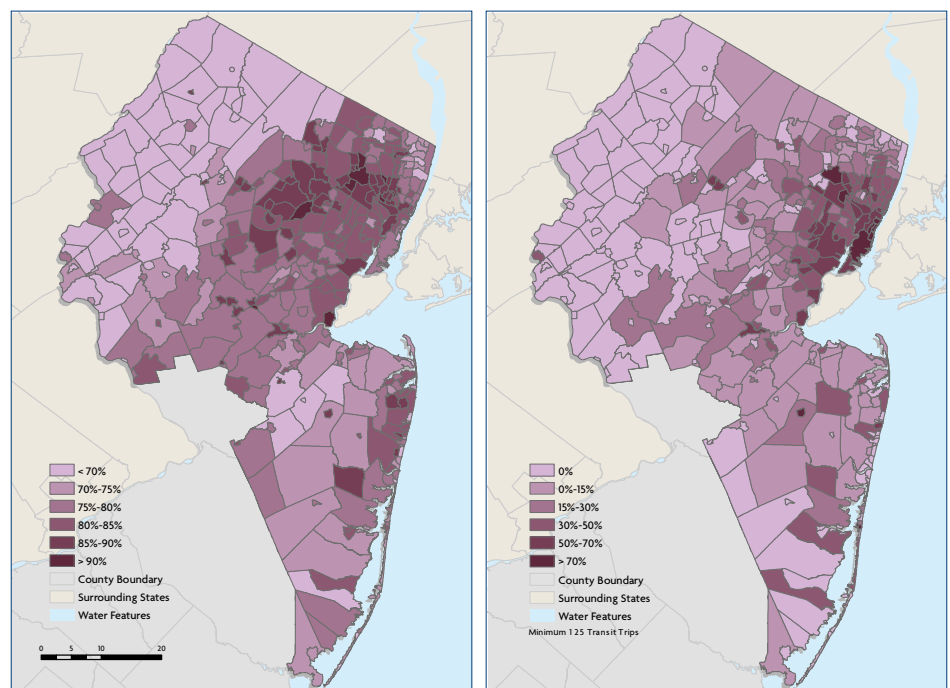
to get them from their homes to their transit stops. Such access to the transit system (along with concentrated development close to stops and stations) helps to generate the ridership needed to support transit service. For some stations, parking capacity and restrictions may also be a factor. Importantly, as discussed in Chapter 5, future growth in transit ridership faces significant capacity constraints, including the need for expanded trans-Hudson capacity.

- Unpredictable roadway travel and bottleneck congestion are prevalent for auto trips to New York City, especially at bridge and tunnel crossings. This also hampers bus travel. While the exclusive bus lane (XBL) used on Route 495, for example, often produces dramatic time savings for bus trips from the suburbs, the facility is at or near capacity, as is the Port Authority Bus Terminal in New York.

### URBAN/DOWNTOWN CONNECTIVITY:

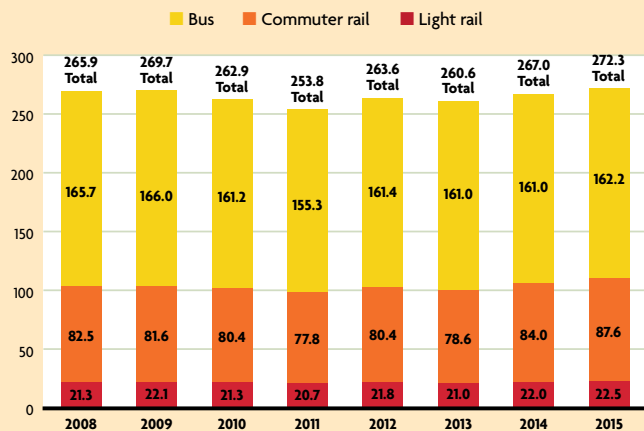
- Rail transit connections are available among and between some of North Jersey’s urban areas and denser downtowns that have train stations, but service can be infrequent. Bus service also varies, by route as well as by time and day of the week

**Maps 5 and 6:**  
**Percent Highway Work Trips, ACS 2011–2015**  
**Less than 45 minutes**                      **Less than 60 minutes**



Source: ACS, 2011–2015

**Figure 3-6:**  
**NJ TRANSIT Ridership, Fiscal Year Ending**  
**June 30 2008 to 2015**  
*(Total annual in millions)*



Source: NJ TRANSIT's Annual Reports

(weekday/weekend). Walkability contributes to the attractiveness of using transit in these areas. Bus access to these locations can be slow or infrequent depending on the route and destination.

- While most of these areas are well served by highways and local roads, auto access can be problematic as most roadways experience increased travel times due to unpredictable conditions and bottleneck congestion during peak hours. Automobile circulation in these areas requires active management

and must be balanced with the need to accommodate walking and bicycling.

### SUBURBAN CONNECTIVITY

- County and municipal roads are important travel routes in the suburbs. Highways often are major economic corridors. In many suburban areas, severe congestion and unpredictable travel times often extend to off-peak hours and weekends, especially in commercial arterial corridors and routes that provide access to seasonal shore and recreational locations.
- Transit access between many suburban areas is available but often limited, with some exceptions during peak hours and along densely populated and commercially well-developed corridors that sustain significant ridership. The ease of auto use and availability of free parking make suburban transit travel less attractive. First/last mile access, particularly via walking, can be challenging in less densely populated places. New on-demand and shared travel services can improve connectivity for such areas.

### RURAL CONNECTIVITY

- Transit access in rural areas is limited in terms of coverage and frequency. As in suburban areas, most travel is by auto, which is supported by abundant free parking. Limited population and employment

## Game Changer—On-Demand/Shared Travel

**A** growing number of travelers are hailing rides with smart phones through companies such as Uber and Lyft. The taxi-like services employ thousands of drivers throughout New Jersey, with particular focus on areas along the Hudson River and the Jersey Shore. Among other uses, they are helping bridge the first/last mile gap for accessing transit, and giving mobility options for seniors and the disabled.

At the same time, car-sharing services—similar to car rental but for shorter time periods—are another option gaining traction. And urban areas are implementing bike share programs with growing success. It all points to a future in which many people can travel easily without owning a car, and the landscape devoted to accommodating all those personal vehicles—two-car garages, acres of free parking and urban parking garages—is drastically altered.



SERGIO RUIZ/FICKR.COM

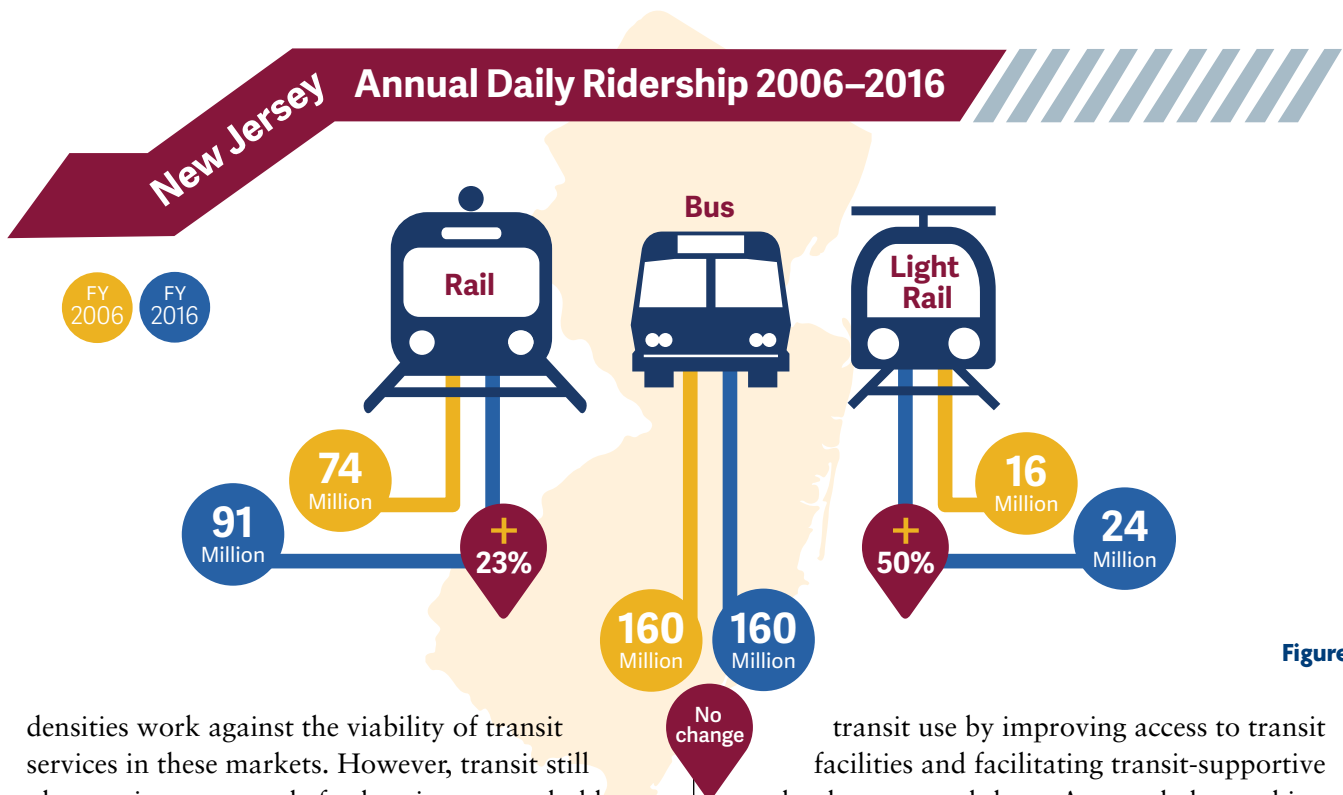


Figure 3-7

densities work against the viability of transit services in these markets. However, transit still plays an important role for low-income and older residents and those with disabilities. On-demand and shared travel services can contribute as well.

- By their nature, rural areas are generally less accessible than other parts of the region. Highway, arterial, county and local roadways provide core travel routes between rural and suburban areas. But as with the rest of the region, unpredictable travel and bottleneck congestion occur both during peak and off-peak hours. The road network serving rural areas tends to have fewer alternative routes than in suburban and urban areas, which can increase travel times and make auto trips less reliable.

### Transit

Transit ridership saw an uptick as the economic recovery gained strength. As shown in Figure 3-6, ridership fell 6 percent during the recession, from a high of 269 million passengers in 2008 to 254 million in 2011. In 2015, it rebounded to 272 million—the highest in eight years, mostly due to increases in rail use consistent with the longer trend (Figure 3-7).

While a stronger economy is the main factor in increasing ridership, land use policies are supporting the trend. Ongoing efforts by the NJTPA, NJ TRANSIT and partner agencies—many coordinated through Together North Jersey—are encouraging

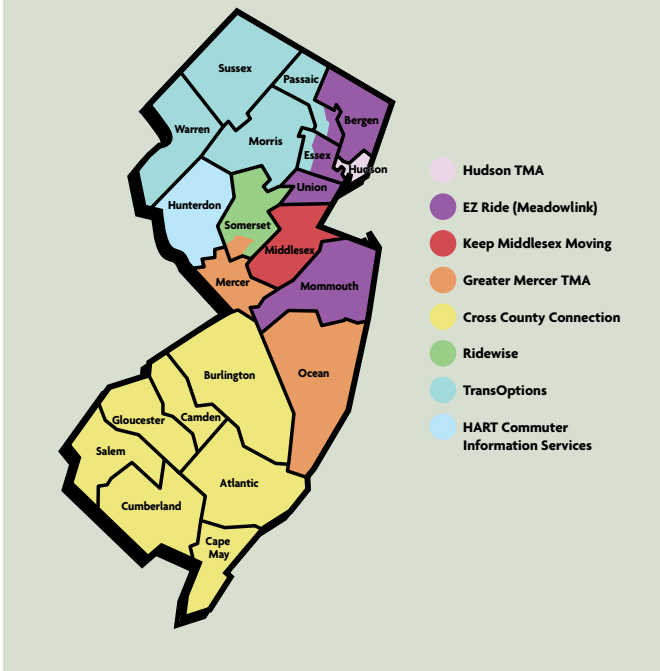
transit use by improving access to transit facilities and facilitating transit-supportive land use around them. As noted above, this type of development is in high demand by the millennial generation. Overall, systemwide rail ridership is expected to grow by 31 percent by 2045. As discussed elsewhere in this plan, the increase in transit demand raises the need for adequate funding to support long-term transit capital and operating needs while keeping fares affordable.

Funding in particular is needed to expand capacity across the Hudson River (see Trans-Hudson p. 57). The Hudson Tunnel Project initially will allow the shut down and repair of the existing 100-plus-year old tunnels, but also supports the larger Gateway Program that would increase trans-Hudson rail capacity and allow possible rail expansions in North Jersey. Also needed are new or upgraded bus facilities and systems, including the Port Authority Bus Terminal.

Figure 3-8 underscores the importance of the trans-Hudson market for the region. This market accounts for 46 percent of all weekday transit trips in North Jersey and the demand for trans-Hudson travel continues to grow. NJ TRANSIT expects to see 30 percent growth in trans-Hudson rail ridership by 2045. It should be noted that the 17,000 daily light rail riders that are making trans-Hudson trips are crossing the river either using a NJ TRANSIT bus or rail service or PATH service.



**Map 7:  
NJ Transportation Management Associations (TMAs)**



River waterfront in New Jersey. Accommodating this growth in demand will be a critical component of planning in the coming years for NJ TRANSIT Hudson Bergen Light Rail (HBLR), the PATH system, and NJ TRANSIT and privately-operated bus services.

NJ TRANSIT has and will continue to advance capacity improvement projects to support increased HBLR service, which now serves more than 50,000 daily trips. The PATH system plays an important role in regional and trans-Hudson commuting. It serves about 288,000 trips daily, including 259,000 trans-Hudson trips and about 29,000 intra-state trips within Newark and Hudson County. The PATH system is adding capacity to address robust growth in demand, but this new capacity is projected to be used up by the mid-2020s, primarily due to rapid development around key stations such as Journal Square and Grove Street in Jersey City.

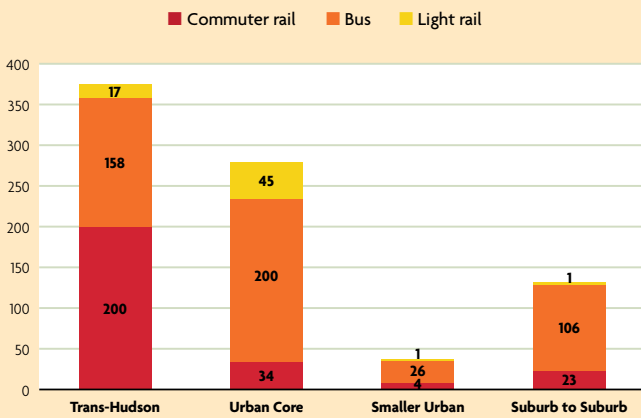
The Port Authority of New York & New Jersey predicts that weekday passenger trips traveling through the Port Authority Bus Terminal could increase from 260,000 in 2015 to 337,000 in 2040. During the morning peak, access to the bus terminal is enhanced by the XBL leading to the Lincoln Tunnel. It is the most efficient highway lane in the country, with 66,000 passengers on 1,850 buses each weekday, including 650 buses in the peak-hour. The infrastructure supporting the critical trans-Hudson bus system has reached capacity, and the bus terminal will require structural replacement within 15 years. Solutions to protect and expand the network serving trans-Hudson bus travel will be vital to the region's economy.

More than half the bus riders to Manhattan come from two counties, Bergen and Hudson. Private bus carriers enhance the availability of bus service to Manhattan, providing more than 37 million annual trips in North Jersey.

In addition, transit is a lifeline for those older adults, veterans, low-income persons and individuals with disabilities who have special transportation needs, as outlined in the NJTPA's Regional Coordinated Human Services Transportation Plan (CHSTP), discussed in Chapter 2 and Chapter 5. The plan, Go Farther, is required to address any special transportation needs of these groups. Suburban and rural parts of Sussex, Warren, Morris, Hunterdon and Ocean counties that are likely to see a growing senior

**Figure 3-8:  
NJ TRANSIT Ridership by Market  
(Trips in thousands, average weekday)**

% of NJ TRANSIT Riders: Trans-Hudson, 46%; Urban Core, 34%; Smaller Urban, 4%; Suburb to Suburb, 16%



Source: NJ TRANSIT, 2010

NOTE: Trans-Hudson = all travel destined east of the Hudson River; Urban Core = all travel destined to Hudson County, Newark, and Newark Airport; Smaller Urban = all travel destined to Elizabeth, Paterson, Hackensack, New Brunswick and Trenton; Suburb = all remaining travel.

High levels of both residential and employment growth are expected in Hudson County, especially in areas that provide access to employment opportunities both in New York and along the Hudson

citizen population are faced with limited rail and bus transit. These older residents will be increasingly reliant on community transportation services provided by county transportation agencies and Transportation Management Associations (TMAs)(Map 7). Ride hailing services such as Uber and Lyft could also play a role.

Ferries are an important supplement to the region’s rail and bus services with private operators providing direct service to Manhattan from Hudson, Bergen, and Monmouth counties. Approximately 8.7 million trips were made on ferries in 2016, with 30 percent expected growth by 2045.

### Freight

Freight is critical to North Jersey’s economy, with about a third of the region’s 3 million jobs highly dependent on goods movement. The freight sector’s strength is based on the region’s location in the center of a major consumer market; its extensive marine, rail and highway infrastructure; and its extensive warehouse and distribution facilities—over 800 million square feet in the region (Figure 3-8).

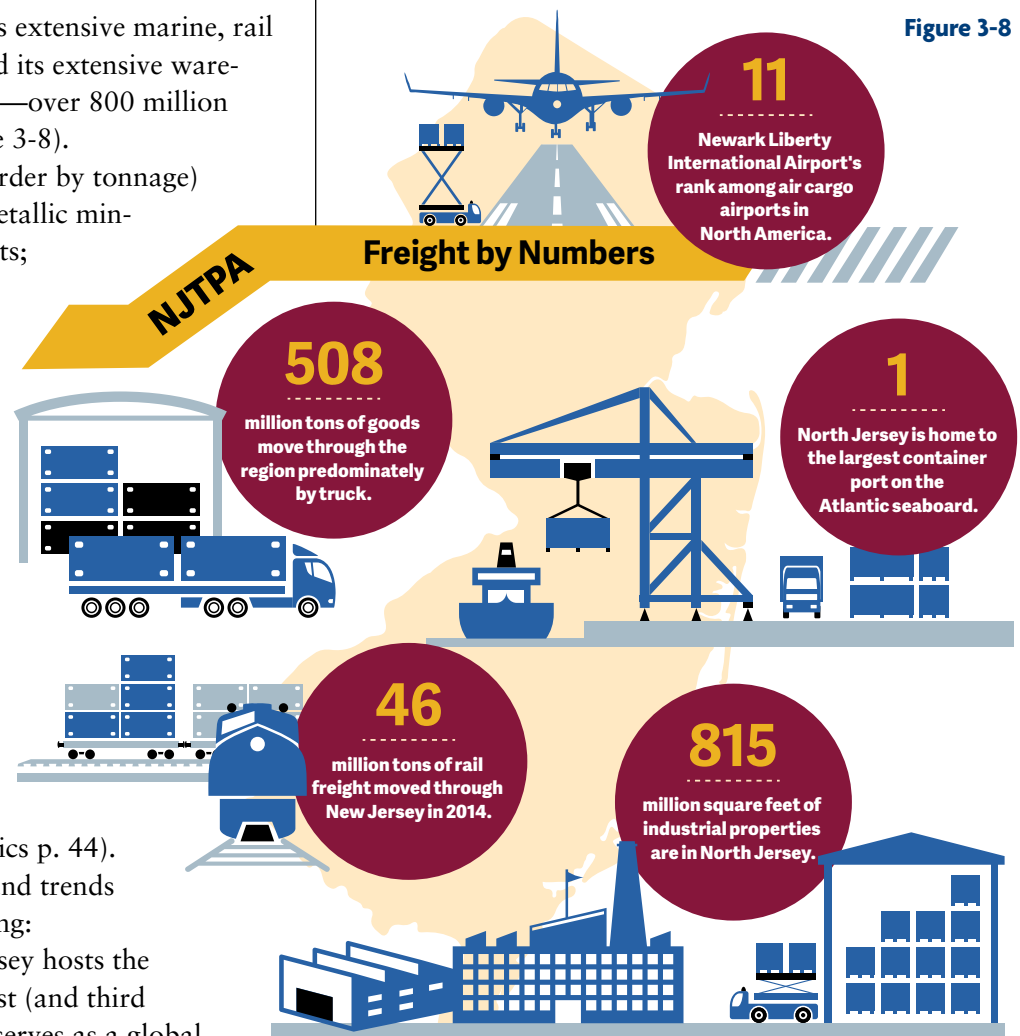
Commodities handled (in order by tonnage) include consumer goods; nonmetallic minerals; petroleum or coal products; chemicals; clay/concrete/glass/stone; food; and municipal solid waste. The domestic freight handled in North Jersey is projected to grow by more than 40 percent to 719 million tons in 2045.

As this growth occurs, the freight sector will undergo major changes, many of them driven by technology advances including continued expansion of e-commerce, 3D printing and truck platooning (see Game Changer—Freight Logistics p. 44). Among the current challenges and trends affecting freight are the following:

**Marine Freight**—North Jersey hosts the largest seaport on the East Coast (and third largest in the United States). It serves as a global

gateway for imports and exports. Port cargo tonnage increased by 30 percent over the last 10 years, and the number of containers handled increased by 33 percent during the same period. In 2016, the port industry supported 200,350 direct jobs, 344,470 total jobs, \$21 billion in personal income, more than \$53.8 billion in business income and nearly \$7 billion in federal, state and local tax revenues in the state. Port traffic is anticipated to grow at 3 to 5 percent annually. Neo-Panamax vessels, with capacities well in excess of 10,000 twenty-foot equivalent units (TEUs) and ultra-large container vessels with capacities of at least 18,000 TEUs, are anticipated to increasingly call on the port with the completion of the Panama Canal expansion, increased use of the Suez Canal and the 2017 completion of work to raise the Bayonne Bridge. The increase in containers being handled at one time with these larger vessels will require enhanced terminal

Figure 3-8



## Game Changer—Freight Logistics

**T**he way freight moves throughout our region will be transformed by technological changes, shifts in consumer habits and other factors. Among the issues that must be considered in planning for the future of freight:

**Truck Platooning**—Tests are underway on systems to allow trucks to travel in closely spaced platoons, increasing efficiency and conserving fuel. The technology could one day mean driverless trucks. Other software allows truckers to find freight along their route, so they fill as much of their cargo space as possible, reducing the number of mostly empty vehicles on the road.

**Changing Retail**—E-commerce has put some brick and mortar stores out of business and forced others to shift to meet the demands of a growing online consumer base. This means more delivery trucks on the road. And companies are opening smaller warehouse operations closer to consumers in order to meet shipping demands.

**Delivery Drones**—Some companies are testing drones as a delivery method. Others, like UPS, have turned to delivery bikes or storage lockers where customers can pick up items. These methods will have to be considered in policy changes as some communities have moved to restrict truck traffic and warehouse hours of operation.

**3-D Printing**—This emerging technology could revolutionize supply chains. Companies will no longer have to rely on parts suppliers in far off places. They can manufacture their own parts or buy them from local firms or regional facilities specializing in custom products.



JEREMY VANDEL/FLICR.COM

operations, as well as new strategies and investments for accommodating the additional truck, rail freight and domestic waterborne movements.

**Rail Freight**—Rail yards in the region not only directly serve the port, Bayway Refinery and other area businesses, they are also end points for rail lines carrying large volumes of consumer and other goods from across the country. Rail freight traffic has undergone significant swings with periods of increased movement of petrochemicals and containers and reductions in shipments such as coal.

Nevertheless, most of the major freight rail lines in North Jersey, including the Lehigh Line and the River Line, will be at or over capacity by 2045.

**Trucking**—Nearly all goods moved in the region travel by truck for at least part of their journey,

especially short haul and time-sensitive deliveries. In all, more than 80 percent of domestic freight traveling to, from or within North Jersey moves by truck. Congestion over key highways and at ports and terminals hampers timely freight movements. As discussed elsewhere in this plan, the industry also faces driver shortages and a lack of parking.

**Air Freight**—While air cargo tonnage had been declining as more freight was moved by land and sea, Newark Liberty International Airport has experienced a consistent year-over-year uptick in tonnage growth since 2013. The airport is a major domestic and international hub for express carriers, as well as an important market for domestic and international commercial carriers, including a major hub for United Airlines. In 2016, the airport handled 746,800 tons of air freight

and 45,800 tons of air mail. The airport ranked 11th nationally and 37th internationally in air freight activity. With air cargo tonnage levels remaining consistently strong, this mode continues to represent a key means for moving time sensitive and extremely high value goods.

### Safety Trends

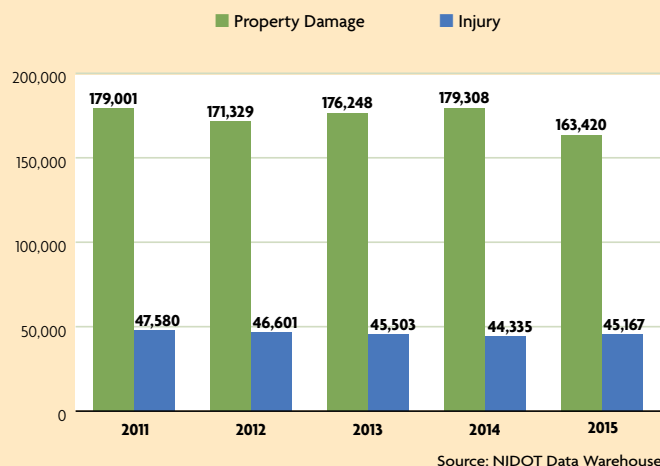
Improving safety is a top priority at the NJTPA and is factored into all aspects of transportation investment decision-making. Each year, there are more than 200,000 motor vehicle crashes in North Jersey, resulting in more than 300 fatalities and 40,000 injuries. It is important to note that the number of crashes has steadily declined—with the exception of an uptick in 2014—despite the fact that the region’s population and VMT have grown.

The NJTPA works in partnership with NJDOT, NJ TRANSIT, the New Jersey Turnpike Authority, the Port Authority, and the New Jersey Division of Highway Traffic Safety, as well as with engineers, planners, local elected officials, New Jersey’s other metropolitan planning organizations and various stakeholders to improve safety on the region’s multi-modal transportation system.

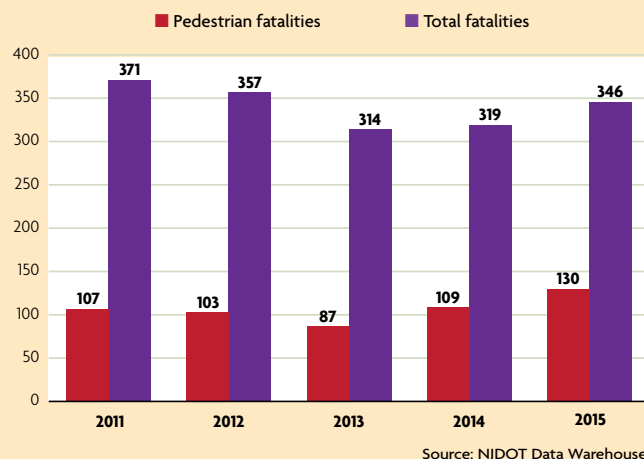
Investment in safety improvements and policy direction for road safety is guided by the statewide Strategic Highway Safety Plan adopted in 2015 to meet federal requirements. New Jersey has adopted “Towards Zero Deaths” as a goal of eliminating fatalities. Chapter 5 outlines the many strategies being pursued towards this goal. Among the plan’s emphasis areas are reducing lane departures, intersection crashes, drowsy and distracted driving, crashes involving drivers over the age of 65, aggressive or impaired driving and protecting bicyclists and pedestrians.

Figures 3-9 through 3-11 below illustrate regional safety trends. The crash rate has mostly declined from 2011 to 2015, mirroring what is happening at both the state and national level. Pedestrian injury crashes in the region steadily decreased between 2011 and 2015. Fatal crashes have also been on the decline since 2011, though there was an uptick in 2015. Pedestrian fatalities, however, have fluctuated during the same period—with an increase in 2014 and 2015—an issue which has prompted more focus on identifying and addressing potential contributing circumstances such

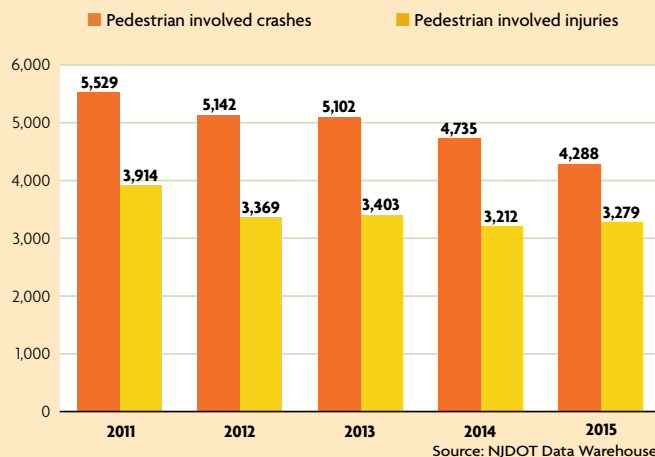
**Figure 3-9:  
NJTPA Crashes 2011–2015**



**Figure 3-10:  
2011–2015 NJTPA Regional Fatal Crashes**

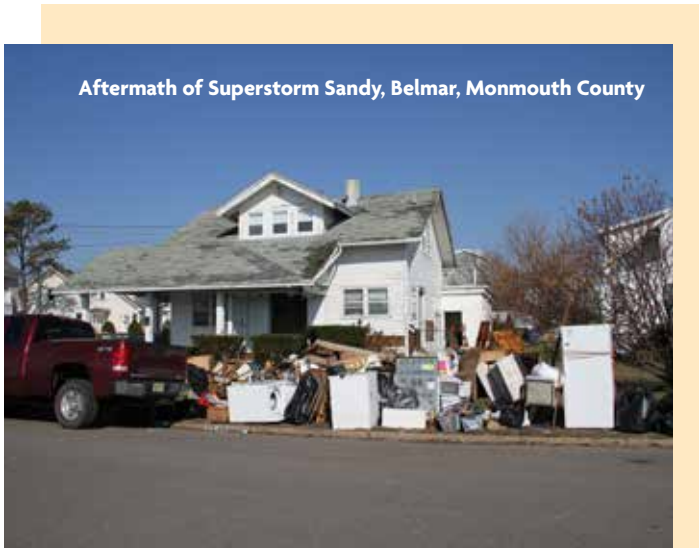


**Figure 3-11:  
2011–2015 NJTPA Region  
Pedestrian Involved Crashes and Injuries**



as driver or pedestrian distraction.

Crash statistics indicate that the most vulnerable travelers—pedestrians and bicycle riders—are disproportionately at risk. Targeted safety investments have improved pedestrian safety, but there is more to be done. Of the region's 346 crash-related deaths in 2015, more than 35 percent were pedestrians, although



## Game Changer— Weather, Cyber, and Other Threats

**S**uperstorm Sandy and the events of September 11, 2001 have given people in the region first-hand experience with the importance of preparing for potentially catastrophic events. For the future, the possibility of increased extreme weather due to climate change, rising sea levels along the region's extensive coastal areas and cyber threats are particular concerns.

This plan calls for building resilience into all future and ongoing transportation investments and programs to prevent and minimize impacts and aid in recovery. This includes improved coordination on security issues among agencies at the state, regional and local levels and contingency planning for events.

walking accounts for about 9 percent of all trips. The uptick in 2014 and 2015 points to the urgent need to address the causes in pedestrian and cyclist fatalities. Working toward zero deaths remains a top priority of the NJTPA's safety improvement work.

In response to the FHWA designation of Newark as a focus city and New Jersey as a focus state, the NJTPA developed Street Smart NJ, a pedestrian safety education campaign launched in 2013 in cooperation with NJDOT and the New Jersey Division of Highway Traffic Safety. Since the initial pilot in five communities, the program has grown annually to now include more than 60 municipalities (see Street Smart NJ p. 95).

Analysis of regional crashes identifies many contributing factors, including age, impaired driving, distracted driving, lighting, vehicle speed and road design. Continued partnerships with NJDHTS, the subregions, other government agencies and traffic safety related organizations is crucial to improving safety through 2045, coupled with investment in proven safety countermeasures at priority locations.

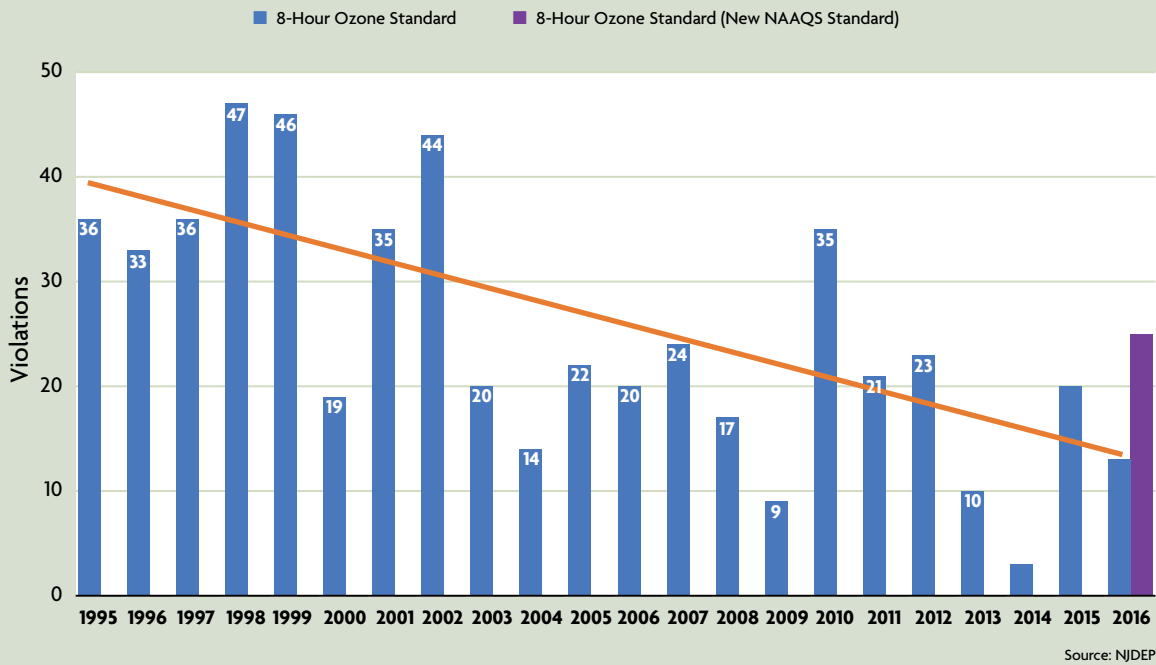
## Air Quality

Transportation is a major source of air pollution, which can exacerbate asthma and other serious health conditions. Many factors affect the level of pollution, including the number of car and truck trips, trip length, time spent idling in congestion, vehicle technology and more.

Portions of the NJTPA region continue to suffer from unhealthy air quality. The NJTPA is charged with using its plans and programs to help the state meet federal standards and improve air quality, and the agency is making strides to reach these goals. To demonstrate conformity with the goals, the NJTPA uses computer modeling to estimate the emissions impacts of approved projects.

Parts of the NJTPA region are in nonattainment for failing to meet standards for ozone. But in recent years, parts of the region previously in nonattainment for fine particulate matter (PM 2.5) have advanced to an initial 10-year maintenance designation for meeting the standards. These standards must be met for 20 years to reach a designation of attainment. In addition, areas previously in the initial 10-year maintenance phase for carbon (CO) have advanced to the

**Figure 3-12: Annual Violations of the 8-Hour Ozone Standard in New Jersey**



final 10-year maintenance phase. When these maintenance phases are completed, the region will advance to attainment for both PM<sub>2.5</sub> and CO.

As seen in Figure 3-12, there has been an overall reduction in air pollution in recent decades, including from transportation. While ozone days have steadily declined, it must be noted that in 2016, the federal Environmental Protection Agency (EPA) revised its air quality standards, which increased the number of ozone days from 13 under the old standard to 25 under the new standard.

Changes in technology have made vehicles cleaner, and the use of public transit and shared rides have helped to reduce emissions. The NJTPA, through its funding programs, investments and partnerships in Together North Jersey supports continued air quality progress. One example is NJTPA's Transportation Clean Air Measures program (see Chapter 5), funded with federal Congestion Mitigation and Air Quality dollars, which focuses on projects that reduce emissions.