

Union County

Transportation Master Plan



Move. Connect. Grow.



June 2016



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Adopted by
The Union County Board of Chosen Freeholders
October 13, 2016

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NJ TRANSIT

PANYNJ

EZ Ride TMA

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CHAPTER 1
Introduction & Background

Move. Connect. Grow.

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CHAPTER 1

Introduction & Background



INTRODUCTION

Union County is diverse and unique. Its 21 municipalities are linked to jobs, retail, medical facilities, parks and schools by an extensive transportation system that includes roadways, highways, passenger rail, bus, freight rail, sidewalks, trails, aviation facilities and a port marine terminal. The condition of this well-connected and balanced transportation network is critical to the economic vitality and quality of life in the County.

People seldom live, work, shop and relax in the same place. Union County is home to more than 540,000 residents,¹ more than 26,000 businesses² and almost 238,000 jobs.³ Residents and visitors must be able to move between various destinations that are important to them and do so with ease.

However, transportation is more than the movement of people. Goods movement is often overlooked. The movement of raw materials to processors and finished goods from manufacturers to their eventual end users also requires a well-established transportation network. Retail stores today rely less on warehouse inventory and more on trucks for “just-in-time” delivery. These stores depend on frequent deliveries to replenish goods resulting in higher volumes of truck traffic.

An efficient and extensive transportation system saves time, reduces costs, expands access to and choice of employment and enhances our health. An inefficient transportation system costs time, money, jobs and adversely impacts the environment and our quality of life.

¹ 2010 – 2014 ACS 5-Year Estimates

² NJTPA 2040 Union County Freight Profile

³ US Census Bureau’s 2014 Longitudinal Employer-Household Dynamic (LEHD) program from OnTheMap application

Purpose of the Plan

The *Union County Transportation Master Plan* identifies current conditions, challenges and opportunities, as well as strategies necessary to meet existing and future travel needs. The Plan was developed in coordination with the County, municipal officials and representatives, regional and state agencies and County residents. It provides guidance for all elements of the transportation system, including components owned, operated and maintained by other entities.

The Plan:

- Provides the framework for making future transportation planning and investment decisions in the County and its municipalities over the next ten years,
- Serves as a basis for seeking funding opportunities to advance transportation improvements,
- Incorporates new and emerging trends that influence the movement of people and goods, and
- Includes a public transportation map for residents to plan trips on the rail and bus network serving Union County.

This is not Union County’s first Transportation Master Plan. A Union County Transportation Plan was adopted in 1994 and was updated in 2002. This current Master Plan is an update of these previous plans and reflects the significant changes made to the local and regional transportation system since 2002.

Key Improvements since 2002

- The Union Township rail station began its first full year of operations in 2004. In 2014, it was the second busiest Union County station on the Raritan Valley Line after Westfield.
- The Route 22 Safety Shuttle began operations in 2007 and links employees to their job site for the “last mile.”
- The construction was completed on the two “missing ramps” at the Garden State Parkway and I-78 Interchange.
- The construction was completed on Route 1&9 for the Elizabeth Viaduct as well as the Rahway River Bridge.
- The Westfield Circle and Clark Circle were redesigned and improved.
- There are now six designated transit villages in Union County: Rahway, Cranford, Elizabeth, Linden, Summit and Plainfield.
- A 1.5 mile off-road segment of the East Coast Greenway bicycle trail was constructed.
- Weekday off-peak, midday and evening one seat ride service to New York City began on the Raritan Valley Line.

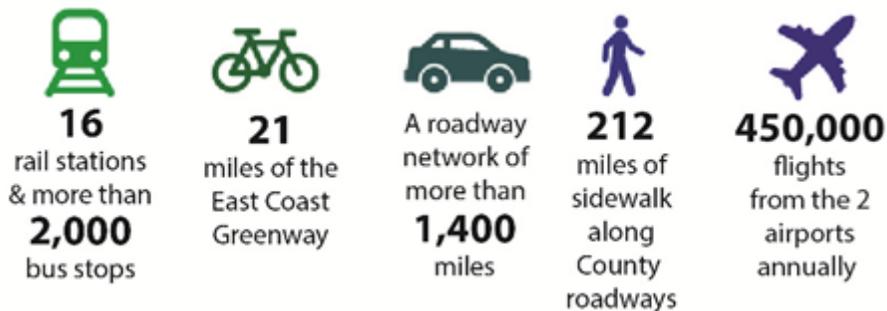


Image: RBA. Sources: NJ TRANSIT, Union County, NJTPA, PANYNJ, City of Linden Airport

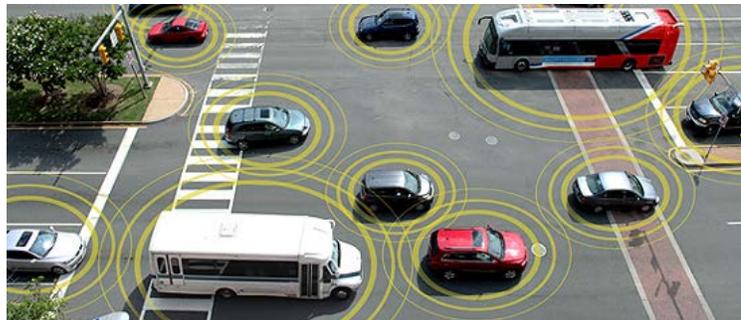
New and Emerging Trends

The Master Plan also considers the future travel needs of people and the movement of goods throughout Union County. Evolving transportation technology is an important consideration in addressing the needs of Union County's transportation system. The use of technology impacts the infrastructure and is changing how people use their vehicles. Examples of trends and technologies that are impacting how people and goods move through the transportation system include:

- The increase in hybrid and electric vehicles will require more recharging infrastructure and may reduce gasoline consumption and emissions.
- The advancement of more Intelligent Transportation Systems (ITS) may help to improve safety and mobility through the integration of advanced communication technologies including electronic toll collection, ramp metering, traffic signal coordination and priority and traveler information systems.
- An increase in driverless or autonomous cars could improve safety by avoiding crashes caused by driver error.
- The expansion of smartphone based applications, such as Uber and Lyft, can offer travelers more options although they may compete with taxi and transit service.
- The growing uses for drones might impact and require transportation regulations and oversight.



Google driverless car on a testing path.
Image: Flickr user jurvetson



Connected vehicles. Image: USDOT



Electric cars in Toronto.
Image: Wikipedia/Mariordo



Uber smartphone based application.
Image: youtube.com



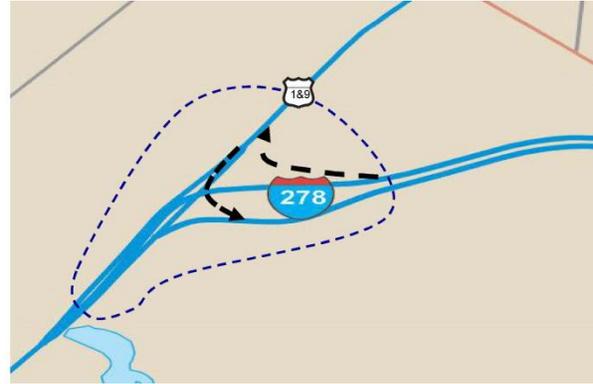
Amazon delivery drone.
Image: Amazon

Key Issues

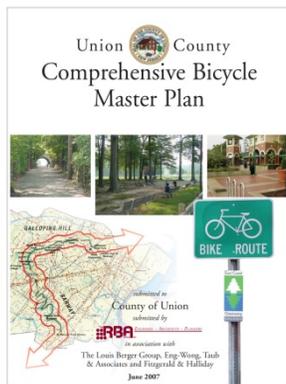
The following questions raise issues specific to Union County. They reflect some of the changes and emerging trends since the 2002 Master Plan and helped guide development of implementation strategies. Additional issues and trends are identified and discussed in *Chapter 3: Transportation Network*.



What changes to the transportation network would contribute to the County's resiliency in responding to future storm events?



What impact will completing the Goethals Bridge Interchange Ramps have on Union County?



Where should bicycle and pedestrian investment be prioritized?



How can the County help to enhance connectivity between modes?



What is the best way to get more people to and from the airport for both jobs and travel?



The population is aging and becoming more culturally diverse. How will this influence transportation?

Plan Organization

The Master Plan is organized into the following chapters:

Chapter 1 – Introduction and Background explains the purpose of the Master Plan, the County’s role in transportation, a summary of the planning and public participation process and an overview of trends including demographic and employment projections.

Chapter 2 – Vision, Goals & Objectives outlines a vision for a safe, reliable, multi-modal transportation system and the ways to achieve it. This section also describes the three main themes that provide the framework of the Master Plan, *Move. Connect. Grow.*

Chapter 3 – Transportation Network provides an inventory, analysis and strategies for improvements. The chapter is organized into sections for each major travel mode. This includes roadways and bridges, public transportation, goods movements, bicycle and pedestrian circulation and aviation facilities. Because projected future changes in weather will have a significant impact on transportation assets in Union County, a section on climate resilience is also included.

Chapter 4 – Implementation Strategies synthesizes the strategies identified in Chapter 3 and provides information on the County role, potential partners and timeframe.

Appendices include List of Acronyms, Bureau of Transportation-Related Plans & Studies and Public Outreach Summary.

The update of the Master Plan was conducted by the Union County Department of Economic Development, Bureau of Transportation Planning with assistance from a team of consultants led by The RBA Group. Funding for the project was provided by the Union County Board of Chosen Freeholders and the North Jersey Transportation Planning Authority (NJTPA).

BACKGROUND

County Role in Transportation

The Union County transportation system goes beyond its borders. To successfully plan for a safe and efficient transportation system in Union County, the interaction of all levels of government and the private sector is required. In New Jersey, counties have limited authority to manage the transportation system. Of the 1,430 miles of roadway in Union County, only 174 miles or 12% are County roads. The majority of the system falls under the responsibility of municipalities and other transportation operating agencies.

The County must coordinate its planning functions with the New Jersey Department of Transportation (NJDOT), North Jersey Transportation Planning Authority (NJTPA), NJ TRANSIT, Port Authority of New York and New Jersey (PANYNJ), NJ Turnpike Authority (NJTA), its 21 municipalities, adjacent counties and the private sector. See *Table 1 - Organizational Roles in Transportation* on the following page for an overview of the various entities having a role in Union County’s transportation network.

Table 1 - Organizational Roles in Transportation

Union County

Division of Engineering and Division of Public Works

The Union County Division Engineering and Division of Public Works are responsible for the construction, operation and maintenance of 174 miles of County roadway, 129 bridges and 268 minor bridges. Other responsibilities include collection of traffic movement data, traffic studies and investigations, intersection improvements including traffic signals, and review of Union County Planning Board site plan and subdivision applications.

Bureau of Transportation Planning

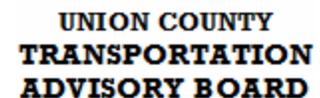
The Union County Bureau of Transportation Planning works towards a balanced transportation system for Union County. It seeks to meet the travel needs of people and goods through a coordinated intermodal transportation system.

To support the complex County transportation network, the Bureau conducts its own studies and partners with other entities to investigate a range of transportation planning problems with the goal of creating alternative solutions and recommendations. Funding for this work is obtained from both state and federal agencies. The Bureau works closely with the NJTPA and is responsible for meetings of the Union County Transportation Advisory Board.



Union County Transportation Advisory Board

The Union County Transportation Advisory Board exists as part of the planning process providing local, citizen input on transportation policy matters and serves as the principal non staff advisor on transportation policy matters to the Board of Chosen Freeholders. Each of the 21 municipalities within the County can appoint representatives.



New Jersey Department of Transportation (NJDOT)

NJDOT is responsible for managing Interstates (I-78, I-278), Federal roads (US 1&9, US 22) and State highways (NJ 82, NJ 81, NJ 28, NJ 124, NJ 24, NJ 27, NJ 35, NJ 439). NJDOT is also involved in transportation policy issues affecting the County and provides funding to County and municipal governments for road, bridge and other transportation projects.



Federal Highway Administration (FHWA) and Federal Transit Administration (FTA)

FHWA and FTA are agencies within the U.S. Department of Transportation (USDOT). FHWA supports state and local governments in the design, construction and maintenance of the nation's highway system (Federal Aid Highway Program). Through financial and technical assistance to state and local governments, the FHWA is responsible for ensuring that America's roads and highways continue to be among the safest and most technologically sound in the world. The FTA provides financial and technical assistance to local public transit systems, including buses, subways, light rail, commuter rail, trolleys and ferries. FTA also oversees safety measures and helps develop next-generation technology research.



Table 1 - Organizational Roles in Transportation

North Jersey Transportation Planning Authority (NJTPA)

The NJTPA is the Metropolitan Planning Organization for Northern New Jersey and oversees and administers Federal funding for transportation projects, studies and planning programs within its thirteen county regions. The agency also facilitates interagency coordination and public dialogue through its Board of Trustees and other committees. It ensures that Federally funded projects comply with national air quality goals.

**NJ TRANSIT**

NJ TRANSIT is New Jersey's statewide public transportation corporation. The agency is responsible for providing bus, rail and light rail transit as well as community transportation services for senior citizens, people with disabilities and underserved rural areas.

**Port Authority of New York and New Jersey (PANYNJ)**

PANYNJ conceives, builds, operates and maintains infrastructure critical to the New York/New Jersey region's trade and transportation network. These facilities include America's busiest airport system, marine terminals and ports (including Elizabeth-Port Authority Marine Terminal), the PATH rail transit system, six tunnels and bridges between NY and NJ, the Port Authority Bus Terminal in Manhattan and the World Trade Center.

**New Jersey Turnpike Authority (NJTA)**

NJTA operates and maintains the New Jersey Turnpike (NJT) and the Garden State Parkway (GSP).

**Transportation Management Associations (TMAs)**

TMAs are private, non-profit, member-controlled organizations established to work with employers and governments to help provide effective and efficient commuting and other transportation options including shuttle services, flex-time, telecommuting, walking and bicycling. EZ Ride TMA serves Union County.

**Municipalities**

Local governments are responsible for the planning, operations and maintenance of all local roadways within that municipality. On County roads, municipalities are also responsible for the maintenance of traffic signals and infrastructure, such as sidewalks, outside the road's curb line.

Private Sector

The private sector makes contributions to the County's transportation network in several ways, including constructing off-tract road improvements as a condition of subdivision and site plan approval, providing additional bus service, taxi and limousine services and ride hailing services. Private companies operate freight rail, trucking and shipping.

Setting

Located in the northeast section of New Jersey, Union County is a diverse, urbanized and densely populated county. The County is bordered across Newark Bay by Hudson County and near Staten Island to the east, and immediately borders Essex County to the north, Morris County to the northwest, Somerset County to the southwest and Middlesex County to the south. See *Map 1 – Location of Union County, New Jersey* on the following page.

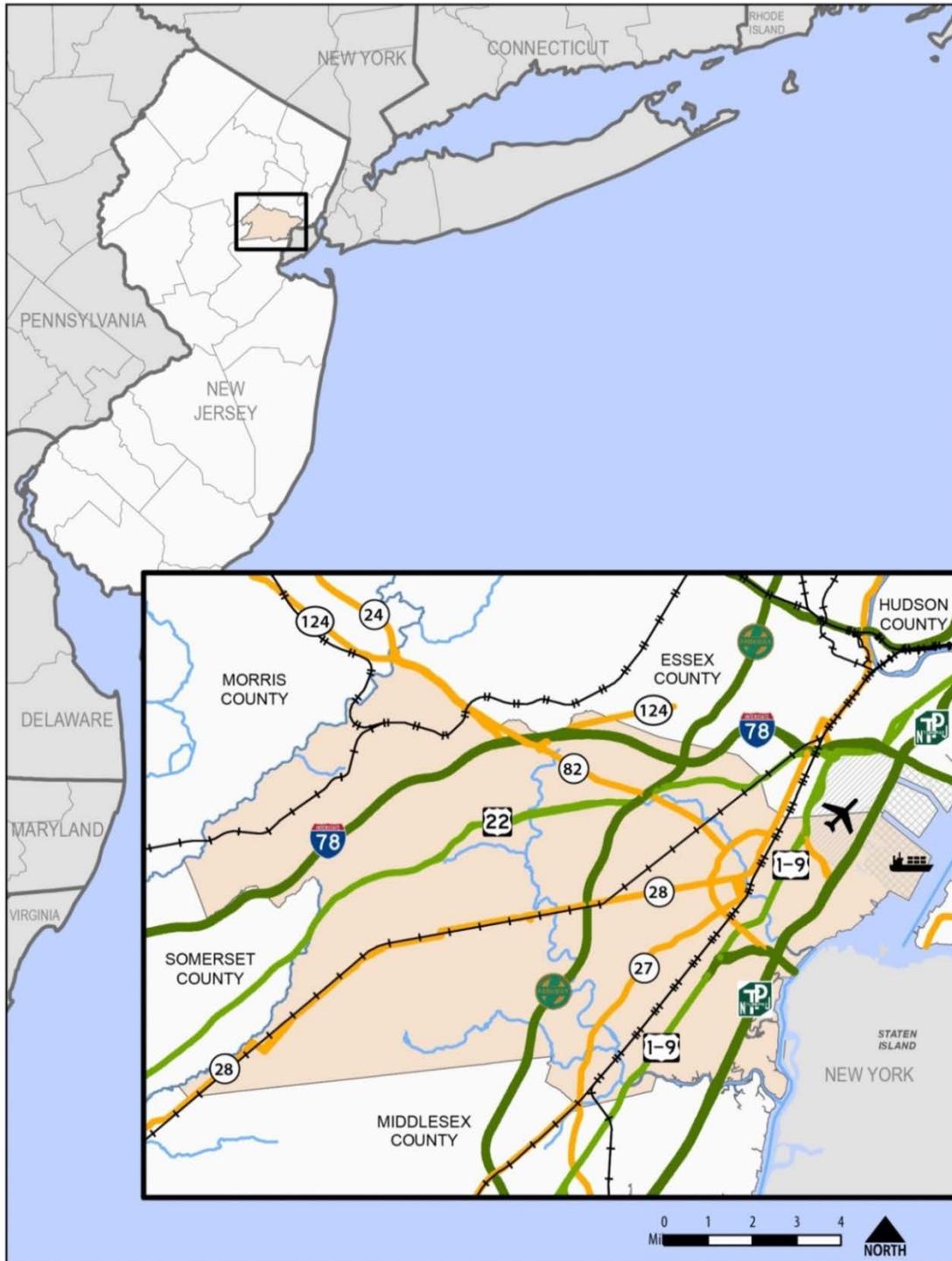
Its centralized location in the Northeast Corridor and its outstanding transportation infrastructure, including the New Jersey Turnpike, Garden State Parkway, extensive freight and passenger rail service, the Elizabeth Marine Terminal and Newark Liberty International Airport, are some of the County's core strengths.

Transportation and Land Use

The transportation network has greatly influenced the development of the County and improvements to the network will aid future growth. The eastern half of the County developed earlier and tends to be more densely populated and urbanized than the more suburban western half of the County. Elizabeth, the County seat, was established in the colonial era and is situated on Newark Bay and the Arthur Kill, the strait between New Jersey and Staten Island, New York.

Development is dependent on transportation access, both locally and regionally. However, there are statutory limitations on the County's power to guide development. Land development in New Jersey is a responsibility of the municipalities. While each municipality controls its own land development, the County can and does help municipalities coordinate with each other and with regional and state agencies to make sure local needs and interests are identified and communicated.

Map 1 - Location of Union County, New Jersey



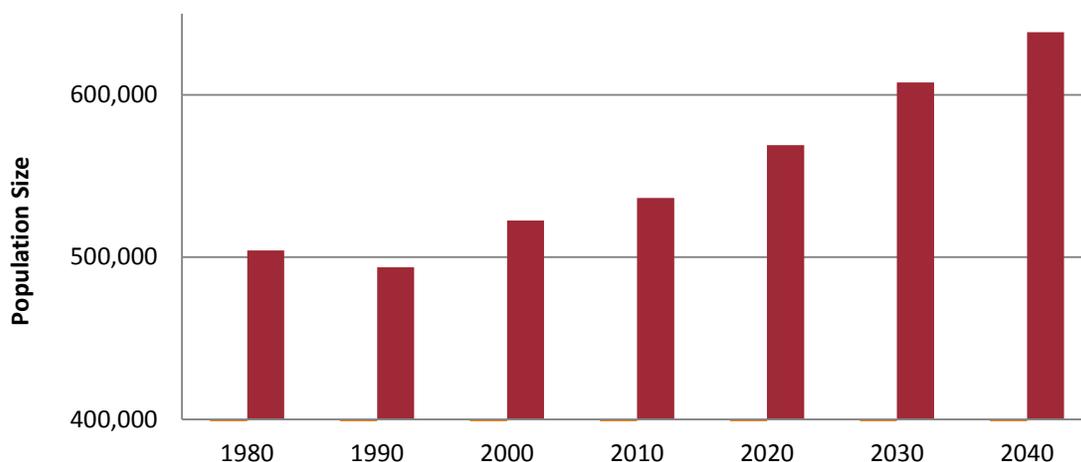
Context

Union County is one of 21 counties in New Jersey and contains 21 municipalities. Its population density and diversity are a benefit. The population density of Union County (5,256 persons per square mile) is more than four times that of the State of New Jersey (1,201 persons per square mile). In comparison to other counties in New Jersey, it is the third-most densely populated county after Hudson and Essex Counties. Union County is also the 18th most densely populated county in the country.⁴ Although Union County has a lower percentage of Asian residents compared to New Jersey as a whole, it is still more diverse than the state with a higher percentage of African-Americans and Hispanic/Latinos. Additionally, almost a third of the County's population is foreign-born.

Growing Population and Changing Demographics

- Between 2010 and 2040, Union County's population is expected to grow by 102,000 or 16% at an annualized percent population change of 0.6%. Between 1980 and 2010, there was only a 6% increase in population. All municipalities in the County are expected to grow with the exception of Winfield.⁵
- Between 2010 and 2020, the greatest increase in population is expected among the 65+ age group (+13,239) and the 45-64 age group (+4,296).⁶ As these older adults begin to drive less, their access to independent mobility will be greatly influenced by how well the County's streets and transportation networks accommodate non-drivers, especially those with special needs.
- Union County's employment is expected to increase by 62,000 or 21% from 2010 to 2040. The majority of employment growth is projected to be in Elizabeth followed by Union Township and Linden.⁷
- For the first time since the end of WWII, New Jersey's urban counties are growing at a faster rate than the suburbs. The fastest-growing counties are the ones closest to NYC (Bergen, Hudson, Middlesex and Union).⁸ Part of the new urban dynamic is driven by young adults and immigrants. This larger, increasingly urban population points to a need for better places for Union County residents to walk and bike.

Figure 1 - Population Growth and Projections for Union County, New Jersey (1980-2040)⁷



4 2009-2013 ACS 5-Year Estimate

5 U.S. 1980, 1990, 2000, 2010 Census; NJTPA *Plan 2040* Population Forecasts

6 NJLWD, Division of Workforce Research and Analytics' 2014 Union County Community Fact Book

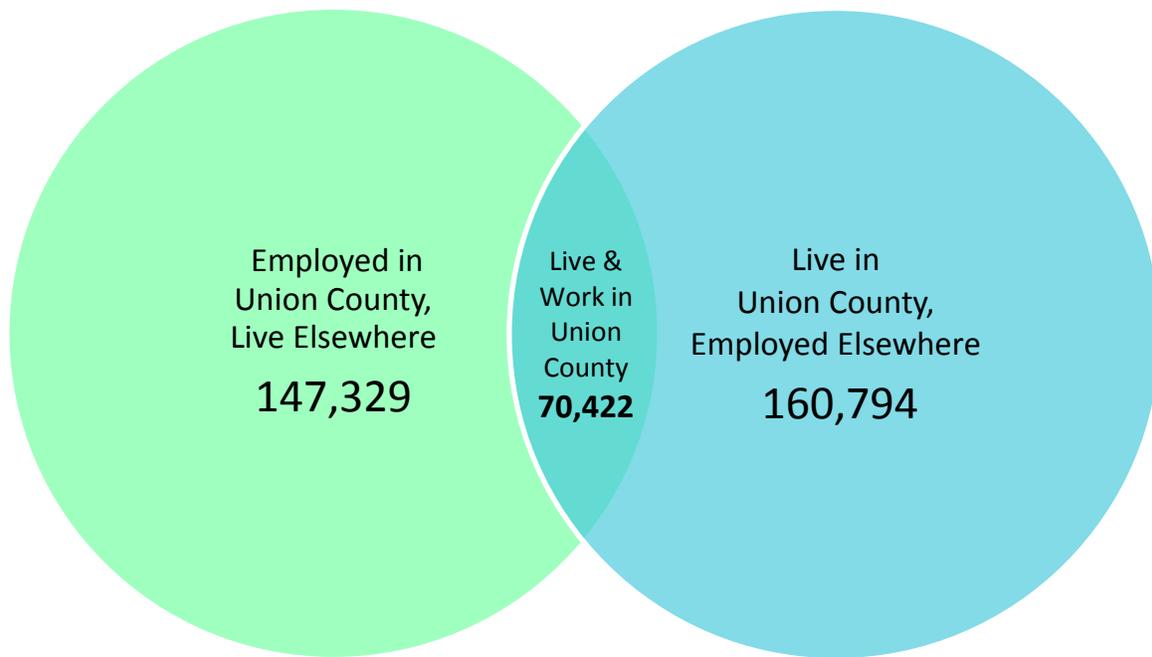
7 NJTPA *Plan 2040* Employment Forecasts

8 Hughes, J., & Seneca, J. "The Receding Metropolitan Perimeter: A New Postsuburban Demographic Normal", Rutgers University Community Repository, 2014. DOI: <http://dx.doi.org/doi:10.7282/T3MS3R70>

Commuting Patterns and Workflow

- More than two-thirds (69%) of employed residents in Union County drive alone to work, which is lower than the state’s percentage and is the third lowest among all counties in the state (after Hudson and Essex Counties). About 10% commute via public transportation (excluding taxicabs), another 8% carpool, 3% walk and 0.4% bike to work.⁹
- Union County has a healthy balance of primary jobs (217,751)¹⁰ and employed residents (231,216).¹¹ While 70,422 residents of Union County are also employed in Union County, two thirds of residents commute out of Union County. However, this does not necessarily mean Union County residents have long commutes. Union County is a smaller county and has good access to the surrounding counties. In fact, more than half (51%) of Union County residents have commutes to work of less than 10 miles.
- Essex and Middlesex Counties have the greatest number of commutes in and out of the County compared to other New Jersey counties and Manhattan.

Figure 2 - Workflow of Union County commuters (2014)¹¹



⁹ 2009-2013 American Community Survey 5-Year Estimates

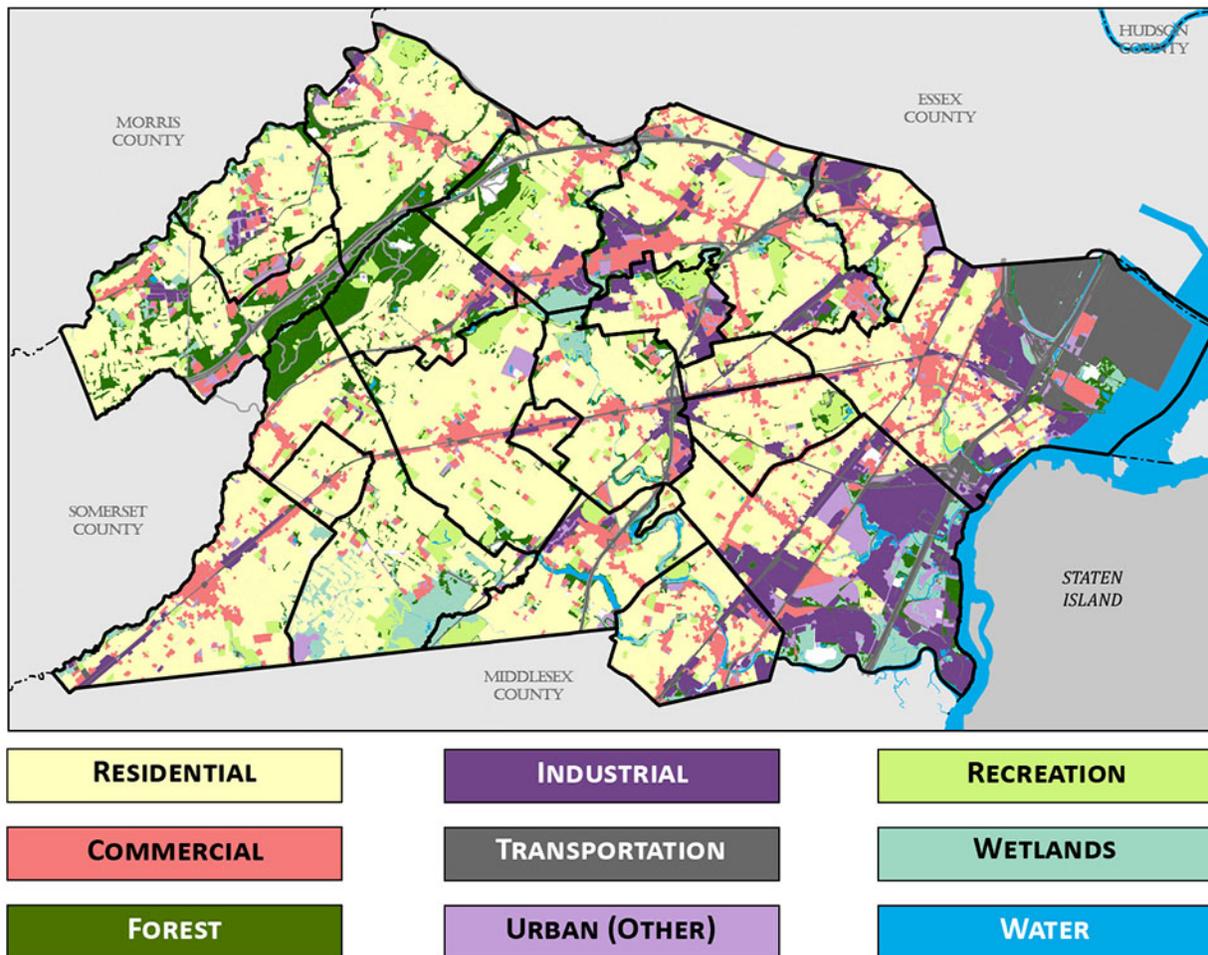
¹⁰ A primary job is a worker’s highest paying job, and since a worker may have only one highest paying job, “primary jobs” may be used as a proxy for workers.

¹¹ U.S. Census Bureau’s 2014 Longitudinal Employer-Household Dynamic (LEHD) program from OnTheMap application

Land Use

- The majority (82%) of land in Union County is classified as urban land. Of the land use classified as urban, approximately 38,000 acres (60%) is residential. The second most predominant land use is commercial (6,440 acres or 10%). The commercial use properties are located mostly along major roadways including Route 22, Route 28, Route 82 and Route 27 and urban centers including Elizabeth and Plainfield.
- Industrial and transportation uses equal approximately 5,370 (9%) and 4,950 (8%), respectively. Industrial uses are concentrated in the eastern part of the County in Linden, Rahway and Elizabeth. Transportation includes the major roads, railroads and Port Newark/Elizabeth Marine Terminal.
- Approximately 13% of the land is covered by forests and recreation. The County’s Department of Parks & Recreation manages 36 parks, covering almost 6,200 acres. This includes the Watchung Reservation in the northwestern section of the county.

Map 2 - Existing Land Use Patterns in Union County, New Jersey

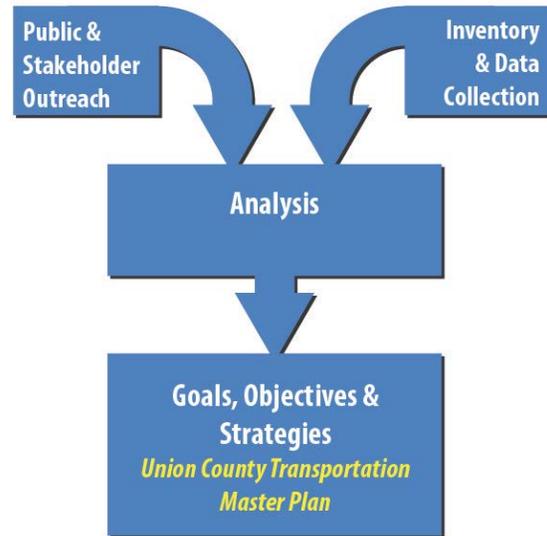


Data Source: NJDEP 2012 Land Use/Land Cover

PLANNING PROCESS

Union County initiated this Master Plan update to reflect the significant changes made to the local and regional transportation system over the last ten years and to identify goals, objectives and future needs for the next ten years.

The *Union County Transportation Master Plan* was completed in a year. The planning process began with an inventory of current conditions and data collection. Data collection included a review of related documents including studies, plans, documents and planned and proposed projects, an analysis of demographic and economic trends, a summary of crash data, input from stakeholders and field investigations.



All transportation modes and climate resilience were then examined for trends, issues and opportunities. This analysis identified challenges to the transportation system and strategies for improvement. Union County also integrated environmental justice issues into the planning process in order to ensure inclusive and more equitable involvement from people of different races, color, income levels and national origins.

Public Outreach

Participation by the public and municipal officials was critical to crafting a relevant Master Plan. Stakeholder and public input was accomplished in several ways. Community engagement efforts are described below.



November 2015 Public Meeting. Image: RBA

Steering Advisory Committee

The Steering Advisory Committee (SAC) was established at the beginning of the study to guide development of the Master Plan. The SAC was comprised of representatives from the municipalities, NJDOT, NJTPA, NJ TRANSIT, PANYNJ, County departments, local employers and advocacy groups. The SAC was instrumental in guiding plan development. In addition to attending three meetings, committee members provided feedback on vision, goals, strategies and the draft plan. The first meeting was held in June 2015.

Project Website

The County created and hosted a project webpage for the Master Plan on the County's website. Visitors to the website (www.ucnj.org/tmp) could submit comments, upload photos, review documents and respond to a short, four-question survey.

A total of 260 respondents completed the public survey on transportation in Union County. The municipalities with the most respondents were: 34 from Cranford (13.1%), 29 from Union Twp. (11.1%) & 29 from Westfield (11.1%) and 26 from Scotch Plains (10%). The fewest number of surveys were collected from Winfield (1 person), Rahway (3 people), and Kenilworth (4 people).

The majority of respondents (51.5%) indicated that the existing transportation system in Union County meets their needs "Well." The top three responses for why respondents thought people would move to their community were because of "Access to parks and open space," "Access to highways and major roads" and "Train Service." The lowest three responses for why people would move to their community were because of "Options for living near work," "Bike paths" and "Congestion-free roadways."

The respondents rated the following issues as "Very Important":

- Maintaining existing roads and bridges (71%)
- Reducing the congestion on roadways (57.7%)
- Making walking easier and safer (56.5%)
- Improving train services (56%)
- Using technology to improve traffic flow (49.8%)

On the other hand, a majority of respondents (50.9%) rated adding more traffic signals as "Not Important."

Public Information Sessions

Two public meetings were held during the development of the Master Plan. Both meetings were held at the Cranford Community Center in an open-house format, with time allotted for one-on-one discussions with the project team. A translator was present to interpret meeting material into Spanish.

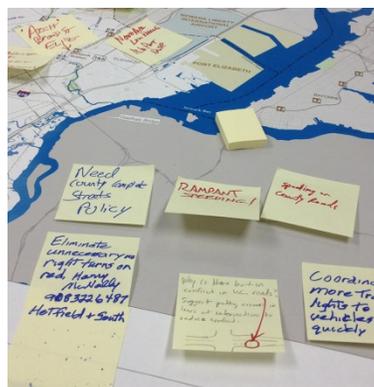
The first public meeting was held on November 2015. The purpose of the meeting was to engage citizens and stakeholders, present findings from the data collection and inventory and gather input on issues and opportunities. Approximately 55 people attended. The second public meeting was held on April 2016. The purpose of the meeting was to present and discuss the Master Plan with the public. The meeting recapped key findings and solicited input on priorities for transportation enhancement strategies. A PowerPoint presentation exhibited the Vision and Goals, Key Issues and Trends and an overview of tactics for transportation enhancements. Following the group presentation, attendees participated in a voting prioritization exercise to discuss and establish priorities for each component of the transportation system with individual subject matter experts.



Homepage of the project website – www.ucnj.org/tmp



August 2015 County Summer Concert at Echo Lake Park. Image: Union County



November 2015 Public Meeting. Images: RBA

Municipal Outreach Survey

A key step in shaping a comprehensive County Master Plan and developing strategies is gathering feedback from municipalities. To that end, a survey was sent to each municipality to obtain feedback and information on transportation and land use-related issues, needs and priorities within Union County. General themes heard from the survey include:

- Recurring and non-recurring traffic congestion is common throughout the County – primarily for roadways to and from major highways including the Garden State Parkway, Route 22, Route 1&9 and the New Jersey Turnpike.
- There is a need for enhanced bicycle and pedestrian infrastructure improvements, as well as improved connections to various trails and activity centers throughout the County.
- Parking challenges are noted county-wide, such as lack of availability and spill-over parking near transit stops and stations.
- More amenities are desired at bus stops and train stations.
- Heavy truck traffic is a complaint by residents throughout the County. Truck restrictions are in place, but at times ignored and/or not enforced. Informal truck parking is also a recurring problem on side streets and at shopping center parking lots after hours.

billion in state and federally funded capital transportation investments over four fiscal years. The “No Build” alternative scenario reflects what might occur if no other action is taken to combat congestion, other than what is included in the most recent TIP.

According to the NJRTM-E model, heavy congestion in Union County is expected to increase by approximately 50% by 2040, or an additional 50 miles of roadway compared to Existing Conditions. Results of this assessment indicate that heavily-congested roadways extend throughout the County—not just along major commercial corridors. This is indicative of limited north/south and east/west connectivity. Over time, traffic congestion will continue to increase on state and County roads. If nothing is done congestion will expand, cut-through traffic will increase, safety will deteriorate and environmental impacts will grow.



The future scenario forecasts an increase in congestion including the intersection of Kenilworth Blvd. and Michigan Ave. Image: Bing Maps



Neighborhood traffic circles like this one in Westfield are a common traffic calming measure for controlling speed of motorists. Image: RBA

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CHAPTER 2

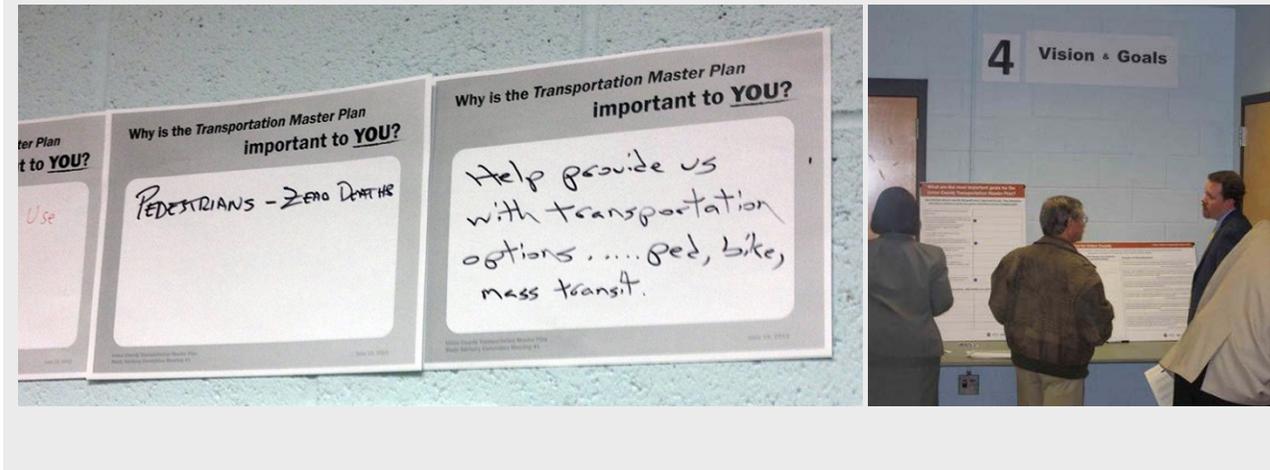
Vision, Goals & Objectives

Move. Connect. Grow.

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CHAPTER 2

Vision, Goals & Objectives



This chapter presents the *Union County Transportation Master Plan* vision, goals and objectives. Vision, goals and objectives provide the basis for implementation strategies included in the following two chapters and are written to be consistent with County plans, programs and policies. The vision, goals and objectives were crafted based on the 2002 Master Plan along with input received at the November 2015 public meeting, Steering Advisory Committee meetings, online survey and municipal survey. Key principles that emerged from outreach to key stakeholders and the community included:

- Improving and maintaining existing facilities,
- Providing frequent and dependable public transportation,
- Improving pedestrian safety and walkability, and
- Supporting innovative traffic mitigation strategies and programs.

VISION STATEMENT

The *Union County Transportation Master Plan* is guided by the following vision statement:

“Union County has a safe, reliable, multi-modal transportation system that will move, connect and grow to enhance economic activity and quality of life for all its communities.”

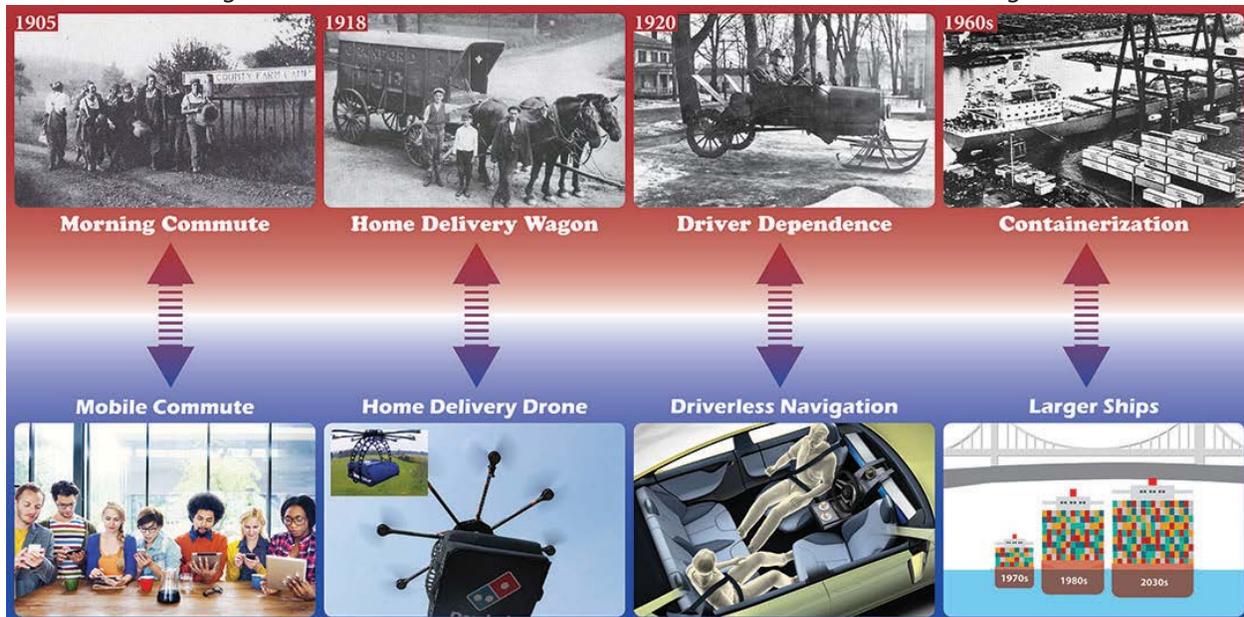
Achieving the vision cannot be accomplished by Union County alone. The County can directly impact the vision by implementing elements of this Master Plan that are within its jurisdiction. The County can also provide technical expertise and leadership to others including its local municipalities. By virtue of the transportation structure, the greatest impact on the success of achieving the vision will be accomplished at the local level.

Move. Connect. Grow.

The vision statement includes three themes: Move. Connect. Grow. Adopted as the project tagline, these three themes outline how the County will achieve its vision.

Move:	Provide more transportation choices, improve accessibility, increase safety, plan for resiliency and reduce traffic congestion.
Connect:	Engage, coordinate and partner with municipalities and regional, state and federal stakeholders.
Grow:	Improve and expand our transportation system to serve a growing population, to support our town and employment centers and to attract and retain regional business enterprises.

Figure 3 - Where have we been? Where are we now? Where will we go?



Attendees at the November 2015 public workshop were asked to think about “where have we been, where are we now and where will we go” when formatting the vision statement. The movement of trends is displayed by historical practices above and predictions of future developments below.

GOALS & OBJECTIVES

The seven goals from the 2002 Master Plan have been retained for this Master Plan but have been slightly modified to reflect trends and current conditions. A new goal has been added to reflect the importance of resiliency and sustainability.

Goal #1 - To improve and maintain a sound transportation infrastructure designed to support the growth of Union County and better serve all users.

Objectives

- Retain our existing corporate base and at the same time attract new business into the County
- Attract emerging industries to Union County
- Attract regional business and tourism to Union County

Goal #2 - To ensure that quality public transportation is available in Union County.

Objectives

- Support and encourage efficient, reliable, safe and convenient passenger rail service
- Ensure efficient, reliable, safe and convenient bus service
- Support transit oriented development
- Identify opportunities and obstacles linking rail and bus service to strategic locations within the County, including job centers, residential areas, shopping and recreational areas
- Develop adequate park-and-ride facilities
- Continue to support specialized and subsidized transportation to serve the travel needs of seniors and the disabled

Goal #3 - To increase safety and mobility while minimizing congestion on the roadway system.

Objectives

- Develop alternatives to capacity expansion
- Improve safety through engineering solutions as well as with education and enforcement
- Improve operating efficiency
- Complete missing links of interchanges

Goal #4 - To maintain the efficient movement of goods.

Objectives

- Promote safe and efficient truck travel
- Promote safe and efficient transport of freight by rail
- Ensure the portside access meets the needs of current and future post-Panamax vessels

Goal #5 - To support aviation services in Union County.**Objectives**

- Mitigate the adverse impacts of air travel on County residents
- Support access and mobility to Newark Liberty International Airport
- Continue to support the use of Linden Airport as a general aviation facility, as appropriate

Goal #6 - To encourage and support programs and policies that create transportation options and enhance quality of life.**Objectives**

- Ensure safe and convenient bicycle and pedestrian facilities, promote flexible working hours and other transportation demand management strategies
- Encourage transportation system management solutions on roadways
- Efficiently utilize capacity
- Promote compact, mixed-use development patterns which promote walkability and support transit

Goal #7 - To promote a coordinated, comprehensive and cooperative transportation planning process.**Objectives**

- Continue to participate in the NJTPA Subregional Transportation Planning Program
- Continue to conduct studies and apply for transportation planning funds available through the state or federal government to investigate a range of transportation planning problems with the goal of creating alternative solutions and recommendations
- Integrate land use and transportation planning

Goal #8 - To prepare for and adapt to changing conditions and withstand, respond to and recover rapidly from disruptions.**Objectives**

- Work with NJDOT, NJ TRANSIT, PANYNJ and other partners to improve the resilience of County transportation infrastructure against the impacts of extreme weather

CHAPTER 3

Transportation Network

Move. Connect. Grow.

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CHAPTER 3

Transportation Network



Visual representation of the modes of transportation and climate. Source: USDOT

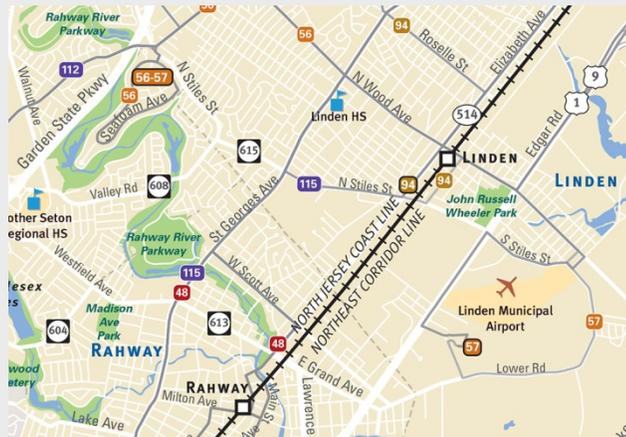


Image: Steve Spindler Cartography

INTRODUCTION

This chapter describes each component of the County's transportation system, including roadways and bridges, public transportation, goods movement, bicycle and pedestrian circulation, aviation and climate resilience. Each transportation mode was examined for trends, issues and opportunities.

The *Trends* include a discussion of the current direction of transportation in Union County and the conditions impacting the system in the future. Numerous factors influence the system such as shifts in population, employment and land use. Additionally, there are business trends, weather patterns and funding and policy changes.

The *Issues* represent the challenges and constraints to the transportation system. Examples of issues identified in Union County include congested corridors and intersections, gaps in transit services, increase in truck and freight movement, vulnerability of the transportation system to flooding and other weather events and barriers. In addition, gaps in bicycle and pedestrian travel are identified.

The *Opportunities* focus on possible improvement and the potential application of new and emerging technologies. These have the potential to improve and enhance the transportation network.

Potential broad *Strategies* as well as specific projects to address issues and opportunities for each mode are presented at the end of each of the six sections.

A. ROADWAYS AND BRIDGES

The Union County roadway network is the primary means of travel to work, social activities, shopping and personal business. The 1,430 miles of roads are shared by vehicles, trucks, buses, bicyclists and pedestrians. The County’s roadway system includes a variety of roadway types including interstate, freeway and expressway, principal arterial, minor arterial, collector and local roads. Each type of roadway performs a different function according to its capacity, design and relationship to the overall transportation network.



Summit Avenue in Summit, NJ. Image: RBA

Table 2 - Roadway System Classification

Functional Class	Description	Examples	Miles in Union County
Interstate	A limited access highway with no grade crossings; officially designated as Interstates by the U.S. Secretary of Transportation.	I-95 (NJ Turnpike) and I-78	24
Freeway and Expressway	Freeways and Expressways not part of the Interstate System.	Garden State Parkway	12
Other Principal Arterial	A roadway with access control, channelized intersections, restricted parking; connects major urbanized areas; collects and distributes traffic to and from minor arterials.	Rt. 1&9, Rt. 22, Rt. 27, Rt. 28, Rt. 82, Rt. 124	63
Minor Arterial	Provide service for trips of moderate length; access to abutting property should be minimized to facilitate traffic flow and safety.	Elizabeth Ave. in Elizabeth; Springfield Ave. in Berkeley Heights and New Providence; Vauxhall Rd. in Union Twp.	174
Collector	Collector roads primarily serve trips of intra-county rather than statewide importance. Speeds and volumes are less than on arterial roadways, but are still high relative to local roads. Collector roads provide for both land access and traffic circulation.	Linden Ave. in Linden; Rahway Ave. in Westfield; Lincoln Ave. in Cranford	131
Local	Lower volume and speed roads that provide direct access to adjacent land; through traffic movement is usually deliberately discouraged; bus routes generally do not run on local roads.	Elm Terrace in Rahway; Hazel Street in Cranford; Garden Street in Union Twp.; Rutgers Avenue in Berkeley Heights	1,026

Source: NJDOT Bureau of Transportation Data and Safety

Primary Travel Corridors

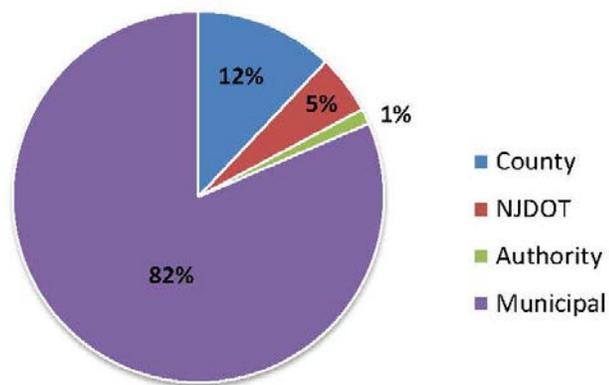
A number of roadway corridors account for the majority of regional traffic through Union County. East-west travel occurs primarily on I-78, Route 22, I-278/Goethals Bridge, and Route 24, Route 124 and Route 82. Roadways running north-south include the Garden State Parkway, the NJ Turnpike, Route 1&9 and Route 27. These corridors provide access to other parts of the County, neighboring counties and other parts of the region.

This system of freeways and arterial roads are supplemented by collector and local roads. If a primary travel corridor is highly congested, drivers will use the other roadways, including collector and local roads, to avoid congestion and continue their trip. It is important to consider the impacts on all roadways within a particular corridor when designing improvements for individual roadways.

Roadway Jurisdiction and Functional Classification

The roadway infrastructure for Union County consists of 1,430 miles of roadway. The majority (82%) of the network is maintained and owned by the municipalities.

Figure 4 - Percent of Miles by Roadway Jurisdiction in Union County, New Jersey



Union County has jurisdiction over 174 miles (or 12%) of total roadway miles, including 138 miles of arterial roadway and 36 miles of collector or local roads. The majority (76%) of the roadway network under County jurisdiction is classified as minor arterial. See *Map 3 – Functional Classification of Roadways under Union County Jurisdiction* on the following page.

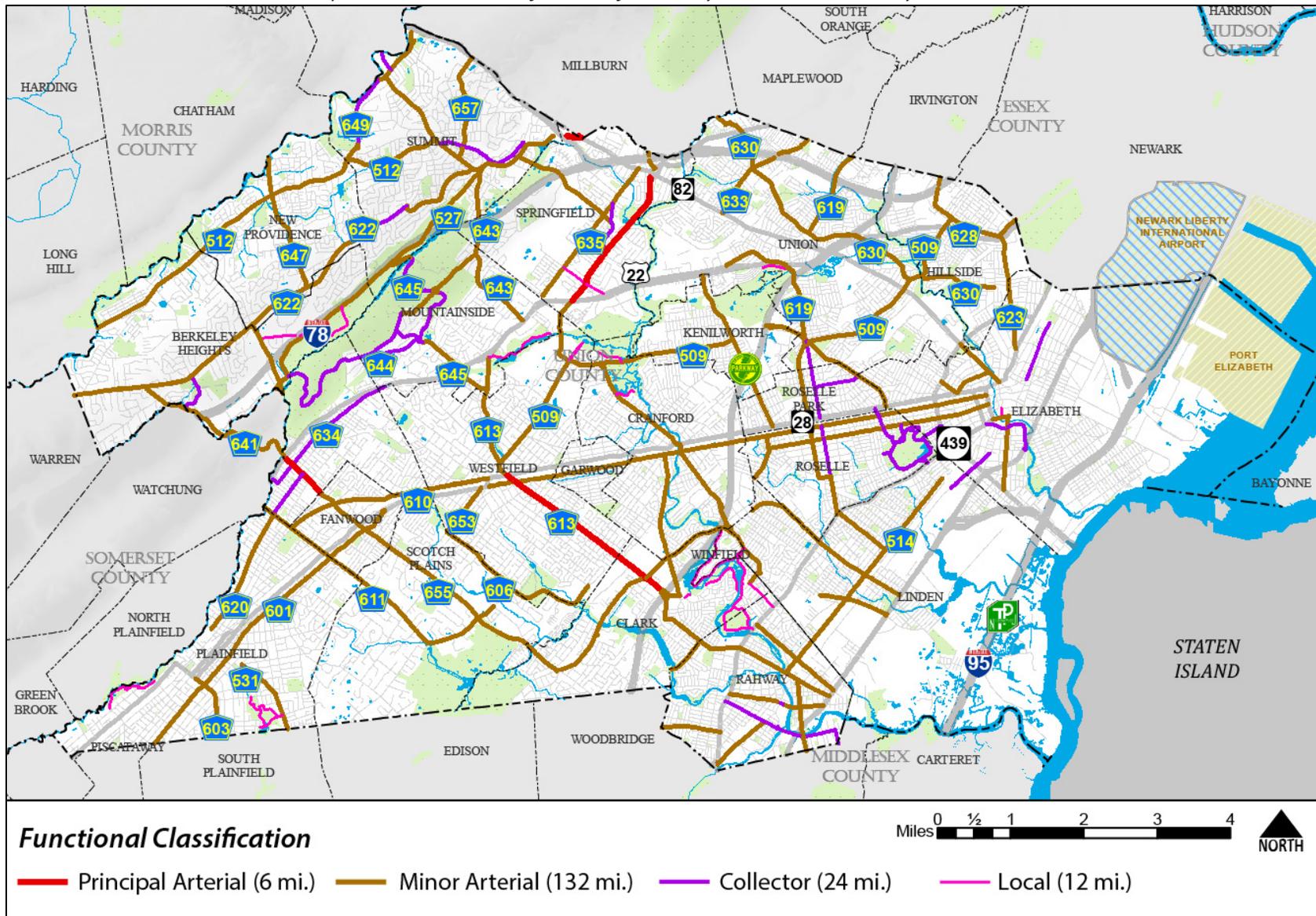
Where Union County has jurisdiction over a roadway, the County typically maintains the roadway from curb to curb, with the host municipality being responsible for the sidewalk area. Union County utilizes a Pavement Management System to inspect roadway deterioration and target its repaving program to prolong the useful life of the roadway through a proactive mill and overlay program. Union County also maintains a Sign Management System for all traffic signs on its roadways.

Table 3 - Functional Classification of Roadways under Union County Jurisdiction

Functional Classification	Miles of Roadway	% of County Network
Interstate	0	0%
Freeway/Expressway	0	0%
Principal Arterial	6	3%
Minor Arterial	132	76%
Collector	24	14%
Local	12	7%
Total	174	100%

Source: Union County Bureau of GIS

Map 3 - Functional Classification of Roadways under Union County Jurisdiction



Data Source: Union County Bureau of GIS

Signalized Intersections

There are 605 signalized intersections in Union County. Of the 605 signals, 338 are at County road intersections and 149 are on NJDOT roadways. The remaining are on local or municipal roads or under the jurisdiction of the NJ Turnpike Authority. It should be noted that, as a policy, Union County does not own or maintain traffic signals—the host municipality is responsible for signals on County roadways. Nearly 30% of all traffic signals in Union County are located in the City of Elizabeth.

Bridges

There are 129 Union County owned bridges (span greater than 20 feet) on roadways in Union County. Federal regulations require bridges to be inspected every two years. Currently, approximately 5% of County bridges are structurally deficient and would generally require replacement when funding is available. Another 30% of County bridges are considered functionally obsolete, which generally means that they may require rehabilitation when funding is available. The Front Street Bridge, Elizabeth, is currently closed and a project is underway to review future alternatives. There are nine bridges in the County which are considered “Orphan Bridges” by NJDOT which are without clear jurisdiction. Union County utilizes a Bridge Management System to manage all bridges under its jurisdiction and prolong their useful lives.

Transportation Management Association

Roadways are dominated by automobiles with drivers as the single occupants and alternatives to that form of travel are promoted by Transportation Management Associations (TMA). There are eight of these organizations in New Jersey and each has its own service area. The TMA serving Union County is EZ Ride. It works with employers and governments to promote Transportation (or Travel) Demand Management (TDM) options to reduce traffic congestions. Examples of Transportation Demand Management options are commuter vanpools and carpools; working with employers to employ flex-time, telecommuting and compressed work initiatives; managing shuttle services; and promoting walking and bicycling.

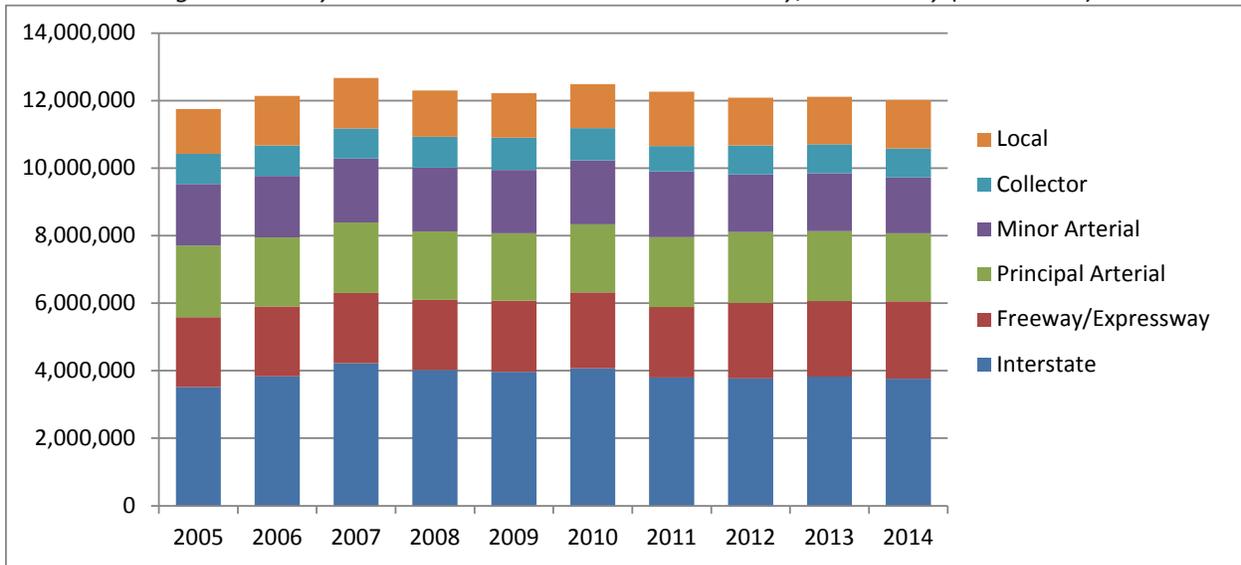
Trends

Vehicle Miles Traveled is Stabilizing

In 2015, approximately 12 million vehicle miles were traveled per day on roadways in Union County, according to the NJDOT Traffic Monitoring Program. Approximately 14% of this travel took place on roadways under Union County jurisdiction. This amount of travel has been relatively consistent since 2006, despite a 5% increase in population over the same period. Daily vehicle miles traveled in Union County consists of the following:

- Approximately 50% occur on interstates, freeways, or expressways,
- Approximately 30% occur on arterial roadways, and
- Approximately 20% occur on collector and local roadways.

Figure 5 - Daily Vehicle Miles Traveled in Union County, New Jersey (2005-2014)

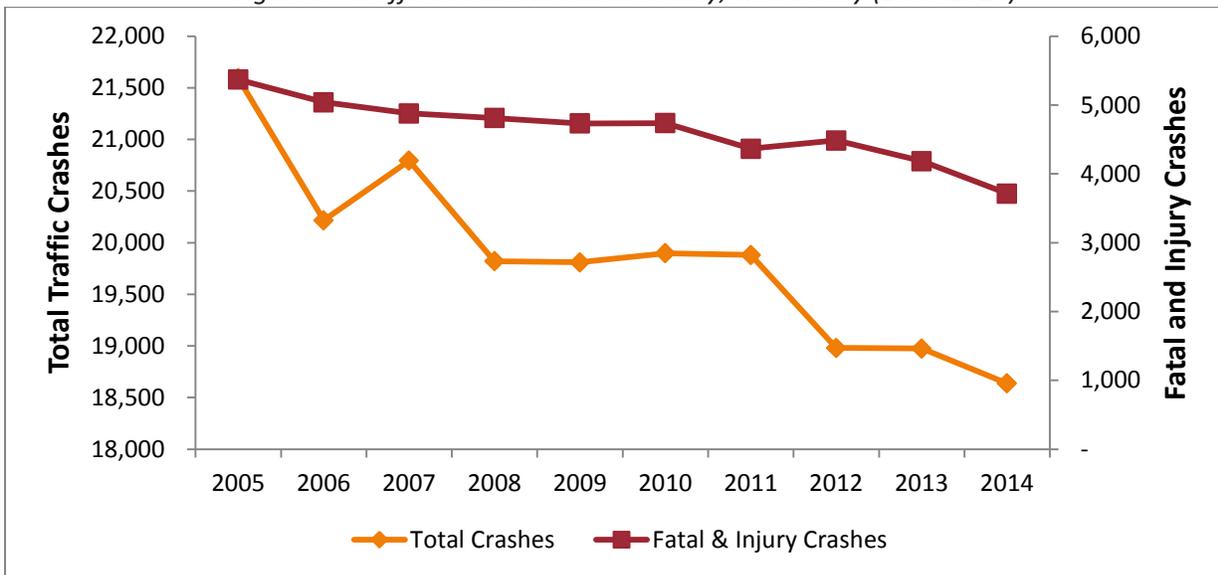


Source: New Jersey Department of Transportation Roadway Information and Traffic Monitoring System Program

Safety

Over the last 10 years, annual traffic crashes on all roadways in Union County declined 14%. This mirrors a statewide trend. The relative severity of these crashes has fallen as well.

Figure 6 - Traffic Crashes in Union County, New Jersey (2005-2014)



Source: New Jersey Department of Transportation Crash Record Database, Highway Safety Manual

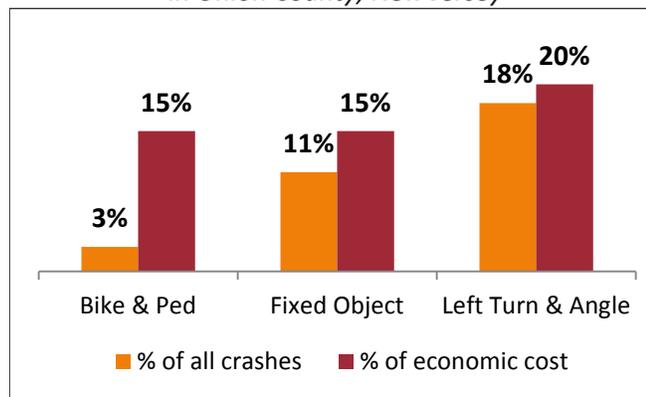
Economic Cost of Crashes

Based on data from the Highway Safety Manual, the economic cost of crashes in Union County has decreased by almost \$150 million, from \$556 million in 2005 to \$413 million in 2014. Approximately 25% of traffic crashes in Union County over this 10-year period occurred on roadways under Union County jurisdiction.

Bicycle and pedestrian crashes represented 2.6% of all crashes in Union County between 2005 and 2014. However, since the severity of these crashes tends to be greater, they represented nearly 15% of the economic cost to society.

Fixed object crashes represented 10.6% of all crashes in Union County, and these represented nearly 15% of the economic cost to society of crashes. Left turn and angle crashes, which are the most common types of intersection crashes, represented 18% of all crashes in the County for the 10-year period, and approximately 20% of the economic cost to society.

Figure 7 - Percent of All Crashes to Percent of Total Economic Cost to Society by Crash Type(2005-2014) in Union County, New Jersey



Safety Countermeasures

The Federal Highway Administration recommends implementing the following nine countermeasures to address crashes that occur in the focus areas of intersections, pedestrians and roadway departure. Given the high cost of these types of crashes in Union County, the following proven safety countermeasures could be effective in improving safety:¹²



Modern Roundabouts



Corridor Access Management



Backplates with Reflective Borders on Traffic Signals



Medians and Pedestrian Crossing Islands



Pedestrian Hybrid Beacons



Enhanced Delineation and Friction for Horizontal Curves



Road Diets (converting 4-lane roads to 3-lane roads)

¹² FHWA, Office of Safety, "Guidance Memorandum on Promoting the Implementation of Safety Countermeasures," January 2012.

Issues and Opportunities

Congestion

North-south travel within Union County is heavily-congested on crossings of Route 22, as there are limited opportunities to cross. Specifically, crossings at Diamond Hill Road/Bonnie Burn Road/Park Avenue in Scotch Plains, New Providence Road in Mountainside and South Springfield Avenue in Springfield are the only crossing opportunities on Route 22 in western Union County. Consequently, these routes are substantially congested during peak hours. Union County has a role in working with the NJDOT and municipalities to address this congestion and find opportunities to provide congestion relief.

Intersection Operations

In Union County, traffic signal equipment is maintained by the municipalities including those on County roadways. Given the high number of traffic signals in the County, the opportunity exists to reduce delays and improve air quality through traffic signal retiming efforts. Delay can be reduced by rebalancing the amount of green time given to each approach based on current traffic conditions and making sure that upon the light turning green one can then proceed through several intersections in a row instead of stopping at every other signal. Past experience has demonstrated that delays can be reduced by 15-20% overall through such efforts. For example, eight years ago the NJDOT retimed signals along Route 82 in Union County and found that delays declined by 25-30%, and vehicle emissions declined by 15-20%. A similar effort on Route 27 in Union County achieved reductions in delays of 10-15%.

The costs of retiming signals include data collection, study and analysis, reprogramming traffic signal controllers and occasionally upgrading some traffic signal controller equipment. These costs are extremely low versus typical transportation infrastructure improvement costs, thus making the cost-benefit ratio quite good. One side benefit of a traffic signal retiming effort is often that the amount of time that pedestrians are given to cross the street is reviewed and brought to current standards. New standards are longer than the older standards that previously existed and are still found in many intersections today. Improving coordination and updating vehicle clearance intervals also often reduces crashes.

Intelligent Transportation Systems (ITS)

Intelligent Transportation Systems (ITS) improve safety and mobility. The ITS technologies enhance productivity through the integration of advanced communications technologies into the transportation infrastructure and vehicles. ITS technologies encompass a broad range of wireless and wire line communications-based information and electronic technologies. Familiar ITS technologies include electronic toll collection, in-vehicle navigation systems, rear-end collision avoidance systems and dynamic message signs. Other ITS applications include:

- emergency vehicle notification systems
- automatic road enforcement including speed cameras
- variable speed limits
- driverless cars
- dynamic traffic light sequencing
- active parking management
- adaptive traffic signal systems

Planned Improvements

I-278 “Missing Links”

Presently, I-278 connects the Goethals Bridge and the New Jersey Turnpike to Route 1&9 only from the south. The PANYNJ, in partnership with the NJDOT, is in the process of designing connections between I-278 and Route 1&9 to the north (for the so called “missing links”). This improvement should reduce regional travel along local roads in Linden and Elizabeth and along Route 439 in Elizabeth.

Goethals Bridge Replacement Project

The PANYNJ Goethals Bridge Replacement Project is currently under construction, and expected to be completed by 2018. The new Bridge will feature more and wider lanes. Three 12 foot wide lanes in each direction will replace two narrow 10 foot wide lanes. A 12 foot wide outer shoulder and a 5 foot wide inner shoulder will be added for both directions. There will be a 10 foot sidewalk/bikeway on the northern edge of the New Jersey bound side, and a central corridor between eastbound and westbound decks that can accommodate future transit.

Implementation Strategies

The proposed strategies to improve and maintain the roadway system include roadway and signal improvements, corridor analysis, safety studies, implementation of ITS and support for municipal Complete Streets policies.

Table 4 - Roadways and Bridges Implementation Strategies

Strategy	
1	Continue to maintain the bridges and roadways of the County system as well as stormwater facilities. Work with the municipalities when needs are identified within the system.
2	Support traffic signal retiming and optimization on County roadways and work with municipalities to find programs to finance the effort.
3	Continue to support NJDOT efforts to reduce congestion and improve state highways in the County including Route 22, 27 and 1&9.
4	Support the construction of a link between I-278 and Route 1&9.
5	Support new technologies which make roadways and vehicles more efficient.
6	Reduce peak hour traffic by working with and encouraging businesses to use Transportation Demand Management (TDM) strategies. Support and integrate activities of EZ Ride Transportation Management Association (TMA).
7	Explore opportunities to reduce congestion.
8	Explore opportunities to improve safety and seek funds for safety improvements.
9	Support municipal and state Complete Streets policy implementation.
10	Support implementation of FHWA roadway safety countermeasures such as corridor access management, medians and pedestrian crossing islands.

B. PUBLIC TRANSPORTATION

Public transportation is critical to mobility in Union County. One in nine households in Union County do not own a car and ten percent of the population commutes to work using public transportation. Union County is well served by multiple transit networks, including rail, bus and Paratransit. Bus and rail services are concentrated at the eastern end of the County and along a small part of the western edge. The train service runs primarily east-west and north-south. The bus route network is structured to focus on travel to Elizabeth, Newark and New York City.



*NJ TRANSIT train on the Raritan Valley Line in Garwood.
Image: VHB*



*The Route 22 Safety Shuttle operated by Union County.
Image: Union County*

Existing Conditions

Rail Service

Union County is served by four NJ TRANSIT rail lines: Northeast Corridor, North Jersey Coast Line, Raritan Valley Line and Morris & Essex Line. Connections are available to all other NJ TRANSIT lines at Secaucus Transfer Station. There are sixteen rail stations in Union County. Below is a description of each rail line.

Northeast Corridor

The Northeast Corridor links Union County to Newark Penn Station, New York Penn Station and Trenton Transit Center with stations in Rahway, Linden, Elizabeth and North Elizabeth. A connection to PATH trains is available at Newark Penn Station. Both the Northeast Corridor and North Jersey Coast Line serve the same Union County stations daily. For either line, passengers can stop at Newark Liberty International Airport station for connections to terminals using AirTrain.

North Jersey Coast Line

The North Jersey Coast Line provides service between New York Penn Station or Hoboken Terminal and Long Branch or Bay Head. The North Jersey Coast Line makes stops in Rahway, Linden, Elizabeth and North Elizabeth. The majority of trains terminate or originate at New York Penn Station, with the rest originating or terminating at Hoboken Terminal. For either line, passengers can stop at Newark Liberty International Airport station for connections to terminals using Airtrain.

Raritan Valley Line

The Raritan Valley Line runs east-west between High Bridge or Raritan and Newark Penn Station or New York Penn Station with stations in Union Township, Roselle Park, Cranford, Garwood, Westfield, Fanwood, Netherwood and Plainfield. The majority of trains terminate or originate at Newark Penn Station. New York bound passengers need to change trains at Penn Station Newark for the last leg of their trip and repeat this on the return trip. Direct service to New York Penn Station during peak hours is currently not feasible due to capacity limitations of the Hudson River tunnels. Direct service to New York Penn Station operates during weekday off-peak, midday and evening hours with the use of dual-mode locomotives.

Morris & Essex Line

The Morris & Essex Line provides service to Hoboken Terminal and New York Penn Station. It is composed of two lines: the Gladstone Branch and the Morristown Line. Summit is served by both the Morristown Line and Gladstone Branch trains while New Providence, Murray Hill and Berkeley Heights are on the Gladstone Branch. The Morris & Essex line has Midtown direct service to New York Penn Station. At Newark, the Morris & Essex trains stop at Broad Station, not Newark Penn Station.

Map 4 - NJ TRANSIT Rail System in Union County, New Jersey

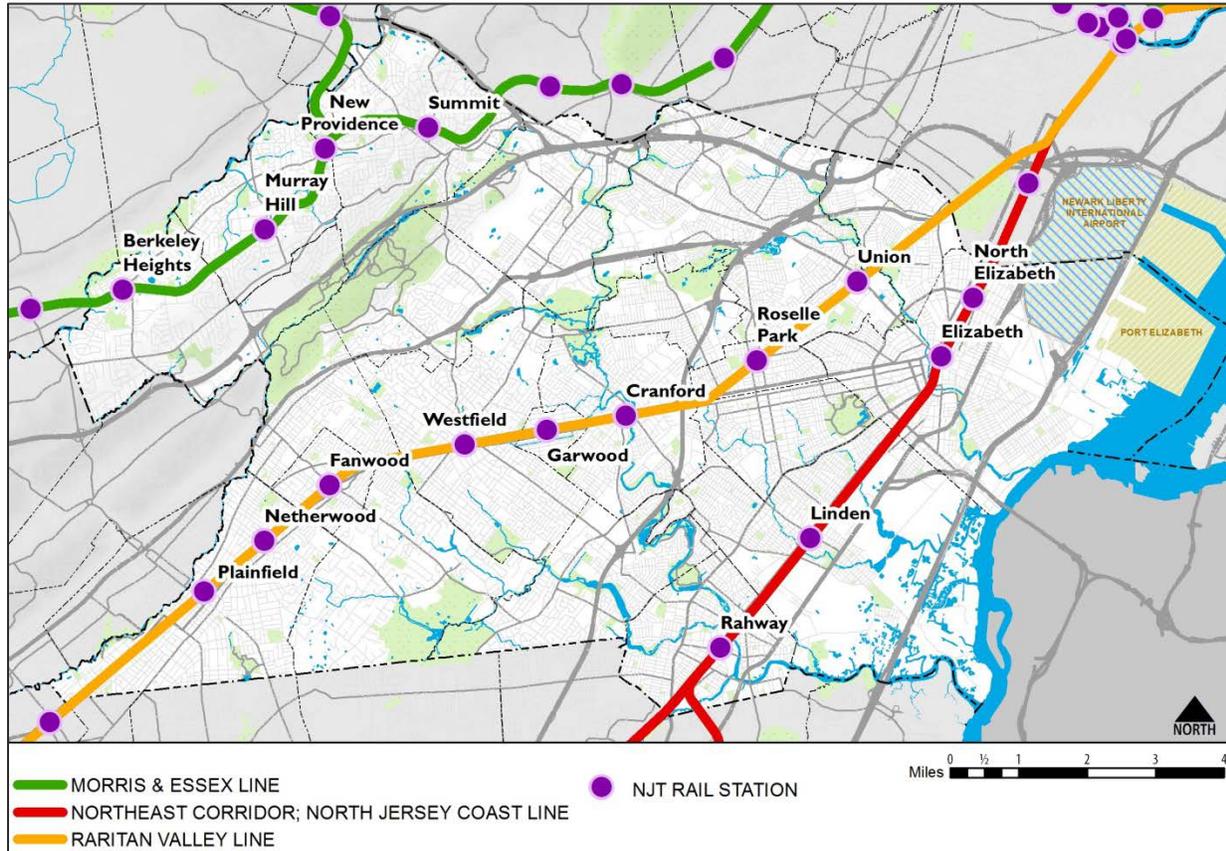


Table 5 - 2014 Average Daily Rail Boardings by Line in Union County, New Jersey

Northeast Corridor; North Jersey Coastline		Raritan Valley Line				Morris & Essex Line	
Station	Avg. Daily Boardings	Station	Avg. Daily Boardings	Station	Avg. Daily Boardings	Station	Avg. Daily Boardings
North Elizabeth	553	Union	1,369	Westfield	2,491	Summit	3,736
Elizabeth	3,843	Roselle Park	856	Fanwood	967	New Providence	539
Rahway	3,245	Cranford	1,349	Netherwood	520	Murray Hill	547
Linden	2,249	Garwood	102	Plainfield	861	Berkeley Heights	511

Data Source: NJ TRANSIT

Fixed Route Bus Service

Multiple bus routes operate in Union County including local, limited and express service. These routes tend to either serve Newark, Elizabeth, New York City or Plainfield.

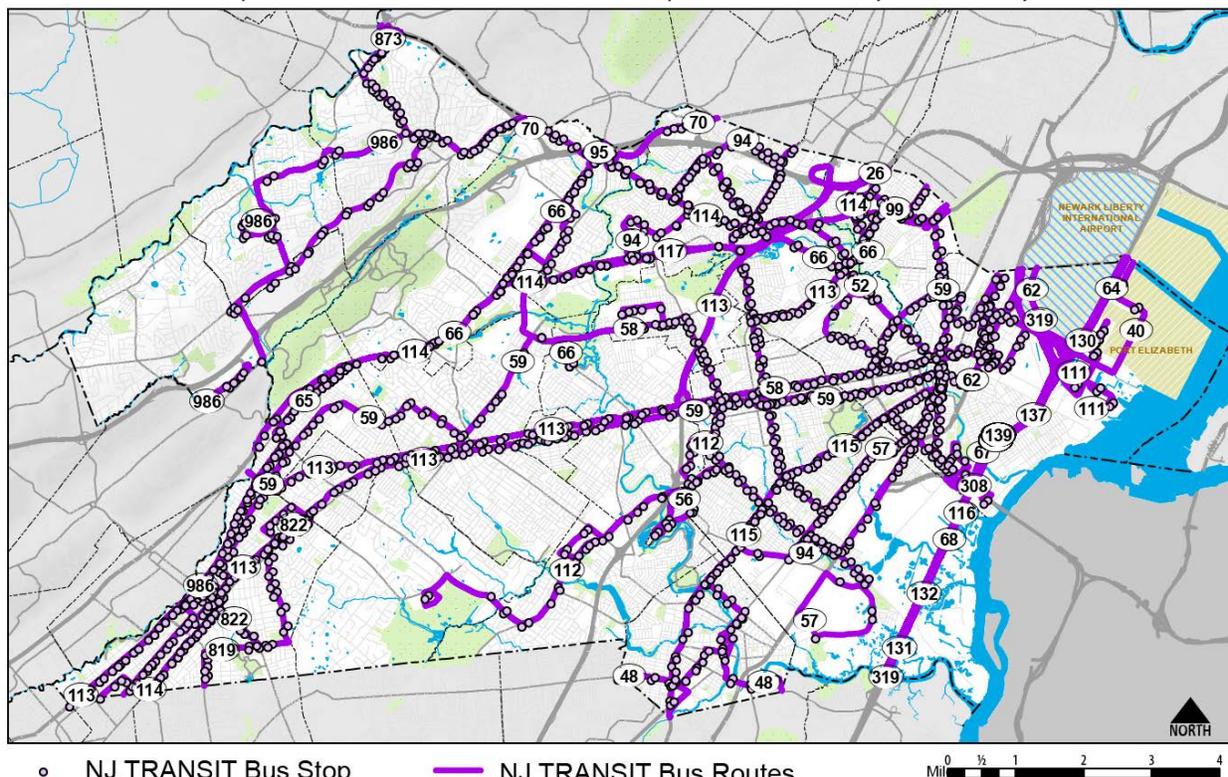


NJ TRANSIT bus in Springfield. Image: VHB

With 25 routes and over 2,100 stops, bus service is primarily provided by NJ TRANSIT. Private bus services within Union County are operated by Coach USA and Lakeland Bus. The Coach USA service connects Elizabeth to Orange, Essex County. Lakeland Bus provides service between New York and Berkeley Heights, New Providence and Summit.

In addition, Union County operates three routes along the center island section of Route 22 in Springfield, Kenilworth and Union Township, providing circulator service to major commercial destinations. Union County also provides Paratransit service for residents over 60 years old or who are 18 years or older and disabled.

Map 5 - NJ TRANSIT Bus Routes and Stops in Union County, New Jersey



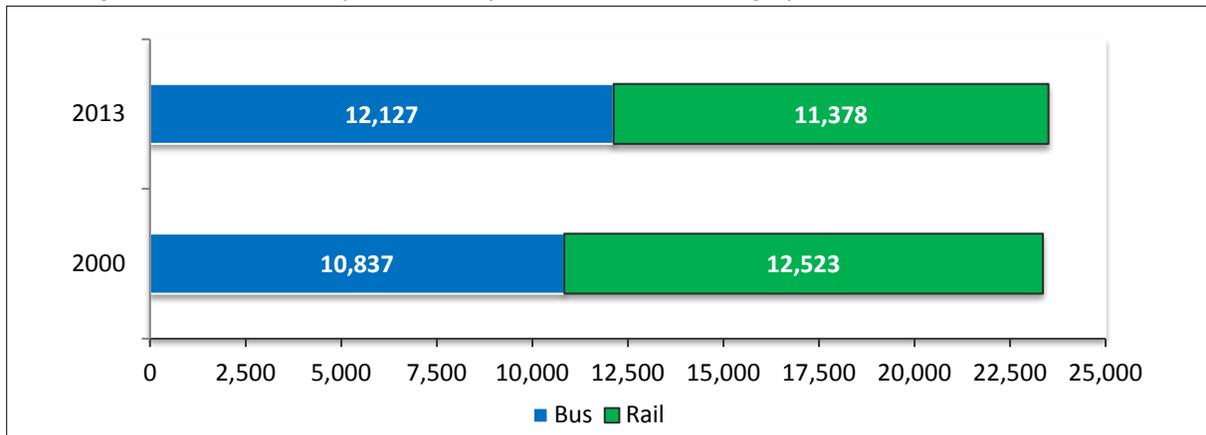
- NJ TRANSIT Bus Stop
- NJ TRANSIT Bus Routes

Data Source: NJ TRANSIT (2015)

Ridership Trends

Transit ridership has generally been increasing in Union County, especially along the Raritan Valley Line and on select bus routes that serve Union County, including Routes 95 and 111. The increase in ridership along the Raritan Valley Line is likely due to the new transit oriented development that has been constructed along that line. Ridership is expected to increase with population and employment. This will complement the already robust ridership on the Northeast Corridor, North Jersey Coast Line and Bus Routes 52 and 94. In 2000, more Union County residents commuted by rail than bus. By comparison in 2013, more Union County residents commuted by bus than rail.

Figure 8 - Union County, New Jersey Residents Commuting by Rail and Bus (2000 to 2013)



Source: 2000 U.S. Census and 2009-2013 ACS

Transit Villages

The Transit Village Initiative creates incentives for municipalities to redevelop or revitalize the areas around transit stations using design standards of transit-oriented development (TOD). TOD helps municipalities create attractive, vibrant, pedestrian-friendly neighborhoods where people can live, shop, work and play without relying on automobiles. Six of NJDOT and NJ TRANSIT’s 30 designated Transit Villages are located in Union County. They are Rahway, Cranford, Elizabeth, Linden, Summit and Plainfield.

In addition to promoting community revitalization, the Transit Village Initiative aims to reduce traffic congestion and improve air quality by increasing transit ridership. Studies have shown that adding residential housing options within walking distance of a transit facility, typically within a half-mile radius, increases transit ridership more than any other type of development. Therefore, one of the goals of the Transit Village Initiative is to bring more housing, businesses and people into the neighborhoods around transit facilities.

Benefits of Transit Villages

- State of New Jersey commitment to the municipality’s vision for redevelopment.
- Coordination among the state agencies that make up the Transit Village Task Force.
- Priority funding from some state agencies.
- Technical assistance from some state agencies.
- Eligibility for NJDOT grants.



Park Square development in Rahway. Image: Landmark

Issues and Opportunities

Based on the data collection and information received during the formulation of this Master Plan, a gap analysis was conducted to identify key issues in transit service, the planned projects that would address these issues and the additional efforts that Union County could undertake or advocate to improve these key issues.

Network Connectivity

Overall, Union County is well served by transit, with rail and bus service connecting major centers of population and employment. Employment in Union County is highest in Elizabeth and Union Township. The majority of Union County employment growth in 2040 is forecasted to be in Elizabeth (+15,619) followed by Union Township (+7,180) and Linden (+5,659). Summit, Cranford and Kenilworth will also see increases in employment and continue to be important secondary job centers in the County. Additionally, Union County is expected to see approximately a 20% growth in its 2010 population within the next 15-20 years¹³.

Table 6 - Employment, Growth and Projections in Union County, New Jersey

	2010 Employment	2040 Employment	Change from 2010 - 2040 (Absolute)	Change from 2010 - 2040 (Percentage)
Elizabeth City	48,130	63,749	15,619	32%
Union Township	32,460	39,640	7,180	22%
Linden City	18,480	24,139	5,659	31%
Summit City	15,650	20,368	4,718	30%
Kenilworth Borough	14,850	16,508	1,658	11%
Cranford Township	13,680	16,708	3,028	22%
Rahway City	12,960	16,068	3,108	24%
Springfield Township	10,750	12,633	1,883	18%
Westfield Town	9,820	13,239	3,419	35%
New Providence Borough	9,050	10,248	1,198	13%
Plainfield City	8,500	11,579	3,079	36%
Berkeley Heights Township	7,550	9,343	1,793	24%
Hillside Township	7,060	9,302	2,242	32%
Clark Township	6,680	7,929	1,249	19%
Scotch Plains Township	6,070	7,649	1,579	26%
Mountainside Borough	5,770	6,390	620	11%
Roselle Borough	4,480	6,240	1,760	39%
Garwood Borough	2,070	2,649	579	28%
Roselle Park Borough	1,960	3,100	1,140	58%
Fanwood Borough	1,150	1,492	342	30%
Winfield Township	10	136	126	1260%

Source: NJTPA Regional Transportation Plan Forecasts, 2040

¹³ NJTPA Regional Transportation Plan Forecasts, 2040

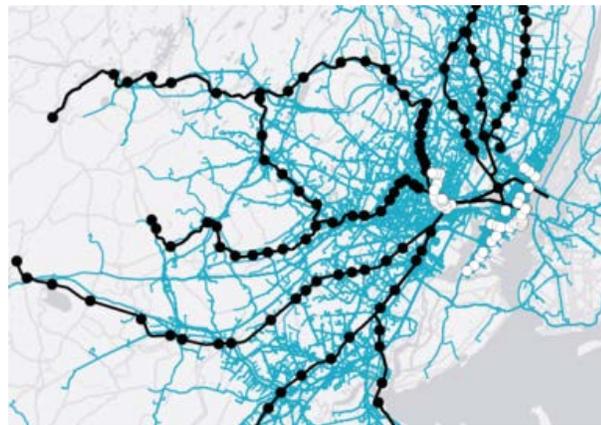
Union County is home to six major office parks, listed below in *Table 7 - Major Employment Centers in Union County*. With the exception of the Liberty Hall Corporate Center, which is located adjacent to the Union Township Train Station, most of these developments are not near a train station and, if served by shuttle buses, the overall levels of service are limited.

Table 7 - Major Employment Centers in Union County, New Jersey

Name Office Park	Address	Town	Transit Access?
Liberty Hall Corporate Center	Morris and North Avenue	Union	Yes
Connell Corporate I & II	200 Connell Drive	Berkeley Heights	Yes
Cranford Business Parks	14/25 Commerce Dr.	Cranford	Limited
65 Jackson Drive		Cranford	Limited
Cranford Office & Industrial Park	Commerce Drive	Cranford	Limited
Morris Plaza I & II	Morris Avenue	Union	Yes
Murray Hill Inn and Office Park	South St. and Central Ave.	New Providence	Yes

Source: Office park information from the Union County Economic Development Corporation 2014 Union County Economic and Demographic Profile. Transit access is based on primary research by VHB.

The majority of transit links focus on travel to Elizabeth, Newark and New York City. The journey-to-work data from the 2013 ACS 5-year estimates indicates that 45% of Union County residents work within Union County, and only four percent of those workers commute via public transit.¹⁴ As employment centers develop beyond these cities, there will be a need for improved intra-county connectivity. The County might explore with NJ TRANSIT the potential for bus service that provides additional connectivity through the County, such as Plainfield to Rahway, or Rahway to Cranford.



In addition to local taxi service, there is a growing use of carshare services like Uber for last mile trips. This map shows Uber trips in blue that originated or ended one-eighth of a mile from an NJ TRANSIT rail line or station, shown in black, or from Light Rail/ PATH stations, shown in white. In September 2015, 25% of Uber's 1.3 million trips region-wide were from commuters making that last part of their journey between stations and their destination. Source: NJ.com

Access to Transit

Some NJ TRANSIT stations along Union County's commuter rail lines such as Rahway have been upgraded or, as is the case with Elizabeth, will be upgraded. Other stations, including the smaller stations along the Gladstone Line (like Berkeley Heights, Murray Hill and New Providence) and Raritan Valley Line (like Garwood, Fanwood, and Netherwood), have not been fully modernized with high-level platforms and other amenities. High-level platforms lower overall dwell time at stations. Dwell time is the time a train spends at a station while passengers board or alight the train. Upgrading every platform to be ADA compliant would not be cost-effective. NJ TRANSIT has developed an implementation plan and policy that identifies key stations for ADA accessibility upgrades. See *Table 8 – Stations with*

¹⁴ US Census, Journey to work County-to-County Commuting Flows by Travel Mode for the United States and Puerto Rico, 2009 – 2013.

Handicapped Accessible Boarding and Alighting on the following page. A challenge for Garwood on the Raritan Valley Line is more train service to its community. While several stops were added, more will be needed to complement Garwood’s plan for transit oriented development nearby the station.

Pricing, supply and availability of parking spaces varies from station to station in Union County. This leads to shortages that municipalities must face at some stations. In addition, while some stations have seen recent parking expansions, there is a major deficiency at most stations and the lack of capacity is an issue for the host municipalities. The ability to upgrade this parking is dependent on the availability of land, local traffic concerns, site suitability and other issues.

All of the stations in Union County have bike racks or bike lockers. In addition to opportunities to improve train station accessibility, there are multiple locations in the County where there are opportunities to improve sidewalk connectivity and amenities such as shelters at bus stops. The desire for better transit connectivity and amenities was reflected in public outreach.

More work can be done to expand and improve access to transit for all modes. This can be accomplished through the addition of sidewalks near bus stops or train stations, addition of bike infrastructure at train stations, or expansion of parking capacity. There is presently shuttle service to train stations in Union Township and Springfield. Union County conducted the “Community Shuttle Efficiency Study” in 2005 and it outlined the steps to consider launching such a service. Where feasible and with sufficient demand, the option of a shuttle can be explored further in the future. The Union Township shuttle runs on a fixed route and serves the Union Township rail station on the Raritan Valley Line. The Springfield Park & Ride Jitney operates between the Community Pool parking lot in town and the Short Hills rail station on the Morris & Essex Line.

Table 8 - Stations with Handicapped Accessible Boarding and Alighting

	Station	Handicapped Accessible?
Northeast Corridor; North Jersey Coast Line	North Elizabeth	Yes
	Elizabeth	Yes
	Rahway	Yes
	Linden	Yes
Raritan Valley Line	Union	Yes
	Roselle Park	No
	Cranford	Yes
	Garwood	No
	Westfield	Yes
	Fanwood	No
	Netherwood	No
Plainfield	Yes	
Morris & Essex Line	Summit	Yes
	New Providence	No
	Murray Hill	No
	Berkeley Heights	No

Reliability and Capacity of Existing and Future Transit Service

The prevalent issues for bus routes in the County are travel time and reliability, with many routes having peak end-to-end travel times of more than an hour. While most customers do not travel the full route, the overall travel times indicate that roadway congestion, stop frequency, route structure, high ridership and roadway infrastructure impede the provision of efficient travel times and reliable service. Although NJ TRANSIT’s MyBus provides real time travel information for trip origins, once passengers are on the bus they are affected by travel time delays due to congestion. NJ TRANSIT collects information through their Smart Bus systems. The Smart Bus data permits evaluation of traffic conditions, weather, detours, access in and out of bus stops and variable passenger loading time.

The two highest volume bus routes, Route 52 and Route 94, operate along some of the most heavily traveled corridors in the County, Morris Avenue and Stuyvesant Avenue in Union Township. Bus priority treatments on highways and key roadways, such as transit signal priority at traffic lights, bus lanes and queue jumps could improve transit timeliness. These types of treatments, for example, transit signal priority, can be implemented independently in small sections within a single municipality or along an entire corridor. The implementation of such priorities should include education and public outreach on how these bus priority treatments function. When combined with other measures such as off-board fare collection, defined stations, exclusive lane use and branded buses, they result in a bus rapid transit corridor. These technologies and infrastructure investments have been proven to greatly enhance transit service reliability and trip time.

While improvements in the transit system are necessary, so is the need to advocate for an affordable transit fare structure. The continued rise in fares has and will continue to have an impact on the affordability of travel within and outside of Union County as well as the attractiveness of the County to business owners and residents. In particular, the emphasis on commuters bearing an increasing share of transit funding has created hardships for transit dependents (low income, zero car and elderly households) and has restricted the affordability radius for access to jobs. It is important to continue to advocate for a balanced method of funding the transit system including state and federal subsidies, private investment (including advertising and other opportunities), and the implementation of cost efficiencies in addition to the reasonable contribution of fare revenues.

Planned Projects

Projects being planned to increase transit usage and solve some of the gaps in service identified within Union County include the following:

The Gateway Project

The Gateway Project is a proposal to create new Hudson River Rail tunnels and infrastructure capacity along the Northeast Corridor between Elizabeth and New York as well as the expansion of New York Penn Station and the replacement of the Portal Bridge, an over 100-year old bridge along the Northeast Corridor. This project would allow for additional train capacity between New Jersey and New York. Construction of the project would result in more direct and frequent rail service between Union County and New York on the Raritan Valley Line as well as improved Northeast Corridor and Morris & Essex Line service.

PATH Train Extension to Newark Airport

The proposed extension of the PATH train to the Newark Liberty International Airport AirTrain station is under study. It would provide enhanced connectivity with PATH service to Jersey City and New York City for travelling residents of Union County and possibly for those reaching jobs at the airport.

Elizabeth Station Redesign

NJ TRANSIT is currently redesigning Elizabeth Station, which will include new elevators, stairs, ticket office, retail space and improved connectivity for passengers transferring trains and buses or other modes including taxis, bikes or private motor vehicles.

Rahway – Elizabeth Track Expansion

The *New Jersey State Railroad Plan* (2015) indicates a planned track expansion between Rahway and Elizabeth along the Northeast Corridor as a potential future improvement for capacity and travel time.

Morris & Essex Lines Track Expansion

The *New Jersey State Railroad Plan* (2015) lists a planned track expansion and interlocking improvement between Summit Station and Milburn Station as a potential future capacity and reliability improvement.

Raritan Valley Line Improvements

There are two critical projects planned that would help to improve capacity along the Raritan Valley Line. According to the Northeast Corridor Commission, Amtrak and NJ TRANSIT are working together on the preliminary engineering and environmental analysis of constructing the Hunter Flyover just west of Newark Penn Station. This flyover would allow eastbound Raritan Valley Line trains to cross the busy Northeast Corridor without impacting Northeast Corridor capacity. According to the *New Jersey State Rail Plan (2015)*, NJ TRANSIT is exploring adding a third track between Bridgewater and Roselle Park, and also between Roselle Park and Newark Penn Station (Lehigh Line Improvements) which would allow NJ TRANSIT to operate express service and improve overall operations.

Bus Priority Improvements

The proposed Union Sustainability Corridor would create a Bus Rapid Transit line off-road along the former Central Railroad of New Jersey right-of-way between Cranford and Newark Liberty International Airport and on-road between Plainfield and Cranford. A Bus Rapid Transit line would shorten the time to travel across the County.

Implementation Strategies

The strategies below are designed to address issues related to transit mobility, coordination of services, equity of accessibility and connectivity to existing public transportation facilities.

Table 9 - Public Transportation Implementation Strategies

Strategy	
1	Advocate for improvements to station facilities and station access in Union County.
2	Continue to advocate NJ TRANSIT for additional rail service.
3	Support transit-supportive land use policies in Union County.
4	Encourage the installation of enhanced amenities and infrastructure at bus stops.
5	Identify opportunities for multi-modal facilities.
6	Encourage NJ TRANSIT to schedule better coordinated connections between bus routes.
7	Support fares at equitable levels.
8	Support shuttle and reverse commute service.
9	Advocate for improvements to public transportation including bus routes and rail service in Union County.
10	Support and advocate for the construction of major infrastructure projects that would enhance rail service in New Jersey.

C. GOODS MOVEMENT

Union County plays an important role in New Jersey's and the regional economy. It is home to some of the most intensive freight activity in the northeastern United States. The County is served by all modes of freight transportation, including truck, rail, water, air and pipeline. The transportation system and the industries it serves include interstate highways, major railroads, the Port Newark/Elizabeth Marine Terminal and many industrial sites throughout the County. The southern portion of Newark Liberty International Airport is also located in Elizabeth, within Union County.



Port of Newark/Elizabeth. Image: VHB

The importance of freight transportation in Union County is reflected in recent data compiled by the NJTPA in its *2040 Freight Industry Level Forecasts*. The information in this document includes the following as of 2010:

- Union County is home to more than 26,000 businesses that employ nearly 225,000 people.
- 35% of these jobs are in industries that depend heavily on freight transportation services and infrastructure.
- There are about 700 warehousing/distribution buildings and 300 manufacturing facilities located in the County.

Existing Conditions

The existing freight transportation infrastructure in Union County is documented in this section, along with current issues and characteristics of freight service.

Highway/Trucks

Union County is served by an extensive network of interstate, federal, state and County roads that provide access to local land uses and carry substantial volumes of through traffic. Trucks accessing the County typically use major limited-access highways, and the County is served by a network of secondary and collector roads that provide access to local industrial sites.

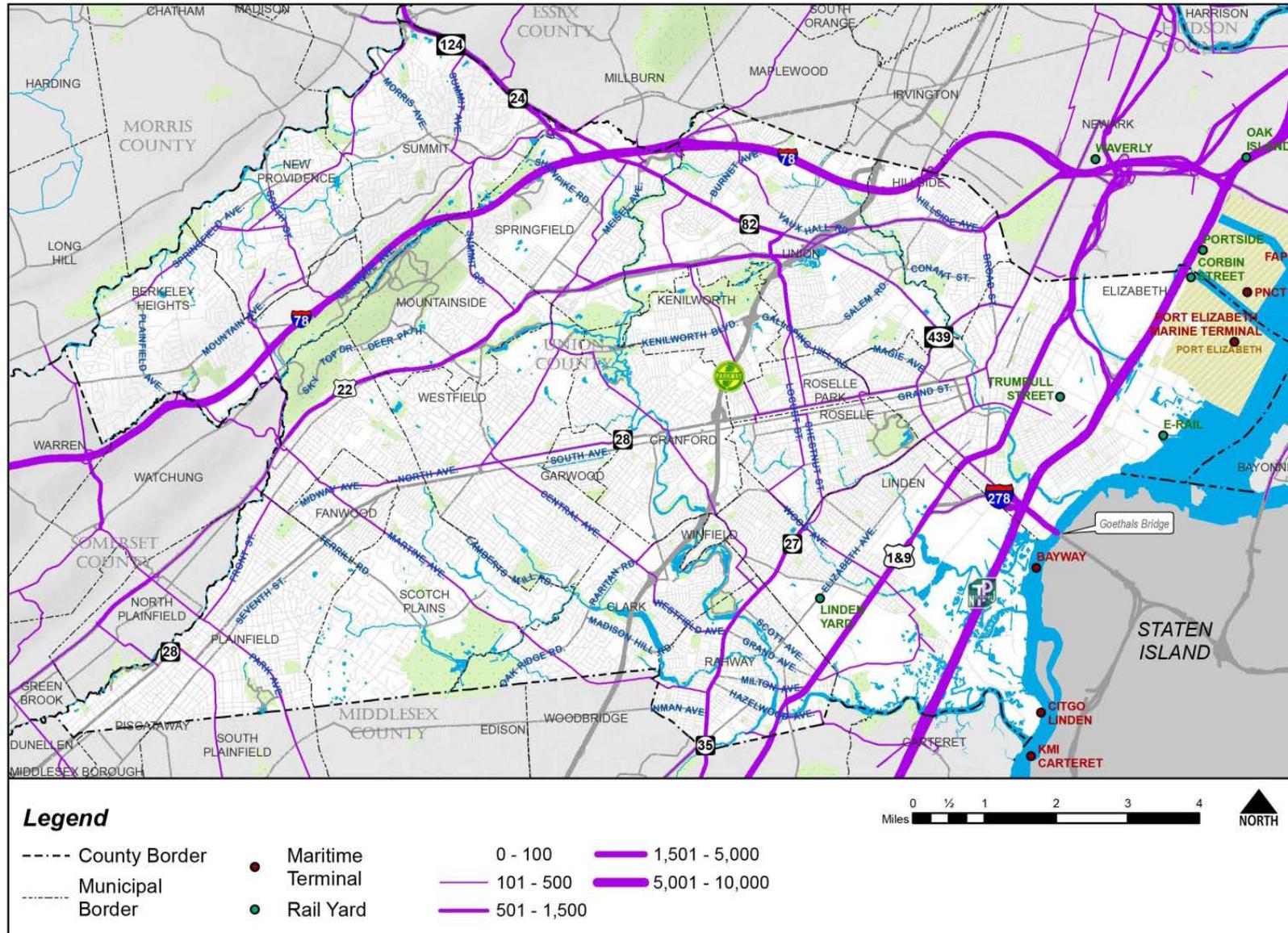
Truck Access: Major Roadways

Major roads in the County that are used by trucks include the following:

- The New Jersey Turnpike (I-95)
- Interstate 78 (I-78)
- Interstate 278 (I-278)
- Routes 1&9
- Route 22
- Route 24
- Route 81
- The Goethals Bridge

In addition to the major roads listed above, other state highways in Union County that provide access to local industrial sites include Routes 27, 28, 82 and 439. Baseline (2010) truck volumes in Union County from the NJRTM-E are shown in *Map 6 - 2010 Daily Truck Volume* on the following page.

Map 6 - 2010 Daily Truck Volume in Union County, New Jersey



Data Source: NJTPA NJRTM-E Model

Truck Size and Truck Routes

Truck size is an important issue in older metropolitan areas where many of the roads were designed when trucks were smaller. Much of the highway system in northern New Jersey is comprised of roadways that predate the interstate era and are inadequate by modern standards.

Roadway limitations include lane widths of less than 12 feet, small curve radii for trucks, vertical clearance issues, substandard sight distances, short ramps and limited acceleration lanes. The resulting challenges are most evident where trucks using limited-access highways such as the New Jersey Turnpike and I-78 must use local roads and older federal highways such as Route 1&9 and Route 22 to access local industrial and retail sites.



Bayway Circle. Image: VHB

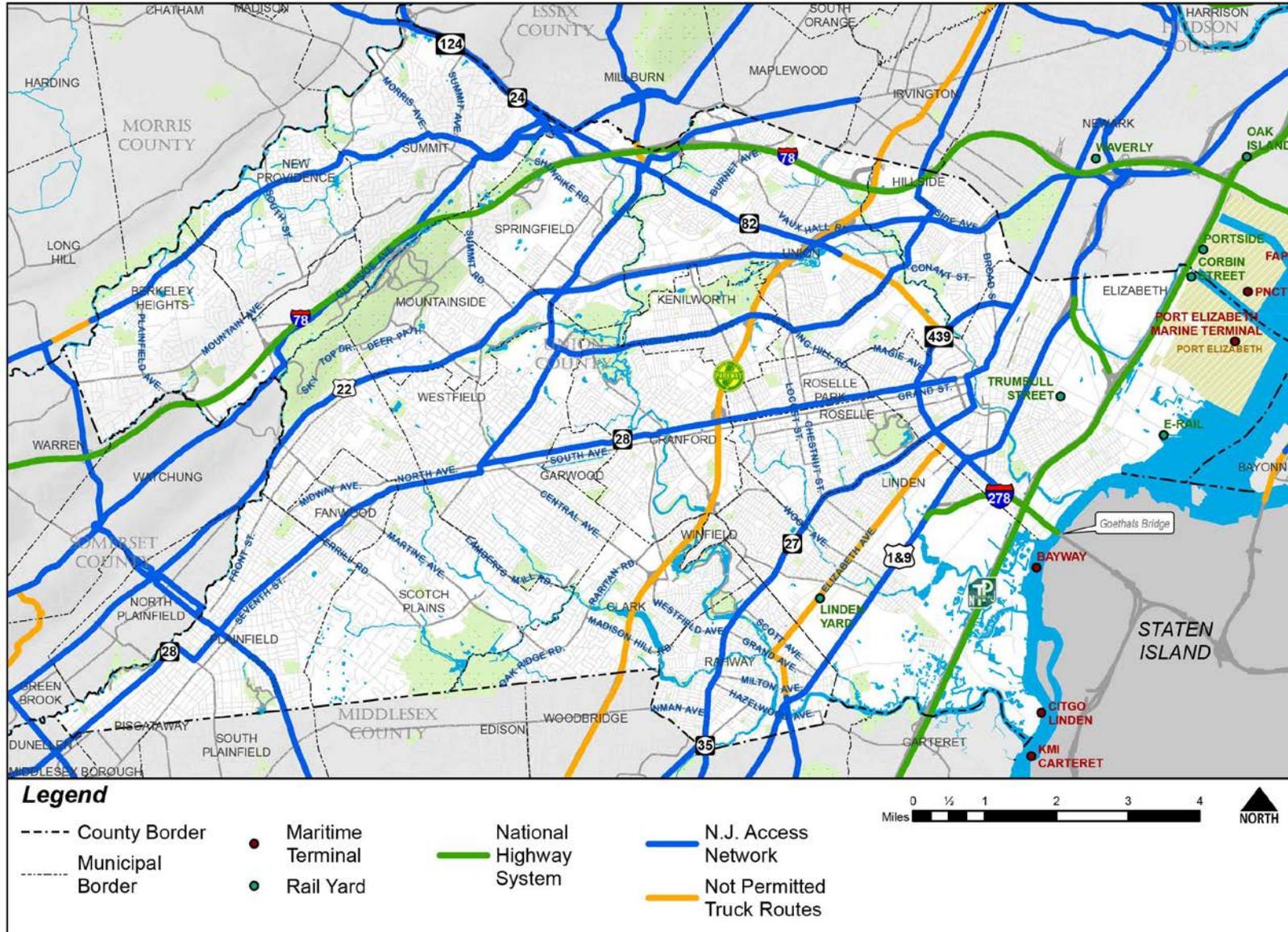
The interstate highways are accessible to double-combination, or two trailer trucks and 53-foot long, 102-inch wide trucks. State highways are also generally designated as appropriate routes for 102-inch wide trucks. But there are a number of roadway segments that are not appropriate as through routes due to a number of factors. These factors include minimum lane width considerations and connectivity needs for the rest of the network. At the state level, limits on trailer sizes are governed through N.J.A.C. 16:32, which reflect guidance from the federal government. Two major roadway segments in Union County included among the restricted segments under N.J.A.C. 16:32 are:

- Route 82 between Kingswood Road and Route 439 in Union Township
- The Garden State Parkway for its entire length in Union County

The State of New Jersey's designated Truck Access Network, which includes all restricted roadway links described in N.J.A.C. 16:32¹⁵, is shown for Union County in *Map 7 - Designated Truck Routes* on the following page.

¹⁵ Additional 500 and 600 series county roadway links that are not appropriate as "through routes" are listed under Appendices B and C of N.J.A.C. 16:32

Map 7 - Designated Truck Routes



Data Source: NJDOT

Railroads

Union County is served by both of the major eastern U.S. Class I railroads, NS Corp (NS) and CSX Corp.¹⁶ Most freight rail service in Union County is operated through the Conrail Shared Assets Operations (CSAO). The CSAO is jointly owned by NS and CSX and functions as a local switching railroad in the Port District as well as nearby industrial areas.¹⁷ Freight rail customers in the CSAO territory can be served by either of the Class I railroads and these customers have the benefit of competitive pricing.



Image: PANYNJ

Key Lines and Carriers

Lehigh Line

The Lehigh Line is the major east-west freight rail link in northern New Jersey, connecting the Port District and surrounding industrial areas with the national rail system through Pennsylvania. In Union County, the Lehigh Line is in the Conrail Shared Assets territory east of Bound Brook and is known as the Conrail (CR) Lehigh Line. It is used by both NS and CSX. At Bound Brook, CSX's West Trenton Line splits off and runs to the southwest, and the Lehigh Line, owned by NS, continues west into Pennsylvania.

The Lehigh Line is one of the busiest rail lines in the nation, with NS and CSX operating up to 44 daily trains through Union County. Operations along this line segment directly impact many communities in the County including Clark, Westfield, Cranford, Roselle, Roselle Park, Union and Hillside. NJ TRANSIT operates passenger rail service, the Raritan Valley Line, on this alignment between Cranford and Amtrak's Northeast Corridor Line in Newark. The combined passenger-freight use along this segment presents some operational challenges for both passenger and freight trains.

Garden State Secondary

The Garden State Secondary, known locally as the Chemical Coast Line, is also part of the CSAO system, serving both NS and CSX customers. The line runs alongside the New Jersey Turnpike through the entire County, serving customers in the chemical and petroleum industries, including the Phillips 66 Bayway Refinery in Linden. Activity on this line has grown substantially in recent years with the increased use of ethanol as a gasoline additive and with increased crude oil shipments by rail from the Bakken deposit in the northern Great Plains.

Northeast Corridor

The Northeast Corridor is a passenger railroad serving regional Amtrak and NJ TRANSIT commuter trains. Freight trains operate during off-peak hours on parts of the line. The level of freight activity on the Northeast Corridor has diminished considerably since the GM plant in Linden and Ford plant in Edison were closed. The Northeast Corridor serves as an alternative rail connection to the Bayway Refinery.

¹⁶ Class I railroads are defined by the U.S. Transportation Board as those with \$250M or more in annual operating revenue, as measured in 1991 dollars. Short line (Class III) railroads are those with less than \$20 million in annual operating revenue, in 1991 dollars.

¹⁷ The Port District includes approximately 1,500 square miles in New York and New Jersey, as defined under the original Port Authority of NY & NJ charter of 1921. It is generally defined as a 50-mile radius centered at the Statue of Liberty. Union County lies entirely within the Port District.

Arthur Kill Lift Bridge

The Arthur Kill Lift Bridge connects New Jersey to Staten Island on the north side of the Goethals Bridge. This bridge was rehabilitated and restored for active use in 2006. It connects a number of industrial sites along the west shore of Staten Island to the national rail system on the Garden State Secondary, Chemical Coast Line including the New York Container Terminal at Howland Hook in Staten Island and the Staten Island Transfer Station at Fresh Kills.

Staten Island Railroad

The Staten Island Railroad is owned by the State of New Jersey. The County of Union has an access and use agreement for the rehabilitation and reactivation of the line as part of the Union County Rail Freight Project. The rehabilitation of the line was funded by NJDOT. The only portion of the line that is currently operable is located in the vicinity of the Bayway Refinery in Linden. The Morristown & Erie, which is the operator retained by Phillips 66 Bayway Refinery in Linden, uses the easternmost segment of the Staten Island Railroad alignment to store rail cars as part of its switching operation at the refinery.

Rahway Valley Railway

The Rahway Valley Railway is owned by the State of New Jersey but is currently inactive. The line runs from Roselle Park to Summit; the right-of-way is continuous but the rail infrastructure is not, and there has been encroachment on the right-of-way along sections of the line.

All of the Class I freight rail lines in Union County described above, with the exception of the Northeast Corridor, can accommodate 286,000-lb. rail cars. This is an important benefit for rail-dependent industries in the County because these customers can handle rail cars that are loaded to a weight limit that is standard for much of the nation's freight rail system. This provides freight rail customers operational flexibility and rail pricing advantages over industrial sites along lines where rail cars must be under-loaded to meet lower weight limits.

There are several notable rail system initiatives identified in NJDOT and NJ TRANSIT's *New Jersey State Rail Plan* (2015) that directly affect Union County. These include:

- The PANYNJ's ExpressRail improvements along the Portside Industrial Track at Port Newark/Elizabeth;
- Incremental capacity expansion along the Lehigh Line from Port Reading Junction in Manville to Oak Island Yard in Newark, including the improvements described previously in the Public Transportation section of this Master Plan to add a third track between Cranford and Newark; and
- Capacity expansion and an upgraded train control system along the Chemical Coast Line.

The County's freight rail system is illustrated in *Map 8- Rail Line by Owner*.

Railroad Bridges and Grade Crossings

There are a number of locations in Union County where the road and rail infrastructure presents potential constraints to current or future freight transportation. These include highway-railroad grade crossings and locations where major roadways in the County have overhead bridge clearances below 14'-0" along the freight and passenger rail lines.

The lowest overhead bridge clearances in Union County are typically found in the urban centers of Elizabeth along the Northeast Corridor Line and Plainfield on the Raritan Valley Line.

Port/Marine Terminals

Port Newark/Elizabeth is home to the largest containerized, deep-water shipping terminals on the East Coast of the U.S. In 2015, The Port of New York was ranked third among U.S. and Canadian ports at 6,371,720 TEUs (twenty-foot equivalent units), a 10.4% increase since 2014.¹⁸ ExpressRail, the Port Authority’s ship-to-rail system serving New York and New Jersey marine terminals, also had a record year. In 2015, ExpressRail handled 522,224 containers, up 12.2% from the previous record year of 2014 when 465,407 containers were handled.¹⁹ It is important to note that Port Newark/Elizabeth is the largest complex in the Port of New York & New Jersey, but the figures cited in this section include marine terminals in Bayonne, Staten Island and Brooklyn.

Figure 9 - PANYNJ Marine Terminals



Source: PANYNJ

Table 10 - Port of NY/NJ Tonnage (2004-2015)

Cargo Type (in metric tons)	2004	2015	% Change
General Cargo Tonnage	25,474,164	6,781,000	44.4%
Bulk Cargo	55,169,827	36,827,000	-33.2%
Total Bulk and General Cargo	80,643,991	73,608,000	-8.7%

Source: 2014 Trade Statistics, The Port Authority of New York and New Jersey (June 2016)

Table 11- Port of NY/NJ Containers (TEUs) (2004-2015)

Type	2004	2015	% Change
General Cargo Tonnage	4,454,192	6,371,720	43.0%

Source: 2004 figures from Port Import-Export Reporting System (PIERS) 2015 figures from http://www.panynj.gov/port/pdf/2015-Port-Trade_Statistics.pdf

The two major marine terminal operators at Port Elizabeth are Maher Terminals and APM Terminals. The Maher facilities cover 454 acres and operate with nineteen container cranes, while the APM

¹⁸ "Top 10 US & Canadian Ports," 2014 Trade Statistics, The Port Authority of New York and New Jersey (April 2015)

¹⁹ "Port Newark Reports Record-Setting Cargo Volumes For 2015." Newark, New Jersey Patch. N.p., 12 Aug. 2015. Web. <<http://patch.com/new-jersey/newarknj/port-newark-reports-record-setting-cargo-volumes-2015>>

terminals cover 350 acres and use fifteen cranes. Crane capacity and operations are key elements of a container port. The cranes unload ships by lifting containers from the cargo hold and placing them on container truck chassis for movement to the container storage locations on the pier. The process is reversed to load ships on an outbound move.

The PANYNJ identified roadway access constraints to the Port Newark/ Elizabeth complex along North Avenue. Several of the considered improvements are part of the *Kapkowski Road Transportation Planning Area Study (2003)*. They include intersection modifications to improve the efficiency of turning movements, new traffic signals and geometric roadway improvements. A new flyover of the North Avenue and Kapkowski Road intersection and grade separations along North Avenue at Dowd Avenue and Division Street was included in the long-term configuration of the roadway system in this area.

Air Cargo

Newark Liberty International Airport handled nearly 450,000 tons of domestic air cargo and more than 255,000 tons of international air cargo in 2015, making it the largest airport in the New York City region for domestic cargo. JFK International Airport, by comparison, reported nearly 235,000 tons of domestic cargo and 1.09 million tons of international freight. This reflects an ongoing trend of segmentation in the air cargo industry, with JFK serving mainly as an international hub and Newark serving the small-parcel and overnight shipping subsector of the industry.

The south area of Newark Liberty International Airport, which is located in Union County, has a large FedEx complex consisting of three buildings on the airport property. Newark Airport is FedEx's third largest cargo hub and FedEx is the second largest tenant at the airport. UPS currently operates in the South Area of the airport and is scheduled to move to a new facility in the North Area at the end of 2018.

Linden Municipal Airport is a public airport that serves private, corporate and charter aircraft. It has no cargo facilities and does not serve any major cargo carriers.

Trends

Truck Volumes

According to the NJTPA's North Jersey Regional Transportation Model – Enhanced (NJRTM-E) 2040 forecasts, truck volumes are projected to increase over the next several decades. Much of this truck traffic in Union County is expected to occur on highways and state jurisdiction roadways, such as the New Jersey Turnpike, I-78 and Route 1&9. Additionally, Route 22 and Route 24 are expected to experience growth in truck volumes. Truck volumes are also expected to increase on roads supporting port operations, reflecting an expected increase in future port traffic at Port Newark/Elizabeth. The largest projected increases in daily truck volumes between 2010 and 2040 on County roads are shown on the following page in *Table 12*.

Table 12- Largest Projected Increases in Truck Volumes on Union County Roads by 2040

Route	Street Name	Increase in Daily Truck Volume ²⁰
CR-617	Wood Avenue	349
CR-621	East Hazelwood Avenue	304
CR-619	Chestnut Street	270
CR-509 Spur	Springfield Avenue	259
CR-635	Mountain Avenue	257

Source: NJTPA NJRTM-E

Future Commodity Flows

In 2011, the NJTPA completed the *2040 Freight Industry Level Forecasts*. In 2011, the NJTPA completed the 2040 Freight Industry Level Forecasts. According to this study, the “Warehousing and Distribution Center” sector was the predominant industrial sector for domestic freight transportation in Union County in 2010, with 15.9 million tons of commodities handled. This sector is forecasted to remain the prevalent mover of tonnage by 2040, shipping nearly 23 million tons, a growth of 44%. “Petroleum and Coal products” (7.8 million) and “Chemicals and Allied Products” (6.4 million) are listed as the 2nd and 3rd highest tonnage sectors by 2040, respectively. The category of “Freight of all Kinds”, “Municipal Solid Waste (MSW)” and “Clay, Concrete, Glass or Stone Products” are all anticipated to increase in tonnage by greater than 40% by the year 2040. Only “Nonmetallic Minerals, Except Fuels” is forecasted to decline between 2010 and 2040, by 3%.

Rail Volumes

The *2040 Freight Industry Level Forecasts* projects growth in rail volumes through 2040. The *Union County Freight Profile* indicates that approximately 13% of domestic freight into, out of, and through Union County is moved by rail. By comparison, 6.5% of the total tonnage in the NJTPA region moves by rail. Most of the 6.8 million tons transported by rail moves along the CR Lehigh Line. The 2040 forecasts indicate that the rail share is expected to increase to 15% of freight tonnage, which would amount to 10.2 million of the 68.2 million tons expected to move to, from, and through Union County by 2040.

The *Rail Freight Capacity Needs Assessment to the Year 2040* examined important freight rail lines in Northern New Jersey. One of these was the CR Lehigh Line. According to the study, up to 44 freight trains run on this line daily. The study also analyzed the maximum capacity under current operating and physical characteristics. This analysis put the CR Lehigh Line at a maximum capacity of 60 trains per day. This capacity is expected to be reached by 2020, which projects a demand for 64 trains on the CR Lehigh Line by that year. By 2040, there is a projected demand for 83 trains per day on the CR Lehigh Line. Limiting the rail line’s freight capacity is the 60 passenger trains per day that also utilize the line. The study recommends installing a third track on a 6.25 mile segment, which would cost an estimated \$220 to \$260 million, based on necessary improvements to bridges, embankments and station areas as part of this project. The *New Jersey State Rail Plan* (2015) lists this as a project to add a third track as described earlier in this Master Plan.

Global Trade and Bayonne Bridge

The anticipated opening of the new Panama Canal and the expansion of the Suez Canal are expected to result in a shift to larger, cleaner more-efficient ships servicing the New York and New Jersey region and

²⁰ Daily volume shown as Average Annual Daily Truck Traffic, which is the average truck volume on a roadway segment for a typical day, measured over the course of a year.

other East Coast markets. These projects have the potential to influence freight movement through the New York/New Jersey region.

To ensure these larger ships can enter the Port of New York and New Jersey, the Port Authority embarked on an aggressive construction project to raise the Bayonne Bridge from 151-feet to 215-feet. The “Raise the Roadway” project will help maintain the natural growth of maritime cargo volumes to Port Newark/Elizabeth. The port will not lose market share.

Truck Parking and Safety Issues

The North Jersey region has seen a dramatic increase in truck parking demand in recent years. The shortage in regional truck parking capacity can be observed throughout the area during overnight hours, with overflowing highway rest areas and illegal parking on highway shoulders and interchange ramps. The increase in truck parking demand is driven by the combination of increased truck volumes on the region’s roadways and regulatory and operational issues. These include the safety considerations and associated Hours-of-Service restrictions implemented and refined over time by the Federal Motor Carrier Safety Administration (FMCSA) and industry operational needs for trucks to access industrial locations that open early in the morning.

Issues and Opportunities

Truck Sizes and Roadway Geometry

Much of the existing road network in Union County was built when trucks were smaller than the typical trucks used in industry today. As a result, larger tractor-trailer combination vehicles with 53-foot trailers are now using roadway segments and intersections in the County that were designed to accommodate older combination trucks with 48-foot trailers. On heavily traveled truck routes, infrastructure limitations such as lane widths, intersection geometry and overhead bridge clearances have become constraints for truck mobility in some areas of the County. Union County should be aware of increasing trailer lengths becoming the industry standard as they relate to geometric requirements on County roads. This is of particular importance as a consideration in Complete Streets initiatives.

Trends

Addressing issues related to the movement of freight can be challenging at the County and local levels. Recently, crude oil being transported from North Dakota into the region by rail has raised concerns related to the safety of this type of transport, particularly in light of some incidents nationally. The rail carriers have an obligation to move such commodities under a common carrier obligation, but the State, working with the County, may have a role to play in promoting the safety of the public even as the transportation of oil by rail continues. Generally, community concerns relate to noise, safety and congestion resulting from goods movement.

Union County has undergone a gradual transition over time that reflects an underlying trend throughout the United States, particularly in the Northeast. More recently, changes in service and retail industries have initiated a second generation of changes in suburban land uses. This can be seen with the migration of jobs from suburban office parks back to urban centers and e-commerce acquiring a growing market share at the expense of many retailers.

Tremley Point Connector Road

The Tremley Point Connector Road is a proposed four-lane industrial road bridging Tremley Point in Linden with Carteret to the south over the Rahway River. This connecting road would link the Tremley Point area to the Carteret International Trade and Logistics Center (I-Port 12) and Interchange 12 of the New Jersey Turnpike in Middlesex County.

The Tremley Point area of Linden is a prime location for industrial redevelopment in conjunction with complementary existing and new transportation infrastructure. The flat terrain of Tremley Point offers an ideal brownfield redevelopment opportunity and needs sufficient road infrastructure in place to provide truck access to and from the New Jersey Turnpike.

ExpressRail

The PANYNJ continues to be engaged in a long-term program to develop and enhance on-dock and near-dock rail facilities at its marine terminals. ExpressRail Newark and ExpressRail Elizabeth are the two major facilities in the Port Newark/Elizabeth complex. They include yard track, storage track and loading facilities to enable the quick, efficient transfer of shipping containers between container vessels and trains. The ExpressRail facilities provide two benefits to the local area:

- They facilitate the transfer of shipping containers directly from ships to trains, thereby eliminating the need for trucks to move the containers on local roads to nearby rail yards in Hudson, Essex and Union Counties or to more distant shippers and receivers.
- The on-dock facilities make the Port of NY/NJ an attractive location for off-loading hinterland cargo on the East Coast. This promotes higher cargo volumes at the port facilities, which in turn enhances the economies of scale and cost efficiencies for local shippers who receive loads through the port facilities. This is a tangible economic benefit for businesses in Union County, along with their suppliers and customers throughout the region.

Implementation Strategies

The recommendations developed for goods movement are aimed at meeting the three overall goals of this Transportation Master Plan: (1) to provide more transportation choices and improve accessibility and safety; (2) to promote a coordinated and comprehensive transportation planning process; and (3) to maximize economic competitiveness for passengers and freight while protecting community and natural assets.

Table 13 - Goods Movement Implementation Strategies

Strategy	
1	Develop a countywide truck route inventory and wayfinding signage to major industrial sites for truck drivers entering Union County.
2	Incorporate modern truck access needs in future roadway improvements on County roads.
3	Support the improvement of traffic signal synchronization along corridors where truck traffic is projected to grow in the next 25 years.
4	Support and promote the planning and construction of the Tremley Point Connector Road.
5	Continue partnering with NJDOT and the railroad industry to preserve abandoned railroad rights-of-way.
6	Work with municipalities in close proximity to Port Newark/Elizabeth and Newark Airport and municipalities with industrial redevelopment opportunities, to maintain industrial zoning and encourage industrial development.
7	Engage the Port Authority of NY&NJ (PANYNJ) on an ongoing basis to identify changes in cargo activity at major facilities.
8	Coordinate with the Port Authority of NY&NJ (PANYNJ) to assess local benefits and impacts of any proposed upgrades and enhancements to increase capacity at Newark Liberty International Airport.
9	Continue playing an active role in organizations where Union County has a strong presence and a vested interest in ongoing planning and advocacy efforts.

D. BICYCLE AND PEDESTRIAN CIRCULATION

Walking and bicycling are essential components of the overall transportation system. Walking is the most fundamental of all transportation modes and part of nearly every trip people make. Planning for pedestrians is planning for everyone. Bicycling also holds potential to increase mobility options for the relatively short trips that make up the majority of daily travel. Support for bicyclists and pedestrian is found throughout federal, state, county, regional and local plans and policies. These plans and policies include:



Pedestrians crossing Route 82 near Kean University in Union Township. Image: RBA

- The 2016 Union County Freeholder Initiatives by Chairman Bruce Bergen's *Move.Connect.Grow Initiative* includes the creation of new bike paths as well as the completion of the Transportation Master Plan.
- According to the *USDOT Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations* (2010), "every transportation agency has the responsibility to improve conditions and opportunities for walking and bicycling and to integrate walking and bicycling into their transportation systems."
- Pedestrians and bicyclists are a first priority safety emphasis area in the *New Jersey Strategic Highway Safety Plan* (2015).
- Together North Jersey's *The Plan* (2015) encourages local municipalities to ensure that planning and redevelopment efforts create places that are accessible by foot and bike.

Benefits of Walking and Bicycling

Walking and bicycling generate health, safety, economic, & environmental benefits including:

- Improved personal health
- Increased mobility and access, particularly for youth, older adults and the financially constrained
- Decreased transportation costs
- Increased opportunities for social interactions
- Enjoyment

At the community level, enabling people to substitute active transportation trips for automobile trips has the potential to realize multiple public benefits such as:

- Improved safety for all road users
- Reduced traffic congestion
- Improved access to public transit
- Decreased air, water and noise pollution
- Increased home values
- Increased spending at local businesses
- Increased opportunities for tourism
- Decreased road maintenance costs

Acknowledgement of these benefits has generated increased interest in and demands for better walking and bicycling conditions from a wide variety of groups, including neighborhood associations, advocacy organizations, public health officials and elected officials.

Existing Conditions

This section documents the network of bicycle and pedestrian accommodations and trails network in Union County. This information is based on existing plans, data and community stakeholder outreach.

Bicycle Accommodations

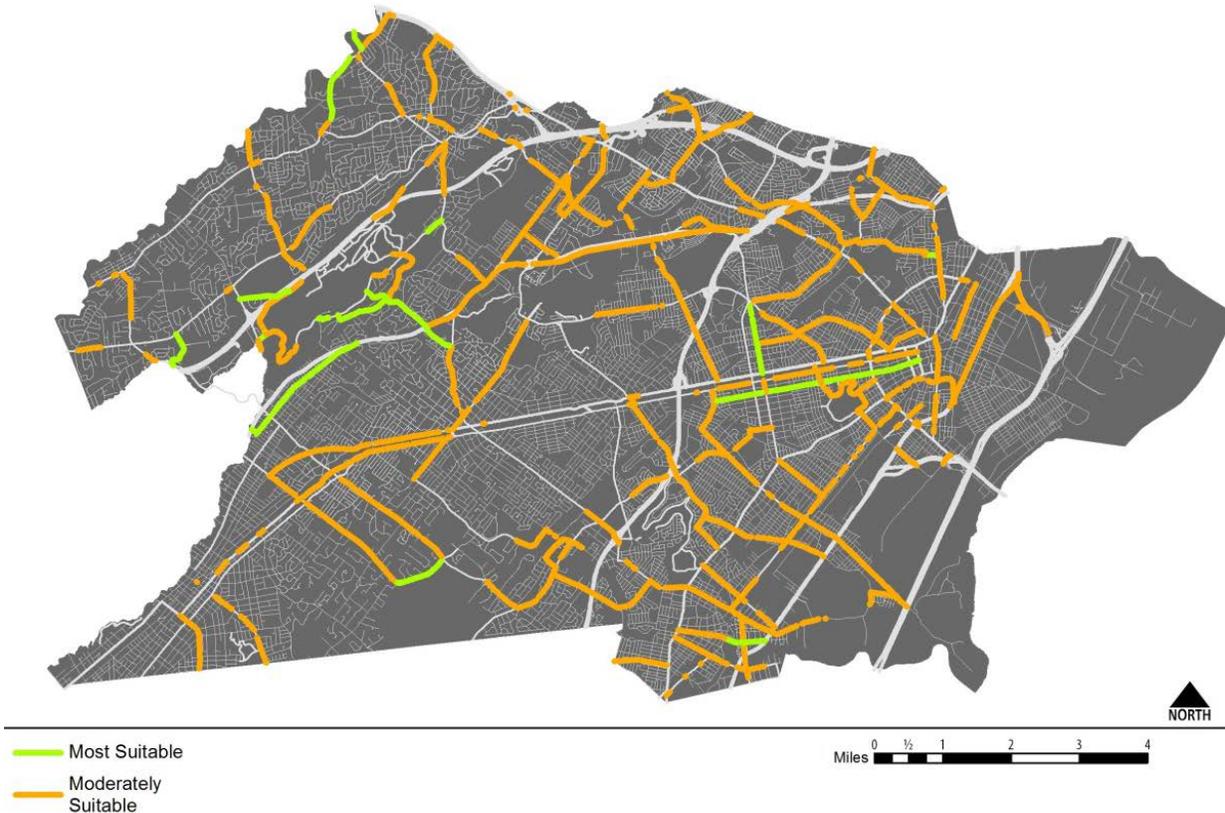
Dedicated on-road bicycle facilities are limited in Union County. Most roadways in Union County are shared use by both motor vehicles and bicyclists. The “bicycle suitability” of these roads varies depending on lane width, motor vehicle volumes and speed, roadway context and presence or absence of shoulders and/or parking.



A woman bicycles with a young child in Fanwood, NJ. Image: RBA

In order to promote bicycling for both transportation and recreation, the NJDOT published a *New Jersey Bicycle Guide and Resource Map* (2012). The map includes information on the suitability of many of the state’s roadways for bicycling, which are mostly considered “through” roads. More than half (53%) of Union County’s 500 and 600 level route network was rated as “Most Suitable” or “Moderately Suitable.”

Map 9 - Most and Moderately Suitable Union County Roadways for Bicycling (2012)



Data Source: *New Jersey Bicycling Map and Resource Guide* (NJDOT, 2012)

As indicated in *Map 9*, the County's most and moderately suitable roadways create a fairly connected network throughout the County. Local access, residential streets have not been rated. However, with their low traffic volumes and speeds, they are generally suitable for bicycling. It is important to note that the suitability measures are geared to an average or typical adult bicyclist. The ratings pertain to the roadway links and not the intersections and are not a measure of safety. Ultimately, the level of comfort or challenge associated with riding on a given section of a roadway is in large part dependent on the competence, confidence and judgment of the bicyclists.

Pedestrian Accommodations

Sidewalks

The presence of a sidewalk network is an important component for a walkable environment. Sidewalk completion is one way of measuring the walkability of a community. In communities with sidewalks, it is often more convenient to choose to walk.

Sidewalk Construction and Maintenance

In New Jersey, municipalities play the most important role in assuring that sidewalks are constructed, inspected, properly maintained and repaired or reconstructed when needed. State statute (N.J.S.A. 40:65-1) gives municipalities the authority to adopt ordinances providing for sidewalk improvements and repairs. This statute states that this work may be funded and performed by:

- The municipality,
- The adjacent property owner, or
- The municipality and the adjacent property owner.



*Per the County's request, NJDOT constructed sidewalk along St. Georges Avenue along Warinanco Park in Roselle.
Image: Union County*

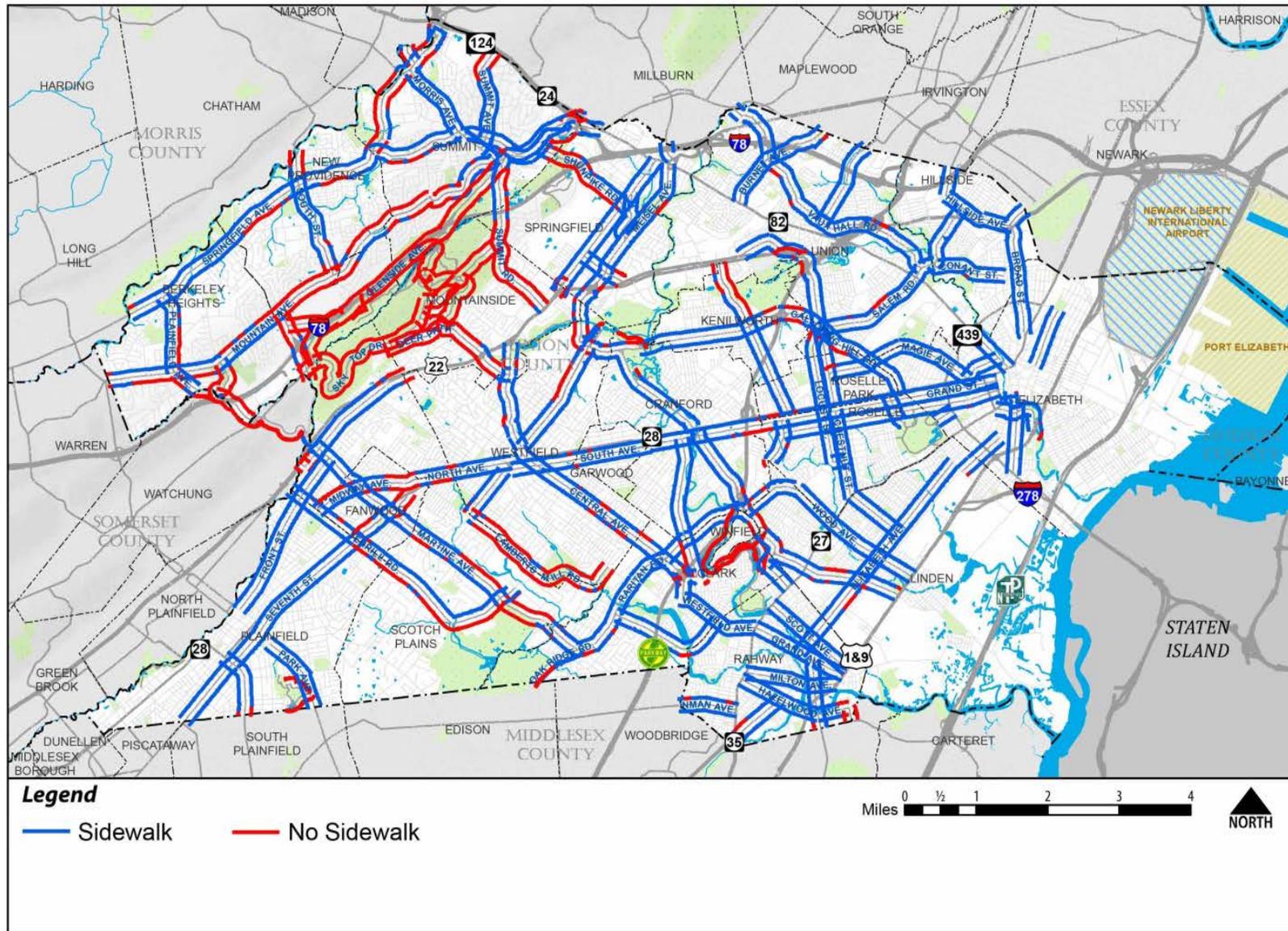
The statute is worded to allow municipalities to construct, repair and improve sidewalks along all highways, whether the highway is a municipal street or a county or state highway. The statute requires municipalities to secure the approval of the county prior to constructing a sidewalk along a county highway.

The *Land Development Standards of the County of Union* (1999) require that a sidewalk shall be provided within the County road right-of-way if such is required by any zoning, subdivision, site plan, or other ordinance of the municipality. However, the *Land Development Standards* also state that "in the absence of a municipal requirement, the County Planning Board may require the installation of a sidewalk in the County right-of-way where it finds that such will be needed to protect pedestrian flow while facilitating vehicular traffic on the County road."

Sidewalk Inventory

Union County's Bureau of GIS completed an updated inventory of sidewalks along County roadways in 2016. Union County can utilize the data collected to work with municipalities to fill in gaps in the sidewalk network as necessary. See *Map 10 –Sidewalk Inventory of Union County Roadways* (2016) on the following page for the location of sidewalk along County roadways.

Map 10 - Sidewalk Inventory of Union County Roadways (2016)



Data Source: Union County Bureau of GIS (2016)

Trails Network

Off-road facilities, such as trails and shared use paths, accommodate both pedestrians and bicyclists. They are an addition, and complementary, to the roadway network. Trails and paths appeal to users of all ages and abilities. During outreach for the *Union County Parks, Recreation & Open Space Master Plan* (2010), the public identified trails as the most important facility to be provided by the County. There are several large scale trail projects that are in various stages of development in Union County.

East Coast Greenway

The East Coast Greenway (ECG) is the ‘urban sister’ to the Appalachian Trail. The segment of the ECG through Union County has been identified and is marked with wayfinding signs. The ECG stretches between Hillside and Rahway, largely following the Rahway River corridor, traversing parts of Union, Kenilworth, Cranford and Winfield along the way. Approximately 7 of the 21 miles (33%) of the ECG in Union County are located off-road on shared use paths.

Elizabeth River Trail

The Elizabeth River Trail is a 2.5-mile trail that will parallel the Elizabeth River from S. Broad Street to the Arthur Kill. A short segment of the trail has already been constructed between S. Broad Street and Bridge Street. Construction of Phase 2 began in spring 2016 along Pearl Street, from Bridge Street to South Street. Funding is provided by Green Acres, County of Union and Community Development Block Grant (CDBG) Disaster Recovery.



The East Coast Greenway in Union County links Nomahegan, Lenape and Black Brook Parks with a continuous walking and bicycling route. Image: RBA



The Elizabeth River Trail highlights the history of Elizabeth with artwork from local artists displayed along its path. Image: www.GoElizabethNJ.com.

Green Brook Multi-Use Trail

The Green Brook Multi-Use Trail will traverse a 7.5-mile corridor parallel to the Green Brook in Plainfield and North Plainfield, from Jefferson Avenue at the Dunellen border to Terrill Road at the Scotch Plains border. The City of Plainfield has advanced the project from the feasibility study through the final design and construction document phase. The City is currently working on the preparation of a wayfinding system and with NJDEP on the permitting process with the NJDEP.

Inactive Railroad Rights-of-Way

The *Union County Parks, Recreation & Open Space Master Plan* (2010) recommends new park and property acquisition including utilization of abandoned railroad rights-of-way. The Plan names two inactive railways that can be used to successfully link several County Parks, the Rahway Valley Railroad (RVR) and the Staten Island Railroad. The RVR section runs from Summit to Roselle Park. Starting in Hidden Valley Park the railroad right-of-way continues by connecting Houdaille Quarry (Summit/Springfield), Briant Park (Summit), Meisel Park, Rahway River Parkway (Springfield Section near Meisel Park), Galloping Hill Golf Course (Kenilworth) and Blackbrook (Kenilworth). The termination point of the existing railroad is on Westfield Avenue in Roselle Park. The Staten Island Railroad section runs

from Cranford to Staten Island, although the section of interest would only run to Linden. The City of Summit has completed a feasibility study on converting the right-of-way for the RVR into a recreational trail and linear park that links the City’s downtown with Briant Park.

Greenways along Rivers

The Summit Environmental Commission has expressed an interest in creating a greenway along the Passaic River in Summit. The Commission also envisions a greenway program that extends outside of city limits and includes Berkeley Heights and New Providence. The Rahway River Greenway is envisioned as a 2-mile riverfront trail for nature observation, fishing and as an alternative mode of travel for pedestrian traffic.

Existing Programs and Policies

Existing conditions include more than infrastructure. There are many programs and policies in Union County that support pedestrians and bicyclists. Examples include:

- Seven of the County’s twenty-one municipalities have adopted a Complete Streets policy;
- The YMCA of Eastern Union County offers a variety of safe cycling classes;
- Hundreds of bicyclists attend the annual Tour de Elizabeth;
- The City of Elizabeth along with the Gateway Family YMCA and Shaping Elizabeth Community Health Initiative has hosted play streets events where streets are closed off and turned into safe play spaces;
- 23 schools in eight Union County municipalities have been awarded for their participation in the NJ Safe Routes to School Recognition Program;
- The Salvation Army Plainfield Corps has a bike giveaway twice annually; and
- Union County Bike Works, the local advocacy group, sponsors rides around the County.



The 12th Annual Tour de Elizabeth was held in 2015. Image: Groundwork Elizabeth

Table 14 - Municipalities in Union County, New Jersey with a Complete Streets Policy, Designated Transit Village and/or a School that has received NJ Safe Routes to School Recognition

Municipality	Complete Streets Policy	Designated Transit Village	NJ SRTS Recognition Winner
Cranford Twp.	Yes (2013)	2003	
Elizabeth City	Yes (2014)	2007	Yes
Fanwood Borough	Yes (2014)		
Linden City	Yes (2013)	2010	Yes
New Providence Borough	Yes (2013)		Yes
Plainfield City		2014	Yes
Rahway City		2002	
Roselle Borough	Yes (2013)		Yes
Scotch Plains Twp.			Yes
Summit City	Yes (2014)	2013	
Union Twp.			Yes
Winfield Twp.			Yes

Trends

Complete Streets

Complete Streets are streets for everyone. They are designed and operated for all users, modes and ability levels, balancing the needs of drivers, pedestrians, bicyclists, transit vehicles, emergency responders and goods movement. The Complete Streets movement is changing the everyday processes that guide transportation decision-making. At the end of 2015, the NJDOT, seven counties and 123 municipalities in New Jersey have adopted a Complete Streets policy.



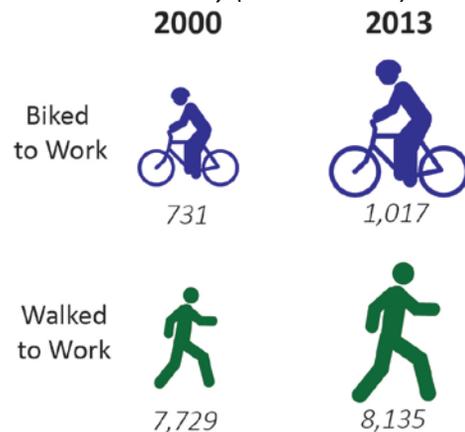
Multiple Complete Streets improvements have been installed along DeForest Avenue in Summit including curb extensions, enhanced crosswalks and painted bicycle facilities. Image: Google

Almost half (47%) of Union County residents live in municipalities with a Complete Streets policy. The seven municipalities in Union County that have adopted Complete Streets policies are Cranford, Elizabeth, Fanwood, Linden, New Providence, Roselle and Summit. Union County works closely with all its municipalities when planning improvements.

Growing acceptance and use of walking and bicycling as transportation modes

Both Union County (3.2%) and New Jersey (3.1%) have a higher rate of commute trips by walking than the national average (2.8%). Over 8,000 County residents walked to work in 2013 compared to approximately 7,700 in 2000. Union County (0.4%) and New Jersey (0.4%) see commute trips by bike at a slightly lower rate than the United States (0.6%). However, the percent and number of people bicycling at the county, state and national level have increased since 2000. In Union County, the number of workers reporting biking to work increased from 731 to over 1,000 in 2013.²¹

Figure 10 - Number of Residents Walking or Bicycling to Work in Union County, New Jersey (2000 to 2013)



Source: 2000 US Census and 2009-2013 American Community Survey

²¹ 2000 US Census and 2009-2013 American Community Survey (ACS)

Increase demand for bicycle accommodations and walkable places

Bicycle Accommodations

Bicyclists can legally share the road with motor vehicle traffic along any roadway where they are not specifically prohibited, such as controlled access highways. However, many bicyclists, especially younger and older bicyclists, are more comfortable riding along dedicated or even protected bicycle facilities, such as bicycle lanes or cycle tracks.

In surveys of Union County municipalities for the Master Plan, many indicated that they were hearing requests for additional and/or improved bicycle facilities and amenities including Berkeley Heights, Cranford, Fanwood, Mountainside, New Providence, Rahway, Summit and Westfield.

Walkable Places

While suburban growth defined most of the second half of the twentieth century, the twenty-first century has seen population growth in the suburban ring slowing and population growth in the historic center increasing. This is true at the national, state and county levels. For the first time since the end of World War II, New Jersey's urban counties, including Union County, are growing at a faster rate than its suburbs.²²

The *2015 National Community and Transportation Preference Survey* conducted by the National Association of Realtors and the Transportation Research and Education Center at Portland State University found that Americans of all ages prefer walkable communities more so than they have in the past. When choosing a new home, 85% of survey participants said that sidewalks are a positive factor when purchasing a home and 79% place importance on being within easy walking distance of places.

If walkable communities continue to grow in popularity, Union County has the potential to continue to benefit. The County has six of New Jersey's 30 designated Transit Villages. In addition, there are many walkable downtowns in Union County that have not been designated as Transit Villages, including but not limited to Scotch Plains, Union Township and Westfield. These Transit Villages and walkable downtowns offer opportunities to increase pedestrian and bicycling activity.

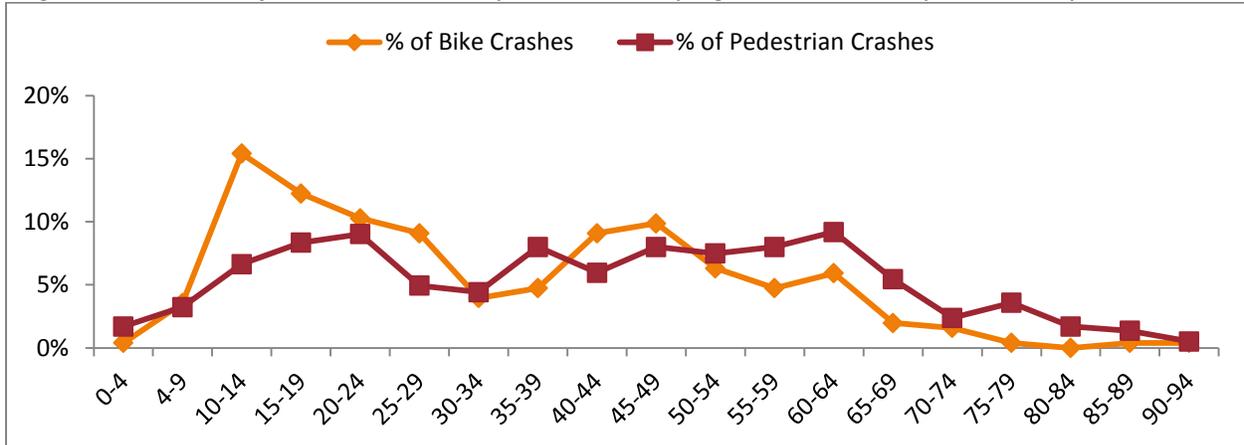
22 Hughes, James W. & Seneca, Joseph J. (2014). The Receding Metropolitan Perimeter: A New Postsuburban Demographic Normal. Rutgers Regional Report, 37, 1-16. Retrieved from <http://dx.doi.org/doi:10.7282/T3MS3R70>

Issues and Opportunities

Bicyclists between 10-14 years of age are overrepresented in the crash data

While this age group accounts for 7% of the Union County population, they represented 15% of all bicycle crashes between 2012-2014.²³ This age group can be targeted with direct outreach through the school system. The County’s Transportation Management Association (TMA), through its Safe Routes to School Regional Coordinator, provides technical assistance with planning and implementing Safe Routes to School programs, including safety presentations and bike rodeos.

Figure 11 - Percent of Pedestrian and Bicyclist Crashes by Age in Union County, New Jersey (2012-2014)



Source: Plan4Safety

Natural and man-made barriers

There are several large scale barriers to non-motorized travel throughout Union County. The natural topography, especially in the area of the Watchung Reservation, can be challenging to traverse due to steep slopes along the terrain. The major roadways, Garden State Parkway, New Jersey Turnpike, I- 78 and Route 22, each present major barriers with limited crossing locations, funneling non-motorized travel to limited overpass and underpass locations. The numerous passenger and freight railroads present a similar constraint to crossing.

Lack of dedicated on-road and off-road bicycle facilities

There are limited dedicated bicycle facilities in Union County. There are signed bicycle routes in Cranford and the East Coast Greenway traverses the County as a north-south spine for bicycle and pedestrian travel.

²³ Plan4Safety is a web-based platform for querying, analyzing and displaying results from NJDOT’s crash database. It is hosted by the Center for Advanced Infrastructure and Transportation (CAIT) at Rutgers University.

Implementation Strategies

The strategies outline actions that address issues and opportunities raised in this section. Included is support for policies and programs, implementation of recommendations from other plans and studies and safety education outreach. The order of the strategies does not reflect priority.

Table 15 - Bicycle and Pedestrian Implementation Strategies

Strategy	
1	Prioritize connections with existing bicycle and pedestrian facilities such as the East Coast Greenway.
2	Continue to support Complete Streets implementation in municipalities that have adopted a Complete Streets policy.
3	Encourage municipalities to install bicycle parking facilities in downtown business districts, near transit, schools and other destinations.
4	Support municipal Safe Routes to School programs near County roads by securing state and federal funding for identified improvements.
5	Implement the recommendations from the <i>Union County Parks, Recreation & Open Space Master Plan (2010)</i> .
6	Utilize Plan4Safety crash data to identify high crash corridors and intersections on County roadways and work with municipalities and local organizations to conduct bicycle and pedestrian audits to identify pedestrian and bicycle improvements.
7	Encourage use of alternative modes of transportation as opposed to the single occupancy vehicle.
8	Continue to participate in the development of local Bicycle and/or Pedestrian Plans and studies.
9	Update <i>The Land Development Standards of the County of Union</i> and <i>Union County Design Standards for Development</i> to encourage a five foot minimum for sidewalks and a minimum eight foot bikeway path.

E. AVIATION FACILITIES

There are two airports located within Union County. Newark Liberty International Airport (EWR) is operated by the PANYNJ, and Linden Airport (LDJ) is owned and operated by the City of Linden. Although the County does not operate these facilities, portions of the County's infrastructure and neighborhoods are adjacent to each of these airports. Union County residents utilize each airport's services and many are employed at these facilities. In addition, many of patrons using these airports travel within and utilize County transportation services and roads.



Newark Liberty International Airport. Image: VHB



Linden Airport. Image: www.lindenairportnj.com

Existing Conditions

Newark Liberty International Airport

Newark Liberty International Airport encompasses 2,027 acres and approximately one-half (the southern portion) of the airport is located in the northeast portion of Union County.²⁴ The airport has three passenger terminals (Terminals A, B and C) and three runways: two main parallel runways (Runways 04-22) and one crosswind runway (Runway 11-29), the longest runway measures 11,000 feet.²⁵ The terminals at Newark Liberty International Airport provide up to 109 aircraft parking positions, 34 of which are equipped to handle arriving international flights. The combined floor space of the three terminals is approximately 3.3 million square feet.

There are seven parking lots and two garages on-airport at Newark Liberty International Airport. Off-site private parking lots are also located within the vicinity of the airport. The terminals and lots are connected along the Airport Terminal Frontage Road. Residential and commercial land uses exist outside of the airport, as well as directly adjacent to the Port Newark/Elizabeth Marine Terminal as shown in *Map 11 - Newark Liberty International Airport and Surrounding Land Uses*. Other industrial and light industrial uses occur to the west and south of Newark Liberty International Airport.

Newark Liberty International Airport has been moved from a Level 3 to a Level 2 airport. This means there are no longer restrictions on flights per hour in and out of the airport. A 14 CFR Part 150 Airport Noise and Land Use Compatibility Study for Newark Liberty International Airport was commissioned to examine ways to mitigate noise problems.

²⁴ Port Authority of New York and New Jersey. 2014 Airport Traffic Report. Accessed October 1, 2015.

²⁵ Regional Plan Association. Upgrading to World Class, The Future of the New York Region's Airports. January 2011.

Map 11 - Newark Liberty International Airport and Surrounding Land Uses



Data Source: Land use data provided by New Jersey Department of Environmental Protection (2010)

Ground Access Modes to Newark Liberty International Airport

All three terminals are interconnected by the AirTrain, which is a people mover system. The AirTrain also connects the terminals to long-term parking areas, rental car locations and to Amtrak and NJ TRANSIT trains at the Newark Liberty International Airport Station. The station is located approximately one mile to the northwest of the terminal area. The airport station makes it possible to connect to Newark Penn Station, New York Penn Station, Elizabeth, Linden, Rahway and to central New Jersey communities including New Brunswick, Princeton and Trenton. The location of Newark Liberty International Airport allows easy access to the New Jersey Turnpike, Route 1&9, Route 21, Route 22, I-78 and I-278. NJ TRANSIT Bus Route 62 provides service to the airport.



EWR Employee Shuttle. Image: VHB

In a 2008 survey, the PANYNJ found that most passengers traveling to Newark Liberty International Airport either drove or were dropped off, which impacts the traffic and roads within the vicinity of the airport.²⁶

Table 16 - Ground Access Modes to Newark Liberty International Airport

Mode	# Surveyed	% of Total
Personal Car	16,841	49.4%
Hired Car	9,934	29.1%
Rail to EWR	4,591	13.5%
Bus	1,422	4.2%
Local Shuttle	1,285	3.8%
Total	34,094	100%

Source: RPA, *Upgrading to World Class, The Future of the New York Region's Airports*. January 2011. Derived from Table 11.1.

Operations

Newark Liberty International Airport is one of the region's primary cargo hubs and is ranked 10th among the top ten domestic cargo airports in the United States.²⁷ Newark Liberty International Airport is the region's express carrier cargo facility, serving as a hub for integrated carriers such as FedEx and UPS. These cargo carriers account for 69% of the freight traffic at the airport. In 2015, the airport accommodated 705,000 cargo tons.

The PANYNJ reported that in 2015, Newark accommodated a total of 37,494,704 passengers. This places Newark Liberty International Airport as the nation's 15th busiest commercial airport. In 2015, Newark Liberty International Airport accommodated 413,521 aircraft moves^{28,29}. This represents a 5.3% increase in passengers and a 4.1% increase in flights from 2014.

²⁶ Regional Plan Association, *Upgrading to World Class, The Future of the New York Region's Airports*. January 2011.

²⁷ Regional Plan Association, *Upgrading to World Class, The Future of the New York Region's Airports*. January 2011.

²⁸ Flights include freight and commuter flights.

²⁹ PANYNJ. June 2015 Traffic Report. http://www.panynj.gov/airports/pdf-traffic/ATR_2015.pdf

Linden Airport (LDJ)

Linden Airport is a public, full service general aviation (GA) airport, owned by the City of Linden. It is located a mile southeast of downtown Linden, next to Route 1&9. See *Map 12 - Linden Airport (LDJ) Aerial* on the following page. The airport's services include fuel, aircraft parking and hangar lease/rentals. Linden Airport is used by local general aviation entities as well as emergency responders, County and federal agencies.³⁰ Aircraft traffic is estimated to be approximately 60% local general aviation, 39% transient general aviation and 1% military operations.³¹ The airport has one runway (Runway 9-27), which is 4,137 feet in length. The airport also accommodates helicopter activity.



Helicopter at Linden Airport. Image: lindenairportnj.com

In 2014, the airport averaged approximately 138 operations a day, which is equivalent to approximately 50,000 operations annually.³² The Airport Manager estimates that in the past year, approximately 40,000 operations occurred at the airport. This is an approximate 50% decrease in operations from the high that occurred in 2008.^{33,34}

³⁰ <http://www.lindenairportnj.com/>

³¹ Local general aviation activity is activity conducted by those aircraft that are based, from where the owner operates the aircraft, at the airport. Transient activity is that of aircraft that are not based at that particular airport.

³² <http://www.airnav.com/airport/KLDJ>. Effective Date August 20, 2015.

³³ Personal Correspondence with Airport Manager, Mr. Paul Dudley. June 2015.

³⁴ This is consistent with general aviation activity nationwide. Since 2008, much of the decrease was due to the economic recession and rapid increase in fuel prices.

Map 12 – Linden Airport (LDJ) Aerial



-  LDJ Airport Boundary
-  County Boundary
-  Municipal Boundary

Known and Projected Future Projects

There are no known capital projects being considered at Linden Airport, other than routine maintenance projects. Within the next few years, the PANYNJ has two projects planned at Newark Liberty International Airport: Terminal A Modernization Project and the AirTrain Replacement Project. Although Terminal A is located in Union County, the terminal modernization project will not have a direct effect on the County. The specific scope of the AirTrain replacement project is uncertain at this time but it is possible there may be some impacts on the County during construction. In addition, the PANYNJ has maintenance and rehabilitation projects on-going at Newark Liberty International Airport. These projects are designed to enhance the safety and security of passengers, modernize facilities and accommodate passengers and airlines. Maintenance and rehabilitation projects are part of the normal maintenance and operation of a large-hub airport.

Newark Liberty International Airport Terminal A Modernization Project

Terminal A was completed in 1973. When the terminal was opened, approximately 6.5 million³⁵ passengers used the airport that year. Today over 37 million passengers use the airport and over 25% of those passengers use Terminal A. In general terms, the redevelopment of Terminal A will focus on reducing passenger congestion in the terminal, accommodating forecasted passenger growth, improving security functions, accommodating new entrant carriers and meeting the competitive objectives of the PANYNJ for the airport.

Newark Liberty International Airport Air Train Replacement Project



AirTrain. Image: VHB

The Newark Liberty International Airport AirTrain is a 3-mile monorail system connecting the terminals at Newark Liberty International Airport and the Newark Liberty International Airport train station, where transfers are possible to Amtrak and NJ TRANSIT's Northeast Corridor Line and North Jersey Coast Line. The existing AirTrain system is almost 20 years old and uses an alignment inside the structure of Terminals A, B and C that was included in the original design and construction of the buildings.

This replacement project will identify an alignment that serves the future needs of the airport. Alternatives will include new potential alignments as well as different station locations, car types, travel modes and systems.

Trends

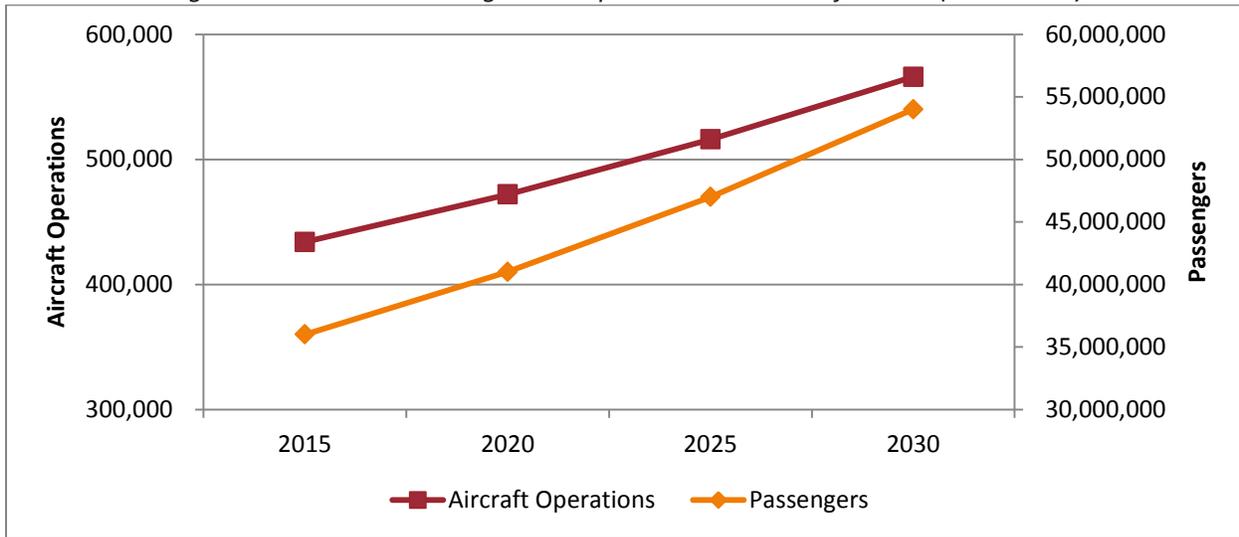
Growth at Newark Liberty International Airport

In 2012, the PANYNJ developed a long range forecast for Newark Liberty International Airport for a 20-year planning horizon.³⁶ The forecast includes the unconstrained forecast of air passenger demand, cargo demand and aircraft operations. An unconstrained forecast does not consider the availability of facilities to accommodate demand, based on the PANYNJ's passenger forecast summary. The number of passengers using the airport is anticipated to grow at an average annual rate of 2.6% and aircraft operations are expected to increase at an average annual rate of 1.8% over that study's planning horizon (2012 through 2032).

³⁵ Port Authority of NY & NJ, Strategic Analysis & External Affairs Division, Traffic & Forecasting Unit.

³⁶ The Port Authority of New York and New Jersey. Prepared for the Federal Aviation Administration. *Long Range Forecast for the Port Authority Airports, Newark Liberty International Airport, John F. Kennedy International Airport, LaGuardia Airport, Stewart International Airport and Teterboro Airport*. April 2012.

Figure 12 - PANYNJ Passenger and Operations Forecasts for EWR (2015-2030)

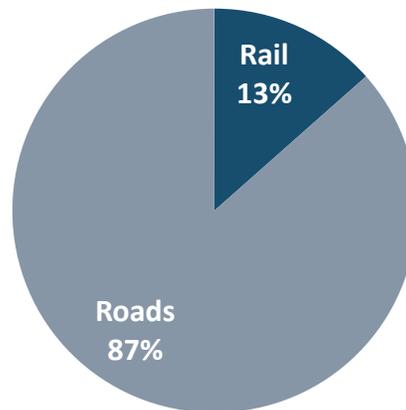


Since the forecast was developed in 2012, the airport has been reporting actual activity values. The difference between actual activity that has occurred since 2012 and the PANYNJ forecast is around 1.5%. Therefore, the PANYNJ forecasts continue to be a good indicator of future passenger and aircraft operations growth at Newark Liberty International Airport.

Increased Demand on the Roadway Network to Access Newark Liberty International Airport

Passengers use a variety of transportation modes to access Newark Liberty International Airport. A January 2011 study conducted by the Regional Plan Association (RPA) found that the majority of passengers surveyed (29,503 or 87%), regardless of their origin, arrive by vehicle to the airport (i.e. private vehicle, bus, van/shuttle, taxi/limo and rental car). With passenger and operations increasing over both the PANYNJ and Federal Aviation Administration (FAA) planning horizons, it is likely that the roadways within close proximity to the airport will be used more in the future to accommodate the increased volume of airport users.

Figure 13 - Percent of Passengers using Rail and Roads to Access Newark Liberty International Airport



Source: RPA, *Upgrading to World Class, The Future of the New York Region's Airports*. January 2011.

Stable Operations at Linden Airport

Linden Airport, as a General Aviation (GA) airport, does not accommodate commercial services and therefore does not have commercial passenger data. The FAA, however, does prepare a Terminal Area Forecast (TAF) report for the airport. According to the TAF report issued in January 2015, aircraft operations are forecast to remain steady between now and the TAF’s planning horizon of 2040 at 42,925 total operations. The FAA does not foresee growth over this time based on the characteristics of the airport and previous operations data. In addition, the proportions of the total operations between general aviation, military and civil operations remain the same for that the duration.

Table 17 - FAA Terminal Area Forecast (TAF) Aircraft Operations Forecast for Linden Airport

General Aviation	Military	Civil	Total
16,426	499	26,000	42,925

It is anticipated that this trend will not place any additional burden on the County’s transportation or roadway network.

Issues and Opportunities

Issues

The two airports located or partially located within Union County’s boundaries are maintained or controlled by others and therefore it can be challenging to coordinate the needs of these facilities with the needs of the County. In addition, airports in the region will be facing new challenges in the future, which may also affect passengers, users and the surrounding communities and corresponding roadway networks. These may include, but are not limited to:

- Increased use of Shared General Aviation Corporate Rentals,
- Increased use of on-demand helicopter charters,
- Increased use of Light Sport Aircraft,
- Increased use or implementation of FAA regulations regarding Unmanned Aerial Vehicles/Drones, and
- Fuel use change from Avgas to Diesel and Electric.



Source: VHB

Opportunities

Both airports are readily accessible for Union County residents. Connecting residents to jobs at Newark Liberty International Airport is important to sustainable economic growth. In addition, proximity to the airports for commercial flights is attractive to residents and commercial interests.

Union County can use Newark Liberty International Airport's forecasted growth to help identify future roadway or access needs. The forecast can be used as an indication of the potential demand on the transportation network that accesses Newark Liberty International Airport.

As an initial step, it is recommended that Union County engage with the PANYNJ on the nature and timing of development at Newark Liberty International Airport. In this way, Union County can coordinate with local municipalities, NJDOT, NJ Turnpike, NJ TRANSIT and other interests to consider decisions regarding the level and type of investment that could potentially be made along with the development proposed by the PANYNJ.

Activities that might complement the PANYNJ's program may include expansion of public transit, capacity enhancements of roads, development of auto parking structures and municipal zoning changes to facilitate the construction of hotels and other facilities like the Jersey Gardens Mall that attract tourists.

Implementation Strategies

As stated in the vision and goals for this Master Plan, Union County strives to support aviation services within its boundaries. Union County's goals include the improvement and maintenance of a sound transportation infrastructure designed to support the growth of Union County and better serve all users, including those that use this infrastructure to access these airports. Implementing solutions associated with aviation issues will require ongoing collaboration and partnerships among County, state and local government and other agencies and authorities.

Table 18 - Aviation Facilities Implementation Strategies

Strategy	
1	Support aviation services within Union County at Newark Liberty International Airport and Linden Airport through coordination of planning and collaboration with multiple stakeholders.
2	Encourage development of land uses that are compatible with Airport traveler's needs, such as hotels and restaurants, off-airport parking facilities, etc. This air travel compatible development would compel air travelers to utilize services in Union County.
3	Support measures to mitigate the adverse impacts of air travel on County residents.
4	Monitor any proposed changes in aviation facilities and services.

F. CLIMATE RESILIENCE

Changes in global and regional climate that are projected to occur in coming decades will have a significant impact on transportation assets in New Jersey. It is vital that transportation infrastructure and operations are resilient. They must be able to withstand environmental and other disruptions, returning to normal operations as quickly as possible following a disruption. In order to prepare for the future, this Master Plan examines existing efforts to address climate resilience; trends in regional climate change related to sea level rise, storm surge, temperature and precipitation; various issues and opportunities; and a strategy to implement recommendations.



Image: nj.com

Guidance on climate issues and efforts to address climate change impacts are found throughout County, federal, state, regional and local reports, policies and partnerships, as summarized below.

- *Sustainable Development in Union County: A Livability Guide* (2015) recommends designing infrastructure for resiliency to extreme weather and climate change.
- *Union County Hazard Mitigation Plan* (2016) focuses on six natural hazards (flood including sea level rise, storm surge, high wind, hazardous material releases, severe storm – winter weather, extreme temperatures) and two technological/man-made hazards.
- *The State of New Jersey Hazard Mitigation Plan* (2014) addresses various climate change impacts in relation to coastal erosion, flooding, hurricanes and tropical storms and nor'easters.
- *The City of Elizabeth's Hazard Mitigation Plan* (2015) addresses sea level rise due to climate change and recommends continual maintenance and planning of the comprehensive hazard mitigation program to increase resiliency to future natural hazards.
- NJTPA's *Plan 2040* (2013) addresses climate change, highlighting its inclusion in a variety of studies and noting that it is related to air quality and the performance of the transportation system.
- *Climate Change Vulnerability and Risk Assessment of New Jersey's Transportation Infrastructure* (2012) was conducted through a partnership among NJTPA, NJDOT, the three New Jersey MPOs, NJ TRANSIT and NJDEP, and financed through a pilot study grant from FHWA. The study area did not include Union County, although some of the analysis (including asset inventory and criticality assessment) was conducted for the entire state.
- The New Jersey Climate Adaptation Alliance (NJCAA) is a network of partner organizations dedicated to the mission of enhancing New Jersey's capacity to plan for and respond to a changing climate. In 2013, the NJCAA released *Resilience: Preparing New Jersey for Climate Change: Policy Considerations* which recommends that a vulnerability assessment of transportation infrastructure be performed.
- The *NY-NJ-CT Post Hurricane Sandy Transportation Vulnerability and Adaptation Assessment* (in progress), initiated by FHWA, examines the impacts on select aspects of the transportation system from Hurricanes Sandy and Irene and Tropical Storm Lee and will identify strategies to protect select transportation assets from the impacts of extreme weather and climate change.
- In 2013, the Sustainable Jersey Climate Adaptation Task Force (CATF) released the *New Jersey Climate Change Trends and Projections Summary*, which provides New Jersey communities with

a clear picture of the observed trends and projected future changes in the climate system. It recommends conducting an adaptation planning process, identifies key elements that should be included in adaptation plans and provides links to useful planning resources.

- Together North Jersey's *The Plan* (2015) notes that temperatures and sea levels are rising and precipitation is increasing, resulting in coastal storm damage and stormwater flooding. The Plan recommends identifying the region's vulnerabilities, adapting communities and infrastructure to be resilient, expanding floodplain buyout programs and returning flood-prone areas to their natural function and using green infrastructure to mitigate the impacts of extreme weather and climate change.
- The *Mayors Council Rahway River Watershed Flood Control* is composed of governing officials from seven communities (Cranford, Kenilworth, Rahway, Springfield and Union Township in Union County, and Maplewood and Millburn in Essex County) working together towards flood control. In 2015, the mayors worked with U.S. Congressional representatives to receive funding to complete a feasibility study of the flood mitigation plan.
- The NJTPA plans a *Climate Resilience and Adaptation Plan* for the Passaic River Basin. The plan will identify adaptation strategies to protect transportation corridors and assets from extreme weather events with a focus on incident management, evacuation routes, key goods movement routes, debris removal and roadway and transit redundancy options.

Existing Conditions

All modes of transportation are potentially vulnerable to the impacts of climate change. In fact, transportation assets along the coast are quite vulnerable to flooding. In 2015, the Federal Emergency Management Agency (FEMA) released a preliminary *Flood Insurance Study* (FIS) for all of Union County. The revised FIS gave special consideration to storms that caused damage to the area in recent years, including Superstorm Sandy in 2012 and Hurricane Irene in 2011. While Sandy produced little flooding in Union County, Irene resulted in \$15 million in residential and business losses; \$560,000 spent in emergency response actions during the storm; and an additional \$775,000 in restoration work.³⁷

In the FIS, coastal storm analyses were performed for the Newark Bay and Arthur Kill and all the bays and inlets within those areas. This effort resulted in revised preliminary Flood Insurance Rate Maps (FIRMs).

High temperatures currently cause damage or deterioration to transportation infrastructure. These impacts are expected to continue and increase as the frequency and intensity of high temperatures grows in the future. *Table 19 - Effects of Climate Change on Transportation Modes* on the following page indicates which transportation modes are vulnerable to specific climate change effects.

³⁷ Federal Emergency Management Agency, Preliminary Flood Insurance Study, Union County, New Jersey, February 3, 2015.

Table 19 - Effects of Climate Change on Transportation Modes

Climate Change Effects	Roadways & Freight	Transit & Rail	Aviation
Flooding			
Pavement damage	✓		✓
Drainage system damage	✓	✓	✓
Scour at in-water structural supports	✓	✓	✓
Thermal expansion of bridge joints	✓	✓	
Roadway/Rail washout	✓	✓	✓
Building damage		✓	✓
Vehicle damage	✓	✓	✓
Service interruptions	✓	✓	✓
Electrical equipment damage	✓	✓	✓
Impacts to emergency evacuation	✓	✓	✓
Surface water contamination	✓		✓
Inundation of tunnels/below grade structures	✓	✓	✓
More Hot Days			
Pavement damage	✓		✓
Rail buckling		✓	
Thermal expansion of bridge joints	✓	✓	
Increased energy demand/reduced availability of electricity			✓
Worker/passenger health impacts	✓	✓	✓
Increased ozone/air quality issues	✓		✓
Impacts to lift/runway length			✓
Payload restrictions			✓
Fewer Cold Days			
Decreased frozen precipitation/improved safety & mobility	✓	✓	✓
Reduced snow & ice removal costs	✓	✓	✓
Reduced environmental impacts from salt and chemicals	✓	✓	✓

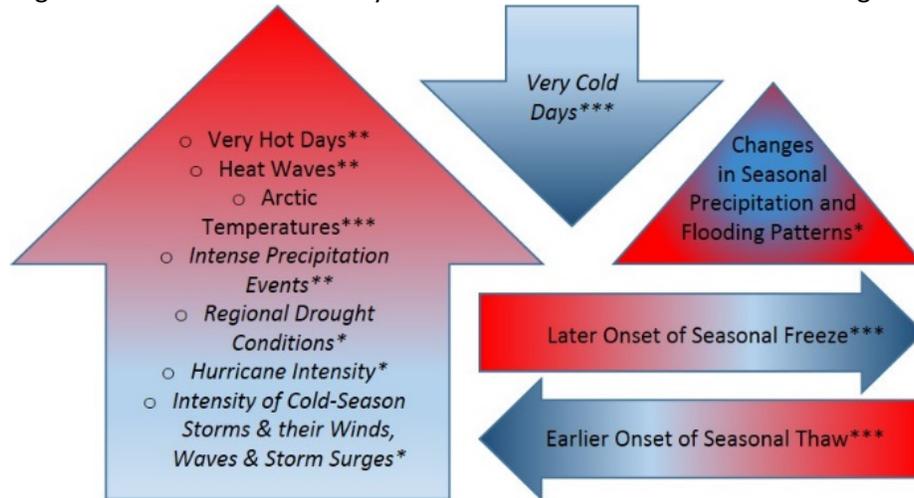
Source: VHB

Trends

Projected regional climate change may have an impact on transportation assets in Union County. Damage from Superstorm Sandy to the two rail tunnels from New Jersey to Manhattan highlights the need for more resilience in the system. This could be accomplished through construction of the Gateway project, which includes the construction of two new Trans-Hudson River rail tunnels. In order to prepare for the future, potential climate impacts from sea level rise, storm surge, temperature and precipitation should be considered. Risk management plans are coordinated with NJDOT, NJ TRANSIT and other partners to improve the resilience of the County transportation infrastructure against the impacts of extreme weather.

Figure 14 - Level of Uncertainty Associated with Potential Climate Changes indicates the potential climate changes of greatest relevance for transportation, including the level of uncertainty associated with each.

Figure 14 - Level of Uncertainty Associated with Potential Climate Changes³⁸



Source: Adapted from TRB (2008); Intergovernmental Panel on Climate Change (IPCC) Working Group I established the terminology to describe uncertainty/probability of occurrence: ***virtually certain, ≥99 percent; **very likely, ≥90 percent; *likely, ≥66 percent

Sea Level Rise and Storm Surge

New Jersey has already experienced relative sea level rise at a rate of 1.5 inches per decade (15 inches total) as measured at Atlantic City, where records have been kept since 1912³⁹. Union County can expect to experience an increased rate of sea level rise over the coming decades.



Flooding on the New Jersey Turnpike near Exit 12 in August, 2005 during Hurricane Irene. Image: npr.org

38 Note: Italicized uncertainty designations are those identified by the Intergovernmental Panel on Climate Change (2007). Others reflect the Committee on Climate Change and U.S. Transportation’s judgment, based on the available literature.

39 New Jersey Climate Adaptation Alliance (NJCAA). A Summary of Climate Change Impacts and Preparedness Opportunities for the Coastal Communities in New Jersey. Rutgers University. New Brunswick, NJ. 2014. Retrieved: <http://njadapt.rutgers.edu/docman-lister/working-briefs/108-njcaa-coastal-communities/file>

Precipitation

Areas that are currently vulnerable to flooding, or will become so due to climate change, include local coastal roads, the New Jersey Turnpike, Newark Liberty International Airport and coastal freight rail lines. The projected increase in precipitation will result in increased incidences of inland flooding, potentially periodically impacting transportation infrastructure.



Flash floods occurred in Scotch Plains and Plainfield, August 19, 2015. Image: nj.com

Temperature

Generally, New Jersey can expect to experience more extremely hot days (reaching or exceeding 95°F) annually as the century progresses, although there will likely be significant variability from year to year.

Issues and Opportunities

Issues

There are many challenges and constraints in responding to projected impacts of climate change on the transportation system. For example:

- Responsibility for transportation infrastructure is decentralized and shared among multiple levels of government and the private sector.
- Various owners and operators are responsible for capital improvements and maintenance budgets.
- Transportation infrastructure assets have a range of service lives. Roads are among the shortest-lived facilities, with surfaces that must be repaved every 10 to 20 years. Airport terminals and railroad tracks are designed to last for 40 to 50 years. Bridges are among the longest-lived, designed for a 50-100 year service life. Much of this infrastructure actually operates far beyond its anticipated design life.
- Transportation infrastructure is largely in place and the vast majority of capital improvement projects involve retrofitting or upgrading the existing transportation system.
- Public and private infrastructure systems and even different assets within the same system, employ different planning horizons.
- Dealing with the impacts of climate change, which generally manifest themselves in extreme weather events, is expensive.

Opportunities

In June 2011, the USDOT issued a policy statement on climate change adaptation mandating the integration of climate change impacts and adaptation into the planning, operations, policies and programs of DOT. The policy statement also directed the federal modal administrations to encourage state, regional and local transportation agencies to consider climate change impacts in their decision-making. Examples in New Jersey are illustrated below. General resiliency responses to current and future climate change impacts may also include:

- Prevent localized flooding by reducing runoff from parking lots, station structures and other impervious surfaces.
- Elevate existing infrastructure where possible and site future infrastructure out of or above future flood-prone areas.
- Enhance hard and soft shoreline infrastructure.
- Increase frequency of inspections and maintenance of infrastructure assets to prevent/repair damage.
- Close roads and temporarily suspend transit and aviation services to increase user safety and reduce potential damage to assets.
- Establish and frequently update emergency detours and evacuation routes.
- Consider hardening infrastructure in chronically flooded locations.



Image: NJ.com

A new elevated structure keeps NJ TRANSIT electrical equipment above flood waters in Bay Head on the North Jersey Coast Line. This structure has been in service since 2014, but others that would protect rail infrastructure from storms are still under design.



Image; VHB

NJ TRANSIT is conducting the Long Slip Fill and Rail Enhancement project to create barriers against storm surges, which is crucial to protecting surrounding communities.

Table 20 - Resilient Responses to Climate Change Effects below provides responses to more specific climate change effects.

Table 20 - Resilient Responses to Climate Change Effects

Climate Change Effects	Resilient Responses
Flooding	
Pavement damage	Use materials that can withstand inundation, taking into consideration the water source (fresh or salt); institute load restrictions on vulnerable roads; enhance drainage to minimize moisture penetration;
Drainage system damage	When replacing drainage structures, size them for future conditions.
Scour at in-water structural supports	Consider designing to reduce scour by strengthening protections around piers.
Building damage	Build or waterproof existing buildings above the anticipated future flood elevation.
Vehicle damage	Move buses to higher ground during flood events to prevent damaging air braking systems, wheel bearings and brake linings. Move commercial vehicles and train sets to higher ground to prevent damage.
Service interruptions	Send out notification broadcasts/messages.
Electrical equipment damage	Waterproof vulnerable housing for electrical components; Raise electrical components above future flood elevations.
Impacts to emergency evacuation	Identify emergency evacuation routes outside of the future floodplain.
Surface water contamination	Store hazardous materials above anticipated flood elevations; Reduce the volume of runoff water.
Inundation of tunnels/below grade structures	Install flood barriers at tunnel/structure openings that are/will become vulnerable to flooding.
More Hot Days	
Pavement damage	Design pavements to absorb less heat by increasing albedo (greater reflectivity); Use higher grade binders and newer pavement mixes to mitigate the effects of heat on asphalt.
Increased energy demand/reduced availability of electricity	Increase power supply redundancy; Reduce dependency on centralized power by installing off-grid solar and wind power at stations.
Worker/passenger health impacts	Design shelter facilities to provide shading and natural ventilation for passenger comfort and safety; Specify reflective roofs to reduce heat gain; Include landscaping at shelters and along pedestrian corridors.

Source: TRB, *Potential Impacts of Climate Change on U.S. Transportation, Special Report 290 (2008)*; FTA, *Flooded Bus Barns and Buckled Rails: Public Transportation and Climate Change Adaption (2011)*

Implementation Strategies

Union County can participate in and/or support the actions listed below to improve climate resilience.

Table 21 - Climate Resilience Implementation Strategies

Strategy	
1	Work with NJDOT, NJ TRANSIT and other partners to improve the resilience of the County transportation infrastructure against the impacts of extreme weather.
2	Identify existing infrastructure that can be elevated and work with partner agencies to pursue funding for this work. When feasible, site future infrastructure out of or above future flood-prone areas.
3	Establish and frequently update emergency detours and evacuation routes.

CHAPTER 4

Implementation Strategies

Move. Connect. Grow.

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CHAPTER 4

Implementation Strategies



Union County Road Construction Update Map from the Union County Website

INTRODUCTION

Coordination is essential for the implementation of the *Union County Transportation Master Plan*. The County serves as a key liaison to local, regional, statewide and federal agencies with respect to interagency coordination on transportation and regional planning issues. The County's Bureau of Transportation Planning works closely with the State of New Jersey, NJ TRANSIT, PANYNJ, NJ Turnpike Authority, NJTPA, 21 local governments and a number of private businesses that provide or rely on the transportation system.

This chapter provides information on the regional transportation planning process and includes information on coordination, implementation and the funding process. It also includes a list of strategies related to transportation planning that effect every component of the County's transportation network. These are presented in an implementation matrix along with the strategies associated with each mode presented in Chapter 3. Each strategy in the implementation matrix defines the County role, lists potential partners, timeframe and related goals.

Planned and Programmed Transportation Improvements

The Project Pipeline

All projects that use federal transportation dollars must be planned and approved through the NJTPA, the Metropolitan Planning Organization (MPO) for the 13-county northern New Jersey region. A Union County Freeholder serves as a member of the NJTPA Board and County staff participates in a Regional Transportation Advisory Committee. Union County works closely with NJTPA on capital construction projects, passenger and freight issues and topics concerning state and federal funding including development of the Regional Transportation Plan and the Transportation Improvement Program.

Plan 2040: NJTPA Regional Transportation Plan (RTP) for Northern New Jersey

Plan 2040, the latest update of the RTP, serves as a blueprint for 25 years of transportation investment for the region. It is a critical document, because all federally funded transportation projects in the region

must flow from the Plan. Inclusion in the Plan is the first step toward making a transportation project idea a reality. By law, the Plan must be updated every four years and must be fiscally constrained. This means that it can only contain projects that the region can reasonably expect to afford over the life of the Plan.

Study & Development Program (S&D)

The Study & Development Program (S&D), formerly known as the Project Development Work Program (PDWP), is a schedule of project planning, environmental reviews and other work to advance proposed improvement projects toward possible federal funding. All projects scheduled for work in the S&D were drawn from or referenced in NJTPA's RTP. Many have been further investigated through regional or subregional studies. Projects in the S&D undergo concept development. This identifies and compares reasonable alternatives and strategies that address the purpose and need statement and selects a preliminary preferred alternative. At the conclusion of this project development work, projects become candidates for inclusion in the NJTPA Transportation Improvement Program (TIP).

Transportation Improvement Program (TIP)

The TIP allocates federal funding to actually implement projects including the completion of preliminary engineering design, right-of-way acquisition and construction. NJTPA's current TIP lists more than \$10 billion in public transit, road, bicycle, pedestrian and freight-related projects. The TIP covers a four-year span and is updated every two years. It also identifies the anticipated funding schedule and cost for each phase of the project.

To help decide which projects should be included in the TIP, the NJTPA uses a "Project Prioritization Process" that scores projects on a variety of criteria. Points are awarded based on measures of how well projects will fulfill goals for transportation set in the NJTPA Regional Transportation Plan. For instance, projects that will improve safety in locations with high accident rates receive extra points, as do projects that help redevelop abandoned industrial sites or channel growth to improvement districts designated by the state.

Once projects have been scored, the NJTPA consults with county and city representatives on the proposed project rankings, discusses the rankings at open public meetings of its Project Prioritization Committee and, finally, engages in negotiations with the NJDOT to mesh NJTPA priorities with those of the state and Governor. A final TIP is approved by the NJTPA Board and must then be approved by the U.S. Department of Transportation.

The funding used to implement the TIP projects comes from a variety of sources including the New Jersey Transportation Trust Fund, PANYNJ and the Federal government. The vast majority of funding allocated through the TIP goes toward maintaining or upgrading existing facilities rather than expanding the transportation system. This reflects a state of good repair approach to investments that is among the guiding principles adopted by the NJTPA as part of its long-range Regional Transportation Plan.

Union County Transportation Improvement Projects (TIP) FY 2016-2019

Projects located in Union County listed in the current Fiscal Years 2016-2019 TIP include:

- Gordon Street over "Out of Service" Conrail Branch, Replacement, Roselle Borough and Roselle Park Borough - DBNUM NS0408
- New Providence Downtown Streetscape - DBNUM 09341
- St. Georges Avenue Improvements, Linden City and Roselle Borough - DBNUM 08434
- Kapkowski/North Avenue Corridor Improvement Project - DBNUM 09341
- Route 1&9 and East Jersey Street - DBNUM 15804
- Route 1&9, Interchange at I-278, Linden City - DBNUM 95023
- Route 1&9, Avenue C to Sylvan Street, Linden City - DBNUM 12311
- Route 22, Bloy Street to Liberty Avenue, Hillside Twp. - DBNUM 658C
- Route 22, Bridge over Echo Lake, Mountainside Borough - DBNUM 14330
- Route 22, Chestnut Street Bridge Replacement (CR 626), Union Twp. - DBNUM 04361
- Route 22, Hilldale Place/North Broad Street, Hillside Twp. - DBNUM 658E
- Route 22, Westbound, Vicinity of Vaux Hall Road to West of Bloy Street, Union Twp. - DBNUM 658B
- Route 22/Route 82/Garden State Parkway Interchange, Union Twp. - DBNUM 658A
- Route 27 ADA Ramps, Evergreen St to Elizabeth River, Edison Twp. and Woodbridge Twp. - DBNUM 10316A
- Route 27, Grand Street NB Intersection, Elizabeth City - DBNUM 12437
- Route 28, Grove Street to Highland Avenue, Roselle Park Borough and Elizabeth City - DBNUM 12421
- Route 82, Caldwell Avenue to Lehigh Avenue, Union Twp. - DBNUM 11404
- Route 82, Rahway River Bridge, Springfield Twp. - DBNUM 94019
- Route 278, Goethals Bridge Replacement, Elizabeth City - DBNUM N1205
- Tremley Point Connector Road, Linden City, NJ Turnpike - DBNUM 9324A
- NJ TRANSIT: NEC Elizabeth Intermodal Station Improvements - DBNUM T600
- NJ TRANSIT: NEC Improvements - DBNUM T44

Union County Study & Development Program

Projects located in Union County listed in the Study & Development Program include:

- Route 1, Route 35 to Bacheller Avenue, Woodbridge Twp., Linden City - DBNUM 15373
- Route 22, Bridge over Echo Lake, Mountainside Borough - DBNUM 14330
- Route 27, Dehart Place to Route 21, Elizabeth City, Newark City - DBNUM 15371
- Route 35, Route 9 to Colonia Boulevard, Woodbridge Twp. - DBNUM 15392
- South Front Street Bridge over the Elizabeth River, Elizabeth City - DBNUM N1409
- Route 439, Baker Place to Route 27, Elizabeth City - DBNUM 15395
- Union County Rapid Transit System - DBNUM TN05007

Union County Engineering, Public Works and Facilities Management

Where Union County has jurisdiction over a roadway, the County typically maintains the roadway from curb to curb, with the host municipality being responsible for the sidewalk area. Types of improvements completed by the County include: bridges, dams, flood control, intersections and road improvements.

Union County utilizes a Pavement Management System to inspect roadway deterioration and programs its repaving projects to prolong the useful life of the roadway through a proactive mill and overlay process. Union County also utilizes a Sign Management System for all traffic signs on its roadways and a Bridge Management System to manage all bridges under its jurisdiction and prolong the useful life of the bridges.

Intersection Improvement Projects

Union County Engineering also works to improve visibility of motorists and reposition traffic and pedestrian signals to more appropriate locations. When it undertakes work to upgrade an intersection, it includes the following improvements:

- Installing new traffic signal poles and mast arms,
- Installing image detectors on the mast arms,
- Upgrading pedestrian signals to count down type push button activation,
- Upgrading the signals to Light Emitting Diodes (LED),
- Upgrading signal heads to 12",
- Replacing the existing traffic signal controllers and cabinets,
- Installing detectable warning surfaces for each handicap ramp,
- Replacing the existing mast-arm mounted street name signs with new signs,
- Replacing the existing regulatory signs with signs conforming to the MUTCD Manual, and
- Restriping the crosswalks, stop bars and roadway center lines.

In addition, the traffic signal controllers are equipped with an Uninterruptible Power Source (UPS) battery backup system that can keep the intersection functioning for at least 2 hours without power. Upon completion of the intersection upgrade, the equipment is turned over to municipalities to maintain. The implementation of these projects has resulted in improved traffic flow, reduction in congestion, increased vehicular and pedestrian safety and a reduction in traffic signal maintenance and energy costs.

Union County Bureau of Transportation Planning

The goal of the Bureau of Transportation Planning is to work towards a balanced transportation system for Union County. It seeks to meet the travel needs of people and goods through a coordinated intermodal transportation system.

The transportation network in Union County includes highways, bus lines, passenger and freight rail line, shuttle services, bicycle trails as well as airport and port facilities. To support this network, the Bureau conducts its own studies and partners with other entities to investigate a range of transportation planning problems with the goal of creating alternative solutions and recommendations. Funding for this work is obtained from both state and federal agencies.

The Bureau of Transportation Planning works closely with the North Jersey Transportation Planning Authority which is the Metropolitan Planning Organization for Northern New Jersey.

The Union County Transportation Advisory Board exists as part of the planning process and as a local and citizen input on transportation policy matters to the Board of Chosen Freeholders. Each of the 21 municipalities within the County can appoint representatives.

Implementation Strategies

The strategies below are designed to improve the transportation network through the integration of land use and transportation planning and legislation. They are aimed at promoting a coordinated, comprehensive and cooperative transportation planning process.

Table 22 - General Planning Implementation Strategies

Strategy	
1	Continue to improve the effectiveness of the planning process by providing opportunities for public participation in the planning and development of plans and projects.
2	Continue participation in subregional planning activities with the NJTPA including the Regional Transportation Advisory Committee, Subregional Studies Program, Local Capital Project Delivery Program and Subregional Transportation Planning Program.
3	Support regional transportation committees to coordinate policies and ordinances between municipalities.
4	Continue reviewing proposed major subdivisions and site plans for transit and transportation impacts and to ensure that they are designed with consideration to bicycle and pedestrian access.
5	Maximize obtaining federal funding for County road projects and transit projects.
6	Monitor, analyze and make recommendations concerning legislative proposals and disseminate information to municipalities, freeholders and state and federal legislative representatives.
7	Reexamine and revise, if necessary, the <i>Union County Transportation Master Plan</i> every five years.

IMPLEMENTATION MATRIX

The following implementation matrix provides the full list of recommended programmatic, project and policy strategies presented in the Union County Transportation Master Plan. Each strategy in the implementation matrix is supplemented by five factors: County Role, Partners, Category, Timeframe and Related Goals.

- *County role* (Lead, Partner or Support) identifies whether the County will lead implementation, assist other agencies and entities as a partner or support implementation through activities such as funding, staffing, education or outreach.
- *Partners* identify other agencies and entities with a role in implementation.
- *Category* identifies the related mode of transportation.
- *Timeframe* identifies the estimated amount of time to capture develop and implement the item. It is categorized into short-term (less than 2 years), mid-term (2 to 5 years), long-term (more than 5 years) and ongoing (continuous).
- *Related Goals* refer to the eight goals described in Chapter 2 of this Master Plan. They are:
 1. To improve and maintain a sound transportation infrastructure designed to support the growth of Union County and better serve all users.
 2. To ensure that quality public transportation is available in Union County.
 3. To increase safety and mobility while minimizing congestion on the roadway system.
 4. To maintain the efficient movement of goods.
 5. To support aviation services in Union County.
 6. To encourage and support programs and policies that create transportation options and enhance quality of life.
 7. To promote a coordinated, comprehensive and cooperative transportation planning process.
 8. To prepare for and adapt to changing conditions and withstand, respond to and recover rapidly from disruptions.

Table 23 - Implementation Matrix

<p>Roadways # 1</p> <p>Continue to maintain the bridges and roadways of the County system as well as stormwater facilities and work with the municipalities when needs are identified within the system.</p> <p>In addition, the County will continue to identify funding opportunities and make applications to improve the County roadway system and replace obsolete and deficient bridges.</p>	<p>County Role</p> <p>Lead</p> <p>Partners</p> <p>USDOT; NJDOT; Municipalities</p> <p>Category</p> <p>Roadways; Bridges; Resiliency</p> <p>Timeframe</p> <p>Ongoing</p> <p>Related Goals (see Chapter 2)</p> <p>1; 8</p>
<p>Roadways # 2</p> <p>Support traffic signal retiming and optimization on County roadways and support municipalities to identify programs for financing the retiming of signals.</p> <p>Optimizing traffic signal timings and coordination can reduce delays by 15-20% and improve air quality. Traffic signals on County roads are maintained by municipalities.</p>	<p>County Role</p> <p>Support</p> <p>Partners</p> <p>Municipalities; NJDOT; NJTPA; FHWA</p> <p>Category</p> <p>Roadways</p> <p>Timeframe</p> <p>Ongoing</p> <p>Related Goals (see Chapter 2)</p> <p>1; 3</p>
<p>Roadways # 3</p> <p>Continue to support NJDOT efforts to reduce congestion and improve safety on state highways in Union County. Advocate for advancement of projects on Routes 22, 27 and 1&9.</p>	<p>County Role</p> <p>Support</p> <p>Partners</p> <p>NJDOT; NJTPA; Municipalities; FHWA</p> <p>Category</p> <p>Roadways</p> <p>Timeframe</p> <p>Ongoing</p> <p>Related Goals (see Chapter 2)</p> <p>1; 3</p>
<p>Roadways # 4</p> <p>Support the construction of a link between I-278 and Route 1&9.</p> <p>This improvement should reduce regional travel along local roads and Route 439 in Elizabeth.</p>	<p>County Role</p> <p>Support</p> <p>Partners</p> <p>NJDOT; PANYNJ</p> <p>Category</p> <p>Roadways; Bridges; Goods Movement</p> <p>Timeframe</p> <p>Short</p> <p>Related Goals (see Chapter 2)</p> <p>1; 4</p>

<p>Roadways # 5</p> <p>Support new technologies which make roadways and vehicles more efficient. Relieve spot congestion and improve air quality through implementation of Intelligent Transportation Systems (ITS).</p>	County Role
	Support
	Partners
	USDOT; NJDOT; NJTPA; Private Sector
	Category
	Roadways; Goods Movement
	Timeframe
	Ongoing
Related Goals (see Chapter 2)	
1; 3; 4; 6; 8	

<p>Roadways # 6</p> <p>Reduce peak hour traffic by working with and encouraging business to use Transportation Demand Management (TDM) strategies. Support and integrate activities of EZ Ride TMA. TDM programs, for example ride sharing, carpools and shuttles, mitigate traffic congestion, improve mobility and accessibility. They improve air quality and optimize the efficiency of the system by increasing travel choices and reducing reliance on the single occupant vehicle. The TMAs are critical facilitators of TDM programs.</p>	County Role
	Partner
	Partners
	NJDOT; NJTPA; TMA; Private sector
	Category
	Roadways; Bicycle; Pedestrian; Public Transportation
	Timeframe
	Ongoing
Related Goals (see Chapter 2)	
2; 3; 6	

<p>Roadways # 7</p> <p>Explore opportunities to reduce congestion. Identify primary arterials to be targeted for congestion mitigation.</p>	County Role
	Lead
	Partners
	NJDOT; NJTPA; Municipalities
	Category
	Roadways
	Timeframe
	Short
Related Goals (see Chapter 2)	
1; 3; 4	

<p>Roadways # 8</p> <p>Explore opportunities to improve safety. Continue to work with NJTPA and NJDOT to identify high crash locations and apply for funding to improve them.</p>	<p>County Role Lead</p> <p>Partners NJDOT; NJTPA; FHWA; Municipalities</p> <p>Category Roadways; Bicycle; Pedestrian; Public Transportation</p> <p>Timeframe Ongoing</p> <p>Related Goals (see Chapter 2) 1; 2; 3</p>
<p>Roadways # 9</p> <p>Support municipal and state Complete Streets policy implementation. Continue to work with municipalities on improvements to County roadways.</p>	<p>County Role Support</p> <p>Partners NJDOT; Municipalities</p> <p>Category Policy; Roadways; Goods Movement; Bicycle; Pedestrian; Public Transportation; Resilience</p> <p>Timeframe Ongoing</p> <p>Related Goals (see Chapter 2) 1; 6; 7</p>
<p>Roadways # 10</p> <p>Support implementation of FHWA roadway safety countermeasures. Improving safety is a priority of the County. FHWA recommends nine countermeasures to address crashes that occur at intersections. These include modern roundabouts, corridor access management, backplates with reflective borders on traffic signals, medians and pedestrian crossing islands, pedestrian hybrid beacons, enhanced delineation and friction for horizontal curves and road diets.</p>	<p>County Role Support</p> <p>Partners USDOT; NJDOT; NJTPA; Municipalities</p> <p>Category Roadways; Pedestrians</p> <p>Timeframe Ongoing</p> <p>Related Goals (see Chapter 2) 1; 3</p>

<p>Public Transportation # 1</p> <p>Advocate for improvements to station facilities and station access in Union County.</p> <p>NJ TRANSIT can be encouraged to prioritize improvements at station facilities.</p>	County Role
	Support
	Partners
	Municipalities; NJ TRANSIT
	Category
	Public Transportation; Roadway; Pedestrian; Bicycle
	Timeframe
Ongoing	
Related Goals (see Chapter 2)	
1, 2, 7	

<p>Public Transportation # 2</p> <p>Continue to advocate NJ TRANSIT for improved rail service.</p> <p>Continued advocacy efforts for additional reverse commuter and one-seat ride service on Raritan Valley Rail Line. As NJ TRANSIT plans for rail expansion as part of the Gateway Project, the ability to expand this service will eliminate the capacity constraints hindering this service and will make it more possible to implement.</p>	County Role
	Support
	Partners
	NJ TRANSIT
	Category
	Public Transportation
	Timeframe
Ongoing	
Related Goals (see Chapter 2)	
1, 2, 7	

<p>Public Transportation # 3</p> <p>Support transit supportive land use policies in Union County.</p> <p>Continue to be a leader in the State of New Jersey and support/promote Transit Villages and Transit Oriented Development. This will encourage and support transit ridership in the County.</p>	County Role
	Support
	Partners
	NJ TRANSIT; Municipalities; NJDOT
	Category
	Public Transportation; Land Use; Policy
	Timeframe
Ongoing	
Related Goals (see Chapter 2)	
6, 7	

<p>Public Transportation # 4</p> <p>Encourage the installation of enhanced amenities and infrastructure at bus stops.</p> <p>Support municipalities in their requests to install bus shelters and stops at locations that warrant these amenities.</p>	County Role
	Support
	Partners
	NJ TRANSIT; Municipalities
	Category
	Public Transportation
	Timeframe
Ongoing	
Related Goals (see Chapter 2)	
1, 2, 7	

Public Transportation # 5	County Role
<p>Identify opportunities for multi-modal facilities. Work with municipalities to study the potential for additional multi-modal facilities in the County, including a potential bus park-and-ride in the western half of the County.</p>	Partner
	Partners
	NJ TRANSIT; Municipalities; NJDOT
	Category
	Public Transportation
	Timeframe
Short-term	
Related Goals (see Chapter 2)	
1, 2, 7	

Public Transportation # 6	County Role
<p>Encourage NJ TRANSIT to schedule better coordinated connections between bus routes. NJ TRANSIT should be encouraged to schedule bus service with connections at important locations in the County.</p>	Support
	Partners
	NJ TRANSIT
	Category
	Public Transportation
	Timeframe
Mid-term	
Related Goals (see Chapter 2)	
2, 7	

Public Transportation # 7	County Role
<p>Support fares at equitable levels. Advocate that fares remain equitable across the state.</p>	Support
	Partners
	NJ TRANSIT
	Category
	Public Transportation
	Timeframe
Mid-term	
Related Goals (see Chapter 2)	
6, 7	

Public Transportation # 8	County Role
<p>Support shuttle and reverse commute service. Encourage and provide support for existing and future shuttle and reverse commute service in the County.</p>	Support
	Partners
	NJ TRANSIT; Municipalities; Private Sector
	Category
	Public Transportation; Policy
	Timeframe
Mid-term	
Related Goals (see Chapter 2)	
2, 6, 7	

<p>Public Transportation # 9</p> <p>Advocate for additional transit service in Union County.</p> <p>Advocate for additional transit service in the County, including the Union County Sustainability Corridor bus rapid transit, as well as transit access to the redevelopment area of the Elizabeth Waterfront.</p>	County Role
	Support
	Partners
	NJ TRANSIT; Municipalities
	Category
	Public Transportation
	Timeframe
	Long-term
Related Goals (see Chapter 2)	
2, 6, 7	

<p>Public Transportation # 10</p> <p>Support and advocate for the construction of major infrastructure projects that would enhance rail service in New Jersey.</p> <p>These projects include the replacement of the Portal Bridge, construction of the Hunter Flyover and construction of the Gateway Project, as well as normal state-of-good repair projects.</p>	County Role
	Support
	Partners
	NJ TRANSIT; NJDOT; Amtrak
	Category
	Public Transportation
	Timeframe
	Ongoing
Related Goals (see Chapter 2)	
1, 2, 6, 7	

<p>Goods Movement # 1</p> <p>Develop a countywide truck route inventory and wayfinding signage to major industrial sites for truck drivers entering Union County.</p> <p>Using the information from the prior recommendation, this map would show preferred truck routes of travel and inform them of height and weight restrictions on County roads.</p>	County Role
	Lead; Partner
	Partners
	PANYNJ; NJTPA; Private Industry
	Category
	Roadways; Bridges; Goods Movement
	Timeframe
	Short-term
Related Goals (see Chapter 2)	
4, 6	

<p>Goods Movement # 2</p> <p>Incorporate modern truck access needs in future roadway improvements on County roads.</p> <p>Future improvements would be designed to accommodate tractor-trailer combination vehicles with 53-foot long, 102-inch wide trailers. This would be implemented on an ongoing basis as roadway improvements are programmed.</p>	County Role
	Lead; Partner
	Partners
	NJDOT; Municipalities
	Category
	Roadways; Bridges; Goods Movement
	Timeframe
	Long Term; Ongoing
Related Goals (see Chapter 2)	
1, 4	

<p>Goods Movement # 3</p> <p>Support the improvement of traffic signal synchronization along corridors where truck traffic is projected to grow in the next 25 years.</p> <p>Traffic signal coordination is a cost-efficient measure to expand roadway capacity without widening roads. In Union County, the routes of interest include Routes 509, 514, 527, 613, 617, 619, 621 and 622 under County jurisdiction and Routes 1&9 and Route 27 under state jurisdiction.</p>	County Role
	Lead; Partner
	Partners
	NJDOT; Municipalities; NJ Turnpike; PANYNJ; Adjacent Counties
	Category
	Roadways; Goods Movement
	Timeframe
	Intermediate
Related Goals (see Chapter 2)	
1, 3, 4	

<p>Goods Movement # 4</p> <p>Support and promote the planning and construction of the Tremley Point Connector Road.</p> <p>The areas served by this road could support up to six million square feet of industrial development. The connector road and the existing rail connections in the area would maximize opportunities for the Tremley Point area.</p>	County Role
	Support
	Partners
	NJ Turnpike; Middlesex County; Municipalities; NJDOT
	Category
	Roadways; Goods Movement; Land Use
	Timeframe
	Short-term
Related Goals (see Chapter 2)	
1, 4, 6, 7	

<p>Goods Movement # 5</p> <p>Continue partnering with NJDOT and the railroad industry to preserve abandoned railroad rights-of-way.</p> <p>The restoration of freight rail service on abandoned alignments can support the redevelopment of adjacent industrial sites.</p>	County Role
	Partner
	Partners
	NJDOT; NJTPA; Private Railroads
	Category
	Railroads; Goods Movement; Land Use
	Timeframe
	Ongoing
Related Goals (see Chapter 2)	
4, 6, 7	

Goods Movement # 6	County Role
<p>Work with municipalities in close proximity to Port Newark/Elizabeth and Newark Airport and municipalities with industrial redevelopment opportunities, to maintain industrial zoning and encourage industrial development.</p> <p>As a County with substantial freight-intensive industries and excellent transportation assets, Union County can play a valuable role in ensuring that transportation planning is coordinated with industrial land use decisions at the local level.</p>	Partner
	Partners
	PANYNJ; Municipalities
	Category
	Goods Movement; Land Use
	Timeframe
Ongoing	
Related Goals (see Chapter 2)	
4, 6, 7	

Goods Movement #7	County Role
<p>Engage the Port Authority of NY&NJ (PANYNJ) on an ongoing basis to identify changes in cargo activity at major facilities.</p> <p>Coordination with the PANYNJ will enable the County to address these challenges and capitalize on these opportunities associated with cargo activity in a proactive manner. Support improvements to the Kapkowski Road/North Avenue area of Elizabeth.</p>	Partner
	Partners
	PANYNJ
	Category
	Goods Movement; Roadways; Railroads
	Timeframe
Ongoing	
Related Goals (see Chapter 2)	
4, 7	

Goods Movement #8	County Role
<p>Coordinate with the Port Authority of NY&NJ (PANYNJ) to assess local benefits and impacts of any proposed upgrades and enhancements to increase capacity at Newark Liberty International Airport.</p> <p>Union County will likely face challenges and opportunities with any capacity expansion at Newark Airport, including passenger and/or cargo activity. Potential relocation or displacement of on-airport facilities to off-airport locations will have benefits and impacts for local municipalities and the County can help stakeholders address these issues proactively.</p>	Partner
	Partners
	PANYNJ
	Category
	Goods Movement; Roadways; Aviation; Land Use
	Timeframe
Ongoing	
Related Goals (see Chapter 2)	
4, 6, 7	

<p>Goods Movement #9</p> <p>Continue playing an active role in organizations where Union County has a strong presence and a vested interest in ongoing planning and advocacy efforts.</p> <p>Union County has been an active participant in organizations such as the NJTPA (including its RTAC and Freight Initiatives Committee) and a collaborative partner with public agencies in the region. Ongoing involvement with these organizations and partners will help the County meet its vision of maintaining a safe, reliable, multi-modal transportation system that enhances economic activity and quality of life for all its communities.</p>	County Role
	Partner
	Partners
	NJTPA; NJDOT; PANYNJ; Municipalities; NJ Turnpike
	Category
	All
	Timeframe
	Ongoing
Related Goals (see Chapter 2)	
4, 7	

<p>Bicycle and Pedestrian # 1</p> <p>Prioritize connections with existing bicycle and pedestrian facilities such as the East Coast Greenway.</p> <p>Connecting new facilities to existing ones is the best way to strengthen the bicycle and pedestrian network in Union County.</p>	County Role
	Lead
	Partners
	Municipalities; Non-profit Organizations
	Category
	Bicycle; Pedestrian; Roadways
	Timeframe
	Ongoing
Related Goals (see Chapter 2)	
1; 3	

<p>Bicycle and Pedestrian # 2</p> <p>Continue to support Complete Streets implementation in municipalities that have adopted a Complete Streets policy.</p> <p>Union County works closely with all its municipalities when planning improvements, including those related to Complete Streets.</p>	County Role
	Support
	Partners
	Municipalities; NJDOT
	Category
	Bicycle; Pedestrian; Public Transportation; Roadways
	Timeframe
	Ongoing
Related Goals (see Chapter 2)	
1; 3; 6; 7	

<p>Bicycle and Pedestrian # 3</p> <p>Encourage municipalities to install bicycle parking facilities in downtown business districts, near transit, schools and other destinations.</p> <p>People must have a secure and convenient place to park their bikes once they reach their destination. Not having a well-planned bicycle parking option can discourage bicycling and lead to theft, damage and locked bikes becoming an obstacle to pedestrians or damaging trees.</p>	County Role
	Support
	Partners
	Municipalities; NJ TRANSIT
	Category
	Bicycle
	Timeframe
Short	
Related Goals (see Chapter 2)	

<p>Bicycle and Pedestrian # 4</p> <p>Support municipal Safe Routes to School programs near County roads and assist with state and federal funding for identified improvements.</p> <p>Work with the municipalities, school districts and the Safe Routes to School Regional Coordinator at the Transportation Management Association (TMA) to support funding proposals, enforcement campaigns and education outreach, especially at the middle school level.</p>	County Role
	Partner
	Partners
	Municipalities; School Districts; TMA; NJ Safe Routes to School Resource Center
	Category
	Bicycle; Pedestrian; Roadway
	Timeframe
Short	
Related Goals (see Chapter 2)	
1; 3; 6	

<p>Bicycle and Pedestrian # 5</p> <p>Implement the recommendations from the Union County Parks, Recreation & Open Space Master Plan (2010).</p> <p>A goal of the Plan is to provide an interconnected system of high quality, accessible, multi-use trails and greenway corridors. The Plan recommends exploring the possibility of utilizing abandoned railway ROW to link County Parks, including the Rahway Valley Railroad.</p>	County Role
	Lead
	Partners
	Union County Department of Parks & Recreation; Municipalities; State Agencies; Utility Companies
	Category
	Bicycle; Pedestrian
	Timeframe
Ongoing	
Related Goals (see Chapter 2)	
1	

<p>Bicycle and Pedestrian # 6</p> <p>Utilize Plan4Safety crash data to identify high crash corridors and intersections on County roadways and work with municipalities and local organizations to conduct bicycle and pedestrian audits to identify pedestrian and bicycle improvements.</p> <p>Many communities have had successful experiences with volunteer efforts by local walking clubs, seniors groups or other civic organizations to perform periodic site visits and report back on areas that may require further investigation. This can help to focus efforts by County staff.</p>	County Role
	Lead
	Partners
	Municipalities; Civic Organizations; NJ Bicycle Pedestrian Resource Center
	Category
	Bicycle; Pedestrian; Roadway
	Timeframe
	Ongoing
Related Goals (see Chapter 2)	
1; 3	

<p>Bicycle and Pedestrian # 7</p> <p>Encourage use of alternative modes of transportation as opposed to the single occupancy vehicle.</p> <p>Since federal legislation mandates that the region reduce single vehicle occupancy miles, the County should encourage increased walking and bicycling.</p>	County Role
	Support
	Partners
	Municipalities; TMA; Private Sector
	Category
	Bicycle; Pedestrian
	Timeframe
	Ongoing
Related Goals (see Chapter 2)	
1; 3; 6	

<p>Bicycle and Pedestrian # 8</p> <p>Continue to participate in the development of local Bicycle and/or Pedestrian Plans and studies.</p> <p>The County currently engages with municipal stakeholders to analyze, coordinate and develop Plans. Continuing to provide technical expertise and leadership is a key to advancing walking and bicycling across the County.</p>	County Role
	Support
	Partners
	Municipalities
	Category
	Bicycle; Pedestrian; Roadway
	Timeframe
	Ongoing
Related Goals (see Chapter 2)	
1; 3; 6; 7	

<p>Bicycle and Pedestrian # 9</p> <p>Update The Land Development Standards of the County of Union and Union County Design Standards for Development to encourage a five foot minimum for sidewalks and a minimum eight foot bikeway path.</p> <p>Current County standards include a four foot minimum for sidewalks. FHWA recommends a minimum five foot sidewalk and according to United States Access Board, the minimum clear width of a pedestrian access route shall be 60 inches (five feet), exclusive of the width of the curb. The Access Board recommends that the pedestrian access route be no less than 72 inches (six feet) wide in high use areas, especially in downtown urban environments, near shopping centers, schools and civic facilities. The AASHTO Guide for the Development of Bicycle Facilities (2012) specifies a minimum paved width of a path is ten feet and in very rare circumstances a reduced width of eight feet.</p>	County Role
	Lead
	Partners
	Category
	Bicycle; Pedestrian; Roadway
	Timeframe
	Short
Related Goals (see Chapter 2)	
1	

<p>Aviation # 1</p> <p>Support aviation services within Union County at Newark Liberty International Airport and Linden Airport through coordination of planning and collaboration with multiple stakeholders.</p> <p>Improving and maintaining sound transportation infrastructure designed to support the growth of Union County and better serve all users, will improve access to and from the airport as well as the economic success of surrounding areas. Interagency objectives will be a large component of supporting aviation in the County.</p>	County Role
	Partner
	Partners
	Municipalities; PANYNJ; NJDOT; Other adjacent local authorities
	Category
	Aviation
	Timeframe
	Ongoing
Related Goals (see Chapter 2)	
5, 6	

<p>Aviation # 2</p> <p>Encourage development of land uses that are compatible with Airport traveler’s needs, such as hotels and restaurants, off-airport parking facilities, etc.</p> <p>Air travel compatible development would encourage air travelers to utilize services in Union County.</p>	County Role
	Support
	Partners
	Municipalities; PANYNJ; NJDOT; Other adjacent local authorities
	Category
	Aviation
	Timeframe
	Ongoing
Related Goals (see Chapter 2)	
5, 7	

<p>Aviation # 3</p> <p>Support measures to mitigate the adverse impacts of air travel on County residents. Examine ways to mitigate noise from traffic. Prioritization should incorporate mechanisms and resources necessary to effectively address environmental justice issues.</p>	County Role
	Support
	Partners
	Municipalities; PANYNJ; NJDOT; Other adjacent local authorities
	Category
	Aviation
	Timeframe
	Ongoing
Related Goals (see Chapter 2)	
	5, 6, 7

<p>Aviation # 4</p> <p>Monitor any proposed changes in aviation facilities and services.</p>	County Role
	Partner
	Partners
	City of Linden; PANYNJ
	Category
	Aviation
	Timeframe
	Ongoing
Related Goals (see Chapter 2)	
	5, 7

<p>Climate Resilience # 1</p> <p>Identify existing infrastructure that can be elevated and work with partner agencies to pursue funding for this work. When feasible, site future infrastructure out of or above future flood-prone areas.</p> <p>Removing or avoiding placement of infrastructure in flood-prone locations, when feasible, will help maintain an efficient, reliable and safe rail, roadway and transit system.</p>	County Role
	Partner
	Partners
	NJDOT; NJ TRANSIT; Municipalities
	Category
	Climate Resiliency; Roadways; Public Transportation
	Timeframe
	Ongoing
Related Goals (see Chapter 2)	
	1, 8

<p>Climate Resilience # 2</p> <p>Establish and frequently update emergency detours and evacuation routes.</p> <p>This would have to be a coordinated effort. OEM would probably monitor the changing flood conditions and broadcast the information about detours and routes, but the agency or office that establishes the evacuation routes would continue to be in charge of establishing them.</p>	County Role
	Lead
	Partners
	NJDOT; Municipalities
	Category
	Climate Resiliency
	Timeframe
	Ongoing
Related Goals (see Chapter 2)	
	3, 8

<p>General Planning # 1</p> <p>Continue to improve the effectiveness of the planning process by providing opportunities for public participation in the planning and development of plans and projects.</p> <p>Obtaining a broad representation of public input is an integral part of the planning process which helps to ensure that decisions are made in consideration of public needs and preferences.</p>	<p>County Role</p> <p>Lead</p> <p>Partners</p> <p>NJDOT; NJTPA; Municipalities</p> <p>Category</p> <p>Planning</p> <p>Timeframe</p> <p>Ongoing</p> <p>Related Goals (see Chapter 2)</p> <p>7</p>
<p>General Planning # 2</p> <p>Continue participation in subregional planning activities with the NJTPA including the Regional Transportation Advisory Committee, Subregional Studies Program, Local Capital Project Delivery Program and Subregional Transportation Planning Program.</p>	<p>County Role</p> <p>Partner</p> <p>Partners</p> <p>NJTPA</p> <p>Category</p> <p>Planning</p> <p>Timeframe</p> <p>Ongoing</p> <p>Related Goals (see Chapter 2)</p> <p>7</p>
<p>General Planning # 3</p> <p>Support regional transportation committees to coordinate policies and ordinances between municipalities.</p>	<p>County Role</p> <p>Support</p> <p>Partners</p> <p>Municipalities</p> <p>Category</p> <p>Planning</p> <p>Timeframe</p> <p>Ongoing</p> <p>Related Goals (see Chapter 2)</p> <p>7</p>

General Planning # 4	County Role
<p>Continue reviewing proposed subdivisions that affect County roads and site plans along County roads for transit and transportation impacts and to ensure that they are designed with consideration to bicycle and pedestrian access.</p> <p>The authority to approve applications for site plans and the subdivision of land is a major responsibility of county planning boards in New Jersey.</p>	Lead
	Partners
	Municipalities
	Category
	Planning
	Timeframe
	Ongoing
	Related Goals (see Chapter 2)
7	

General Planning # 5	County Role
<p>Maximize obtaining federal and state funding for County road and transit projects.</p> <p>Applying for Federal and State Aid Programs is a method for the County to advance projects that enhance safety and maintain infrastructure.</p>	Lead; Support
	Partners
	FHWA; NJDOT; NJTPA; Municipalities
	Category
	Planning
	Timeframe
	Ongoing
	Related Goals (see Chapter 2)
7	

General Planning # 6	County Role
<p>Monitor, analyze and make recommendations concerning legislative proposals and disseminate information to municipalities, freeholders and state and federal legislative representatives.</p> <p>Continue to support legislation that provides funding for the transportation system and is consistent with the goals, objectives and policies of the County.</p>	Lead; Support
	Partners
	Municipalities
	Category
	Planning; Policy
	Timeframe
	Ongoing
	Related Goals (see Chapter 2)
7	

General Planning # 7	County Role
<p>Reexamine and revise, if necessary, the <i>Union County Transportation Master Plan</i> every five years.</p> <p>Reexamining the Plan offers an opportunity for the County to see which aspects of the Plan might be in need of updating.</p>	Lead
	Partners
	Municipalities
	Category
	Planning
	Timeframe
	Long-term
	Related Goals (see Chapter 2)
7	

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Union County Transportation Master Plan



Move. Connect. Grow.

Appendix

- List of Acronyms
- Bureau of Transportation-Related Plans & Studies
- Public Outreach Summary

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Union County Transportation Master Plan



Move. Connect. Grow.

List of Acronyms

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List of Acronyms

AASHTO	American Association of State & Highway Transportation Officials
ACS	American Community Survey
ADA	Americans with Disabilities Act
BRT	Bus Rapid Transit
CAIT	Rutgers Center for Advanced Infrastructure & Transportation
CATF	Climate Adaptation Task Force
CNJ	Central Railroad of New Jersey
CR	Conrail Lehigh Line
CSAO	Conrail Shared Assets Operations
CSX	CSX Corp.
EWR	Newark Liberty International Airport
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
GIS	Geographic Information Systems
ITS	Intelligent Transportation Systems
LDJ	Linden Airport
M&E	Morristown & Erie Railway
MOE	Margin of Error
MPO	Metropolitan Planning Organization
MUTCD	Manual on Uniform Traffic Control Devices

List of Acronyms

NACTO	National Association of City Transportation Officials
NJDEP	New Jersey Department of Environmental Protection
NJDOT	New Jersey Department of Transportation
NJLWD	New Jersey Department of Labor & Workforce
NJRTPM-E	North Jersey Regional Transportation Model- Enhanced
NJTPA	North Jersey Transportation Planning Authority
NS Corp.	Norfolk Southern
NYMTC	New York Metropolitan Transportation Council
NYSERDA	New York State Energy Research & Development Authority
PANYNJ	Port Authority of New York & New Jersey
RHTS	Regional Household Travel Survey
RPA	Regional Planning Association
RRA	Rahway River Association
RTP	NJTPA Regional Transportation Plan
RVR	Rahway Valley Railroad
S&D	Study & Development Program
SAC	Steering Advisory Committee
SIRT	Staten Island Rapid Transit
SRTS	Safe Routes to School
TAF	Terminal Area Forecast

List of Acronyms

TEUs	Twenty-foot Equivalent Units
TIP	Transportation Improvement Project
TMA	Transportation Management Association
TOD	Transit-Oriented Development
USDOT	United States Department of Transportation
USDOT NTAD	National Transportation Atlas Database

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Union County Transportation Master Plan



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Bureau of Transportation- Related Plans & Studies

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County Reports and Studies

Past planning studies funded by the North Jersey Transportation Planning Authority and Union County through the Subregional Studies Program since 2003:

Union County Route 1&9 Corridor Study: 2011

The study looked at the Route 1&9 Corridor through the Cities of Elizabeth, Linden and Rahway. The goals of the study were: to further safety along the corridor; reduce delays and traffic conflicts; and, balance the needs of the local communities with those of the region.

Union County Route 27 Corridor Safety Study: 2009

This focused on transportation along the Route 27 Corridor from midtown Elizabeth through the City of Linden, the Borough of Roselle and the City of Rahway. The goal was to reduce vehicular accidents, improve mobility, support transit and increase pedestrian safety.

Union County Freight Access Study between Port Elizabeth and Tremley Point: 2007.

The Study identified and prepared for the project pipeline freight mobility options to maximize port and airport related redevelopment. It was part of Union County's ongoing process to facilitate the movement of goods in this area and to foster economic development that supports trade and commerce in the region.

Union County Comprehensive Bicycle Master Plan: 2007

The goal of the work was to develop safe opportunities for both an integrated bikeway system of both on-road and off-road facilities and to develop an overall plan for bicycle use in the County with guidelines to insure that bicycle pathways are integrated into the design of future municipal mixed use development and local transportation improvement projects.

Union County Community Shuttle Efficiency Project: 2005

The study developed sustainable, technical operating plans, using shared or regionalized program components to maximize the effectiveness of the shuttles at rail stations on the Raritan Valley Line. The project examined efficient service to the ridership markets.

Union County Port Area District 151 Parking & Intermodal Facility Study: 2005

The *Port Area Parking Study* examined parking needs, access, circulation and transit use within the northeastern portion of Elizabeth. It was part of ongoing strategic planning for the area surrounding Elizabeth's Port District.

Pedestrian Crossing Options for Route 22 Center Island: 2003

The study identified cost effective pedestrian crossing options that could be considered at four locations along Route 22.

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Union County Transportation Master Plan



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Public Outreach Summary

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Public Outreach Summary

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Introduction

This document summarizes the public involvement strategy for the Union County Transportation Master Plan. It outlines the coordinated approach used to generate input and build consensus among a wide and diverse group of stakeholders. There was flexibility in this plan to take advantage of opportunities as they arose and to adjust to the needs of Union County.

The public will be engaged throughout the project in many ways, including the following:

1. Steering Advisory Committee (SAC)
2. Presentation and updates to the Union County Transportation Advisory Board
3. Municipal Outreach Survey
4. Public Information Sessions (2)
5. Study Newsletters
6. Tagline and Logo
7. Project Website
8. Online Public Survey
9. Interviews and Meetings
10. Special Events

Steering Advisory Committee (SAC)

The RBA Team worked with the County to develop a list of stakeholders to review work products and share their knowledge of local issues and goals. Balanced representation was the objective. The list included the mayors, clerks, and/or business administrators for each municipality as well as representatives from state agencies, County departments, local employers and advocacy groups.

The SAC met three times during the plan's development. Representatives from the RBA Team attended each SAC meeting and prepared presentation materials and handouts prior to each meeting.

The first meeting was held on June 15, 2015. The purpose of the meeting was to introduce the project and solicit input on priorities and goals. Twenty-six stakeholders representing the County, multiple municipalities, EZ Ride TMA, and NJ TRANSIT were present. In preparation for the meeting, the RBA Team developed a PowerPoint presentation and survey questions.

The second Steering Advisory Committee meeting was held on Monday, February 8, 2016. The purpose of the meeting was to present findings, discuss vision and goals, get input on strategies and discuss the ideas with the Steering Advisory Committee members. Attendees were provided with a summary of findings from the municipal surveys and they were given a handout to provide input on wish lists. The PowerPoint presentation was interactive in format, utilizing a wireless voting system, also called a clicker exercise, for participants to provide real-time input on questions related to the project.

The third Steering Advisory Committee meeting was held on Monday, April 25, 2016. The purpose of

the meeting was to recap key findings and establish priorities for strategies. The presentation consisted of a PowerPoint show and displays, featuring a preview of the final plan, including Vision and Goals, Key Issues and Trends and an overview of the strategies for transportation enhancements. Attendees participated in a voting prioritization exercise to discuss and establish priorities at six stations with individual subject-matter facilitators for:

- Roadways and Bridges
- Public Transportation
- Goods Movement
- Bicycle and Pedestrian
- Aviation
- Climate Resilience

Presentation to the Union County Transportation Advisory Board

On July 1, 2015, a member of The RBA Team presented the project to the members of the Union County Transportation Advisory Board. The Board is comprised of representatives from the 21 municipalities. In preparation for the meeting, The RBA Team developed a survey to gain input on their top areas of concern, top projects and strategies and most appropriate use of transportation resources.

Municipal Outreach Survey

Obtaining municipal feedback on needs, issues and opportunities was critical to the development of the plan. The RBA Team, with Union County, developed a 17-question survey for distribution to all 21 municipalities that make up Union County. Development of the survey included multiple reviews and edits and coordination with the County to finalize and test the survey. The RBA Team also prepared a draft transmittal letter for the County to distribute to the 21 mayors in the County.

A PDF of the survey and a link to an online survey was emailed to every Mayor in the County on September 14, 2015. The municipalities were asked to respond by September 25. Of the 21 municipalities, 19 responded. A summary of the results of the survey was presented at the first public meeting on November 9, 2015.

Public Information Sessions

There were two public meetings during the development of the plan. The RBA Team prepared presentations, displays and facilitated both meetings. The activities, format and materials were based on agendas developed jointly by the RBA Team, the County and the SAC. It was important to make sure that these public meetings were accessible to all who would like to participate. The chosen venue was transit-accessible. In addition, Spanish translators were available to assist attendees. The RBA Team worked with the County to publicize the meetings.

Public Meeting 1: Discovery

Public meeting #1 was held on Monday, November 9th, at 4:00 PM in the Cranford Community Center, 220 Walnut Ave, Cranford, NJ 07016. Approximately 55 attendees were present. The purpose of the meeting was to engage citizens and stakeholders, present key findings from *Tech Memo 2: Data Collection and Inventory*, and gather public input on issues and opportunities to inform *Tech Memo 3: Analysis*. The meeting was held in an open-house format, with time allotted for input and conversation before and after two brief presentations. The project team facilitated a series of information stations with exercises to engage the public. The stations included:

- Existing Conditions & Key Issues
- Municipal Survey & Scenario Planning
- Vision & Goals
 - Goals Exercise – “What are the most important goals for the Union County Transportation Master Plan?” – attendees placed dots next to their top 3 choices
 - Visioning Exercise – people were asked to write key words that relate to their vision for Union County
 - Survey – (2) laptops with wireless internet connection were provided enabling the public to participate in the project survey on the County website.
 - Mapping Poster – “Where do you live and work?” – people and were asked to place red and blue dots where they live and/or work
- Issues & Opportunities – These stations included maps for attendees to mark-up with markers and sticky notes, each topic area staffed by an expert from the project team. The public was asked to identify assets, issues, deficiencies, opportunities and trends. Red markers were used to identify issues and deficiencies; green markers were used to identify assets; blue markers were used to identify opportunities and big ideas.
 - Roadways and Bridges (Gordon Meth, RBA)
 - Bicycle and Pedestrian (Mike Dannemiller, RBA)
 - Public Transportation (Colin Foley, VHB)
 - Freight and Aviation (Tom Phelan or Eric DeLine, VHB)

Public Meeting 2: Presentation

Public meeting #2 was held on Monday, April 25, at 5:00 PM in the Cranford Community Center, 220 Walnut Ave, Cranford, NJ. The purpose of the meeting was to recap key findings and solicit input on priorities for transportation enhancement strategies. Approximately 25 attendees were present.

Attendees were provided with several handouts including the Vision Statement, a summary of the Strategies for transportation enhancements grouped by travel mode and a list of the project Goals and Objectives. The presentation included a PowerPoint preview of the final plan with an overview of the key recommendations. Following the group presentation, attendees participated in a voting prioritization exercise to solicit public feedback on the recommendations. Each participant was given ten “Union County Dollar” sheets and asked to vote by depositing them among the following six stations:

- Roadways and Bridges
- Public Transportation
- Goods Movement
- Bicycle and Pedestrian
- Aviation
- Climate

Conducting this exercise provided feedback on funding opportunities and helped establish priorities for strategies.

Study Newsletter

Two project newsletters were developed. The first newsletter described the purpose and overview of the project and was distributed to those involved in the first SAC meeting on June 15, 2015 at the Cranford Community Center. The second newsletter was prepared prior to the April 25, 2016 public meeting and included an overview of the planning process, the goals and objectives of the Plan and highlights of the municipal survey. The newsletter served as an invitation to the second public meeting and provided information on the project website. The newsletter was translated into Spanish and was distributed electronically to a contact from each municipality. It was available in a hard copy version at meetings.

Tagline and Logo

In the early stage of the project, the RBA Team along with the County brainstormed a list of eight potential taglines for the Transportation Plan. Based on input from the SAC and the County Transportation Advisory Board, “*Move. Connect. Grow.*” was chosen as the tagline. In addition, the RBA Team provided input and revisions to drafts of the logo created by the County’s graphic designer. The goal of a tagline and logo was to create a brand by which Union County residents could recognize the Transportation Plan.

Project Website

Websites are essential tools to maintain interest and dialogue during plan development. The project webpage provided an outlet for the public and interested stakeholders to receive updated project information, review relevant documents and participate in the online survey.

The website for this plan was hosted and the webpage created by the County. The County webmaster created the webpage. The RBA Team assisted with content and input on the site.

Public Survey

The RBA Team assisted the County in developing a 4-question public survey for posting on the project website. The survey was used to solicit information on how well the transportation system currently met the needs of the public and how they would prioritize types of projects. This survey was available on the County's project webpage, www.ucnj.org/tmp. It was inaugurated at the August 5, 2015 County Summer Concert at Echo Lake Park.

A total of 260 respondents completed the public survey. The municipalities with the most respondents were: 34 from Cranford (13.1%), 29 from Union Twp. (11.1%), 29 from Westfield (11.1%), and 26 from Scotch Plains (10%). The fewest number of surveys were collected from Winfield (1 person), Rahway (3 people), and Kenilworth (4 people).

The majority of respondents (51.5%) indicated that the existing transportation system in Union County met their needs "Well." The top three responses for why respondents thought people would move to their community were: "Access to parks and open space," "Access to highways and major roads" and "Train Service." The lowest three responses for why people would move to their community were: "Options for living near work," "Bike paths" and "Congestion-free roadways."

The respondents rated the following issues as "Very Important":

- Maintaining existing roads and bridges(71%)
- Reducing the congestion on roadways(57.7%)
- Making walking easier and safer(56.5%)
- Improving train services(56%)
- Using technology to improve traffic flow(49.8%)

On the other hand, a majority of respondents (50.9%) rated adding more traffic signals as "Not Important."

Special Events

There was flexibility in this outreach plan to take advantage of opportunities as they arose and to adjust to the needs of Union County. The first such opportunity was the County Summer Concert in August 2015, at Echo Lake Park in Mountainside. The RBA Team assisted with preparing for the event and County staff were in attendance to inform residents of the Plan and to solicit input through the public survey with laptops set up for that purpose. As a thank you, a reflector safety band was given to each person who completed the survey.

Attachment A: Municipal Survey Responses

The following provides a summary of the responses received from the Municipal Survey conducted as part of the Union County Transportation Master Plan Update. A summary is provided for the 19 municipalities in Union County who submitted the survey. Findings by municipality are organized by:

- Roadway Corridors/Intersections
- Parking
- Bicycle and Pedestrian Safety, Issues, and Barriers
- Public Transportation Improvements
- Goods Movement
- Environment
- Transportation Wish List

Berkeley Heights

Roadway Corridors/Intersections

- Plainfield Avenue and Springfield Avenue (timing of lights)
- Mountain Avenue and Snyder Avenue (timing of lights)
- Accidents at Snyder Avenue and Hamilton Avenue

Parking

- Parking is a concern for the businesses along Springfield Avenue; they would like parking to be close to the businesses and safe for pedestrians.
- A parking lot has been paved behind the municipal building for commuters, and weekly parking passes have been offered.
- Informal parking for the train has occurred in the old Kings lot and at the tennis courts across from town hall.

Bicycle and Pedestrian Circulation, Safety, Issues, and Barriers

- Heavy traffic and lack of shoulder on Snyder Avenue
- No sidewalks along Mountain Avenue near Snyder Avenue
- Mountain Avenue poses safety issues for cyclists
- Received requests for more bike facilities to connect paths to/from the school with the downtown area.

Public Transportation Improvements

Three Most Beneficial Public Transportation Improvements

- Train station amenities, bicycle lockers and racks
- Town operates a bus service primarily utilized by seniors

Senior Bus Service and/or Train Shuttle

- No shuttle to the train station

Taxi or Limousine Serving the Community

- There is taxi and limousine service. Uber usage is not known.

Goods Movement

- Occasional truck traffic on Snyder Avenue; causes issues with school traffic (vehicular, bike and pedestrian).

Berkeley Heights (cont'd)

Environment

- There are plans to implement sustainable practices and TOD is already in use
- Flooding across Springfield Avenue near Passaic River Park occurs once a year
- Flooding near Mountain Avenue near County Road 525

Transportation Wish List

- Improvements/expansion of bike routes
- Handicap accessible sidewalk/crossings in school areas
- Improved streetscape improvements on Springfield Avenue

Clark

Roadway Corridors/Intersections

- Congestion: Central Avenue /Raritan Road/Walnut Avenue /Garden State Parkway

Parking

- Limited parking is available in the downtown area of Westfield Avenue.
- Informal commuter parking occurs in the Target Parking lot on Central Avenue.

Bicycle and Pedestrian Circulation, Safety, Issues, and Barriers

- Sidewalks are needed in front of Oak Ridge Park on the park side of the street.

Public Transportation Improvements

Three Most Beneficial Public Transportation Improvements

- Bus stop location
- Relocation of NJ Transit bus stop on Raritan Road at Central Avenue intersection

Senior Bus Service and/or Train Shuttle

- Town operates the senior bus service for local shopping

Taxi or Limousine Serving the Community

- Rahway has taxi service that is used in the area.

Goods Movement

- There are designated truck routes
- Truck traffic issues
 - From Westfield Avenue to Brant Avenue; No trucks posted but they use it anyway
 - Lake Avenue
- Complaints regarding truck idling at night

Environment

- The municipality currently uses green infrastructure
- Flooding occurs on the Pumpkin Patch Brook/Robinson Branch and on the Valley Road (Jacksons Pond Dam)
- There are complaints about truck idling overnight

Clark (cont'd)

Transportation Wish List

- Additional lane on Central Avenue from Garden State Parkway to Raritan Road (westbound).
- Signalization and intersection improvements Westfield Avenue/Central Avenue/Raritan Road and Terminal Avenue/Westfield Avenue.
- Signalization of Raritan Road/Sunset Drive and Raritan Road/James Avenue.

Cranford

Roadway Corridors/Intersections

- Congestion: North Avenue (Rt. 28) and South Avenue (CR-610)
- South Avenue East (CR-610) and Centennial Avenue (CR-615) represented the location within the township having the most motor vehicle crashes in 2015.
- Safety challenges: The intersection of Centennial Avenue (CR-615) and Raritan Road (CR-617). The intersection is maintained by the NJ Turnpike. It is adjacent to both the entrance and exit ramps of the GSP at Exit 136. The Traffic Control Signal was installed in 1979. An updated controller, signal timings, and even pedestrian countdown timer would make the intersection safer.

Parking

- The parking system is operationally efficient. The system is a year and a half old and has 48 multi-space pay stations and approximately fifty single head meters. There are about 1,000 parking spaces in our business district and offer a variety parking options and include commuter permits, employee permits or pay as you go spots. Although not a major concern, parking is at a premium similar to most suburban communities along the NJ Transit Northeast Corridor. We have active waiting lists for commuter permits and township officials have been proactive in searching for new surface lots to complement our 300-space parking garage.
- The Township of Cranford has done a great job of preventing our commuter parking from spilling into residential areas. This has been accomplished through local ordinances and enforcement by our police department.

Bicycle and Pedestrian Safety, Issues, and Barriers

- 13.5 mile bicycle route. Bike paths have succumbed to extreme weather conditions (flooding, etc.) The blacktop conditions have potholes, cracks, and missing sections challenging the best of riders.
- Springfield Avenue (CR-615) is the most highly traveled road with bicycles. This roadway is not only the main thoroughfare to Cranford High School, but is also the route to the main entrance of Union County College. We would love to entertain an idea such as complete streets, with designated bicycle lanes, but due to the current design and engineering of the roadway it is not a viable option.
- We have brought up the idea of a pedestrian/bicycle overpass bridge linking Union County College and Nomahegan Park but it has not been considered because of project's cost.

Cranford (cont'd)

Public Transportation Improvements

Three Most Beneficial Public Transportation Improvements

- Train station amenities
- Full-time one-seat ride from Cranford Station to New York Penn Station
- Coordination of bus and rail schedules

Senior Bus Service and/or Train Shuttle

- The Recreation Dept. oversees and operates the Senior Bus

Taxi or Limousine Serving the Community

- There are four companies that serve the community. Information on Uber service is not known at this time.

Goods Movement

- There are designated truck routes. We have had no issues or concerns related to this topic. Strict enforcement has been our best policy of changing behavior and generating compliance.

Environment

- Currently using multiple sustainable practices and plans to implement sustainable practices will exist in the future.
- Flooding occurs at Casino and Manor, South Union and James, High and Chestnut, Willow and Brookside Place and all areas by river.
- The township seldom receives complaints about noise.

Transportation Wish List

- Redesign and Install new traffic signal at the intersection of Raritan Road (CR 617) and Centennial Avenue (CR 615).
- Resurfacing our entire 13.5 mile bicycle route and also a new traffic signal at North Union and Alden.
- Construction of a pedestrian/bicyclist overpass bridge at UCC and Springfield Avenue (CR 615)/Nomahegan Park.

Elizabeth

Roadway Corridors/Intersections

- Congestion: Spring Street (US Routes 1 and 9) and North Avenue; South Elmora and Elmora Avenue Corridor between Bayway Circle and Westfield Avenue (State Highway Route 28).
- Safety challenges: Fairmount Avenue Corridor between Spring Street (US Routes 1 & 9) and Newark Avenue (State Highway Route 27). Serves as an additional route parallel to North Avenue to provide access from Newark Avenue to industrial areas east of Spring Street. Vehicles consistently speed, take/run through red lights.

Parking

- Vehicles park too close to the corners of intersections.
- Illegally and double parked vehicles. Jaywalking and pedestrians crossing outside of crosswalks.
- Parking near the North Elizabeth Train Station should be re-evaluated after new and proposed development in and around the train station is completed and opened.
- NJ Transit bus stops are consistently blocked by illegally parked vehicles, commercial vehicles making deliveries, etc.
- Informal commuter parking occurs at North Elizabeth Train Station - the perimeter of Kellogg Park along North Avenue and Madison Avenue.

Bicycle and Pedestrian Circulation, Safety, Issues, and Barriers

- All signalized intersections that cross Spring Street (US 1 and 9).
- The main routes into downtown and other business districts are used by bicyclists.
- The sections with the highest pedestrian traffic are the various business districts in the municipalities: Broad Street, Elizabeth Avenue, Elmora Avenue, North Broad Street and North Avenue. Sidewalks are sufficient in most areas.
- The main routes into downtown and other business districts are used by bicyclists: Bayway, Broad Street, First Street, East Grand Street, East Jersey Street, Elizabeth Avenue, Elmora Avenue, Morris Avenue, Newark Avenue, North Avenue, North Broad Street, South Broad Street, South Elmora Avenue, Third Street, Trumbull Street, West Grand Street, West Jersey Street, Westfield Avenue.

Elizabeth (cont'd)

Public Transportation Improvements

Three Most Beneficial Public Transportation Improvements

- Train station amenities, bicycle lockers and racks
- Coordination of bus and rail schedules, the implementation of recommendations from various mass transit, pedestrian, bicyclist, vehicular, truck and rail freight studies completed by the NJTPA. Aspects from the "Elizabeth Midtown Multi-Modal Integration Study Final Report September 2011", "The Greater Newark Bus System Study Final Report - July 2011" and the "Pedestrian Safety At and Near Bus Stops Final Report June 2011" have been implemented but many of the proposals, changes and enhancements have not.
- Continued build out and the eventual complete redevelopment within the Midtown Redevelopment Area in downtown Elizabeth.

Senior Bus Service and/or Train Shuttle

- The City of Elizabeth operates a fleet of (4) 20-passenger buses and (1) 14-passenger bus to provide transportation for seniors to various locations throughout the City.

Taxi or Limousine Serving the Community

- Various taxi or limousine companies serve the City of Elizabeth. Taxi companies based in Elizabeth can only pick up passengers at Terminal A at Newark Airport. These companies are prohibited from picking up passengers in Terminals B&C because they are located in Newark. Uber, Lyft, and other app-based ride share platforms are known to operate in the city.

Goods Movement

- U.S. State 1 and 9, 439, 27, 28, 81 and County Highways are designated truck routes.
- City ordinances prohibit truck traffic to designated routes unless making local deliveries.

Environment

- There are sustainable practices being utilized and planned for the future.
- The City of Elizabeth experiences localized flooding during every significant rain event.
- Locations which are vulnerable to such flooding are Trumbull Street, Division Street at Fairmount Avenue, South Street/Fourth Avenue, and Third Avenue.

Elizabeth (cont'd)

Transportation Wish List

- The construction of the new NJ Transit Broad Street Train Station in downtown Elizabeth.
- The construction of the proposed BRT line along the former Central Railroad ROW connecting EWR, Jersey Gardens Mall, downtown Elizabeth, and western Union County.
- The construction of the proposed ferry service between Jersey Gardens Mall and New York City providing an additional transportation link that would be free from traffic and congestion.
- Continued build out and the eventual complete redevelopment within the Midtown Redevelopment Area in downtown Elizabeth.

Fanwood

Roadway Corridors/Intersections

- Congestion: Martine Avenue corridor from commuters accessing Routes 22 and 78
- Terrill Road at Midway and LaGrande Avenues
- When school is in session: Trenton Avenue, Westfield Road, Madison Avenue

Parking

- Parking is limited near the train station, downtown area, Madison Avenue, Willow Avenue, North Avenue, and Second Street.
- Informal parking occurs on La Grande Avenue, Hetfield Avenue, Midway Avenue, Terrill Avenue, Second Avenue, North Avenue, Shady Lane, and at the Municipal Lot.

Bicycle and Pedestrian Safety, Issues, and Barriers

- South Avenue and Second Street – crosswalks and signage needed
- Midway Avenue and Tillotson Road – no sidewalks
- Midway Avenue: no sidewalks Ridge Way to Shasta Pass
- Lighted pedestrian signs are needed.
- More bike parking in the downtown
- Pedestrian safety challenges on: Martine Avenue at LaGrange/Second Avenues; Madison Avenue; Second Street/South Avenue; Downtown Area; Westfield Avenue/North Avenue
- Improved/additional bicycle facilities: Downtown area; Park areas (Forest Avenue, La Grande Avenue); LaGrande Avenue; Midway Avenue; North Avenue

Fanwood (cont'd)

Public Transportation Improvements

Three Most Beneficial Public Transportation Improvements

- Bus stop locations
- Peak period one-seat ride to New York Penn Station
- Bicycle lockers and racks

Senior Bus Service and/or Train Shuttle

- Senior bus provided by Scotch Plains Township for Fanwood resident pickups as a joint program. Chelsea at Fanwood Bus.

Taxi or Limousine Serving the Community

- One limousine service

Goods Movement

- Truck routes: Martine Avenue and Terrill Road; receive noise and truck weight complaints.

Environment

- Sustainable practices are being utilized and will be used in the future.
- Flooding occurs at Westfield Road between Birchwood Road and Sun Valley and at Midway and North Avenue.
- Martine Avenue gets complaints from residents about the noise from traffic.

Transportation Wish List

- Lighted pedestrian signs in the Downtown and Park areas
- Peak service, one-seat train ride to New York Penn Station
- Crosswalks in school areas
- North Avenue and Sheelan's Crossing bumpout

Garwood

Roadway Corridors/Intersections

- Congestion and safety challenges: Intersection of North Avenue and Center Street; Intersection of South Avenue and Center Street.

Parking

- Town wide parking is a problem because too many commuters park on local streets.

Bicycle and Pedestrian Safety, Issues, and Barriers

- Safety challenges: Center Street, North and South Avenues; Walnut Street (A school is located on this street); East Street.

Public Transportation Improvements

Three Most Beneficial Public Transportation Improvements

- Parking Facility
- Bicycle lockers and racks

Senior Bus Service and/or Train Shuttle

- One vehicle operated by the borough for seniors. No train shuttle

Taxi or Limousine Serving the Community

- Two licenses are issued per year. Uber usage is not known.

Goods Movement

- N/A

Environment

- No problems with flooding or noise
- Plan to incorporate TOD and sustainable practices

Transportation Wish List

- N/A

Hillside

Roadway Corridors/Intersections

- Congestion and safety challenges: All of these intersections are located near schools or school routes and are in close proximity to Route 22 - Liberty Avenue/Hillside Avenue; Liberty Avenue/Long Avenue; North Broad Street at Hillside/Central and Hollywood.

Parking

- Parking is a concern because it is limited in certain locations, especially near multi-dwelling homes.
- There is a problem with parking at bus stops from NYC commuters.

Bicycle and Pedestrian Circulation, Safety, Issues, and Barriers

- High pedestrian traffic on Liberty Avenue
- Anywhere around schools
- Bicycle travel is limited and the safety issue is always mixing pedestrians with vehicular traffic.

Public Transportation Improvements

Three Most Beneficial Public Transportation Improvements

- Bus route changes, bus stop amenities, and bus stop pull-off
- Commuter parking

Senior Bus Service and/or Train Shuttle

- Township provides senior transportation

Taxi or Limousine Serving the Community

- There is a Route 22 Limousine and a handful of limo licenses. Uber usage is not known.

Goods Movement

- There are truck routes yes. Specifically, in the industrial area. Weight limited streets essentially make up the route to travel.
- Truck traffic is a common complaint. The typical complaint is accidents caused by trucks venturing down streets where they don't belong. Cars, electric and cable wires, street signs usually take the brunt of damage.

Hillside (cont'd)

Environment

- Plan on incorporating better site design and low impact development to be more sustainable.
- Flooding occurs at Evans Terminal near Weequahic Park, Route 22, and the Bloy Street area.
- Truck driving is a major complaint.

Transportation Wish List

- Better NJ Transit Bus Service and facilities
- A better school transportation system
- Establishing detailed truck routes

Kenilworth

Roadway Corridors/Intersections

- Congestion: North Michigan Avenue and Boulevard; especially southbound on North Michigan.

Parking

- No problems with parking

Bicycle and Pedestrian Safety, Issues, and Barriers

- N/A (Skipped Question)

Public Transportation Improvements

Three Most Beneficial Public Transportation Improvements

- N/A (Skipped Question)

Senior Bus Service and/or Train Shuttle

- N/A (Skipped Question)

Taxi or Limousine Serving the Community

- N/A (Skipped Question)

Goods Movement

- N/A (Skipped Question)

Environment

- N/A (Skipped Question)

Transportation Wish List

- North Michigan Avenue (Southbound) and Boulevard intersection.
- North Michigan and Route 22- Acceleration lane onto Route 22.

Linden

Roadway Corridors/Intersections

- Congestion: North Wood Avenue from Curtis Street to Linden Avenue; Intersection of North Wood Avenue and Elizabeth Avenue; South and North Stiles Street; Northbound from West Munsell Avenue to West Elizabeth Avenue.
- Safety challenges: all of the above, especially N. Wood Ave. and Elizabeth Ave.

Parking

- Parking is a concern on North Wood Avenue.
- All municipal lots and Commuter lots are at capacity.
- The formation of a parking authority is being evaluated.
- Informal parking occurs in residential areas near the train station and bus stops.
- Trucks attempt to park on streets, but police enforce the no truck parking between 2am to 6am.

Bicycle and Pedestrian Circulation, Safety, Issues, and Barriers

- Currently widening sidewalks along N. Wood Avenue under SRTS and Transit Village grants.
- N. Wood Ave. is the largest bicycling area. However, parking and heavy traffic make it unsafe.
- Intersections along N. Wood Ave. are difficult to safely cross.

Public Transportation Improvements

Three Most Beneficial Public Transportation Improvements

- Train station amenities
- Traffic signal modernization

Senior Bus Service and/or Train Shuttle

- The City provides bus transportation to all senior citizens. There are no transit shuttles.

Taxi or Limousine Serving the Community

- There are two taxi services and Uber usage is not known.

Linden (cont'd)

Goods Movement

- There are designated truck routes
- Truck traffic issues – streets are clogged with trucks
 - Truck Routes like Stiles Street and Edgar Road are overcapacity
 - Trucks take local street like South Wood Avenue, Linden Avenue, and residential light traffic streets
 - Trucks cut through Linden on Stiles Street to get through the Turnpike, Goethals Bridge, and Route 1 and 9

Environment

- Sustainable practices are being used and will continue in the future
- Flooding occurs in wards 6 and 7.
- Noise from industry has been a problem for residents living in Linden. This issue is being dealt with.

Transportation Wish List

- Modernization of traffic signals

Mountainside

Roadway Corridors/Intersections

- Congestion: Route 22 Corridor; Intersection at New Providence Road and Route 22; Mountain Avenue and New Providence Road.
- Safety challenges: at New Providence Road & Route 22 and intersection at Mountain Ave & New Providence Road.

Parking

- Parking at local stores on Mountain Avenue is a problem because there are not enough spaces.
- There needs to be more parking at the bus stop near Borough Hall.
- Commuters park on all side streets near the bus stop around Borough Hall.

Bicycle and Pedestrian Circulation, Safety, Issues, and Barriers

- Most pedestrian traffic is at Mountain Ave at the local stores....those sidewalks are maintained by the stores. There are no other sidewalks in the Borough.
- Mountain Ave, New Providence Rd are the most highly traveled bike routes. Always requests for more space on roadway for bicycles.
- Safety issues for walking and bicycling - Mountain Avenue, southbound from Route 22 to Westfield line.

Public Transportation Improvements

Three Most Beneficial Public Transportation Improvements

- Bus stop pull off.
- Bicycle lockers and racks.
- Develop additional parking for Borough Hall bus stop.

Senior Bus Service and/or Train Shuttle

- Borough operates senior bus service three days a week.
- We do not have a shuttle service to local trains, but would like to.

Taxi or Limousine Serving the Community

- There are no taxi services, but there are 3 limousine services. Uber services are not known.

Mountainside (cont'd)

Goods Movement

- Late night truck traffic complaints in commercial areas.

Environment

- Mountainside is using sustainable development tactics and will continue to expand on environmentally friendly strategies.
- There is flooding on Route 22 at mile post 50.5.
- There are noise complaints from late night trucking in commercial areas.

Transportation Wish List

- Widening New Providence Road from Mountain Avenue to Route 22.
- Move bus stop from Route 22 West at New Providence Road to Route 22 West under overpass.
- Pave ball field at Borough Hall for parking and bus stop pull off on Route 22 East.

New Providence

Roadway Corridors/Intersections

- Congestion: Springfield Avenue and South Street – high traffic volumes intersect at the center of the Downtown Business District; Union Avenue and Mountain Avenue.
- Safety challenges: Springfield Avenue and South Street.

Parking

- Parking in the downtown area is limited.
- Parking near public schools must increase for drop off.

Bicycle and Pedestrian Circulation, Safety, Issues, and Barriers

- Sidewalks are sufficient downtown.
- Requests for bike racks in the center of town and around schools.

Public Transportation Improvements

Three Most Beneficial Public Transportation Improvements

- Train station amenities
- Bicycle lockers and racks

Senior Bus Service and/or Train Shuttle

- Senior Citizen Center controls and operates one bus

Taxi or Limousine Serving the Community

- There is limited limousine service and Uber usage is on the rise.

Goods Movement

- Union Avenue (a lightweight street) has many issues it is a main thoroughfare that comes directly off of Route 78.

Environment

- Plans to implement sustainable development and environmentally conscious behavior exist.
- Flooding occurs anywhere near the Passaic River and the Salt Brook's tributaries.

Transportation Wish List

- Parking development downtown and around the schools
- Shuttle service to downtown

Plainfield

Roadway Corridors/Intersections

- Congestion: 1-Watchung Avenue and East Front Street; 2-Downtown Plainfield Area, 3- Front Street between Roosevelt and Grant Avenues, 4-Park Avenue from 7th Street to the North Plainfield municipal line, 5-Watchung Avenue from 7th Street to the North Plainfield municipal line, 6-7th Street from Watchung Avenue to Arlington Avenue, 7- Leland and South Avenues, 8-Leland Avenue and 7th Street, 9-Terrill Road and South Avenue, 10- Terrill Road and 7th Street, 11-West Front Street and West End (Grant) Avenue.
- Intersections with safety challenges:
 - Woodland Avenue intersection with South End Parkway and Belleview Avenue
 - East 7th Street and Belvidere Avenue
 - Grant and Sherman Avenues
 - North Avenue and Berckman Street
 - Berckman and East Third Street
 - East 7th Street intersection with Franklin and Putnam Avenues
 - Roosevelt & East 5th Street

Parking

- Parking is limited in the Downtown area because high density apartment buildings were not built with enough parking.
- Parking at Cedar Brook and Green Brook Park is limited.
- Informal commuter parking occurs at all busstops.

Bicycle and Pedestrian Circulation, Safety, Issues, and Barriers

- Sidewalks are for the most part sufficient, but there are still residential sections of the city that do not have sidewalks.
- Bicyclists utilize all city streets; there are no roadways ‘most traveled’. Commercial land use board applicants are typically required to provide bicycle racks as part of their application, especially when located within our two TOD (Downtown and Netherwood train station) areas.
- The city has advanced a seven mile Green Brook bicycle/pedestrian trail, but lack of funding delays trail implementation.
- City streets outside of residential areas are narrow.
- Planning Board has discussed implementation of Complete Streets policy.

Plainfield (cont'd)

Public Transportation Improvements

Three Most Beneficial Public Transportation Improvements

- Bus route changes to Rutgers University in New Brunswick
- One Seat Ride to Manhattan
- Transit connections from the West End of the city to the Plainfield Downtown Train Station

Senior Bus Service and/or Train Shuttle

- City owns and operates senior services

Taxi or Limousine Serving the Community

- See page 68 of the 2009 Master Plan. Taxis have become an integral part of the community circulation options. Uber services are available.

Goods Movement

- Truck traffic located along North Avenue, South Second Street, Terrill Road, and Leland Avenue.
- No city designated truck routes; there are “truck exclusion routes;” need to designate “Street Routes”.
- Park and South Avenues have designations for 102” wide truck and double trailer truck combinations.

Environment

- Sustainable practices are being used and will be part of future developments.
- Flooding occurs on East Front Street, Norwood Avenue, and Farragut Road.

Transportation Wish List

- One seat ride to New York City.
- Construction of a new parking deck within TRDD zone.
- Transfer of Route 28 to NJDOT control and improvements within right of way.
- BRT Line/Cross County Rail Link, with service to Rutgers/ New Brunswick.

Rahway

Roadway Corridors/Intersections

- Congestion: Route 1 Corridor; Intersections along Route 27/Street George's Avenue at New Brunswick Avenue and Westfield Avenue.
- Safety challenges at the intersection of Route 27 and Murray Street and Jaques Avenue.

Parking

- Parking is a concern at the local elementary school.

Bicycle and Pedestrian Circulation, Safety, Issues, and Barriers

- Sidewalk along West Grand Avenue should be replaced and widened.
- Request for bicycle parking at the YMCA.

Public Transportation Improvements

Three Most Beneficial Public Transportation Improvements

- Train station amenities
- Better maintenance at train station
- Bicycle lockers and racks

Senior Bus Service and/or Train Shuttle

- Two buses are operated by the Golden Age Towers for the entire senior population.

Taxi or Limousine Serving the Community

- Yes there are taxi companies within the city. There is no inventory of Uber usage.

Goods Movement

- Occasional problems on Barnett Street with regards to truck traffic on light traffic streets (designated by ordinance).

Environment

- Sustainable practices are in use and will be used in the future.
- Flooding occurs along the Robinson Branch of the Rahway River near Central Avenue, New Church Street, Lower Main Street, and the CBD.
- Airplane noise from Newark Airport

Transportation Wish List

- Improvements to the train station, trestles and underpasses
- New sidewalks and curbs along West Grand Avenue

Roselle

Roadway Corridors/Intersections

- Congestion: 1st Avenue; Chestnut Street; 3rd Avenue
- Safety challenges: 1st Avenue & Gordon Street (Gordon Street Bridge); 3rd Avenue & Locust Street; 4th Avenue & Chestnut Street; 5th Avenue & Chestnut Street; 6th Avenue & Chestnut Street.

Parking

- Need more municipal building parking

Bicycle and Pedestrian Safety, Issues, and Barriers

- Safety issues: Chestnut Street; Amsterdam Avenue; 1st Avenue.
- No requests have been made to date for bicycle facilities or routes.

Public Transportation Improvements

Three Most Beneficial Public Transportation Improvements

- Bus route changes
 - Bus routes that lead directly to points of higher education and trade schools
- Bus stop amenities
- Bus stop locations

Senior Bus Service and/or Train Shuttle

- The Borough provides two buses for our senior population to travel to local events and shopping opportunities. There is no bus shuttle to the local train stations.

Taxi or Limousine Serving the Community

- There is not a strong taxi or limousine service.

Goods Movement

- There are designated truck routes as per our local Ordinances and at this time there are only minor truck traffic issues which the Borough has been able to resolve.

Environment

- Plans to use sustainable practices have been implemented.
- Flooding occurs on 3rd Avenue and Pine Street.

Transportation Wish List

- Traffic Light on Chestnut Street and 5th Avenue
- Traffic Light on Amsterdam Avenue and Wood Avenue
- Update County Street Signs as new retroreflective Federal Law

Scotch Plains

Roadway Corridors/Intersections

- Congestion: Park Avenue Corridor from center of Fanwood to Route 22 (Northbound in AM peak, Southbound in PM peak); The entire Martine Avenue Corridor due to commuters accessing Route 22 and Route 78 Terrill Road at Midway and La Grande Avenues School in session: Trenton Avenue, Westfield Road, Madison Avenue
- Safety issues: school areas (on Park Avenue, Terrill Road, Raritan Road, Westfield Road); Intersection of Raritan Road at Rahway Road.

Parking

- Parking is a concern on Mountain Avenue, Front Street, near bus stops, near high school, and around the municipal building.
- Informal commuter parking occurs at bus stops, near residential driveways, and near the municipal building.

Bicycle and Pedestrian Circulation, Safety, Issues, and Barriers

- Most pedestrian traffic is on the north side of the municipality. About 70% of the south side streets do not have sidewalks.
- The main roads are most highly traveled by bicyclists.
- No sidewalks from North Avenue to Promenade (Heading East towards Westfield town center).

Public Transportation Improvements

Three Most Beneficial Public Transportation Improvements

- Bus stop amenities
 - Not all bus stops have shelters.
- Bus stop location
 - North Avenue bus shelter has no sidewalk.

Senior Bus Service and/or Train Shuttle

- The Township's Recreation Department operates the senior bus. There is no shuttle service to the train.

Taxi or Limousine Serving the Community

- The Township does not have a strong taxi service; however, Plainfield taxis serve Scotch Plains. Uber ridership is not known.

Scotch Plains (cont'd)

Goods Movement

- There are designated truck routes
- Truck traffic issues
 - Park Avenue is not conducive to truck traffic because it is too narrow. It receives a high volume of large dump trucks and tractor-trailer trucks
 - Residents along Park Avenue complain of truck noise

Environment

- There are sustainable practices being utilized and plans to implement practices in the future.
- Flooding occurs near Route 22 at Union Avenue and Park Avenue, West Broad Street culvert near Oak Road, and on Lambert Mill Road.
- Residents along Park Avenue complain about truck noise.

Transportation Wish List

- Change the Maritime Avenue extension from 4 lanes to 2, and reduce speed limit.
- Replace “S” curve on Raritan Road (West of Terrill Road).
- Add barrier system to Route 22 (Eastbound) beyond Westfield Road.

Summit

Roadway Corridors/Intersections

- Morris Avenue - numerous traffic signals; traffic is significant during the AM and PM commutes.
- River Road - peak hour volumes make left turn movements from side streets and businesses challenging.
- Broad Street from Summit Avenue to Ashwood Avenue – design and surrounding land uses impact its capacity during peak hours.
- Safety Challenges:
 - Mountain Avenue corridor. The topography, roadway geometry, and minimal setback to the residences pose challenges.
 - Broad/Walnut/Upper Overlook intersection. A five point intersection with topographical constraints.
 - Broad/Middle intersection. This intersection includes a County Road, a City Road, access ramps to Route 24 and limited pedestrian facilities.
 - Springfield Avenue at railroad bridge. Springfield Avenue serves as a direct link to downtown and restricts the movement of people and goods due to the narrow and low railroad bridge. Pedestrians have no access along the route.

Parking

- Parking shortage issues occur within the central retail business district.

Bicycle and Pedestrian Safety, Issues, and Barriers

- The downtown has high pedestrian volume during the day. Pedestrian volume is also high on routes from commuter parking to the train station during commuting hours. Areas in the downtown could benefit from an increased operating width.
- Areas adjacent to all schools experience an uptick during pickup and drop off
- Parking for bicycles around the train station has been requested as have bike lanes.
- Springfield Avenue is a direct link to downtown and restricts the movement of people and goods due to the narrow and low railroad bridge. No pedestrian access.
- Mountain Avenue/Ashland Avenue - limited shoulder, high volumes and speeds, and challenging roadway geometries.

Summit (cont'd)

Public Transportation Improvements

Three Most Beneficial Public Transportation Improvements

- Train station amenities
- Bicycle lockers and racks
- Direct train link from Summit to Newark Airport

Senior Bus Service and/or Train Shuttle

- Senior Connections Inc. is the not for profit entity that operates a single twenty-two passenger bus that transports seniors to local shops, stores, and the community center. The senior bus is used only for senior transportation and not as a shuttle to public transportation.

Taxi or Limousine Serving the Community

- The city has an active taxi and limousine service industry and there are established pickup and drop-off zones at the train station. The city does not have a Zipcar service and Uber usage is unknown.

Goods Movement

- By ordinance, we have 4 designated truck routes: Broad Street, Morris Avenue, River Road, and Springfield Avenue.
- Trucks occasionally hit the low railroad bridge on Passaic Avenue or are forced to make an unsafe maneuver to return to established truck routes.

Environment

- There are sustainable practices being implemented and there are plans to incorporate more sustainable development in the future.
- Some localized flooding occurs on an annual basis near the City's Municipal Golf Course, along the Salt Brook, and Bellevue Avenue.

Transportation Wish List

- River Road corridor - depending on the proposed use at the current Merck property, a signal may be warranted for the intersection with Chatham Road.
- Railroad bridge at Springfield Avenue - this low-clearance bridge prohibits truck traffic, creates a bottleneck, and prevents an adequate pedestrian network from being installed which could better link downtown with the eastern part of Summit.
- Direct pedestrian/bike link from the county's Briant Park to downtown via the abandoned railway as part of the Summit "Highline" Project.

Union

Roadway Corridors/Intersections

- Congestion: Vauxhall Road from Millburn line to Salem Road; Morris Ave between North Avenue and Salem Road; Liberty Ave between Rahway Avenue and US Route 22; Intersection of Morris Avenue and Rahway Avenue; Intersection of Stuyvesant Avenue and W. Chestnut Street; US Highway Route 22 West.
- Safety challenges: Vauxhall Road at Route 78 West exit 50B – one of the highest crash locations in the township; Burnet Avenue – on street parking permitted and needed in this densely populated residential zone and parked cars are often struck by moving traffic.

Parking

- More park and ride options need to be examined for the Kean University students and people working in New York City.
- Informal parking occurs on side streets near Morris Avenue.

Bicycle and Pedestrian Circulation, Safety, Issues, and Barriers

- Major roads do not have marked bike lanes or shoulders for safe bike travel.
- East Coast Greenway is heavily used.
- Local residents and Greenway users have expressed concerns regarding Fairway Drive between Route 22 exit ramp and Chestnut Street - a narrow, pot-hole ridden county roadway with no sidewalk or bike lanes.

Public Transportation Improvements

Three Most Beneficial Public Transportation Improvements

- Bus stop locations, coordination of bus and rail schedules, and the Township does provide senior bus service operated by DPW and operates shuttle service to the train station. There is no fare.
- Ticket office operating hours.
- Peak time “one seat ride” trains to NYC Penn Station during the am and pm peak hour commute.

Senior Bus Service and/or Train Shuttle

- The Township of Union does provide senior bus service operated by our DPW employees, we provide medical appointment transportation in town and service for shopping in town. We also operate shuttle service to the train station operated also by our DPW employees. There is no fare charge to the rider.

Taxi or Limousine Serving the Community

- There is a taxi service. Uber usage is unknown.

Union (cont'd)

Goods Movement

- The township does have designated truck routes.
- A more effective truck route signage system is needed and would help truck traffic navigate through the town and county.
- Updating GPS Software Technology to direct oversized trucks to their destination by approved truck routes is needed.
- Incorporating an effective truck route signage plan will facilitate better traffic flow, curtail the need for police ticketing and reduce complaints from local residents about unwanted truck traffic on local roadways.

Environment

- Sustainable practices are in use and will be used in the future.
- Flooding occurs on Franklin Street, Springfield Avenue, and Liberty Avenue.

Transportation Wish List

- Improve traffic signal timing and coordination on Morris Ave between North Avenue and Salem Road.
- Install an acceleration lane on US 22 West at Springfield Road to allow safe merging of traffic coming off Springfield Road and it would also assist in mitigating traffic congestion.
- Prioritize the US 22 bridge replacement at Chestnut Street, based on its recent failure and subsequent temporary repair of the bridge decking.

Westfield

Roadway Corridors/Intersections

- Congestion: All State and County roads handle large volume of vehicles and at times can be congested.

Parking

- Informal commuter parking happens on the side streets near the train station.

Bicycle and Pedestrian Circulation, Safety, Issues, and Barriers

- The downtown central business district generates the most pedestrian traffic. Sidewalks are sufficient and all sidewalks in the municipality are the responsibility of the abutting property owner.

Public Transportation Improvements

Three Most Beneficial Public Transportation Improvements

- Bus stop amenities.
- Train station amenities.
- Bicycle lockers and racks.

Senior Bus Service and/or Train Shuttle

- The municipality does provide senior transportation and multiple vehicles are used. The transportation program is administered by the Recreation department.

Taxi or Limousine Serving the Community

- There are taxi and limousine services that operate in the municipality.

Goods Movement

- The municipality has specific streets that prohibit certain truck traffic.

Environment

- Sustainable practices are being used and will be used in the future.
- Airplane and helicopter noises have been an issue for residents.

Transportation Wish List

- Permanent direct line train service for riders of the Raritan Valley Line.
- Realignment of North and Elm intersection and installation of new traffic signal.

Winfield

Roadway Corridors/Intersections

- N/A

Parking

- There is no off street parking, which is an issue for residents that have multiple vehicles.

Bicycle and Pedestrian Safety, Issues, and Barriers

- Our sidewalks throughout the entire town are the responsibility of the Municipality. The most travel by bicyclist is Wavecrest Ave. & Seafoam Ave. The township has no request for additional and or improved bicycle parking.

Public Transportation Improvements

Three Most Beneficial Public Transportation Improvements

- N/A

Senior Bus Service and/or Train Shuttle

- We have 1 (15) passenger senior van/bus use for trips to food store, shopping malls, social events and delivering meals to shut ins on a daily basis.

Taxi or Limousine Serving the Community

- N/A

Goods Movement

- N/A

Environment

- There are sustainable practices being used and they will be continued in the future.

Transportation Wish List

- Resurfacing municipal roadways
- Sidewalk replacement
- Upgrade handicapped curb cuts



UNION COUNTY TRANSPORTATION MASTER PLAN

Attachment B: Municipal Survey Form

Union County is creating a new *Union County Transportation Master Plan* and we are sending along this **survey** to gather feedback and information on transportation-related needs, issues, and priorities within your municipality.

Our new *Transportation Master Plan* will guide transportation planning and investments within the County and its municipalities for years to come. This survey is **your opportunity** to tell the County about existing transportation systems and services within your community, and identify what may be needed for the future. Union County values your participation in this effort.

Instructions:

- To provide the most meaningful input, we recommend that your municipality **review the survey among elected officials, municipal engineers/planners, and others** familiar with current transportation issues in advance of online submission. A copy of the survey is attached.
- We ask that one individual be the lead in responding to the survey and coordinate with other offices of government for information where necessary. **The aim is to have one collective response from the municipality.**
- **Submission of the survey online is the preferred method.** The online survey is available at www.surveymonkey.com/r/UnionCountyTransportationPlan. Responses can also be emailed, scanned or faxed to Liza Betz (contact information below).
- Submission of the survey **will take 20-30 minutes** and must be completed within a single session (i.e. it cannot be saved and returned to at a later date).
- Each municipality in the County is receiving the same 17-question survey. We understand that not every question will apply to your municipality.

Your participation in this effort is important. **The survey closes on September 25, 2015.**

Thank you for taking the time to share your thoughts with us. Funding for this project is through Union County and the North Jersey Transportation Planning Authority. If you have any questions about this survey or the *Union County Transportation Master Plan*, please contact:

Liza Betz, AICP, PP
Transportation Planning Manager
Bureau of Transportation Planning
Union County Department of
Economic
Development ebetz@ucnj.org
Phone: 908-558-2273
Fax: 908-527-4715



UNION COUNTY TRANSPORTATION MASTER PLAN

CONTACT INFORMATION

Name: _____

Municipality: _____

Title: _____

Email address: _____

Phone number: _____

A representative from the County or Project Team may follow-up with you.

ROADWAY NETWORK

1. What corridors/intersections within your municipality (if any) would you consider congested? Z
Please explain or describe.

2. What corridors/intersections within your municipality (if any) would you consider to have safety challenges?



UNION COUNTY TRANSPORTATION MASTER PLAN

PARKING

3. Is parking a concern within your municipality? If so, where are the problem areas in the town and what are the key contributing factors?

4. If parking is a problem near train stations and bus stops in your municipality, are long term solutions being considered to address the issue? If so, please describe.

5. Are there locations where informal commuter or truck parking occurs? If so, where?



UNION COUNTY TRANSPORTATION MASTER PLAN

PEDESTRIAN AND BICYCLE CIRCULATION

6. Which sections of your municipalities get the most pedestrian traffic? Are the sidewalks sufficient in your municipality and who is responsible for maintaining them?

7. Which roadways are most highly traveled by bicyclists? Are you hearing requests for additional and/or improved bicycle facilities such as more routes or bicycle parking? If yes, where?

8. Are there specific corridors or intersections that pose safety issues or barriers to walking or to bicycle travel? If yes, where?



UNION COUNTY TRANSPORTATION MASTER PLAN

PUBLIC TRANSPORTATION

9. What public transportation improvements would benefit your municipality most? Select the top3.

- | | |
|--|---|
| <input type="checkbox"/> Bus route changes | <input type="checkbox"/> Train station amenities |
| <input type="checkbox"/> Bus or rail scheduling headways | <input type="checkbox"/> Bicycle lockers and racks |
| <input type="checkbox"/> Bus stop amenities | <input type="checkbox"/> Ticket office operating hours |
| <input type="checkbox"/> Bus stop locations | <input type="checkbox"/> Coordination of bus and rail schedules |
| <input type="checkbox"/> Bus stop pull-off | <input type="checkbox"/> Other _____ |

If applicable, please explain.

10. If your town provides senior bus service, who operates it, what services do they provide and how many vehicles are used? If your town operates its own shuttle service to a train station, are the senior buses used and is there a fare for the train shuttle?

11. Does your municipality have taxi or limousine serving the community? Are more residents using Uber or ride sharing?



UNION COUNTY TRANSPORTATION MASTER PLAN

GOODS MOVEMENT

12. Are there designated truck routes in your municipality? Do you have issues with truck traffic in areas or routes that are not conducive to trucks? (Please be specific)

ENVIRONMENT

13. What is your municipality's approach to sustainability?

	Currently use	Plan to use	No plan to use
Green infrastructure (rain gardens, bioswales, protect open space)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Infrastructure resiliency (flood barriers, resiliency planning)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Technology (smart parking, electric vehicle infrastructure, intelligent traffic signals, digital communication boards)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Incorporate better site design and low impact development principles into the zoning code	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Update master plan and other planning documents to identify goals and objectives related to sustainability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Transit-oriented development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Complete Streets program	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



UNION COUNTY TRANSPORTATION MASTER PLAN

14. If flooding is a recurring problem in your town, which are your top three locations and approximately how often does the flooding occur there?

15. Does the municipality get noise complaints from residents and businesses stemming from airplane and/or truck/roadway traffic? Please be specific.



UNION COUNTY TRANSPORTATION MASTER PLAN

GENERAL

16. If you could pick 3 transportation related improvements or projects for your municipality to be completed within the next 5 years, what would they be? Please explain or describe.



UNION COUNTY TRANSPORTATION MASTER PLAN

17. Has the municipality approved plans or are approvals pending for new development (residential, commercial or industrial) that may require transportation infrastructure improvements within the next 5 to 10 years?

Please add any additional comments.

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Union County Transportation Master Plan



Move. Connect. Grow.



June 2016

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