Morris County Master Plan Circulation Element

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Morris County Master Plan

Circulation Element
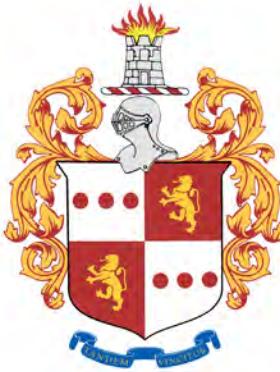
Prepared By:

Morris County Department of Public Works

Division of Engineering and Transportation

In Conjunction with:

Morris County Planning Board

ADOPTED: October 18, 2018

I hereby certify that this document is a true copy of the
Circulation Element adopted by the Morris County Planning Board
at its regular meeting on October 18, 2018.

Christine G. Marion

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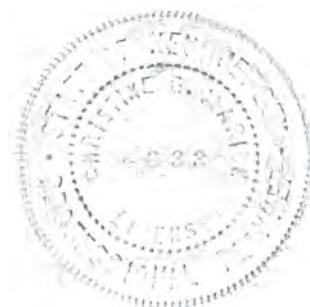
ACKNOWLEDGEMENTS

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CHAPTER 1:
Goals, Objectives, and Strategies

A. The Need for a Plan

The Morris County Master Plan is composed of various elements that address issues affecting county residents, businesses, municipalities, and the region. The last *Circulation Element of the Morris County Master Plan* was adopted in 1992. Since then, Morris County has gained approximately 80,000 residents reaching a total population of about 500,000 persons. Over the last quarter century, major transportation, land use, demographic, and regulatory changes have occurred, accompanied by shifting traffic patterns, increased traffic volumes, congestion, and demand for transportation services. Morris County and other agencies have continued to analyze and advance solutions to address these evolving challenges. The purpose of this new Circulation Element is to provide a comprehensive review of current conditions and transportation trends, and to present strategies to respond to the transportation issues and concerns identified during this plan's development.

This Circulation Element promotes the County's vision of a well-maintained transportation system that accommodates all users, advances overall mobility, and supports the efficient movement of people and goods that is necessary to maintain, improve, and enhance local and regional economic growth and quality of life. It presents information that may be used by local governments to inform their transportation planning and decision-making and will be used to help coordinate local, county, and state transportation policy and actions in Morris County. This new Circulation Element will serve as a guiding document for transportation planning and investment in Morris County for the next 25 years. Over this period, substantial changes to the transportation environment are anticipated. Examples include increased traffic associated with continued growth, increasing demand on public transit/specialized transportation, and the challenges and opportunities associated with new technologies, such as autonomous vehicles, drones, and alternative fueling infrastructure.

Plan Structure

The Circulation Element is divided into five chapters. Chapter One describes the process used to create this document and presents the essential policy and action elements of the Circulation Element, i.e., the goals, objectives, strategies, and guidelines that will help direct the County's transportation polices and decisions. Chapters two through five document the context in which this Circulation Element was developed, demographic conditions, the existing transportation network, and future trends.

B. Plan Development Process

The Circulation Element was developed through a comprehensive planning process. This process included input from the public and a variety of stakeholders, identification of current County transportation system conditions, analysis of demographic trends and economic issues, and review of municipal transportation plans and initiatives. The information gathered was used to help develop the goals, objectives, and strategies contained herein.

Public Outreach

Input from local residents and the business community played an important role in developing the Circulation Element. A robust public outreach effort was conducted to provide a variety of opportunities for public participation. This public outreach effort included the following:

- Public Workshops in Denville, Lincoln Park, Morris Township, and Roxbury

- Staffed tables at various community events:
  - → Morris County 4-H Fair in Chester Township (July 2015)
  - → Wharton Canal Day (August 2015)
  - → Fosterfields Country Fair & Heritage Festival in Morris Township (September 2015)
  - → Boonton Transportation Heritage Festival (September 2015)
  - → Morristown Festival on the Green (September 2015)

- A Transportation and Economic Development Business Panel and Luncheon hosted by the Morris County Economic Development Corporation (MCEDC)

- Regular e-mail communication with municipal administrators and governing bodies informing them of the project

- Social media posts and press releases announcing the project and advertising the public workshops

- A project website to share project documents and obtain comments

- Online surveys to gather public feedback on transportation issues and needed improvements

Technical Advisory Committee

In addition to the input received from the public through various workshops and events, a Technical Advisory Committee (TAC) for this project was created to obtain a diverse range of input and opinions from representative members of relevant public agencies, advocacy groups, and transportation planning partners of Morris County and the region. The TAC consisted of representatives from the following entities:

- Morris County Department of Human Services
- Morris County Park Commission
- Morris County Office of Emergency Management
- Morris County Tourism Bureau
- Morris County Chamber of Commerce
- Morris County Economic Development Corporation (MCEDC)
- Morris County League of Municipalities
- Morris County Planning Board
- New Jersey Highlands Council
- Morristown & Erie Railway
- Morristown Municipal Airport
- New Jersey Bike & Walk Coalition
- New Jersey Department of Transportation (NJDOT)
- NJ TRANSIT
- North Jersey Transportation Planning Authority (NJTPA)
- TransOptions, Inc.

TAC meetings were held in 2015 to solicit input regarding transportation related issues, concerns, and needs in Morris County, which helped to inform development of the Circulation Element.

Background Reviews

Development of this Circulation Element included a comprehensive review of transportation infrastructure and services, transportation planning efforts and initiatives, and municipal studies and plans. This review focused on three primary areas.

- First, a literature review was undertaken to examine the various Municipal, County, and regional planning documents that influence or relate to Morris County's transportation network. These include master plans, land use plans, and transportation studies for all 39 municipalities in Morris County. Morris Coun-

ty's plans and studies were also reviewed, along with regional plans conducted by the NJTPA and state agencies. Nationwide best practices were also reviewed.

- Next, an inventory and trends analysis was conducted to analyze current conditions in Morris County and throughout the 13 county North Jersey region. Topics considered in this analysis included demographics, transportation infrastructure and services, land use, and economic influences. Examination of this data helped determine important future trends that could influence transportation and land use in Morris County over the next 25 years.

- Finally, a review of policy and design guidelines was completed to consider policies, design standards, and other aspects of the regulatory framework for transportation planning in Morris County. This review included County planning and design standards, best practices for roadway design, and transit accessibility guidelines. Planning and design practices that link land use and transportation infrastructure were also appraised.

The findings from this examination are incorporated throughout this Circulation Element.

C. Goals and Objectives

The following goals and objectives of the Morris County Circulation Element present a vision for the County's transportation network. They provide a framework for advancing transportation, engineering and planning initiatives to create a transportation system that is responsive to the needs of its users, the communities, and the economy in the County and region.

Goal 1: Improve the safety, accessibility, and efficiency of Morris County's transportation network

Objectives:

1.1 Reduce congestion and improve safety on County roads

1.2 Support the expansion and enhancement of public transit

1.3 Provide for the special transportation needs of low-income workers, senior citizens, and people with disabilities

1.4 Support bicycle and pedestrian network improvements

1.5 Improve air quality and protect environmental resources

Goal 2: Conduct a coordinated, comprehensive, and cooperative transportation planning process

Objectives:

2.1 Coordinate transportation planning with Federal, State, regional, and local agencies

2.2 Continue to advance the County's interest at the regional and State level

2.3 Incorporate the needs of businesses, employees, residents, and others in transportation planning

2.4 Encourage the use of context sensitive roadway design

2.5 Support integration of land use and transportation planning

Goal 3: Support economic development through diverse transportation investment

Objectives:

3.1 Maintain and invest in the County's transportation infrastructure

3.2 Support efficient goods movement in the region

3.3 Advance transportation planning efforts that support economic development

3.4 Advocate for stable transportation funding sources

3.5 Integrate emerging transportation technologies into planning and infrastructure

The specific strategies for advancing these goals and objectives are presented in the next section.

D. Strategies

Strategy #1: Maintain adequate funding levels for County transportation infrastructure

Morris County will continue to provide adequate funding levels for the maintenance and upgrade of the County's transportation infrastructure. The County maintains about 283 miles of roads and owns approximately 1,000 bridges that are located on County and municipal roads. The County funds a significant proportion of its road and bridge projects through its annual capital budget. It also adopts a six-year capital plan for longer term budget planning. The capital budget will continue to support safe and efficient travel.

Supported Objectives	Topics
1.1, 1.4, 1.5, 2.1, 2.2, 2.3, 3.1, 3.4	Funding, Maintenance, Safety, Congestion
Partners	**Timeline**
NJDOT, NJTPA, Municipalities	Ongoing

Strategy #2: Seek State and Federal grants to fund transportation projects

Morris County will continue to apply to State and Federal grant programs to fund transportation projects. The County uses various grant programs to supplement its capital budget for road and bridge improvements. The three freight railroads owned by Morris County are primarily maintained and improved with grants from the NJDOT administered State Rail Plan and Crossing Program. The County will also continue to seek funding for transportation planning efforts typically provided through NJTPA programs, and for the operation of the Morris Area Paratransit System and Job Access Reverse Com-

mute shuttles. These programs allow the County to reduce its dependency on local taxes to pay for transportation.

Supported Objectives	Topics
1.1, 1.3, 1.4, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 3.4	Funding, Maintenance, Safety, Congestion
Partners	**Timeline**
NJDOT, NJTPA, Municipalities	Ongoing

Strategy #3: Advocate for stable and greater transportation investment at national, state, and regional levels

Investment in transportation infrastructure and services is critical for mobility, commerce, and economic growth. Continued investment at all levels of government is required to support comprehensive planning, design, and implementation of transportation projects. This funding is vitally important to maintain and improve the safety, efficiency, and accessibility of the County transportation system. The County will continue to advocate for funding to address the transportation needs of County residents, businesses, and visitors.

Supported Objectives	Topics
1.1, 1.2, 1.3, 1.4, 1.5, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 3.4	Funding, Maintenance, Economic Development
Partners	**Timeline**
Municipalities	Ongoing

Strategy #4: Examine high crash locations and improve safety on County roads

Crashes have physical, personal, and economic impacts. Morris County will continue to work with local law enforcement to identify the contributing factors for high crash locations on County roads. The County will work with NJDOT, NJTPA, and local authorities to employ infrastructure improvements, education, and enforcement to reduce crashes and improve safety for all users of the road network.

Morris County will continue to support and participate in various safety programs, including NJTPA's Local Safety and High Risk Rural Roads

grant programs and Street Smart Pedestrian Safety Campaigns. Where appropriate, FHWA Proven Safety Countermeasures will be considered as part of related infrastructure review.[1]

Supported Objectives	Topics
1.1, 1.3, 1.4, 2.1	Safety, Congestion
Partners	Timeline
NJDOT, NJTPA, Municipalities	Ongoing

Strategy #5: Monitor and reduce congestion on County roads

Reducing congestion will improve regional mobility, enhance the efficiency of the roadway system, reduce greenhouse emissions, and improve air quality. Morris County will identify and implement **infrastructure improvements and transportation management strategies** to improve operations on the County road network for all users. The County will continue to monitor congestion on County roads, **and identify operational and physical improvements** to reduce congestion in coordination with the state, NJTPA, and municipalities.

Supported Objectives	Topics
1.1, 1.2, 1.5, 2.1, 2.2, 2.3, 2.5, 3.1, 3.2, 3.3, 3.4	Congestion, Air Quality
Partners	Timeline
NJDOT, NJTPA, Municipalities	Ongoing

[1] Federal Highway Administration Proven Safety Countermeasures are infrastructure-oriented safety treatments and strategies that can be implemented to reduce roadway departure, intersection, pedestrian, and bicycle crashes.

Strategy #6: Support NJDOT and municipal initiatives to construct interchanges and connector roads between NJ 24 and NJ 124

NJ 24 is a state highway in southeast Morris County that connects I-287 in Hanover Township and I-78 in Springfield Township, Union County. Original plans for NJ 24 included additional interchanges and connector roads between Exit 2 (Columbia Turnpike) and Exit 7 (JFK Parkway); however, NJDOT abandoned these plans during construction because of municipal opposition.

These interchanges would have provided more direct access from the highway to the downtowns and employment sites on NJ 124. Instead, motorists must travel further along NJ 124 to reach their destinations, resulting in increased congestion on local streets in Morris Township, Madison Borough, and Chatham Borough. In recent years, local officials and the public have been more supportive of creating additional interchanges in this area; however, there has been no consensus on their location. Chatham Borough adopted a resolution in support of this concept in 2015. Morris County supports municipal efforts for attaining additional interchanges and/or connector roads, or other related improvements, pertaining to this issue.

Supported Objectives	Topics
1.1, 1.5, 2.1, 2.2, 2.3, 3.2, 3.3	Congestion, Safety, Air Quality
Partners	Timeline
NJDOT, Municipalities	Long

Strategy #7: Work with NJDOT to advance NJ 24 interchange improvements at Columbia Turnpike

Morris County will continue to work with NJDOT to advance NJ 24 interchange improvements at Columbia Turnpike to alleviate the congestion and safety issues at the nearby intersection of Columbia Turnpike and Park Avenue. Increasing regional traffic utilization of Park Avenue and anticipated traffic growth due to ongoing redevelopment is of concern to public officials, residents, and commuters. Concern over the safety of vehicles exiting NJ 24 eastbound onto Columbia Turnpike westbound, and then subsequently merging several lanes over to turn left onto southbound Park Avenue has resulted in discussions with Morris County and NJDOT. NJ 24 is under NJDOT's jurisdiction while Columbia Turnpike and Park Avenue are County roads, therefore close coordination will be required between the two entities to address safety concerns. As of 2017, NJDOT is advancing preliminary engineering for extending the NJ 24 eastbound off-ramp over Columbia Turnpike and connecting it to Park Avenue, south of Columbia Turnpike effectively removing a significant volume of traffic from the intersection.

Supported Objectives	Topics
1.1, 1.5, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3	Goods Movement, Safety, Congestion, Air Quality, Economic Development
Partners	Timeline
NJDOT, NJTPA, Municipalities	Long

Strategy #8: Accommodate the dimensions of commercial trucks in the design of County roads, intersections, and bridges

Commercial trucks are vital to the economy of Morris County. County roads and bridges typically serve as the main local routes for these trucks, connecting businesses to Interstates and other highways. Standard commercial trucks have 53-foot-long trailers and County roadway dimensions must be adequate to accommodate these vehicles. Intersections must have sufficient curb radius for turning movements, bridges must be able to support their weight and height clearance requirements, and roadway width must be sufficient to support their safe movement on County roads.

Supported Objectives	Topics
1.1, 1.5, 2.1, 2.3, 2.4, 3.1, 3.2, 3.3	Goods Movement, Safety, Air Quality
Partners	Timeline
NJDOT, Municipalities	Ongoing

Strategy #9: Utilize the Morris County Street Design Guidelines to assist in the design of County road improvement projects

Morris County will apply Street Design Guidelines to assist in the design of County road improvement projects. County roads serve a variety of functions, often simultaneously. They can serve as the main streets of town centers, corridors for regional travel, or access ways for shopping and office park districts. The design of roads must be appropriate to their location and capable of meeting these various needs. These guidelines will assist in the development of applicable roadway designs that address both County and municipal needs to improve the overall transportation network for all users.

Supported Objectives	Topics
1.1, 1.3, 1.4, 1.5, 2.1, 2.3, 2.4, 2.5, 3.1, 3.2, 3.3	Safety, Land Use, Economic Development
Partners	Timeline
NJDOT, Municipalities	Ongoing

Strategy #10: Incorporate the goals and objectives of the Circulation Element in the County's Land Development Standards

The *Morris County Land Development Standards* contain requirements for site plan and subdivision projects that are located on County roads or affect County drainage facilities and include traffic and roadway design standards. While the scope of these requirements is limited by the New Jersey County Planning Act (N.J.S.A. 40:27-1, et seq.), the goals and objectives of the Circulation Element will be incorporated into the County Land Development Standards where applicable. In this manner, the County Land Development Standards will advance these goals and objectives through development review requirements and recommendations with new development and redevelopment.

Supported Objectives	Topics
1.1, 1.2, 1.3, 1.4, 1.5, 2.1, 2.3, 2.4, 2.5, 3.1, 3.2, 3.3	Land Use, Congestion, Safety
Partners	**Timeline**
Municipalities	Short

Strategy #11: Maintain and improve the three County-owned freight railroads
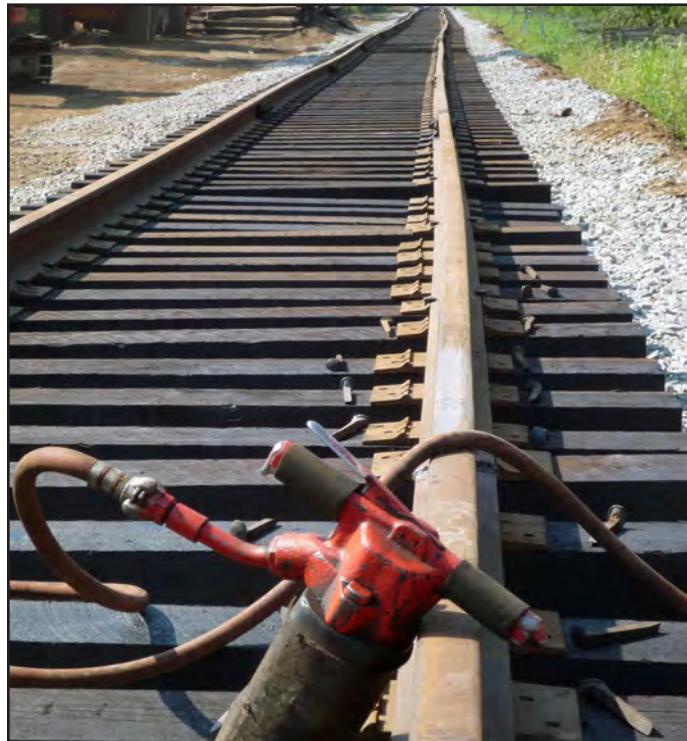
Morris County owns three freight railroads that run through Mount Olive, Roxbury, Rockaway Borough, and Rockaway Township. The businesses served by these railroads are important contributors to the County's economy and they rely on an efficient rail system for their operations. Use of rail freight reduces the number of trucks on the road and can be more cost effective for businesses than the use of trucks. A well-maintained rail network provides opportunities for use by businesses currently relying on truck transport and can help attract new businesses to the area who would benefit from rail access. Morris County will continue to make improvements to ensure that these railroads remain in a state of good repair.

Supported Objectives	Topics
1.5, 2.1, 2.2, 2.3, 2.5, 3.2, 3.3	Maintenance, Goods Movement, Economic Development, Air Quality
Partners	**Timeline**
NJDOT, Municipalities, Railroad Operators	Ongoing

Strategy #12: Assist with the efforts of the Morris County Economic Development Corporation (MCEDC) and rail operators in marketing rail-accessible industrial properties to businesses requiring freight rail service

The County will continue to support development of industrial land along the branches of its three railroads in cooperation with the municipalities served by the railroad, the Morris County Economic Development Corporation (MCEDC), and the rail operator. The *Morris Country Freight Infrastructure and Land Use Analysis* (2011) and *Morris/Warren County Rail Corridor Study* (2013) examined a number of prime industrial development sites in the County with freight rail access. The County will work with the MCEDC to expand on these prior studies and identify additional locations to market to businesses.

Supported Objectives	Topics
2.1, 2.2, 2.3, 2.5, 3.2, 3.3	Goods Movement, Land Use, Economic Development
Partners	**Timeline**
Municipalities, MCEDC, Railroad Operators, Businesses	Ongoing

Strategy #13: With regional partners, work towards the elimination of height limitations for railcars in Warren and Morris Counties

Morris County will work with its regional partners, including NJ TRANSIT, Warren County, NJTPA, and Norfolk Southern to eliminate vertical clearance limitations in Warren and Morris Counties to increase the viability of current and future rail freight access in Morris County. Existing clearances limit the potential for current and future freight rail in Morris County. The current standard freight railcar, known in the industry as Plate F, is 17 feet high. Previous generations of railcars are shorter and therefore require less vertical clearance for travel; however, they are less efficient transporting freight due to their smaller size. In addition, these smaller cars are no longer being produced and will **eventually be replaced by Plate F cars, which will dominate future rail freight use.**

Most rail freight is delivered from Pennsylvania by Norfolk Southern on the Washington Secondary, **which cannot accommodate Plate F cars because** they are unable to pass under the South Main Street Bridge located in Phillipsburg, Warren County. Only railcars of a 16'6" height (Plate C) or less can traverse beneath the bridge. A three-year study to evaluate and design a solution, sponsored by Morris County, and funded and managed by the NJTPA, started in 2017.

There are also several height restrictions along the NJ TRANSIT Morristown Line east of Dover because of catenary wires, which provide power to the NJ TRANSIT locomotives. According to the *Morris/Warren County Rail Corridor Study* completed by the NJTPA in 2013, approximately six inches of additional clearance will be required

to accommodate Plate F railcars along this segment of the line. When the height restrictions at the Philipsburg Bridge and locations in Morris County are eliminated, it will be less costly for businesses in Morris County to receive freight by rail. This will help attract new businesses to the County and encourage existing businesses to become freight rail customers.

Supported Objectives	Topics
1.5, 2.1, 2.2, 2.3, 3.2, 3.3	Goods Movement, Economic Development, Air Quality
Partners	**Timeline**
NJDOT, NJ TRANSIT, NJTPA, Warren County, Norfolk Southern, Railroad Operators	Long

Strategy #14: Encourage NJ TRANSIT to increase the railcar weight limit allowed along its railroads from 263,000 to 286,000 lbs.

The current standard weight limitation in the U.S. is 286,000 lbs. per railcar. However, NJ TRANSIT limits the maximum railcar weight to 263,000 lbs. due to concern about the increased track and bridge maintenance that would be required due to the heavier cars.

Morris County will continue to work with regional partners to encourage NJ TRANSIT and the State to permit the industry standard railcar weight on their tracks. Allowing the standard railcar weight would reduce the cost of shipping for freight rail operators and their customers. Reducing the cost to transport freight by rail would also make it more competitive than shipping by truck, which will help reduce truck traffic on roads, reduce congestion, and encourage more businesses to use rail.

Supported Objectives	Topics
1.5, 2.1, 2.2, 2.3, 3.2, 3.3	Goods Movement, Economic Development, Air Quality
Partners	**Timeline**
NJDOT, NJ TRANSIT, Railroad Operators	Long

Strategy #15: Advance the realignment of the Dover & Rockaway Railroad and the creation of the Rockaway River Greenway

The Dover & Rockaway (D&R) Railroad is one of three freight railroads owned by Morris County. The D&R runs from its junction with NJ TRANSIT in Wharton, east through Dover and Rockaway Borough, ending in Rockaway Township. The rail line generally follows NJ 15 south to the center of Dover and then heads east paralleling Blackwell Street until it turns north towards Rockaway Borough east of Dover Rockaway Road. The D&R has thirteen at-grade rail crossings in Dover at locations that are active with traffic and pedestrians.

A realignment of this rail segment would provide several benefits to Dover and businesses served on the D&R line, which are clustered near the eastern end of the line in Rockaway Borough and Rockaway Township. It would improve safety by eliminating eleven railroad crossings in Dover and two at the Howmet Castings property located east of the town center. Depending on the alignment of the new connection of the D&R with the Morristown Line, the project could also eliminate the need for a bridge over the Rockaway River.

Several issues will require attention if the D&R is relocated. These include, managing the movement of freight and passenger trains on the Morristown Line east of Dover, mitigating the environmental impact of railroad construction through wetlands, and ensuring safety and mobility of any new crossings. The County will advance this study for conceptual development and capital programming through the *NJTPA's Pilot Freight Concept Development Program* in 2017.

Supported Objectives	Topics
1.1, 1.4, 1.5, 2.1, 2.2, 2.3, 2.5, 3.2, 3.3	Goods Movement, Bike/Ped, Safety, Economic Development
Partners	**Timeline**
NJDOT, NJTPA, NJ TRANSIT, Municipalities, Morris County Park Commission Railroad Operators	Long

Strategy #16: Work with Morris County's Boards and Committees to obtain feedback and advance the goals of the Circulation Element

The Morris County Board of Transportation, Freight Railroad Advisory Committee, Planning Board, and Airport Advisory Committee work closely with the Department of Public Works on transportation issues. The Department of Human Services also has **boards related to transportation that are more specifically focused on the needs of seniors, people with disabilities, veterans, and lower income residents. These boards and committees obtain feedback on County activities and discuss transportation related issues** with their Freeholder-appointed members. The Department of Public Works will continue to work with these various boards and committees to advance the goals of the Circulation Element.

Supported Objectives	Topics
1.1, 1.2, 1.3, 1.4, 1.5, 2.1, 2.2, 2.3, 2.4, 2.5, 3.1, 3.2. 3.3, 3.4	Public Transportation, Bike/Ped, Goods Movement, Community Transportation, Land Use, Maintenance, Economic Development
Partners	**Timeline**
Municipalities, Businesses	Ongoing

Strategy #17: Continue active participation with the Morris County Economic Development Corporation (MCEDC) and the Morris County Chamber of Commerce

The MCEDC, local governments, and businesses all recognize the importance of transportation infrastructure to a dynamic business climate and the continued economic development of Morris County. Morris County will continue work with the MCEDC in support of transportation and economic development. The County will also continue to work with the Morris County Chamber of Commerce, which is a partnership of businesses and government dedicated to promoting economic growth in Morris County.

Supported Objectives	Topics
2.1, 2.2, 2.3, 3.2, 3.3, 3.4	Economic Development, Goods Movement, Land Use
Partners	**Timeline**
MCEDC, Businesses, Municipalities	Ongoing

Strategy #18: Support TransOptions ridesharing, Safe Routes to School, and educational programs

TransOptions is the Transportation Management Association (TMA) serving Morris, Sussex, and Warren Counties, and the suburban areas of Essex,

Passaic, and Union Counties. It plays an important role in supporting mobility options for residents and workers in Morris County and specializes in marketing and developing programs that reduce congestion and encourage healthy activity. The organization works directly with businesses and schools on various programs such as van and carpools, bicycling to work, and Safe Routes to School. Morris County will continue to support the organization's work with local businesses, schools, and communities to increase mobility options within the County.

Supported Objectives	Topics
1.1, 1.2, 1.3, 1.4, 1.5, 2.1, 2.2, 2.3, 3.3, 3.4	Multi-Modal, Safety, Congestion, Air Quality, Economic Development
Partners	**Timeline**
NJDOT, NJTPA, NJ TRANSIT, TransOptions, Municipalities, Businesses	Ongoing

Strategy #19: Support municipal projects and grant applications that advance the goals, objectives, and strategies of the Circulation Element

Municipalities can receive assistance in advancing their transportation priorities through Federal and/or State grants or participation in transportation programs. Grant opportunities and programs available include, but are not limited to: Safe Routes to School, NJDOT Bikeways and Safe Streets to Transit, NJDEP Recreational Trails, Walkable Community Workshops, Complete Streets Technical Assistance Program, NJTPA's Street Smart Safety Program, and NJTPA's Local Safety Program and Emerging Centers Program. Morris County will provide technical assistance, participate in stakeholder groups, provide agency coordination, and support grant applications, program participation, and municipal projects that help advance the goals and objectives of the Circulation Element and support municipal efforts to improve transportation.

Supported Objectives	Topics
1.1, 1.2, 1.3, 1.4, 1.5, 2.1, 2.3, 2.4, 2.5, 3.2. 3.3, 3.4	Safety, Congestion, Economic Development
Partners	**Timeline**
NJDOT, NJTPA, Municipalities, TransOptions	Ongoing

Strategy #20: Support municipal Transit Supportive Development initiatives

Transit Supported Development (TSD) is a planning concept that integrates local land use and transit planning at local, corridor, and regional levels. TSD is larger in scale than Transit-Oriented Development (TOD), i.e. development at specific sites that integrate a mix of uses and amenities integrated into a walkable neighborhood in close proximity to public transit.

TSD is applicable to communities that may not yet have an extensive transit system or service, but are interested in creating denser, more walkable communities that promote future transit expansion and TOD. These strategies will assist with reducing congestion on County and local roads, expand the use of public transit, and increase pedestrian activity within municipalities. In New Jersey, Rahway and South Orange are examples of TSDs. Morris County will support municipal TSD initiatives and TOD projects through technical assistance, participation in stakeholder groups, and coordination with other governmental agencies. The County's *NJ 124 Corridor Transit Access Improvement Study* can serve as a model for this strategy.

Supported Objectives	Topics
1.1, 1.2, 1.3, 1.4, 1.5, 2.1, 2.2, 2.3, 2.4, 2.5, 3.3	Multi-modal, Land Use, Economic Development, Public Transportation
Partners	**Timeline**
NJDOT, NJTPA, NJ TRANSIT, Municipalities	Ongoing

Strategy #21: Actively participate on NJTPA's boards and committees

Morris County will continue to participate on the North Jersey Transportation Planning Authority's (NJTPA) boards and committees. Morris County, like other counties in NJTPA's region, serves as a permanent member on NJTPA's Board of Trustees and Regional Transportation Advisory Committee. Federal transportation dollars are allocated to the County through the NJTPA, and budgets are approved by the Board of Trustees. Serving on these bodies is a requirement for County receipt of these Federal transportation funds.

County representatives also rotate as members of the NJTPA Project Prioritization Committee, Planning and Economic Development Committee, Freight Initiatives Committee, and the Executive Committee. In addition, the NJTPA develops important documents, such as the *Regional Transportation Plan* (RTP), that plans and strategizes future transportation investment. Staff regularly serve as technical advisory committee members, or in other capacities, for the RTP and various studies and projects initiated by NJTPA, which benefits transportation initiatives in Morris County and the surrounding region.

Supported Objectives	Topics
1.1, 1.2, 1.3, 1.4, 1.5, 2.1, 2.2, 2.3, 2.4, 2.5, 3.1, 3.2. 3.3, 3.4	Funding, Maintenance Safety, Congestion, Public Transportation, Bike/Ped, Goods Movement, Economic Development
Partners	**Timeline**
NJTPA	Ongoing

Strategy #22: Support economic activity and growth at Morristown Municipal Airport and Lincoln Park Airport

Morristown Municipal Airport and Lincoln Park Airport contribute to the economic strength of Morris County. The airports provide access and support for many of the County's major corporations and businesses, generating substantial economic benefit and tax revenue through the jobs, income, and spending created by their presence. The County supports these facilities through the Morris County Airport Advisory Committee, a forum where representatives of County government, municipal government, the corporate community, and others discuss a wide range of airport related matters including on-going projects, noise control, and funding. Further economic growth in the County and the region will place greater demand on existing airport facilities, and the County will continue to support efforts to increase airport efficiencies, improve service, and upgrade facilities through the Committee and the MCEDC.

Supported Objectives	Topics
2.1, 2.3, 3.3	Aviation, Economic Development
Partners	**Timeline**
NJDOT, Municipalities, Airports	Ongoing

Strategy #23: Improve access to tourist destinations, such as historical, cultural, and recreational sites

Morris County is actively engaged with the Morris County Tourism Bureau, a non-profit organization that markets the County's many excellent recreational, historical, and cultural sites. These tourist destinations are managed and operated by the Morris County Park Commission, local municipalities, private organizations, and businesses. Tourism provides a significant economic benefit to Morris County, and the County will continue to work with these agencies and organizations to improve access to tourist sites.

Supported Objectives	Topics
1.4, 2.1, 2.3, 3.3	Bike/Ped, Economic Development
Partners	**Timeline**
Municipalities, Morris County Park Commission, Morris County Tourism Bureau	Ongoing

Strategy #24: Update the Bicycle and Pedestrian Element of the Morris County Master Plan

The 1977 *Morris County Bikeway Element* was Morris County's first Master Plan document that focused exclusively on non-motorized travel in the County. The *Bicycle and Pedestrian Element of Morris County's Master Plan* was subsequently adopted in 1998 and included pedestrian-related goals, objectives, and strategies. New planning and land use strategies that support bicycle and pedestrian transportation have emerged since the 1998 Element's adoption, including Complete Streets and walkable communities. An update to the 1998 Bicycle and Pedestrian Element will incorporate these new planning practices, identify communities that have provided accommodations for bicyclists and pedestrians since 1998, identify potential bikeway/pedestrian improvements on County Roads, prioritize corridors in need of improvement, support physical activity/improved fitness, and identify missing links in the network.

Supported Objectives	Topics
1.1, 1.4, 1.5, 2.1, 2.2, 2.3, 2.4, 2.5, 3.1, 3.3	Bike/Ped, Safety, Air Quality
Partners	**Timeline**
NJDOT, NJTPA, Municipalities, Morris County Park Commission	Medium

Strategy #25: Support local efforts to construct and expand trails on or connecting to public parkland

In November 2014, the voting electorate of Morris County approved a ballot question to allow trail construction on public lands with Morris County Preservation Trust Program funds. In 2016, the Morris County Trail Construction Grant Program was established. This program funds construction of trails for recreational use and to connect with other existing trails and pathways. In 2016, 13 grants were awarded to projects in 13 Morris County communities. Another six grants were awarded in 2017.
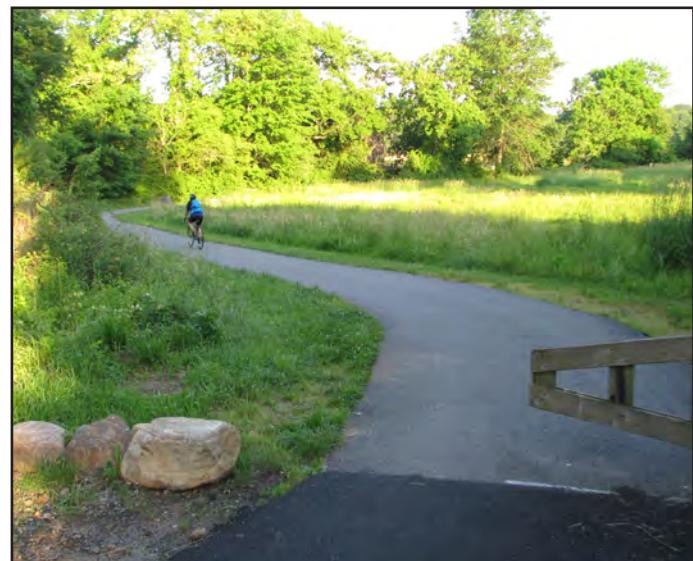
The Morris County Park Commission and its non-profit agency, the Morris County Park Alliance, initiated the Connect To Walk and Bike program in 2016. The program is intended to provide physical activity opportunities through walking and biking. The task force is comprised of planners, health officials, and parks and recreation professionals. The program works with municipalities to identify missing pedestrian and bicycle linkages between parks and the community, and to help plan for the general walk and bikeability of each municipality.

Supported Objectives	Topics
1.2, 1.4, 2.1, 2.2, 2.3, 3.3	Bike/Ped, Public Transportation, Multi-modal, Economic Development
Partners	**Timeline**
NJDOT, NJTPA, Municipalities, Morris County Park Commission	Medium

Strategy #26: Construct the NYS&W Bicycle and Pedestrian Path

The New York, Susquehanna, and Western (NYS&W) Bicycle and Pedestrian Path will be a 4.8-mile shared-use path that will start at River Drive in Pequannock and end at the Mountain View Train Station in Wayne. The path will be constructed on top of the abandoned railroad bed of the NYS&W Railway's Pompton Industrial Branch. This recreational and transportation facility will connect residents and visitors with nearby amenities, including public parks, businesses, schools, and transit.

Federal funding has been secured for the acquisition of the railroad bed and construction of the path. When completed, the path will be maintained by the Morris County Park Commission. The County will continue to evaluate opportunities for connections to other trail systems that would further enhance this resource. The County will also examine the potential for extension of the NYS&W Bicycle and Pedestrian Path north into Riverdale to Post Lane, where the alignment ended in the original plans for the path.

Supported Objectives	Topics
1.2, 1.4, 2.1, 2.2, 2.3, 3.3	Bike/Ped, Public Transportation, Multi-modal, Economic Development
Partners	**Timeline**
NJDOT, NJTPA, Municipalities, Morris County Park Commission	Medium

Strategy #27: Support advancement of the Morris Canal Greenway

The NJTPA established the Morris Canal Working Group (MCWG) in 2012 to preserve the former Morris Canal right-of-way between Phillipsburg and Jersey City, and to facilitate the Canal's conversion into a public greenway. The greenway will consist of interconnected linear parks and trails for bicyclists and pedestrians. Morris County will continue to participate in the MCWG and support efforts to advance the creation of the Greenway. NJTPA will develop a strategic plan to identify a route for the Greenway in cooperation with local communities, recommend linkages to parks and cultural facilities along the route, and identify funding opportunities for bicycle and pedestrian improvements.

Supported Objectives	Topics
1.2, 1.4, 2.1, 2.2, 2.3, 3.3	Bike/Ped, Economic Development
Partners	**Timeline**
NJDOT, NJTPA, Municipalities, Morris County Park Commission	Long

Strategy #28: Identify and support access improvements to public transit

Convenient access to public transit is an important element of the transportation system. The County will support efforts to improve access to train stations and bus hubs. Where appropriate, improvements can include infrastructure changes to parking or sidewalks, (including but not limited to making trains stations and bus stops ADA accessible), increased parking opportunities, operational adjustments for bus-to-rail connections, increased transit station parking and offsite parking with shuttles and changes to the built-environment such as TOD and TSD projects as discussed in Strategy 20. The County will participate at varying levels in municipal, NJ TRANSIT, NJTPA, and NJDOT initiatives.

Supported Objectives	Topics
1.1, 1.2, 1.3, 1.4, 1.5, 2.1, 2.2, 2.3, 3.3, 3.4	Public Transportation, Multi-Modal, Economic Development, Land Use
Partners	**Timeline**
NJDOT, NJ TRANSIT, Municipalities	Ongoing

Strategy #29: Meet the current and future demand for the Morris County Paratransit System (MAPS)

MAPS' curb to curb service is available to residents who are 60 or older or 18 or older and have a physical or mental disability that includes functional limitations or reside in the rural areas of Morris County. MAPS may also be able to provide transportation for people temporarily disabled by illness or injury. Trips to medical appointments, especially chemotherapy, radiation therapy and dialysis, have high priority. Trips to work, school and adult day care are also important. If scheduling permits, transportation for other reasons, like nursing home visits, may be available.

Over the next 25 years, Morris County anticipates growth in the number of persons eligible for community transportation services, particularly older adults. Expanding the availability of MAPS will help ensure that the growing population of older adults will have mobility options to reach medical appointments, to shop, and to access other critical services. Inter-agency coordination and cooperation will be important, as new sources of funding will be needed to meet this growing demand.

Supported Objectives	Topics
1.3, 2.1, 2.3, 2.3, 3.3, 3.4	Community Transportation, Funding
Partners	**Timeline**
NJDOT, NJ TRANSIT, Municipalities, Human Services	Ongoing

Strategy #30: Support advancement of the Lackawanna Cutoff Passenger Rail Service Restoration Project

The Lackawanna Cutoff was once a passenger and freight railroad owned by the Delaware, Lackawanna & Western Rail that ran between Scranton, Pennsylvania and Port Morris in Morris County. The line was abandoned in 1979 due to lack of demand for rail service; however, traffic volume growth on I-80 between Pennsylvania and New Jersey has renewed interest in passenger rail service on the Cutoff as a way to relieve congestion on I-80. Funding for Phase 1 of the restoration effort, which would rebuild the easternmost segment between Port Morris Junction and Andover, was approved in 2008 and construction began in 2010. The long-term vision for the Lackawanna Cutoff Passenger Rail Service Restoration Project is to provide passenger service from Scranton, PA to New Jersey. In the near term, the County will support the Cutoff's construction to Andover in Sussex County and to stations further west into Pennsylvania.

Supported Objectives	Topics
1.1, 1.2, 1.5, 2.1, 2.2, 2.3, 3.3, 3.4	Public Transportation, Congestion, Economic Development, Air Quality
Partners	**Timeline**
NJDOT, NJ TRANSIT, Municipalities	Ongoing

Strategy #31: Support the Passaic-Bergen Passenger Service Restoration Project

Morris County will continue to support the reactivation of passenger rail service along the NYS&W freight rail line, known as the Passaic-Bergen Passenger Service Restoration Project. In 2015, representatives from Bergen, Hudson, and Passaic Counties formed the North Jersey Rail Coalition. The purpose of the Coalition is to encourage the re-establishment of passenger service between Hawthorne in Passaic County and North Bergen in Hudson County. As documented in the 1996 *NYS&W Passenger Service Restoration Project* study, reactivation could extend passenger service west to Hardyston in Sussex County. Such an extension would run along the northern Morris County border, granting potential passenger rail access to Morris County municipalities such as Riverdale, Butler, Kinnelon, and Jefferson. Passenger service along this corridor would also help alleviate existing

and anticipated future congestion on NJ 23 in Morris and Passaic Counties. The County will support the Passaic-Bergen Passenger Service restoration project as it moves forward and advocate for the eventual expansion of the line to serve Morris County.

Supported Objectives	Topics
1.1, 1.2, 1.5, 2.1, 2.2, 2.3, 3.3, 3.4	Public Transportation, Congestion, Economic Development, Air Quality
Partners	**Timeline**
NJ TRANSIT, Municipalities	Ongoing

Strategy #32: Seek more service on local NJ TRANSIT bus routes in Morris County

Morris County continues to support increased bus service on the NJ TRANSIT local routes that serve the County. Currently, local buses 871-880 have limited service hours and frequency. Increasing the level of service to downtowns, employment centers and redevelopment areas would make these routes more convenient and attractive to residents and workers. Public transportation should also be provided to human service destinations, such as employment training centers, which often serve a transit dependent population. NJ TRANSIT surveys have shown that many of the local route riders do not have vehicles of their own. Additional service hours would also better serve those who work on weekends and/or have jobs that end later in the evening. Increasing frequency of service would give

riders more flexibility to travel to their destinations such as work, school, and home, and would enable better transfers between bus routes and trains. An enhanced local bus system would also allow more commuters to take transit and thereby help reduce traffic congestion.

Supported Objectives	Topics
1.1, 1.2, 1.3, 1.5, 2.1, 2.2, 2.3, 3.3, 3.4	Public Transportation, Economic Development, Air Quality, Funding
Partners	**Timeline**
NJ TRANSIT, Municipalities	Ongoing

Strategy #33: Advocate for off-peak rail service on the NJ TRANSIT Montclair-Boonton Line in Morris County

Morris County will work with municipalities along the Montclair-Boonton Line to advocate for increased off-peak hours service and to support transit-oriented development around train stations on the line. Rail stations located along the Montclair-Boonton Line experienced declining ridership between 2004 and 2014 and a number of rail stations on the Montclair-Boonton Line would benefit from improved rail service, notably during off-peak hours and on Saturdays. The Town of Boonton and Lincoln Park both support transit-oriented development in their town centers near the existing train stations. Boonton studied the potential for an NJDOT Transit Village designation in 2015, and the town is furthering their initiative as part of the NJTPA's Emerging Centers Program. Lincoln Park completed a *Downtown Revitalization Action Plan* in 2012, which encouraged NJ TRANSIT to expand bus and rail service as a key recommendation. Coordination with NJ TRANSIT to address ongoing transportation funding challenges and identify potential new funding sources to support off-peak rail service will be required.

Supported Objectives	Topics
1.1, 1.2, 1.3, 1.5, 2.1, 2.2, 2.3, 3.3, 3.4	Public Transportation, Economic Development, Funding, Land Use
Partners	**Timeline**
NJ TRANSIT, Municipalities	Ongoing

Strategy #34: Work with NJ TRANSIT to implement the recommendations of the Northwest New Jersey Bus Study

The *Northwest New Jersey Bus Study* was completed in 2010 through the joint effort of NJ TRANSIT and NJTPA. The study identified strategies and specific recommendations for improving bus transit in Morris, Passaic, Sussex, and Warren Counties. Recommendations presented in this study include restructuring and expansion of existing bus routes, creating new bus lines, improving park and ride facilities, and adding bus priority treatments at intersections and along corridors. The study also included a region-wide assessment of commuters' travel patterns and the potential demand for expanding the transit system.

Public transit service in Morris County is primarily designed to provide access to urban centers to the east, such as Newark and New York City; however, only a small percentage of Morris County's workforce commutes to these destinations. The majority of the County's commuters work within the County. The transit network is not well suited for trips within the County, or for traveling in northbound or southbound directions. Further, there are large areas of Morris County with no transit access. Morris County will work with and encourage NJ TRANSIT to advance the recommendations of the Study.

Supported Objectives	Topics
1.1, 1.2, 1.3, 1.5, 2.1, 2.2, 2.3, 3.3, 3.4	Public Transportation, Economic Development, Funding, Air Quality
Partners	**Timeline**
NJ TRANSIT, Municipalities, adjoining Counties	Short

Supported Objectives	Topics
1.1, 1.2, 1.3, 1.5, 2.1, 2.2, 2.3, 3.3, 3.4	Public Transportation, Economic Development, Funding, Air Quality
Partners	**Timeline**
Municipalities, NJ TRANSIT	Long

Strategy #35: Work with municipalities and NJ TRANSIT to implement the recommendations of the NJ 124 Corridor Transit Access Improvement Study

The *NJ 124 Corridor Transit Access Improvement Study* examined transportation conditions in the NJ 124 corridor, which has three NJ TRANSIT Morris & Essex Line stations: Chatham, Madison, and Convent Station. The study, completed in 2013, documented deficiencies in pedestrian, bicycle, parking availability, and coordinated bus access to the stations. The study identified strategies and made specific recommendations for improving roads, bicycle and pedestrian infrastructure, parking, and transit service to improve access to these stations and mobility through the study area. Morris County will work with and encourage municipalities and NJ TRANSIT to advance the recommendations of the NJ 124 Corridor Transit Access Improvement Study. Additionally, as the Park Avenue corridor continues to redevelop, transit access to offices, medical, and residential development should continue to be evaluated.

Strategy #36: Evaluate the potential for an inter-county bus route between Morris County, the Veterans Administration Health Center, and employment centers in Somerset County

Public transit service in Morris County is primarily designed to provide access to urban centers to the east, such as Newark and New York City. However, only a small percentage of Morris County's workforce commutes to these destinations. The majority of the County's commuters work within the County and adjoining counties. There are significant employment centers located in Somerset County; however, there is no direct public transit connection from Morris County. Additionally, a transit connection between Morristown and the Veterans Administration Health Center in Lyons should be considered. Morris County will discuss with NJ TRANSIT and Somerset County the potential for evaluating the ridership demand for an inter-county bus route connecting Morris County to employment centers along the US 202 corridor in Somerset County and the Veterans Administration Health Center.

Supported Objectives	Topics
1.1, 1.2, 1.3, 1.5, 2.1, 2.2, 2.3, 3.3, 3.4	Public Transportation, Economic Development, Funding, Air Quality
Partners	**Timeline**
NJ TRANSIT, Somerset County, Municipalities	Short

Strategy #37: Adapt plans and policies as needed to address emerging transportation technologies and trends

Transportation technologies are progressing at a rapid pace and substantial changes are anticipated over the next 25 years. This period will likely see the introduction and widespread use of autonomous vehicles, the employment of commercial aerial drones, and the construction of new infrastructures to serve alternatively fueled vehicles. Accommodating these and other evolving technologies will present new planning and regulatory challenges, but also provide new opportunities to reduce traffic congestion, increase transportation safety, improve mobility, improve air quality, and spur continued economic growth. Keeping abreast of advancements in transportation technology will be necessary if the County is to adopt appropriate planning and policy responses in advance of changing transportation conditions.

Supported Objectives	Topics
1.1, 1.5, 2.1, 2.2, 2.3, 2.5, 3.2, 3.3	Technology Trends, Economic Development
Partners	**Timeline**
NJDOT, Municipalities, adjoining Counties	Long

Source: Intelligent Transportation Systems Joint Programs Office, USDOT

E. Morris County Street Design Guidelines

Morris County's Street Design Guidelines were developed through the technical research conducted for the Circulation Element, review of feedback received at public workshops and community events, and analysis of current roadway design practices. Instead of a single standard design for all County roads, the guidelines present five conceptual variants for County roads.

Public roads in the United States are assigned functional classifications by each State based on the Federal Highway Administration's (FHWA) Highway Functional Classification System (see Chapter 4). A functional classification indicates the purpose of a road as a part of the roadway network. Further discussion of these classifications is discussed in Chapter 4. The design guidelines suggest which variant is appropriate to apply based on a street's functional classification and the type of area served, **such as suburban, rural, town center, industrial, or commercial.**

These "context sensitive" design guidelines do not replace the Federal classification system, but supplement it by considering the relationship of land use and transportation.[2] The variants provide context sensitive street designs for County roads so that they not only meet the needs of automobiles, but also accommodate trucks, transit service, bicyclists, and pedestrians where appropriate. These variants also incorporate strategies such as complete **streets, transit supportive development, road diets,** and walkable communities to reflect the goals and objectives of this Circulation Element.

The guidelines support the plan's first goal to "improve the safety, accessibility, and efficiency of Morris County's transportation network." Each variant is designed to meet the needs of the users who may travel on a particular roadway. Additionally, the street design guidelines support the second goal to "conduct a coordinated, comprehensive, and cooperative transportation planning process." The designs serve as a **basis for discussion** between the County and the municipalities on improvements that **can** be incorporated into County road projects and be adapted to meet each community's needs. Finally, these guidelines advance the Element's third goal to "support economic development through transportation investment." The guidelines intend that road improvements enhance surrounding land uses and better support existing and new development.
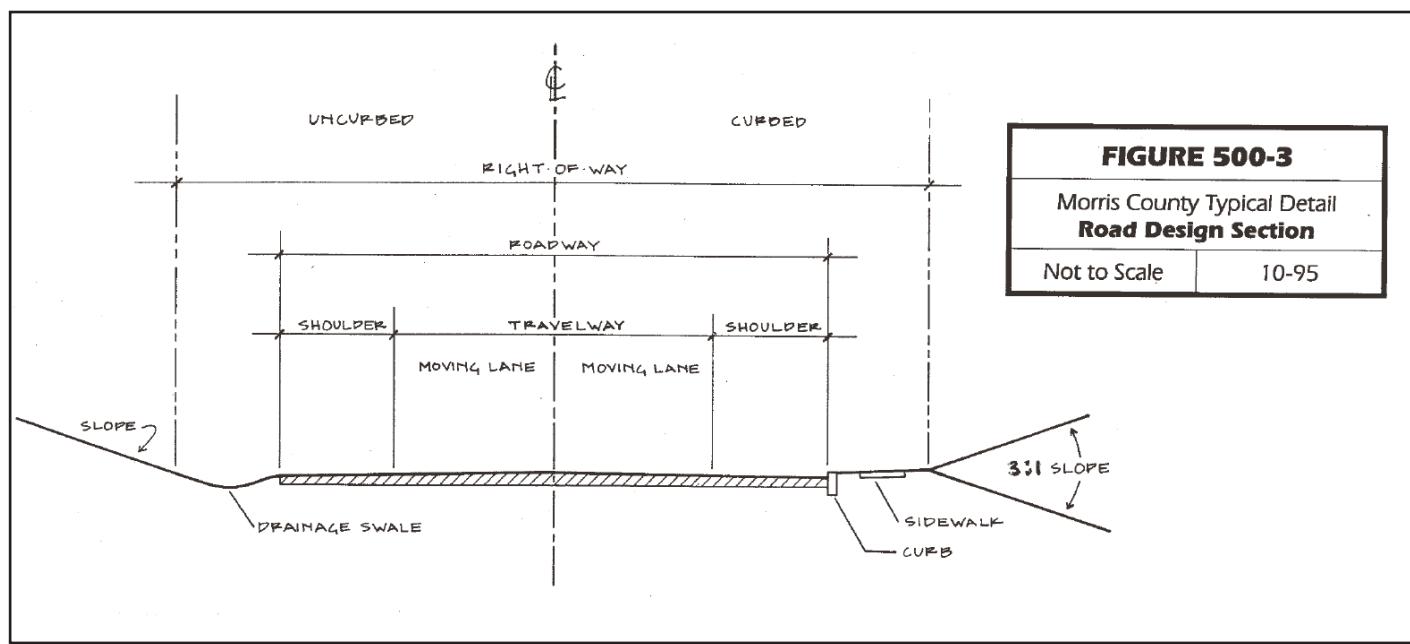
Source: Morris County Land Development Standards

[2] Context Sensitive Design maximizes the integration of the roadway into the surrounding environment/community, while providing for the road user's needs in a manner which is fiscally feasible (Source: *NJDOT - Smart Transportation Guidebook 2008).*

STREET VARIANT 1

The design elements of Street Variant 1 are generally appropriate for roads classified as Principal Arterials by FHWA's Functional Classification System. Street Variant 1's purpose is to support higher volumes of vehicles traveling to major regional destinations such as commercial corridors, shopping malls, industrial facilities with intensive truck activity, and downtowns. In applying this variant, lane widths and intersections should be designed to accommodate trucks and buses. In comparison to other variants, this design provides for more travel lanes and higher speed limits to support regional travel. Pedestrians and bicyclists are accommodated through standard width sidewalks and signage for

bike routes. Bus shelters should be provided along transit routes to offer a protected location for passengers. On-street parking should be prohibited, and the **number of driveways should be minimized in order** to maintain safety and efficiency. At a minimum, traffic signals along these corridors should use video detection to optimize traffic flow. A system of coordinated signals along the corridor would provide the highest degree of traffic efficiency. The figure below shows a conceptual configuration of Street Variant 1 in a typical 66-foot County right of way. While **certain situations have resulted in a variation of this** standard, the minimum 66-foot required right-of-way is depicted for all Street Variants.


CHARACTERISTICS					
Roadway	**Intersections**	**Parking**	**Transit**	**Sidewalks**	**Bicycle**
• 12'-14' travel lanes • 2-4 lanes • 40-55 MPH speed limit desired	• Coordinated signals • Video detection • High visibility crosswalks (continental markings shown) • Pedestrian countdown timers • Transit signal prioritization	• None	• Bus Shelters	• 3'-4' buffer from curb • 4'-8' sidewalks • ADA accessible ramps • Limited curb cuts	• Signage for designated routes • Facilities determined by local municipality • Supported by striped shoulders, if present

STREET VARIANT 2

Street Variant 2 contains the highest number of design elements of the variants, and two sub-variants are presented below to demonstrate various configurations. These configurations would be appropriate for roads classified as Principal Arterials, but can also be suitable for other road classes. The design is suitable for a variety of surrounding land uses including single or multi-family residential, office and shopping districts, and light industrial development. This variant encourages narrower lane widths of 11'-12' and slightly lower vehicle speeds than Variant 1. Similar to Variant 1, the Variant 2 is designed to maintain efficient traffic movement at intersections and along the corridor. Traffic cameras or signal **coordination should be implemented to maintain** optimal traffic flow, and the number of driveways should be minimal. On-street parking is generally not

encouraged, but can be accommodated if designated spaces already exist. Sidewalks are recommended to be 4'-8' to provide safe mobility for pedestrians. **Bike lanes can be incorporated where space allows, and** bus shelters should be provided along bus routes.

County roads with lower traffic volumes may be **candidates for a reduction in the number of lanes** (Variant 2a), known as a road diet, to reduce speeds **and improve safety for vehicles, bicyclists, and pedestrians.** A wider off-road multi-use path (Variant 2b) **for bicyclists and pedestrians can be considered if the** pavement width is not sufficient to provide bike lanes, **or if other factors, such as volume, safety, or vehicle** speed, suggest that an off-road path is more appropriate to accommodate bicyclists and pedestrians.

CHARACTERISTICS					
Roadway	**Intersections**	**Parking**	**Transit**	**Sidewalks**	**Bicycle**
• 11'-12' travel lanes • 2-4 lanes (typically 2) • 25-40 MPH speed limit desired • Potential for road diet, if appropriate	• Coordinated signals • Video detection • High visibility crosswalks (continental markings shown) • Pedestrian countdown timers • Transit signal prioritization, where needed	• Not encouraged unless previously existing	• Bus Shelters	• 3'-4' buffer from curb • 4'-8' sidewalks • Potential for 10' multi-use path • ADA accessible ramps • Limited curb cuts • Sidewalks continue across driveways	• Signage for designated routes • Potential for bike lanes • Bike parking at major destinations

Street Variant 2a with Road Diet

4-8'
Ped
Zone

3-4'
Amenity
Zone

5-6'
Bike
Lane

1'
Shoulder

11-12'
Travel Lane

10'
Turning Lane

11-12'
Travel Lane

1'
Shoulder

5-6'
Bike
Lane

3-4'
Amenity
Zone

4-8'
Ped
Zone

66'
Right-Of-Way
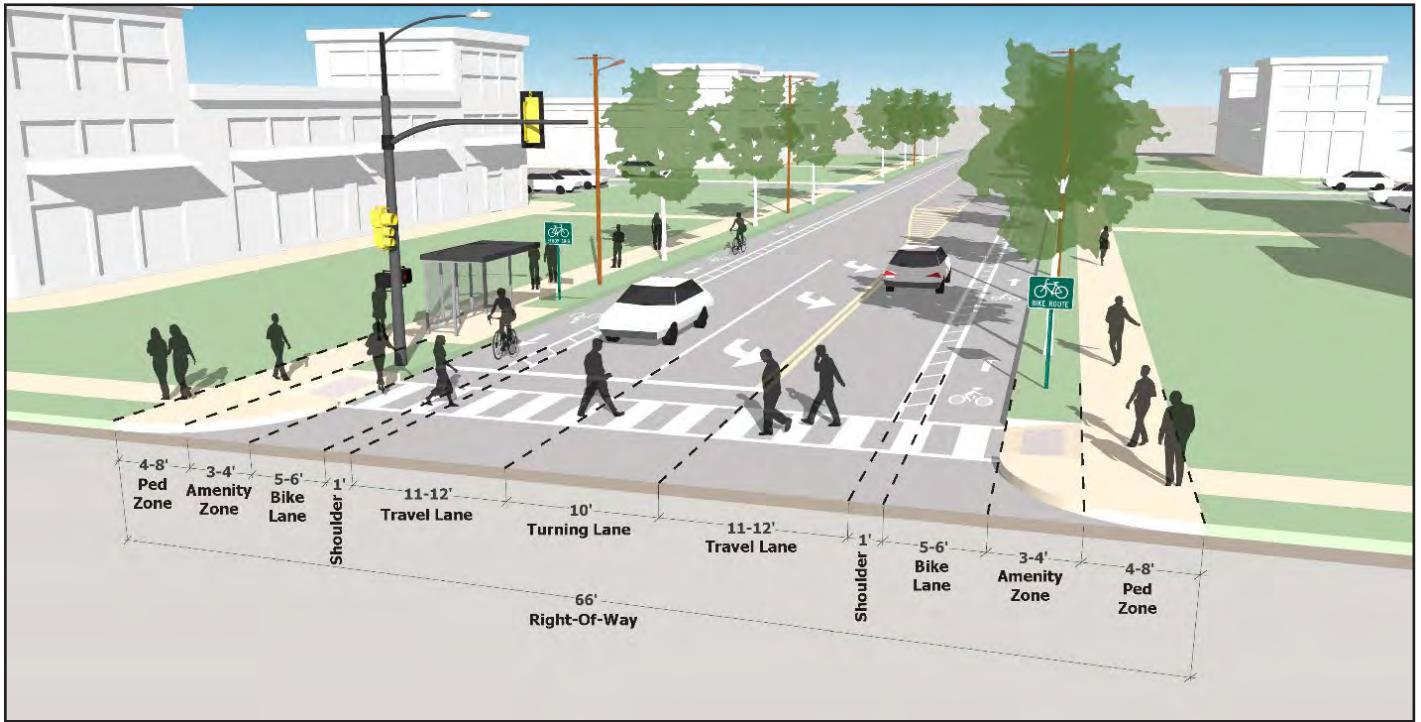
Street Variant 2b with 10' Multi-use Path

10'+
Multi-Purpose
Path

3-4'
Amenity
Zone

5-6'
Shoulder

11-12'
Travel Lane

11-12'
Travel Lane

5-6'
Shoulder

3-4'
Amenity
Zone

10'+
Multi-Purpose
Path

66'
Right-Of-Way
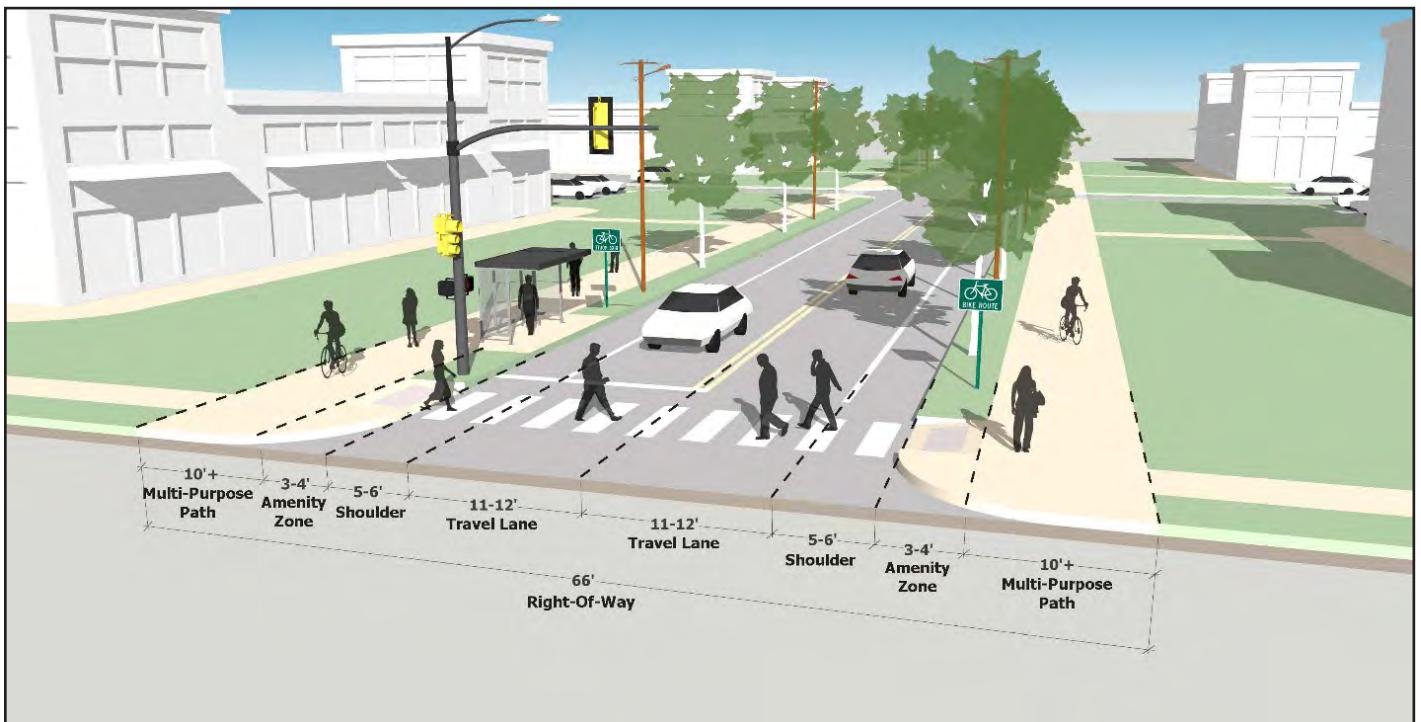
STREET VARIANT 3

Maintaining the residential character of neighborhoods throughout the County is an important theme that emerged from public feedback. The features of Street Variant 3 are appropriate for maintaining and enhancing residential streets. This variant is suitable for roads primarily with single-family residential homes and civic, cultural, religious, and educational land uses, and with functional classifications ranging from Major Collectors to Local Roads. Variant 3 provides 2-lane roads with narrower lanes (11'-12') **and lower speed limits than Variants 1 and 2 to discourage high traffic volumes.** Bus stop signs should be provided along bus routes. Shared-lane markings or bike route signage can be provided as potential improvements to support bicycle travel. Sidewalks **are desirable, but if not currently provided they can be omitted in order to preserve the character of the street.** On-street parking may be accommodated **where space allows for it, and does not need to be formally striped.** Intersections may generally be stop-controlled, and signalized intersections should include appropriate safety and pedestrian crossing treatments.

CHARACTERISTICS					
Roadway	**Intersections**	**Parking**	**Transit**	**Sidewalks**	**Bicycle**
• 11'-12' travel lanes • 2 lanes • 35 MPH or less speed limit desired	• Generally stop-controlled • Pedestrian countdown timers at signalized intersections • High-visibility crosswalks	• On-street parking if space allows	• Well-marked bus stops, with sidewalk access	• Desirable, but not required • 3'-4' buffer from curb • Sidewalks continue across driveways	• Shared lanes are appropriate • Signage for designated routes

STREET VARIANT 4

The Variant 4 design can be appropriate for rural areas in Morris County. Large tracts of farmland and forested areas are found along many County roads, typically in the north and west. Like Variant 3, the FHWA Classifications range from Major Collector to Local Roads, and maintaining the character of **these areas is an important feature of this variant.** Roadways are designed with two 11'-12' wide **lanes, with wide shoulders to reduce the potential** for vehicles driving off the road. In areas where sidewalks, on-street parking, or bicycle facilities do not currently exist, such improvements may not be necessary. Bicycle infrastructure improvements may **be considered where possible and where compatible** with the character of the surrounding area. Bike route signage should be included on any road that is part of a designated bike route. Well-marked bus stops should be provided on transit routes. Intersections may be stop-controlled as necessary, though signalization may be appropriate if warranted by traffic volumes or other factors.

CHARACTERISTICS					
Roadway	**Intersections**	**Parking**	**Transit**	**Sidewalks**	**Bicycle**
• 11'-12' travel lanes • 2 lanes • Wide shoulders (8'+) • 25-45 MPH speed limit desired	• Stop-controlled, as necessary	• None	• Well-marked bus stops, with sidewalk access	• 4'-8' sidewalks as needed	• Signage for designated routes

STREET VARIANT 5

Variant 5 is appropriate to consider for County roads that serve as main streets or traverse town centers, and have high levels pedestrian and bicycle activity with public transit. FHWA Classifications for County roads in downtowns and village centers range from Major Collectors to Local Roads. There are various traffic calming techniques that can be applied to **improve safety and support pedestrian and bicycle** travel. Lanes should be narrower (11') than in other variants to encourage slower speeds. Curb extensions, on-street parking, and street trees that create **a canopy over the roadway may be considered as** traffic calming techniques. Sidewalks may also be wider to accommodate high volumes of pedestrians,

and to support café-style seating along the corridor without impeding pedestrian circulation. Buildings, which are characterized by mixed uses, are more typically built to or near the edge of the County's right-of-way. Excessive numbers of driveways are discouraged, while striped, on-street parking is encouraged. Provisions for on-street loading should **be considered where there is no accessibility for** deliveries in the rear of the buildings. The level of activity may not be optimal for bicyclists, so bike lanes or signage should only be considered where they can be accommodated; alternate bicycle bypass routes could also be considered along adjacent parallel streets.

CHARACTERISTICS					
Roadway	**Intersections**	**Parking**	**Transit**	**Sidewalks**	**Bicycle**
• 10'-11' travel lanes • 12'-13' for bus lanes or truck route • 2 lanes • 20-30 MPH speed limit desired	• High visibility crosswalks • **Pedestrian countdown timers with audible indicators** • Lead pedestrian interval • Curb extensions at wide crossings	• Striped, on-street parking • Consideration for on-street loading zones	• Bus Shelters and other amenities • Consideration for bus loading zones	• 10'-15' sidewalks • Streetscape amenities (benches, bike parking, lighting) • ADA accessible ramps • Limited curb cuts • **Sidewalks continue across driveways**	• **Facilities where appropriate** • Buffered from on-street parking • If not appropriate for roadway, **facilities should be considered on adjacent parallel roadways**

CHAPTER 2: Planning Context and Background

A. Partners in Transportation

The planning, maintenance, and growth of a safe and efficient transportation system requires the interaction of all levels of government. Morris County coordinates its transportation projects with the New Jersey Department of Transportation, the North Jersey Transportation Planning Authority, NJ TRANSIT, USDOT, and the 39 municipalities in the County, as well as private and non-profit organizations. Each agency and organization in the planning process has its own strategies and policies; therefore, coordination among all partners is critical. Below are summaries of all the organizations that plan, fund, or implement transportation projects.

Morris County

Morris County is responsible for the construction, maintenance, and planning of County roads and bridges. It conducts planning studies, intersection improvements, bridge and road inspections, engineering improvements, and development review. Additionally, the County owns three freight railroad lines and contracts with an operating railroad to serve industries within the County. Morris County also provides community transportation services to residents through the Morris Area Paratransit System (MAPS). Morris County is a member of the North Jersey Transportation Planning Authority's (NJTPA) Board of Trustees and serves on various regional committees to coordinate transportation planning and funding decisions that shape the County and the region's future.

Municipalities

Morris County's 39 municipal governments are responsible for the planning, operation, and mainte-nance of municipal roads. Their police departments are responsible for the enforcement of traffic laws and regulations to help ensure safe travel. Municipalities also develop master plans, review and approve development applications, and coordinate with other levels of government. The State of New Jersey has empowered municipalities to zone land and perform land use planning, which has a direct impact on transportation. Most municipalities in Morris County also sponsor local transportation for senior citizens, generally called Dial-A-Ride pro-grams.

National Transportation Safety Board

The National Transportation Safety Board (NTSB) is an inde-pendent Federal agency that investigates civilian transporta-tion. The NTSB investigates and reports on aviation accidents and certain types of highway crashes, railroad, ship and marine, and pipeline incidents. For each accident, the NTSB identifies the cause and makes recommendations to improve safety. The agency has investigated over 137,000 aviation-related and thousands of surface transportation incidents, and issued more than 13,700 safety recommendations.

New Jersey Department of Transportation (NJDOT)

The New Jersey Department of Transportation (NJDOT) is responsible for managing and guiding the state transportation network. The NJDOT controls Interstates, Federal roads, and State highways. While these roads only comprise a small percentage of the total road mileage in the County, they carry substantial traffic volume. In addition to constructing and maintaining roads and high-ways, NJDOT is involved in many transportation policy issues affecting the County, including goods movement, transportation planning, and rideshar-ing. NJDOT also monitors traffic operations using Intelligent Transportation Systems and coordinates responses to major incidents.

North Jersey Regional Transportation Planning Authority (NJTPA)

The North Jersey Transportation Planning Authority (NJTPA) is the federally authorized Metropolitan Planning Organization (MPO), for the 13-county northern New Jersey region, which includes Morris County. MPOs are responsible for updating the Regional Transportation Plan for their area, overseeing federal funding by approving transportation projects for inclusion in the Transportation Improvement Program, and coordinating transpor-

NORTH JERSEY TRANSPORTATION PLANNING AUTHORITY

tation planning efforts among state, county, municipal, and transit agencies. The NJTPA is governed by a Board of Trustees consisting of one elected member from each county, Newark, Jersey City, a Governor's Representative, the Commissioner of NJDOT, the Executive Directors of NJ TRANSIT and the Port Authority of New York and New Jersey, and a Citizen's Representative appointed by the governor. All transportation projects that use federal dollars must be planned and approved by MPO's. Each year, the NJTPA oversees the disbursement of more than $2 billion in transportation improvement projects, and provides a forum for interagency cooperation and public input. It also sponsors and conducts studies, assists county planning agencies, and monitors compliance with national air quality goals.

NJ TRANSIT

NJ TRANSIT was created in 1979 as New Jersey's statewide public transportation corporation. It is the third largest transit agency in the U.S. The agency provides passenger train and bus service in the state and into New York City and Philadelphia. In Morris County, NJ TRANSIT operates the 29, 70, 73, 79, and 194 bus routes, along with the 871, 872, 873, 874, 875, 878, and 880 local buses, and rail service on the Morris & Essex and Montclair-Boonton Lines. NJ TRANSIT provides transportation for people with disabilities through its Access Link service. It also supports private bus companies in the State.

TransOptions

TransOptions is the Transportation Management Association for Morris, Sussex, Warren, and suburban Essex, Passaic, and Union Counties. This non-profit agency promotes alternative transportation programs to employers, commuters, and communities. TransOptions encourages flexible work schedules and telecommuting, and works with businesses to set up employee shuttles. TransOptions' programs include rideshare coordination and incentives, bike and walk to work events, management of bike lockers at train stations, and providing transit information. At the local level, TransOptions works with municipalities and schools to encourage Safe Routes to School programs, Bike Right® safe bicycling education classes, and sponsors the Junior Solar Sprints.

United States Department of Transportation

The United States Department of Transportation (USDOT) was created by Congress in 1966 with a mission to "serve the United States by ensuring a fast, safe, efficient, accessible, and convenient transportation system that meets our vital national interests and enhances the quality of life of the American people, today and into the future." The USDOT directs the operation of the Federal Aviation Administration (FAA), the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), the Federal Railroad Administration (FRA), the National Highway Traffic Safety Administration (NHTSA), and the Surface Transportation Board (STB). The FAA oversees all civil aviation. FHWA coordinates highway transpor-

tation programs, such as the Federal Aid Highway Program. FTA helps local communities develop and improve mass transportation systems. FRA promotes safe and environmentally sound rail transportation. NHTSA promotes highway and motor vehicle safety programs. STB is responsible for the **economic regulation of interstate surface transportation** – primarily railroads – within the U.S.

B. Transportation Planning Activities Since 1992

The Circulation Element of the Morris County Master Plan was adopted by the Morris County Planning Board in 1992. The purpose of the element is to guide the planning and development of an efficient transportation system throughout the County. Many transportation initiatives have been advanced since the adoption of the Circulation Element. Several significant transportation activities and planning efforts are described as follows.

Morris County Bicycle and Pedestrian Element (1998)
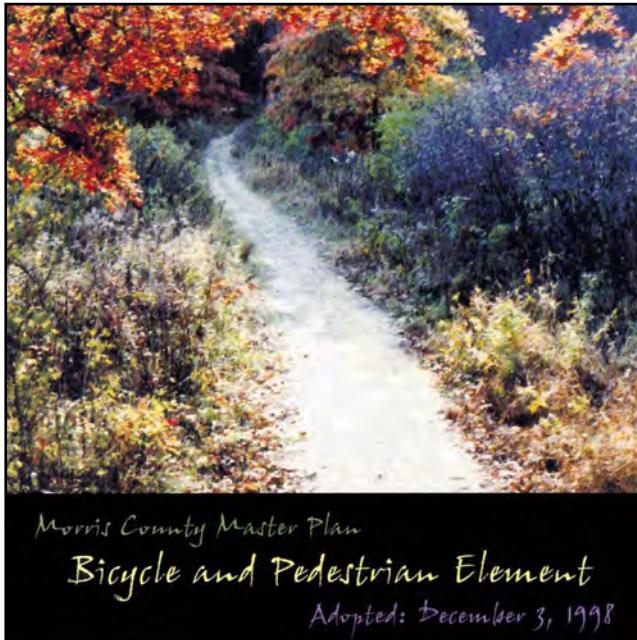
The Bicycle and Pedestrian Element of the Morris County Master Plan was adopted by the Morris County Planning Board in 1998. The Element examines bicycle and pedestrian travel, issues, and opportunities within the County. The Element identifies the County's bicycle and pedestrian goals and objectives, presents best practices for new and

upgraded infrastructure, and documents existing and proposed facilities.

Intermodal Freight Network and Land Use Report (1999)

The Intermodal Freight Network and Land Use Report was completed in 1999. The study examines **important origins and destinations of freight in the County**, the characteristics of operating railroads, peak period and off-peak congestion levels, and major industrial properties along existing rail lines within the County.

Morris County Rail Access Improvement Study (2000)

The Rail Access Improvement Study, completed in 2000, provides an inventory and assessment of the **eighteen**[1] train stations located in Morris County. The study presents recommendations for improving rail station access for pedestrians, bicyclists, automobiles, bus transit, and people with disabilities. The study also examines development patterns, infrastructure, and public amenities around each train station.

Northeast Morris Bus Service Feasibility Study (2001)

The Northeast Morris Bus Service Feasibility Study was completed in 2001. The study estimates the cost and ridership demand for providing Morris County Metro (MCM) bus service between Morristown and the municipalities in northeast Morris County, specifically Butler, Kinnelon, Lincoln Park, Montville, Pequannock, and Riverdale. The study determined that there was insufficient demand for the service at that time.

NYS&W Bicycle and Pedestrian Path Local Scoping Study (2001) and Path Development (ongoing)

Morris County received Federal funding to conduct a scoping study to determine the feasibility of constructing a bicycle and pedestrian path along the inactive New York, Susquehanna, and Western (NYS&W) railroad right-of-way in Riverdale, Pequannock, and Wayne (Passaic County). The scoping study, completed in 2001, determined that

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[1] A nineteenth train station, Mount Arlington Station, opened in 2006.

the project would be feasible. Subsequently, the County secured federal funding for right-of-way acquisition, design, and construction for the project. Riverdale chose not to participate any further in this project; therefore, the path will only be constructed in Pequannock and Wayne. When completed, the NYS&W Bicycle and Pedestrian Path will be a 4.8-mile shared-use path for non-motorized transportation starting at River Road in Pequannock and ending in Passaic County at the Mountain View Train Station in Wayne. The NYS&W Bicycle and Pedestrian Path will be owned by Morris County and maintained by the Morris County Park Commission. Future connections with other trail systems will continue to be evaluated. Environmental permitting has been completed, and property acquisition and project design continue to advance.

Bus Shelter How-To Guide (2001)

The Bus Shelter How-To Guide was created in 2001 as an informational resource to support and encourage municipalities in the acquisition and funding of bus shelters. The Guide identifies potential vendors that install and maintain bus shelters, and share advertising revenue with the municipality. An online version of the guide and a PowerPoint presentation highlighting the key themes were prepared as part of this effort.

Morris County Metro Bus Marketing Plan (2001)

The Morris County Metro (MCM) Bus Marketing Plan was completed in 2001. Ridership and demographic data were analyzed to develop a marketing strategy to increase ridership on MCM bus routes. The plan identifies several efforts to raise public awareness of the transit system. Several television commercials funded by Morris County were produced and aired during the decade since the plan's completion. Additional marketing efforts, including web-based and printed materials, have been initiated to help attract riders to the bus system.

Morris County Public Transportation System Integration Study (2001)

The Morris County Public Transportation System Integration Study was completed in 2001. The public transit network in Morris County was analyzed to develop recommendations for improving coordination and connections between transit services. Recommendations presented in the plan included changes to bus schedules and routes, and improvements to park & ride facilities.

Morris County Bicycle and Pedestrian Safety Study (2002)

The Morris County Bicycle and Pedestrian Safety Study was completed in 2002. It presents general information on bicycle and pedestrian crash trends, and discusses the cost and effectiveness of various safety improvements. The Study recommends several potential strategies to reduce the number of bicycle and pedestrian crashes in Morris County.

Morris County Bicycle and Pedestrian User Guide (2002, 2004)
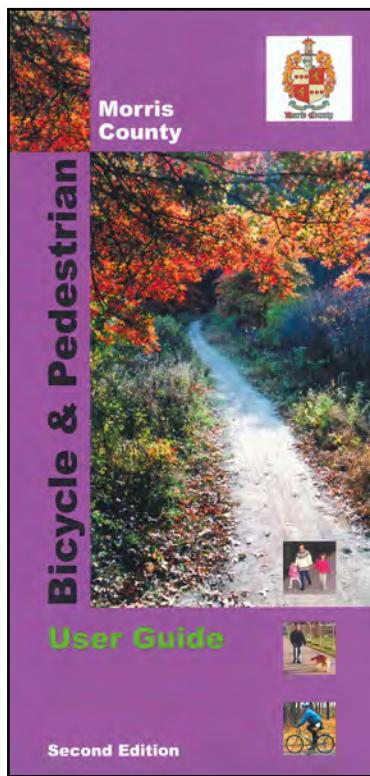
The Morris County Bicycle and Pedestrian User Guide was a foldout map published in 2002 and updated in 2004. On the map side, the Guide presents the locations of existing and proposed trails, multi-use paths, bike lanes, shared roadways, parks, train stations, and points of interest such as historic and cultural sites. The information side provides summaries of bicycle organization with websites, safety tips, and descriptions of a few popular County trails.

Morris County Transit Guide (2002, 2005, 2009, 2011)
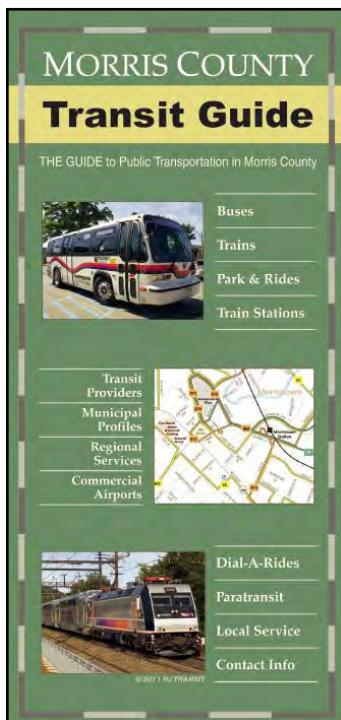
Four editions of the Morris County Transit Guide were published between 2002 and 2011. The Guide is a two-sided foldout map that identifies public transportation available in the County and region. The map side presents all rail and bus routes in Morris County. The reverse side includes general information on transit providers and park & rides.

Morris County Road Construction Map (2003-11)

The Morris County Road Construction Map was a foldout map published annually from 2003 to 2011. The map side provides the location of each road and bridge project anticipated to occur within the County during the year. The information side lists the dates, types, and sponsors of each planned project. Details of municipal and state construction projects are included in addition to the County's projects.

Wharton Safe Routes to School Plan (2006)

Safe Routes to School is a program that encourages children to safely walk and bicycle to school as a way to promote healthy lifestyles, and highlights the importance of quality infrastructure to support these activities. From 2005 to 2006, Morris County worked with schools in Wharton to create a Safe Routes to School program as part of the development of the Borough's Safe Routes to School Plan. The plan included recommendations that focused on educating people on the benefits of walking to school, encouraging children to walk to school, improving infrastructure to provide safe facilities, and enforcing laws related to pedestrian safety.[2]

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[2] The Safe Routes to School Program is currently being carried out by TransOptions.

Walkable Community Workshops (2006-2012)

From 2006 to 2012, Morris County hosted and organized several Walkable Community Workshops **designed to help municipalities address pedestrian** safety and accessibility issues. Each workshop included a field visit by local and regional stakeholders, **a discussion of issues and opportunities, and recommendations of policies, programs, and** projects to improve walkability in the study area. Walkable Communities Workshops were held in Dover, East Hanover, Lincoln Park, Morristown, Pequannock, Randolph, and Washington.

Morris County Transportation Bulletins (2006-2010)

Between 2006 and 2010, Morris County developed a series of transportation bulletins that highlighted **important transportation issues in the region. The**

bulletins provided an overview on a variety of topics and proposed a number of recommendations. These bulletins covered the following topics:
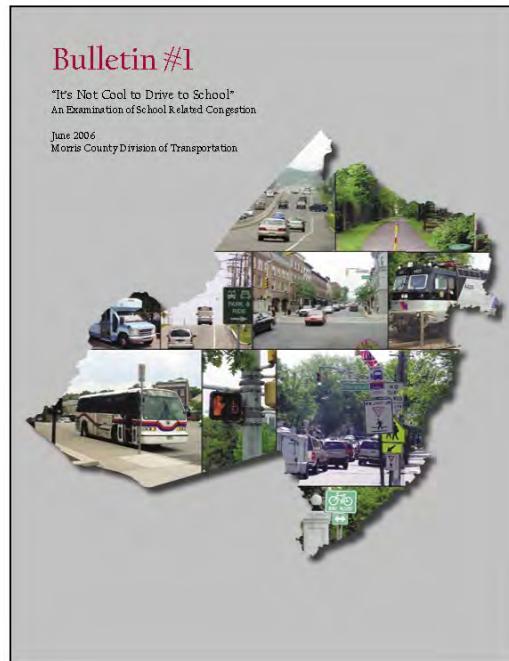
- School-Related Congestion
- Road Congestion
- Roadway Safety
- Walking and Biking
- Goods Movement
- **Aviation**
- Parking at Transit
- Public Transportation
- **Transportation Funding**
- Land Use and Transportation

Northwest New Jersey Bus Study (2010)

The Northwest New Jersey Bus Study was conducted by the NJTPA and NJ TRANSIT, in coordination with Morris County, to identify potential strategies for improving public transportation service in Morris, Passaic, Sussex, and Warren Counties. Recommendations identified in this study include new bus routes, adjustments to existing routes, park & ride improvements, and bus priority **treatments along corridors and at intersections.**

Exxon Redevelopment Regional Traffic Study (2010)

The 260-acre Exxon Research Facility on Park Avenue (CR 623) in Florham Park had been vacant since 1999. A proposed general development plan and traffic impact report was submitted by a developer in 2008. Park Avenue and other roads in the area already experienced high levels of congestion, and concern among several towns and the County prompted a regional traffic impact study to look beyond the immediate area of the site. Morris County, in cooperation with Morristown, the Boroughs of Florham Park, Madison, and Chatham, and the Townships of Hanover and Morris, contracted for a regional traffic study that determined the impact of the proposed redevelopment of the Exxon property. The study reviewed and identified improvements to several intersections and roads not included in previous analyses. It also presented general recommendations for transit, bicycle, and pedestrian enhancements in the area.

Morris County Freight Infrastructure and Land Use Analysis (2011)
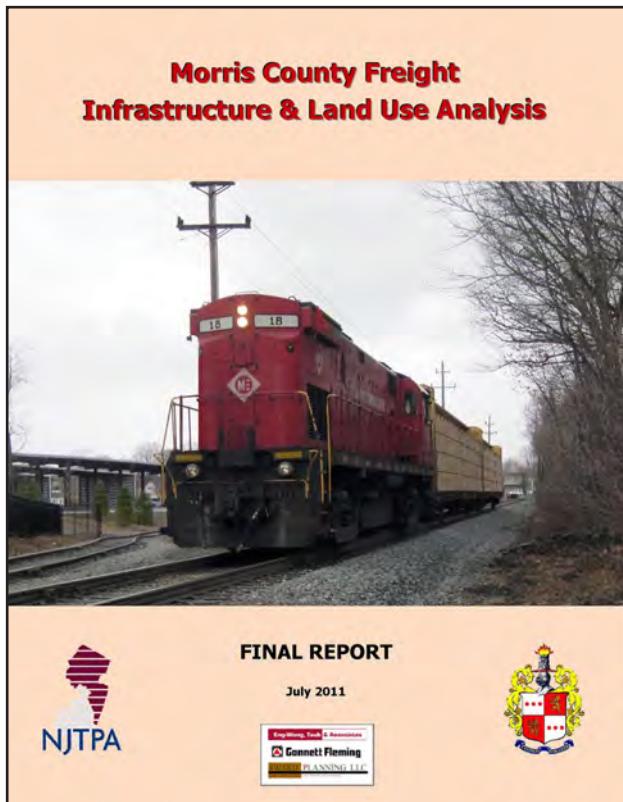
The Morris County Freight Infrastructure and Land Use Analysis was a comprehensive examination of freight movement in Morris County. The study included an investigation of existing and underutilized industrial land. The analysis identified four areas in the County that were well suited for industrial development because of their proximity to interstates and access to freight rail lines. The economic impact of freight on Morris County was also analyzed, with a focus on the three County-owned freight railroads. The plan recommended several policies and actions to encourage more efficient goods movement in the County. A best practices guide for municipal planning and zoning for freight-related land uses was developed as part of this study.

Morris County Human Services Transportation Coordination Plan (2008)

In 2005, Presidential Executive Order 13330 mandated the coordination of all human service transportation. The State of New Jersey directed each county to develop a plan in coordination with NJ TRANSIT. The Morris County Transportation Coordination Plan was completed in 2008. The Morris County plan presents recommendations to reduce service duplication, close service gaps, address customer service inefficiencies, and improve the coordination between transportation agencies.

NJ 124 Corridor Transit Access Improvement Study (2013)

The NJ 124 Corridor Transit Access Improvement Study examined transportation conditions in the NJ 124 corridor, which has three NJ TRANSIT Morris & Essex Line stations: Chatham, Madison, and Convent Station. Deficiencies in pedestrian, bicycle, parking availability, and coordinated bus access to the stations were documented. The report included a number of recommendations for roads, bicycle and pedestrian improvements, parking, and transit service to improve access to these stations and mobility through the study area.
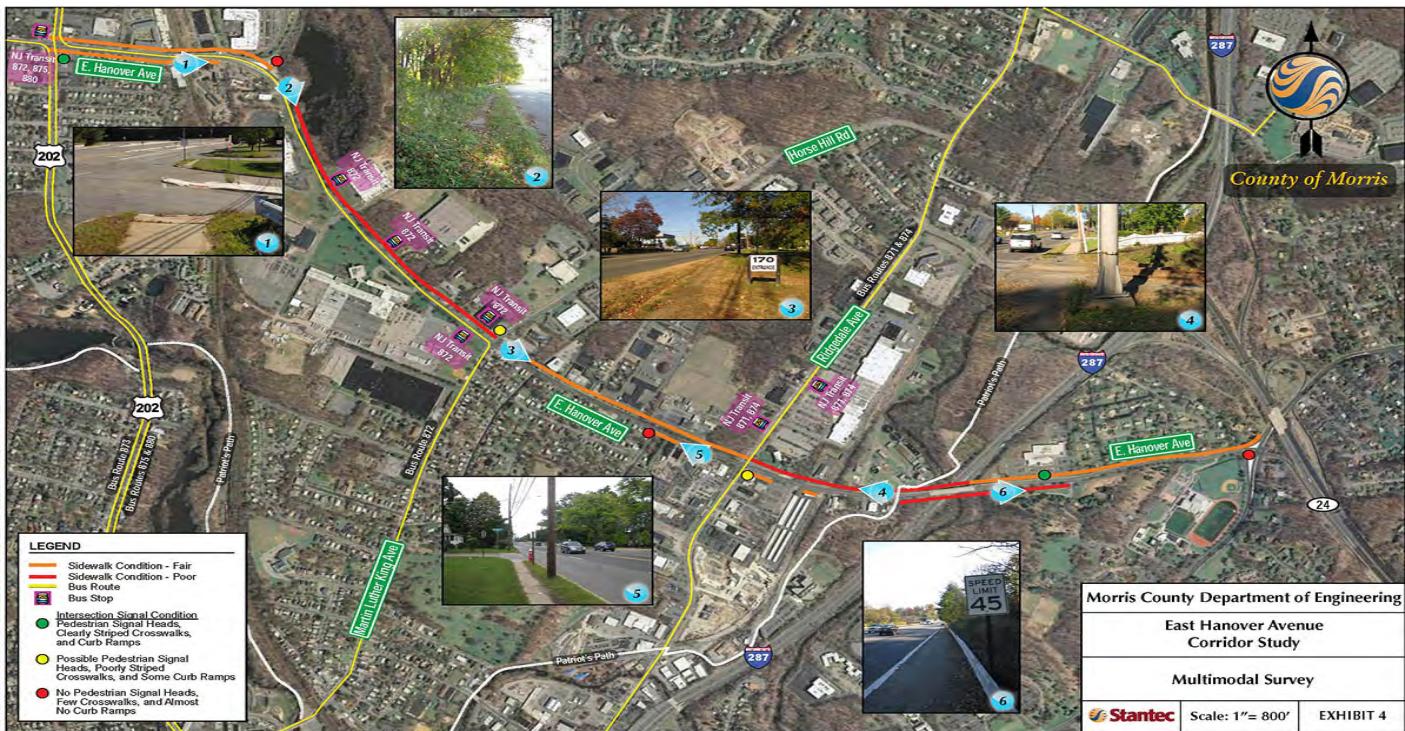
East Hanover Avenue Corridor Traffic Study (2013)

The East Hanover Avenue Corridor Traffic Study was completed in 2013 with consultant services provided by NJDOT, and guided by a committee of County and municipal representatives. Congestion and anticipated redevelopment along East Hanover Avenue (CR 650) presented a need for a comprehensive plan for addressing traffic along the corridor. The study evaluated current (2011) roadway conditions, including trip generation, pedestrian and bicyclist activity, traffic volume, transit, travel time, and crash data along East Hanover Avenue in Hanover, Morris Plains, and Morris Township. Traffic growth and congestion levels were analyzed for 2015 and 2035 forecast years. Three alternative scenarios were developed to evaluate the effectiveness of potential improvements in mitigating the impacts of future traffic growth.

Morris County Human Services Transportation Coordination Plan – Update (2013)

The Morris County Human Services Transportation Coordination Plan was updated in 2013. The Steering Committee and Stakeholder Group reviewed and adjusted the 2008 Plan's goals and objectives to address current needs. The 2013 Plan provides updates to the data and tables that were originally presented in the 2008 plan. Additionally, the 2013 Plan lists all human service agencies and transportation providers in Morris County. An agency is required to be included in the Coordination Plan to be eligible for Federal Funding.

Kenvil Team Track Improvement Project (2014)

Morris County rehabilitated the County-owned Kenvil Team Track in 2014. The facility is located in Roxbury Township on Berkshire Valley Road (CR 642), north of US 46. The team track serves as a public transload facility for products and raw materials to be transferred from railroad cars to trucks. The Team Track is used by railroad customers that are not located along freight rail lines and do not have rail sidings for direct deliveries.

C. Important Transportation and Land Use Changes Since 1992

Since the adoption of the 1992 Morris County Circulation Element, new development and transportation improvements have shaped the County's economy and facilitated changes in travel patterns. Several significant transportation and land use changes in the County since 1992 are described below.

Opening of NJ 24 (1992)

The Morris County section of NJ 24 was completed and opened to traffic in 1992, providing an important link between I-78 in Springfield and I-287 in Morris Township. It also provided a more efficient route for traffic that previously used the old NJ 24 route, now renumbered as NJ 124, through Chatham Borough, Madison, and Florham Park. Originally, NJ 24 was planned to extend west of I-287 as a limited access highway and connect to US 206 in Chester Township. The highway was also planned to have additional exits between Exit 7 at the JFK Parkway and Exit 2 in Florham Park. Both of these plans were abandoned due to municipal opposition.

Completion of I-287 (1994)

Construction of I-287 began in the 1950's in Middlesex and Somerset Counties, but the last segment between US 202 in Montville Township (Exit 47) and I-87 at the New York State line was not completed until 1994. This segment of highway was the last link in the I-287 bypass around New York City and established a critical north-south travel route in northern New Jersey. Previously, roads such as US 202, US 206, CR 511, and CR 618 were the only routes available for north-south through-travel in Morris County.

Midtown Direct Rail Service (1996)

The introduction of Midtown Direct Service to the Morris & Essex Lines greatly improved passenger rail service for Morris County residents traveling to Manhattan. Prior to 1996, riders on the Morris & Essex Lines traveled to Hoboken, where trips across the Hudson River required a transfer to a ferry or

to the Port Authority of New York and New Jersey's PATH service. This rail system improvement connected the Morris & Essex Lines to the Northeast Corridor and gave riders a one-seat ride to Penn Station in New York.

Closing of Hercules and Brownfield Cleanup (1996-Present)

The former Hercules munition site in Roxbury Township is an important property with substantial redevelopment potential. With over 1,000 acres this site's redevelopment would have major transportation implications. Its proximity to I-80, accessibility for passenger rail, and potential for service by freight rail create unique possibilities for the property. The land is currently undergoing **remediation activities, and conceptual proposals** for redevelopment suggest a significant commercial **and/or residential development potential for the** site, supported by the site's proximity to the Mount Arlington Train Station.

I-287 HOV Lanes Construction and Removal (1998)

Between 1996 and 1998, new High Occupancy Vehicle (HOV) lanes were constructed on I-287 between I-78 in Bridgewater and I-80 in Parsippany-Troy Hills to encourage carpooling. The final segments opened in January 1998. Vehicles were required to **have two or more occupants in order to travel in the** HOV lanes. However, the lanes did not result in as **much carpooling and usage as anticipated. Addi-** tionally, many of the planned supporting services, such as park & ride lots and north-south bus service, never came to fruition. The HOV lanes were re-designated as conventional lanes and opened to all traffic in November 1998.

Montclair Connection (2002)

The Montclair Connection opened in 2002 connecting the Montclair Branch to the Boonton Line in

Montclair. Previously, riders on the Boonton Line could only travel as far east as Hoboken. This new connection gave these riders access to New York City via the Midtown Direct connection, though they must still change trains if they board the line west of Montclair State University.

Highlands Water Protection and Planning Act (2004)

The adoption of the Highlands Water Protection and Planning Act in 2004 fundamentally changed future land development in the Highlands Region, which encompasses just over 859,000 acres, including 88 municipalities and parts of seven counties, including Morris County. Intended to protect freshwater resources in northwest New Jersey from major development, the law designated two zones within this region; the Preservation Area and the Planning Area. About 39% of Morris County's land area is in the Preservation Area and about half of Morris County is located in the Planning Area.[3] Municipalities with land in the Preservation Area must conform their master plans and development regulations, for Preservation Area lands, to the Highlands Regional Master Plan (RMP). The RMP, developed in accordance with the provisions of the Highlands Act, identifies various development restrictions and enhanced environmental standards applicable in the Highlands Region. Conformance for lands in the Planning Area is voluntary.

Mount Arlington Station (2006)

In 2006, Mount Arlington Train Station opened for NJ TRANSIT rail service. The location at Exit 30 on I-80 made it an ideal site to encourage eastbound auto commuters to take public transportation. The facility already was an informal park & ride served by Lakeland Bus Lines, a private bus company **connecting commuters to Manhattan. Providing train service at the location gave commuters additional options to travel to Newark, Hoboken, and New York by rail on the Morris & Essex or Montclair-Boonton Lines.** The station has 285 parking spaces.

Commercial Office Growth in NJ 124/Park Avenue Corridors (2008-Present)

In the late 2000's, office park growth began shifting from the Parsippany area to southeastern municipalities in Morris County such as Florham Park, Madison, Hanover, and Morris Township. **Construction of a new headquarters and training facility for the New York Jets, BASF's North American headquarters, Realogy's headquarters, and the Green at Florham Park[4] occurred during this period.** The traffic generated by this new development and redevelopment has added to existing congestion on NJ 24, Columbia Turnpike (CR 510), Park Avenue (CR 623), NJ 124, and other roads in the area.

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4 The Green at Florham Park includes general office and research use, major medical offices, and two hotels.

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3 Chatham Borough, Chatham Township, East Hanover, Florham Park, Lincoln Park, Long Hill, and Madison are not in the Highlands Region.

Chester Branch Railroad Acquisition and Rehabilitation (2009-2011)

Morris County had acquired two freight railroads from Conrail in the early 1980's, the Dover & Rockaway Railroad and the High Bridge Branch, to preserve the lines for use by rail-served industries. In 2009, the County purchased the Chester Branch Railroad from Holland Manufacturing to preserve the railroad for existing industries and encourage industrial development along the line in Roxbury and Randolph.[5] Morris County was awarded $5.8 million from the American Recovery and Reinvestment Act in 2010 to rehabilitate the Chester Branch Railroad. The rehabilitation of the Chester Branch was completed in 2011 and continued to support Holland Manufacturing and Kuiken Brothers Building Materials, located at the southern terminus of the line.

NJ Transit Bus Service Restructuring (2010 and 2012)

The Morris County Metro (MCM) bus system was an important element of the County's transportation system since the 1970's. It provided bus service in Morris County for local trips and connections to NJ TRANSIT train stations. In 2010, NJ TRANSIT proposed the elimination of six of the seven MCM routes as part of a series of statewide cost-cutting and service efficiency measures. In response to strong feedback from the public and the County, NJ TRANSIT continued service on the majority of the MCM bus routes. However, three of the buses with

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5 The Hercules and Petillo properties, which are situated adjacent to the Chester Branch in Roxbury, comprise one of the four priority industrial development areas identified in the *Morris County Freight Infrastructure and Land Use Analysis* (2011).

very low ridership that served the western parts of Morris County were discontinued. The remaining four MCM routes were restructured and rebranded into six 870/880-series NJ TRANSIT routes with new schedules. NJ TRANSIT performed additional route modifications in 2012. The new routes and schedule changes were based on the findings of the Northwest New Jersey Bus Study.

Trans-Hudson Rail Access (2010-Present)

The need for improved passenger rail access between New Jersey and New York City continues to be a major regional issue. The existing two-track tunnel under the Hudson River, completed in 1910, is in need of major repairs. The Access to the Region's Core (ARC) project sought to increase passenger service as the tunnels were at capacity for years. As part of the initiative, construction began in 2009 on a new two-track tunnel under the Hudson River to increase passenger rail service to Manhattan. Governor Christie canceled construction of the ARC project in 2010. The damage caused to the existing north tunnel by Hurricane Sandy in 2012 has increased maintenance requirements and service disruptions. Amtrak has since advanced plans known as the Gateway Program that includes replacing the Portal Bridge and construction of a new Trans-Hudson rail tunnel.

Lackawanna Cutoff Passenger Service Restoration (Ongoing)

The Lackawanna Cutoff was a railroad that split off the Delaware Lackawanna & Western Railroad mainline at Slateford, Pennsylvania connecting to Port Morris in Morris County. The Cutoff was built to reduce the travel distance and bypass the curvature and grades along a section of mainline. The Cutoff was abandoned in 1979 and track removal occurred in 1983. Traffic volume growth on the I-80 corridor from Pennsylvania created new interest in passenger rail service on the Cutoff as a way to relieve congestion. Funding for Phase 1 of the restoration effort, known as the Lackawanna Cut-off Minimal Operating Segment (MOS) Trackbed Restoration Project, was approved in 2008 to rebuild the easternmost segment of the alignment between Port Morris Junction and Andover. Construction began in 2010, and several elements of the MOS including the Roseville Tunnel rehabilitation and the Andover Station site are in the environmental permitting and design phases.[6] The goal of future phases will be to provide passenger rail service to Scranton, Pennsylvania.

Growth of Morristown Municipal Airport (Ongoing)

Morristown Municipal Airport (MMU) is a general aviation airport owned by Morristown that has served private and corporate aircraft since 1945. It is an important amenity providing substantial economic benefits to Morris County and the region. Many businesses located in Morris County, including several Fortune 500 companies, due in part to the access to MMU. The number of corporate and other aircraft based at this airport grew during the 2000's and it is now the third busiest airport in New Jersey, behind Newark-Liberty and Teterboro airports.

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[6] New Jersey Transit Corporation Board of Directors Meeting Minutes, March 9, 2016

D. Plans and Programs Affecting Transportation

Morris County Master Plan

The Morris County Master Plan is comprised of several elements, including the Circulation Element, which have been adopted by the Morris County Planning Board. These elements provide a framework for planning efforts and programs in Morris County. The other elements of Morris County's Master Plan are:

- Bicycle and Pedestrian Element (1998)
- Farmland Preservation Element (2008)
- Future Land Use Element (1975)
- Historic Preservation Element (1976)
- Open Space Element (1988)
- Water Supply Element (1994)
- Wastewater Element (1988)

The County Office of Planning and Preservation also conducts various studies and reports that may directly or indirectly address, or provide information related to, transportation issues. For example, the Morris County State of the County Report (2013) addresses various planning-related subjects and includes a chapter summarizing County transportation conditions and associated trends and issues.

Morris County Land Development Standards

The Morris County Land Development Standards specify the requirements for land development applications that affect County roads and drainage facilities. These standards were adopted by the Morris County Board of Chosen Freeholders in 1998 and amended in 2004 under the statutory authority granted to counties in the New Jersey County Planning Act.[7] Subdivisions and site plans that are subject to County approval must provide all necessary improvements to the County transportation system that are required for the safe and efficient movement of traffic on County roads.

Land Development Standards
Morris County, New Jersey
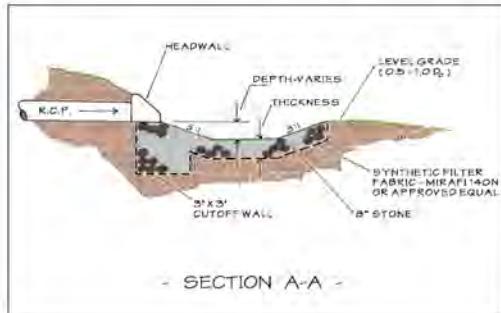
- SECTION A-A -

The Board of Chosen Freeholders of the County of Morris

Prepared by the Morris County Planning Board

Highlands Act / Highlands Regional Master Plan

The Highlands Water Protection and Planning Act divides the Highlands Region into the Preservation Area and the Planning Area, each area comprising approximately half of the Region. In the Preservation Area, future roadway development is severely limited. While the goals of the Highlands Act and the subsequent Highlands Regional Master Plan (RMP) generally promote an efficient transportation system that meets the region's needs, this is to be accomplished without adding new roadway capacity that may induce additional development. New roadway infrastructure is constrained, with exemptions only for routine maintenance, rehabilitation, reconstruction, or repair of existing infrastructure, provided such action does not result in any new through capacity travel lanes.

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[7] N.J.S.A 40:27-1 et seq.

New Jersey State Development and Redevelopment Plan

The State Development and Redevelopment Plan, adopted in March 2001, is designed to coordinate planning and public policy among all levels of government. The statewide policies set forth in this plan address 19 areas of concern, one of which is transportation. The statewide transportation policies seek to improve transportation systems by encouraging the coordination of transportation and land-use planning, integrating transportation systems, developing and enhancing alternative modes of transportation, improving management structures and techniques, and utilizing transportation as an economic development tool.

The New Jersey State Development and Redevelopment Plan

New Jersey State Planning Commission
Adopted March 1, 2001

NJTPA Regional Transportation Plan

PLAN 2040

NJTPA Regional Transportation Plan for Northern New Jersey

NJTPA
NORTH JERSEY
TRANSPORTATION
PLANNING AUTHORITY
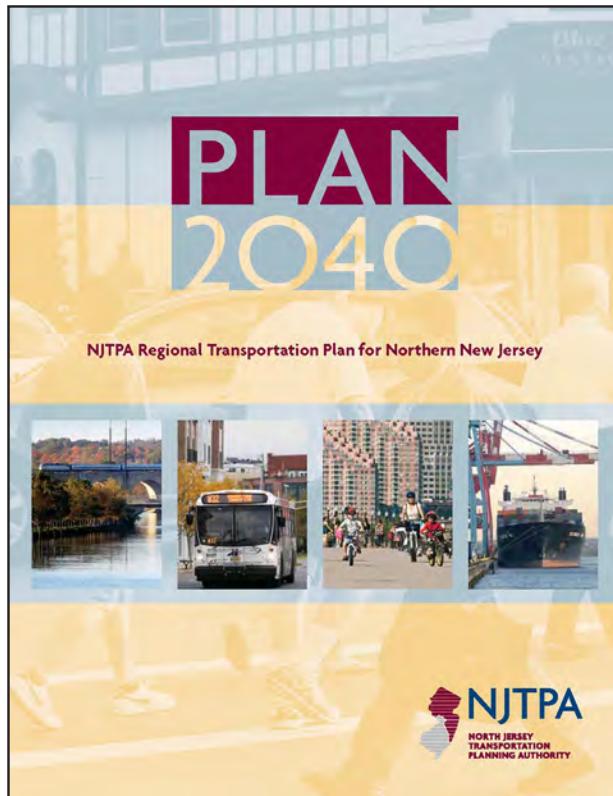
Metropolitan Planning Organizations like the NJTPA are required to develop and update their long-range Regional Transportation Plan (RTP) every four years in order to receive Federal transportation funding. The Regional Transportation Plan provides a transportation investment vision for each MPO region. All projects funded with Federal dollars through the MPO must have purposes consistent with the goals of the RTP. Therefore, like all other counties, any Morris County project that is funded through the NJTPA must be consistent with NJTPA's current RTP.

New Jersey Transportation Capital Program

New Jersey's Transportation Capital Program lists all the planned capital projects in the State for each fiscal year, which starts July 1. The capital program includes construction and maintenance projects for roads, bridges, and transit. The annual program is funded by Federal resources and the State Transportation Trust Fund.

NJTPA Transportation Improvement Program

The NJTPA Transportation Improvement Program (TIP) is approved every two years by the Board of Trustees. It lists all Federal and State funded transportation projects within the NJTPA's region. Any project or program that is federally funded is required to be listed in the TIP. The TIP allocates Federal funding to design, right-of-way acquisition, and construction projects over four fiscal years. It includes specific projects and ongoing region-wide maintenance, repair, and procurement programs. The TIP describes each program or project's location, phase of work, schedule, and funding.

Together North Jersey

Together North Jersey is a planning initiative, led by NJTPA and Rutgers, to guide the NJTPA region towards a more sustainable future. Four task forces were created to help develop the Plan, each with a separate focus, these being: competitiveness, efficiency, livability and resiliency. The resulting 2015 North Jersey Plan presents 15 focus areas and 73 strategies for improving the transportation, economy, environment, mobility, land use, housing, workforce development, and infrastructure of northern New Jersey. It identifies the strengths, weaknesses, issues, and challenges of the region. Subsequent to the completion of the 2015 Plan, Together North Jersey continues its efforts through task force meetings and training workshops.

Federal Surface Transportation Acts

Transportation funding from the Federal government has been provided primarily through surface transportation acts of various names. The Fixing America's Surface Transportation Act (FAST Act) was signed into law in December 2015. This Federal legislation authorizes $305 billion in transportation investments over its five-year cycle (FY 2016-2020), with approximately $5.3 billion allocated to New Jersey through formula funding over that period. The FAST Act is the successor to the Moving Ahead for Progress in the 21st Century Act (MAP-21) of 2012, and largely maintains the programs, funding structures, and goals of its predecessor.

CHAPTER 3: Demographics

A. Population

Population Growth: Morris County

Morris County's population increased from 2000 to 2014 by a slightly higher percentage than the statewide growth of 6.1%. Morris County's 2014 population was estimated at 499,727,[1] a 6.3% increase from the 2000 Census population of 470,212. However, growth has not been uniform across the state. Between 2010 and 2014, several counties to the west of Morris County lost population. Hunterdon, Warren, and Sussex Counties experienced population declines of 1.0%, 1.6%, and 2.7%, respectively.

As shown in **Table 3-1**, Morris County's population growth between 2000 and 2014 has not been consistent in all age groups.

Table 3-1: 2000 to 2014 Population Change by Age Range

Age Range	2000	2014	% Change 2000-2014	% Population 2014
0-4	32,906	25,584	-22.3%	5.1%
5-9	34,234	29,769	-13.0%	6.0%
10-14	32,425	34,489	6.4%	6.9%
15-19	26,598	34,348	29.1%	6.9%
20-24	20,571	28,446	38.3%	5.7%
25-29	26,928	25,586	-5.0%	5.1%
30-34	36,761	28,140	-23.5%	5.6%
35-39	44,021	29,223	-33.6%	5.8%
40-44	42,444	34,575	-18.5%	6.9%
45-49	37,332	41,126	10.2%	8.2%
50-54	34,535	43,251	25.2%	8.7%
55-59	27,524	38,108	38.5%	7.6%
60-64	19,403	30,127	55.3%	6.0%
65-69	15,706	24,359	55.1%	4.9%
70-74	13,685	17,906	30.8%	3.6%
75-79	11,061	12,628	14.2%	2.5%
80-84	7,426	10,108	36.1%	2.0%
85+	6,652	11,864	78.4%	2.4%
Totals	470,212	499,727	6.3%	100.0%

Source: U.S. Census Bureau, 2000 Census and 2014 Population

[1] U.S. Census Bureau, 2014 Population Estimates Program

The number of children in the 0-9 age range declined in this period, as did the population between 25 and 44 years old. These two declines are likely related, as the number of adults of peak child-rearing age would naturally correlate with a decline in the population of very young children. Additionally, people are tending to have fewer children and having them at older ages. Population growth in the County was concentrated in the 15-24 age ranges and in the 50-69 age ranges. The largest population growth rates were seen in the 85+ age group, in the 60-64 range, and in the 65-69 range. These three groups experienced population growth rates of 78.4%, 55.3%, and 55.1%, respectively.

The Baby Boomer and Millennial generations are notable because of their large sizes in comparison to other generations in the United States. In 2014, Baby Boomers, who were born between 1946 and 1964, made up 27.2% of the County's population. Although Morris County's Baby Boomer population has declined by approximately 14.2% between 2000 and 2014, it remains the largest generational cohort within Morris County as of 2014. The oldest in this group turned 65 in 2011.

The aging of this population will have significant implications for the County's transportation infrastructure and service needs over the next 25 years, as the ability to remain mobile is critical. Increasingly, more Baby Boomers will stop driving, whether by choice or because of diminished ability, placing greater demands on public transportation alternatives. Due to the size of the Baby Boomer generation, this demand may present a significant challenge for government.

The second largest generational cohort in Morris County is the Millennial generation, which is comprised of individuals born between the early 1980's

and the early 2000's. In 2014, they comprised 116,400 people; about 23.3% of the County's population. The number of Millennials has also declined between 2000 and 2014 in Morris County, by 7.6%.

Millennials have been typically characterized as less auto dependent than earlier generations, particularly for those that have sought more urban or downtown live, work, play lifestyles. However, some studies question this assumption and the degree to which this generation will continue to live in cities. Their embrace of public transit and alternative transportation may continue, but may also diminish if millennials move to more suburban auto-oriented areas to raise families.

Population Growth: Municipalities

The size of Morris County's 39 municipalities varies widely. Nearly half of the County's municipalities have fewer than 10,000 residents. Seventeen of them are home to between 10,000 and 25,000 residents. The Township of Parsippany-Troy Hills has the largest population, with 53,679 residents. Victory Gardens has the fewest residents in the County with a population of 1,531.

Municipal population densities also vary widely across the County and these are illustrated in **Figure 3**-**1**. The municipalities with the lowest population densities, Washington, Mendham, Harding, and Chester Townships, are located along the County's southern border with neighboring Somerset and Hunterdon Counties. The municipalities with the highest population densities typically have older town centers. Many of them, including Dover, Morristown, the Town of Boonton, and Madison, are located along NJ TRANSIT rail lines.

The population growth of each municipality from

2000 to 2014 is shown in **Table 3**-**2**. Six municipalities experienced a decline in population from 2000 to 2010. Lincoln Park lost 409 residents in the decade, the largest population decrease. All other municipalities gained population from 2010 to 2014.

Riverdale had the greatest population growth by percentage (42.5%) between 2000 and 2010, growing from 2,498 to 3,559 residents. It was also the only municipality to have double-digit percentage growth (13.7%) between 2010 and 2014, growing to a population of 4,046 by 2014. The municipality with the largest increase in the number of residents from 2000 to 2010 was Mount Olive, at 3,924. From 2010 to 2014, Hanover Township gained 947 residents, the highest gain in the four-year period.

Figure 3-1: Population Density, 2010

People Per Square Mile

- 193 - 750
- 751 - 1,500
- 1,501 - 2,500
- 2,501 - 6,000
- 6,001 - 10,491

Source: Census 2010, US Census Bureau
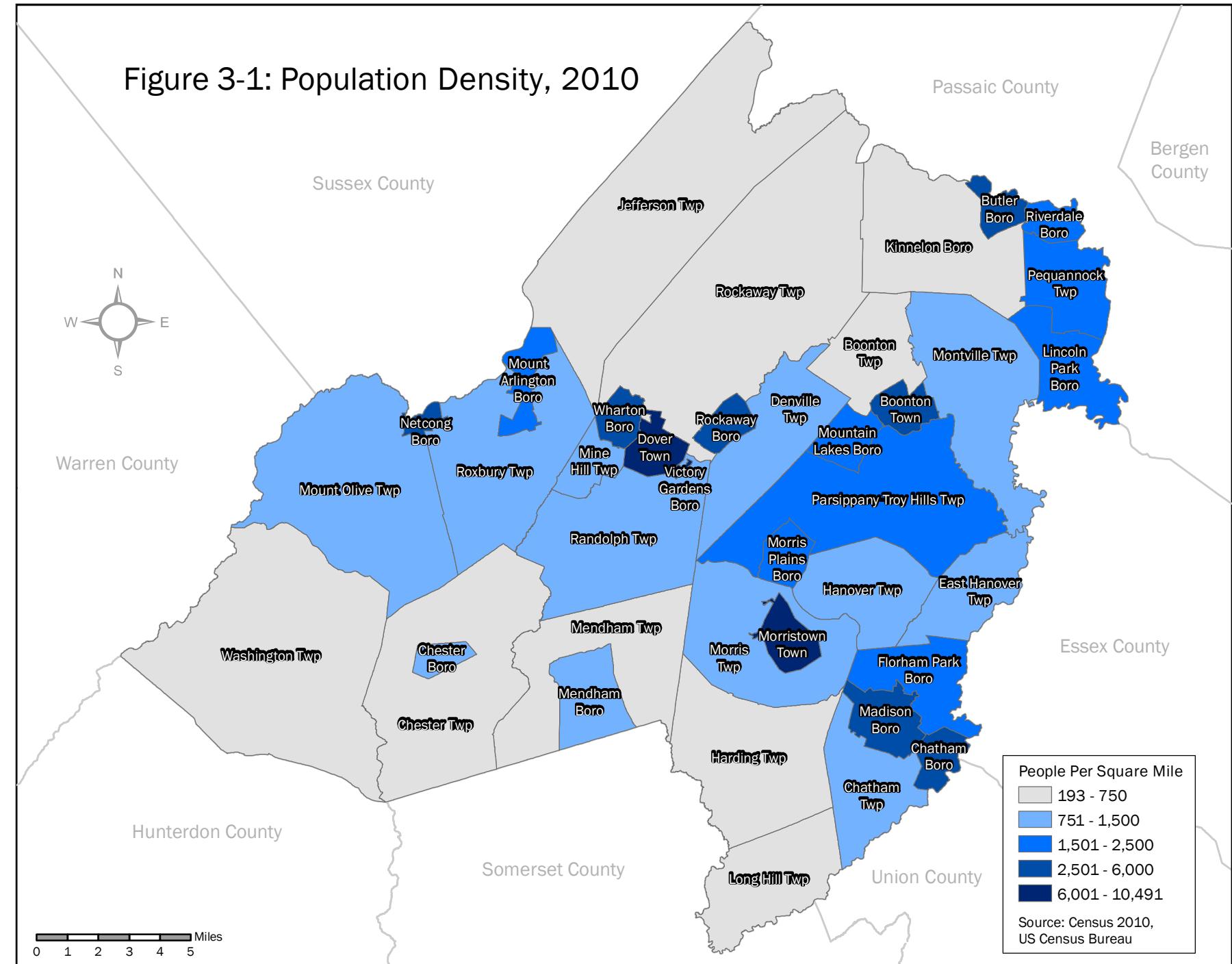
Table 3-2: Population Changes by Municipality, 2000 to 2014

Municipality	2000 Population	2010 Population	% Change 2000-2010	2014 Population	% Change 2010-2014	% Change 2000-2014
Boonton Town	8,496	8,347	-1.8%	8,412	0.8%	-1.0%
Boonton Township	4,287	4,263	-0.6%	4,353	2.1%	1.5%
Butler Borough	7,420	7,539	1.6%	7,690	2.0%	3.6%
Chatham Borough	8,460	8,962	5.9%	9,022	0.7%	6.6%
Chatham Township	10,086	10,452	3.6%	10,615	1.6%	5.2%
Chester Borough	1,635	1,649	0.9%	1,674	1.5%	2.4%
Chester Township	7,282	7,838	7.6%	7,945	1.4%	9.1%
Denville Township	15,824	16,635	5.1%	16,829	1.2%	6.4%
Dover Town	18,188	18,157	-0.2%	18,313	0.9%	0.7%
East Hanover Township	11,393	11,157	-2.1%	11,289	1.2%	-0.9%
Florham Park Borough	10,296	11,696	13.6%	11,829	1.1%	14.9%
Hanover Township	12,898	13,712	6.3%	14,659	6.9%	13.7%
Harding Township	3,180	3,838	20.7%	3,866	0.7%	21.6%
Jefferson Township	19,717	21,314	8.1%	21,483	0.8%	9.0%
Kinnelon Borough	9,365	10,248	9.4%	10,381	1.3%	10.8%
Lincoln Park Borough	10,930	10,521	-3.7%	10,482	-0.4%	-4.1%
Long Hill Township	8,777	8,702	-0.9%	8,791	1.0%	0.2%
Madison Borough	15,460	15,845	2.5%	16,122	1.7%	4.3%
Mendham Borough	5,097	4,981	-2.3%	4,999	0.4%	-1.9%
Mendham Township	5,400	5,869	8.7%	5,882	0.2%	8.9%
Mine Hill Township	3,679	3,651	-0.8%	3,657	0.2%	-0.6%
Montville Township	20,839	21,528	3.3%	21,842	1.5%	4.8%
Morris Township	21,427	22,306	4.1%	22,573	1.2%	5.3%
Morris Plains Borough	5,236	5,532	5.7%	5,733	3.6%	9.5%
Morristown Town	18,544	18,411	-0.7%	19,085	3.7%	2.9%
Mountain Lakes Borough	4,256	4,160	-2.3%	4,262	2.5%	0.1%
Mount Arlington Borough	4,663	5,050	8.3%	5,211	3.2%	11.8%
Mt Olive Township	24,193	28,117	16.2%	28,921	2.9%	19.5%
Netcong Borough	3,236	3,232	-0.1%	3,254	0.7%	0.6%
Parsippany-Troy Hills Twp.	50,649	53,238	5.1%	53,679	0.8%	6.0%
Pequannock Township	13,888	15,540	11.9%	15,567	0.2%	12.1%
Randolph Township	24,847	25,734	3.6%	25,964	0.9%	4.5%
Riverdale Borough	2,498	3,559	42.5%	4,046	13.7%	62.0%
Rockaway Borough	6,473	6,438	-0.5%	6,483	0.7%	0.2%
Rockaway Township	22,930	24,156	5.3%	24,441	1.2%	6.6%
Roxbury Township	23,227	23,324	0.4%	23,524	0.9%	1.3%
Victory Gardens Borough	1,546	1,520	-1.7%	1,531	0.7%	-1.0%
Washington Township	17,592	18,533	5.3%	18,706	0.9%	6.3%
Wharton Borough	6,298	6,522	3.6%	6,612	1.4%	5.0%
County Total:	470,212	492,276	4.7%	499,727	1.5%	6.3%

Source: U.S. Census Bureau, 2000 and 2010 Census, and 2014 Population Estimates Program

Environmental Justice Communities

The U.S. Environmental Protection Agency defines Environmental Justice (EJ) as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies." Under Executive Order 12898, which was signed on February 11, 1994, Federal agencies were directed to include environmental justice as part of their missions by identifying and addressing how their programs or policies may have disproportionately high and adverse health and/or environmental effects on minority and low-income populations in the U.S. This directive covers effects resulting from transportation programs, plans, and projects, including statewide and regional transportation plans. As such, the identification of patterns in transportation, housing, and employment of low-income populations and minority populations is an important element of a comprehensive transportation plan. Environmental Justice will be considered, where required, on a project-by-project basis when implementing the strategies of the Circulation Element.

Since 1994, additional guidance on EJ analyses has been issued. The most recent definitions of EJ populations are documented in Technical Guidance on Assessing Environmental Justice in Regulatory Analysis, which was published by the U.S. Environmental Protection Agency in June 2016. In this document, an EJ population is defined as either (a) the minority population of the affected area exceeds 50%, or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.[2]

The EPA guidelines also identify several racial/ethnic groups that are defined as "minorities" for the purpose of EJ analyses. These include American Indian or Alaskan Native; Asian or Pacific Islander; Black or African American; and Hispanic. A summary of these populations in Morris County is shown in **Table 3-3**.

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[2] U.S. Environmental Protection Agency, Technical Guidance on Assessing Environmental Justice in Regulatory Analysis, Section 2.2.1 (June 2016).

Table 3-3: Minority Populations in Morris County

Racial/Ethnic Group	Population	% of County Population
American Indian or Alaskan Native	404	0.1%
Asian or Pacific Islander	50,709	10.1%
Black or African American	15,853	3.2%
Hispanic	64,064	12.8%

Source: U.S. Census Bureau, ACS, 2014, 1-Year Estimates

Census data for the municipalities in Morris County were analyzed to identify where EJ populations reside against various categories of race, ethnicity, and/or income. These populations are summarized in **Table 3-4**. The standards used for this assessment were as follows:

- Household Income: Municipalities were identified as EJ communities if more than 15% of their populations had a total household income of less than $25,000, as described previously in Section 2.2B.

- Total Minority Population: Municipalities were identified as EJ communities if the minority groups listed in **Table 3-3** comprised more than 50% of their populations. These would meet the first definition of EJ communities as documented in the June 2016 EPA guidelines.

- Disproportionately High Minority Population: Municipalities were identified as EJ communities if the percentage of the population for any of the minority groups listed in **Table 3-3** exceeded approximately 150% of the County-wide averages in **Table 3-3**. This 150% threshold was used to define the "meaningfully greater than the minority population percentage" used in the EPA guidance.

Table 3-4: Environmental Justice Populations in Morris County

Municipality	Household Income	Total Minority Population	Disproportionately High Minority Population			
			American Indian or Alaskan Native	Asian or Pacific Islander	Black or African American	Hispanic
Boonton Town					■	
Butler Borough			■			
Chester Borough	■					
Dover Town		■	■			■
Florham Park Borough					■	
Kinnelon Borough			■			
Mendham Borough			■			
Mine Hill Township						■
Montville Township				■		
Morris Township					■	
Morristown Town	■				■	■
Netcong Borough	■					■
Parsippany-Troy Hills			■	■		
Rockaway Borough					■	
Victory Gardens Boro.	■	■	■		■	■
Wharton Borough						■

Source: U.S. Census Bureau, ACS, 2010-2014, 5-Year Estimates

Table 3-5: Meaningfully Higher EJ Populations in Morris County by Municipality

Municipality	Disproportionately High Minority Population			
	American Indian or Alaskan Native	Asian or Pacific Islander	Black or African American	Hispanic
Boonton Town			414	
Butler Borough	36			
Dover Town	113			12,889
Florham Park Borough			714	
Kinnelon Borough	24			
Mendham Borough	22			
Mine Hill Township				696
Montville Township		3,796		
Morris Township			1,206	
Morristown Town			2,393	6,040
Netcong Borough				757
Parsippany-Troy Hills Twp.	125	16,756		
Rockaway Borough			438	
Victory Gardens Township	7		299	900
Wharton Borough				3,009

Source: U.S. Census Bureau, ACS, 2010-2014, 5-year estimates

Those municipalities listed in **Table 3-4** with specific racial/ethnic groups that met the "meaningfully greater" standard were examined in further detail. Since some of the municipalities in Morris County have relatively small populations, many of the EJ populations listed in **Table 3-4** are actually very small even though they met the 150% threshold. American Indians and Native Alaskans, for example, comprise only 0.1% of the County's population, so the difference between the 0.1% baseline percentage and the 0.15% threshold under the 150% standard is usually a very small number of residents in any given municipality. The actual EJ population figures for the "Disproportionately High Minority Population" municipalities from **Table 3-4** are shown in **Table 3-5**.

Population Forecasts

According to the population forecasts prepared by the North Jersey Transportation Planning Authority (NJTPA),[3] Morris County's population is forecasted to be 530,200 by 2040, an increase of 37,900 residents (7.7%) from the 2010 population of 492,276. This increase represents an annualized population growth rate of about 0.2% for the County, which is the lowest rate of growth among the thirteen counties in the NJTPA region.[4] The projected 2010-2040 population changes for the municipalities in Morris County are listed in **Table 3-6**.

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[3] Population data obtained from Plan 2040: NJTPA Regional Transportation Plan for Northern New Jersey, Appendix A: 2040 Demographic Projections

[4] The NJTPA Region consists of 15 sub-regions consisting of 13 counties; i.e. Bergen, Essex, Hudson, Hunterdon, Middlesex, Monmouth, Ocean, Morris, Passaic, Somerset, Sussex, Union, and Warren, and the cities of Newark and Jersey City.

Table 3-6:
Population By Municipality, 2010-2040

Municipality	2010 Population	2040 Population	Population Change 2010-2040	% Population Change 2010-2040
Boonton Town	8,350	9,220	870	10.4%
Boonton Township	4,260	4,590	330	7.7%
Butler Borough	7,540	8,400	860	11.4%
Chatham Borough	8,960	9,130	170	1.9%
Chatham Township	10,450	11,380	930	8.9%
Chester Borough	1,650	1,790	140	8.5%
Chester Township	7,840	7,870	30	0.4%
Denville Township	16,640	18,310	1,670	10.0%
Dover Town	18,160	19,970	1,810	10.0%
East Hanover Township	11,160	12,490	1330	11.9%
Florham Park Borough	11,700	13,440	1,740	14.9%
Hanover Township	13,710	15,700	1,990	14.5%
Harding Township	3,810	4,220	410	10.8%
Jefferson Township	21,310	21,350	40	0.2%
Kinnelon Borough	10,250	10,250	0	0.0%
Lincoln Park Borough	10,520	11,350	830	7.9%
Long Hill Township	8,700	9,460	760	8.7%
Madison Borough	15,850	16,630	780	4.9%
Mendham Borough	4,980	5,110	130	2.6%
Mendham Township	5,870	6,100	230	3.9%
Mine Hill Township	3,650	4,190	540	14.8%
Montville Township	21,530	23,100	1,570	7.3%
Morris Township	22,330	24,130	1,800	8.1%
Morris Plains Borough	5,530	5,860	330	6.0%
Morristown Town	18,410	22,490	4,080	22.2%
Mountain Lakes Borough	4,160	4,450	290	7.0%
Mount Arlington Borough	5,050	5,480	430	8.5%
Mount Olive Township	28,110	30,150	2,040	7.3%
Netcong Borough	3,230	3,500	270	8.4%
Parsippany-Troy Hills Township	53,240	57,950	4,710	8.8%
Pequannock Township	15,540	16,200	660	4.2%
Randolph Township	25,730	27,280	1,550	6.0%
Riverdale Borough	3,560	4,680	1,120	31.5%
Rockaway Borough	6,440	7,060	620	9.6%
Rockaway Township	24,160	24,360	200	0.8%
Roxbury Township	23,330	25,660	2,330	10.0%
Victory Gardens Borough	1,520	1,520	0	0.0%
Washington Township	18,530	18,650	120	0.6%
Wharton Borough	6,520	6,680	160	2.5%
Morris County Total	492,300	530,200	37,900	7.7%

Source: NJTPA Plan 2040 Demographic Forecasts

The projected population growth rates for 2010 to 2040 vary considerably among the County's 39 municipalities. Riverdale (0.9%), Morristown (0.7%), and Florham Park, Hanover, and Mine Hill (all 0.5%) have the highest projected growth rates. Several municipalities, meanwhile, are forecasted to see very little population growth by 2040. These include Chester Township, Jefferson Township, Kinnelon Borough, Rockaway Township, Washington Township, and Victory Gardens.

B. Housing

Housing Units

The total number of housing units in Morris County grew by 15,463 between 2000 and 2010.[5] Household growth in most municipalities exceeded 10% during this period. Riverdale experienced the highest rate of household growth (76.3%) owing to the impact of one large development in this relatively small community.[6] The municipality that gained the most units in the County was Mount Olive at 1,933 units, followed by Pequannock with 1,697 units. While most municipalities gained housing units during this period, the number of housing units declined in others. Chatham Borough, Mendham Borough, Mine Hill Borough, and Victory Gardens Borough experienced a decline in housing units. **Figure 3-2** displays the growth or reduction of housing by municipality from 2000 to 2010.

Housing growth slowed considerably between 2010 and 2014 compared to the previous decade. Some of this decline can likely be attributed to the limitations placed on new development in the Highlands Region[7] and to the 2008 economic recession. According to 2014 Census Population Estimates, the number of housing units increased by 1,631 from 2010 to 2014, which is an increase of 0.9% from the 189,842 total units recorded in the 2010 Census. By comparison, the housing unit total increased by 8.9% between 2000 and 2010.

Housing density in Morris County is low compared to the New Jersey average. The County's 2010 housing density was 412.5 units per square mile, somewhat lower than the New Jersey average of 483.2 units per square mile. Additionally, the County has the fifth-lowest housing density in the thirteen-county NJTPA region. Twenty-four municipalities in the County have less than one housing unit per acre. Victory Gardens, followed by Morristown and Dover, has the highest density of housing.[8] **Figure 3-3** shows the housing density for each municipality in the County.

The average household size in 2000 was 2.72 persons in Morris County compared to an average household size of 2.68 for New Jersey. In 2010, the average household size had slightly decreased to 2.68 in the County, while statewide the average household size remained at 2.68 persons.[9]

5   2000 U.S. Census, 2010 U.S. Census
6   Alexan Riverdale.
7   39% of the Morris County lies within the Highlands Preservation Area

8   2010 U.S. Census
9   2000 U.S. Census, 2010 U.S. Census

Figure 3-2: Housing Unit Change, 2000 - 2010

Sussex County

Passaic County

Bergen County

Warren County

Hunterdon County

Somerset County

Union County

Essex County

Jefferson Twp

Rockaway Twp

Butler Boro

Riverdale Boro

Kinnelon Boro

Pequannock Twp

Mount Arlington Boro

Wharton Boro

Boonton Twp

Montville Twp

Lincoln Park Boro

Netcong Boro

Dover Town

Rockaway Boro

Denville Twp

Boonton Town

Mine Hill Twp

Mountain Lakes Boro

Roxbury Twp

Mount Olive Twp

Victory Gardens Boro

Parsippany Troy Hills Twp

Randolph Twp

Morris Plains Boro

East Hanover Twp

Hanover Twp

Washington Twp

Mendham Twp

Morristown Town

Morris Twp

Florham Park Boro

Chester Boro

Madison Boro

Mendham Boro

Chatham Boro

Chester Twp

Harding Twp

Chatham Twp

Long Hill Twp

Housing Unit Change

- -30 - 0
- 1 - 500
- 501 - 1,000
- 1,001 - 1,500
- 1,501 - 1,933

Source: Census 2000 & 2010, US Census Bureau

N W E S

Miles
0 1 2 3 4 5

Figure 3-3: Housing Density, 2010

Units Per Acre
- 0.12 - 0.5
- 0.51 - 1.0
- 1.1 - 2.0
- 2.1 - 4.0
- 4.1 - 5.9

Source: Census 2010,
US Census Bureau

Sussex County

Passaic County

Bergen County

Warren County

Essex County

Hunterdon County

Somerset County

Union County

Jefferson Twp

Rockaway Twp

Kinnelon Boro

Boonton Twp

Montville Twp

Butler Boro

Riverdale Boro

Pequannock Twp

Lincoln Park Boro

Mount Arlington Boro

Netcong Boro

Roxbury Twp

Mount Olive Twp

Wharton Boro

Mine Hill Twp

Dover Town

Victory Gardens Boro

Rockaway Boro

Denville Twp

Mountain Lakes Boro

Boonton Town

Parsippany Troy Hills Twp

Randolph Twp

Morris Plains Boro

Hanover Twp

East Hanover Twp

Washington Twp

Chester Boro

Mendham Twp

Morris Twp

Morristown Town

Florham Park Boro

Chester Twp

Mendham Boro

Harding Twp

Madison Boro

Chatham Boro

Chatham Twp

Long Hill Twp

Miles
0 1 2 3 4 5

3-11

Building Permits

Home construction within the County and New Jersey is recovering from the 2008 recession. According to the New Jersey Department of Community Affairs,[10] there were 691 new units authorized by building permits in 2014, an increase of 72% from 2010. In 2012 and 2013, increases in housing permit authorization outpaced the statewide percentage growth, as shown in **Table 3-7**. The growth was aided by the authorization of multi-family housing; more than half (478) of the permits issued in 2013 were for units in multi-family structures. These were concentrated in Morristown (291) and Hanover (151). In 2014, the number of permits for multi-family units dropped to 161. However, authorizations for one-and two-family units[11] continued to increase reaching 459, the highest since 2007. In 2014, 79 one-and two-family unit permits were issued in Mount Olive, followed by Morris Township (57) and Denville (39).

Table 3-7: Housing Units Authorized by Buildings Permits in Morris County

| Year | % Change | Total Units | Housing Type | | | Rank in NJ | Statewide Comparison | |
			1 & 2 family	Multi-family	Mixed use		% Change	Total Units
2006		1,364	725	624	15	11		32,050
2007	-32.5%	921	518	396	7	11	-19.0%	25,948
2008	-57.5%	391	254	136	1	17	-37.0%	16,338
2009	18.9%	465	216	248	1	10	-31.8%	11,145
2010	-14.0%	400	260	140	0	14	6.6%	11,885
2011	5.3%	421	283	137	1	13	0.0%	11,882
2012	43.7%	605	391	208	6	9	28.5%	15,270
2013	48.6%	899	420	478	1	8	23.1%	18,795
2014	-23.1%	691	459	161	71	10	21.8%	22,896

Source: New Jersey Department of Community Affairs

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[10] http://www.state.nj.us/dca/divisions/codes/reporter/building_permits.html
[11] Category includes single family detached homes, townhomes, and duplexes

C. Income and Employment

Income

In 2010, Morris County had the third highest median household income in New Jersey at $91,469, behind Hunterdon and Somerset Counties, and the County had the 10th highest median household income in the nation.[12] In 2010, the County's per capita income was $44,393. The U.S. Census Bureau's 2014 American Community Survey estimates that the County's median household income grew to $100,579 and per capita income grew to $48,937. This elevates the County's median household income rankings to the second highest County in New Jersey and eighth highest nationally.

Figure 3-4 presents the number and percentage of households by income level. **Table 3-8** shows the percent of households with incomes above $100,000 and below $25,000 by municipality. Although Morris County has a high percentage of affluent households, nearly one out of every ten households in the County has a total household income below $25,000.

Figure 3-4: Morris County Household Income
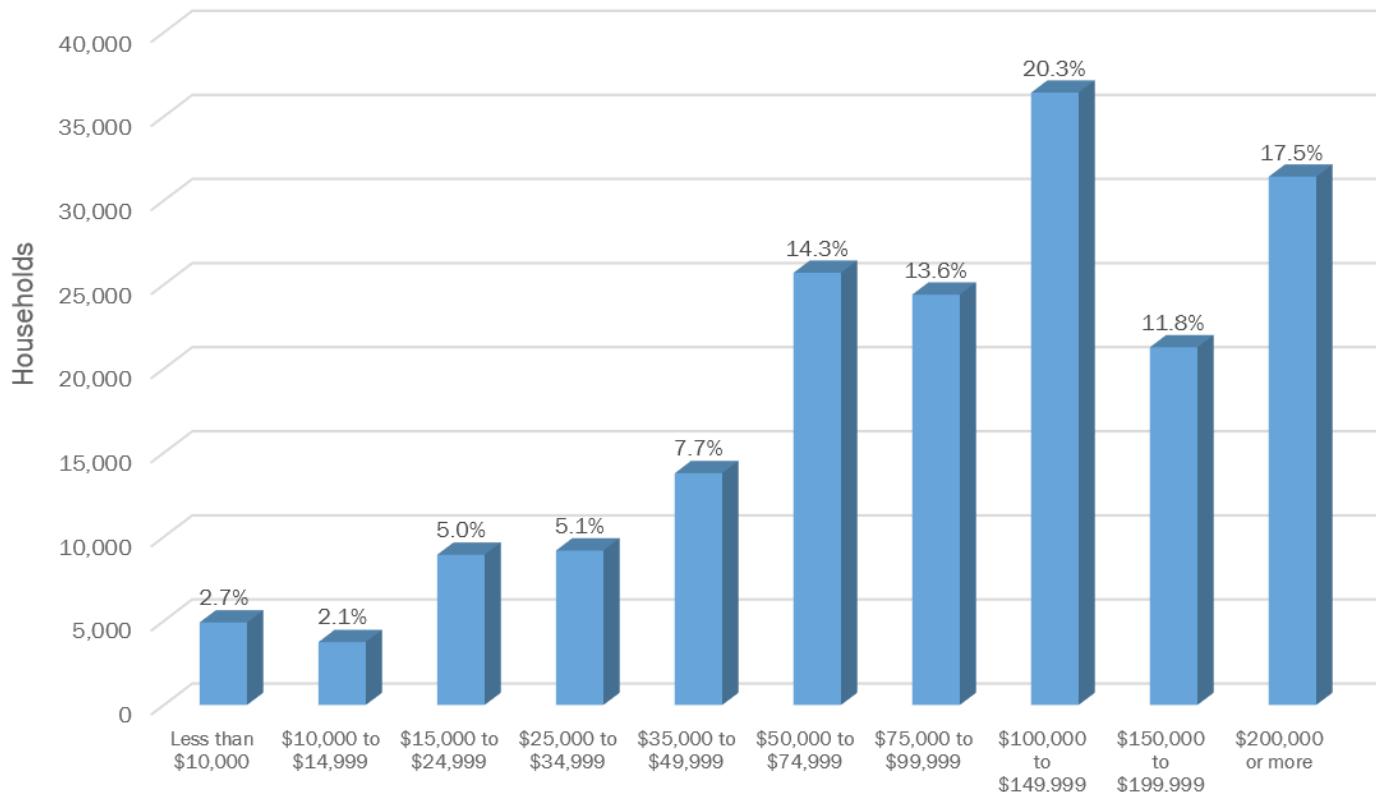
Source: U.S. Census Bureau, ACS, 2010-2014 5-Year Estimates

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[12] Census Bureau, 2010 American Community Survey

Table 3-8: Household Income by Municipality

Municipality	Percentage of Households That Earn Over $100,000	Percentage of Households That Earn Less Than $25,000
Boonton Town	44.0%	13.6%
Boonton Township	55.2%	13.9%
Butler Borough	42.0%	8.5%
Chatham Borough	68.2%	6.4%
Chatham Township	61.5%	9.7%
Chester Borough	47.7%	17.9%
Chester Township	70.5%	3.2%
Denville Township	54.5%	7.1%
Dover Town	23.7%	14.0%
East Hanover Township	54.0%	7.3%
Florham Park Borough	53.3%	12.0%
Hanover Township	53.6%	9.5%
Harding Township	65.3%	9.5%
Jefferson Township	47.9%	8.2%
Kinnelon Borough	61.7%	6.1%
Lincoln Park Borough	36.4%	9.1%
Long Hill Township	54.0%	7.2%
Madison Borough	54.7%	8.8%
Mendham Borough	62.5%	4.2%
Mendham Township	67.3%	7.7%
Mine Hill Township	46.4%	9.2%
Montville Township	59.2%	9.9%
Morris Township	61.3%	6.8%
Morris Plains Borough	55.2%	6.9%
Morristown Town	35.3%	15.3%
Mountain Lakes Borough	73.2%	3.8%
Mount Arlington Borough	37.2%	8.4%
Mount Olive Township	42.7%	13.2%
Netcong Borough	16.7%	16.9%
Parsippany-Troy Hills Twp.	42.5%	11.5%
Pequannock Township	42.2%	10.7%
Randolph Township	58.6%	8.0%
Riverdale Borough	40.0%	7.5%
Rockaway Borough	33.0%	8.6%
Rockaway Township	51.5%	8.6%
Roxbury Township	53.2%	10.2%
Victory Gardens Borough	9.3%	26.1%
Washington Township	60.7%	5.6%
Wharton Borough	27.0%	18.6%
Morris County Total	49.6%	9.8%

Source: U.S. Census Bureau, ACS, 2010-2014 5-Year Estimates

Employment Forecasts

The projected change in employment for Morris County's municipalities from 2010 to 2040 is shown in **Table 3-9**. Overall, the number of jobs in Morris County is estimated to increase by 32% (86,100) by 2040. The County's anticipated annual employment growth rate is 0.9%, which is comparable to the anticipated growth rate for the NJTPA region.[13] The highest annualized growth rates are generally in municipalities with few jobs as of 2010, such as Boonton Township, Chatham Township, and Harding, which have annualized projected employment growth rates of 1.9%. In terms of the number of jobs, Parsippany-Troy Hills (14,840 jobs) and Morristown (7,010 jobs) are anticipated to see the largest increase by 2040. In addition, several municipalities in eastern Morris County, including East Hanover, Florham Park, Hanover, and Morris Township, are each expected to gain more than new 4,000 jobs.

[13] *Plan 2040: NJTPA Regional Transportation Plan for Northern New Jersey,* Appendix A: 2040 Demographic Projections

Table 3-9: Employment By Municipality, 2010-2040

Municipality	2010 Employment	2040 Employment	Employment Change 2010-2040	% Employment Change 2010-2040
Boonton Town	3,470	5,590	2,120	61.1%
Boonton Township	680	1,180	500	73.5%
Butler Borough	2,370	3,890	1,520	64.1%
Chatham Borough	4,250	5,960	1,710	40.2%
Chatham Township	2,200	3,920	1,720	78.2%
Chester Borough	2,840	3,670	830	29.2%
Chester Township	1,410	1,780	370	26.2%
Denville Township	9,840	13,580	3,740	38.0%
Dover Town	6,000	8,610	2,610	43.5%
East Hanover Township	17,870	22,470	4,600	25.7%
Florham Park Borough	17,190	22,090	4,900	28.5%
Hanover Township	14,850	19,190	4,340	29.2%
Harding Township	1,220	2,130	910	74.6%
Jefferson Township	3,630	3,730	100	2.8%
Kinnelon Borough	1,950	2,030	80	4.1%
Lincoln Park Borough	3,860	5,490	1,630	42.2%
Long Hill Township	2,930	4,160	1,230	42.0%
Madison Borough	7,300	10,460	3,160	43.3%
Mendham Borough	1,920	2,270	350	18.2%
Mendham Township	850	1,180	330	38.8%
Mine Hill Township	500	580	80	16.0%
Montville Township	11,270	15,220	3,950	35.0%
Morris Township	10,460	14,940	4,480	42.8%
Morris Plains Borough	6,310	7,280	970	15.4%
Morristown Town	24,700	31,710	7,010	28.4%
Mountain Lakes Borough	3,060	4,000	940	30.7%
Mount Arlington Borough	1,420	2,270	850	59.9%
Mount Olive Township	9,390	13,150	3,760	40.0%
Netcong Borough	1,900	2,650	750	39.5%
Parsippany-Troy Hills Township	53,090	67,930	14,840	28.0%
Pequannock Township	6,690	8,250	1,560	23.3%
Randolph Township	8,110	11,120	3,010	37.1%
Riverdale Borough	2,580	2,840	260	10.1%
Rockaway Borough	4,720	6,210	1,490	31.6%
Rockaway Township	10,860	11,560	700	6.4%
Roxbury Township	8,740	12,780	4,040	46.2%
Victory Gardens Borough	130	140	10	7.7%
Washington Township	3,430	3,690	260	7.6%
Wharton Borough	2,420	2,810	390	16.1%
Morris County Total	276,400	362,500	86,100	31.2%

Source: NJTPA Plan 2040 Demographic Projections

CHAPTER 4:
The Transportation Network

A. Roads and Bridges

Road and bridges in Morris County are managed and maintained by several public agencies at various levels of government. There are approximately 283 miles of roads under Morris County's jurisdiction. This represents 11% of the 2,593 total roadway miles within Morris County. Most of the roadway miles (81% or 2,105) in the County are under municipal jurisdiction. Additionally, there are 162 miles of Interstate, Federal, and State roads in Morris County, representing 6% of the total roadway miles in the County under NJDOT's jurisdiction.[1] Morris County has jurisdiction over 999 roadway bridges and 16 railway bridges in the County. NJDOT has jurisdiction over 272 road and rail bridges, and NJ TRANSIT has jurisdiction over another 119 road and rail bridges.[2] The road network in Morris County and associated roadway jurisdictions are shown in **Figure 4-1**.

Interstate Highways

The New Jersey Department of Transportation (NJDOT) is responsible for Interstates I-80, I-280, and I-287 in Morris County.

Interstate 80 (I-80) is a national highway that runs from New Jersey to California. I-80 enters New Jersey from Pennsylvania, crossing the Delaware River into Warren County. It enters Morris County in Mount Olive from the west and exits the County through Montville Township in the east. Running through Passaic, Essex, and Bergen Counties, I-80 terminates at the George Washington Bridge, which connects to New York City. I-80 interchanges with I-287 and I-280 in Morris County, and with the Garden State Parkway and the New Jersey Turnpike (I-95) east of the County.

Intestate 280 (I-280) begins at an interchange with I-80 in Parsippany-Troy Hills and exits Morris County in East Hanover. I-280 travels through Essex County to the east terminating in Hudson County at the New Jersey Turnpike. I-280 also interchanges with the Garden State Parkway and US 46.

Interstate 287 (I-287) begins at the interchange with the New Jersey Turnpike and NJ 440 in Middlesex County. I-287 enters Morris County from the south in Harding Township, and leaves Morris County to the north in Riverdale Borough, heading to the New York/New Jersey state line in Bergen County. I-287 interchanges with I-95 in Middlesex County, I-78 in Somerset County, and I-80 in Parsippany-Troy Hills. The final segment of I-287 between Exit 47 in Montville and New York was opened in 1994.

Federal and State Roads

The New Jersey Department of Transportation (NJDOT) has jurisdiction over Federal and State roads in Morris County, with the exception of a portion of US 202, which is under County jurisdiction, as described below. These range from highways such as NJ 24, to major arterials such as NJ 10 and US 46. Some of these routes also are main streets in town centers, such as NJ 124 in Chatham Borough and Madison, and US 202 in Morristown.

Federal Routes: US 46, 202, and 206

State Routes: NJ 10, 15, 23, 24, 53, 124, 159, 181, and 183

Jurisdiction of US 202 in Morris County is split between the State and Morris County. Morris County has jurisdiction over approximately 14 miles of US 202 from the intersection with NJ 53 in Morris Plains to the County's border in Lincoln Park, with some exceptions such as in the vicinity of the I-80 interchange. NJDOT has jurisdiction of US 202 south of NJ 53 to the County border in Harding.

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[1] NJDOT Bureau of Transportation Data and Safety, 2015
[2] *State of the County Report*, Morris County Planning Board, 2013

Figure 4-1: Road Network
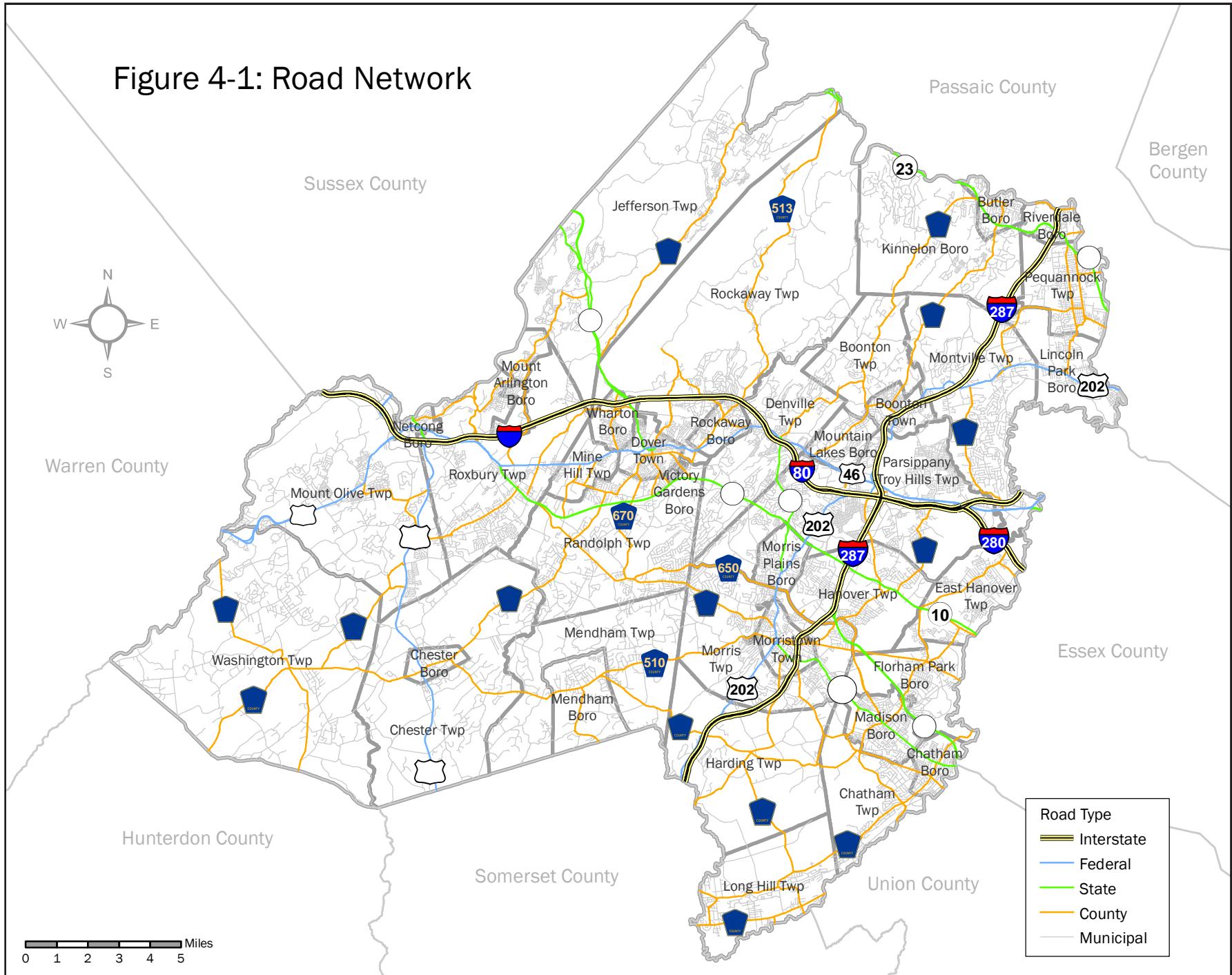
County Roads

Morris County is responsible for the construction, maintenance, and planning of 500 and 600 series County Routes (CR) and US 202 north of NJ 53. There are 74 Morris County routes. The 500-series routes account for approximately 95 of the 283 miles of roads under Morris County's jurisdiction. The 600-series routes make up approximately 174 of the 283 miles of County roads.[3] In New Jersey, 500-series routes often traverse through multiple counties and support regional travel, while 600-series routes do not cross county borders and tend to serve local traffic.

County Routes 500-Series: CR 504, 510, 511, 511A (Alternate), 512, 513, 517, 525, and 531

County Routes 600-Series: CR 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 615, 616, 617, 618, 619, 621, 622, 623, 624, 624A, 625, 628, 630, 631, 632, 633, 633A, 634, 635, 636, 637, 638, 640, 642, 643, 644, 646, 647, 648, 650, 651, 654, 655, 655A, 656, 657, 659, 660, 661, 662, 663, 664, 665, 667, 668, 669, 670, 671, 680, 694, and 699

US 202: Morris County has jurisdiction of over approximately 14 miles of US 202 from the intersection with NJ 53 in Morris Plains to the County's border in Lincoln Park. NJDOT has jurisdiction of US 202 south of NJ 53.

On these roads, the County maintains the pavement, standard traffic control signs such as stop and yield signs, and guide rail. Sidewalks are the responsibility of the property owners or the municipalities. Traffic signals are owned by municipalities, or owned by NJDOT at intersections with State routes;

the County does not own or maintain traffic signals after installation.

Municipal Roads

Municipal governments are responsible for the construction, maintenance, and planning of municipal roads. The majority of road mileage (81%) in the County is under municipal jurisdiction. Municipalities own and maintain traffic signals on County roads, except at County intersections with State routes. Local police departments are responsible for the enforcement of traffic laws and regulations to help ensure safe travel.

Bridges

There are approximately 1,000 roadway bridges and 16 railway bridges in Morris County that are under the County's jurisdiction. NJDOT has jurisdiction over 272 road and rail bridges, and NJ TRANSIT has jurisdiction over another 119 road and rail bridges.[4]

The Federal Highway Administration maintains a listing of many bridges throughout the nation in its National Bridge Inventory (NBI). The 2014 version of the NBI includes 495 bridges in Morris County.[5] Each bridge in the NBI is rated based on a several factors to determine its condition, such as whether it is structurally deficient or functionally obsolete. Structural deficiency is based on condition ratings for the deck, superstructure, substructure, overall condition, and the adequacy of the structure to accommodate the flow of water under the bridge (if applicable). Functional obsolescence is based on ratings for deck geometry, vertical clearances under the

[3] The 283 miles of County roads includes the 14 miles of US 202 under Morris County's jurisdiction.

[4] *State of the County Report*, Morris County Planning Board, 2013
[5] The NBI only includes bridges 20 feet in length or longer. It does not include all bridges, bridge structures, and culverts in Morris County.

bridge, and approach roadway alignment.[6] A bridge that is structurally deficient or functionally obsolete is eligible for Federal funding under the Highway Bridge Replacement and Rehabilitation Program.[7]

Functional Classifications

States assign a functional classification to each road in accordance with Federal Highway Administration (FHWA) guidelines. The classification of a road is determined by its purpose in the road network. The FHWA defines each classification based on two principal functions of road:

Mobility: Enabling the efficient movement of vehicular traffic with minimal connections to surrounding land uses and other roads.

Accessibility: Providing connection via direct or secondary access to land uses.

A roadway's functional classification is important because it can determine its eligibility for Federal and State funding for capital projects and maintenance. **Figure 4-2** presents the road mileage in Morris County by functional classification.

Figure 4-2: Road Mileage by Functional Classification in Morris County
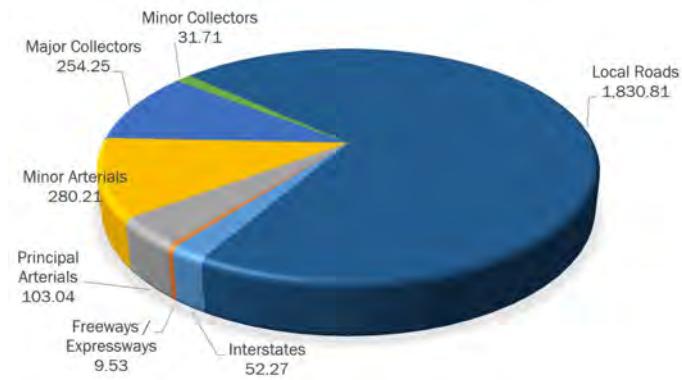
Source: NJDOT Functional Classification Map, 2013

Interstates are designated by the United States Secretary of Transportation. They are the highest classification of Arterials and were designed and constructed with mobility and long-distance travel in mind. These highways provide limited access, divided highways with the intention of high levels of mobility between major urban areas. The Interstates in Morris County are I-80, I-280, and I-287.

Freeways/Expressways serve a purpose similar to that of Interstates. These roads provide high levels of mobility, have limited access at interchanges, and are not intended to serve adjacent land use directly. NJ 24 and sections of NJ 15 are classified as Freeways by the FHWA.

Principal Arterials provide a high level of mobility, but unlike Interstates and Freeways/Expressways, these roads can provide direct access to abutting properties. US 46, US 206, NJ 10, NJ 15, NJ 23, NJ 159, and segments of CR 511A, CR 623, and CR 630 are considered Principal Arterials. Sections of US 202, NJ 124, and CR 510, and all of NJ 53 and NJ 183, are also categorized as Principal Arterials.

Minor Arterials provide a high degree of mobility, though not as high as Principal Arterials, for trips of moderate length and offer direct access to development. County Routes in Morris County are often Minor Arterials, as well as some municipal roads, such as Newark-Pompton Turnpike in Riverdale Borough, Main Street in Butler, and Espanong Road in Jefferson Township. Sections of US 202, US 206, NJ 15, and NJ 124 are also classified as Minor Arterials.

Major Collectors are roads that provide greater access to surrounding land uses than Arterials, connecting to higher density residential and commercial/industrial areas. Major Collectors distribute and channel trips between Local Roads and Arterials. In Morris County, these roads tend to be either under County or municipal jurisdiction.

Minor collectors generally have fewer travel lanes, carry lower traffic volumes, and are shorter connections between Local Roads and Arterials than Major Collectors. All Minor Collectors in Morris County are municipal roads with exception of certain highway ramps and a small segment of NJ 124.

Local Roads comprise the remainder of the roadway network, and account for the majority of all road mileage in Morris County. Local Roads, which provide direct access, tend to be in residential areas and not used for regional through-travel. Several county roads are categorized as local roads; sections of CR 625 (Bartley-Chester Road) in Mount Olive Township and CR 664 (Mount Hope Road) in Rockaway Township, and all of CR 668 (Highview Avenue) in Hanover Township and CR 671 (John Street) in Morris Township. All other Local Roads in the County are under municipal jurisdiction.

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[6] A structurally deficient bridge is excluded from the functionally obsolete category.
[7] 23 CFR 650.409

Figure 4-3: Functional Classification of Roads under County Jurisdiction

Passaic County

Bergen County

Sussex County

Warren County

Hunterdon County

Somerset County

Union County

Essex County

Jefferson Twp

Rockaway Twp

Butler Boro

Riverdale Boro

Kinnelon Boro

Pequannock Twp

23

287

Boonton Twp

Montville Twp

Lincoln Park Boro

202

Mount Arlington Boro

Denville Twp

Boonton Town

Netcong Boro

Wharton Boro

Rockaway Boro

Mountain Lakes Boro

Parsippany Troy Hills Twp

Roxbury Twp

Mine Hill Twp

Dover Town

513

46

80

Victory Gardens Boro

202

Mount Olive Twp

670

Randolph Twp

Morris Plains Boro

287

280

650

Hanover Twp

East Hanover Twp

Washington Twp

Chester Boro

Mendham Twp

Morris Twp

Morristown Town

10

Florham Park Boro

510

Mendham Boro

202

Madison Boro

Chatham Boro

Chester Twp

Harding Twp

Chatham Twp

Long Hill Twp

Miles
0 1 2 3 4 5

Functional Classification

— Principal Arterial
— Minor Arterial
— Major Collector
— Local Road

In accordance with NJDOT Functional Classification Map, 2013.

Traffic Volume

Two common statistics for reporting traffic data are Vehicle Miles Traveled (VMT) and Annual Average Daily Traffic (AADT). VMT is the miles traveled during a certain time in an area such as a County or State. **Figure 4-4** presents annual VMT in Morris County from 2000 to 2014. There were approximately 14.26 million vehicle miles traveled (VMT) in 2014, the lowest since 2010 and the second lowest since 2002.

Figure 4-4: Annual VMT in Morris County
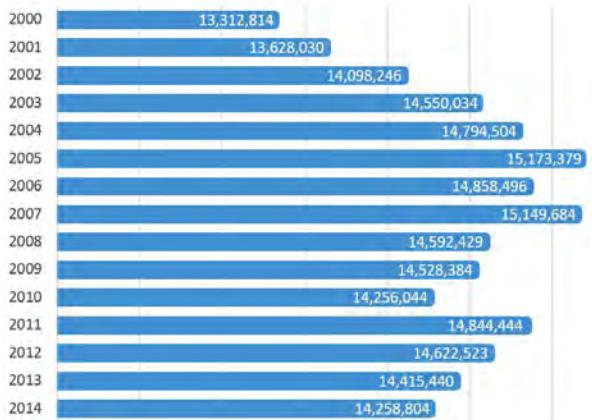
Source: NJDOT Bureau of Transportation Data and Safety, Roadway Systems Section

Figure 4-5 shows 2014 VMT in Morris County by functional classification. Roads that are under NJDOT's jurisdiction experience more than half of VMT, however Local Roads, which are primarily under municipal control, have significant VMT as well.

Figure 4-5: 2014 Morris County VMT by Functional Classification
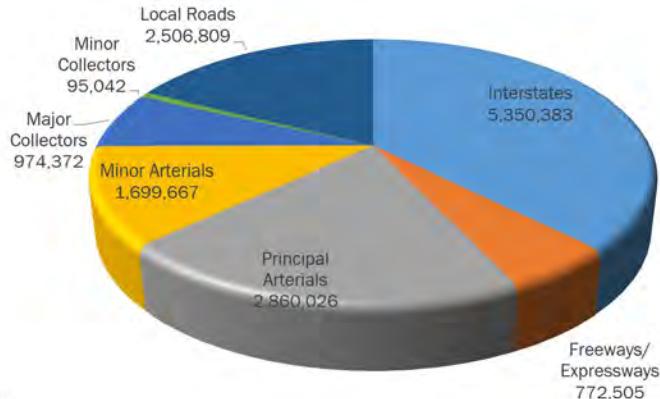
Source: NJDOT Bureau of Transportation Data and Safety, Roadway Systems Section

Annual Average Daily Traffic (AADT) is the number of vehicles that travel by a specific location during a typical weekday. Traffic volume is usually collected over several days at a location to generate a 24-hour average volume. As Interstates and State highways tend to provide the greatest roadway capacity for vehicular traffic, they also handle the highest traffic volumes. I-80 typically accommodates the highest traffic volumes in the County, with AADTs in excess of 140,000 and 150,000 in some sections.[8] The County Routes with the highest volumes recorded by Morris County's Traffic Count Program between 2009 and 2014 are presented in **Table 4-1.** Most of the County Routes listed are in the eastern part of Morris County. The high traffic volume reflects the higher population and employment activity in this areas, and higher capacity roadways.

Table 4-1: County Roads with Highest Traffic Volumes, 2009-2014

Road	Count Location	AADT
Columbia Tpk (CR 510)	West of Park Ave	31,709
Morris St (CR 510)	West of Lafayette Ave	27,256
Hanover Ave (CR 650)	West of Ridgedale Ave	23,425
Watchung Ave (CR 646)	West of Fairmount Ave	22,992
Park Ave (CR 623)	South of Columbia Tpk	22,626
Landing Rd (CR 631)	North of I-80	21,673
Littleton Rd (US 202)	South of Park Rd	21,580
Paterson-Hamburg Tpk (CR 511A)	At Passaic County line	20,890
South Salem St (CR 665)	North of NJ 10	20,554
Ridgedale Ave (CR 632)	North of Mann Ave	20,391

Source: Morris County Traffic Count Program, 2015

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[8] NJDOT 2015 Straight Line Diagrams, Bureau of Transportation Data and Safety, 2015

Traffic Congestion

Traffic congestion is an ongoing issue for Morris County and the region resulting in longer commutes, increased greenhouse gas emissions, lost worker productivity, and higher risk of crashes. While Interstate, Federal, and State highways in Morris County have the high levels of congestion, County Routes also experience significant recurring traffic delay. The most congested roads under the County's jurisdiction are:[9]

- Columbia Turnpike (CR 510), Florham Park
- Littleton Road (US 202/CR 630), Parsippany-Troy Hills
- Main Street (CR 513), Chester Borough
- Morris Street (CR 510), Morristown
- Park Avenue (CR 623), Florham Park/Hanover/Morris Township
- Parsippany Boulevard (CR 511), Parsippany-Troy Hills
- Parsippany Road (CR 511), Parsippany-Troy Hills
- Paterson-Hamburg Turnpike (CR 694), Riverdale
- West Blackwell Street (CR 513), Dover
- West Main Street (CR 510), Mendham Borough

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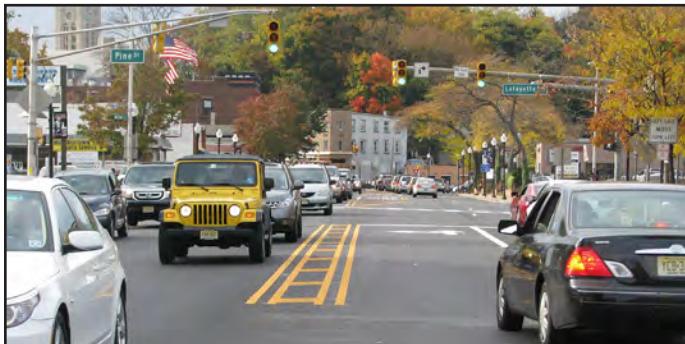
[9] Congestion measures for County roads were documented using INRIX® vehicle probe data provided through the I-95 Corridor Coalition's Vehicle Probe Project (VPP) Suite. Congestion is measured based on observed speed during peak weekday travel periods compared to "free-flow" speeds. A roadway segment where the average travel speed during peak periods is 20 miles per hour and the free-flow speed during off-peak hours is 50 miles per hour has a congestion index of 0.40, for example. INRIX® compiles sample vehicle data through phone applications such as Google Maps, and Waze® that collect information about a user's location, direction of travel, and speed to calculate congestion and travel time for vehicle navigation and reporting purposes.

Traffic Forecasts

Traffic volume is expected to grow throughout the County between 2014 and 2040, based on forecasts provided by the NJTPA's North Jersey Regional Transportation Model – Enhanced (NJTRM-E). Volume growth at several sections of Interstate, Federal, State, and major County roads is shown in **Table 4-2**.

The most growth by percentage is projected to be on arterial roads in the eastern part of the County. Major roadways including NJ 124, Park Avenue (CR 623), Morris Street (CR 510), Watchung Avenue (CR 646), and Columbia Turnpike (CR 510) are all projected to see daily traffic volume growth of 12% or more by 2040. On NJ 124 and Park Avenue, areas that have ongoing office and mixed-use development projects, growth is projected to exceed 20%. Outside this southeastern part of the County, Paterson-Hamburg Turnpike (CR 511A) and US 206 are projected to see the highest percentage growth, but in absolute numbers it will not be substantial. NJ 15, which serves a part of the County that lies entirely in the Highlands Preservation Area, is projected to see only a 6% increase in traffic volumes by 2040. This is the lowest percent increase among any major roadway in Morris County.
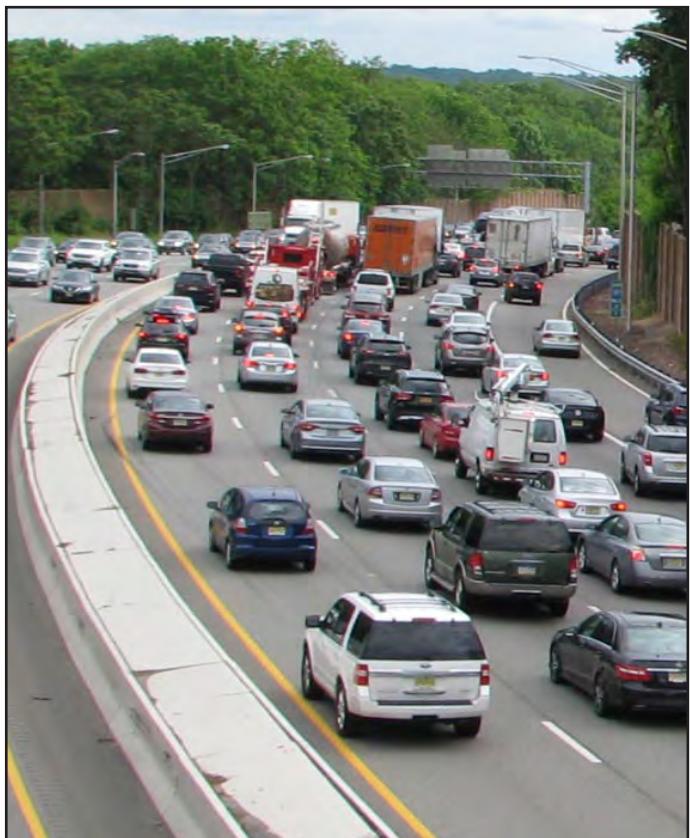
Table 4-2: Traffic Volume Forecasts 2014 to 2040

Roadway	NJRTM-E 2014 Volume	NJRTM-E 2040 Volume	NJRTM-E Change	NJRTM-E % Change
I-80	125,910	137,847	11,937	9.48%
I-280	49,036	53,760	4,724	9.63%
I-287	104,879	114,614	9,735	9.28%
US 46	30,984	33,705	2,721	8.78%
US 202	25,564	28,057	2,493	9.75%
US 206	13,365	15,228	1,863	13.94%
NJ 10	51,872	57,788	5,916	11.40%
NJ 15	33,288	35,289	2,001	6.01%
NJ 23	34,468	37,298	2,830	8.21%
NJ 24	52,310	56,680	4,370	8.35%
NJ 124	21,075	25,368	4,293	20.37%
Columbia Turnpike (CR 510)	24,453	27,388	2,935	12.00%
Morris Street (CR 510)	19,906	22,931	3,025	15.20%
Hanover Avenue (CR 650)	12,846	13,634	788	6.13%
Watchung Avenue (CR 646)	10,293	11,606	1,313	12.76%
Park Avenue (CR 623)	6,297	7,576	1,279	20.31%
Landing Road (CR 631)	15,845	17,407	1,562	9.86%
Paterson-Hamburg Turnpike (CR 511A)	11,926	13,644	1,718	14.41%
South Salem Street (CR 665)	13,285	13,850	565	4.25%
Ridgedale Avenue (CR 632)	7,660	8,269	609	7.95%

Source: North Jersey Regional Transportation Model – Enhanced, NJTPA
*Note: Sections of each road may have higher or lower volume depending on location.*

Traffic volumes on the major highways are expected to see growth through 2040, although at somewhat lower percentage change than many of the arterial roadways. These increases range from about 8.3% for NJ 24 to around 9.6% for I-280. However, some are expected to see larger growth numerically. I-80 is projected to see approximately 12,000 more vehicles per day, and I-287 is expected to have nearly 10,000 additional automobiles per day, equal to the existing daily traffic on many County Routes.

Crashes

There were 81,899 crashes recorded in Morris County from 2009 to 2013; almost 20% occurred on County Roads.[10] Of the various types of crashes, same-direction rear-end collisions was the dominant crash type in Morris County during this period, representing 30% of the total crashes reported. Other types of crashes that occurred frequently in Morris County over this period include crashes with fixed

objects (13.7%), right-angle collisions (11.4%), and same-direction side-swipe crashes (11.2%). **Figure 4-6** shows the total annual crashes in Morris County from 2009 through 2013.

Figure 4-6: Morris County Crashes, 2009-2013

Year	Crashes
2009	16,224
2010	16,255
2011	16,902
2012	16,015
2013	16,503

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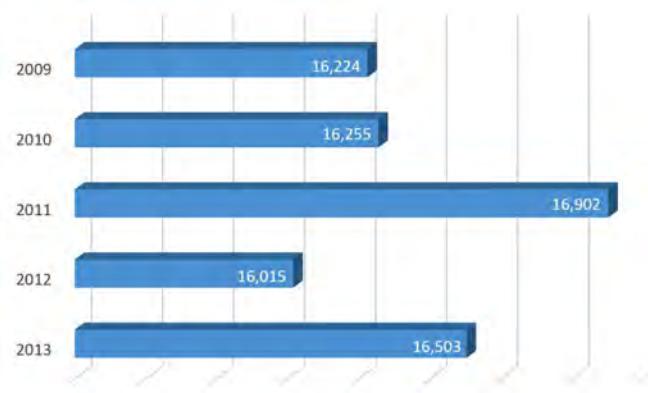
[10] Crash data obtained from Rutgers University Center for Advanced Infrastructure and Transportation (CAIT) Plan4Safety® decision support tool and database.

I-80 had the most crashes (8,128) in Morris County during the five years. This was followed by US 46 (5,890), I-287 (4,954), NJ 10 (4,539), US 202 (2,507), CR 513 (1,949). The County Routes with the most recorded crashes from 2009 through 2013 are shown in **Figure 4**-7.

Figure 4-7: Most Crashes by County Route, 2009-2013
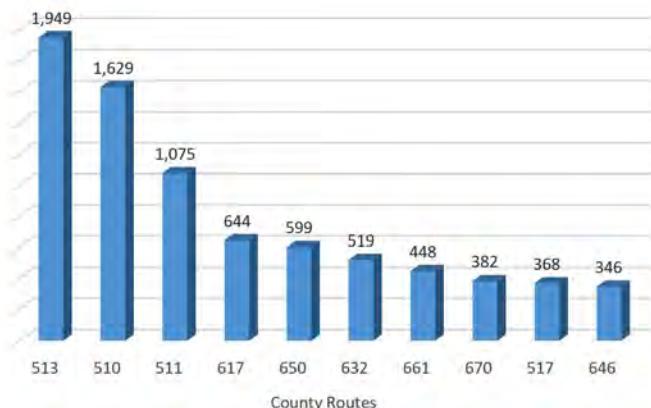
Source: Plan4Safety, Rutgers CAIT, 2014

There were 1,173 crashes in Morris County from 2009 to 2013 involving a bicyclist, a pedestrian, or both.[11] The heaviest concentrations of bicycle and pedestrian crashes were in Morristown and Dover, the largest and most dense town centers in the County. Additional concentrations occurred in the smaller town centers of Boonton Town, Butler, Chester Borough, Denville, Netcong, and Pequannock. There were 294 bicycle and/or pedestrian crashes recorded on County Routes, representing 25% of the total bicycle/pedestrian crashes in that period. The County Routes with the most recorded crashes were:

- CR 513 – 64 crashes (40 in Dover)
- CR 510 – 37 crashes (22 in Morristown)
- CR 511 – 16 crashes (7 in Boonton Town)
- CR 504 – 12 crashes (11 in Pequannock)
- CR 512 – 12 crashes (all in Long Hill)
- CR 634 – 9 crashes (all in Wharton)

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[11] Rutgers CAIT Plan4Safety® decision support tool and database.

Fatal Crashes

There were 122 fatal crashes in Morris County from 2009 through 2013, representing less than 0.15% of total crashes.[12] The highest number of fatal crashes during this period were on:

- I-80 – 22 crashes
- US 46 – 16 crashes
- I-287 – 11 crashes
- NJ 10, NJ 15, and CR 513 – 5 each
- US 206 – 4 crashes

Table 4-3 shows the breakdown of the 122 fatal crashes by crash type in Morris County. Fatal crashes involving fixed-objects were the most common crash type from 2009 through 2013. Although not shown in this table, alcohol was a reported factor in ten of the 122 fatal crashes. A combined total of 25 fatal crashes, or 20%, involved a pedestrian or bicyclist. As a result of these 122 fatal crashes, there were 129 fatalities, of which 25 were pedestrians and two were bicyclists.

Table 4-3: Fatal Crashes by Crash Type, 2009-2013

Crash Type	Count	Percentage
Fixed Object	47	38.5%
Pedestrian	24	19.7%
Other	10	8.2%
Right Angle	9	7.4%
Same Direction - Side Swipe	7	5.7%
Opposite Direction - Head On/Angular	7	5.7%
Same Direction - Rear End	6	4.9%
Overturned	4	3.3%
Struck Parked Vehicle	4	3.3%
Animal	1	0.8%
Left Turn/U-turn	1	0.8%
Opposite Direction - Side Swipe	1	0.8%
Pedalcyclist	1	0.8%
Total	122	

Source: Plan4Safety, Rutgers CAIT, 2014

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[12] Rutgers CAIT Plan4Safety® decision support tool and database.

B. Public Transportation

Morris County is served by several public transportation providers. NJ TRANSIT, the state's public transportation agency, operates rail lines, bus routes, and paratransit (Access Link) in the County. Two private commuter bus companies, Lakeland Bus Lines, Inc. and Coach USA, also operate within Morris County. The County's Morris Area Paratransit System (MAPS) serves seniors and people with disabilities, and municipal dial-a-rides provide local transportation for resident seniors.

NJ TRANSIT Rail

There are two NJ TRANSIT rail lines in Morris County: the Morris & Essex (M&E) Lines, comprised of the Morristown Line and Gladstone Branch, and the Montclair-Boonton Line. The western terminus of the Morristown Line is Hackettstown, while the western terminus of the Gladstone Branch is Gladstone Yard. Both of these rail lines run seven days a week, with eastern terminuses at either New York Penn Station or Hoboken. The Morristown Line is electrified as far west as Dover Station; diesel-powered locomotives are required for service west of Dover.

The Montclair-Boonton Line operates between Hackettstown and Hoboken. Riders can transfer at Montclair State University or Newark Broad Street Station to travel to New York Penn Station. The Montclair-Boonton Line operates seven days a week; however, there is no weekend service in Morris County since the train does not operate west of Bay Street Station in Montclair on weekends. The Montclair-Boonton Line is electrified between Hoboken and Montclair State University Stations. Service west of Montclair State requires diesel-powered locomotives.

There are 19 train stations in Morris County. Three stations are along the M&E Gladstone Branch, 12 stations are along the M&E Morristown Line, and 10 stations are on the Montclair-Boonton Line. Six of the stations in the County are served by both the M&E Morristown Line and the Montclair-Boonton Line. The rail system is shown in **Figure 4**-**8**. The NJ TRANSIT train stations in Morris County, along with some of their important characteristics, are listed in **Table 4**-**4** and **Table 4**-**5**.

Overall, average weekday boardings declined between 2004 and 2014 in Morris County resulting in a net decrease of 1.8%. The ridership decline may be attributed to the 2007-2009 recession, service reductions on the Morris & Essex and Montclair-Boonton Lines in 2010, and multiple system-wide NJ TRANSIT fare increases in 2005, 2007, and 2010.[13] Additionally, gasoline prices remained low during and after the recession potentially encouraging more driving rather than train ridership.

Montclair-Boonton Line stations in Morris County have lower weekday boardings than many of the stations on the Morristown Line. The Montclair-Boonton Line has significantly less service in Morris County with trains running eastbound only in the morning and westbound only in the evening. Further, riders boarding at stations west of Montclair State, such as those stations in Morris County, must change trains to reach New York City extending commute times, which may discourage ridership.[14]

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[13] The most recent NJ TRANSIT fare increases in 2015 are not included here, as they had no impact on 2004-2014 ridership changes.
[14] Only electric trains on the Montclair-Boonton Line travel to New York City, so passengers boarding trains in the non-electrified territory west of Montclair State University (MSU) must transfer at MSU or at one of the stations east of there in order to reach New York.

Table 4-4: Train Stations in Morris County

Station Name	Train Lines	2004 Average Weekday Boardings	2014 Average Weekday Boardings	10-year Trend	Peak Travel Time to New York or Hoboken
Boonton	Montclair-Boonton	76	65	-14.5%	64 Minutes (Hoboken)
Chatham	Morris & Essex	1,315	1,634	+24.3%	54 Minutes (New York) 56 Minutes (Hoboken)
Convent Station	Morris & Essex	1,245	1,092	-12.3%	63 Minutes (New York) 64 Minutes (Hoboken)
Denville	Morris & Essex/ Montclair-Boonton	425	532	+25.2%	80 Minutes (New York)
Dover	Morris & Essex/ Montclair-Boonton	1,340	1,110	-17.2%	88 Minutes (New York) 82 Minutes (Hoboken)
Gillette	Gladstone Branch	141	139	-1.4%	69 Minutes (Hoboken) 61 Minutes (New York)
Lake Hopatcong	Morris & Essex/ Montclair-Boonton	142	67	-52.8%	101 Minutes (Hoboken) 110 Minutes (New York)
Lincoln Park	Montclair-Boonton	148	95	-35.8%	66 Minutes (Hoboken)
Madison	Morris & Essex	1,344	1,574	+17.1%	58 Minutes (New York) 60 Min (Hoboken)
Millington	Gladstone Branch	161	154	-4.3%	87 Minutes (Hoboken) 68 Minutes (New York)
Morris Plains	Morris & Essex	762	640	-16.0%	71 Minutes (New York) 73 Min (Hoboken)
Morristown	Morris & Essex	1,949	1,877	-3.7%	67 Minutes (New York) 68 Minutes (Hoboken)
Mount Arlington	Morris & Essex/ Montclair-Boonton	N/A	93	N/A	96 Minutes (Hoboken) 105 Minutes (New York)
Mount Olive	Morris & Essex/ Montclair-Boonton	33	17	-48.5%	112 Minutes (Hoboken)
Mount Tabor	Morris & Essex	45	34	-24.4%	78 Minutes (New York) 72 Minutes (Hoboken)
Mountain Lakes	Montclair-Boonton	47	17	-63.8%	68 Minutes (Hoboken)
Netcong	Morris & Essex/ Montclair-Boonton	188	105	-44.1%	107 Minutes (Hoboken)
Stirling	Gladstone Branch	111	101	-9.0%	75 Minutes (Hoboken) 65 Minutes (New York)
Towaco	Montclair-Boonton	122	79	-35.2%	62 Minutes (Hoboken)
Total		9,594	9,425	-1.8% overall net decrease	

Source: NJ TRANSIT

Figure 4-8: NJ TRANSIT Rail System
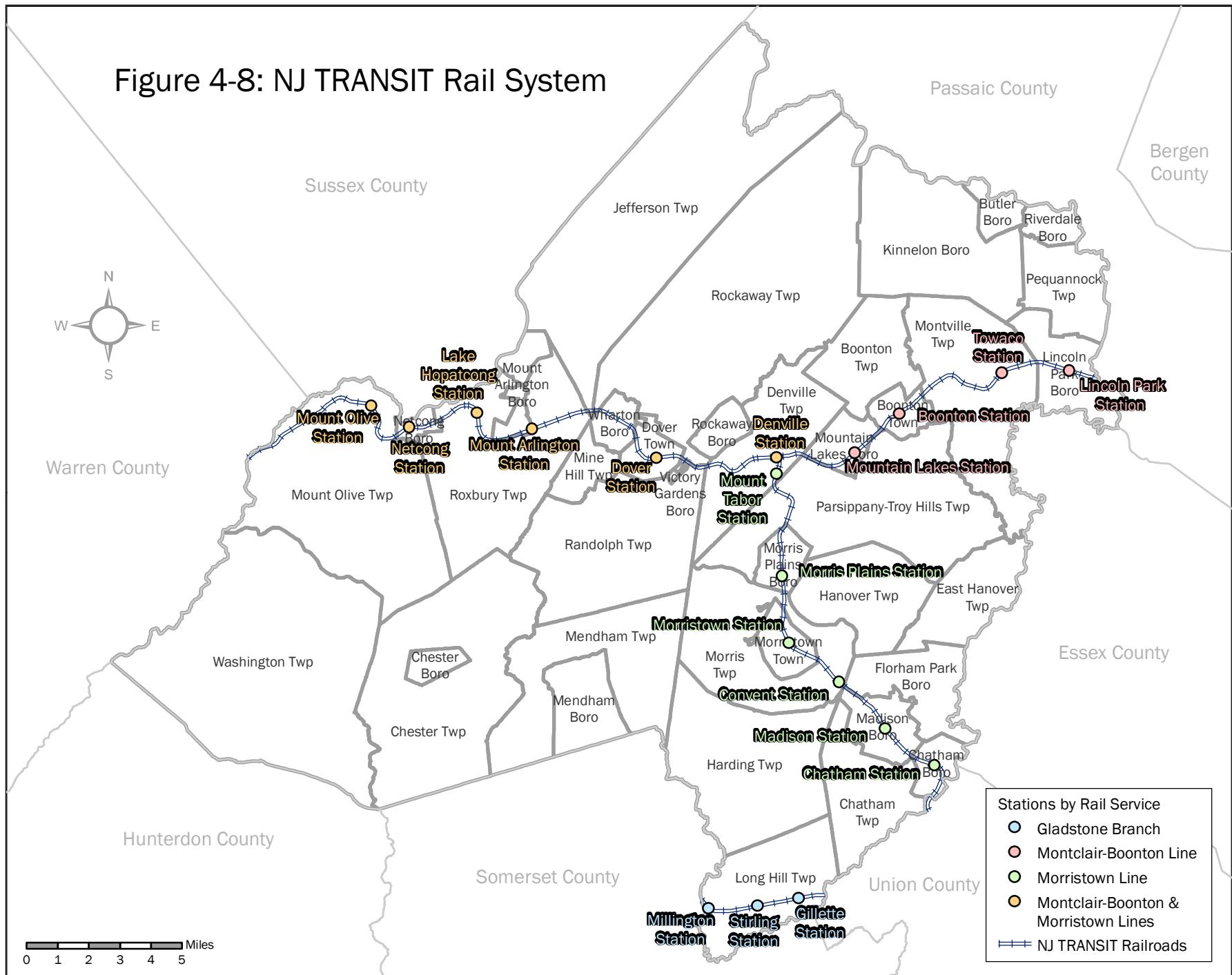
Table 4-5: Train Station Features

Station Name	Standard Parking Spaces (2013)	Standard Parking Occupied (2013)	ADA Parking Spaces	ADA Accessible Station	Bike Racks or Lockers	Connecting NJT Bus Service
Boonton	69	23 (33%)	3	Yes	Yes	871
Chatham	402	392 (98%)	10	No	Yes	873
Convent Station	617	449 (73%)	9	No	Yes	873, 878
Denville	237	167 (70%)	10	Yes	Yes	None
Dover	861	392 (46%)	23	Yes	Yes	875, 880
Gillette	82	72 (88%)	2	No	Yes	None
Lake Hopatcong	96	25 (26%)	1	No	Yes	None
Lincoln Park	247	58 (23%)	5	No	Yes	None
Madison	410	324 (79%)	10	Yes	Yes	873
Millington	114	54 (47%)	0	No	Yes	None
Morris Plains	245	184 (75%)	3	No	Yes	872, 875, 880
Morristown	566	458 (81%)	13	Yes	Yes	871, 872, 873, 874, 875, 880
Mount Arlington	285	285 (100%)	7	Yes	Yes	None
Mount Olive	23	5 (22%)	2	Yes	No	None
Mount Tabor	48	12 (25%)	1	No	Yes	880
Mountain Lakes	87	20 (23%)	0	No	Yes	None
Netcong	247	76 (31%)	5	No	Yes	None
Stirling	39	22 (56%)	1	No	Yes	None
Towaco	220	68 (31%)	8	Yes	Yes	None

Source: 2013 Parking Guide: Rail, NJ TRANSIT; www. njtransit.com

Gateway Program

As discussed in Chapter 2, the cancellation of the Access to the Region's Core project (ARC tunnel) in 2010 left the need for increased passenger rail access between New Jersey and New York City unaddressed. To revisit this ongoing need, Amtrak has since advanced plans known as the Gateway Program that includes construction of a new Trans-Hudson rail tunnel.

The Gateway Program is comprised of multiple rail improvements to maintain the current system and eventually increase train service into NYC. The Program will be led by several project partners, which include Amtrak, the Federal Railroad Administration, and the States of New Jersey and New York. The first initiatives will be the Hudson Tunnel and Portal Bridge Replacement Projects. The Gateway Program includes the following:[15]

- Construct a new two-track Hudson Tunnel between Newark and New York City. The new tracks will allow for the required rehabilitation of the existing two-track tunnel without significant service disruption; the rehabilitation will require a track to be out of service reducing capacity. The new tunnel alone will not allow for more service into Manhattan, capacity expansions at Penn Station will be required.

- Extensive repairs to the existing Hudson River tunnel, which was damaged during Hurricane Sandy in 2012.

- Expansion of Penn Station in Manhattan to accommodate new platforms and concourses.

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[15] https://nec.amtrak.com/content/gateway-program

- Expansion of the Secaucus Junction train station and construction of the Secaucus Loop to allow access to New York Penn Station from the Main, Bergen, and Pascack Valley Lines without a transfer.

- Replacement of the NEC's Portal Draw Bridge over the Hackensack River with a higher fixed span, and construction of a second fixed span to accommodate two additional tracks.

- Modernization of existing electrical and signal systems to improve rail operations and support future high-speed rail service on the NEC.

Advancement of this initiative will require a substantial commitment of state and federal dollars.

NJ TRANSIT Bus

NJ TRANSIT operates the 29, 70, 73, 79, and 194 regional bus routes, along with the 871, 872, 873, 874, 875, 878, and 880 local buses in Morris County. The regional bus routes all begin in northern or eastern Morris County. The 194/304 route is an interstate commuter bus route that operates along NJ 23 and terminates at the Port Authority Bus Terminal in Manhattan. The four other regional bus routes end in Newark. **Table 4-6** shows the average weekday ridership for each of the regional bus routes in 2015.

Table 4-6: Average Weekday Ridership, 2015

Route	2015 Ridership
29	8,633
70	14,274
73	6,268
79	616
194/304	2,144

Source: NJ TRANSIT

The 800-series routes serve population, employment, and shopping centers in the County such as Morristown, Dover, Madison, County College of Morris, Rockaway Townsquare Mall, and office parks in Parsippany. Some of these local routes connect to destinations outside the County, including Livingston Mall, Short Hills Mall, and Willowbrook Mall. Ridership on the 870/880-series routes is lower than ridership on the other NJ TRANSIT routes shown in **Table 4-7**, but most routes have experienced ridership growth from 2011 to 2014. The 880 route has the highest ridership of the 800-series routes, while the 872 route has seen the largest increase in average daily ridership. The three routes with declining ridership include the weekday service on the 873, 878, and 879 routes.

Source: Hudson Tunnel Fact Sheet #3, Fall 2016

Table 4-7: Average Daily Ridership And Trends, 2011-2014

Route	Day of Service	2011	2012	2013	2014	% Change 2011-2014
871	Weekday	167	177	229	215	+28%
871	Saturday	102	116	127	125	+23%
872	Weekday	63	94	108	122	+94%
872	Saturday	Does not operate				N/A
873	Weekday	212	221	217	202	-5%
873	Saturday	106	115	128	117	+10%
874	Weekday	101	135	129	133	+32%
874	Saturday	74	89	85	94	+27%
875	Weekday	173	221	261	247	+43%
875	Saturday	Does not operate				N/A
878*	Weekday	57	56	51	47	-18%
878*	Saturday	Does not operate				N/A
879*	Weekday	44	33	29	19	-57%
879*	Saturday	Does not operate				N/A
880	Weekday	430	518	570	560	+30%
880	Saturday	308	380	444	441	+43%

Source: NJ TRANSIT

*As of January 2016, the 878/879 were merged into one route now known as the 878, and the 879 designation was discontinued.

Private Bus Lines

Lakeland Bus and Coach USA operate daily commuter bus service to New York City. Lakeland is headquartered in Dover and has three routes that operate seven days a week in Morris County. Bus Route 46 primarily operates along US 46 and I-80, terminating at the Port Authority Bus Terminal (PABT) in New York City. Bus Route 80 operates seven days a week along I-80 to midtown Manhattan and Wall Street in lower Manhattan. Lakeland Bus Route 78 operates Monday through Friday between Bedminster and the PABT. Coach USA operates Bus Route 77 between Morristown, Whippany, Hanover, Florham Park, and the PABT. The 78 route operates Monday through Friday between Bedminster in Somerset County and the PABT, with stops in Long Hill Township.

Municipal Bus Service

Parsippany-Troy Hills and Morristown provide bus service within their municipalities. Parsippany Transit is a free bus service for Parsippany-Troy Hill residents. The service operates two routes that begin at Morris Hills Shopping Center on US 46. It makes numerous stops at various apartment complexes, grocery stores, shopping plazas, the Parsippany Community Center, and the Brookside Senior Center. The service operates five days per week between 9:00 AM and 4:00 PM; Route #2 also operating on Saturdays.

The Colonial Coach is a free bus service for Morristown residents. It operates on Mondays, Wednesdays, and Fridays. The service provides six loops through Morristown; beginning and ending at Headquarters Plaza on Speedwell Avenue, between 9:00 AM and 2:45 PM. Stops along the route include Morristown Memorial Hospital, Morristown Town Hall, Headquarters Plaza, the Morris County Library, and local supermarkets.

Paratransit and Dial-A-Rides

NJ TRANSIT also operates Access Link, a flexible route service that provides transportation to people with disabilities. Pick-ups and drop-offs by Access Link are only made within three-quarters of a mile radius of an existing NJ TRANSIT bus route. Additionally, Access Link is available only during the time the associated bus route operates. Therefore, changes to a bus route or schedule affect the eligible pick-up and drop-off locations and times for the associated Access Link service. System-wide, the Access Link service averaged 8,293 weekly passenger trips in Fiscal Year 2015 (July 1, 2014 to June 30, 2015).[16]

Morris County and many of its municipalities provide flexible on-demand transportation services, commonly referred to as community transportation, or dial-a-rides. Typically, they are available for older adults, people with disabilities, and low-income workers. These services provide essential mobility to connect people to employment, health care, and shopping.

Morris County's community transportation service is the Morris Area Paratransit Service (MAPS). MAPS provides curb-to-curb service for residents who are 60 or older, or who are 18 or older and have a physical or mental disability. Service is provided Monday through Friday. Passengers must call or email 48 hours in advance to schedule their trip. Between 2008 and 2012, MAPS provided an average of approximately 62,000 trips per year.[17] In addition to the MAPS, 29 municipal dial-a-rides serve the residents of 34 Morris County municipalities. Harding, Florham Park, Morris Township, Mountain Lakes, and Victory Gardens are not covered by municipal dial-a-ride service in Morris County.

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[16] *NJ TRANSIT Facts at a Glance, Fiscal Year 2015*
[17] *Morris County Human Services Transportation Coordinated Plan - 2013 Update*, Morris County Department of Human Services, December 2013.

C. Bicycle and Pedestrian Network

Morris County and its municipalities manage a network of bicycle and pedestrian facilities. These include on-street bike lanes and off-street paths in County and municipal parks. The Morris County Park Commission manages parks, trails, and other facilities. The County allows bicycle and pedestrian facilities on County roads where feasible, but municipalities are responsible for implementation and maintenance. There are several new and ongoing bicycle and pedestrian initiatives improving the network in Morris County.

- In 2016, the Morris County Trail Construction Grant Program was established. The grant program funds trail construction for recreational purposes and for connectivity with other trails and paths. In the years 2016 and 2017, a total of nineteen grants were awarded in seventeen municipalities.

- Now in its design phase, the New York, Susquehanna, and Western (NYS&W) Bicycle and Pedestrian Path will be a 4.8-mile shared-use path that will start at River Drive in Pequannock and end at the Mountain View Train Station in Wayne. The path will be constructed on top of the abandoned railroad bed of NYS&W Railway's Pompton Industrial Branch. This recreational and transportation facility will connect residents and visitors with nearby amenities, including public parks, businesses, schools, and transit. Federal funding has been secured for the acquisition of the railroad right-of-way and construction of the path. When completed, the path will be maintained by the Morris County Park Commission. The County will continue to evaluate opportunities for connections to

other trail systems that would further enhance this resource. The County will also examine the potential for extension of the NYS&W Bicycle and Pedestrian Path north into Riverdale to Post Lane, where the alignment ended in the original plans for the path.

- The NJTPA established the Morris Canal Working Group (MCWG) in 2012 to preserve the former Morris Canal right-of-way between Phillipsburg and Jersey City, and to facilitate the Canal's conversion into a public greenway. The greenway will consist of interconnected linear parks and trails for bicyclists and pedestrians. Morris County will continue to participate in the MCWG and support efforts to advance the creation of the Greenway. NJTPA will develop a strategic plan to identify a route for the Greenway in cooperation with local communities, recommend linkages to parks and cultural facilities along the route, and identify funding opportunities for bicycle and pedestrian improvements.

- A regional bicycle/pedestrian project is the September 11th National Memorial Trail, connecting the three National Memorials at the World Trade Center in New York City, in Shanksville, Pennsylvania, and at the Pentagon in Washington, D.C. In Morris County, the NYC-Shanksville leg of the trail follows the route of the Patriots Path as it passes through the County in an east-west direction.

- The potential construction of the Rockaway River Greenway in Dover will require the relocation of the Dover & Rockaway (D&R) Railroad, one of three freight railroads owned by Morris County. The D&R runs from its junction with NJ TRANSIT in Wharton, east through Dover and Rockaway Borough, ending in Rockaway Township. The rail line generally follows NJ 15 south to the center of Dover and then heads east paralleling Blackwell Street until it turns north towards Rockaway Borough east of Dover Rockaway Road. The D&R has thirteen at-grade rail crossings in Dover at locations that are active with traffic and pedestrians. The relocation of the D&R was advanced to concept development and capital programming through the NJTPA's

Pilot Freight Concept Development Program in 2017. A realignment of this rail segment would ultimately allow the property along the river in Dover to be converted into a bicycle and pedestrian path, conceptually called the Rockaway River Greenway.

D. Freight Transportation

Freight transportation plays a significant role in Morris County's economy. The industry helps connect goods and products between manufacturers, farmers, and other producers to consumers. It helps attract businesses, which in turn provide employment and tax revenue. The County and the region have a significant amount of daily freight activity. Many businesses rely on highway and, to a limited extent, rail infrastructure, for their operations. Additionally, the metropolitan area's enormous population results in a high amount of freight movement to support daily living. Like commuters and other travelers, the freight industry depends on an efficient and well-maintained transportation network.

Highways and Truck Restrictions

Most of the freight that moves into, out of, and through Morris County moves by truck, primarily on Interstate, Federal, and State highways. The Federal Surface Transportation Assistance Act (STAA) of 1982 regulates truck size, weight, and movement. The STAA formed the National Network for large trucks based upon guidelines related to roadway geometry and function, lane width, and safety.

Nationwide regulations were set to allow for the use of the National Network by any truck with a 48-foot trailer length and up to 102 inches wide.[18] This overrode any individual state regulations that set lower limits for length or width, The STAA was amended in 1984 to allow individual states to seek exemptions for size constraints based upon a highway system's capacity to accommodate larger trucks. The Federal limits established through the STAA and its amendments contained a complex set of vehicle length provisions that have been instrumental in the legal acceptance of 53-foot-long semi-trailers on nearly all major highways nationwide.

There are State regulations that govern truck movements on certain roads in Morris County. Under the New Jersey Access Code (N.J.A.C.) Title 16, Chapter 32, large trucks are directed to drive on higher-level roadways in order to avoid adverse impacts on local communities.[19] The intent of this regulation is to "protect the public interest by assuring that specified vehicles are operated on suitable roadways."[20] The New Jersey statute for these large trucks includes two basic provisions:

1. Double-trailer combination trucks are permitted only on the Interstate highways in Morris County, including I-80, I-280, and I-287.

2. 102-inch wide trucks are permitted on all Interstate highways as well as on most State highways. The statute identifies several Federal, State, and County routes that are not appropriate as "through routes," which means they should only be used to access local destinations. These road segments are listed in **Table 4-8**.

[18] 49 Code of Federal Regulations, Sections 411 and 412
[19] "Large trucks" are defined in this legislation as double-trailer truck combinations and 102-inch wide trucks.
[20] N.J.A.C. 16:32-1.1

Table 4-8: Roadway Segments not Appropriate for Truck Through Routes

Route	Begin	End
NJ 53	NJ 10 (Parsippany)	I-80 (Denville)
US 202	I-287 (Parsippany)	I-287 (Boonton Town)
US 202	Main Street (Lincoln Park)	Passaic County line
CR 504	Main Street (Montville)	West Parkway (Pequannock)
CR 512	Mountain Avenue (Long Hill)	Union County line
CR 513	Hunterdon County line	Schooley's Mountain Road (Washington)
CR 513	Mountain View Avenue (Washington)	Chester Township border
CR 517	Hunterdon County line	East Mill Road (Washington)
CR 525	Somerset County line	Main Street (Mendham Borough)

Source: N.J.A.C. 16:32

Truck Volumes and Projections

Trucks are the most common mode for transporting freight in the United States, carrying 11.5 billion tons or 64% of the nation's freight in 2015 as measured by tonnage. For comparison, pipelines carried 18% (3.3 billion tons) and rail carried 9% (1.69 billion tons) of the nation's freight by tonnage. By 2045, the tonnage of freight moved by truck is projected to grow by 44% to 16.5 billion tons.[21] During this period, freight tonnage carried by rail is expected to increase to 2.09 billion, a 24% increase, and pipeline freight will increase by 38% to 4.55 billion tons.

The Federal Highway Administration (FHWA) publishes truck volume dataset for commodity movement known as the Freight Analysis Framework (FAF). According to the FAF's base year of 2007, the highest levels of truck activity in the

County are on the I-80 and I-287 corridors.[22] NJ 24, as a highway connecting I-287 and I-78, also experiences significant levels of truck traffic. Additionally, average daily truck volume exceeds 6,000 on NJ 10 west of I-287.

The *Morris County Freight Infrastructure and Land Use Analysis* (2011) presented truck volume forecasts based on the FAF. For the 2020 and 2035 forecast years, the most substantial percentage growth in truck traffic is projected to occur on I-287, I-280, NJ-24, and I-80 east of the I-287 interchange. Total truck volume on these roadways is expected to increase by approximately 5.5% to 8.3% between 2009 and 2020, and by 13.5% to 20.8% between 2009 and 2035. For I-80 west of I-287, truck volume is projected to grow by 1.2% between 2009-2020 and 2.9% from 2009-2035.

[22] Since the primary intent of FAF data is to understand how freight moves on the national level, the network does not include every roadway in Morris County.

[21] National figures obtained from "DOT Releases 30-Year Freight Projections," USDOT Bureau of Transportation Statistics, Press Release #BTS 13-16, 3/3/16. Data for this document was based on the FHWA Freight Analysis Framework (FAF) version 4.1, 2016.

Freight Railroads

Rail enables businesses to move heavy goods efficiently and can be the most cost effective way to transport freight over long distances. Rail is not as efficient for moving time-sensitive commodities or for traveling short distance as trucks; however, it has an important role in northern New Jersey and Morris County. Freight rail supports a number of businesses that strengthen and diversify the County's economy. It offers opportunities for economic development in rail-oriented industries without adding substantial truck volume to the highway network.

The County's freight rail network is illustrated in **Figure 4**-**9**. The railroads that own freight lines in Morris County are described below.

- Norfolk Southern (NS) is one of two major Class I railroads[23] that operate in the eastern United States. NS moves freight into Morris County from the west along the Washington Secondary from Phillipsburg. The Washington Secondary ends at Hackettstown, and NS operates on NJ TRANSIT's Morristown Line and Boonton Line to reach customers to the east.

- The New York, Susquehanna & Western (NYS&W) is a Class II railroad that operates freight rail service in the northern section of Morris County. All of its service is operated on its own line, which runs from upstate New York to Croxton Yard in Hudson County. In Morris County, freight is delivered to local customers through a transfer facility in Riverdale Borough.

- The Morristown & Erie Railway (M&E) is a Class III railroad that operates in Morris County. The M&E owns and operates the Whippany Line. This alignment runs from Morristown to Roseland in Essex County. The M&E serves as a local switching railroad for NS. It receives rail cars from NS at Lake Junction Yard in Roxbury Township and Morristown Yard, and runs service to its customers on the Whippany Line via the NJ TRANSIT Morristown Line. It also receives rail cars from CSX at Center Street in Newark.


- Morris County owns three freight lines in the central area of the County: the Chester Branch, High Bridge Branch, and Dover & Rockaway Railroad. Service on these County-owned lines is provided through a 5-year operating agreement with a railroad operator. Originally built by private companies to serve Morris County's iron industry, the County-owned lines currently provide service to various modern industries such as plastic pellet and resin manufacturing, warehousing, and lumber distribution. Service is provided to these customers either directly at rail sidings, or at transload facilities[24] that provide freight rail access to customers who are not located directly adjacent to the rail alignments.

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[23] Class I railroads are defined by the U.S. Surface Transportation Board as those with $250M or more in annual operating revenue, as measured in 1991 dollars. Regional (Class II) railroads are those with less than $250M but more than $20M in annual operating revenue, in 1991 dollars. Shortline (Class III) railroads are those with less than $20 million in annual revenue.

[24] The terms "transload facility" and "team track" are used interchangeably in the railroad industry.

Figure 4-9: Rail Freight Network

Freight Railroads
- Chester Branch
- Dover and Rockaway RR
- High Bridge Branch
- NYS&W
- Pompton Industrial Spur
- Whippany Line
- NJ TRANSIT*

*Freight also travels on NJ TRANSIT railroads in Morris County.
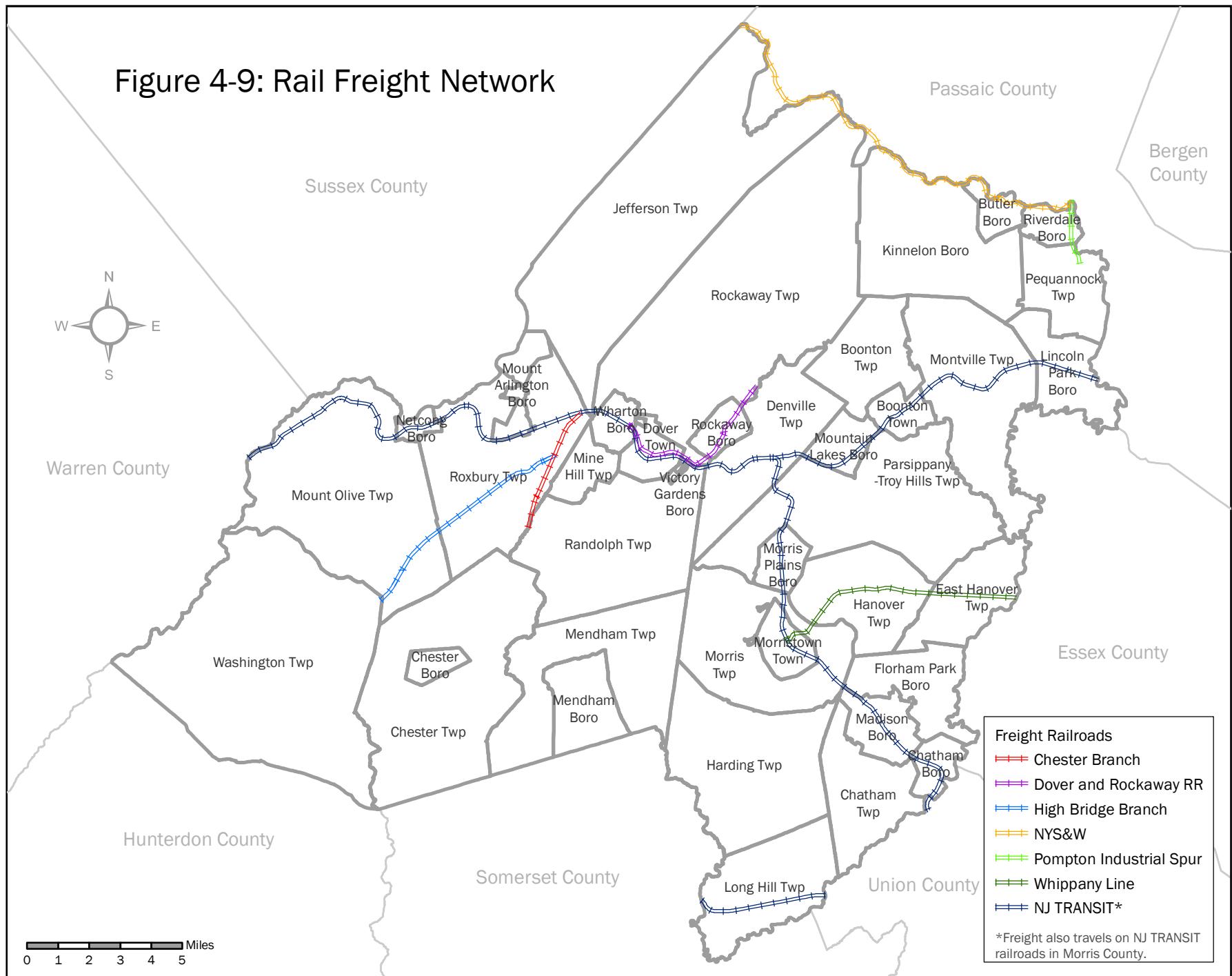
County-Owned Freight Railroads

Morris County owns three freight railroads and contracts with an operating railroad to serve businesses within the County. The County-owned freight lines and two transload facilities are shown in **Figure 4-10**.

Chester Branch: The Chester Branch entirely located in Roxbury runs from a connection with NJ TRANSIT at Lake Junction south to its terminus just north of Righter Road. The branch was acquired by the County in 2009 from Holland Manufacturing, a customer located on the line. The track was rehabilitated in 2011 with funding from the American Recovery and Reinvestment Act of 2009. The Chester Branch also provides the connection to the High Bridge Branch at Ferromonte Junction.
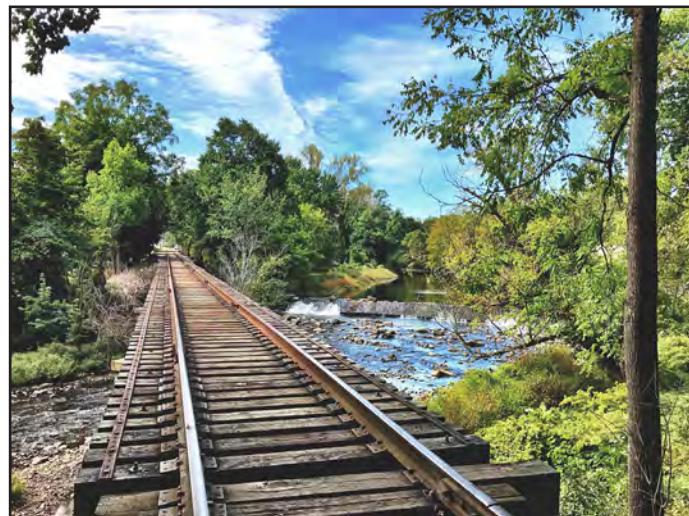
Dover & Rockaway (D&R) Railroad: The Dover & Rockaway Railroad starts at NJ TRANSIT railroad west of Dover to its terminus in Rockaway Township, parallel to Green Pond Road. The line runs through downtown Dover, along the banks of the Rockaway River. This line was acquired in 1986 after Conrail began divesting itself of its rail assets in the early 1980's. The line includes a team track located at Franklin Avenue in Rockaway Borough.[25]

High Bridge Branch: The High Bridge Branch was also acquired by Morris County in 1986. This line begins at Ferromonte Junction in Roxbury and terminates to the southwest in Mount Olive Township. The line includes the Kenvil Team Track, which is located between Berkshire Valley Road and US 46. The team track allows the County's railroad operator to provide rail deliveries to customers not located directly on the line.

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[25] A team track is a small siding, switch or spur intended for the use of local industries to load and unload products.

The 2011 *Morris County Freight Infrastructure and Land Use Analysis* presented the economic impacts generated from the businesses that benefit from the County-owned lines. The eight rail customers identified in the study employed about 350 workers in 2011, with a total annual economic output of nearly $120 million and almost $40 million in labor income. The top industries that benefit from the output of the railroad customers include building materials and garden supply dealers, paper manufacturing, plastic, and rubber production, real estate, and professional/scientific services. The eight customers served by the railroads provided an estimated $13.3 million in state and local taxes in 2011. The total direct, indirect, and induced economic impacts of the eight industries exceed $175 million.[26]

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[26] All figures cited in this paragraph are from Section 3.3.3 of the *Morris County Freight Infrastructure and Land Use Analysis* (2011).

Figure 4-10: County-Owned Rail

Sussex County

Jefferson Twp

Rockaway Twp

Mount Arlington Boro

Netcong Boro

Wharton Boro

Rockaway Boro

Mount Olive Twp

Roxbury Twp

Mine Hill Twp

Dover Town

Victory Gardens Boro

Denville Twp

Parsippany-Troy Hills Twp

Randolph Twp

Washington Twp

Chester Twp

Mendham Twp

Morris Township

County-Owned Rail
- Chester Branch
- Dover and Rockaway RR
- High Bridge Branch

County-Owned Transload Sites
- Franklin Rd Team Track
- Kenvil Team Track
- NJ TRANSIT

Miles
0   1   2   3   4   5

Changes in Maritime Shipping

The expansion of the Panama Canal has the potential to influence how freight moves through the New York metropolitan region. The widening of the canal allows what is referred to as "New Panamax" ships to navigate from China and Southeast Asia to deep water ports along the Atlantic seaboard. These ships are capable of carrying up to 13,000 TEUs (twenty-foot equivalent units) to ports that have sufficient channel depths and vertical clearances to unload them. In addition, "New Suezmax" ships transiting the revamped Suez Canal, will have the capability to carry 18,000 TEUs. More Far Eastern origin cargoes are beginning to use the North Atlantic route to New York-New Jersey.

The Port Authority of New York & New Jersey completed a project in 2017 to raise the Bayonne Bridge deck to increase the vertical clearance from 151 feet to 215 feet. This will enable the shipping channel to accommodate the vertical clearance required for these larger ships. The Bayonne Bridge project is the latest in a series of major capacity enhancements in the port. The others include a deepening of the major shipping channels to a depth of 50 to 53 feet, along with the development and expansion of on-dock rail terminals at Port Newark/Elizabeth, Bayonne, and Howland Hook in Staten Island.

This improvement will help to maintain the growth of maritime cargo volumes to Port of Newark/Elizabeth, helping to ensure that the port will not lose market share to other East Coast ports. Economic forecasts completed for the *Bayonne Bridge Navigational Clearance Project Environmental Assessment* indicate that the clearance project itself is not expected to result in any additional growth in cargo volumes beyond the "natural" growth of import and export activity in the region.[27] However, the port's ability to accommodate 13,000-TEU ships, coupled with the on-dock rail terminals and other landside improvements, will help reduce shipping costs for industries across the region due to the improved economies of scale.

Studies indicate that most truck traffic in Morris County is not port-related because the initial movement of goods from ship to warehouse typically occurs outside of the County. However, the County may experience indirect or induced economic impacts related to growth at the port. The major industrial properties in Morris County, including those identified in the 2011 *Morris County Freight Infrastructure and Land Use Analysis*, could offer opportunities for industrial development.

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[27] *Bayonne Bridge Navigational Clearance Program: Final Environmental Assessment*, Port Authority of NY & NJ, May 2013.

E. Aviation

The New York-New Jersey Metropolitan Area is home to several of the most active airports in the United States. Newark Liberty International Airport in Newark, and John F. Kennedy and LaGuardia International Airports in New York City provide domestic and international flights, accessible to Morris County residents and business travelers. Morristown Municipal Airport and Lincoln Park Airport are the two reliever airports in Morris County.[28] These airports provide significant economic benefit to the County through job creation, business activity, and tax revenue.

Morristown Municipal Airport (MMU) is one of New Jersey's largest corporate airports serving many of the region's major corporations. It is owned by Morristown and operated by DM Airports, LTD. Its presence provides an amenity that supports business attraction, retention, and economic growth. The 2016 New Jersey Statewide Airport Economic Impact Study concluded that MMU annually supports 1,794 jobs and $128 million in income through direct and secondary employment. The estimated 33,430 visitors who fly into Morristown Airport spend $18.5 million annually. Overall, the study found that the airport generates $417 million in annual output and $13 million in annual tax revenue. There are 203 aircraft based at the airport with services including charter flights, air taxis, helicopter flights, flight instruction, flight clubs, maintenance and repair, sales, rentals, and fueling.

Lincoln Park Airport is a privately owned public use airport, which has been permanently preserved for public use by the NJDOT. Lincoln Park Airport annually supports 74 jobs and $5 million in income

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[28] Reliever Airports are airports designated by the FAA to relieve congestion at Commercial Service Airports and to provide improved general aviation access to the overall community.

through direct and secondary employment. The estimated 3,410 visitors who fly into Lincoln Park Airport spend $726 thousand annually. Overall, the airport generates $17 million in annual output. There are 107 aircraft based at the airport with services including maintenance, sales, rentals, dining, fueling, and flight training.[29]

F. Commuting Patterns

As shown in **Table 4**-**9**, 57% of employed Morris County residents work in the County. Slightly less than 43% work outside of the County, with 25% commuting to jobs in counties bordering Morris. Of residents employed outside Morris County, the highest number commute to Essex County for work.

Table 4-9: Where Residents of Morris County Work

Destination	Workers	Percent
Morris County	141,100	57.33%
Essex County	23,906	9.71%
Bergen County	12,948	5.26%
New York County (Manhattan, NY)	12,699	5.16%
Passaic County	12,025	4.89%
Somerset County	10,984	4.46%
Union County	9,474	3.85%
Hudson County	5,010	2.04%
Middlesex County	3,894	1.58%
Sussex County	2,553	1.04%
Warren County	2,135	0.87%
Hunterdon County	1,243	0.51%
Other Counties (all < 1,000/day)	8,160	3.32%
Total	246,131	

Source: U.S. Census Bureau, 2009-2013 ACS 5-Year Estimates, County to County Commuting Flows Table 1

As shown in **Table 4**-**10**, almost 50% of the people working in Morris County reside outside of the county. Bordering counties provide 34% (96,343) of the County's workforce. The daily influx of commuters and departure of County residents for jobs outside the County results in the net gain of the working population by 35,369.[30] Of workers who

live outside of Morris County, the highest number commute from Essex County.

Table 4-10: Where Persons Employed in Morris County Live

Residence	Workers	Percent
Morris County	141,100	50.12%
Essex County	24,829	8.82%
Sussex County	19,163	6.81%
Passaic County	17,120	6.08%
Union County	11,925	4.24%
Somerset County	11,521	4.09%
Bergen County	10,963	3.89%
Warren County	8,801	3.13%
Hudson County	5,870	2.09%
Middlesex County	5,279	1.88%
Monroe County, PA	3,098	1.10%
Hunterdon County	2,984	1.06%
Monmouth County	2,841	1.01%
Northampton County, PA	2,027	0.72%
New York County, NY (Manhattan	1,301	0.46%
Rockland County, NY	1,085	0.39%
Orange County, NY	1,004	0.36%
Other Counties (all < 1,000/day)	10,589	3.76%
Total	281,500	

Source: U.S. Census Bureau, 2009-2013 ACS 5-Year Estimates, County to County Commuting Flows Table 1

Figure 4-**11** lists the types of transportation Morris County commuters use to reach work. The high percentage of commuters driving alone is indicative of the generally suburban development pattern of the County and region. There are 386,531 commuters traveling in, out, and within Morris County and a high majority of these commuters drive alone. These commuters, along with the significant number of additional commuters traveling through the County on their way to work, combine to generate the high level of congestion found on the region's road network.

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[29] *New Jersey Statewide Airport Economic Impact Study, NJDOT ``Bureau of Aeronautic, 2016*
[30] A total of 105,031 Morris County residents work outside of the County, 140,400 commute to Morris County from other counties: 140,400-105,031 = 35,369.

Figure 4-11: Means of Transportation to Work, Morris County Residents
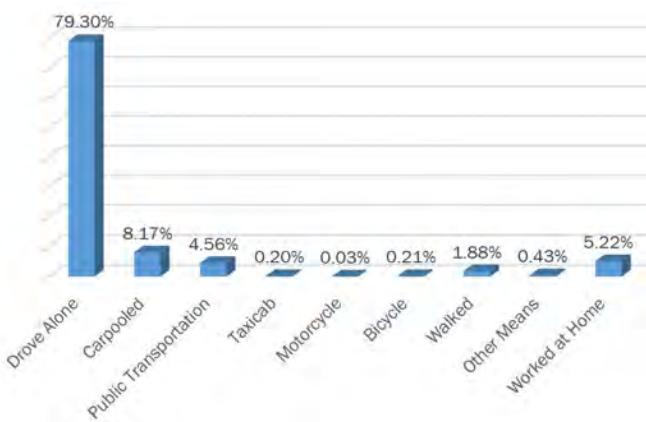
Source: U.S. Census Bureau, 2009-2013 ACS 5-Year Estimates

Morris County commuters' travel time to work is detailed in **Table 4-11**. The average commute time is 30 minutes. Slightly over 55% of commuters travel less than 30 minutes to work, and 77% travel less than 45 minutes to work. While it takes less than 15 minutes for 25% of the working residents to reach work, almost 13% commute for an hour or more.

Table 4-11: Travel Time to Work for Morris County Residents

Travel Time	Workers	Percent
Less than 5 minutes	5,822	2.50%
5 to 9 minutes	21,408	9.18%
10 to 14 minutes	30,246	12.96%
15 to 19 minutes	28,991	12.43%
20 to 24 minutes	29,765	12.76%
25 to 29 minutes	13,872	5.95%
30 to 34 minutes	29,135	12.49%
35 to 39 minutes	8,178	3.51%
40 to 44 minutes	12,922	5.54%
45 to 59 minutes	22,743	9.75%
60 to 89 minutes	19,165	8.21%
90 or more minutes	11,046	4.73%
Total	233,293	
Average Travel Time to Work	30 minutes	

Source: U.S. Census Bureau, 2009-2013 ACS 5-Year Estimates

CHAPTER 5: Infrastructure, Development, and Technology Trends

A. Infrastructure Trends

No New Major Roads

The New York-New Jersey metropolitan region's highway network is essentially complete. I-287, finished in 1994, was the last major highway constructed in Morris County. While traffic volume and congestion in Morris County and the region will continue to grow, there will be few, if any, significant new roads or roadway expansions due to the cost, the regulatory environment, and the availability of land.

Acquiring land in northern New Jersey for highway construction is extremely difficult. Many areas are largely built-out, making it difficult to put together a contiguous linear area for a future road without substantial displacement of current land use along existing roadways. Widening an existing road or highway to provide additional lanes is also challenging due to the proximity and density of development. Property acquisition, especially developed land, is expensive in this region. Furthermore, adding new roads or road lanes only provides temporary congestion relief. Adding more capacity eventually results in more development and vehicle trips, returning the road to a state of congestion.

Standards and regulations designed to prevent further environmental degradation also discourage construction of significant new roads. Much of the NJTPA region is in either a "maintenance" or a "nonattainment" area for failing to meet EPA National Ambient Air Quality Standards under the Federal Clean Air Act, as amended.[1] Federally funded transportation projects in these areas are subject to air quality conformity standards and are required to demonstrate a positive impact. It is difficult for capacity projects to meet these air quality standards. Further, in the Highlands Preservation Area, which covers a significant portion of Morris County, adding new through-capacity lanes is prohibited.

Complete Streets

Complete Streets is a context-sensitive approach to road design that considers the needs of all users, including motorists, bicyclists, pedestrians, transit riders, people of limited mobility, and delivery trucks. Complete streets policies and land use also factor into the street's design. The elements of a Complete Street can include:

1. Pedestrian infrastructure: sidewalks, crosswalks, ADA ramps, crossing island, curb extensions/ sidewalk bump-outs, pedestrian crossing signals

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[1] The entire NJTPA region is a nonattainment area for ozone (O3). Most of the NJTPA region, including Morris County, is a maintenance area for fine particulate matter (PM2.5). Within the County, Morristown is part of the carbon monoxide (CO) maintenance area that includes Passaic, Bergen, Essex, Hudson, and Union Counties.

2. Bicycle facilities: bicycle lanes and signs, wide shoulders, share the road signs, greenways

3. Public transportation: bus shelters, dedicated bus lanes, bus pullouts

4. Traffic calming: road diets (reduction of travel lanes), street trees, on-street parking, center medians, curb extensions/sidewalk bump-outs

5. Truck deliveries: on-street loading zones, parking regulations

Not all of these features are needed for a road to be considered a Complete Street, and not all roads can be appropriate for all users. Specific road features will depend on the design standards and policies of the jurisdiction responsible for the road.

Agencies and governments at all levels have recognized the need to accommodate people using all modes of transportation on public roads. The New Jersey Department of Transportation (NJDOT) adopted a Complete Streets policy in 2009, representing a commitment by NJDOT to create street corridors that safely accommodate all road users.[2] In 2017, the *State of New Jersey Complete Streets Design Guide* was released, the third complete streets guide developed by NJDOT that presents standards and best practices for the design of streets in various areas. As of January 1, 2018, ten municipalities in Morris County have adopted Complete Streets policies or specifically identified Complete Streets policies in their master plans: Chatham Borough, Chester Township, Denville, Dover, Long Hill, Madison, Morristown, Mount Arlington, Netcong, and Randolph.[3]

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[2] *New Jersey Complete Streets Policy,* NJDOT, 2009.
[3] The 2017 Roxbury Township Reexamination Report also recommends that the Township consider development of a Complete Streets program

Road Diets

A Road Diet is the reduction of the number of lanes in an existing roadway to improve safety. Typically, it is the conversion of a four-lane road to a two-lane road that incorporates turning lanes at intersections or a continuous center turning lane that allows left turns to be made outside the normal flow of traffic, reducing the risk of rear-end and left-turn crashes. According to the FHWA, overall crashes can be reduced between 19% and 47% through the implementation of a Road Diet.[4] Additional benefits may include slower vehicle speeds, reduced pedestrian crossing distance, and the use of the shoulders for on-street parking, bus stops, or bicycle lanes.
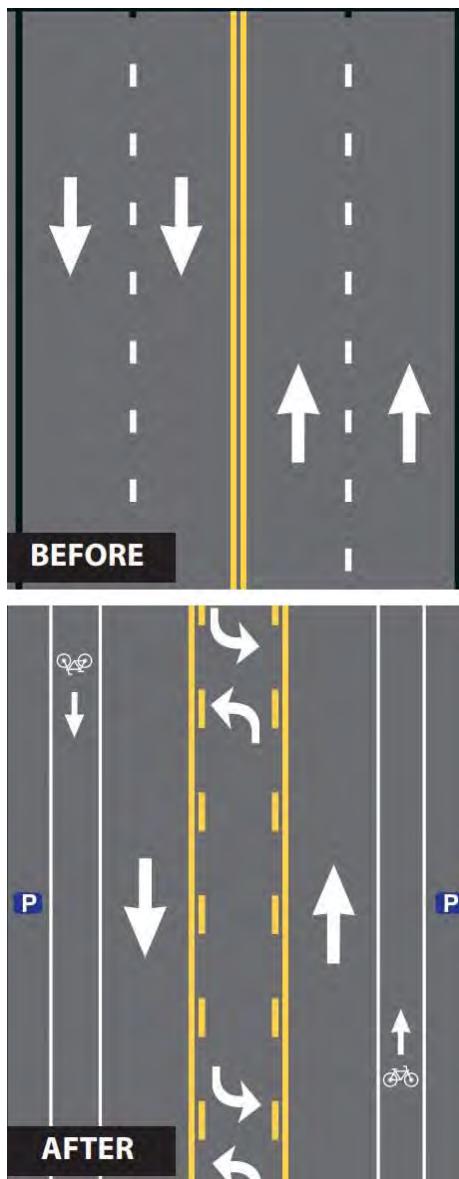
Source: *Road Diet Case Studies, FHWA*

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[4] *Road Diet Informational Guide*, FHWA, 2014.

B. Development Trends

Morris County hosts a wide range of existing development patterns. The landscape includes rural areas, farmland, open space, suburban housing, commercial corridors, and town centers of various sizes. Long term regional and county transportation plans need to consider existing development patterns, land use policy, and future trends to ensure that the transportation network remains safe and efficient.

Housing

During the late 19th and early 20th centuries, housing construction in Morris County was concentrated in town centers and around railroads. The post-WWII growth in automobile ownership and the expansion of highways led to less compact and decentralized development patterns, prompting the creation of new housing developments outside of traditional centers and corridor areas. During the 1980's and 1990's, spurred by rapid economic growth and office park construction, significant new suburban housing growth occurred in Morris County. The number of housing units authorized by building permits in Morris County from 1995 to 2014 is shown in **Figure 5-1**. The number of residential permits peaked in 2000 at 3,171. This was followed by a slowing rate of new housing construction and an eventual decline owing largely to the Great Recession.[5] In 2008, total building permits authorized dropped to 391 and remained in the 400's until 2012 when it began to increase, reflecting the recovering economy.

Changing market conditions, buyer preferences, increased demand for rental housing, and the lack of available land typically needed for new detached single-family homes has led to an increase of townhouse development; such development is captured

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[5] December 2007 to June 2009, U.S. National Bureau of Economic Research

in the 1 & 2 Family data in Figure 5-1. Redevelopment and infill development also has become more common in recent years as available undeveloped and developable land has diminished and is the only meaningful option to meet new housing demand in many municipalities.

Figure 5-1: Housing Units Authorized by Building Permits in Morris County
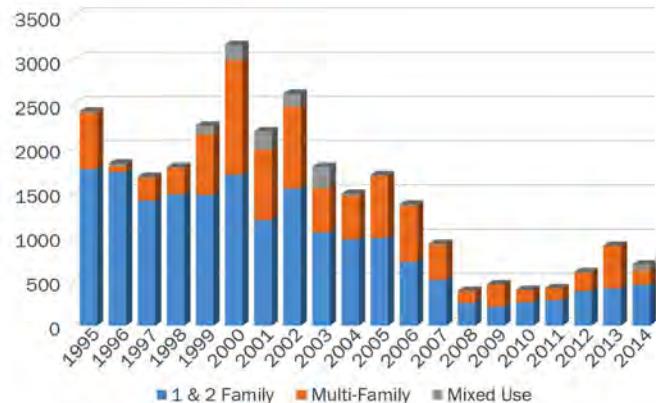
Source: New Jersey Department of Community Affairs

Office Park Vacancies and Redevelopment

As stated, the 1980's and 1990's saw the rapid growth in office park development in Morris County and in other suburban locations around the nation. The overwhelming preference for this type of development diminished during the 2000's and presently there is a high vacancy rate of suburban office space in Morris County. This condition is a result of many factors, including business consolidations, changing market and/or locational demands, and the functional obsolescence of many buildings.

With an excess of older suburban office development in Morris County, redevelopment is likely to occur on many of these sites. One of the challenges in their redevelopment will continue to be rapidly changing real estate market conditions. This redevelopment model requires flexibility in the private and public sectors; municipalities will have to grapple with changes in local zoning and developers will have to address rapid changes in economic conditions, business needs, and market demands.

Most Class A office parks in Morris County, which compete for the top office users, are clustered around Morristown and Parsippany, in areas east of I-287, and south of I-80.[6] The Parsippany-Troy Hills region has approximately 20 million square feet of Class A office space, primarily in suburban office buildings that were constructed in the early 1980's. As of 2015, nearly a quarter (23.7%) of this office space was vacant.[7] Factors contributing to this condition include the functional obsolescence of many buildings, limited accessibility to public transit, and the absence of nearby downtown commercial centers, **which are becoming increasingly important in corporate site selection.**

The office market is currently favoring areas such as Morristown and areas of Florham Park and Madison along the NJ 24 and Park Avenue corridors. Major companies such as BASF and Realogy have located their headquarters in these areas on sites that have undergone redevelopment. The Green at Florham Park, a master-planned mixed-use development, is home to BASF, the New York Jets training facility and corporate offices. A hotel, three additional office buildings, and 425 residential units are under development or are planned for future construction. A number of features distinguish this site from many of the older suburban office parks elsewhere in Morris County, including the combination of mixed uses, its proximity to town centers, NJ TRANSIT rail station access, and the modern, state-of-the art design and construction of its buildings.

The surplus of office space and demand for new housing is also driving the conversion of some office parks into high density mixed-use developments. The ongoing redevelopment of the Honeywell International property in Morris Township is an **example of a multi-use repurposing project at a** former suburban office site. This new mixed-use project is envisioned to include 715,000 square feet of modern office space along with 235 townhomes and a community center.

Highlands Region

The Highlands Water Protection and Planning Act of 2004, associated NJDEP rules, and the Highlands Regional Master Plan significantly influence current and future development in the Highlands Region, which is divided into the Preservation Area and the Planning Area. Within the Preservation Area, which overlays 39% of Morris County's land area, new development is constrained by additional environmental regulations. Municipal compliance with the Highlands is mandatory in the Preservation Area, and affected municipalities are required to revise their master plans and development regulations to conform to the Highlands Regional Master Plan for areas within the Preservation Area. In the Planning Area, **municipal compliance to the Act is optional,** and growth is encouraged where water and sewer capacity is available. About half of Morris County is located in the Planning Area.

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[6] Classifications in commercial real estate can be subjective, and vary by location. In general, Class A buildings have floors that are large in area, high quality finishes, and state of the art building systems. They attract the highest rents in any given market.
[7] *Transwestern Real Estate Outlook, New Jersey Office Market – Fourth Quarter 2015, 2016*
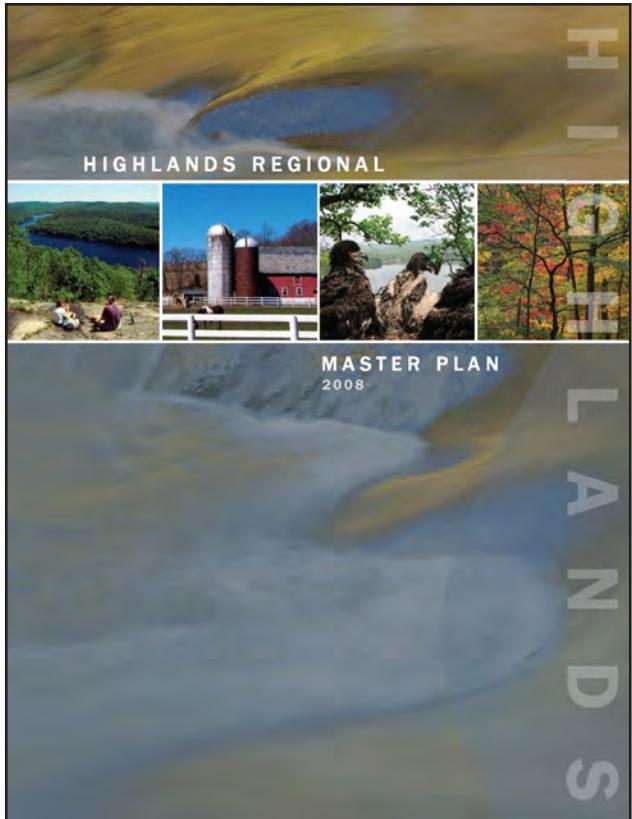
The Act imposes additional limitations on development in the Preservation Area through restrictions on the extension of sewer and public water service, septic density requirements, water withdrawal limits, new environmental standards and, as related to transportation, limits on roadway expansion. Under the Highlands Act, development of new through-lane roadway capacity in the Preservation Area is prohibited; the act permits only maintenance, rehabilitation, reconstruction, or repair of existing infrastructure.

Transit-Oriented Development

Transit-Oriented Development (TOD) involves the construction of a mix of residential, commercial, or mixed-use buildings in close proximity to public transportation, such as at a train station or a regional bus hub. The proximity of residential and commercial development to a transit hub reduces the need to drive for commuting, recreation, and shopping. Providing a mix of different land uses in close proximity also promotes pedestrian activity, fosters local economic development, and enhances real estate values while minimizing the expenditure of public resources for streets and utilities.

The nineteen NJ TRANSIT train stations in Morris County provide a number of municipalities with the potential for TOD. Municipalities that meet certain criteria are eligible for designation as a Transit Village by NJDOT's Transit Village Task Force. This designation qualifies a municipality for priority funding and technical assistance from certain State agencies, as well as grants from the New Jersey Department of Transportation. Morris County currently has two designated Transit Villages; Morristown, which was among the original designees in 1999, and Netcong, which was designated in 2005. More recently, the Town of Boonton conducted a feasibility assessment for Transit Village designation and received an NJTPA Emerging Centers grant to assist in master planning and zoning efforts to support this initiative.

Municipalities do not need be a designated Transit Village in order to promote and implement TOD projects. Several municipalities in Morris County without the designation have advanced redevelopment around their train stations to take advantage of this development concept. For example, while Madison is not a designated Transit Village, several mixed-use buildings and townhouses have been constructed recently within three blocks of the train station. The Borough has also established a special mixed-use redevelopment zone at the former Green Village Road School site in close proximity to the train station. If the economy and housing market remain strong, and regional transit projects such as the Gateway Program[8] are advanced, TOD construction will likely continue in Morris County.

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[8] The Gateway Program is comprised of multiple rail improvements to maintain the current system and eventually increase train service into NYC. The first initiatives will be the Hudson Tunnel and Portal Bridge Replacement Projects. See Chapter 4 for more details or visit https://nec.amtrak.com/.

Walkable Communities

The pedestrian-friendly character of TOD is part of a broader trend supporting walkable communities. The term "walkable community" refers to a community that provides access for people of all ages and abilities to walk to their destinations. Residential areas that are in close proximity to town centers, parks, and other public amenities have become more popular in recent years. According to the 2013 Community Preference Survey conducted by the National Association of Realtors, 60% of respondents prefer to live in a neighborhood with a mix of residential, commercial, and recreational uses within walking distance. Municipalities have responded to this preference by incorporating Complete Streets elements in their planning efforts, including greater emphasis on the safety and mobility of pedestrians and bicyclists. Benefits of walkable communities include improved health, reduced greenhouse gas emissions, higher property values, and increased community involvement. As discussed in Chapter 4, Morris County recently established a Trail Construction Grant Program, which provides support for local walkable communities policy. For example, a grant was recently awarded from this program to Morris Township for the "Blue Gate Farm Preserve Connector Trail," which will provide a pedestrian and bicycle connection between two neighborhoods and to Township parkland.

C. Technology Trends

Intelligent Transportation Systems (ITS)

Intelligent Transportation Systems (ITS) is a term for a variety of technologies built into transportation infrastructure, vehicles, and personal electronic devices to help improve the efficiency and safety of the transportation network and the mobility of its users. ITS technologies relevant to the County's transportation network generally fall into four categories:

Infrastructure-based ITS are installed on roads and highways to monitor traffic and provide guidance to motorists about travel conditions such as congestion, crashes, or weather. Examples of these applications include closed-circuit television cameras (CCTV) and dynamic message signs (DMS). Infrastructure-based ITS applications also include advanced signal systems, which can moderate traffic flow along corridors. Traffic conditions information can be monitored at a traffic operations center that coordinates emergency response and the dissemination of travel information to the public through the internet or radio.

Transit-based ITS are similar to Infrastructure-based ITS; the purpose is to provide information to transit riders and improve the operating efficiency of a transit system. Examples include automatic vehicle location (AVL) technology for buses and trains, and passenger information systems at bus stops and train stations about transit routes, schedules, and waiting times in real-time.

Vehicle-based ITS include on-board navigation systems and associated software technology that provide location and driving directions, display information about congestion and crashes, and identify alternative travel routes.
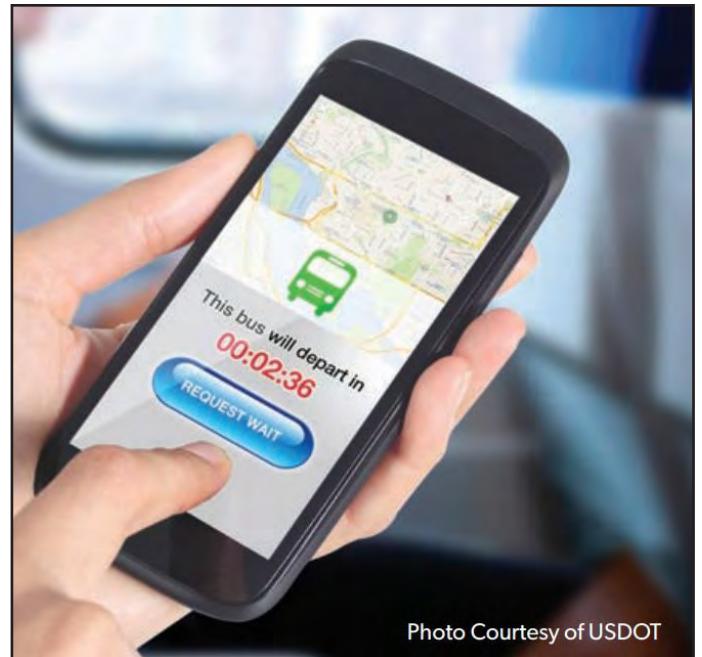

Photo Courtesy of USDOT

Source: *ITS Strategic Plan 2015-2019, Intelligent Transportation Systems Joint Program Office, USDOT*

Personal device ITS applications are variations of the vehicle-based applications, used on personal electronic devices. They can provide traffic conditions, non-motorized transportation modes, and transit-based information. Smartphone applications such as Waze® or Google® Maps provide travel directions using traditional global positioning system (GPS), and they consistently monitor traffic conditions during navigation functions. These applications use real-time data on travel speeds and traffic conditions to suggest alternative routes or notify motorists of estimated arrival times at a destination.

Infrastructure-based ITS may be particularly relevant to Morris County and its municipalities. These systems include advanced traffic signal control that improve upon the video detection and signal actuation currently used at many intersections. Technologies such as Computerized Traffic Signal Systems (CTSS) and real-time Adaptive Traffic Signal Systems (ATSS) coordinate multiple traffic signals along a corridor or in a street network in order to optimize traffic signal timing to meet traffic demand, improve travel time reliability by progressively moving vehicles through green lights, and reduce congestion by creating smoother traffic flows. In keeping with promoting safe travel for all modes, these advanced signal systems require evaluation concerning their impact on pedestrian safety.

Connected and Autonomous Vehicles

Connected Vehicle Technology (CVT) and Autonomous Vehicles refer to the advancement of technology within vehicles, including automobiles, buses, trucks, and even trains. The National Highway Traffic Safety Administration (NHTSA) identifies five different levels of automation for a single vehicle:

Level 0: The human driver is in complete control of all functions of the vehicle.

Level 1: One function is automated.

Level 2: More than one function is automated at the same time (e.g., steering and acceleration), but the driver must remain constantly attentive.

Level 3: The driving functions are sufficiently automated that the driver can safely engage in other activities.

Level 4: The car can drive itself without a human driver.

Most vehicles sold today are at Level 1, with automated functions such as cruise control or traction control. However, many new vehicles can be considered a Level 2 because they have multiple features such as blind spot monitoring systems, parking assistance, or adaptive cruise control where the vehicle automatically maintains a safe following distance from another vehicle in the same travel lane.

CVT applications take these technologies one-step further by allowing vehicles to communicate wirelessly with other vehicles to monitor speed or anticipate movements by detecting turn signal indicators or braking.[9] **This information is then** transmitted from one vehicle to the next, so the nearby driver can react accordingly, or the vehicle **takes action by itself.**

CVT may also include communication with infrastructure, in which information is transmitted to a vehicle from a roadside device.[10] **An example of this** application would be an adaptive traffic signal that transmits data to a vehicle about its signal timing and pending changes in its phasing. This information is then relayed to the driver to indicate the optimal speed to ensure that the vehicle arrives at the signal during a green phase or stops safely at a red phase.

Source: *Intelligent Transportation Systems Joint Program Office, USDOT*

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[9] This type of CVT is known as vehicle-to-vehicle, or V2V, technology.
[10] This is known as vehicle-to-infrastructure, or V2I, technology.

Autonomous vehicles (Level 3 or Level 4), also referred to as self-driving cars, represent the next advancement in vehicle technology by operating without any human control. Autonomous vehicles use GPS to manage direction of travel, speed, and position on the roadway. These vehicles are being tested in a several states, and some auto industry analysts anticipate that vehicles with Level 3 automation will be available to consumers within the next five years. The Institute of Electrical and Electronics Engineers has predicted that autonomous vehicles will account for 75% of the cars on the road by 2040.[11] **While this may be optimistic, it remains** that the eventual introduction of autonomous vehicles will have profound impacts.

Autonomous vehicles have the promise to provide significant benefits to users and society, potentially reducing crashes, fuel consumption, and greenhouse gas emissions, while improving mobility and reducing roadway congestion. In particular, an autonomous vehicle provides a means of transportation for individuals who may not have the ability to drive, such as disabled persons, children or senior citizens (supporting their ability to age in place). Level 4 automation, in which the vehicle moves itself without a driver, may also have dramatic cultural and economic impacts by reducing or eliminating the need to own vehicles.

There remain many unanswered questions concerning the widespread adoption of autonomous vehicles:

- Will they reduce VMT by reducing the number of cars on the road or increase VMT because it will be easier for motorists to travel long distances?

- **What will be the impact on parking requirements for different land uses?** If a car can move itself, will a business need to supply parking for customers and employees at its own location?

- Will autonomous vehicles lead to more suburban sprawl?

- Who is liable if a driverless car is involved in a crash?

- How secure is the wireless communication controlling the car?

- What will be the impact on transit service?

- Who does the car protect in a crash, itself or the other car in a crash?

There are potentially major implications for Morris County and the nation as a whole over the next

[11] http://www.thecarconnection.com/news/1079261_ieee-says-that-75-of-vehicles-will-be-autonomous-by-2040

25 years as these vehicles are deployed. For the County's transportation planning efforts, the most important elements of advanced vehicle technology will likely involve changes in roadway design standards and traffic signal operations, and the need for new telecommunications infrastructure in road rights-of-way.

Shared Mobility

The use of personal automobiles remains the dominant form of transportation in Morris County, as it is in most suburban and rural areas of the United States. However, recent trends of both millennials and empty nesters moving to urban areas, combined with the near-universal public adoption of smart phone technology, have enabled the rise of various new shared-mobility options, such as ride hailing, and car and bicycle sharing. These options can reduce the need for vehicle ownership and/or present an alternative to owning multiple vehicles, particularly where personal vehicles are not needed on a regular basis. This can also save money for those who do not want the cost of full time automobile ownership when there is only a part time need.

While the impact depends on the option, the collective use of shared mobility options can lessen the amount of needed parking, decrease congestion, cut fuel consumption, and reduce pollution. Increased use of shared-mobility options in Morris County is likely to accompany the current and most likely continued future growth and redevelopment of downtown areas in County. Typical shared mobility services include:

Traditional Ridesharing: Traditionally ridesharing is conducted via vanpools and carpools, which involves commuters typically meeting at a common origin, such as a parking lot or other location, to reach a common destination. This type of rideshare may involve the use of a personal vehicle, usually among friends and/or coworkers, or a fleet vehicle, such as a van, owned by a company or other organization that can be used by its employees or members. The North Jersey Transportation Planning Authority, in association with various Transportation Management Associations in New Jersey, hosts a ride matching web service, NJ Rideshare (nj.rideproweb.com), to help commuters connect and organize carpools and vanpools.

Application-Based Ridesharing/Ride-Hailing: The most current incarnation of ridesharing may be more accurately described as "ride-hailing" and is largely associated with car service companies such as Uber and Lyft. These companies and others

like them provide smartphone applications by which members may request an on-demand ride to and from specific locations. Unlike taxis, there are no fleet vehicles or regular operating hours; companies subcontract with individual drivers who use their own vehicles to transport passengers. Fares are automatically calculated and charged to the payment method selected by the rider via their smartphone application.[12] The driver is paid by the ride-hailing/ridesharing company.

Carsharing: Where ride-hailing companies provide a car and driver, carsharing companies, such as ZipCar and Car2Go, provide just the car. Use of a car sharing company provides an alternative to traditional car rental and/or car ownership for those who have only an occasional need of a car. The service is different from traditional car rental in that users of this service are members pre-approved to drive, and vehicles can be rented by the minute or hour rather than by the day. The reservation, pickup, and return of vehicles is by self-service; members pick up and return vehicles at designated service areas or fixed stations at which a fleet of cars is located, typically using access key cards or other technology.

There are different types of carsharing, i.e. round trip, one-way, peer-to-peer, and fractional. Round trip car sharing is exactly that; the driver begins and ends a trip in the same designated fleet location **from which the car was taken. In a one-way car** share, members pick up a vehicle from one designated fleet location and drop it off at another. In peer-to-peer car sharing, the vehicles are usually privately owned or leased, and car owners enter

into agreements to make their vehicles available to others in the peer community for short periods **of time. A peer-to-peer sharing system is typically** enabled and overseen by a third party company, which provides a service to host and match drivers and vehicles, and which provides equipment and software that can allow access to member vehicles through a smartphone application, such as "Getaround." Fractional ownership refers to a model in which several persons buy or lease a car together and split the costs of ownership and operation, the vehicular equivalent to the traditional "timeshare" model of vacation home ownership. Recognizing the rising use of car sharing services, many traditional vehicle rental companies have broadened their business models to include similar services, such as Enterprise CaShare, Hertz 24/7, U-Haul CareShare, and Avis On-Location.

Bike-sharing: The shared mobility movement **has also seen the rise in Bike-sharing, particularly** in cities and other concentrated areas where car dependency is low. Ideal for short trips, bike shar**ing usually allows users to pick up a bicycle at a** self-service bike station and return it to any other station within the systems service area. Bike sharing programs offer short-term rentals via stations where bikes are typically docked in high-tech bike racks designed to unlock a bike with the swipe of a credit card or insertion of an electronic key. Access may be gained through membership or on an as needed basis with daily passes. For some programs, **access to bicycles may be free with registration.** Some systems provide smartphone mapping applications indicating the location of stations and the availability of bikes. There are also dockless bicycle **sharing systems. In these systems, an electronic lock** is included with the bike that can be unlocked and paid for via smart phone application. GPS systems are incorporated for bike location.

The largest bike share provider in the region is Citi Bike operating approximately 12,000 bikes from 750 stations in NYC and Jersey City.[13] Locally, **Zagster, another bike share company, has stations** at Novartis in East Hanover, the Loantaka Brook Reservation in Morristown, and the new Estling Village multi-family apartments in Denville.[14]

E-Commerce

The growth of online retail has had important implications for overnight shipping, small parcel deliveries, and terminal-based truck activity in

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[12] Smart phones are not always needed to access these services. For example, "GoGo Grandparent" is a company that provides a service linking potential riders with car service companies via telephone. Locally, Chatham Township, Chatham Borough and Madison Borough recently created the Tri-Town 55 Foundation to facilitate and subsidize ridesharing programs for seniors, who may not always own smart phones or be comfortable with the use of smart phone applications. The Foundation operates with GoGo Grandparent to link local seniors with ride-hailing services.

[13] www.citibikenyc.com 8/2018
[14] www.zagster.com 8/2018

metropolitan areas like the greater New York City region. Amazon.com® has become a dominant player in industrial real estate development, and the company's business model combines high volume and specialized handling for customer deliveries. This type of operation has different labor needs and warehouse operating characteristics than traditional distribution centers. An e-commerce facility has **substantial labor requirements, so access to an appropriate labor supply is important. It also has** markedly different impacts on traffic operations on adjoining roads. The following example offers a comparison of employment at a traditional distribution center with a similarly sized modern e-commerce facility:

- A 1.2 million square foot Toys 'R Us distribution center in Mount Olive employed about 1,200 people during its peak holiday season.

- An Amazon distribution center that opened in Robbinsville, New Jersey in 2014 is about the same size as the Toys 'R Us facility, but had about 4,000 employees on site during the holiday season in 2015.

The Amazon facility was the subject of controversy in Robbinsville in late 2015. The road network around the site experienced heavy congestion during commuter peak periods when thousands of employees arrived for work.[15] These traffic conditions at e-commerce facilities are often exacerbated by truck operations, since large numbers of FedEx and UPS trucks are typically used for local deliveries. **While there are no e-commerce facilities currently** located in Morris County, the industrial properties documented in the 2011 Morris County Freight Infrastructure and Land Use Analysis may be attractive locations for either e-commerce distribution **centers or terminal operations for carriers such as** FedEx and UPS.

Commercial Drone Aircraft

The commercial use of unmanned aircraft, also called drones, has been the subject of much discussion in recent years, most commonly as a possible method of small package delivery. Unmanned aircraft are already being used in a variety of commercial applications, such as farming, real estate, construction, and photography. They are also being employed by local governments for police, fire, and rescue operations. However, widespread commercial use of drones is limited by FAA regulations. Specifically, regulations require drones to stay within

a pilot's line of site, **which limits their commercial practicality. The commercial use of autonomous** or long-range drones will require regulations that address such topics as how automated deliveries would work, weight limits on delivery items, and privacy issues. Expanded commercial drone use will also require the creation of special air traffic regulations to address altitude limitations, where they may (or may not) fly, and how they must be operated to avoid mid-air collisions with each other and with traditional aircraft. Current FAA rules include requirements that drone operation must avoid conflict with airport operations, yield the right of way to manned aircraft, weigh less than 55 lbs. at takeoff, and fly below 400 feet.[16]

Unmanned aircraft may also see an expanded government role. For example, drones equipped with high resolution cameras can be used where frequent and precise monitoring and inspection are crucial to ensure safety and correct operations, **particularly where access to infrastructure may** be difficult or dangerous. This technology can be applied to monitor utility infrastructure such as high voltage lines and telecommunications facilities, and **for the monitoring of public infrastructure, such** as the roads, bridges, railroads, and regional trails maintained by the County.

Alternative Fuel Vehicles (AFV)

Alternative Fuel Vehicles (AFV), i.e. those not powered by gasoline or diesel fuels, have advanced significantly in recent years. AFV's include electric, natural gas, ethanol, biodiesel, propane, and hydrogen. Most major car companies are making

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[15] http://www.nj.com/mercer/index.ssf/2015/12/amazons_mega_warehouse_gridlocks_traffic_in_nj_tow.html

[16] https://www.faa.gov/uas/getting_started/

substantial investments in AFV technology, with current emphasis on the development of fully electric vehicles (EV). While gas/electric hybrids have been on the market for years, all electric cars are becoming increasing common, with the recent introduction of models such as the Chevy Bolt, Nissan Leaf, and Tesla Model 3. An upsurge of new electric and hybrid vehicles to the market is anticipated over the next decade, with plans by such manufactures as GM, Ford, Toyota, Mazda, Renault, Nissan, Mitsubishi, Jaguar, Volvo, and VW to invest billions of dollars and roll out dozens of new models in the next five to ten years. For example, GM plans to release 20 new electric models by 2023. Volvo plans to electrify its entire vehicle line by 2019, and the VW Group (Volkswagen, Audi, and Porsche) plans to offer electric and hybrid versions of hundreds of vehicles by 2030.[17]

These announcements reflect technological advancements and changes in the world market for alternative fuel vehicles, a market driven in large part by worldwide government efforts to reduce greenhouse gas emissions. For example, the United Kingdom and France intend to ban new diesel and gasoline cars and vans beginning in 2040.[18] Norway and India plan to make these changes even sooner, in 2025 and 2030 respectively.[19] China, which has the world's biggest car market, plans to ban gasoline and diesel cars in the future. Automobile manufacturers are preparing for the end of internal combustion engine dominance.[20]

While automakers strive to produce ever more efficient and affordable electric cars, the speed at which the transition to fully electric vehicles can take place is tied to the creation of abundant and ubiquitous charging stations, a lack of which presents a barrier to substantial growth in EV acceptance and use. EV growth also requires the presence of an electricity grid that can support increased demand, and the availability of mechanics who can service these vehicles. The time it takes to develop this infrastructure ecosystem will regulate the pace of widespread adoption of electric or other alternative fuel vehicles.

The US Department of Energy currently identifies 252 existing alternative charging stations in New Jersey, of which 217 are electric stations containing a total of 509 charging outlets.[21] **Typically, these** stations are located at automobile dealerships that sell EVs, and at hotels, parking authorities, or public service areas. Tesla has also created numerous charging stations for the exclusive use of their customers. The challenge for all AFV makers and proponents will be to expand this support infrastructure to augment, and ultimately replace, conventional fueling stations.

Proactive planning will be needed to support the adoption of electric and/or other alternatively fueled vehicles. A network of fueling and/or charging stations with sufficient density and placement will be needed to allow for the viable use of alternatively fueled vehicles. Federal and state governments can support this conversion to alternative energy vehicles through programs to develop incentives, regulations, and partnerships with private industry. For example, the U.S. Department of Energy is supporting this conversion through its "Clean Cities" program, which advances the nation's economic, environmental, and energy security by supporting **local actions to cut petroleum use in transportation.**[22] Federal tax credits are also available to consumers to offset the higher costs of specified alternatively fueled vehicles,[23] and a variety of New Jersey laws and incentive programs also support the purchase and use of AFVs.[24]

[17] http://mashable.com/2017/10/03/electric-car-development-plans-ford-gm/#NSn603R5uiq8
[18] http://www.bbc.com/news/uk-40723581
[19] http://mitsloan.mit.edu/newsroom/articles/the-real-barriers-to-electric-vehicle-adoption/
[20] https://www.economist.com/news/business/21728980-its-government-developing-plan-phase-out-vehicles-powered-fossil-fuels-china-moves

[21] https://www.afdc.energy.gov/locator/stations/places/75875
[22] https://cleancities.energy.gov/coalitions/
[23] https://www.fueleconomy.gov/feg/taxevb.shtml
[24] https://www.afdc.energy.gov/laws/state_summary?state=NJ

Glossary

AFV - **Alternative fuel vehicles,** those not powered by gasoline or diesel fuels, include electric, natural gas, ethanol, biodiesel, propane, and hydrogen. Most major car companies are making substantial investments in AFV technology, with current emphasis on the development of fully electric vehicles.

Autonomous vehicles, also referred to as self-driving cars or trucks, represent the next advancement in vehicle technology by operating without any human control. Autonomous vehicles use GPS to manage direction of travel, speed, and position on the roadway.

CVT - **Connected Vehicle Technology** allows vehicles to communicate wirelessly with other vehicles to monitor speed or anticipate movements. Information is transmitted from one vehicle to the next, so the nearby driver or the vehicle itself can react accordingly.

AADT - **Annual Average Daily Traffic** is the number of vehicles that travel by a specific location during a typical weekday. Traffic volume is typically collected over several days at a location to generate a 24-hour average volume.

ADA - **Americans with Disabilities Act**, enacted in 1990, ensures that people with disabilities have the same right as any citizens to access public services and facilities, including transportation.

Clean Air Act as Amended requires that federally funded transportation projects be subject to applicable air quality conformity standards. Projects that demonstrate a positive impact on air quality are given funding priority.

Complete Streets is a context-sensitive approach to road design that considers the needs of all users, including motorists, bicyclists, pedestrians, transit riders, people of limited mobility, and delivery trucks. Complete streets policies and land use also factor into the street's design.

Dial-A-Rides are municipally-sponsored local transportation for senior citizens. Most municipalities in Morris County provide Dial-A-Ride programs. Some are able to accommodate persons with disabilities.

EJ - **Environmental Justice** is "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies," as defined by the U.S. Environmental Protection Agency. The concept of EJ means that government decisions, such as transportation-related actions, should affect all population groups equally.

Federal Surface Transportation Acts, of various names, have been the primary source of transportation funding from the Federal government. The Fixing America's Surface Transportation Act (FAST Act) was signed into law in December 2015. This Federal legislation authorizes $305 billion in transportation investments over its five-year cycle (FY 2016-2020), with approximately $5.3 billion allocated to New Jersey through formula funding over that period. The FAST Act is the successor to the Moving Ahead for Progress in the 21st Century Act (MAP-21) of 2012, and largely maintains the programs, funding structures, and goals of its predecessor.

FHWA - **Federal Highway Administration** is an agency within the USDOT that oversees Federal transportation funding of roads and bridges.

FRA - **Federal Railroad Administration** is an agency within the USDOT that manages railroad assistance programs, and researches, issues, and enforces rail safety regulations.

FTA - **Federal Transit Administration** is an agency within the USDOT that oversees Federal transportation funding of public transportation.

Gateway Program is an initiative comprised of multiple rail improvements to maintain the current system and eventually increase train service into NYC. Amtrak has started to advance plans that includes construction of a new Trans-Hudson rail tunnel.

Highlands Act is intended to protect freshwater resources in northwest New Jersey from major development. The Highlands Water Protection and Planning Act, adopted in 2004, fundamentally changed future land development in the Highlands Region,

which encompasses just over 859,000 acres, including 88 municipalities and parts of seven counties, including Morris County. The law designated two zones within this region: the Preservation Area and the Planning Area.

Highlands Regional Master Plan, developed in accordance with the provisions of the Highlands Act, identifies various development restrictions and enhanced environmental standards applicable to the entire Highlands Region. Conformance to the Plan for lands in the Planning Area is voluntary. Preservation Area lands must have municipal Master Plans and development regulations conform to the Plan.

Highway Functional Classification System indicates the purpose of a road as a part of the roadway network. States assign a functional classification to each road in accordance with Federal Highway Administration (FHWA) guidelines.

ITS - Intelligent Transportation Systems is a term for a variety of technologies built into transportation infrastructure, vehicles, and personal electronic devices to help improve the efficiency and safety of the transportation network and the mobility of its users.

JARC - Job Access Reverse Commute program is managed by the Federal Transit Administration (FTA). JARC funds commuting assistance programs for residents with low income in order to improve access to employment opportunities.

Journey to Work data is compiled and processed by the U.S. Census Bureau and other agencies conducting travel studies. The data typically includes the mode of transportation and the time it takes individuals to travel to work.

Lincoln Park Airport is a privately owned public use airport, which has been permanently preserved for public use by the NJDOT. There are 107 aircraft based at the airport with services including maintenance, sales, rentals, dining, fueling, and flight training.

MAPS - Morris Area Paratransit Service is Morris County's community transportation service operated by the Department of Human Services. MAPS provides weekday curb-to-curb service for residents who are 60 or older, or who are 18 or older and have a physical or mental disability.

MCEDC - Morris County Economic Development Corporation aids local companies and owners in seeking various resources for business assistance, including financing, training, and networking. MCEDC works with local governments and businesses to foster a dynamic business climate and the continued economic development of Morris County.

Mixed Use Development is an approach to land development that combines different types of land uses, such as residential, office, and retail within the same building, on the same property, or in close proximity, with the intent to reduce automobile usage and increase walking and bicycling.

MMU - Morristown Municipal Airport is a general aviation airport owned by Morristown and operated by DM Airports, LTD that has served private and corporate aircraft since 1945. The number of corporate and other aircraft based at this airport grew during the 2000's and it is now the third busiest airport in New Jersey, behind Newark-Liberty and Teterboro airports. There are 203 aircraft based at the airport with services including charter flights, air taxis, helicopter flights, flight instruction, flight clubs, maintenance and repair, sales, rentals, and fueling.

Morris County Chamber of Commerce is a partnership of businesses and government dedicated to promoting economic growth in Morris County.

Morris County Land Development Standards specify the requirements for land development applications that affect County roads and drainage facilities. Subdivisions and site plans that are subject to County approval must provide all necessary improvements to the County transportation system that are required for the safe and efficient movement of traffic on County roads.

Morris County Master Plan is comprised of several elements, including the Circulation Element, which have been adopted by the Morris County Planning Board. These elements provide a framework for planning efforts and programs in Morris County.

MPO - Metropolitan Planning Organizations are required for urbanized areas with populations of 50,000 or more in order to receive Federal highway funding. They were first created to meet the regional transportation planning requirements of the Highway Act of 1962. MPOs are typically governed by local government elected representatives and state

agencies, and are required plan and approve transportation projects that use Federal funds.

TCP - Transportation Capital Program lists all the planned capital projects in the State for each fiscal year, which starts July 1. The capital program includes construction and maintenance projects for roads, bridges, and transit. The annual program is funded by Federal resources and the State Transportation Trust Fund.

NJ TRANSIT was created in 1979 as New Jersey's statewide public transportation corporation. It is the third largest transit agency in the U.S. The agency provides passenger train and bus service in the state and into New York City and Philadelphia. In Morris County, NJ TRANSIT operates the 29, 70, 73, 79, and 194 bus routes, along with the 871, 872, 873, 874, 875, 878, and 880 local buses, and rail service on the Morris & Essex and Montclair-Boonton Lines. NJ TRANSIT provides transportation for people with disabilities through its Access Link service. It also supports private bus companies in the State.

NJDOT - New Jersey Department of Transportation is responsible for managing and guiding the state transportation network. The NJDOT controls Interstates, Federal roads, and State highways. While these roads only comprise a small percentage of the total road mileage in the County, they carry substantial traffic volume. In addition to constructing and maintaining roads and highways, NJDOT is involved in many transportation policy issues affecting the County, including goods movement, transportation planning, and ridesharing. NJDOT also monitors traffic operations using Intelligent Transportation Systems and coordinates responses to major incidents.

NJRTM-E - North Jersey Regional Transportation Model – Enhanced is NJTPA's computer model of the region's transportation network that seeks to predict the impact of demographic and transportation changes on daily travel patterns. NJTPA uses the NJRTM-E to confirm that projects in their Regional Transportation Plan and the Transportation Improvement Program will allow the region to meet air quality goals.

NJTPA - North Jersey Transportation Planning Authority is the federally authorized Metropolitan Planning Organization for the 13-county northern New Jersey region, which includes Morris County. MPOs are responsible for updating the Regional Transportation Plan for their area, overseeing federal funding by approving transportation projects for inclusion in the Transportation Improvement Program, and coordinating transportation planning efforts among state, county, municipal, and transit agencies.

NTSB - National Transportation Safety Board is an independent Federal agency that investigates civilian aviation accidents and significant railroad, highway, marine, and pipeline incidents. For each accident, the NTSB identifies the cause and makes recommendations to improve safety. The agency has investigated over 137,000 aviation-related and thousands of surface transportation incidents, and issued more than 13,700 safety recommendations.

PANYNJ - Port Authority of New York & New Jersey builds, operates, and maintains the region's airport system, marine terminals and ports, the PATH rail transit system, six tunnels and bridges between New York and New Jersey, the Port Authority Bus Terminal in Manhattan, and the World Trade Center.

Paratransit is transportation for people with disabilities or are elderly.

Road Diet is the reduction of the number of lanes in an existing roadway to improve safety. Typically, it is the conversion of a four-lane road to a two-lane road that incorporates turning lanes at intersections or a continuous center turning lane that allows left turns to be made outside the normal flow of traffic, reducing the risk of read-end and left-turn crashes. Additional benefits may include slower vehicle speeds, reduced pedestrian crossing distance, and the use of the shoulders for on-street parking, bus stops, or bicycle lanes.

RTP - Regional Transportation Plan is a long-range transportation investment vision that Metropolitan Planning Organizations, like the NJTPA, are required to develop and update every four years by in order to receive Federal transportation funding. All projects funded with Federal dollars overseen MPO's must have purposes consistent with the goals of the RTP.

SDRP - State Development and Redevelopment Plan, adopted in March 2001, is designed to coordinate planning and public policy among all lev-

els of government. The statewide policies set forth in this plan address 19 areas of concern, one of which is transportation. The statewide transportation policies seek to improve transportation systems by encouraging the coordination of transportation and land-use planning, integrating transportation systems, developing and enhancing alternative modes of transportation, improving management structures and techniques, and utilizing transportation as an economic development tool.

Smart Growth is an approach to land development that focuses growth and resources in areas with existing infrastructure and development, in order to discourage suburban sprawl and minimize the expenditure of public resources for new streets and utilities.

SRTS - Safe Routes to School is a program to encourage children safely walking and bicycling to school as a way to promote healthy lifestyles, and highlights the importance of quality infrastructure to support these activities.

STAA - Surface Transportation Assistance Act of 1982 regulates truck size, weight, and movement. The Federal STAA formed the National Network for large trucks based upon guidelines related to roadway geometry and function, lane width, and safety.

Sustainable development is a concept of community growth that seeks to ensure that development patterns of today do not jeopardize the environment for future generations.

TMA - Transportation Management Associations are non-profit agencies that promotes alternative transportation programs to employers, commuters, and communities. They play an important role in supporting mobility options for residents and workers, and specialize in marketing and developing programs that reduce congestion and encourage healthy activity. There are eight TMAs serving New Jersey, including TransOptions in Morris County.

TNJ - Together North Jersey is a regional planning initiative, led by NJTPA and Rutgers, to guide the state towards a more sustainable future. The initiative conducted several demonstrations studies and ultimately produced the Together North Jersey Plan in 2015. The Plan presents goals and strategies for improving the economy, environment, mobility, land use, and infrastructure.

TOD - Transit-oriented development involves the construction of a mix of residential, commercial, or mixed-use buildings in close proximity to public transportation, such as at a train station or a regional bus hub. The proximity of residential and commercial development to a transit hub reduces the need to drive for commuting, recreation, and shopping. Providing a mix of different land uses in close proximity also promotes pedestrian activity, fosters local economic development, and enhances real estate values while minimizing the expenditure of public resources for streets and utilities.

Traffic Calming is a concept that seeks to reduce vehicle speed, improve safety for pedestrians, bicyclists, and motorists, and/or discourage cut-through traffic. Traffic Calming can be implemented through various approaches, including the narrowing of or reduction in the number of travel lanes, raised cross walks, speed tables or humps, sidewalk extensions/bump-outs at intersections, and on-street parking.

TransOptions, Inc. is the Transportation Management Association for Morris, Sussex, Warren, and suburban Essex, Passaic, and Union Counties. This non-profit agency promotes alternative transportation programs to employers, commuters, and communities. It plays an important role in supporting mobility options for residents and workers, and specializes in marketing and developing programs that reduce congestion and encourage healthy activity.

TSD - Transit Supported Development is a planning concept that integrates local land use and transit planning at local, corridor, and regional levels. TSD is larger in scale Transit-Oriented Development (TOD), i.e. development at specific sites that integrate a mix of uses and amenities integrated into a walkable neighborhood in close proximity to public transit. TSD is applicable to communities that may not yet have an extensive transit system or service, but are interested in creating denser, more walkable communities that promote future transit expansion and TOD.

USDOT – United States Department of Transportation was created by Congress in 1966 with a mission to "serve the United States by ensuring a fast, safe, efficient, accessible, and convenient transportation system that meets our vital national interests and enhances the quality of life of the American people, today and into the future." The USDOT directs the operation of the Federal Aviation Administration (FAA), the Federal Highway Administration

(FHWA), the Federal Transit Administration (FTA), the Federal Railroad Administration (FRA), the National Highway Traffic Safety Administration (NHTSA), and the Surface Transportation Board (STB).

VMT - **Vehicle Miles Traveled** are the miles traveled during a certain time in an area such as a County or State by all motorized vehicles.

Walkable Community refers to a community that provides access for people of all ages and abilities to walk to their destinations. Pedestrian infrastructure helps to support and encourage walking and reduce automobile usage for local trips within a community.
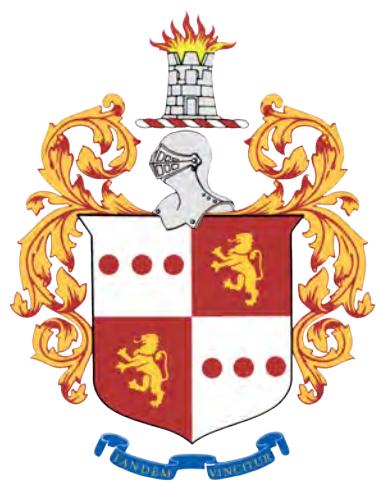
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