Morris County Freight Infrastructure & Land Use Analysis

FINAL REPORT

July 2011

NJTPA

Eng-Wong, Taub & Associates
Gannett Fleming
4WARD PLANNING LLC

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The *Morris County Freight Infrastructure & Land Use Analysis* was conducted under the leadership of the 2011 Morris County Board of Chosen Freeholders.

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About the MCDOT

The Morris County Division of Transportation (MCDOT) is part of the Morris County Department of Planning & Development.

MCDOT serves the county through regional transportation planning, implementation, and coordination of various modes of transportation. The division secures federal and state funds for road, bridge, railroad, bicycle, and pedestrian projects. The division conducts studies and coordinates planning efforts with state agencies, municipalities, county departments, and the North Jersey Transportation Planning Authority. Two Freeholder appointed boards, the Morris County Board of Transportation and the Morris County Freight Rail Advisory Committee, advise the division on its activities. MCDOT directs efforts toward the best use of transportation resources to benefit the region.

For Transportation information in Morris County and beyond, visit www.MorrisDOT.org.

This publication has been prepared as part of the North Jersey Transportation Planning Authority's Subregional Study Program with financing by the Federal Transit Administration and the Federal Highway Administration of the U.S. Department of Transportation. This document is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange. The NJTPA and Morris County are solely responsible for its contents.

NJTPA

July 2011

TABLE OF CONTENTS

LIST OF TABLES AND FIGURES

List of Tables

List of Figures

MORRIS COUNTY FREIGHT INFRASTRUCTURE & LAND USE ANALYSIS

Executive Summary

Background

The Morris County Freight Infrastructure and Land Use Analysis is a two-year comprehensive study examining the impact and role of the goods movement industry on the county's transportation network, land use, and economy. The project was funded through a North Jersey Transportation Planning Authority FY 2010-2011 subregional study grant. This study report includes a comprehensive review of transportation infrastructure and operating conditions, documentation of land use policy and other issues associated with potential freight-oriented development, and economic analyses of key industrial sectors in Morris County and industrial customers on the three county-owned freight railroads. Key sites for potential industrial development or redevelopment opportunities are identified in this report, along with policy and infrastructure recommendations to support current and potential future freight-related transportation needs in the county.

This study report will help will enable county planners and their municipal partners to make informed, accurate recommendations, and provide tools for improving community relations and marketing that will maximize the success and support of future freight-related development and infrastructure improvements.

The Freight & Land Use Analysis study included a series of supporting documents that have informed and supported the findings of this final report. These include the following:

- *Technical Memorandum #1: Data Collection and Review* includes a documentation of existing conditions and review of data from existing sources, including conditions and utilization of the transportation system in the county, land use information and regulatory issues, zoning information, and some industry-level employment statistics and trends.
- *Technical Memorandum #2: Land Use Analysis* is an overview of current conditions for industrial development in the county and an assessment of land uses to identify those areas that are most suitable for freight-oriented development.
- An assessment of the benefits and costs of freight-related industries to Morris County is documented in *Technical Memorandum #3A: Economic Impact Analysis*, while a separate

financial and economic analysis of the three county-owned freight rail lines is contained in *Technical Memorandum #3B: Cost/Benefit Analysis of County-Owned Railroads*.

- Policy recommendations and transportation infrastructure improvements related to current and potential future freight-oriented development in the County are documented in *Technical Memorandum #4: Infrastructure Improvements and Needs*.
- The *Municipal Guide for Freight Planning*, an informational publication developed in this study, to be used by municipalities and other public agencies in planning efforts related to industrial land use and freight-oriented development.
- A summary of the ongoing efforts of the Morris County Economic Development Corporation, and recommendations for marketing industrial sites in the county for development or redevelopment, are contained in the Task 6 document, *Marketing Plan for Industrial Properties*.
- A supplemental project document, *Review of Easement and License Agreements for Railroads*, contains a cursory review of current practices in the railroad industry for easements and license agreements. This supplemental research was done to identify some possible sources of additional revenue for the county-owned rail lines.
- A number of presentations that were given during the course of this project have been posted on the website of the Morris County Division of Transportation. These include presentations at public meetings, SEAMLESS, 2010 TransAction Conference, Freight Railroad Advisory Committee meetings, a regular Freeholder Board meeting, and a meeting of the NJTPA Freight Initiatives Committee.

Technical Advisory Committee

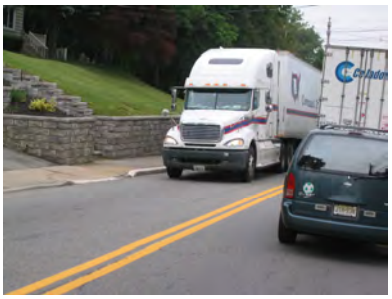
The Technical Advisory Committee for this study included representatives of the following agencies and organizations:

- Morris County Chamber of Commerce
- Morris County Economic Development Corporation
- Morris County Division of Engineering
- Morris County Board of Transportation
- Morristown & Erie Railway
- New Jersey Department of Transportation
- New Jersey Transit
- North Jersey Transportation Planning Authority
- Port Authority of New York and New Jersey

Key Findings

A summary of key findings from the Morris County Freight Infrastructure and Land Use Analysis project is as follows:

- Manufacturing accounts for about 8.7% of the total employment base in the county, compared to 6.8% for the State of New Jersey and 7.4% for the greater New York City Metropolitan Statistical Area (MSA).
- Key manufacturing and warehouse/transportation industries produced a combined $17.9 billion in direct economic output, with the chemical manufacturing industry providing the largest share of that total ($16.1 billion). When indirect and induced output is added, these industry groups contribute to over $25.2 billion in economic output in Morris County.
- From this economic output, over $957 million was returned to state and local governments as tax revenue.
- The overall strength of the entire region is the size of the local consumer market and the underlying demand for finished products.
- Between 2009 and 2035, the most substantial growth in truck traffic in Morris County is projected to occur along I-287 and on the major highways inside the I-287 loop. This includes I-280, Route NJ-24 and the segment of I-80 east of the I-287 interchange. Ongoing suburban growth in the county is expected to increase congestion on all major roadways.
- There is currently no substantial industrial development taking place in Morris County, or in the larger New Jersey market. There exists a several year supply of industrial space in Morris County, with no latent demand and no rental rate price appreciation.
- Land costs for industrial development are high, due primarily to the limited supply of land for industrial uses. But industrial space near rail lines becomes more attractive when energy prices rise.
- The county owns three railroad alignments: the Dover and Rockaway Railroad, the High Bridge Branch and the Chester Branch, all of which that serve industrial sites, including the Chester Branch.
- The Chester Branch, acquired in 2009, underwent a full rehabilitation under a Federal ARRA grant and was completed in early 2011. This line will also provide freight rail access to current and potential future businesses further south along the line in areas such as the BETA Corporate Park in Randolph Township.



- One of the important elements of the regional rail system that adversely affects freight rail service in Morris County is the limitation on the size and weight of railcars moving to and from the county due to height restrictions on the freight lines.
- Vertical clearance constraints hinder the movement of railcars on the rail system within and outside Morris County. Railcars moving to and from the east via CSX over the Morristown Line are subject to a 15'-5" vertical clearance restriction, a condition exacerbated by the overhead catenary wire on this line. Railcars moving to and from the west via Norfolk Southern over the Morristown Line and Washington Secondary are subject to a 16'-6" restriction under the South Main Street bridge in Phillipsburg (Warren County).
- The 263,000-lb. weight limit on the North Jersey rail system is also a limiting factor for the railroads as 286,000-lb. rail cars have become more common in the freight rail industry; this issue has been the subject of ongoing attention by NJDOT, NJ TRANSIT, and the freight railroads in recent years.

Key Recommendations

A number of policy recommendations and infrastructure improvements are documented in the final study report. These were based on a series of general objectives for balancing freight-related transportation needs with local quality-of-life concerns, while at the same time protecting and enhancing industrial sites within the county. These objectives were:

1. Minimize highway capacity expansion to the extent possible.
2. Protect and enhance freight rail service in the county on the three County-owned alignments as well as on the NJ TRANSIT, New York, Susquehanna & Western (NYS&W), and Morristown & Erie (M&E) systems.
3. Promote rail-oriented industrial development on existing or inactive rail rights-of-way, and protect intact abandoned rights-of-way to the extent possible.
4. Where local truck access needs are identified, enhance truck access to the major regional highway system in ways that minimize future community impacts and reduce existing impacts to the extent possible.
5. Address existing inefficiencies in the county's freight system in a cost-effective manner that minimizes community impacts and addresses quality-of-life issues.
6. Enhance the county's forecasting capability for truck traffic by developing enhanced data elements and forecasting tools for itself and its municipalities.

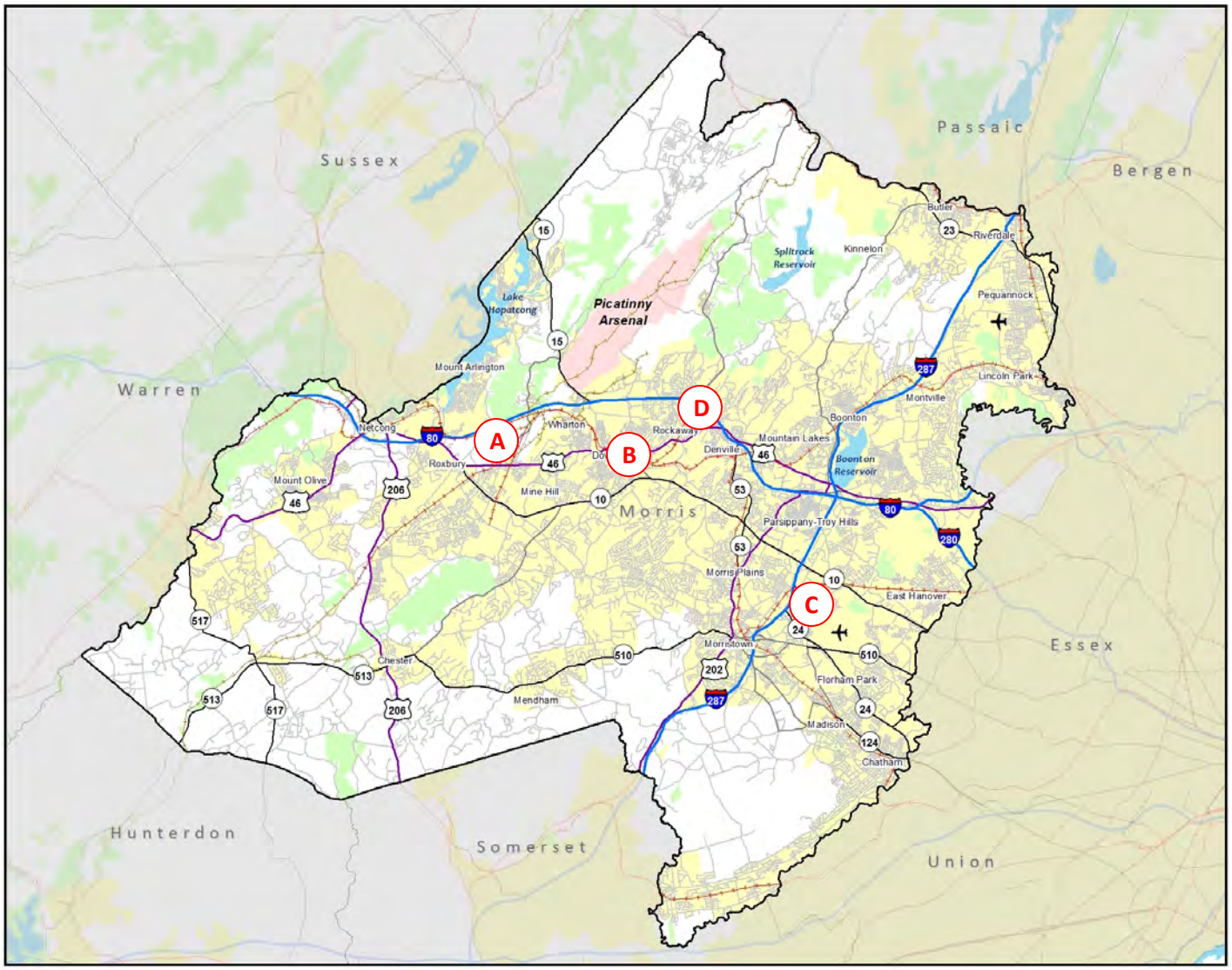
Key recommendations for the Morris County Freight Infrastructure and Land Use Analysis include the following:

- Support an initiative to address bridge clearances along the Morristown Line and Washington Secondary to accommodate Plate F (17'-0") rail cars.
- Actively participate in efforts at the state level to increase the rail car weight limit on the Morristown Line from 263,000 to 286,000 pounds.

- Document a truck route system in Morris County as an informational resource for industrial developers, trucking companies and other interested parties to identify local and regional routes suitable for trucks of various sizes.
- Enhance the County's traffic model to include expanded industrial land uses.
- Promote rail-oriented industrial development on existing or inactive rail rights-of-way, and protect intact abandoned rights-of-way to the extent possible. Both of these are goals of the Highlands Regional Master Plan, which governs land use and future development for nearly 90% of the County's land area.
- Support local efforts to enhance capabilities related to planning and zoning for industrial sites by providing guidance to municipal governments for land use planning efforts to minimize local impacts of truck traffic and other community impacts related to industrial and other commercial development.

A summary table listing the detailed infrastructure and policy recommendations is shown on the following page.




Sussex
Passaic
Bergen
Warren
Morris
Essex
Hunterdon
Somerset
Union
Lake Hopatcong
Picatinny Arsenal
Splitrock Reservoir
Boonton Reservoir
Mount Arlington
Netcong
Wharton
Rockaway
Denville
Mountain Lakes
Boonton
Montville
Lincoln Park
Pequannock
Riverdale
Butler
Kinnelon
Roxbury
Mine Hill
Mount Olive
Parsippany-Troy Hills
Morris Plains
East Hanover
Morristown
Florham Park
Madison
Chatham
Chester
Mendham
A
B
C
D

Area of Influence		Recommendations	Roadway Issues			Railroad Issues			Community Issues		
			Congestion	*Geometry*	*Regional Connectivity*	*Rail Car Size*	*Freight Velocity*	*Industrial Connectivity*	*Noise / Safety*	*Land Use Compatibility*	*Support Industrial Development*
Regional / Policy		Address bridge clearances along Morristown Line and Washington Secondary to accommodate Plate F (17'-0") rail cars.				✓		✓			✓
		Increase rail car weight limit on the Morristown Line from 263,000 lb. to 286,000 lb.				✓		✓			✓
		Document a truck route system in the County.			✓				✓	✓	✓
		Enhance the County's traffic model to include expanded industrial land uses.	✓		✓					✓	✓
		Protect intact abandoned railroad rights-of-way for potential future use as freight rail alignments.					✓	✓		✓	✓
A	*Roxbury/Kenvil*	Address height restriction on Berkshire Valley Road (currently 11'-5").		✓	✓				✓	✓	
		Potential new east-west connection through Hercules site, tied to future development plans for that site.	✓	✓	✓				✓	✓	✓
		Intersection improvements on Dell Avenue at US-46.		✓							
		Re-alignment of Dell Avenue intersection at Berkshire Valley Road, tied to future development plans for Petillo and Kenvil Newcrete sites.		✓	✓				✓	✓	
B	*Dover/Rockaway*	Potential re-alignment of D&R Junction, Option 1 -- relocate to former DL&W alignment through McWilliams Forge property and build new connection on Morristown Line.	✓				✓	✓	✓	✓	✓
		Potential re-alignment of D&R Junction, Option 2 -- extend existing Dover & Rockaway alignment directly south from Alcoa-Howmet to new connection on Morristown Line.	✓				✓	✓	✓	✓	
C	*Hanover Township*	Intersection improvements at Route NJ-10 / Jefferson Road (currently listed on TIP as NJDOT-sponsored project).	✓		✓				✓		
		Potential Apollo Drive extension to Eden Mill site, tied to future development plans for that property.		✓					✓	✓	✓
		Potential Rosin Road extension to Eden Mill site, tied to future development plans for that property.		✓					✓	✓	✓
D	*I-80 Exit 37*	Potential re-configuration of partial cloverleaf interchange links north of I-80 (westbound I-80 to/from Green Pond Road), to eliminate conflicting movements along Green Pond Road at intersection of Morris Avenue.	✓	✓							✓

1.0 Introduction

Morris County lies in the heart of northern New Jersey and plays an important role in the regional economy. Rooted in a long and storied history that dates back before the founding of the nation, the development of the county has been a story of economic vitality, innovation, and progress. The county has an extensive roadway system, active freight and passenger railroads, and many former industrial sites that afford promising opportunities for economic development and employment growth that are compatible with the high quality of life enjoyed by the county's residents.

Over the years the county has seen changing trends in transportation and land use that parallel the experience of the nation as a whole. Patterns of suburban development and industrial decline in the county are consistent with the development of a more service-oriented economy, and these trends have placed a growing strain on the county's transportation infrastructure. Even though there have been reductions in manufacturing, mining and agricultural activities, freight transportation needs have grown as a result of increased residential and retail development.

The last century and a half has seen a progression from canals to railroads and then to highways as the primary form of freight transportation in Morris County. Globalization and the general economic growth in the larger metropolitan region have resulted in a dramatic increase in through truck traffic on the county's major highways (I-80 and I-287). The movement of freight into and through the county is influenced by the growth of the Port of New York and New Jersey and the growth of warehousing and distribution facilities in strategic locations far outside the New York metropolitan area.

This study is a three-pronged effort that examines the County in the context of the three major influences in the County's freight transportation system and needs. **Section 2** of this report deals with the existing transportation infrastructure and its utilization, along with current and future issues related to system needs. **Section 3** is an analysis of current economic conditions and near-term forecasts for key industrial sectors, along with a separate assessment of the economic impact, costs and benefits of the three County-owned railroads. **Section 4** addresses the regulatory environment and market conditions related to industrial land use in the County and identifies potential industrial development opportunities at key locations in the County. Policy and infrastructure recommendations to support current and potential future freight-related transportation needs in the County are documented in **Section 5**.

2.0 Transportation Infrastructure and Operations

Morris County has an extensive roadway system and rail transportation infrastructure, and is well positioned as an economically diverse region within the nation's largest metropolitan area. The county serves as part of an important "freight corridor" in this region, and is expected to experience increased activity related to truck and rail freight movement in the future. Major regional highways including I-80, I-280, I-287 and NJ-24 carry substantial volumes of truck traffic through the region, and truck volumes on intermediate roadways such as US-46, US-202, US-206, and NJ Routes 10, 15 and 23 carry increased regional traffic even as they continue to serve changing local land uses. Regional traffic volume forecasts indicate that future increases in demand on the highway system represent a challenge to the county in light of changing economic conditions and development opportunities.

A base map of Morris County and its key transportation features is shown in **Figure 2-1**.

2.1 Roadway Volume Data

An extensive review of traffic volume data from a number of different sources was completed for this study, including NJDOT 48-hour and permanent count station data, North Jersey Transportation Planning Authority's (NJTPA) regional traffic model, Morris County's subarea traffic model, and classification counts conducted in 2010 for the purpose of validating data from these other sources. The primary objective of the traffic data collection was the documentation and validation of truck data for the major roadways in Morris County.

Because this study includes an assessment of projected traffic conditions for future horizon years, current and projected truck volume data were compiled from two primary sources. These include the following:

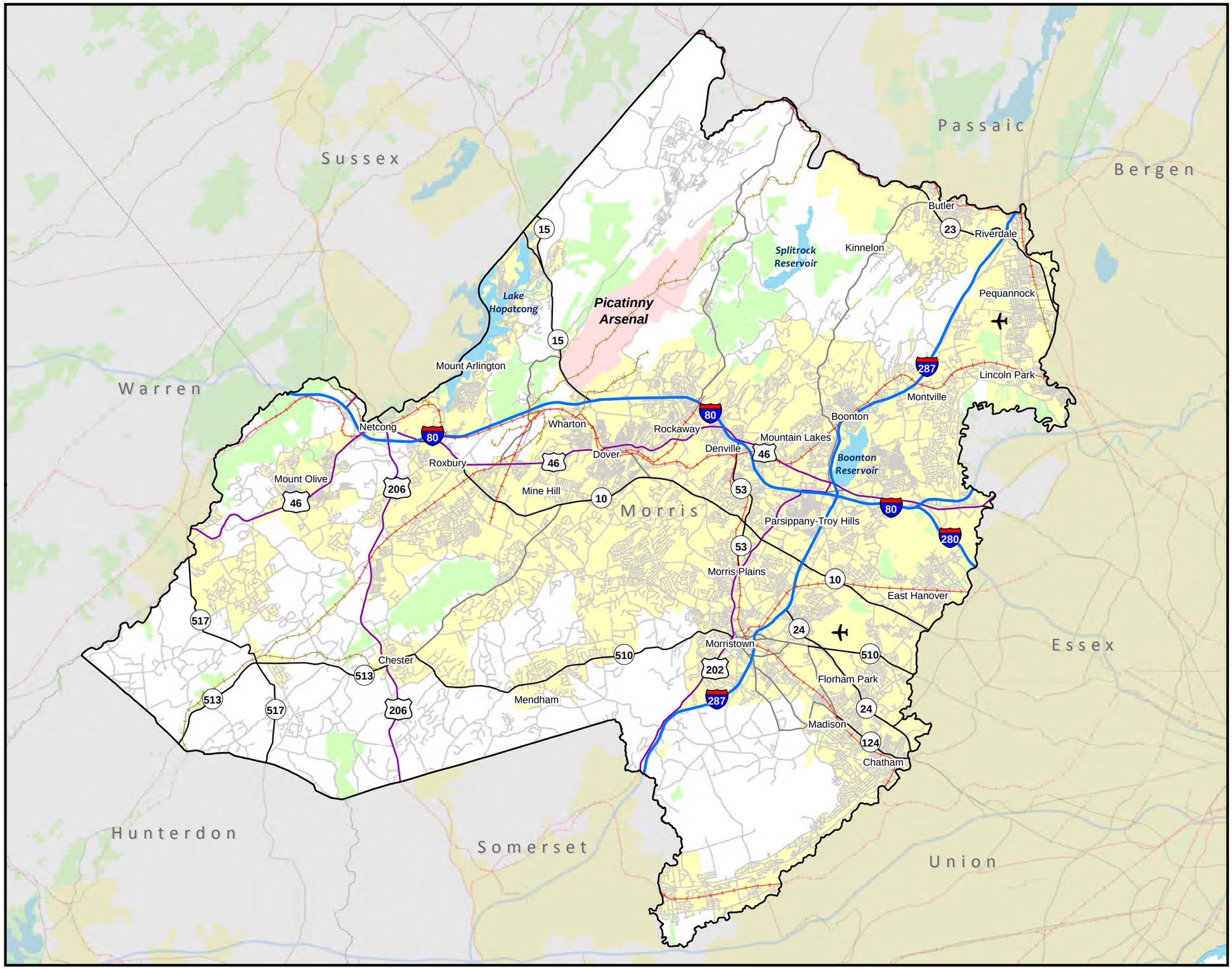
- The regional traffic forecasting model that has been developed and refined by the NJTPA. The latest upgrade to the regional model, which was done in 2008, is called the North Jersey Regional Transportation Model-Enhanced (NJRTM-E). Within the North Jersey region the model's highway network includes all limited-access highways and most major and minor arterials, and most 500 and 600 level county roads. The model has a separate truck table in addition to its six basic travel modes: single occupant vehicles, three different multiple-occupant vehicles, transit/walk access and transit/drive access.

  Internal truck trips in the region are estimated based on trip types by employment and different rates for special generators such as port terminals, rail yards and warehouse centers where employment levels may not accurately reflect truck activity. Current observed data are used for external trips.

  This resource was used to document base year (2009) truck volumes for the entire model network and projected truck volumes for two future horizon years (2020 and 2035) for all roads within Morris County except for the major limited-access highways.

Morris County, NJ
Freight Plan

FIGURE 2-1
Transportation Infrastructure



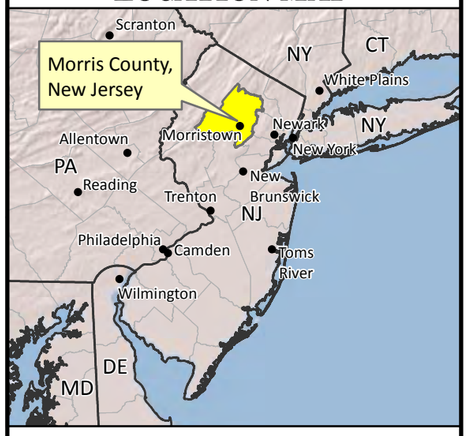
Map Legend

- Airports
- County Boundary
- Abandoned Railroad
- Active Railroad
- Interstate
- State Route
- US Route
- Other Major Roads
- Surrounding Counties
- Major Water Bodies
- Minor Roads
- Urbanized Areas
- Morris County
- Protected Open Space and Recreation Areas
- Picatinny Arsenal

Scale (Miles)

2.5 1.25 0 2.5 5

LOCATION MAP



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Source: 2008 Bureau of Transportation Statistics - National Transportation Atlas Database
New Jersey DEP - 2008
NJDEP TIGER Roads 2000 in Morris County, NJ

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- Freight Analysis Framework (FAF) data compiled by the FHWA's Office of Freight Management and Operations uses data from multiple sources to document current conditions and future projections for multi-modal freight movement among states and major metropolitan areas. This data source is most suitable for estimating economic activity and freight movement on larger geographic scales, so it was used in this project primarily to identify long-term trends on major highways in Morris County.

  During the data collection phase of this project, Version 3 of the FAF data (FAF^3) was still in the process of being compiled for public distribution by the FHWA, so FAF^2 data was used to estimate long-term truck volume projections for the major highways in Morris County. Annualized growth factors were computed for the 2002-2035 period for the limited-access highways in Morris County, and these growth factors were applied to the base year (2009) truck volumes from the NJRTM-E to estimate projected truck volumes for two future horizon years (2020 and 2035) for these major limited-access highways.

One concern about traffic volume data is that some of the underlying data behind these resources are collected over a three-year period through the NJDOT's Highway Performance Monitoring System (HPMS) data collection process. HPMS counts are done over a 48-hour period every three years, so many of the traffic count locations throughout New Jersey have traffic data on file for 2007 and 2008. The traffic data for these locations may not reflect changing traffic conditions during the recession of 2008-09 – something that may have particularly important implications for truck traffic.

To determine the accuracy of the NJRTM-E base year (2009) truck volumes for the Morris County road network, truck volume counts were conducted at six different locations along major limited-access roadways in the County. Two-directional volume data were collected at each location. The counts were conducted in August 2010 using digital video cameras placed off the rights-of-way of these highways, and minute-by-minute counts of vehicles under the following classifications: (1) autos, (2) medium trucks, (3) heavy trucks, (4) buses, and (5) RVs. Medium and heavy trucks were combined into a single truck volume for the purpose of documenting the results of this data collection effort and making comparisons to other data sources. Buses and RVs were counted separately to ensure that these two vehicle classes would not be included in the medium truck total as would sometimes be the case with automated traffic counting equipment.

Directional 24-hour traffic counts were conducted at the following locations:

- I-80 eastbound/westbound at Changebridge Road (Montville)
- I-80 eastbound/westbound at Mount Hope Road (Rockaway Township)
- I-280 eastbound/westbound at New Road (Parsippany-Troy Hills)
- I-287 northbound/southbound at Intervale Road (Parsippany-Troy Hills)
- I-287 northbound/southbound at NJ-24 interchange (Hanover Township)
- NJ-24 eastbound-westbound at I-287 interchange (Hanover Township)

These count locations were selected after consultation with Morris County staff and site visits to determine the feasibility of collecting video data at these locations. These sites were selected so that the consultant team could obtain two-way truck volume data on six key segments of the limited-access highway system in Morris County: (a) I-80 east of I-280 and west of I-287; (b) Interstate 280; (c) I-287 north of I-80 and south of NJ-24; and (d) Route NJ-24.

A comparison of the 2009 NJRTM-E truck volumes and the 2010 truck volumes from the data collection effort for this study is shown in **Table 2-1** on the following page. Truck volumes are lower on I-287 and NJ-24 in 2010 than 2009, while the figures for I-80 and I-280 are relatively stable. Several factors that may influence these volumes in recent years may include: (1) a "natural" decline in trucking activity associated with a recessionary economic climate; (2) seasonal variations in trucking activity; and (3) ongoing construction work on I-78 east of the NJ-24 interchange in Summit that may depress truck volumes on those highways that connect to I-78.

Table 2-1

Truck Volume Comparison – 2010 Counts vs. 2009 NJRTM-E

Roadway	***Location***	***24-Hour Two-Way Truck Volume***		***Difference***	***Pct.***
		2009 NJTPA	*2010 Count*		
I-280	East of I-80	3,614	3,826	212	5.9%
I-80	East of I-280	9,182	8,595	-587	-6.4%
I-287	North of I-80	12,660	10,587	-2,073	-16.4%
I-80	West of I-287	12,948	12,988	40	0.3%
I-287	South of NJ-24	16,705	13,590	-3,115	-18.6%
NJ-24	East of I-287	4,586	4,072	-514	-11.2%
Combined Locations		**53,658**	**59,695**	**-6,037**	**-10.1%**

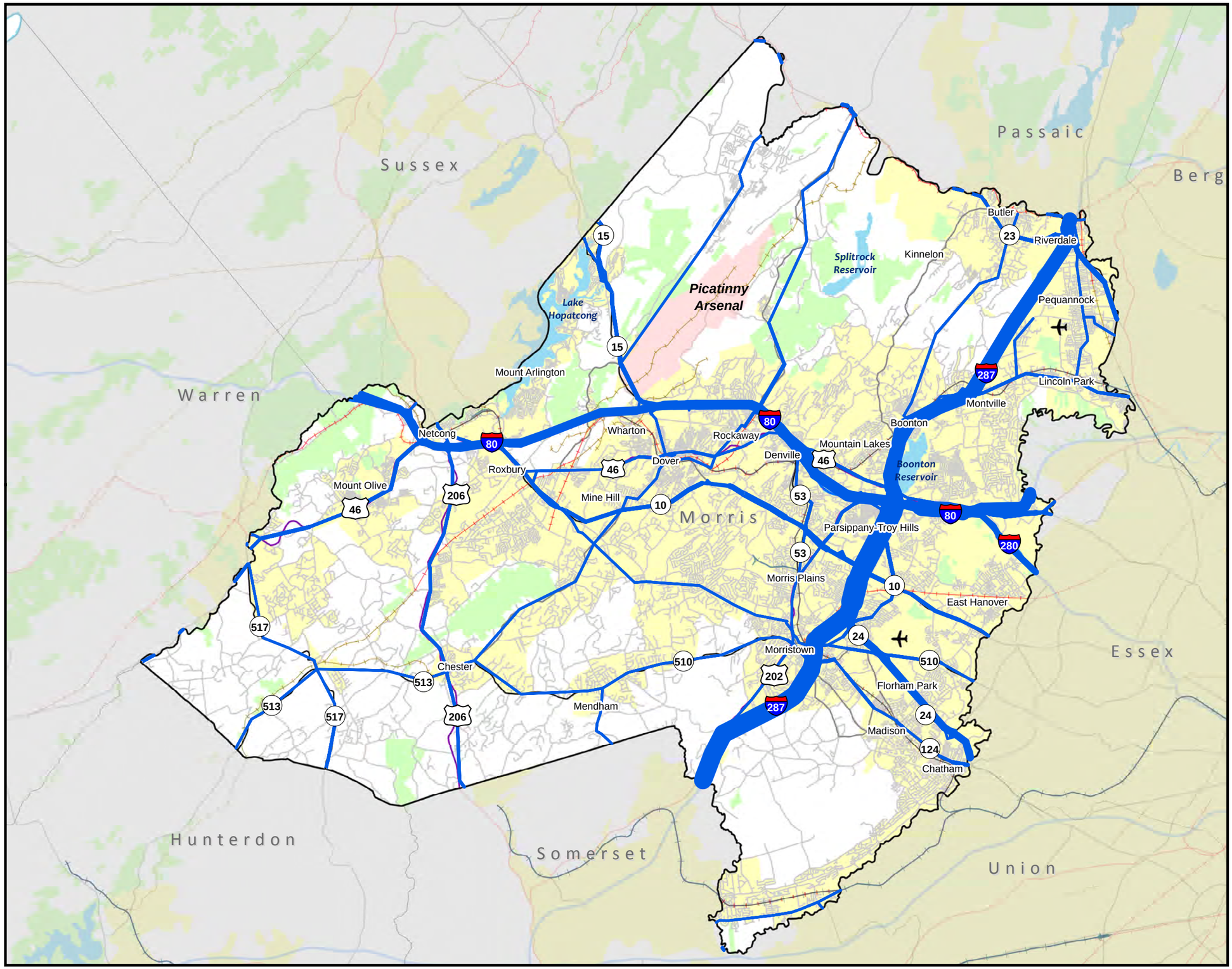
Based on the review of this information, it was determined that the 2009 base year truck volume data from the NJRTM-E represents a reasonable estimate of 24-hour volumes throughout the roadway network. More importantly, there is no reason to make any adjustments in the NJRTM-E projected truck volumes for the two future horizon years used in this study (2020 and 2035).

Base year (2009) and future horizon year (2020 and 2035) two-way 24-hour truck volumes are shown in **Figures 2-2A** through **2-2C**. Current and future estimates of roadway congestion are shown in **Figures 2-3A** through **2-3C**, using the evening peak period outputs from the NJRTM-E as the standard for measuring congestion.[1]

[1] Congestion cannot be accurately measured over a 24-hour period. The PM peak period is typically used for measurements of congestion for this type of study, since the PM peak in a suburban area includes site-generated traffic from many retail sites that are closed during the AM peak.

Morris County, NJ
Freight Plan

FIGURE 2-2A
Total 2009 Truck Volumes



Map Legend

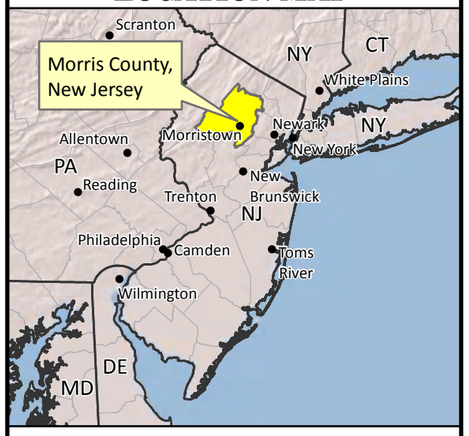
Two-Way 24 Hour Total Truck Volumes

15,000 10,000 5,000 500

Scale (Miles)

2.5 1.25 0 2.5 5

LOCATION MAP



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2009 NJTPA Travel Demand Model
2010 Bureau of Transportation Statistics - National Transportation Atlas Database
New Jersey DOT Road Centerlines
FHWA Freight Analysis Framework (FAF/2)

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Morris County, NJ
Freight Plan

FIGURE 2-2B
Total 2020 Truck Volumes

Map Legend

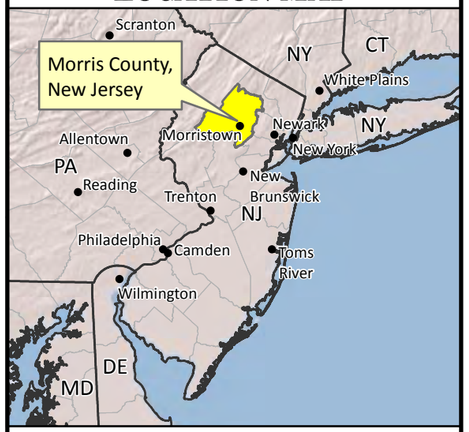
Two-Way 24 Hour Total Truck Volumes

15,000 10,000 5,000 500

Scale (Miles)

2.5 1.25 0 2.5 5

LOCATION MAP



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2009 NJTPA Travel Demand Model
2010 Bureau of Transportation Statistics - National Transportation Atlas Database
New Jersey DOT Road Centerlines
FHWA Freight Analysis Framework (FAF/2)

N

Morris County, NJ
Freight Plan

FIGURE 2-2C
Total 2035 Truck Volumes

Map Legend

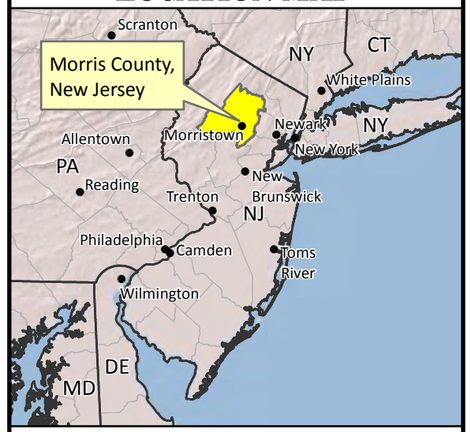
Two-Way 24 Hour Total Truck Volumes

15,000 10,000 5,000 500

Scale (Miles)

2.5 1.25 0 2.5 5

LOCATION MAP



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2009 NJTPA Travel Demand Model
2010 Bureau of Transportation Statistics - National Transportation Atlas Database
New Jersey DOT Road Centerlines
FHWA Freight Analysis Framework (FAF/2)

N

Sussex
Passaic
Berg
Warren
Morris
Essex
Hunterdon
Somerset
Union
Lake Hopatcong
Picatinny Arsenal
Splitrock Reservoir
Boonton Reservoir
Kinnelon
Butler
Riverdale
Pequannock
Lincoln Park
Montville
Boonton
Mountain Lakes
Denville
Rockaway
Wharton
Dover
Roxbury
Mount Arlington
Netcong
Mount Olive
Mine Hill
Parsippany-Troy Hills
Morris Plains
East Hanover
Morristown
Florham Park
Madison
Chatham
Chester
Mendham
15
23
80
287
46
206
10
53
280
24
510
202
513
517
124

Morris County, NJ
Freight Plan

FIGURE 2-3A
PM 2009 Peak Congestion

Map Legend

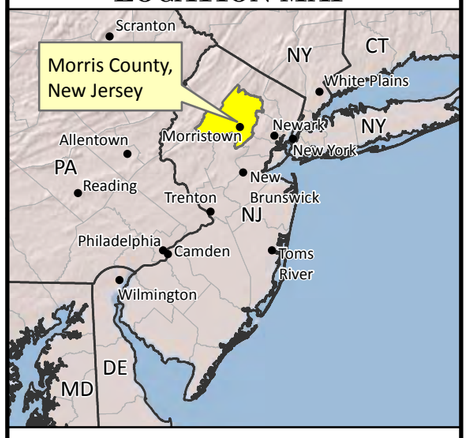
PM Peak Congestion

- FREE FLOW SPEED
- 1 - 5 MPH BELOW FREE FLOW SPEED
- 5 - 10 MPH BELOW FREE FLOW SPEED
- 10 - 15 MPH BELOW FREE FLOW SPEED
- > 15 MPH BELOW FREE FLOW SPEED

Scale (Miles)

2.5 1.25 0 2.5 5

LOCATION MAP



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July 2011

2009 NJTPA Travel Demand Model
2010 Bureau of Transportation Statistics - National Transportation Atlas Database
New Jersey DOT Road Centerlines

N

Sussex
Passaic
Bergen
Warren
Morris
Essex
Hunterdon
Somerset
Union
Lake Hopatcong
Picatinny Arsenal
Splitrock Reservoir
Boonton Reservoir
Butler
Riverdale
Kinnelon
Pequannock
Lincoln Park
Montville
Boonton
Mountain Lakes
Denville
Rockaway
Wharton
Dover
Roxbury
Mount Olive
Netcong
Mount Arlington
Mine Hill
Parsippany-Troy Hills
Morris Plains
Morristown
East Hanover
Florham Park
Madison
Chatham
Chester
Mendham
15
23
80
46
206
53
10
287
280
24
510
202
513
517
124

Morris County, NJ
Freight Plan

FIGURE 2-3B
PM 2020 Peak Congestion

Map Legend

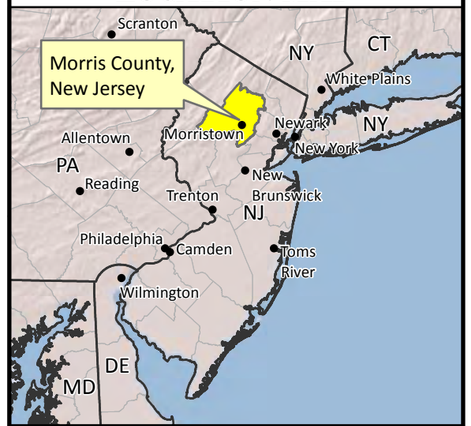
PM Peak Congestion

- FREE FLOW SPEED
- 1 - 5 MPH BELOW FREE FLOW SPEED
- 5 - 10 MPH BELOW FREE FLOW SPEED
- 10 - 15 MPH BELOW FREE FLOW SPEED
- > 15 MPH BELOW FREE FLOW SPEED

Scale (Miles)

2.5 1.25 0 2.5 5

LOCATION MAP



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2009 NJTPA Travel Demand Model
2010 Bureau of Transportation Statistics - National Transportation Atlas Database
New Jersey DOT Road Centerlines

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Morris County, NJ
Freight Plan

FIGURE 2-3C
PM 2035 Peak Congestion

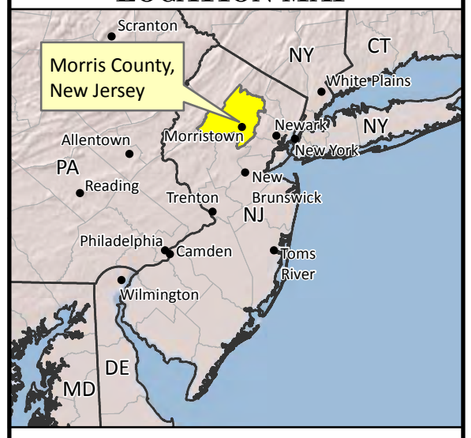
Map Legend

PM Peak Congestion

- FREE FLOW SPEED
- 1 - 5 MPH BELOW FREE FLOW SPEED
- 5 - 10 MPH BELOW FREE FLOW SPEED
- 10 - 15 MPH BELOW FREE FLOW SPEED
- > 15 MPH BELOW FREE FLOW SPEED

Scale (Miles)
2.5 1.25 0 2.5 5

LOCATION MAP



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July 2011

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2010 Bureau of Transportation Statistics - National Transportation Atlas Database
New Jersey DOT Road Centerlines

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As would be expected, the highest truck volumes on the Morris County road network can be found on the major interstate highways (I-80 and I-287 in particular) and other limited-access roads. The region surrounding the I-80 and I-287 interchange has a particularly heavy concentration of truck activity related to the convergence of these two interstates and the close proximity of other limited-access highways (I-280 and NJ-24) and other major roads that serve industrial and commercial sites (US-46, NJ-10, US-202, etc.).

For the 2020 and 2035 horizon years, the most substantial growth in truck traffic is projected to occur along I-287 and the limited-access highways inside the I-287 loop. This includes I-280, NJ-24 and the segment of I-80 east of the I-287 interchange. Total truck volume growth between 2009 and 2020 for these roadways is projected to be in the 5.5% to 8.3% range, with growth between 2009 and 2035 projected to be in the 13.5% to 20.8% range. For the western segment of I-80 outside the I-287 loop, the growth in truck volumes is projected to be 1.2% and 2.9%, respectively, for the 2009-2020 and 2009-2035 periods.

The important role of NJ-10 in the County's highway network west of I-287 is also clear from these figures. As a busy commercial corridor parallel to I-80 without the older, densely populated towns that can be found along parts of US-46 (e.g., Dover, Denville), NJ-10 has emerged as a busier east-west route in central Morris County than US-46, which also parallels I-80 for its length through the county.

Figures 2-2A through **2-2C** do not show substantial changes in truck volumes over the NJTPA's forecast horizon years on the County's secondary roads. Truck volume forecasts in the NJRTM-E are done using a truck trip sub-model based on trip rates for various segments (standard, terminal related, warehouse related, industrial-employment related, and special generator related), and growth rates for these industries in this heavily developed region are likely to be low. However, data available from any number of sources in the greater New York City region indicate that truck traffic has grown dramatically in recent decades even as much of the region's heavy industry has declined. The NJTPA's ongoing efforts to develop improved industry-level freight forecasts out to 2040 will be particularly important in this regard, as the results of that study will likely provide a more accurate estimate of future truck volumes on the regional highway network.

One area where the NJTPA model outputs provide good insight into future traffic conditions is their measurement of congestion. The base year model results present a picture of some heavily congested roadway links in Morris County, mainly through the center of the county and along the major limited-access highways from I-80 to the south. The congested roadway links are shown in Figures 2-2A through 2-2C as red and amber links. More red links show up in the latter two figures for the 2020 and 2035 horizon years, with much of the increased congestion projected to occur north of I-80. The appearance of red lines along I-287 between Boonton and Riverdale, around the Riverdale/Butler area along NJ-23, and along US-202 between Boonton and Lincoln Park are indicative of projected population and employment growth in that area, including substantial retail development along the NJ-23 corridor and future residential growth in northeastern Morris and central Passaic Counties.

All of the information reviewed for this study indicates that in future horizon years, increasing numbers of these trucks are likely to be traveling on congested roadways.

2.2 Accident/Crash Statistics

The New Jersey Department of Transportation compiles accident statistics since 1997. Data from the last three full years (2007-09) were compiled and summarized for this study, with a focus on those accidents potentially related to freight activity. The two particular accident types of interest were as follows: (1) those involving one or more trucks, and (2) those that occurred at grade crossings on any of the rail alignments used by freight trains (these accidents might indicate a potential grade crossing safety issue for freight trains even if the documented accidents involved passenger trains). As it turns out, Item (2) is not relevant for this study as none of the accidents documented in the most recent three-year period occurred at any of the grade crossings in the County.

Each accident in the NJDOT database contains geographical fields denoting the latitude and longitude of the exact crash location. Those accidents involving one or more trucks are summarized in **Table 2-2**, with no indication or judgment about whether the truck(s) in question for any given accident was at fault.

Table 2-2

Truck Accident Data for Morris County, 2007-09

Truck Type	***Years***		
	2007	*2008*	*2009*
Single Unit (2 axle)	578	478	462
Single Unit (3+ axles)	193	180	147
Light Truck with Trailer	20	18	21
Single Unit Truck with Trailer	80	65	73
Bobtail	28	17	24
Semi-Trailer	654	529	478
Tractor + Double Trailers	9	12	8
Other	160	134	139
Totals	**1,722**	**1,433**	**1,352**

Source: *http://www.state.nj.us/transportation/refdata/accident/*

The data in **Table 2-2** indicate a decline in accidents involving trucks in Morris County over the last three years. Some of this decline may be attributable to an overall decline in truck volumes on the major roadways throughout the County in this period. To identify locations in the County with possible safety concerns related to trucking activity, the NJDOT accident database was examined in detail and all of the fatal accidents involving one or more trucks during the 2002-2009 period were extracted. These accident locations – 37 in all – are mapped in **Figure 2-4**.

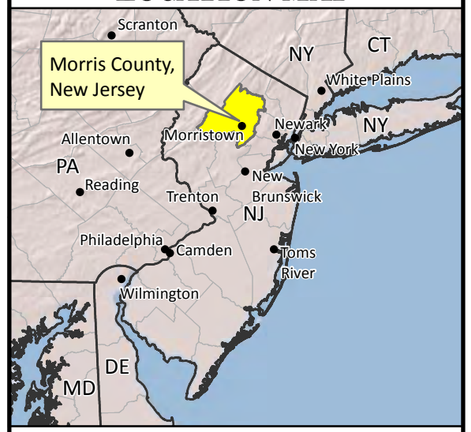
Morris County, NJ
Freight Plan

FIGURE 2-4
Fatal Truck Accident Locations (2002 - 2009)

- Single Accident
- Two Accidents
- Three Accidents
- Accident Groupings

Scale (Miles)
2.5 1.25 0 2.5 5

LOCATION MAP



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Data Source:
New Jersey DOT Crash Statistics

N

The mapped data points do not point to any obvious high-accident locations, though the fatal accidents tend to be concentrated along the major interstate routes where truck volumes are highest. Small concentrations of accidents appear on **Figure 2-4** along the segment of I-280 just east of the I-80 interchange, and along I-80 in western Morris County in the vicinity of US-206. One potential item of concern may be the two fatal truck-related accidents in the vicinity of Long Valley, as truck volumes are typically low in this area and the two accidents may be unusually high number for that type of area.

2.3 Designated Truck Routes

Morris County does not have a designated truck route system, but many of its major roadways are included in the truck access regulations adopted by the State of New Jersey in 2008. Under N.J.A.C. Title 16, Chapter 32, "large trucks" (defined in this legislation as double-trailer truck combinations and 102-inch wide trucks[2]) are assigned a hierarchical roadway network that should be used for trips to avoid adverse impacts on local communities. These state regulations are intended to "protect the public interest by assuring that specified vehicles are operated on suitable roadways."[3] The relevance to Morris County of the double-trailer truck restrictions under §16:32 is relatively simple and clear. In Morris County, these combination vehicles are permitted only on the interstate highway system (I-80, I-287 and the westernmost segment of I-280 that lies within the County).

The 102-inch width restrictions are somewhat more complex, for they involve a series of exceptions and other provisions that relate to a number of roadways in Morris County. As with the aforementioned double-trailer restrictions, all interstate highways in the County are accessible to these 102-inch wide trucks. State highways are also generally designated as appropriate routes for 102-inch wide trucks, but Appendix A of §16:32 contains a series of roadway segments that are not appropriate as "through routes." In Morris County, these include the following:

- NJ-53 between NJ-10 (Parsippany) and I-80 (Denville)
- US-202 between I-287 (Parsippany) and I-287 (Boonton)
- US-202 between County Route 633 (Lincoln Park) and the Passaic County line

Additional roadway segments that are not appropriate as "through routes" are listed under Appendices B and C for 500 and 600 series county roads, respectively. There are a number of these segments in the County. The State's designated Truck Access Network, which includes all of the restricted roadway segments as described above and in Appendices A through C of §16:32, is illustrated in **Figure 2-5**.

One important consideration related to these regulations is that they do *not* necessarily restrict 102-inch wide trucks on minor roads and those routes specifically listed as inappropriate for through traffic as described above. The State's truck access regulations contain a number of exceptions for travel by these 102-inch wide trucks, for reasons that include (among others): (1) detours for road closings; (2) route diversions necessitated by bridge height or weight limits; (3)

[2] Applies to any truck that is wider than 96 inches, up to a width of 102 inches.
[3] N.J.A.C 16:32-1.1

access to terminals and other similar trip ends; (4) access to facilities providing food, fuel, rest accommodations and repairs for trucks and/or their drivers. These 102-inch wide trucks that travel off the designated Truck Access Network under these exceptions are required to avoid residential areas whenever possible, though trucks carrying household goods for residential deliveries are exempt from this provision as well.

2.4 Highway Bridges

A review of highway and railroad bridge data from the National Bridge Inventory for Region 2 (includes New Jersey and New York) was conducted for this study. This inventory is included in the National Transportation Atlas Database under the Bureau of Labor Statistics. More than 3,300 bridges are contained in the database for New Jersey, and the focus of the consultant's efforts was on the 150+ "highway over highway" bridges in Morris County. The bridge height field was of particular interest, as it would provide some indication about potential height restrictions on key roadways. The database appears to contain some obvious errors in a number of fields that were confirmed based on field observations, so an assessment of weight and height restrictions for individual bridges was completed only on those bridges in the vicinity of proposed industrial sites documented in Section 5 of this report.

A discussion of rail height clearance issues that have serious implications for freight movement on the rail system in the County is included in Section 2.6 of this document.

2.5 Rail System – Overview

The Geographic Information Systems (GIS) data layers obtained for this project contain about 140 miles of railroad alignments in Morris County, including active lines, abandoned lines, and rights-of-way that may have no track infrastructure on them but are still intact. A map of the Morris County rail system is shown in **Figure 2-6**. Details about the passenger and freight rail operators in the County and key active and abandoned rail alignments are provided in the following subsections. A summary of a series of interviews conducted with various railroad industry representatives is included in Section 4.3.1 of this report.

Morris County, NJ Freight Plan

FIGURE 2-5
New Jersey 102-inch Truck Access Network

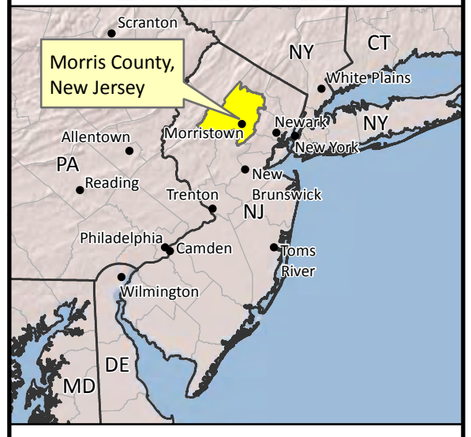
Map Legend

- National Highway System
- N.J. Access Network
- Not Appropiate Through Truck Routes

Scale (Miles)

2.5 1.25 0 2.5 5

LOCATION MAP



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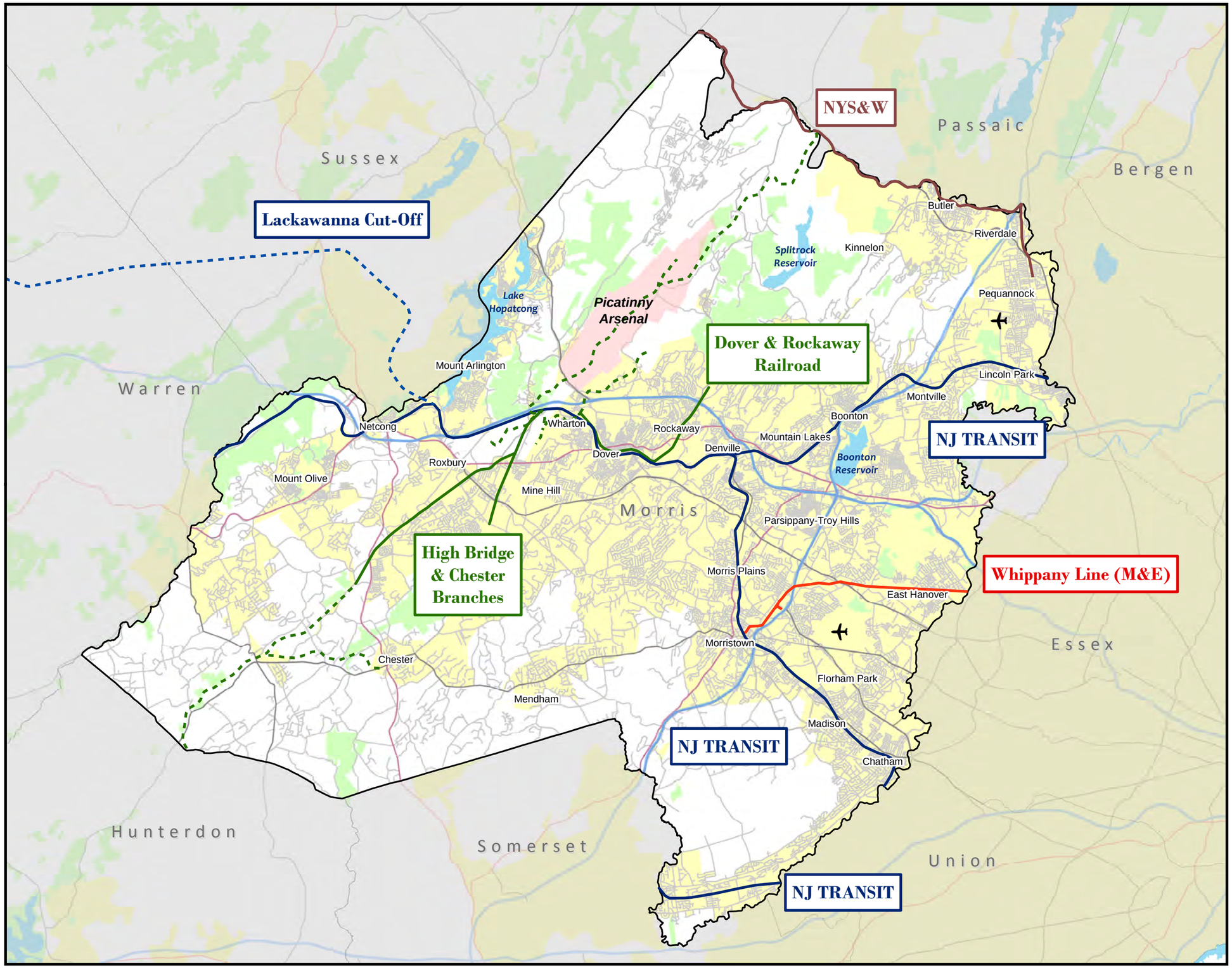
Data Source:
New Jersey DOT

N

Sussex
Passaic
Bergen
Warren
Morris
Essex
Hunterdon
Somerset
Union
Lake Hopatcong
Picatinny Arsenal
Splitrock Reservoir
Boonton Reservoir
Mount Arlington
Netcong
Wharton
Rockaway
Dover
Roxbury
Mount Olive
Mine Hill
Denville
Mountain Lakes
Kinnelon
Butler
Riverdale
Pequannock
Lincoln Park
Montville
Boonton
Parsippany-Troy Hills
Morris Plains
East Hanover
Florham Park
Madison
Chatham
Morristown
Chester
Mendham
Valley Road (CR-512)
15
80
46
206
10
53
287
280
23
24
510
202
513
517
124

Morris County, NJ Freight Plan

FIGURE 2-6
Morris County Railroad System



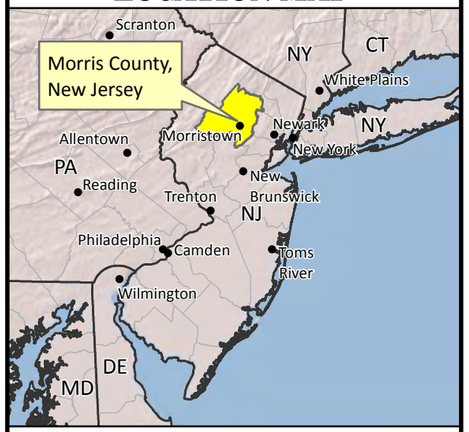
Map Legend

- NJ Transit
- Morristown & Erie
- NYS&W
- Public/Others
- Key Abandoned Lines

Scale (Miles)

2.5 1.25 0 2.5 5

LOCATION MAP



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Data Source:
National Transportation Atlas Database 2009

N

2.5.1 NJ TRANSIT (NJT)

NJ TRANSIT operates passenger rail service on three different rail alignments in Morris County, one of which is the short section of the Gladstone Branch through Long Hill Township in the southernmost tip of the County. This line segment does not play a key role for freight movement in the region. Key features of the other two routes are as follows:

- The Morristown Line is one of the main NJ TRANSIT routes that serves Hoboken Terminal on the Hudson River waterfront, and provides direct access to Manhattan via the Midtown Direct service on the Northeast Corridor Line. The line extends from Hoboken to Hackettstown, with key Morris County stations in Morristown and Dover. An overhead electrification system exists as far west as Dover, and the company provides regular service between Dover and Hoboken/NYC on this segment of the line. Limited diesel service is provided west of Dover to Hackettstown. The Morristown Line is a two-track mainline in Morris County as far west as Morris Junction, which is just east of the Lake Hopatcong Station in Roxbury Township; from this point to Hackettstown it is a single-track alignment. The segment of the Morristown Line west of Netcong is owned by Norfolk Southern and leased to NJ TRANSIT, which maintains operational control.
- The Montclair-Boonton Line was established in its current configuration in 2002 when the company opened a new connection in Montclair between the former Montclair Branch and the Boonton Line. Service between Montclair and Hoboken on the old Boonton Line route through Essex and Hudson Counties was terminated at that time. The Montclair-Boonton Line runs west of Montclair, and the Morristown Line connects to this alignment at Denville Station. The Montclair-Boonton route has an overhead electrification system as far west as Great Notch in Passaic County; all service west of this point is operated using diesel locomotives. The route is a single-track alignment within Morris County from Denville east to the Passaic County line in Lincoln Park.

  The line segment west of Denville is of particular interest for this study, as this is the segment where the diesel Montclair-Boonton Line service and the electric Morristown Line service operate on the same track segment and therefore represents the most constrained segment of the system from the standpoint of main line freight operations. The line segment west of Dover is also of interest because of the freight train activity, though passenger train service is less frequent beyond Dover.

NJ TRANSIT operates about 90 combined eastbound and westbound revenue trains on a typical weekday along the section of the rail alignment between Dover and Denville. The company runs limited service of about 25 daily revenue trains west of Dover. Morristown Line service currently operates on an hourly basis during the midday off-peak period; this was recently reduced from half-hourly service under NJ TRANSIT's recent service cutbacks. Norfolk Southern and Morristown & Erie freight trains in Morris County will usually operate during these midday hours between NJ TRANSIT passenger trains.

2.5.2 Norfolk Southern Railway (NS)

Norfolk Southern is one of the two major Class I railroads (along with CSX Corporation) in the eastern United States, with a system that covers 22 states and contains more than 21,000 route miles.[4] Northern New Jersey lies close to the farthest reach of the NS network to the northeast, although the level of NS activity in Morris County is substantially lower than elsewhere in its system. Norfolk Southern is the dominant Class I presence in Morris County, since it acquired the former Conrail assets in Morris County as part of the division of Conrail between NS and CSX that was formally approved by the U.S. Surface Transportation Board in 1998.

The company's operations in this region are conducted through its Harrisburg Division, and it does business on several line segments in Morris County and its immediate vicinity. These include: (1) service to customers on its own Washington Secondary west of Hackettstown, which connects the Morris County rail system to the NS main line in Phillipsburg; (2) service east of Netcong via trackage rights on the NJ TRANSIT Morristown Line; (3) service east of Denville on the Montclair-Boonton Line, including service to customers on the Totowa Industrial Track in Passaic County; and (4) infrequent service to a limited customer base in Union County west of Summit on the Gladstone Branch. The company serves a total of about 12-18 customers throughout the area, with service to many of them through connecting short line service provided by the Morristown & Erie Railway (M&E). All traffic interchanged with the M&E is handled through Lake Junction Yard in Roxbury Township.

2.5.3 New York, Susquehanna & Western Railway (NYS&W)

The NYS&W is a Class II railroad that operates over about 400 miles of track, mainly in New Jersey and upstate New York.[5] The company serves more than 80 customers on its own network, and can interchange railcars with three Class I railroads (NS, CSX and Canadian Pacific). In northern New Jersey, the NYS&W interchanges with NS at Passaic Junction in Saddle Brook (Bergen County) and at Marion Junction in Jersey City, and with CSX in North Bergen.[6] Only a small portion (approximately 13 miles) of the NYS&W network lies in Morris County, as the railroad's main line crosses between Morris and Passaic Counties several times along the Pequannock River which marks the northern border of Morris County. The NYS&W main line is a single-track route through Morris County and its vicinity.

The NYS&W was one of the few railroads in the region to survive the wave of bankruptcies that befell the industry in the late 1960s through the early 1970s and resulted in the establishment of the Consolidated Rail Corporation (Conrail). NYS&W operated under difficult financial circumstances after a section of track west of Butler was washed out in 1971, and was ultimately sold to the Delaware Otsego Corporation in the early 1980s.

Under the Delaware Otsego ownership, the NYS&W restored their original main line as far west as Sparta, and purchased the former Lehigh & Hudson River Line from Sparta up north into Orange County, New York. Through a trackage rights agreement with Conrail that enabled the NYS&W to

[4] *http://www.nscorp.com/nscportal/nscorp/Media/Corporate%20Profile/*
[5] All descriptive information about the NYS&W was obtained from: *http://www.nysw.com/*
[6] The northern New Jersey region is part of NYS&W's Southern Division.

operate on the Southern Tier Line to Binghamton, the NYS&W had effectively cobbled together a system that provided 286,000-lb. capacity and double-stack vertical clearance into the lucrative North Jersey market. From the mid-1980s until the acquisition of Conrail by Norfolk Southern and CSX in 1998, the NYS&W represented the only competing service to Conrail in this region for rail freight moving to and from the west.

The company's fortunes changed when NS and CSX began offering competitive Class I rail service in the Northeast after 1998. The NYS&W was no longer a competitive player in the intermodal business and had to build its business around carload traffic – including such commodities as chemicals, lumber, building materials, aggregates, plastics and food products. In the vicinity of Morris County, the company has bulk[7] distribution facilities for various commodities in Oakland, Riverdale, Midland Park, Saddle Brook, and Sparta. The Pompton Industrial Track is active from Pompton Junction on the NYS&W mainline as far south as the Morris Pipe & Supply Co. of New Jersey, located adjacent to NJ-23 in Pompton Plains.

The NYS&W main line has been the subject of some interest over the years for passenger service restoration along much of its route in northern New Jersey (passenger service east of Butler operated until the mid-1960s) and as far north and west as Warwick, NY. A comprehensive passenger service study was done by NJ TRANSIT in 1994, and the final station screening process in that study included four prospective endpoints for service: Butler, Newfoundland, Sparta and Warwick.[8] In 2009 NJ TRANSIT approved a plan to construct and operate passenger service along a short segment of the NYS&W line between Hawthorne and Hackensack, but due to funding constraints and limited ridership potential any extension of passenger rail service to Morris County along this route is likely years away.

2.5.4 Morristown & Erie Railway (M&E)

The Morristown & Erie Railway is a short line railroad that operates primarily in Morris County. The company had its roots serving industrial customers along the Whippany River in the 19th century, was resurrected out of bankruptcy in 1982, and operates today on its own route and on three branch lines owned by Morris County. The NJ TRANSIT Morristown Line serves as the M&E "main line" through a trackage rights agreement; train service on these four branch lines is coordinated with NJ TRANSIT's passenger service on the line through simple radio dispatching. The M&E serves local customers through its interchange service with both Class I railroads. The railroad can access the CSX system through its trackage rights agreement with NJ TRANSIT via the Morristown Line to South Kearny Yard in Hudson County, but there are vertical constraints along this route that limit the size of railcars that can be moved. As a result, the M&E primarily serves NS customers at this time. This will be discussed in more detail later in this section.

The M&E offers service on the following lines (these are all single-track branch lines):

[7] In freight transportation, "bulk" freight includes any commodities that are bought, sold and transported in loose form and are not packaged in individual units. Common examples of bulk freight include liquid commodities such as petroleum and chemicals and solid loads such as grain and stone.

[8] *New York, Susquehanna and Western Railway Passenger Service Study, Draft Technical Memorandum 2.1: Station Location Report*, NJ TRANSIT, 1994.

- The **Whippany Line** extends from the M&E shop and facilities at CP Baker on NJ TRANSIT's Morristown Line to Roseland in Essex County. The route runs north from Morristown roughly parallel to I-287, then east along the Whippany River, crossing NJ-10 at grade level in the village of Whippany. The line passes through a light industrial and residential area in East Hanover before crossing Eisenhower Parkway and terminating in Roseland. The line is owned by the M&E and is about eight miles in length, with most of it situated in Morris County.
- The **Dover & Rockaway Railroad** connects to the NJ TRANSIT Morristown Line at D&R Junction west of Dover. The line runs roughly parallel to the NJ TRANSIT alignment through the north side of downtown Dover, crossing many streets at grade level. East of downtown Dover it diverges from the NJ TRANSIT alignment and turns north, running up along the Rockaway River through the center of Rockaway Borough before terminating at several industrial sites north of I-80 on the east side of Green Pond Road (County Route 513). The line was acquired by Morris County in 1986 and is about six miles long.
- The **Chester Branch** connects to the Morristown Line at Chester Junction in northern Roxbury Township. Lake Junction Yard is adjacent to Chester Junction and serves as the interchange point between Norfolk Southern and the Morristown & Erie for the M&E's customers on all four lines. The Chester Branch runs south through Roxbury, roughly parallel to Dell Avenue. High Bridge Branch connects from the southwest at Ferromonte Junction, while the Chester Branch continues south and crosses both US-46 and NJ-10 at-grade. South of NJ-10, the line runs along the east side of Horseshoe Lake and terminates west of the former Westinghouse site, now BETA Corporate Park, in Randolph Township. The remnants of an old spur track into the site are still in place. The line is nearly 4½ miles long, which includes the entire length from Lake Junction to its southern terminus. Morris County acquired this line from Holland Industries in 2009, and completed a rehabilitation of the alignment in May 2011.
- The **High Bridge Branch** was originally a branch line of the Central Railroad of New Jersey (CNJ) from the south that ran from High Bridge in Hunterdon County up to the industrial and mining areas around Wharton, Mine Hill and the highlands north of what is now I-80. The line originally crossed the Chester Branch (a branch of the Delaware, Lackawanna & Western from the north) at a diamond crossing at what is now Ferromonte Junction in Roxbury Township. The junction between the two lines was constructed when the High Bridge Branch segment east of the Chester Branch was abandoned several decades ago. The active section of this line runs in roughly a southerly direction from Ferromonte Junction through the older area of Kenvil and Succasunna, crossing both US-46 and NJ-10 at grade level. South of this point the area is mostly suburban in character, and the line terminates at the Toys R Us distribution center in the industrial area west of US-206 in the Bartley section of Mount Olive Township. The High Bridge Branch has been owned by Morris County since 1986 and is nearly seven miles in length between Ferromonte Junction and its current southern terminus. South of this point, the right-of-way is mostly intact but has no track in place, and is now owned by the Columbia Gas Company as a pipeline right-of-way. Hunterdon and Morris Counties operate and maintain the Columbia Trail along this alignment under a lease agreement with the company.

The M&E customer base (including active, prospective and dormant sites) on these four branch lines is listed in **Table 2-3**. The information presented here includes sites on the M&E's Whippany Line that are outside Morris County but are served by the M&E via NJ TRANSIT's Morristown Line. "Active" customers are those who either send or receive shipments by rail on a regular basis or have used rail on an as-needed basis for specialized loads within the last twelve months. "Future" customers include: (1) new customers scheduled to locate on the M&E system in the near future; and (2) existing businesses that are expected to begin shipping and receiving loads that are moved most cost efficiently by rail. "Dormant" customers are businesses that have used rail service in the past and may still have active sidings, but have not shipped or received any loads by rail in the last twelve months.

Table 2-3

Morristown & Erie (M&E) Railway Customers

Line/Branch	*Active*	*Future*	*Dormant*	TOTAL
Whippany Line	4	2	8	14
Dover & Rockaway Railroad	4	0	1	5
Chester Branch	1	3	1	5
High Bridge Branch	1	0	2	3
Total Current/Prospective Customer Base	**10**	**5**	**12**	**27**

Source: *Morristown & Erie Railway (as of Fall 2010)*

The M&E also provides service to customers without direct rail access through three transload, or team track, facilities – on the Whippany Line in Cedar Knolls, on the Dover & Rockaway Railroad in Rockaway, and on the High Bridge Branch in Kenvil. Morris County owns the Rockaway and Kenvil facilities, and is in the process of upgrading the Kenvil facility to allow for enhanced lumber transloading capabilities and added security at the site.

2.5.5 Abandoned Rail Rights-of-Way

There are several inactive rail alignments and abandoned rights-of-way shown as dashed lines in **Figure 2-6**. The history of these lines is tied to the ongoing changes that have occurred in Morris County as well as the nation as a whole over the years. The County has become increasingly suburbanized over time, with residential, office and commercial development supplanting much of the industrial base that once thrived here. The overall volume of freight originating in the county has declined with the activity related to mining, manufacturing and agricultural; these three sectors were major elements of the freight railroad market in this region over the years. Abandoned/inactive lines of interest in Morris County include the following:

- The **High Bridge Branch Extension** is the portion of the High Bridge Branch that extends from the southern terminus of the active High Bridge Branch in Bartley (see previous

subsection) down to the original junction of this branch with the old CNJ main line (now the NJ TRANSIT Raritan Valley Line) in High Bridge. This alignment now part of the Columbia Trail system operated jointly by Morris and Hunterdon Counties through a lease agreement with the Columbia Gas Company which owns the property and uses it as a pipeline right-of-way. The alignment is largely intact, with the exception of a small residential development in the village of Long Valley. The route also runs through the Lockwood Gorge Wildlife Area near Califon in Hunterdon County, and the Columbia Trail passes over the Raritan River in the Gorge on a pedestrian bridge built in place of the old CNJ railroad bridge.

- The **Lackawanna Cut-Off** was part of the old Delaware, Lackawanna & Western (DL&W) system, constructed in the early 20th century to replace the original southward-looping section of the old DL&W main line through Oxford, New Jersey. The alignment runs from Slateford Junction, Pennsylvania to Port Morris, New Jersey. The Cut-Off was an engineering marvel at the time of its construction, with extensive sections of cut and fill and large concrete viaducts designed to minimize curves, reduce grades, and eliminate grade crossings. Rail traffic on the line declined in the aftermath of the Erie-DL&W merger in 1960, and it was ultimately placed out of service by Conrail in 1979. The right-of-way is intact and is owned by the State of New Jersey; respective efforts by both New Jersey and Pennsylvania have resulted in the acquisition of a continuous alignment from Port Morris to Scranton, PA over this route. NJ TRANSIT is in the early stages of constructing an initial operating segment on this line as far west as Andover, with a full restoration of rail service all the way to Pennsylvania in the future.

- The **Wharton & Northern (W&N) Line** originally connected to the CNJ system at Lake Junction and looped northward and westward underneath the old DL&W main line (now the NJ TRANSIT Morristown Line) before running to the northeast across NJ-15 and through Picatinny Arsenal and connected to the NYS&W at Green Pond. The right-of-way for this line is still intact, though the tracks have been removed from most of the line.

- The NYS&W system includes a short industrial spur from Pompton Junction in Passaic County down into Riverdale. This was part of the old **Pompton Branch** that extended along the original New York & Greenwood Lake alignment from Wayne to Greenwood Lake. The Pompton Branch right-of-way is intact through Riverdale, Pequannock and Pompton Plains, but most of the alignment has been inactive for years. As indicated previously, the short segment of the alignment between Pompton Junction and the Morris Pipe & Supply Co. in Pompton Plains is still active. Morris County is in the process of developing the NYS&W Bicycle and Pedestrian Path along a 4.8 mile section of this alignment between Pequannock and NJ TRANSIT's Mountain View Station in Wayne.

There are a number of other small railroad alignments in the vicinity of Dover, Wharton and Lake Junction, most of which served industrial sites in this area and the mining region to the north. These include the Mount Hope Mineral Railroad, the Hibernia Mine Railroad, and the Lake Hopatcong Railroad. These lines were abandoned years ago, but there are some rights-of-way in that area that are still intact and might offer some potential for restoration if rail access to local industrial sites is needed.

2.6 Rail System – Other Infrastructure Issues

2.6.1 Height Restrictions

One of the important elements of the regional rail system that adversely affects freight rail service in Morris County is the limitation on the size of railcars moving to and from the County due to height restrictions on the freight lines. The NJ TRANSIT Morristown Line has several constraints to the east, where the maximum allowable railcar height is lower than to the west due to the catenary wires on the electrified section of track east of Dover. One challenge for Morris County as it pertains to this study is that some of the height restrictions relate to bridges or other overhead obstructions that are outside the County itself, which means the County would have to pursue any improvements related to these locations through other bodies (e.g., NJDOT, USDOT). The height clearance constraints for the rail lines in Morris County relative to standard North American railcar configurations are shown below in **Table 2-4**.

Table 2-4

Height Limits of Morristown Line by Railcar Type[9]

Rail Car Type / Access Route	*Car Height*	*Limits*
Plate B	15'-1"	
CSX Interchange Limit to/from the East		15'-5"
Plate C	15'-6"	
Plate E	15'-9"	
NS Interchange Limit to/from the West		16'-6"
Plate F	17'-0"	
Plate H	20'-2"	

Source: *Morristown & Erie Railway*

The immediate implications of the height restrictions listed in **Table 2-4** is that large portions of the North American railcar fleet cannot access the Morris County rail network, particularly from the east via the CSX system. Anything larger than a Plate B railcar cannot be moved to and from the east via CSX, while the NS system to the west cannot accommodate anything larger than a Plate E car. This is an important consideration that will become a more pressing concern over time. As older cars in the railcar fleet are replaced, newer cars are taller and therefore cannot be used to serve Morris County customers with these vertical constraints in place.

[9] Railcar types listed according to Association of American Railroad (AAR) railcar classifications.

An illustration of the impact of these constraints on the Morris County freight rail system can be found in data compiled by the American Association of Railroads for different types of railcars. According to the AAR's 2009 railcar fleet data, more than 75% of the nation's box car fleet is over 25 years of age. As these cars are retired, they are replaced by new box cars that are built to a Plate F standard, which requires 17'-0" of vertical clearance as indicated in **Table 2-4**. Similar issues exist for new center-beam flat cars used to haul lumber. In the future, this is likely to seriously diminish the railroad industry's ability to serve Morris County customers who use these types of cars.

Beyond the obvious constraints related to railcar size and the associated limitations on the quantities of freight that can be moved in a single carload, there is a potential added cost associated with a Class I railroad's need to serve this market with a dedicated fleet of railcars that meets these constraints. This is especially the case with lighter commodities which exceed a railcar's volume at a weight below the weight limit on the railroad system. This issue has been identified as one of the limiting factors in providing competitive freight rail service for Morris County.

2.6.2 Weight Restrictions

In addition to these height restrictions, railcar weight limits are also a limiting factor – in Morris County as well as much of the rest of New Jersey. The national standard for railcar weight limits has now reached 286,000 pounds, while the AMTRAK and NJ TRANSIT systems have a 263,000-lb. limit in place due to the lower weight requirements for passenger trains. Norfolk Southern's Washington Secondary, which links Morris County to the NS system to the west via Phillipsburg, is currently rated for 286,000-lb. railcars as far east as Hackettstown, but the NJ TRANSIT system east of there is rated for the lower weight. This is another issue that has been identified as a limiting factor for the railroad industry in the region, and upgrading bridges on the freight rail system to accommodate 286,000-lb. cars has recently been identified as one of the priority capital projects and initiatives for the State of New Jersey.[10] NJ TRANSIT, NJDOT and the freight railroads are currently engaged in an ongoing effort to determine the impacts of 286,000-lb. railcars on the rail network.

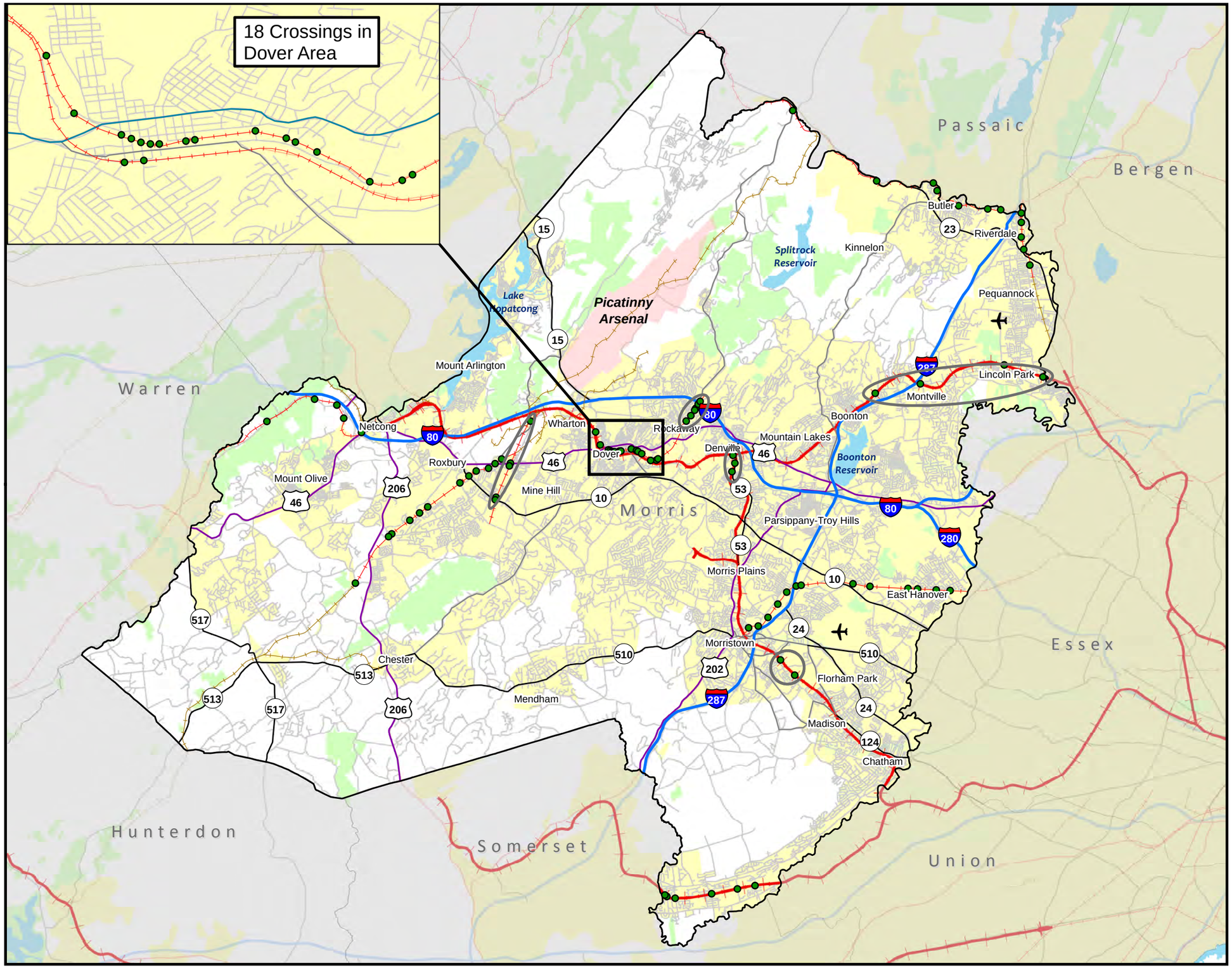
2.6.3 Highway-Railroad Grade Crossings

Highway-railroad grade crossings present a potential safety concern for motorists, though none of the accident data reviewed for this study and outlined in Section III of this document related to accidents at these crossings. The Morris County GIS resources included more than 90 grade crossing locations on active lines or inactive alignments adjacent to active lines, shown in **Figure 2-7**. While none of the crossings included in this data review represented an apparent safety concern at this time, there are several locations where current freight rail activity as well as any future growth in freight rail service in the County might present some challenges.

[10] Report of the Subcommittee on Transportation; NJDOT and NJ TRANSIT; 1/5/10.

Morris County, NJ Freight Plan

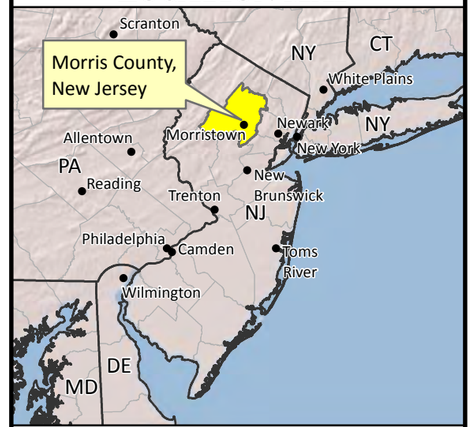
FIGURE 2-7
At-Grade Railroad Crossings



Scale (Miles)

2.5 1.25 0 2.5 5

LOCATION MAP



Eng-Wong, Taub & Associates

Gannett Fleming

4WARD PLANNING LLC

July 2011

Data Source:
Morris County GIS Inventory

N

One location in particular is the center of Dover where the D&R Branch runs at grade level through an older neighborhood of mixed residential and many of the industrial uses. Many of the industrial sites in this area have been undergoing a slow change to commercial development over the years. This location has been the subject of some study in recent years, and several options for potentially re-locating D&R Junction to a point further east on the Morristown Line. The current location of this junction west of Dover offers some operational advantages because it minimizes conflicts between freight and passenger trains on the line (NJ TRANSIT runs limited service west of Dover). However, a potential relocation of this junction to a point east of Dover would eliminate community impacts in the neighborhood where the line now runs, while at the same time offering an opportunity for the development of a linear park along the right-of-way. This issue will be examined in more detail in Section 5.3.4 of this report.

Additional grade crossings that may warrant further study in the future are the four points in Roxbury Township where the Chester and High Bridge Branches cross US-46 and NJ-10. These crossings have adequate protection measures for the low frequency of rail traffic they handle and the small number of railcars that are moved on these lines at any given time. These crossings may require some additional study in the future if the train frequency and/or train lengths increase substantially to the point where traffic on these busy roads is blocked for extended periods.

2.7 Commodity Flow Data

A review of county-level commodity flow data that had been compiled previously by outside agencies was conducted for this study. Freight data tends to be updated less frequently than other traffic data, and the most recent county-level data available was from the NJDOT 2003 TRANSEARCH® Freight Profiles.[11] More recent information – including forecasts for future horizon years – was reviewed from the Freight Analysis Framework (FAF^2) data compiled by the FHWA's Office of Freight Management and Operations. This data, however, is aggregated on a metro-area geographic level[12] and does not lend itself well to county-level summarization.

The 2003 NJDOT data for Morris County indicated total freight flows in excess of 23 million tons – including about 14.5 million tons inbound, 8 million tons outbound, and nearly 250,000 tons moved internally in the county. Of this total freight volume less than 1% (217,000 tons) was moved by rail, with the remaining 99% moved by truck. This accurately reflects the freight "landscape" of Morris County, in which the freight railroads serve a small number of customers that deliver and receive few carloads at a time on branch lines. The absence of a major rail-oriented freight generator in the county, such as Port Newark/Elizabeth or the petrochemical industries on the Chemical Coast Line, also diminishes the rail mode share for Morris County freight.

Among inbound freight shipments to Morris County, the top five commodities were Secondary Traffic[13] (7.6 million tons, representing 52.6% of the total tonnage in Morris County), Petroleum

[11] The *Morris County 2003 TRANSEARCH® Freight Profile*, compiled by Cambridge Systematics for NJDOT, was used as the primary county-level freight data resource for this effort.

[12] The geographic breakdown of FAF data is based on the 126 Combined Statistical Areas (CSAs) as defined by the United States Office of Management and Budget.

[13] Rail shipments involving additional non-rail moves at one or both ends of the trip; primarily intermodal freight.

and Coal Products (1.3 million tons, representing more than 9% of the total tonnage in the County), Food or Kindred Products (1.3 million tons, or about 9% of the total tonnage), Clay/Concrete/Glass/Stone (1.1 million tons, or nearly 8% of the tonnage), and Chemical or Allied Products[14] (about 630,000 tons, or 4.3% of the total freight volume in Morris County).

For outbound freight shipments from Morris County, the top five commodities were Secondary Traffic (2.4 million tons, representing nearly 30% of the total tonnage from Morris County), Clay/Concrete/Glass/Stone (1.4 million tons, or 17.5% of the volume originating in the County), Chemical or Allied Products (more than 1.3 million tons, or nearly 17% of the total freight volume from Morris County), Petroleum or Coal Products (more than 830,000 tons, 10.4%), and Food or Kindred Products (nearly 570,000 tons, 7.1%).

Regional geographic summaries illustrating the volume of freight moving to and from Morris County from various trading regions are shown in **Tables 2-5** and **2-6**.

Table 2-5

Morris County Freight Volumes by Trading Region

Trading Region	*Total Tonnage*	*Pct.*
New Jersey	12,773,471	56.73%
New York	2,076,540	9.22%
Pennsylvania	1,947,482	8.65%
West Central U.S. (IA, KS, MN, MO, ND, NE, SD)	1,590,190	7.06%
South Atlantic (DC, southern DE, FL, GA, MD, NC, SC, VA, WV)	1,350,191	6.00%
East Central (AL, IL, IN, KY, MI, MS, OH, TN, WI)	1,191,433	5.29%
New England (CT, MA, ME, NH, RI, VT)	931,391	4.14%
Pacific U.S. (AK, CA, HI, OR, WA)	414,910	1.84%
Mountain U.S. (AZ, CO, ID, MT, NM, NV, UT, WY)	141,727	0.63%
Delaware (northern)	93,790	0.42%
Canada (All Canadian Provinces)	6,840	0.03%
Total	**22,517,965**	**100.00%**

Source: NJDOT Morris County 2003 TRANSEARCH® Freight Profile*, compiled by Cambridge Systematics*

[14] Includes raw materials and products in other related industries that are used in chemical manufacturing.

Table 2-6

Morris County Inbound/Outbound Volumes by Trading Region

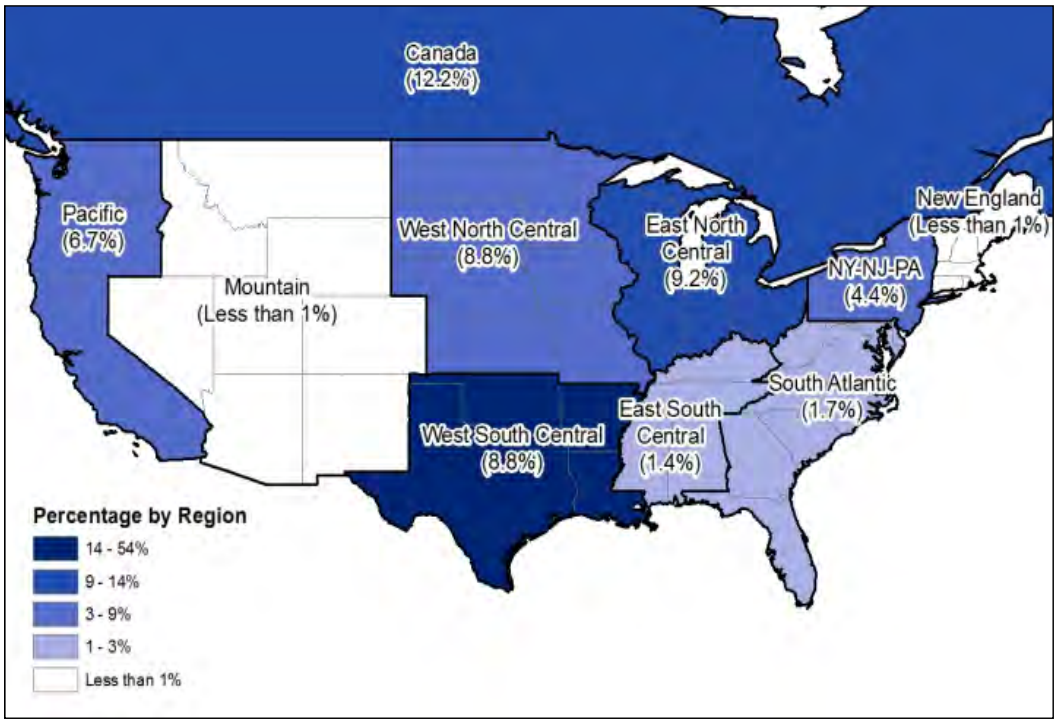
Trading Region	*Total Tonnage*	*Inbound Tons*	*Pct. of Total*	*Outbound Tons*	*Pct. of Total*
New Jersey	12,773,471	8,958,131	70.1%	3,815,341	29.9%
Delaware	93,790	76,613	81.7%	17,177	18.3%
Pennsylvania	1,947,482	1,344,578	69.0%	602,904	31.0%
New York	2,076,540	626,891	30.2%	1,449,649	69.8%
New England	931,391	279,836	30.0%	651,555	70.0%
South Atlantic U.S.	1,350,191	797,607	59.1%	551,584	40.9%
East Central U.S.	1,191,433	743,134	62.4%	448,299	37.6%
West Central U.S.	1,590,190	1,262,029	79.4%	328,161	20.6%
Mountain U.S.	141,727	108,131	76.3%	33,594	23.7%
Pacific U.S.	414,910	315,341	76.0%	99,570	24.0%
Canada (All Canadian Provinces)	6,840	6,840	100.0%	0	0.0%
Total	**22,517,965**	**14,519,131**	**64.5%**	**7,997,834**	**35.5%**

Source: NJDOT Morris County 2003 TRANSEARCH® Freight Profile*, compiled by Cambridge Systematics*

The 65%-35% inbound/outbound split shown above in **Table 2-6** is typical for a consumer-based regional market where industrial production represents a diminishing share of the overall freight that is being shipped. This is also reflected in the two regions for which Morris County's *outbound* freight volume share exceeds this 65% threshold – New York and New England (Morris County has a 30%-70% inbound/outbound split for freight moving to and from both of these regions). This means that those two regions are more heavily consumer-oriented than Morris County is, at least as it pertains to freight that is shipped between the regions.

One item of note in **Table 2-5** is that Morris County's trading activity with those regions in closest proximity to it (including New Jersey, New York, Pennsylvania and New England) represent nearly 80% of the total freight tonnage shipped to and from the County. This is an indication of just how difficult it is for freight railroads to capture a sizeable mode share in Morris County, since these trading regions are located within a distance where railroads cannot compete effectively with trucking for most types of freight.

Figure 2-8: M&E Trading Regions (2004-2010)



An illustration of trading regions for rail shipments to M&E customers from 2004 through mid-2010 is shown above in **Figure 2-8**. The M&E data indicate that approximately 90% of the railcar loads handled by the M&E in Morris County originated in Texas, the West Coast, Canada and the Midwest.

3.0 Economic Analyses

3.1 Analysis of Industrial Employment Trends

3.1.1 Methodology

In identifying freight industry conditions within Morris County, the consultant team conducted a comparative analysis of specified industry trends for three geographic levels: (1) Morris County, (2) the State of New Jersey (NJ); and (3) the New York-Northern New Jersey-Long Island Metropolitan Statistical Area (MSA). Quantitative techniques appropriate for assessing urbanized and rural areas having redevelopment potential were employed utilizing data from several sources, each having its own strengths for this analysis. Real 2007 to 2009 labor and industry market data were collected from the NJ Department of Labor and Workforce Development's (NJLWD) Quarterly Census of Employment and Wages (QCEW). These data are collected and disseminated from the quarterly tax returns of the universe of establishments in the State.

Ten-year projections from 2006 to 2016 come from the NJLWD's Current Employment Statistics (CES). CES data are based on a sample of establishments and are considered the most up-to-date. They are collected by MSA or Metropolitan Division; QCEW data are used to break down CES estimates into smaller geographies (e.g., counties) for projection purposes. Due to the difference in sampling and collection methodologies, the CES estimates for 2006 employment differ from the QCEW data and therefore are not directly comparable to one another.

Data from the US Census Bureau's Quarterly Workforce Indicators (QWI) are collected by the NJ State Data Center and are household-based (as opposed to the establishment-based QCEW and CES data). They are used here for 2007 to 2009 MSA labor and employment trends as well as the location quotient (LQ), hiring trends, and earnings trends analyses.

The methodology used in this effort is known as the Location Quotient (LQ) Analysis. This is the most commonly utilized economic base analysis method. It was developed in part to offer a slightly more complex model among the variety of analytical tools available to economic base analysts. This technique compares the local economy to a reference economy to identify specializations in the local economy. The location quotient technique is based upon a calculated ratio between the local economy and the economy of some reference unit. If an industry has a greater share than expected of a given industry, then that "extra" industry employment is assumed to be jobs above and beyond what a local economy should have to serve local needs.[15]

Data were collected and analyzed for freight-related North American Industry Classification System (NAICS) sectors, specifically manufacturing and transportation/warehousing. As the two largest manufacturing sub-sector employers in Morris County, chemical manufacturing (which includes employment in the lucrative pharmaceutical sector) and computer/electronics manufacturing were

[15] Suppose, for example, that a local economy has 5% of its workforce in computer manufacturing and the national economy has only 0.05% of its workforce in this sector. The LQ technique assumes that the local economy would have this same 0.05% of its workers in the computer manufacturing industry to serve its local needs. Any employment over and above the expected share (0.05% in this case) is therefore considered to consist of basic sector jobs because these workers are assumed to be exporting their goods and services to non-local areas.

also included in the analysis. In addition, the truck transportation and warehousing and storage sub-sectors were highlighted from within the transportation/warehousing sector because of their heavy reliance on freight corridors.

Based on the availability of complete data sets, a three-year span from the end of the fourth quarter 2007 to the end of the fourth quarter 2009 served as the principal period in which the majority of data trends were examined. Ten-year employment projections from 2006 to 2016 are also analyzed.

3.1.2 Industrial Trend Analysis – Employment

Employment Trends in the County, State and MSA for the key freight-related industries are shown in **Tables 3-1A** and **3-1B**. **Table 3-1A** shows short-term trends from 2007 to 2009 using data from the NJ DOL's QCEW, while **Table 3-1B** shows the ten-year projection from 2006 to 2016 as estimated by the CES.

Table 3-1A

Industry Employment Trends (End-of-Q4 Employment)

							Percent Change
	2007		2008		2009		2007-09
All NAICS Sectors	288,944	100.00%	288,179	100.00%	283,028	100.00%	-2.09%
All Manufacturing	29,968	10.37%	30,353	10.53%	27,809	9.83%	-7.77%
Chemical Manufacturing	12,306	4.26%	12,137	4.21%	11,439	4.04%	-7.58%
Comp. & Elec. Manufacturing	3,133	1.08%	3,160	1.10%	3,217	1.14%	2.61%
All Transportation and Warehousing	9,397	3.25%	9,196	3.19%	8,231	2.91%	-14.16%
Truck Transportation	1,789	0.62%	1,695	0.59%	1,426	0.50%	-25.52%
Warehousing and Storage	1,154	0.40%	1,129	0.39%	1,180	0.42%	2.20%
							Percent Change
	2007		2008		2009		2007-09
All NAICS Sectors	3,339,055	100.00%	3,351,080	100.00%	3,434,598	100.00%	2.78%
All Manufacturing	336,123	10.07%	322,730	9.63%	302,405	8.80%	-11.15%
Chemical Manufacturing	81,852	2.45%	77,111	2.30%	68,643	2.00%	-19.24%
Comp. & Elec. Manufacturing	33,030	0.99%	32,512	0.97%	31,835	0.93%	-3.76%
All Transportation and Warehousing	155,331	4.65%	159,412	4.76%	154,138	4.49%	-0.77%
Truck Transportation	40,085	1.20%	37,920	1.13%	36,225	1.05%	-10.65%
Warehousing and Storage	26,526	0.79%	27,859	0.83%	28,306	0.82%	6.29%
							Percent Change
	2007		2008		2009		2007-09
All NAICS Sectors	2,847,815	100.00%	2,854,308	100.00%	2,813,872	100.00%	-1.21%
All Manufacturing	254,866	8.95%	243,546	8.53%	225,343	8.01%	-13.10%
All Transportation and Warehousing	133,597	4.69%	139,076	4.87%	134,893	4.79%	0.96%

Source: US Census Bureau; QWI; 4ward Planning, 2010

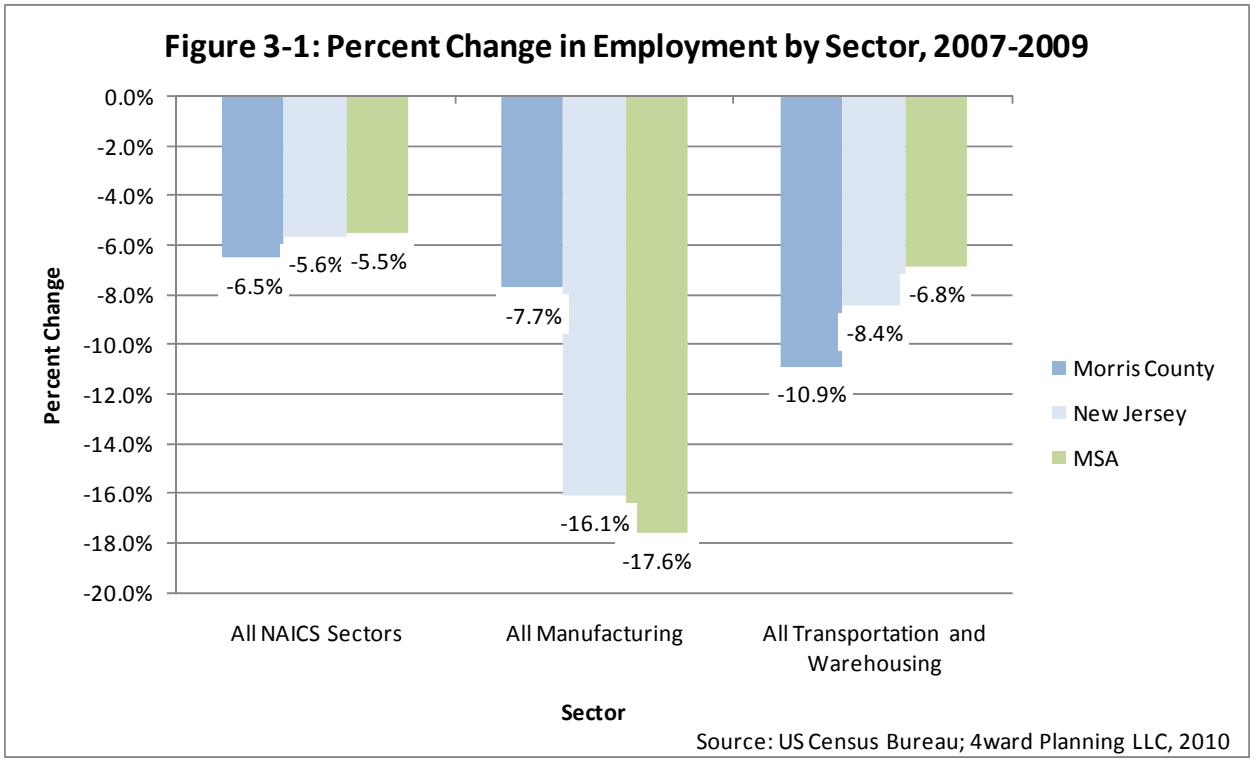
Table 3-1B

Current Employment Statistics: Industry Employment Projections 2006-2016

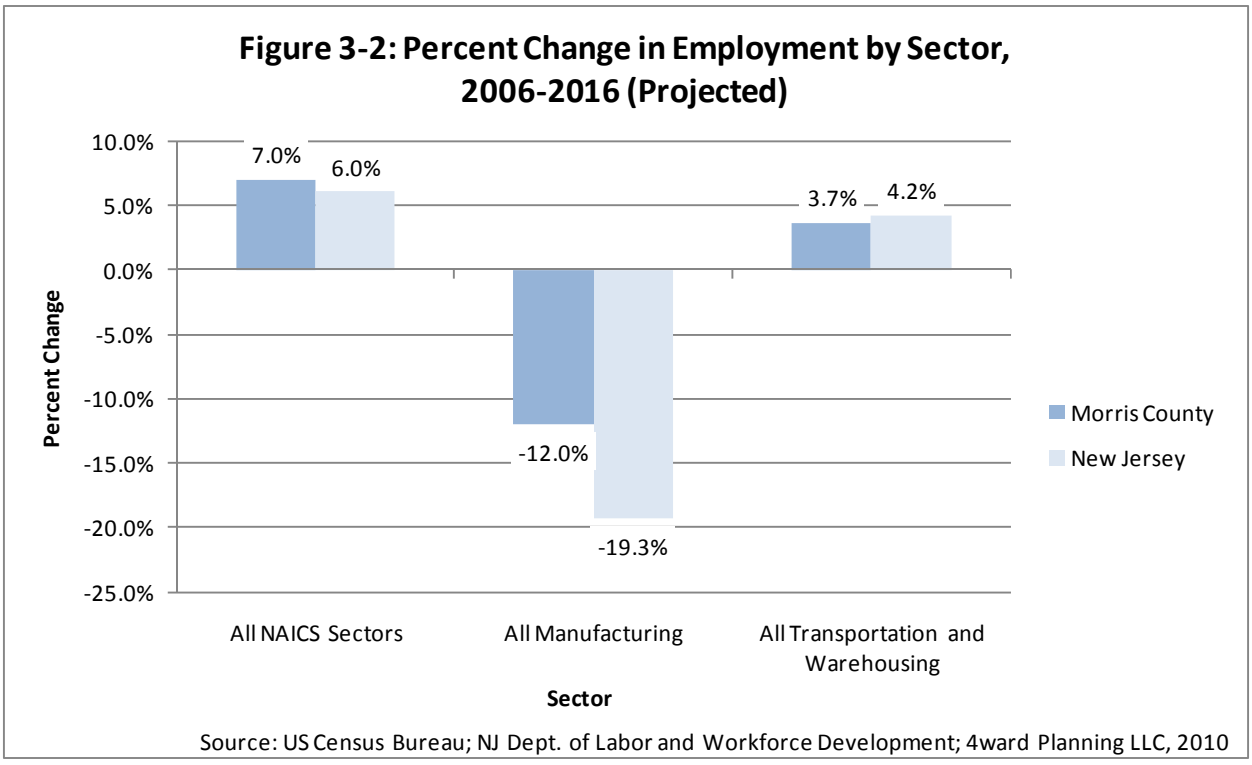
Morris County					Percent Change
	2006 (estimated)		2016 (projected)		2006-2016
All NAICS Sectors	337,100	100.00%	360,700	100.00%	7.00%
All Manufacturing	27,500	8.16%	24,200	6.71%	-12.00%
Chemical Manufacturing	9,850	2.92%	9,600	2.66%	-2.54%
Comp. & Elec. Manufacturing	3,150	0.93%	2,650	0.73%	-15.87%
All Transportation and Warehousing	9,450	2.80%	9,800	2.72%	3.70%
Truck Transportation	1,700	0.50%	1,850	0.51%	8.82%
Warehousing and Storage	1,250	0.37%	1,350	0.37%	8.00%
New Jersey					**Percent Change**
	2006 (estimated)		2016 (projected)		2006-2016
All NAICS Sectors	4,387,800	100.00%	4,653,150	100.00%	6.05%
All Manufacturing	323,900	7.38%	261,400	5.62%	-19.30%
Chemical Manufacturing	70,900	1.62%	64,200	1.38%	-9.45%
Comp. & Elec. Manufacturing	31,900	0.73%	25,800	0.55%	-19.12%
All Transportation and Warehousing	162,700	3.71%	169,600	3.64%	4.24%
Truck Transportation	40,400	0.92%	41,000	0.88%	1.49%
Warehousing and Storage	27,500	0.63%	28,400	0.61%	3.27%

Source: Current Employment Statistics, NJ. Dept. of Labor & Workforce Development; 4ward Planning, 2010

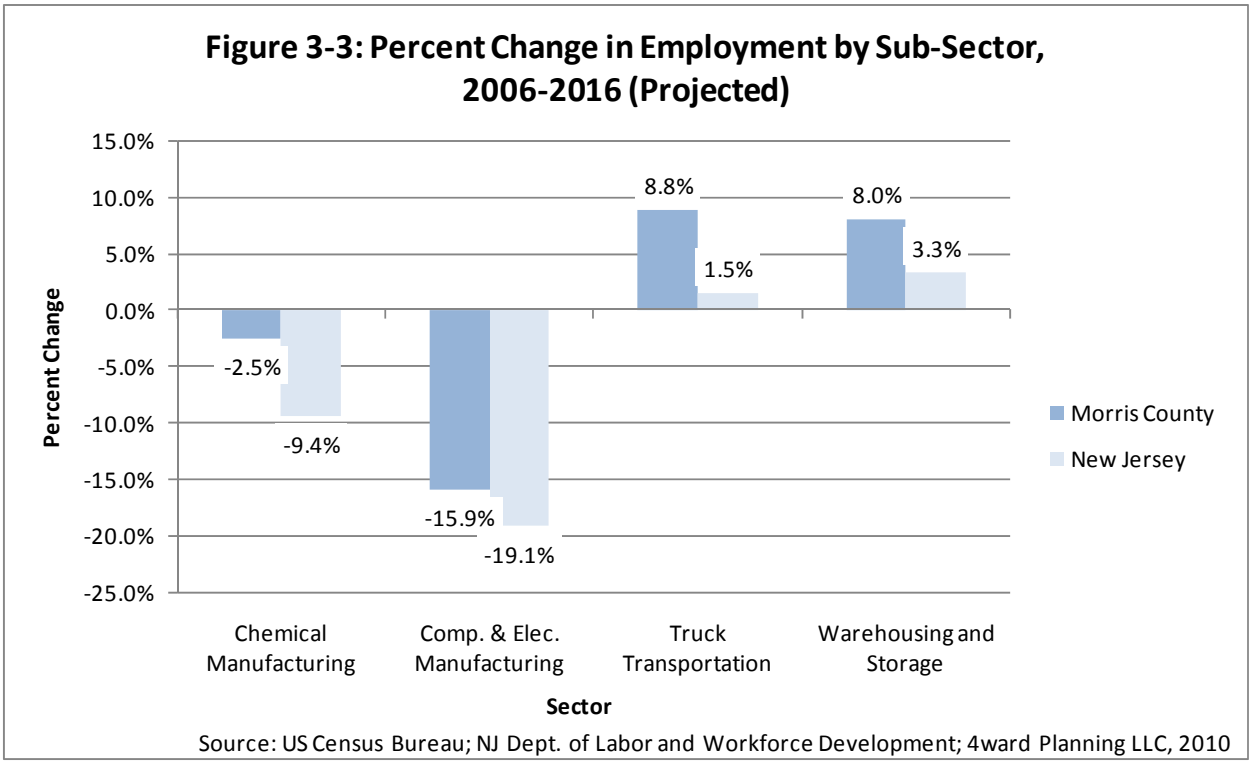
The information in **Figure 3-1** further demonstrates real employment change from the end of 2007 to the end of 2009. Over this period the state and the MSA experienced similar declines in overall employment numbers (-5.63% and -5.50%, respectively) while Morris County lost a slightly greater share (-6.50%). Morris County did not experience the same level of decline in manufacturing sector employment (-7.71% in Morris County versus -16.07% in New Jersey and -17.59% in the MSA). On the other hand, Morris County realized a sharper decrease in transportation and warehousing sector employment over this period (-10.88%) than did the state (-8.41%) or the MSA (-6.82%).



As demonstrated in **Figures 3-2** and **3-3**, Morris County is projected to realize an overall (all NAICS Sectors) employment increase (7.00%) from the average quarterly year 2006 to 2016. This increase is projected to be more robust than for the state which should see an increase of about 6.05%. Compared to the State, the DOL projects smaller losses in overall manufacturing jobs (-12.00% to -19.30%) as well as in the chemical and computer/electronics manufacturing subsectors.



Source: US Census Bureau; NJ Dept. of Labor and Workforce Development; 4ward Planning LLC, 2010

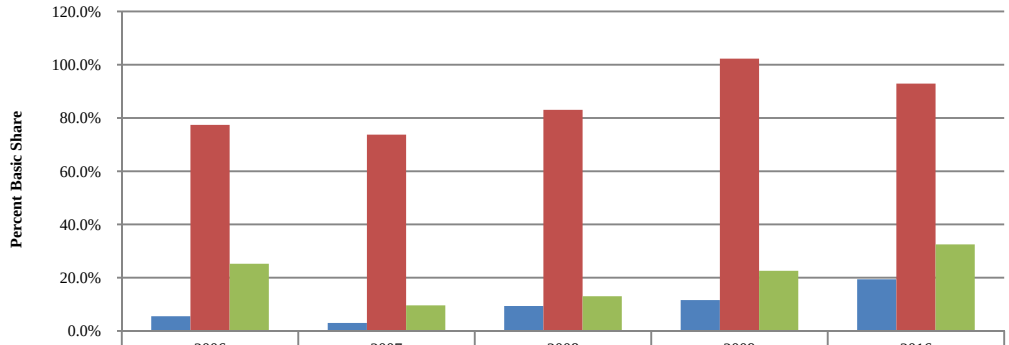


Source: US Census Bureau; NJ Dept. of Labor and Workforce Development; 4ward Planning LLC, 2010

At the same time, the County should experience slightly lesser gains in the transportation and warehousing sector (3.70% to 4.20%). Despite the overall sector lagging the state, however, the truck transportation and warehousing and storage subsectors should grow at a healthier rate in Morris County (8.82% and 8.00%, respectively) than statewide (1.49% and 3.27%), suggesting larger gains in other transportation and warehousing subsectors for the state. While the County is expected to outperform the State of New Jersey in these subsectors, it is important to note that these subsectors are relatively small in Morris County, so slight changes in nominal employment may appear more significant in terms of growth percentage.

Despite generally downward trends in employment from 2007 to 2009, Morris County is still a relatively strong manufacturing employer. Based on the location quotient analysis for this region, it has been determined that Morris County has a larger share of manufacturing employees than expected compared to State manufacturing employment levels. As illustrated in **Figure 3-4**, Morris County consistently exceeds its relative manufacturing employment share by 5.5% in the quarterly average ending in the first quarter of 2006, 3.0% in the quarterly average ending in the first quarter of 2007, 9.4% in the quarterly average ending in the first quarter of 2008, 11.6% in the quarterly average ending in the first quarter of 2009, and projected to be 19.4% by 2016. This trend is even more prominent for chemical manufacturing where Morris County employs 73% to more than 100% of its expected share in the same period. This trend continues, although to a lesser extent, in the computer and electronics manufacturing subsector where Morris County is expected to peak at 32.5% over relative state employment share by 2016.

Figure 3-4: Morris County Average Quarterly Basic Employment Share by Sector, 2005Q2 - 2009Q1 and 2016
(Morris County vs. State of New Jersey)

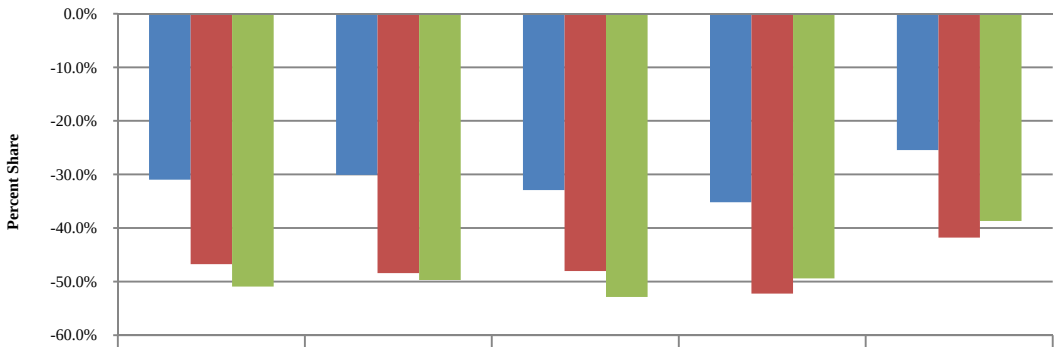


	2006	2007	2008	2009	2016
Manufacturing	5.5%	3.0%	9.4%	11.6%	19.4%
Chemical Manufacturing	77.4%	73.7%	83.0%	102.2%	92.9%
Computer & Electronics Manufacturing	25.3%	9.6%	13.0%	22.6%	32.5%

Source: US Census Bureau, 4ward Planning, 2010

Conversely, Morris County does not fare as well in the transportation sector where employment is considered "non-basic" (i.e., Morris County's relative share of jobs is less than expected relative to State employment levels over the same period). As illustrated in **Figure 3-5**, Morris County consistently fails to meet its relative transportation employment share by -31.0% in the quarterly average ending in the first quarter of 2006, -30.1% in the quarterly average ending in the first quarter of 2007, -32.9% in the quarterly average ending in the first quarter of 2008, -35.2% in the quarterly average ending in the first quarter of 2009 and -25.5% (projected) by 2016. The trend illustrated in this period continues when looking at the truck transportation and warehousing and storage sub-sectors over the same period.

Figure 3-5: Morris County Average Quarterly Non-Basic Employment Share, 2005Q2-2009Q1 & 2016 (Morris County vs. State of New Jersey)



	2006	2007	2008	2009	2016
Transportation and Warehousing	-31.0%	-30.1%	-32.9%	-35.2%	-25.5%
Truck Transportation	-46.8%	-48.4%	-48.0%	-52.2%	-41.8%
Warehousing and Storage	-50.9%	-49.7%	-52.9%	-49.4%	-38.7%

Source: US Census Bureau, 4ward Planning, 2010

3.1.3 Industrial Trend Analysis – Hiring

Trends in new hires in any given industry might be expected to follow a pattern similar to "existing" employment trends, but this is not always the case. New hiring trends for Morris County, as illustrated in **Table 3-2** indicate that Morris County generally fares better than its State or MSA counterparts.

Figure 3-6 further details Morris County's new hiring performance. From the second quarter 2005 to the first quarter 2009, Morris County realized less significant declines in new hires over all sectors (-13.67% compared to the State at -19.24% and MSA at -19.33%) and in the manufacturing super-sector (-29.21% compared to the State of New Jersey at -31.71% and the MSA at -32.03%). Morris County was the only studied geography to realize a gain in new hires over the same period in chemical manufacturing (+11.06%), the transportation and warehousing super-sector (+27.14%) and in the warehousing and storage sub-sector (+6.98%). Morris County, however, did not fare as well as the State of New Jersey in computer and electronics manufacturing (-45.55% compared to -22.14%) or in truck transportation (-50.34% compared to -33.19%).

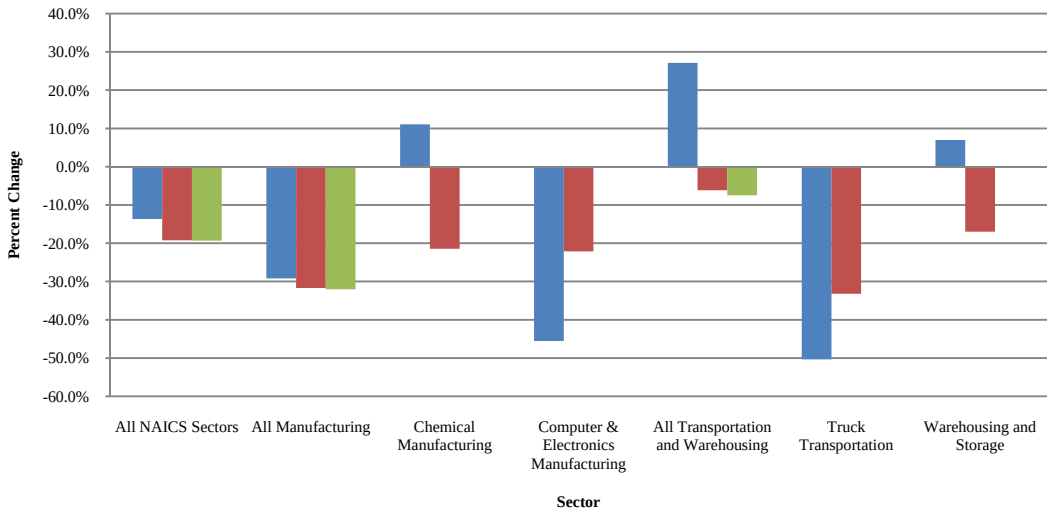
Table 3-2

Industry New Hire Trends (Average Quarterly New Hires 2005Q3-2009Q1)

	Morris County								Percent Change
	2006		2007		2008		2009		2006-09
All NAICS Sectors	39,488	100.00%	40,348	100.00%	38,853	100.00%	34,091	100.00%	-13.67%
All Manufacturing	1,950	4.94%	1,965	4.87%	1,881	4.84%	1,380	4.05%	-29.21%
Chemical Manufacturing	477	1.21%	631	1.56%	444	1.14%	530	1.55%	11.06%
Comp. & Elec. Manufacturing	228	0.58%	189	0.47%	198	0.51%	124	0.36%	-45.55%
All Transportation and Warehousing	1,539	3.90%	1,468	3.64%	1,320	3.40%	1,956	5.74%	27.14%
Truck Transportation	331	0.84%	295	0.73%	279	0.72%	164	0.48%	-50.34%
Warehousing and Storage	140	0.35%	116	0.29%	163	0.42%	150	0.44%	6.98%
	New Jersey								**Percent Change**
	2006		2007		2008		2009		2006-09
All NAICS Sectors	588,631	100.00%	571,563	100.00%	560,012	100.00%	475,363	100.00%	-19.24%
All Manufacturing	30,541	5.19%	28,033	4.90%	25,489	4.55%	20,855	4.39%	-31.71%
Chemical Manufacturing	4,546	0.77%	4,422	0.77%	3,699	0.66%	3,570	0.75%	-21.47%
Comp. & Elec. Manufacturing	2,050	0.35%	1,992	0.35%	1,851	0.33%	1,596	0.34%	-22.14%
All Transportation and Warehousing	24,008	4.08%	22,750	3.98%	22,260	3.97%	22,530	4.74%	-6.16%
Truck Transportation	6,436	1.09%	5,959	1.04%	5,412	0.97%	4,300	0.90%	-33.19%
Warehousing and Storage	3,582	0.61%	3,767	0.66%	3,699	0.66%	2,973	0.63%	-16.99%
	MSA								**Percent Change**
	2006		2007		2008		2009		2006-09
All NAICS Sectors	445,440	100.00%	435,458	100.00%	427,003	100.00%	359,359	100.00%	-19.33%
All Manufacturing	22,545	5.06%	20,731	4.76%	18,780	4.40%	15,324	4.26%	-32.03%
All Transportation and Warehousing	19,594	4.40%	19,334	4.44%	18,136	4.25%	18,124	5.04%	-7.50%

Source: US Census Bureau; QWI; 4ward Planning, 2010

Figure 3-6: Percent Change in New Hires by Sector, 2005Q2-2009Q1



Source: US Census Bureau, 4ward Planning 2010

3.1.4 Industrial Trend Analysis – Earnings

Earnings trends for key freight-related industries in the County, State and MSA are shown in **Table 3-3**.

All geographies, with few exceptions, realized earnings increases across all sectors and time periods. While all geographic regions grew at a consistent rate overall (across all NAICS sectors) from the second quarter of 2005 to the first quarter of 2009, Morris County out-performed the State and MSA (as applicable) in all observed sectors except computer/electronics manufacturing over the same period (see **Figure 3-7**). Moreover, Morris County employee average earnings are generally higher than their counterparts' average earnings in all industries and over all periods, with the exception again of computer/electronics manufacturing. As expected, chemical manufacturing seems to be faring best among the freight-related industries with regard to earnings. Chemical manufacturing had the greatest proportional gain in earnings from the second quarter of 2005 to the first quarter of 2009 (20.8%) and the highest average monthly salary of all observed sectors ($12,985.25 in 2009), as well as in its comparative earnings to the State (138.4% of the State average).

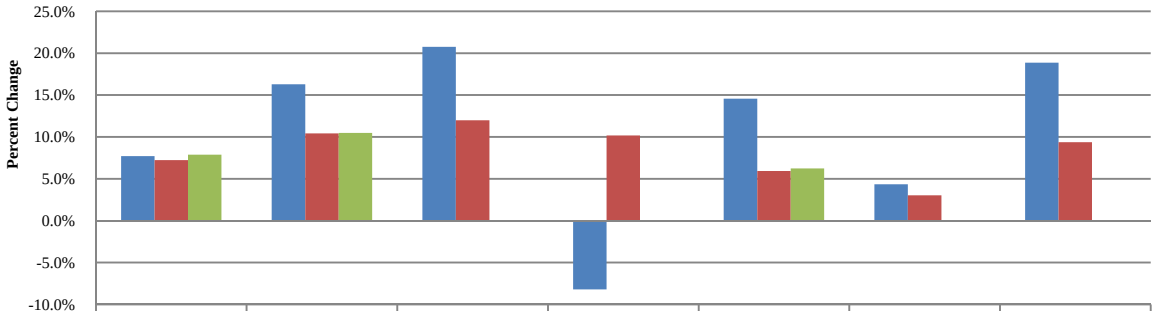
Table 3-3

Industry Earnings Trends (Average Monthly Earnings 2005Q2-2009Q1)

	Morris County								Percent Change
	2006		2007		2008		2009		2006-09
All Industry Sectors	5,282	100.00%	5,492	100.00%	5,633	100.00%	5,689	100.00%	7.71%
All Manufacturing	7,299	138.19%	7,855	143.03%	8,163	144.92%	8,488	149.20%	16.29%
Chemical Manufacturing	10,753	203.59%	11,893	216.57%	12,412	220.35%	12,985	228.25%	20.76%
Comp. & Elec. Manufacturing	6,348	120.18%	5,923	107.85%	5,978	106.13%	5,826	102.41%	-8.21%
All Transportation and Warehousing	3,818	72.28%	3,956	72.03%	4,243	75.32%	4,374	76.88%	14.56%
Truck Transportation	4,104	77.70%	4,116	74.95%	4,335	76.95%	4,282	75.27%	4.35%
Warehousing and Storage	4,445	84.15%	4,843	88.19%	5,445	96.67%	5,283	92.86%	18.86%
	New Jersey								**Percent Change**
	2006		**2007**		**2008**		**2009**		**2006-09**
All NAICS Sectors	4,375	100.00%	4,556	100.00%	4,711	100.00%	4,691	100.00%	7.23%
All Manufacturing	5,415	123.77%	5,785	126.99%	5,966	126.65%	5,979	127.45%	10.42%
Chemical Manufacturing	8,378	191.51%	9,136	200.54%	9,326	197.97%	9,382	200.01%	11.99%
Comp. & Elec. Manufacturing	6,068	138.71%	6,417	140.87%	6,536	138.76%	6,685	142.50%	10.16%
All Transportation and Warehousing	3,700	84.57%	3,786	83.10%	3,884	82.45%	3,919	83.55%	5.93%
Truck Transportation	3,974	90.84%	4,083	89.62%	4,182	88.79%	4,094	87.27%	3.02%
Warehousing and Storage	3,820	87.31%	3,896	85.52%	4,101	87.06%	4,177	89.05%	9.37%
	MSA								**Percent Change**
	2006		**2007**		**2008**		**2009**		**2006-09**
All NAICS Sectors	4,523	100.00%	4,720	100.00%	4,876	100.00%	4,879	100.00%	7.88%
All Manufacturing	5,618	124.20%	6,084	128.90%	6,256	128.30%	6,207	127.21%	10.48%
All Transportation and Warehousing	3,845	85.00%	3,919	83.03%	4,064	83.35%	4,085	83.72%	6.24%

Source: US Census Bureau; QWI; 4ward Planning, 2010

Figure 3-7: Percent Change in Average Quarterly Earnings by Sector, 2005Q2-2009Q1



	All Industry Sectors	All Manufacturing	Chemical Manufacturing	Comp. & Elec. Manufacturing	All Transportation and Warehousing	Truck Transportation	Warehousing and Storage
Morris County	7.7%	16.3%	20.8%	-8.2%	14.6%	4.3%	18.9%
New Jersey	7.2%	10.4%	12.0%	10.2%	5.9%	3.0%	9.4%
MSA	7.9%	10.5%			6.2%		

Source: US Census Bureau, 4ward Planning 2010

3.1.5 Industrial Trend Analysis – Summary

Of all the freight-related industries examined, manufacturing – and chemical manufacturing in particular – is the strongest sector within Morris County. Services and capital investments should be targeted to projects that support and enhance this industry sector. Given the anticipation for warehousing and storage employment gains (based on 2016 projection data), a logical planning approach moving forward would include strategies and incentives to encourage warehouse businesses that compliment the County's major manufacturing industry, thus reducing transportation needs and costs. This basic approach will be expanded and enhanced in Section 5 of this study.

3.2 Economic Impact Analysis

3.2.1 Methodology

Economic impact analysis involves the application of final demand changes to a predictive economic input-output model, and then analysis of the resulting changes in the economy under study. More concisely, an impact analysis is an assessment of change in overall economic activity as a result of some change in one or more economic activities.

Economic impacts, whether related to employment or industrial/service output, are typically referenced as *direct*, *indirect* and *induced*. Direct impacts represent the total employment or financial investment made by a firm or government institution (i.e., the start of the impact chain). Indirect impacts reflect secondary activity that results from direct impacts, and are estimated within the impact model by location-specific multipliers. These multipliers are based on regional purchase coefficients and the economic and demographic metrics associated with the region for a given time period (the analysis for Morris County was done using 2008 county-level data). Induced impacts refer to expenditures and

employment created by area households that benefit from the direct and indirect impacts. This reflects the additional economic activity by area residents who are employed directly or indirectly by the industries in this analysis, and who will tend to spend some or most of their income within the study area. In this analysis, the estimated direct, indirect and induced impacts are analyzed for the year 2009.

The basic categories for which these economic impacts are measured include *employment*, *output* and *value added*. These are defined as follows:

- Employment includes both full- and part-time jobs created, presented in full-time-equivalencies (i.e., an employment estimate of 100 can mean, in real terms, 100 full-time workers or 200 half-time workers).
- Output represents the value of industry production. These are annual production estimates for the year of the data set and are measured as producer prices. For manufacturers this would be sales plus or minus change in inventory. For service sector industries, production is simply the total sales. For retail and wholesale trade, output is measured as gross margin and not gross sales.
- Value Added represented the difference between the total output of an industry or business establishment and the cost of its intermediate inputs. It equals gross output (sales or receipts and other operating income, plus inventory change) minus intermediate inputs (consumption of goods and services purchased from other industries or imported). Value Added consists of compensation of employees, taxes on production and imports less subsidies, and gross operating surplus. Gross value added is the value of output less the value of intermediate consumption; it is a measure of the contribution to GDP made by an individual producer, industry or sector.

The economic analysis for Morris County was performed using IMPLAN Professional 3.0, a widely-used economic impact assessment software system. IMPLAN is designed to simplify and expedite input-output (I-O) accounting processes for the industries and consumers included in the analysis, reflecting commodity flows from producers to intermediaries to final consumers and all related multipliers associated with output and employment for the study area.

The economic impacts associated with the key freight-related industries in Morris County (manufacturing and transportation/warehousing) are based on the 2008 Morris County Economic and Demographic data set for IMPLAN. These data files, once processed within the IMPLAN Professional 3.0 software, provide for the creation of a detailed Social Accounting Matrix (SAM) and location-specific multipliers for the study area.

Quarterly Workforce Indicator (QWI) data, collected via the QWI Online database tool available through the U.S. Census Bureau, provided estimates of direct employment within the Chemical Manufacturing, Computer & Electronic Manufacturing, Warehousing and Storage, and Truck Transportation industries for the year 2009. Using this employment within the IMPLAN I-O model, estimates were calculated of the related indirect and induced employment, as well as the direct, indirect and induced economic output associated with these industry activities. Data collected via QWI Online also provided estimates of the average annual earnings and hourly wages for jobs within these industries.

The figures summarized in Section 3.2.2 are in 2010 dollars.

3.2.2 Economic Analysis Results

The results of the IMPLAN analysis for key freight-related industries in Morris County are summarized below and detailed in **Tables 3-4** and **3-5**.

- The Chemical Manufacturing, Computer & Electronic Manufacturing, Warehousing and Storage, and Truck Transportation subsectors had a total direct employment in Morris County of 17,262 people in 2009. Most direct employment was in the Chemical Manufacturing subsector, followed by Computer & Electronic Manufacturing. Combined, these industry subsectors employ nearly 55,000 people, which represents more than 17% of the County's total employment base.
- All of these industries contributed to the indirect employment (jobs in the supply chains of these industries) of 19,883 people in the County. In addition, these industries contributed to the induced employment (jobs supported by household spending) of 17,595 people.
- Total direct, indirect and induced employment for these industries totaled 54,740 jobs in 2009.
- These industries produced a combined $17.9 billion in direct economic output, with the Chemical Manufacturing industry providing the largest share of that total ($16.1 billion). When indirect and induced output is added, these four industries contribute to over $25.2 billion in economic output in Morris County.
- From this economic output, over $957 million was returned to State and local governments as tax revenue. Again, the Chemical Manufacturing sector contributed the majority of this revenue.

Table 3-4

Key Industry Economic Impacts for Morris County (2009)

Employment				
	Direct	*Indirect*	*Induced*	*Total*
TOTAL	17,262	19,883	17,595	54,740
Chemical Manufacturing	11,439	411	9	11,859
Computer & Electronic Manufacturing	3,217	16	2	3,235
Warehousing & Storage	1,426	203	47	1,676
Truck Transportation	1,180	90	15	1,285
Output (in $Thousands)				
	Direct	*Indirect*	*Induced*	*Total*
TOTAL	$17,871,526	$4,896,238	$2,504,699	$25,272,463
Chemical Manufacturing	$16,186,562	$581,137	$12,402	$16,780,101
Computer & Electronic Manufacturing	$1,327,955	$6,604	$639	$1,335,198
Warehousing & Storage	$211,412	$30,103	$6,995	$248,510
Truck Transportation	$145,597	$11,050	$1,800	$158,447
Value Added (in $Thousands)				
	Direct	*Indirect*	*Induced*	*Total*
TOTAL	$6,916,924	$2,884,634	$1,604,638	$11,406,196
Chemical Manufacturing	$6,369,514	$228,681	$4,880	$6,603,075
Computer & Electronic Manufacturing	$316,895	$1,576	$152	$318,623
Warehousing & Storage	$117,335	$8,905	$1,451	$127,691
Truck Transportation	$113,180	$16,116	$3,745	$133,041

Table 3-5

Key Industry Tax Impacts for Morris County (2009)

Tax Revenue Source	*Chemical Manufacturing*	*Computer. & Electronics Manufacturing*	*Truck Transportation*	*Warehousing & Storage*
Dividends	$82,559,248	$7,227,595	$1,629,393	$804,800
Social Ins. Tax (Employer + Employee)	$3,504,806	$1,274,827	$168,220	$82,122
Indirect Business Tax: Sales Tax	$115,937,864	$42,626,980	$4,571,115	$1,442,685
Indirect Business Tax: Property Tax	$232,202,624	$85,374,144	$9,155,118	$2,889,437
Indirect Bus. Tax: Motor Vehicle License	$1,849,274	$679,924	$72,912	$23,012
Indirect Business Tax: Other Taxes	$23,107,312	$8,495,887	$911,059	$287,538
Indirect Business Tax: S/L Non-Taxes	$3,942,806	$1,449,655	$155,454	$49,063
Corporate Profits Tax	$80,257,888	$7,026,124	$1,583,974	$782,366
Personal Tax: Income Tax	$135,804,496	$46,428,192	$6,786,550	$2,939,977
Personal Tax: Non-Taxes (Fines/Fees)	$22,566,400	$7,714,893	$1,127,709	$488,531
Personal Tax: Motor Vehicle License	$3,785,785	$1,294,266	$189,187	$81,957
Personal Tax: Property Taxes	$3,464,468	$1,184,416	$173,130	$75,001
Personal Tax: Other Tax (Fish/Hunt)	$677,308	$231,555	$33,847	$14,663
TOTAL STATE AND LOCAL TAXES	**$709,660,279**	**$211,008,458**	**$26,557,668**	**$9,961,152**

3.2.3 Additional Economic Considerations for Morris County

The economic data compiled and analyzed in this study provides additional information regarding the role of freight-related industries in Morris County and the benefits and costs of this activity to County residents. These residents enjoy a high standard of living but also bear higher costs for many of their everyday amenities. Some of these costs and benefits are related directly to these industries, but most are tied to factors outside the County that are not directly impacted by the industrial sectors and subsectors analyzed in this study.

Some of the important "cost" considerations for the County are as follows:

- A major metropolitan area such as the New York City MSA is adversely affected by the added cost of transportation associated with traffic congestion. A profile of current and projected roadway congestion in Morris County is documented in Section 2 of this report. Congestion

within the County directly affects freight originating in or destined for the County, but these freight movements are also heavily impacted by regional congestion beyond the County's borders and outside the County's jurisdictional control.

- The higher costs of transportation associated with traffic congestion are exacerbated by (and in many cases related to) higher costs for many freight-related activities that take place outside the region due to competing uses for land (residential, office, and retail in particular) in such a heavily-developed metropolitan area.
- As a major consumer market in which manufacturing represents a very small segment of the overall economic base, the transportation of freight to this region from elsewhere in North America and abroad is heavily imbalanced. Trucks and freight trains that deliver freight to this region do not usually pick up loads inside this region for their return trips.[16] This imbalance tends to produce higher transportation costs because of the long empty trips for truck and rail carriers.
- While wage data documented in this report indicate that the County enjoys an economic benefit from higher wage rates in these freight-related industries compared to the surrounding region (and beyond), these wages also translate into higher labor costs for employers that do business here.
- All of these freight industries have environmental impacts to some degree, though manufacturing industries have become more environmentally responsible over time and much of the mining and heavy manufacturing activity that was once prevalent in Morris County has disappeared in recent decades. For many of the remaining freight-related industries in the County, the most visible environmental impacts may be the air quality and noise impacts of their freight transportation activity. These industries may present a general quality-of-life concern if they are located in areas where their industrial processes or their transportation activity affects nearby residential neighborhoods or sensitive land uses such as schools and hospitals.

Many of the factors described above that result in higher transportation costs for this metropolitan region also reflect underlying demographic and economic factors that enable County businesses to enjoy tangible benefits. Most of these benefits do not derive directly from Morris County's business climate and its own industries, but relate to regional assets and other factors that apply beyond the County's borders. These include the following:

- The greater New York City MSA has an estimated population of about 20 million residents. While this population is an underlying driver in some of the higher costs described earlier (e.g., real estate costs, congestion), this population base also allows residents and businesses in the New York City metropolitan area to benefit from enormous economies of scale associated with the transportation of raw materials and finished products. Simply put, this means that the cost of transportation, while elevated due to the factors described previously, is reduced on a unit basis because the quantities being transported are so substantial.

[16] NJDOT county-level commodity flow data from 2003 indicates a 65%-35% split between inbound and outbound freight flows. These figures will be updated during the course of the ongoing NJTPA 2040 Freight Industry Level Forecast.

- Coupled with this previous point, this metropolitan region has a number of major port and rail terminals and air cargo facilities that enable large quantities of freight to be transported to and from a global market. Morris County's freight facilities are dwarfed by the major Class I rail terminals in Essex, Hudson, Union and Bergen Counties, the various marine facilities in Newark, Elizabeth and Staten Island, and the air cargo operations at JFK and Newark Liberty International Airports, yet County residents and businesses derive a substantial benefit from their proximity to these freight transportation assets.
- While the information presented in Section 2 of this report indicates that the freight rail infrastructure in Morris County is somewhat constrained by weight and height limits, the County's ownership of the three branch lines does provide benefits for businesses that require access to the national rail system. This will be discussed further in Section 3.3.

The County's location within this large metropolitan region, and its extensive highway system, provide valuable access to a lucrative consumer market for businesses engaged in warehousing and distribution. This advantage is offset by cost factors, current logistics practices and other constraints that make other areas in the surrounding region more suitable for this type of operation, but there are still opportunities for certain industry sectors where close proximity to a customer base makes Morris County an attractive place to locate. Building materials and the food/beverage distribution are good examples of industries where warehousing/distribution activity are suitable for a region like Morris County that is not ideal for traditional large-scale warehousing, but serves a major consumer market nonetheless.

3.2.4 Economic Analysis Summary

Freight-related industries provide a substantial benefit to Morris County in the form of economic output, employment and tax revenue. Chemical Manufacturing is the dominant manufacturing industry subsector in the County, while Computer & Electronic Manufacturing is also an important subsector. The Truck Transportation and Warehousing & Storage subsectors of the Transportation and Warehousing industry sector also play an important role in the County's economy.

Combined, these industry subsectors employ nearly 55,000 people, representing more than 17% of the County's total employment base. Total economic output by these subsectors exceeded $25 billion in 2009, with an additional $11 billion in value-added activity. These subsectors also generated more than $950 million in state and local tax revenue in 2009.

While employment in chemical and computer/electronic manufacturing is expected to decline in Morris County over the next five years, these industries will continue to be important contributors to the County's economy. Some of the County's key freight transportation assets such as the three County-owned rail alignments make this a good location for businesses engaged in production and/or handling of heavy products and raw materials that are ideally transported via rail.

Employment in the transportation and warehousing industry sector is projected to enjoy modest growth in Morris County. These industries do not provide the same level of economic benefit for the County as the manufacturing sector, but they are valuable elements of the County's economy and provide support to other industries in the region. The most attractive opportunities for industrial development in the County related to warehousing and distribution are likely to be in industry sectors where close proximity

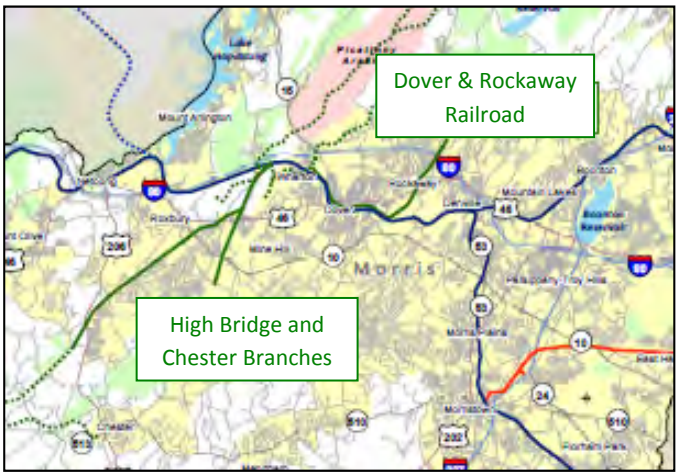
to customers is a critical element of the business model. These might include building materials and food/beverage distribution (including temperature-controlled facilities).

The transportation infrastructure investments and potential industrial development identified in this project should be aimed at protecting and maintaining road and rail access for existing firms in these industries and supporting growth in these subsectors in the future.

3.3 Cost/Benefit Analysis of County-Owned Railroads

3.3.1 Background

In addition to the economic analyses documented previously in this section, a separate effort related to the County-owned rail alignments was conducted for the study. It is comprised of two parts: (1) a financial and economic analysis of the County's ownership of the three branch lines; and (2) a broad economic analysis of the businesses currently served by these lines. The financial analysis was conducted based on financial information provided by Morris County staff that documented costs and current/projected revenues from the railroad operations. It was not performed by a professional accountant, nor is this analysis intended to be a formal audit of the County's railroad operations; this assessment is intended to help inform the County and provide guidance for some options that may enhance the value of these assets for the County and local businesses that rely on the rail lines for their operations.



The County has acquired three different freight railroad alignments over the last 25 years. Descriptive information about these lines and the businesses they currently serve and may serve in the future is documented previously in Section 2. The High Bridge Branch was acquired in 1982 and the Dover & Rockaway Railroad was acquired in 1986 from the Consolidated Rail Corporation (Conrail) when Conrail was seeking to abandon the lines.[17] The Chester Branch was acquired in 2009 from private owner Jack Holland, whose company, Holland Manufacturing, relies on freight rail service for its adhesives business. Under the purchase agreement for the Chester Branch, the County acquired the right-of-way for $1 and contracted for the rehabilitation of the line through a $5.8 million grant under the American Recovery and Reinvestment Act of 2009 (ARRA). The project was completed in May 2011.

Freight rail service for the three County-owned lines is provided by the Morristown & Erie Railway (M&E), under an operating contract with the County that runs through mid-2012. The County functions as the owner of the real estate and its rail infrastructure, while the operating and maintenance costs of

[17] Norfolk Southern (NS) became the dominant Class I railroad serving Morris County since the acquisition and division of Conrail by NS and CSX in 1998.

the infrastructure are covered by the M&E as part of their railroad operations. The M&E is a short line railroad headquartered in Morristown that provides switching service to customers on four branch lines (the three County-owned lines, plus its own Whippany Line), with connections to the national rail system via the two major Class I railroads in the Northeast. Rail cars moving to and from the west on the Norfolk Southern (NS) system are interchanged at Lake Junction in Roxbury, while access to the CSX system to the east is via South Kearny Yard. Because of height restrictions to the east on NJ TRANSIT's Morristown Line, most of the M&E's current business involves NS traffic through Lake Junction.

In 2009, the Morris County Board of Chosen Freeholders established a Freight Railroad Advisory Committee (FRAC) to deal with issues involving freight rail service on the three County-owned lines. Members of this committee include County Freeholders, municipal officials, M&E leadership and industry representatives. The group meets on a quarterly basis to discuss items of concern to the County, its municipalities and its various industries that rely on the freight railroads for their business, and to provide information related to the County's ownership of these lines to the Board of Chosen Freeholders.

3.3.2 Approach and Methodology

The methodology for assessing these broad economic impacts is similar to what was done for the County-wide economic assessment for freight-related industry subsectors and documented in Section 3.2. In general, economic impact analysis involves the application of a final demand change to a predictive input-output model and an analysis of the resulting changes in the economy that result from a change in one or more economic activities. For this effort, the analysis is focused on those businesses either currently served by the M&E on these three branch lines or expected to begin operations in the near future.

In addition to the economic factors described in Section 3.2, research using Infogroup's SalesGenie.com and input from M&E staff was used to obtain estimates of the employment and sales volume for the following rail customers in this analysis (sales are annual):

- Holland Manufacturing Company: 79 employees, $40.0 million in sales
- Blue Ridge Lumber: 8 employees; $2.8 million in sales
- 84 Lumber: 8 employees, $2.8 million in sales
- Endot Industries Incorporated: 30 employees, $11.7 million in sales
- Polyfil: 27 employees, $10.6 million in sales
- County Concrete Sand & Gravel: 150 employees, $38.7 million in sales
- Kuiken Brothers Company: 42 employees (est.), $12.6 million in sales (est.)[18]
- Tri-Pack Industries / Kari-Out Co.: 5 employees (est.), $1.9 million in sales (est.)

These are the current M&E customers who receive rail car loads on a regular basis, along with two

[18] The Succasunna location of Kuiken Brothers located on NJ-10 has been upgraded to receive deliveries of lumber and building materials by rail, but was not an active M&E customer until after this analysis was completed. Employee and sales figures were estimated for this study based on average figures from their other northern New Jersey locations.

businesses (Kuiken Brothers and County Concrete) that have existing businesses in place on the Chester Branch and represent customers who have either begun receiving rail shipments after 2010 or are expected to begin shipping by rail in 2011. Other businesses that send or receive rail freight infrequently are not included in this analysis. The economic analysis was done based on projected activity for the year 2011. All dollar figures are presented in 2011 dollars.

Among a number of current customers on these lines as well as one dormant customer who previously served as a substantial part of the industrial customer base for the railroad industry (Toys "R" Us in Mount Olive Township), there is a consensus that two constraints in the regional rail system that adversely impact their ability to conduct business in the County. The 263,000-lb. weight limit on the Morristown Line primarily affects those industries that receive lumber or liquid (e.g., chemicals and corn starch) and dry (e.g., plastic pellets) bulk shipments by rail; the national standard weight limit for freight rail cars is 286,000 pounds, which means rail cars serving these industries in Morris County often cannot be loaded to their maximum weight. Additionally, lumber and box car traffic on the County rail system is constrained by the overhead clearance limit on the County rail system described in Section 2.6.1 (**see Table 2.4**).

3.3.3 Key Findings

The results of the economic impact analysis of the businesses served by the three County-owned rail alignments are summarized below and detailed in **Tables 3-6** through **3-9**.

- *Direct effects:* The eight existing and future rail customers will employ an estimated total of 349 full-time workers in 2011. The total annual direct economic output is estimated to be $118.8 million, which includes $38.6 million in labor income.
- *Indirect and induced effects:* Indirect and induced employment from the operations of the eight rail customers is an estimated 316 full-time workers in 2011. The total annual indirect and induced economic output is approximately $56.6 million, including $20.6 million in labor income.
- *Top industries affected by output:* The top five industries affected by both employment and output (direct, indirect, and induced) are:
  - Building materials and garden dealers (212 employees, $56.4 million in output)
  - Paper manufacturing (81 employees, $40.1 million in output)
  - Plastics and rubber production (62 employees, $23.6 million in output)
  - Real estate (45 employees, $10.5 million in output)
  - Professional, scientific, and technical services (38 employees, $6.7 million in output)
- *State and local tax impacts:* Estimated state and local taxes total $13.3 million, including $6.6 million in property taxes, $3.3 million in sales tax, and $1.5 million in personal income tax.

It should be noted that the figures summarized here and presented in **Tables 3-6** through **3-9** are not intended to reflect the full degree of economic activity that is directly tied to the railroad alignments and entirely reliant on these lines. The figures are presented to demonstrate the extensive economic impact of businesses served by the M&E on the County-owned lines. While some of the rail customers on these

lines may rely entirely on the freight rail service and could not remain in business without them, others may have some flexibility to use either alternative modes of transportation or continue to use rail service through transload facilities on other freight lines in the region. As such, the figures presented here should not be construed to indicate that all of the employment, income and economic output documented here would vanish if the three County-owned rail lines did not exist. Additionally, there are several qualitative effects outlined in Section 3.3.4 as a result of County ownership that should be considered in comparison to the railroads being under private ownership or not in service at all.

Table 3-6

Overall Economic Impact

Impact Type	*Employment*	*Labor Income*	*Value Added*	*Output*
Direct Effect	349	$38,615,967	$59,560,466	$118,773,432
Indirect Effect	148.8	$11,680,134	$19,867,350	$31,515,889
Induced Effect	167.2	$8,883,676	$16,161,284	$25,125,353
TOTAL	665	$59,179,777	$95,589,100	$175,414,674

Table 3-7

Top 10 Industries Affected by Employment (Direct, Indirect and Induced)

Sector Description	*Employment*	*Labor Income*	*Value Added*	*Output*
Building Materials & Garden Dealers	211.6	$23,529,271	$38,130,553	$56,432,785
Paper Manufacturing	81.1	$9,081,111	$11,901,172	$40,081,318
Plastics & Rubber Products	62.1	$6,398,432	$10,100,247	$23,639,201
Real Estate	44.8	$1,059,952	$7,782,340	$10,545,335
Professional: Scientific & Tech Services	38.4	$3,829,831	$4,447,588	$6,681,725
Administrative Support Services	28.5	$1,315,448	$1,767,295	$2,642,135
Government & Non-NAICS[19]	18.1	$1,365,966	$1,515,445	$1,457,115
Wholesale Trade	17.2	$2,073,945	$3,569,210	$5,366,908
Food Services & Drinking Places	14.4	$366,533	$536,233	$942,803
Ambulatory Health Care	11.8	$1,101,753	$1,396,070	$2,020,962

[19] North American Industry Classification System

Table 3-8

Top 10 Industries Affected by Output (Direct, Indirect and Induced)

Sector Description	*Employment*	*Labor Income*	*Value Added*	*Output*
Building Materials & Garden Dealers	211.6	$23,529,271	$38,130,553	$56,432,785
Paper Manufacturing	81.1	$9,081,111	$11,901,172	$40,081,318
Plastics & Rubber Products	62.1	$6,398,432	$10,100,247	$23,639,201
Real Estate	44.8	$1,059,952	$7,782,340	$10,545,335
Professional: Scientific & Tech Services	38.4	$3,829,831	$4,447,588	$6,681,725
Wholesale Trade	17.2	$2,073,945	$3,569,210	$5,366,908
Administrative Support Services	28.5	$1,315,448	$1,767,295	$2,642,135
Insurance Carriers & Related	7.4	$968,325	$1,547,263	$2,566,694
Management of Companies	7.4	$1,128,647	$1,517,312	$2,226,938
Telecommunications	3.9	$378,674	$1,022,376	$2,194,746

Table 3-9

State and Local Tax Impacts

Tax Revenue Source	*Value*
Dividends	$387,541
Social Ins. Tax (Employer + Employee)	$38,306
Indirect Business Tax: Sales Tax	$3,293,131
Indirect Business Tax: Property Tax	$6,595,546
Indirect Business Tax: Motor Vehicle License	$52,527
Indirect Business Tax: Other Taxes	$656,346
Indirect Business Tax: S/L Non-Taxes	$111,993
Corporate Profits Tax	$376,738
Personal Tax: Income Tax	$1,498,727
Personal Tax: Non-Taxes (Fines/Fees)	$249,041
Personal Tax: Motor Vehicle License	$41,780
Personal Tax: Property Taxes	$38,234
Personal Tax: Other Tax (Fish/Hunt)	$7,475
TOTAL STATE AND LOCAL TAXES	**$13,347,385**

3.3.4 Additional Qualitative Impacts

While the information presented in Section 3.3.3 presents a summary of the broad economic impacts of the County-owned railroad alignments, it is also important to note that this ownership structure carries a number of qualitative benefits for the County, its residents and its businesses. These benefits cannot be quantified to the same degree as the economic benefits documented in this report, but they help reinforce the importance of the railroad lines to the County. These benefits are as follows:

- When Morris County acquired the High Bridge Branch and the Dover & Rockaway Railroad in the 1980s, these two lines were candidates for abandonment by Conrail. Many of the industries located along the alignments depended on freight rail service for their business. While some of these businesses have since relocated or shut down, the railroad access remains an important asset for those that have remained and thrived. Also, a number of new businesses have chosen to locate in Morris County because of the availability of the rail service. None of this would have been possible if the County had not intervened to acquire and protect the rail assets when it did.
- Similarly, the acquisition of the Chester Branch in 2009 salvaged a deteriorated railroad held under private ownership that did not have the means to adequately rehabilitate the line. Had this rail service been lost due to the deterioration of the line, it is probable that Holland Manufacturing, employing 79 people and generating approximately $40 million in sales, would have been at risk of closure or relocation outside the County. The rehabilitation of this branch that has been undertaken through the County's leadership will also provide freight rail access to current and potential future businesses further south along the line in areas such as the BETA Corporate Park in Randolph Township.
- In addition to the essential role it plays for business retention and economic growth in certain industries, freight rail service in Morris County also helps alleviate roadway traffic congestion by providing shippers an alternative mode of transport, improves air quality in communities (locomotives release less pollutants than trucks, as measured on a ton-mile basis) and allows businesses to move certain commodities in a safer and more cost-effective way than by truck.
- Public ownership allows the County to be more responsive to quality of life issues affecting residents who live along the rail lines. This would include a wide array of issues such as noise abatement, brush maintenance and removal, removal of railroad tie scraps, and grade crossing safety. By maintaining an operating agreement with the M&E for railroad operations, the County can retain control over non-railroad activities that may have adverse quality-of-life impacts.

As the owner of the rail alignments, the County also acts as an intermediary between the operating railroad company and the municipalities where it operates. The Freight Railroad Advisory Committee is a good example of a cooperative effort undertaken by the County to bring these interests together to address various concerns.

3.3.5 Financial Analysis of Railroad Operations

From the County's perspective as an owner, the business operations of the three rail alignments is a simple venture with few direct costs and limited current revenues tied to its operating agreement with Morristown & Erie Railway (M&E). Financial information provided by the County includes a mix of 2009 and 2010 data. No adjustment to any of these figures was made for the purpose of this analysis. Estimated annual revenues from the County's railroad ownership are **$25,111**, which includes the following:

- Plastic Surcharge Fees: $23,600[20]
- Annual Operating Fee: $1,511

Total annual County expenses related to the ownership of the three rail lines are **$127,163**, which includes the following:

- Insurance: $78,750
- Legal Expenses: $14,834
- Estimated Salaries: $33,579[21]

It is important to note that some of these cost items are somewhat distorted by recent events related to the acquisition and restoration of the Chester Branch, including a portion of the estimated salaries for County personnel as well as some of the legal expenses associated with this acquisition and subsequent issues with municipalities along the line. It is expected that these expenses are likely to diminish in the future now that the rehabilitation is complete, though no estimate for a reduction in these expenses is included in this analysis. In addition, the "Estimated Salaries" item is essentially a fixed cost for the County in that it includes time spent on railroad matters by County staff that have been hired for an array of different planning functions and would therefore remain on the County payroll even if there was no involvement in the railroad management.

A simple calculation yields an estimated net annual cost to the County in excess of $100,000 for these three rail alignments.

3.3.6 Conclusions and Recommendations

The three railroad alignments owned by Morris County provide important access to the national rail network for industries located along these lines. Costs associated with ownership of these assets are relatively low, though the revenues generated for the County are insufficient to cover these costs. The primary benefit of maintaining County ownership of the three branch lines is the level of economic activity they support in industries that rely on freight rail service for their well-being. The lines were purchased over the course of more than 20 years in the face of outside economic forces that would

[20] A $200 surcharge is applied to each rail car of plastic shipped to the M&E customers on the three County-owned lines. The surcharge funds are placed in a dedicated County account that may only be used for railroad rehabilitation projects on the County-owned lines. The figure presented here is an estimate of 2010 surcharge revenue.

[21] This figure is based on an estimated share of the time spent by County employees involved in the management and administration of the railroad assets.

likely have threatened the viability of many businesses on these lines, including the intended abandonment of the High Bridge Branch and Dover & Rockaway Railroad by Conrail in the 1980s and the rehabilitation needs for the Chester Branch in the last few years.

A number of recommendations are presented here to help support the County's goals of maintaining freight rail service for existing industries that currently rely on it, support future rail-oriented industrial development on brownfield sites and other industrial properties along these lines, and help promote diversification of the County's economy by preserving and expanding the industrial employment base in the region. To that end, the following measures are recommended:

(1) **Seek new sources of revenue to enable the County to maintain a positive or neutral (at worst) cash flow for the railroads.** Potential sources of revenue could include easement leases across the rights-of-way for energy and telecommunications firms, and commodity-specific surcharges similar to what the County already collects for plastics (these would likely be substantially lower for lower-value commodities). A detailed market assessment of commodities shipped on the County-owned lines would be needed to determine the price elasticity and alternative freight modes for these shipments, as it would be completely counterproductive to impose an additional cost on shippers that causes them to stop shipping by rail entirely.

(2) **Develop an active promotional campaign to attract interest among multiple short-line railroads when the current operating agreement comes up for renewal in 2012.** The lease revenues generated under the current agreement were likely constrained by the lack of interest among railroad companies other than the M&E the last time this agreement was negotiated. The M&E has certain advantages due to the local proximity of its headquarters, its long history in the region, and its ongoing operating relationship with NJ TRANSIT for its own branch line, as well as the three County-owned lines. A strong, concerted effort by the County to garner positive public attention for its railroad assets could help enhance the visibility of this market for other shortline railroads that provide similar switching and transload services elsewhere in the region.

    An additional consideration related to this item would be a clarification of the County's liability insurance requirements for its railroad infrastructure. The railroads operated without additional insurance until 2010, with the Morristown & Erie Railway indemnifying the County under the company's own liability insurance coverage. The insurance premiums represent the largest railroad expense item for the County by a substantial margin, so it would be helpful to pursue any opportunity to incorporate this coverage into the County's general insurance package or tailor the terms of the upcoming operating agreement renewal with these insurance requirements in mind.

(3) **Actively promote new rail-oriented industrial development opportunities along the County-owned railroad lines through cooperative efforts involving the Morris County Economic Development Corporation, the Chamber of Commerce, and other organizations.** The County has already taken a strong step in this direction through this study, and a number of potential sites for industrial development have been identified in this study and documented later in Section 4. New rail customers would enhance the surcharge and lease revenue potential as described above in Items 1 and 2.

(4) **Continue to actively pursue funds for capital projects through the State Rail Freight Assistance Program and other funding sources.** Morris County has been active in seeking outside funding sources for improvement and rehabilitation projects, and has a number of such projects in the pipeline now, including a number of grade crossing improvements and a partial rehabilitation of the High Bridge Branch. These projects enhance the value of the freight lines and may help enhance the revenue potential for some of the proposals listed in Items 1 and 2. In addition to the State Rail Freight Assistance Program, potential funding sources could include the Federal Railroad Administration's Railroad Rehabilitation & Improvement Financing (RRIF) and Highway-Rail Crossing Program, and other sources of State and Federal funding that may be available in the future.

(5) **Work toward implementation of some of the infrastructure improvements identified in this study, particularly those that enhance freight rail access for the County.** These improvements will be documented in the Section 5 for this study, but some are worth noting here because they provide additional freight rail capacity to current and potential rail customers in the County. Morris County should work with NJDOT, Norfolk Southern, M&E and NJ TRANSIT to make needed improvements to permit movement of 286,000-lb. rail cars on the NJ TRANSIT Morristown Line between Hackettstown and D&R Junction in Wharton. In addition, the elimination of vertical clearance constraints west of Dover to allow access for Plate F cars (17'-0" clearance) and the upgrade of the NJ TRANSIT Morristown Line between Hackettstown and D&R Junction to accommodate 286,000-lb. rail cars are two measures that would enhance the value of the County's rail infrastructure for freight activity. All of the industries in Morris County that are served by freight rail rely on the Morristown Line for service. The line was originally designed for a lower weight capacity and lower overhead bridge clearances, and NJ TRANSIT inherited the system with this infrastructure in place when the agency assumed operation of commuter rail service in 1983.

4.0 LAND USE ANALYSIS

4.1 Regulatory Framework: Highlands Plan Review

4.1.1 Capital Infrastructure Projects

Morris County lies within the New Jersey Highlands Region and is subject to the regulatory provisions of the Highlands Regional Master Plan (RMP). The RMP the states that mobility is "critical to the needs of a growing freight industry which continues to use the Region's infrastructure to haul goods to and from the State's major ports. However, a growing number of freight trucks are having a negative impact on the Region's roads. By improving upon existing rail infrastructure and shifting from truck to rail for long-distance transport, more freight can be moved safely and efficiently."[22] In order to effectuate this goal, the RMP transportation program component requires "that all circulation plan elements and county plans, as part of Plan Conformance, evaluate opportunities to increase freight service through the reactivation of abandoned freight lines."[23] The Plan also includes coordination with NJDOT on a new statewide freight plan. It is evident that the Highlands Council is not likely to be supportive of additional road infrastructure to support new development or redevelopment, and therefore would place a high value on the expansion of freight rail service along existing alignments.

The RMP policy related to freight movement is particularly important in the Preservation Area, where the Highlands Council has explicit authority over capital improvements and other development. Section 16 of the Highlands Act requires submission to the Highlands Council for review and comment of any State or local government capital projects that involve the disturbance of two or more acres of land and/or a cumulative increase of impervious surface area by one or more acres.[24] The only items exempt from this Highlands Council review are the maintenance and operations of existing infrastructure, along with the repair or reconstruction projects that do not involve additional travel lanes on existing or new roadways. This review is binding in the Highlands Preservation Area and non-binding in the Planning Area.

According to the RMP, the review of transportation projects will generally include the following:

1. Consistency with the goals, policies and objectives of the RMP and smart growth planning principles;
2. Determination of net effect on through lane capacity, consistent with the RMP requirement that the project does not induce future growth;
3. Impact on water quantity and quality and Highlands natural resources such as forests, habitat, Highlands Open Waters, historic, and scenic resources;
4. The relationship to surrounding land uses and near and long-term transportation plans for the Highlands Region and the larger 13-county regional transportation planning area;
5. An evaluation of growth-inducing impacts regarding new land use, new residents, and new permanent employment which could have secondary growth implications, or

[22] Highlands Regional Master Plan; Chapter 5, Part 5; 2008
[23] Highlands RMP; Chapter 5, Part 5
[24] Highlands RMP; Chapter 5, Part 5

greatly expand transportation infrastructure capacity, especially in areas with high natural resource values and limited capacity to support human development;

6. Use of alternative modes of transportation including transit, bus, pedestrian and bicycle;
7. Safety measures such as traffic calming strategies and pedestrian, and bicycle safety features;
8. Impact on agricultural and freight mobility; and
9. Effect on eco-tourism, agri-tourism and heritage tourism in the Region.

4.1.2 Freight Transportation-Related and/or Supporting Development

Development is extremely limited within the Preservation Area of the Highlands Region. The best opportunities for transportation-related and/or supportive improvements is in areas exempt under Section 30 of the Act, specifically "the reconstruction of any building or structure . . . within 125% of the footprint of the lawfully existing impervious surfaces on a site, provided that the reconstruction does not increase lawfully existing impervious surface by one-quarter acre or more."[25] In addition, opportunity exists for redevelopment at a "brownfield site designated by the Department of Environmental Protection or a site at which at least 70% of the area thereof is covered with impervious surface."[26] Therefore, future freight-related land uses within the Preservation Area should be planned targeted to the Highlands "Existing Community Zone" and/or appropriate redevelopment sites.

Development may also be limited in the Planning Area, where municipalities that choose to conform to the RMP must adopt a Master Plan and implementing ordinances that meet at least the minimum standards of the RMP, and may adopt stricter development limitations. Therefore, any capital infrastructure projects or freight transportation-related and/or supportive development should be contemplated and addressed in the municipalities' conformance request. Morris County municipalities that submitted conformance documentation for the Planning Area as of the initial December 8, 2009 deadline include: Chester Township, Denville Township, Kinnelon Township, Parsippany-Troy Hills Township, Randolph Township, Rockaway Township, Washington Township and Wharton Borough. In addition, the following Planning Area municipalities submitted a Letter of Intent to the Highlands Council to conform with the RMP, but have not yet submitted the required documentation: Chester Borough, Hanover Township, Mendham Borough and Township, Mine Hill Township, Morris Plains Borough, Mountain Lakes Borough and Riverdale Borough.

4.2 Interviews of Real Estate Brokers and Developers

Several active industrial real estate brokers and developers were interviewed in order to obtain a better understanding of the industrial real estate market in Morris County. The interviews included a general discussion of the current state of the market, along with questions about the best perceived industrial locations in the county and a discussion of specific types of sites. The overall findings from these interviews are summarized as follows:

[25] Highlands Regional Master Plan; Chapter 4, Part 7; 2008
[26] Highlands RMP; Chapter 6, Part 2; 2008

- There is currently no substantial industrial development taking place in Morris County, or in the larger New Jersey market. There exists a several year supply of industrial space in Morris County, with no latent demand and no rental rate price appreciation.
- Morris County is composed of two submarkets, designated "East" and "West." The Morris East submarket includes the municipalities along the I-287 corridor and the entire area in the county east of this roadway, while the Morris West submarket includes the area of the county west of Parsippany. The northwestern reaches of Morris County in Rockaway and Jefferson Townships are not included in either submarket, due to the extensive protected lands and the large area of Picatinny Arsenal. The West submarket currently has higher vacancy, lower demand, and large blocks of space that have been vacant for some time compared to the East submarket. Geography, land use and some road network constraints hurt the West submarket, in that there are more low-density residential areas in the western part of the county and there are no limited-access north-south roadways west of I-287.
- Warehouse/distribution is more service-related these days, and distribution is mostly comprised of local deliveries in the New York metropolitan market.
- Morris County is a value-add and flex market, and is not perceived as a place to develop new industrial space. Users that would be interested in the County are typically small/mid-cap companies that want to be close to a supply of labor.
- A substantial area of Morris County has been eliminated for possible new development by the Highlands Regional Master Plan.
- The New Jersey Turnpike corridor would be a focus area for new development and is currently perceived as a more attractive market for industrial development involving warehousing and distribution.
- One key advantage of industrial space in Morris County is that it is located near a large labor supply and is an attractive place for senior executives to live.
- Industrial space near rail lines becomes more attractive when energy prices rise.
- Land costs are high, due primarily to the limited supply of land for industrial uses.
- Large distribution users are not common in Morris County, as it is located between regions that are more suitable for different types of distribution. Areas to the south and east are more common locations for these users oriented to the New York City metro area and along the I-95 corridor, while Pennsylvania has become an increasingly attractive location for users whose distribution area includes large sections of the Northeastern U.S.
- Morris County's history as a higher income area and its suburban character makes it difficult to develop freight-related uses.
- There has been a slow, steady increase in properties for sale, but transactions require sellers to price properties appropriately and reduce expectations.

- If local communities have had recent success in attracting industrial users, they could potentially serve as subjects of small case studies to identify the keys to their success and determine possible applicability elsewhere in the County.
- Incentives are seen as comparable to other areas, but zoning can sometimes be an important deciding factor for a user. For new industrial users to build new facilities and create jobs there needs to be some flexibility on the part of local communities with regard to zoning.

4.3 Interviews with System Users

4.3.1 Railroad Industry

Information was obtained from three railroads that do business in Morris County and/or the surrounding region. Discussions took place that centered on the County itself, but some of the items that were discussed involve issues that apply throughout the North Jersey region as a whole. For the purpose of maintaining confidentiality, the items summarized here are not attributed to any one railroad unless they involve a discussion point that would clearly apply to a single railroad by definition. The overall findings from these interviews are summarized as follows:

- The overall strength of the entire region is the size of the local consumer market and the underlying demand for finished products. This region is very strong as a *destination* point for the railroad industry, and the population base allows for large economies of scale for inbound rail shipments that help reduce the cost of doing business on a per-unit basis. This is particularly true for inbound commodities that are moved in large volumes, such as intermodal shipments.
- One obstacle to doing business in Morris County that was noted by the freight railroad industry is the overall suburban/exurban character of the area. Because the County is affluent and largely residential in its character, there is a perception among prospective railroad customers that Morris County simply is not an ideal place to do business. This is reinforced within the railroad industry itself by long-standing public perceptions and numerous complaints about railroad operations (train noise in particular). One recurring theme that came up in the railroad interviews has been the underlying land use pressures associated with residential and office/retail development "crowding out" industrial land uses in Morris County.
- As a result of the factors described in the previous point, it is difficult for the railroad industry to serve a "critical mass" of industrial sites in Morris County that would enable the railroads to develop large economies of scale for the mixed freight (bulk commodities in particular) that is the dominant form of freight moved by rail to the County. The dispersed nature of industrial sites in the County is also the primary reason why both of the smaller railroads in the county (the NYS&W and the Morristown & Erie) move a lot of freight to their customers through transload or "team track" facilities.
- Vertical clearance constraints hinder the movement of railcars on the rail system within and outside Morris County. Railcars moving to and from the east via CSX over the NJ TRANSIT Morristown Line are subject to a 15'-5" vertical clearance restriction – a

condition exacerbated by the overhead catenary wire on this line. Those railcars moving to and from the west via Norfolk Southern over the Morristown Line and Washington Secondary are subject to a 16'-6" restriction (see Section 2.6 for additional details on this). The 263,000-lb. weight limit on the NJ TRANSIT system is also a limiting factor for the railroads; this issue has been the subject of attention elsewhere in New Jersey in recent years.

- From the general perspective of all Class I railroads, one attractive characteristic of Morris County is that its industrial sites are located outside the Conrail Shared Assets Area, which means there is one less railroad involved in the process of moving rail freight from the west than for rail customers in other parts of North Jersey to the east. This was identified as one aspect of the County that probably should be highlighted to prospective industrial users, especially if the vertical constraints mentioned previously can be addressed.
- The cost of installing switches for new sidings to industrial sites was identified as a potential financial obstacle to rail-oriented industrial development. This is an issue everywhere in New Jersey; one attractive aspect of doing railroad business in Pennsylvania is that Pennsylvania's state funding program includes considerations for switches and sidings, where New Jersey's does not.
- The region's complex political climate (this goes beyond Morris County to the North Jersey region as a whole) presents challenges to the railroad industry that are not common elsewhere. The state's "home rule" governing structure and multiple levels of government can make it very cumbersome to secure financing and permitting for projects.
- One Federal regulatory issue that appears to have some serious financial consequences for the Morristown & Erie Railway is the requirement under the Rail Safety Improvement Act of 2008 for the installation of positive train control (PTC) systems on a nation-wide basis by December 31, 2015. There are potentially onerous implications for the M&E because their locomotive equipment would have to be compatible with two different PTC systems for the railroads with which they interact (NJ TRANSIT and Norfolk Southern).

4.3.2 Trucking Industry

Information was obtained from several trucking firms as well as retail/industrial firms with substantial employment related to trucking or warehousing. These firms were all located in Morris County, which may have actually limited the value of this interview subtask because the limited industrial and warehousing/distribution sites in the County represent a very small component of the overall truck volume on the highway network in the County.

- Discussions about operating constraints or other limiting factors related to the region's highway system centered on typical concerns in the trucking industry related to congestion. One important characteristic of most businesses in Morris County that own/operate their own fleets of trucks is that their local truck operations primarily serve a local market in the New York City metro area. As a result, many of the issues and constraints related to trucking in this metropolitan area that are commonly voiced in the long-haul interstate trucking industry were not mentioned in these discussions.

- General concerns about traffic congestion were voiced, but most of the firms interviewed were located close to the interstate highway system (e.g., Montville, Parsippany, Rockaway, etc.) and had few comments about local highway access.
- Staggered work hours for fleet drivers appear to be common among companies involved in trucking and warehousing/distribution. This helps minimize local congestion during periods of peak background traffic as well as avoid problems with internal site congestion for trucks leaving loading docks and circulating inside the gate.
- Limited north-south connectivity on limited-access highways was identified as one regional constraint, particularly in western Morris County. The market reach of a firm making deliveries from the Mount Olive area to points in Central Jersey (e.g., New Brunswick, Princeton, Trenton, etc.), for example, is limited by the lack of strong north-south connections west of I-287. US-206 is a key north-south route in the western part of the county, but truck travel on this roadway can be constrained by lower speed limits and traffic signals in town centers in Morris County and the adjacent counties along the route.
- The recent/ongoing improvements at the I-80/I-287 interchange in Parsippany were noted as an upgrade to the regional highway system that will have tangible benefits for mobility and safety.

4.4 Industrial Real Estate Market Snapshot

4.4.1 Current Trends as of 1Q2010

For this study, data from several prominent brokerage firms (CBRE, Cushman & Wakefield, and Grubb & Ellis) were reviewed and compiled. The Morris County industrial submarket is part of the larger Northern New Jersey market area and has several areas with concentrations of industrial space, specifically along the I-80 and I-287 corridors. The junction of these two interstates in Parsippany is an attractive location for those users dependent on convenient highway access for reach throughout and beyond the region. The Morris County sub-market includes over 43 million square feet of total industrial space, which accounts for approximately 13% of the Northern New Jersey market and 6.8% of the combined Northern and Central New Jersey industrial markets. In these two combined markets, Warehouse/Distribution space accounts for over 56% (366 million SF) of the total space and R&D/Flex space accounts for 4.58% (29 million SF) of the total industrial space. Within these two categories, Warehouse/Distribution space is 15.81% available and R&D/Flex is 18.73% available, with both figures being higher than the overall market availability rate of 14.11%. Asking rents differ between these categories as well; asking rents for Warehouse/Distribution space average $5.23/SF, while R&D/Flex average $9.36/SF.

As shown in **Table 4.1**, the northern NJ market (337 million SF) enjoys a slightly lower availability rate of 12.61%. Asking rents differ from the larger combined market with Warehouse/Distribution averaging $5.95/SF and R&D/Flex averaging $8.28/SF. Examining the 43 million square foot Morris County market in more detail shows a higher availability rate of 18.55% with an availability rate of nearly 20% in the Morris East submarket within the county. Asking rents in Morris County for Ware-house/Distribution space are higher than the larger Northern and Central NJ market averages, led by the higher asking rents in the Morris East submarket ($6.89/SF). Although the

Warehouse/Distribution market sees higher asking rents in Morris County, the R&D/Flex market sees lower asking rents ($7.41/SF) than both the Northern NJ ($8.28/SF) and combined Northern/Central NJ markets ($9.36/SF).

CBRE notes that there continues to be a "disparity between asking and taking rates, the average difference being 24.9%." It should also be noted that there is no industrial space under construction in Morris County and only 240,000 square feet under construction in the combined Northern and Central NJ market as of early 2010.

Table 4-1

Morris County Industrial Real Estate Data

				Net Absorption			Asking Rent	
	Total SF	*Available SF*	*% Available*	*Current*	*YTD SF Under Const.*		*WH/Dist*	*R&D/Flex*
Northern & Central NJ Industrial Market	643,614,875	90,784,828	14.11%	(182,805)	(182,805)	240,000	$5.23	$9.36
Warehouse/Distribution	366,062,755	57,874,374	15.81%	542,041	542,041	240,000	$5.23	
R&D/Flex	29,481,799	5,521,383	18.73%	(150,350)	(150,350)	-		$9.36
Northern NJ Industrial Market	337,295,089	42,548,269	12.61%	(1,427,838)	(1,427,838)	-	$5.95	$8.28
Submarket: Morris East	26,759,088	5,283,606	19.75%	(48,297)	(48,297)	-	$6.89	$7.39
Submarket: Morris West	17,084,905	2,849,752	16.68%	(200,009)	(200,009)	-	$5.86	$7.43
Submarket TOTAL	43,843,993	8,133,358	18.55%	(248,306)	(248,306)	-	$6.49	$7.41

Average Asking Sale Rates per SF	*4Q 2007*	*4Q 2009*	*1Q 2010*
New Jersey Industrial Market	$82.97	$69.89	$70.32
Northern NJ Submarket		$75.57	$76.86

Source: Grubb & Ellis, CBRE

4.4.2 Sales Trends

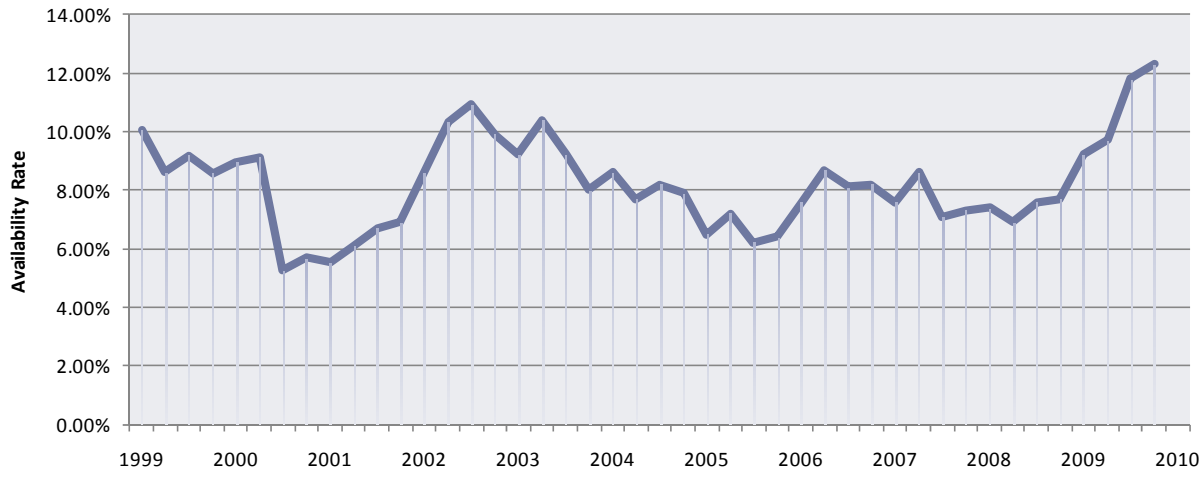
Examining industrial for-sale listings and data shows lower average asking rates in 2010 than in past years and depressed sales velocity. In the first quarter of 2010, average asking sale rates for the New Jersey industrial market were $70.32/SF, up modestly from $69.89/SF in the previous quarter. These asking rates are down over 15% from just over two years ago in the fourth quarter 2007 when asking rates were nearly $83/SF. The Northern NJ market enjoyed slightly higher average asking sale rate of $76.86/SF. CBRE noted that while asking rates only increased slightly in early 2010, the amount of properties coming to market has steadily increased. Also, sales transactions "continue to be difficult to close as financing is still a challenge."

4.4.3 Morris County Historical Data

The Morris County industrial submarket, availability rates and the total quantity of available industrial space are both at historic highs, as noted in **Figures 4-2A** and **4-2B** below. While the pace of rising availability has slowed, there remains a large amount of currently available industrial space in Morris County. The lack of any projects under construction in the market area contributes

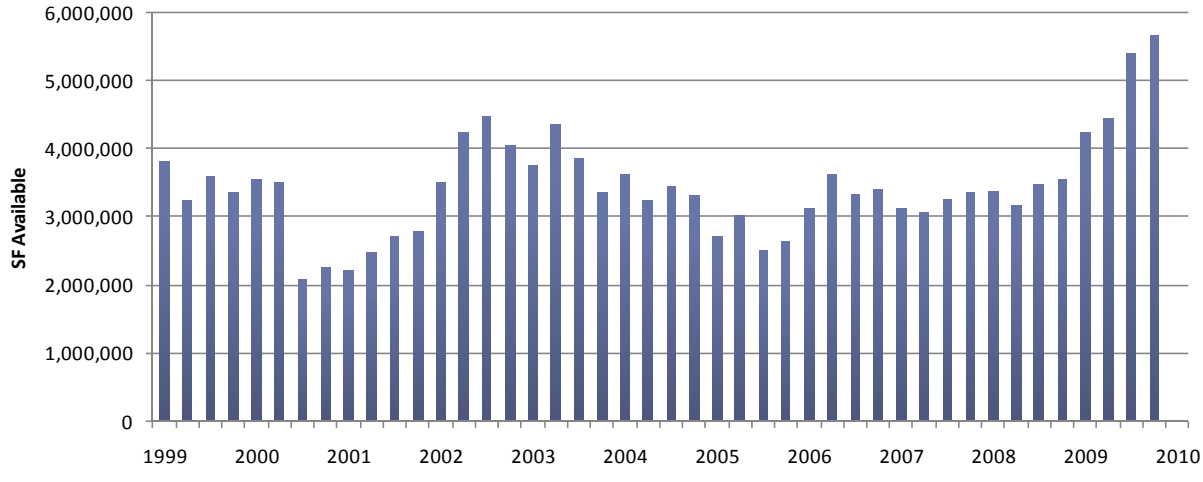
to a consensus that short term demand will remain at depressed levels. Looking forward, Grubb & Ellis notes that improvements in the industrial market "will be dependent on a strengthening economy, including increased consumer spending."[27]

Figure 4-1: Morris County Industrial Availability Rate 1999-2009



Sources: *CBRE, Cushman & Wakefield, Morris County EDC*

Figure 4-2: Morris County Industrial SF Available 1999-2009



Sources: *CBRE, Cushman & Wakefield, Morris County EDC*

[27] *Industrial Trends Report – First Quarter 2010, Northern and Central New Jersey*; Grub & Ellis

4.5 Case Studies & Best Practices: The Freight Village Concept

A freight village is a location with a defined area that includes different types of functions related to freight transportation, logistics, warehousing and distribution. It typically hosts different functions carried out by independent companies involved in these sectors, but one of the defining characteristics of a freight village is that its support functions are managed and operated by a single entity. A more comprehensive definition of a freight village is as follows:

> *"A Global Freight Village is a cluster of quality industrial-intermodal-distribution-logistics buildings located within a secure perimeter where a range of support services are provided to tenant firms and their operations. Global Freight Villages focus on transportation, intermodal operations, and logistics activities, and are located close to intermodal transport links, seaports, and/or airports, usually on the outskirts of metropolitan areas. Though there may be multiple tenants in a Global Freight Village, either owning or leasing their building(s), management of operations and the direction of support services is in the hands of one organization or entity."*[28]

Key elements of a freight village include the following:

- Economic activity oriented towards specific business sectors, which include transportation, logistics, and warehousing/distribution, and could also include some value-added manufacturing.
- Unified management of the area by a single entity.
- Access to multiple freight transportation modes. This would involve truck access as a matter of course for almost any freight village, while access to other modes (rail, marine, barge, air cargo, etc.) would depend on geographic location and infrastructure conditions.
- Depending on the nature of the industries in the freight village, a number of different support functions may be offered, including office space and freight-oriented retail establishments including food, fuel service, hotels, and truck rest/staging facilities.

Other functions provided in a freight village may be provided for specific types of transportation and logistics operations. Examples of these other functions might include customs services for international trade and truck repair facilities.

For an area such as Morris County that is largely suburban in character but has substantial transportation assets that serve the larger metropolitan region as a whole, the general objectives of the freight village concept would be as follows:

- Consolidate related industrial functions into a defined geographic area that offers the benefits Unified management of the area by a single entity.
- Related to the previous point, improve traffic operations, optimize truck flows and reduce truck volumes on roadways that may not be suitable for this type of vehicular traffic.

[28] Weisbrod, Roberta E., Ernest Swiger, Gerhardt Muller, F. Mack Rugg and Mary Kay Murphy; *Global Freight Villages: A Solution to the Urban Freight Dilemma*; 2001

- Lay the groundwork for the development of an underlying industrial base to help increase rail mode share for freight transportation in the region.
- Enhance the efficiency of the regional freight transportation system, from both a financial perspective and for other non-financial measures such as environmental quality.
- Serve as a catalyst for industrial development that fits in the context of surrounding land uses, plays a valuable role for regional freight transportation, and has other economic benefits (e.g., employment, tax ratables, etc.) for the County and the region as a whole.

Traditional freight villages are typically hundreds or even thousands of acres in size. Many of the European freight villages function through private-public partnerships, with substantial government involvement. Freight Villages provide high value and/or value-added services, including a wide range of support services, like 24 hour security, telecommunications connections, food vendors, child care, training, and postal facilities. An NJTPA study concluded that "high quality, dynamic information-integrated, value-added warehouse-distribution centers will be needed increasingly in the near term," with value-added processing as a means of increasing the return on investment of expensive real estate.[29]

The New York Metropolitan Transportation Council (NYMTC) recently commissioned a freight village feasibility study, which included a review of international and stateside freight villages.[30] Of the fourteen United States freight village sites reviewed, size ranged from 239 to 17,000 acres, with an average of 3,088 acres. New Jersey has several freight villages, three of which were reviewed in the NYMTC study:

- In central New Jersey, Raritan Center is 2,350 acres in size with 26 miles of railroad tracks and sidings, has direct access to the New Jersey Turnpike (I-95) and is approximately 20 minutes to Newark Liberty International Airport and the North Jersey and Staten Island port terminals owned by the Port Authority of NY & NJ. Its own marine facility has been proposed.
- The 8.7 million square foot Heller Industrial Park is located at Exit 10 of the NJ Turnpike and 20 miles from Newark International Airport and the Port of NY & NJ. Heller also has direct rail access via short line.
- Pureland, in southern New Jersey, is a 3,000-acre site at Exit 10 on Interstate 295 and close to Interstate 95. It is served by short rail, within 15 minutes of Philadelphia International Airport and about 20 miles from South Jersey Port Corporation operations.

Given the large scale of freight villages, another less land-intensive concept of Freight Planned Unit Developments (PUDs) has emerged in the United States. Freight PUDs are clusters of warehouses-distribution centers set in industrial park-like settings. According to a study completed for the proposed Tremley Point freight village in Union County, freight PUD "facilities are highly

[29] Report: *Preparing Modern Intermodal Freight Infrastructure to Support Brownfield Economic Development – Phase 1 Final Report*; North Jersey Transportation Planning Authority; Newark, NJ; April 2001.
[30] *Feasibility of Freight Villages in the NYMTC Region: Task 3 – Description of How a Typical Freight Village Works*; Prepared for New York Metropolitan Transportation Council; 2008.

automated (and highly information integrated) to meet just-in-time delivery needs, with rapid cross-docking allowing them to keep inventory lean. The clustering allows for synergistic relationships among companies engaged in warehousing, light manufacturing, value-added assembly, and other operations."[31]

The primary characteristics of the PUDs identified in the 2001 Weisbrod/Swiger report included: (1) a size of up to 150 acres; (2) ownership by one or more companies; and (3) housing a number of relatively small warehouse-distribution centers.

An example of a freight PUD is a "compact" freight village proposal for a 260-acre site off US-206 in Hillsborough that includes an intermodal rail transfer and 45-acre carload yard.[32] The site, while multi-modal for rail-truck transfers, is farther from major air and sea ports and does not include extensive support services like the other NJ freight village examples.

Given the limited amount of land available in Morris County, a "compact" freight village/freight PUD model would likely be most attainable. Regardless of name, and to avoid being just another "warehousing district", an inter-modal freight development in Morris County should include the tenets of successful freight villages around the world. The freight village should:

(a) have direct rail access (Class I, Class II or short line);

(b) be located within close proximity to major interstate highway(s);

(c) be oriented towards value-added services appropriate to the area's major industries (chemical manufacturing in Morris County's case);

(d) include high-tech logistical operations to increase efficiency;

(e) include on-site or nearby services for users (restaurants, postal facilities, child care, etc.);

(f) include office space either on-site or in close proximity;

(g) be compatible with existing and surrounding land uses (i.e. away from residential areas and other sensitive land uses);

(h) include aesthetic treatments to diminish visual impact;

(i) be established by and managed through a public-private partnership; and

(j) include a diversified tenancy under unified logistical management.

4.6 Site Selection Process

In order to identify sites for potential freight development, the consultant team completed a GIS analysis of land uses in Morris County, New Jersey. This analysis was done using tax data and GIS data from various sources, including the NJ Department of Environmental Protection (NJDEP), the NJ

[31] Weisbrod, Roberta E., Ernest Swiger, et.al.; *Global Freight Villages: A Solution to the Urban Freight Dilemma*; 2001

[32] Presentation: *Applicability of the Freight Village Concept to Urban Areas*; Presented by A. Strauss-Wieder, Inc. at the 2007 National Urban Freight Conference

Geographic Information Network (NJGIN), Morris County GIS, the NJ Highlands Council, and the NJ Department of Community Affairs (NJDCA).

To aid in the identification of sites for development or redevelopment the analysis included the examination of several pertinent factors, including proximity to existing rail and major roadways, brownfields/contaminated sites, location in relation to the Highlands Preservation Area, assessed values per acre, municipal equalized tax rates, and the ratios of assessed improvement value to assessed land value. To represent brownfield sites within the County (for which there currently is no definitive and up-to-date database), the consultant extrapolated from NJDEP's known contaminated sites data layer and identified the industrial, commercial, and vacant parcels that contain these sites. While this likely is not an exhaustive list of brownfield sites, it is wholly inclusive of all industrial, commercial, and vacant sites in need of remediation within the County.

Figure 4-3 lists the municipal equalized tax rates per $100 of assessed value for each municipality in Morris County as well as the neighboring municipalities. This is a comparative analysis that shows the relative competitiveness of each municipality for attracting development for land uses such as manufacturing and warehousing. The lower equalized rates are clustered in the southern portion of Morris County and its neighboring municipalities in Somerset and Hunterdon. The higher rates tend to be in the municipalities in the northwestern part of Morris County and neighboring municipalities in Sussex and Passaic. The tax rates for each of the municipalities are included in a separate appendix for this study.

Figure 4-4 shows the parcels identified as key parcels for potential freight development sites. These parcels are all commercial, industrial, and vacant land parcels greater than five acres. The composition of these parcels is summarized in **Table 4-2**.

Table 4-2

Morris County Freight & Land Use Study – Key Parcels

	Vacant	*Industrial*	*Commercial*	***Total***
Parcels	1,035 (55.1%)	299 (15.9%)	545 (29.0%)	**1,879**
Acres	29,145 (62.3%)	6,397 (13.7%)	11,213 (24.0%)	**46,755**
Avg. Acres per Parcel	28.16	21.39	20.57	**24.88**

A plurality of the 1,879 parcels is vacant land and slightly less than one-third are commercial, while industrial parcels make up only 15.9% of the total. In terms of acreage, the vacant parcels tend to be significantly larger (average of 28.2 acres/parcel) than both industrial (21.4) and commercial (20.6) parcels. Though spread throughout the County, many of the larger vacant parcels are clustered in the northwest portion of the County and are located within the Highlands Preservation Area. Not surprisingly, most of the commercial and industrial parcels are clustered around the major state and federal roadways (NJ-10 and US-46, for example) as well as the major freight and commuter rail lines.

The assessed value per acre for the study area parcels is shown in **Figure 4-5**. This analysis incorporates both land and improvement values. Generally speaking, the smaller commercial and industrial parcels located in the denser parts of the County have the highest assessed values per acre. Parcels located near major roadways and rail lines also exhibit higher assessed values. Vacant parcels – particularly larger ones and formerly developed sites – tend to have lower assessed values per acre, in part due to the lack of improvements on the properties.

The ratio of assessed improvement value to assessed land value is another important metric for identifying underutilized land parcels. Higher improvement-to-land value (I/L) ratios generally indicate that the land is being utilized more productively than parcels with lower I/L ratios, due to the latter's small lot coverage, economic or physical obsolescence, etc.). **Figure 4-6** displays these ratios for the 844 commercial and industrial parcels identified above. Approximately two-thirds of these parcels (560 of 844) have ratios that are less than 2.00, indicating parcels that are better suited for redevelopment; the median I/L value ratio for the parcels is 1.43 – a relatively low value.

Another analysis included an examination of the proximity of the study's brownfield sites to existing major passenger and freight rail lines in the County. Using point locations, the consultant counted the number of sites within a half-mile, a mile, and two miles from the rail lines. The information contained in **Figure 4-7** suggests that a substantial portion of brownfield sites within the County are close to the major rail lines. As indicated in **Table 4-3** below, nearly half of the sites are within a half-mile of the rail lines and slightly more than three-quarters are within the two-mile buffer. Accordingly, there appears to be a significant potential for the redevelopment of existing brownfields within the County.

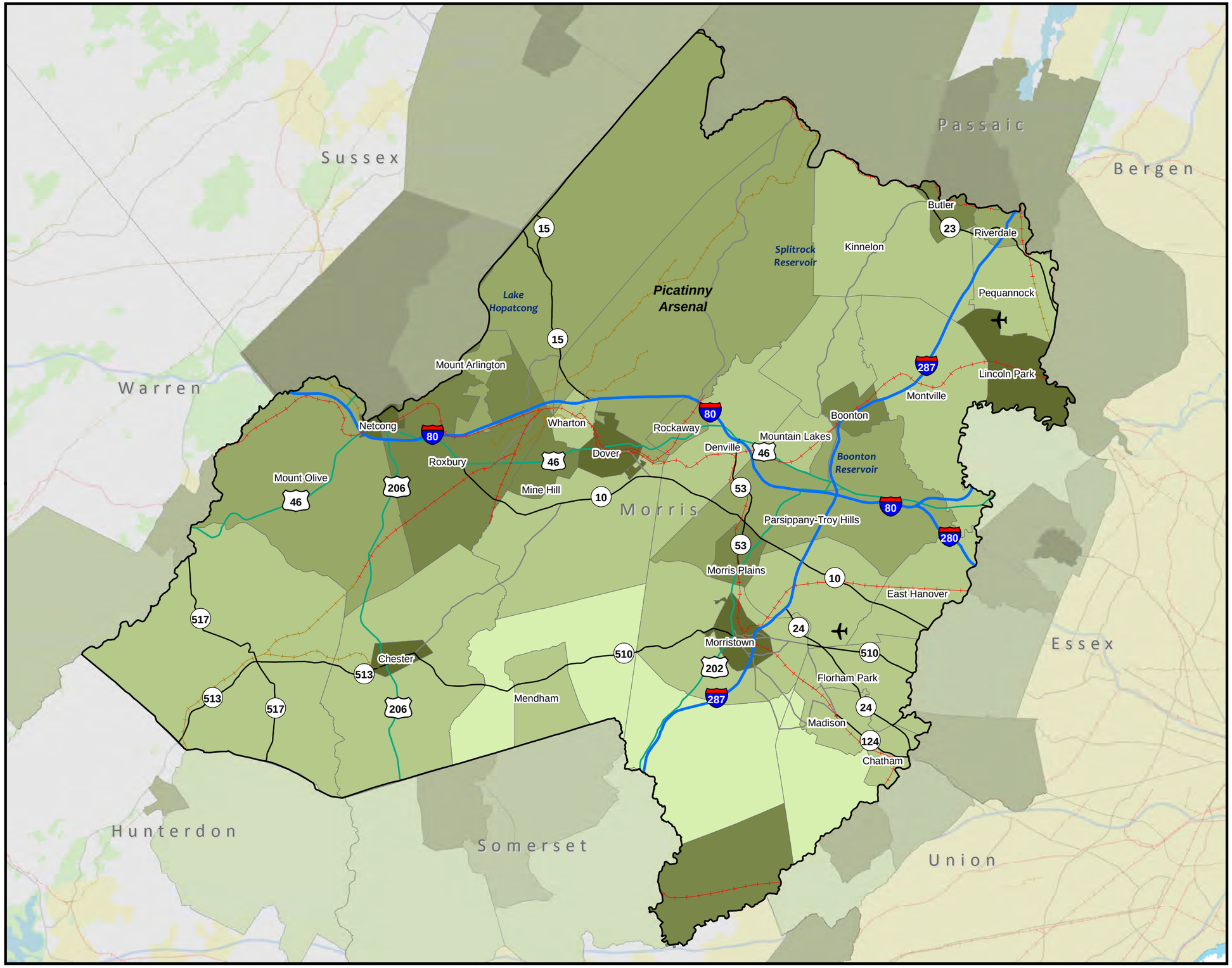
Table 4-3

Proximity of Brownfield Sites to Major Rail Alignments

Buffer Distance	*Number of Sites*
½ Mile	172 (48.6%)
1 Mile	225 (63.6%)
2 Miles	267 (75.4%)
Entire County	**354 Sites**

Morris County, NJ Freight Plan

FIGURE 4-3
Municipal Equalized Tax Rates Per $100 of Assessed Value



Map Legend

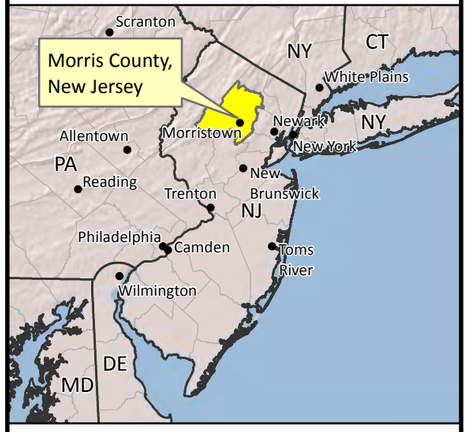
Municipal Equalized Tax Rate

- 0.200 - 0.299
- 0.300 - 0.399
- 0.400 - 0.499
- 0.500 - 0.599
- 0.600 +

Scale (Miles)

2.5 1.25 0 2.5 5

LOCATION MAP



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Source: 2008 Bureau of Transportation Statistics - National Transportation Atlas Database
New Jersey DEP - 2008
NJDEP TIGER Roads 2000 in Morris County, NJ

N

Morris County, NJ Freight Plan

FIGURE 4-4
Commercial, Industrial, and Vacant Parcels Over Five Acres

Map Legend

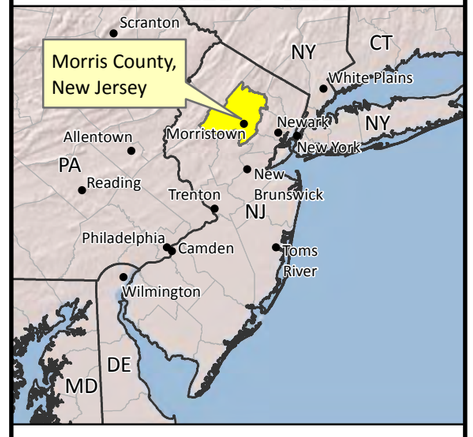
Land Use Type

- Commercial
- Industrial
- Vacant land

Scale (Miles)

2.5 1.25 0 2.5 5

LOCATION MAP



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Source: 2008 Bureau of Transportation Statistics - National Transportation Atlas Database
New Jersey DEP - 2008
NJDEP TIGER Roads 2000 in Morris County, NJ

N

Morris County, NJ
Freight Plan

FIGURE 4-5
Assessed Value Per Acre

Map Legend

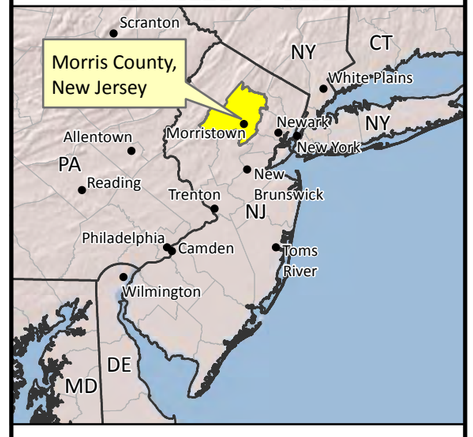
Assessd Value Per Acre

- $0 - $19,999
- $20,000 - $49,999
- $50,000 - $99,999
- $100,000 - $199,999
- $200,000 +

Scale (Miles)

2.5 1.25 0 2.5 5

LOCATION MAP



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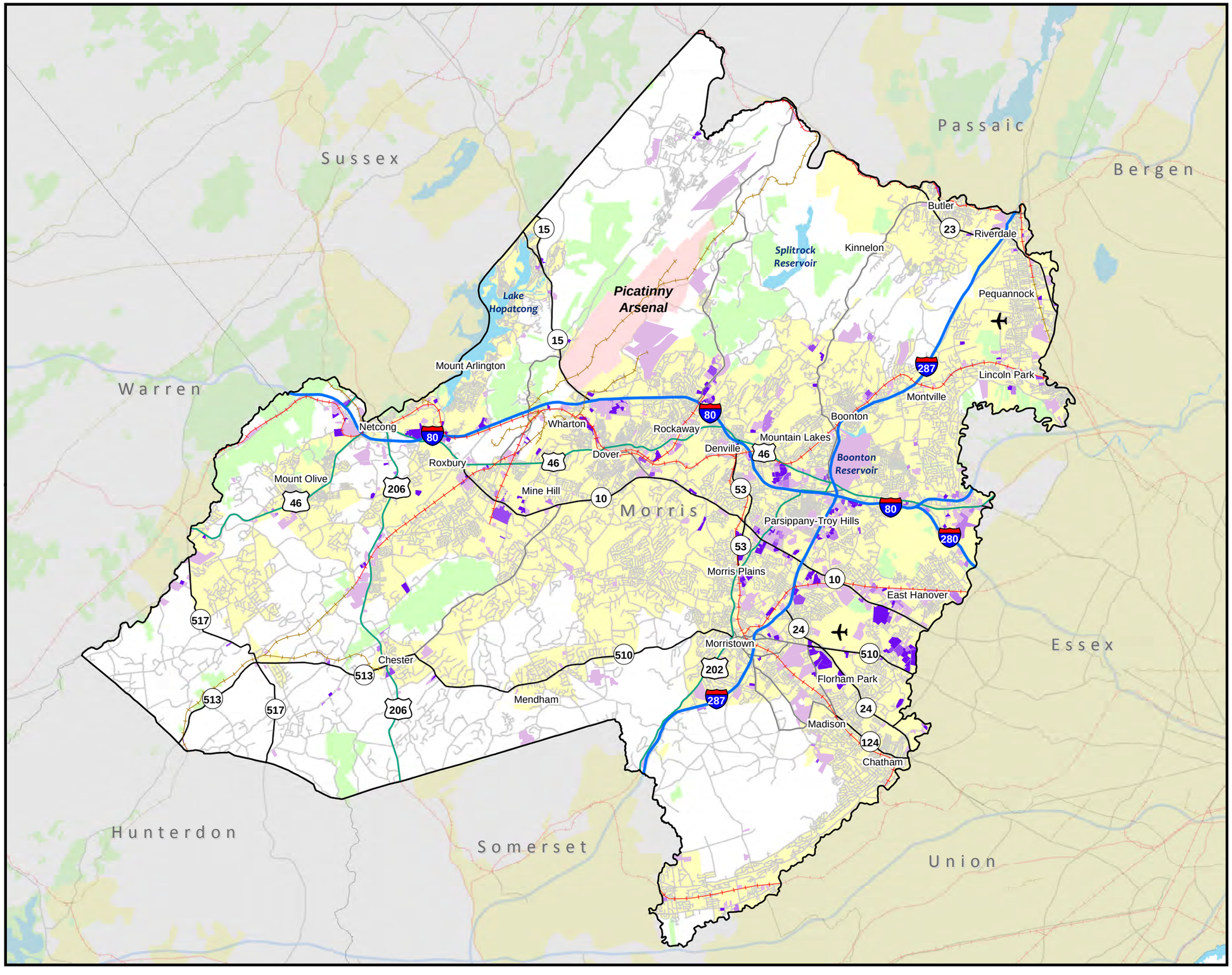
Source: 2008 Bureau of Transportation Statistics - National Transportation Atlas Database
New Jersey DEP - 2008
NJDEP TIGER Roads 2000 in Morris County, NJ

N

Sussex
Passaic
Bergen
Warren
Morris
Essex
Hunterdon
Somerset
Union
Lake Hopatcong
Picatinny Arsenal
Splitrock Reservoir
Boonton Reservoir
Butler
Riverdale
Kinnelon
Pequannock
Lincoln Park
Montville
Boonton
Mountain Lakes
Denville
Rockaway
Wharton
Dover
Roxbury
Mount Olive
Netcong
Mount Arlington
Mine Hill
Parsippany-Troy Hills
Morris Plains
East Hanover
Florham Park
Madison
Chatham
Morristown
Chester
Mendham
15
23
80
46
206
10
53
280
287
24
510
202
513
517
124

Morris County, NJ Freight Plan

FIGURE 4-6
Assessed Improvement Value to Assesssed Land Value Ratios



Map Legend

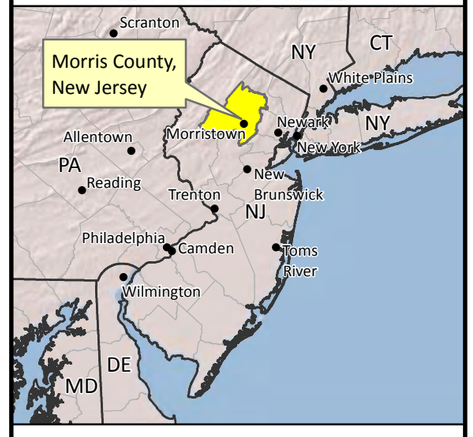
Improvement-to-Land Ratio

- 0.01 - 1.99
- 2.00 - 2.49
- 2.50 - 2.99
- 3.00 +

Scale (Miles)

2.5 1.25 0 2.5 5

LOCATION MAP



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Source: 2008 Bureau of Transportation Statistics - National Transportation Atlas Database
New Jersey DEP - 2008
NJDEP TIGER Roads 2000 in Morris County, NJ

N

Morris County, NJ Freight Plan

FIGURE 4-7 Brownfield Sites: Proximity to Major Rail Lines

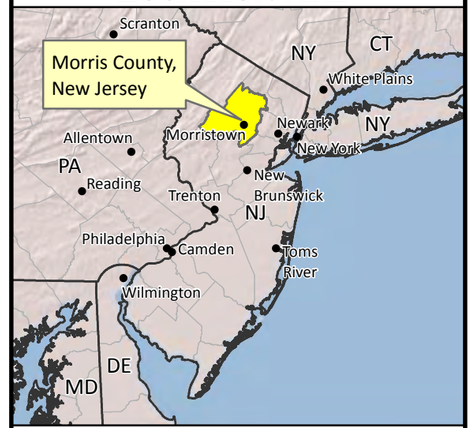
Map Legend

- Brownfield Locations
- Half-mile buffer
- Mile buffer
- Two-mile buffer

Scale (Miles)

2.5 1.25 0 2.5 5

LOCATION MAP



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July 2011

Source: 2008 Bureau of Transportation Statistics - National Transportation Atlas Database
New Jersey DEP - 2008
NJDEP TIGER Roads 2000 in Morris County, NJ

N

4.7 Identification of Key Industrial Parcels

Based on the land use data collected to date and the research conducted in this study, four clusters of industrial sites have been recommended for further study as potential industrial development/redevelopment locations. These recommendations are based on the results of this assessment, incorporating factors that include: (1) large land areas; (2) industrial zoning or current/pending brownfield designation; (3) proximity to existing rail alignments and major highways; and (4) low I/L ratios. The initial locations for consideration are mapped in **Figure 4-8** on a County-wide scale, and clusters of these sites are shown in detail in **Figures 4-9A** through **4-9D**. The top locations from the site selection matrix are provided below in **Table 4-4**.

Table 4-4

Morris County Freight & Land Use Study – Preliminary Site Selection Matrix

Parcel	*Total Acreage*	*Municipality*	*Classification*	*Brownfield (Y/N)*	*Approx. Distance to Rail (ft.)*	*Assessed Value per Acre*	*I/L Ratio*
A	903.6	Roxbury Township	Vacant	Y*	40	$66	N/A
B	74.02	Roxbury Township	Vacant	N	50	$143	N/A
C	67.79	Hanover Township	Industrial	N	20	$95,450	0.02
D	30.09	Rockaway Borough	Vacant	N	30	$6,647	N/A
E	22.72	Rockaway Twp.	Vacant	N	0	$1,937	N/A
F	18.65	Denville Township	Industrial	Y	265	$305,600	2.68
G	17.31	Rockaway Borough	Industrial	Y	30	$245,500	1.55
H	13.29	Rockaway Twp.	Industrial	N	0	$265,700	1.27
I	12.82	Hanover Township	Industrial	N	40	$345,500	1.01
J	10.64	Randolph Twp.	Vacant	N	370	$4,558	N/A

* The former Hercules Powder site in Roxbury Township was not listed as a contaminated site in the version of the NJDEP database of known contaminated sites used for this study (that database was current as of 2009), but an NJDEP remediation permit has been in place at that site since late 2009.

It is important to note that this study is principally focused on Morris County alone; a comparable analysis done on a state-wide scale based on real property assessed values and associated real property tax rates may indicate that other locations outside Morris County would provide better potential sites for industrial development than those listed here.

Recommendations for infrastructure improvements associated with potential industrial development at these sites are documented in Section 5 of this report.

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Morris County, NJ
Freight Plan

FIGURE 4-8
Site Selection Matrix Map

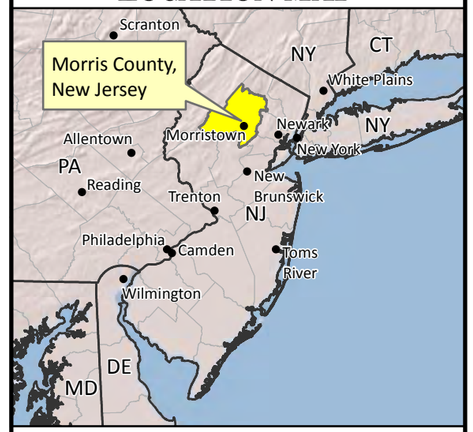
Map Legend

- Industrial
- Vacant land

Scale (Miles)

2.5 1.25 0 2.5 5

LOCATION MAP



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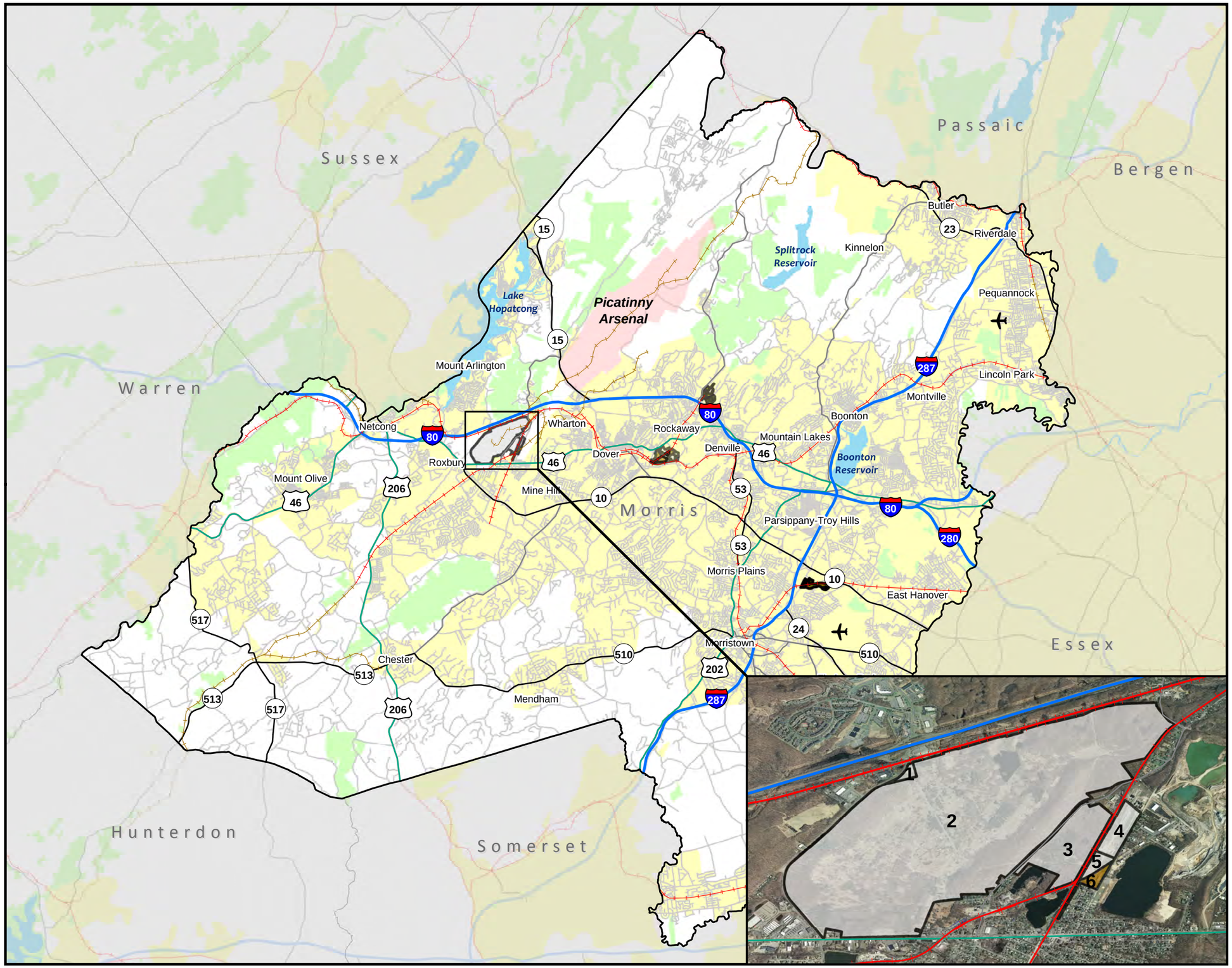
Source: 2008 Bureau of Transportation Statistics - National Transportation Atlas Database
New Jersey DEP - 2008
NJDEP TIGER Roads 2000 in Morris County, NJ

N

Morris County, NJ
Freight Plan

FIGURE 4-9A
Potential Freight Site I



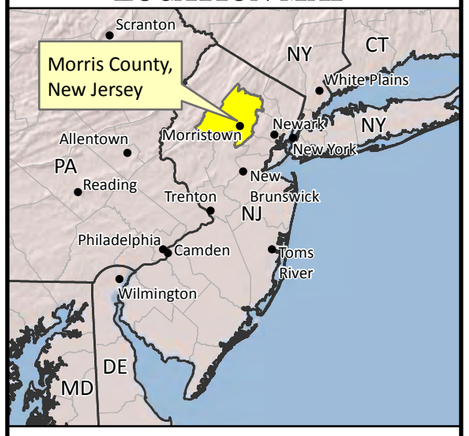
Map Legend

- Commercial
- Industrial
- Vacant land

Scale (Miles)

2.5 1.25 0 2.5 5

LOCATION MAP



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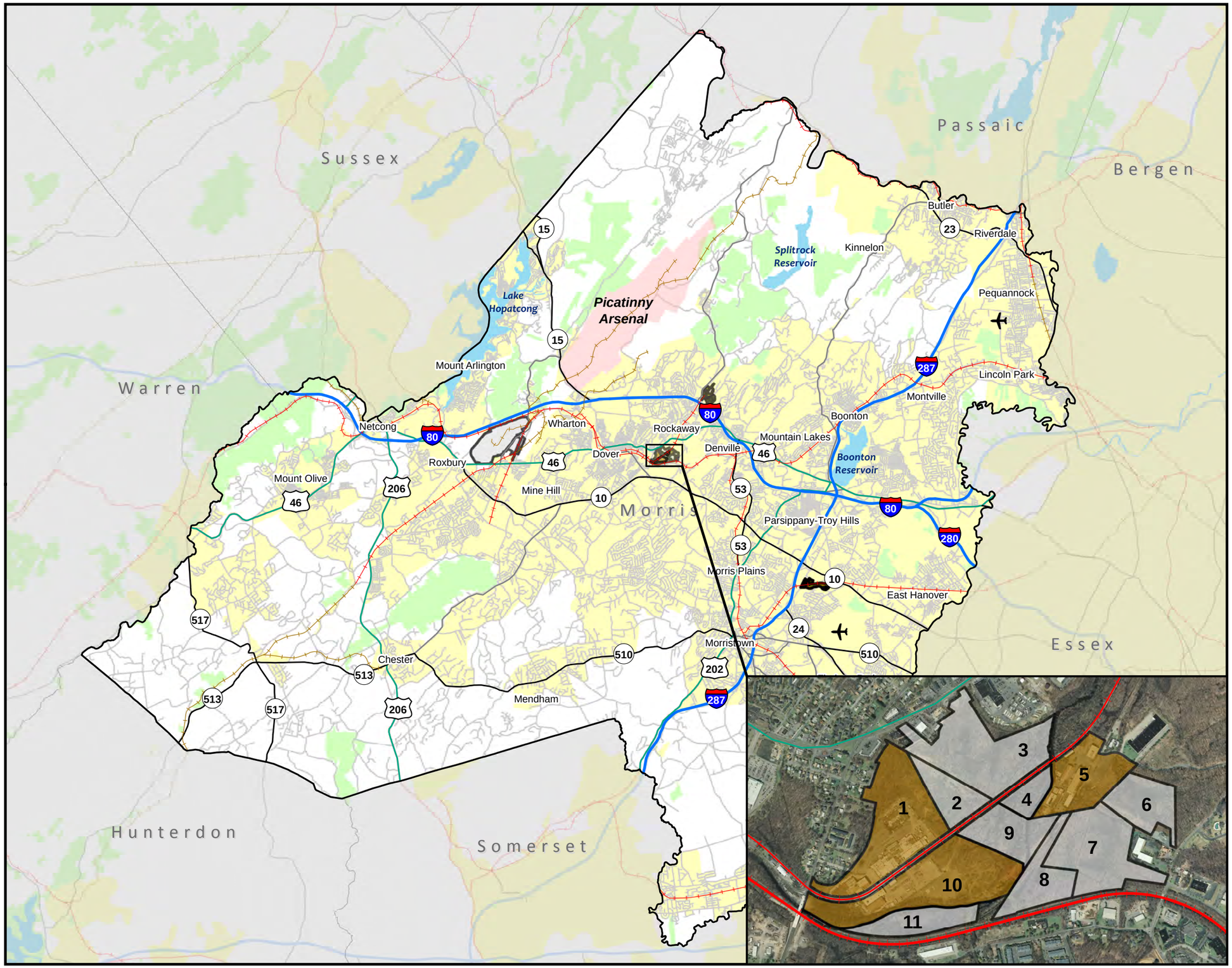
Morris County, NJ
Freight Plan

FIGURE 4-9B
Potential Freight Site II



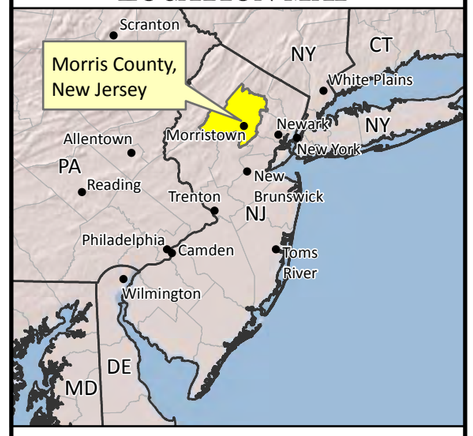
Map Legend

- Commercial
- Industrial
- Vacant land

Scale (Miles)

2.5 1.25 0 2.5 5

LOCATION MAP



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Source: 2008 Bureau of Transportation Statistics - National Transportation Atlas Database
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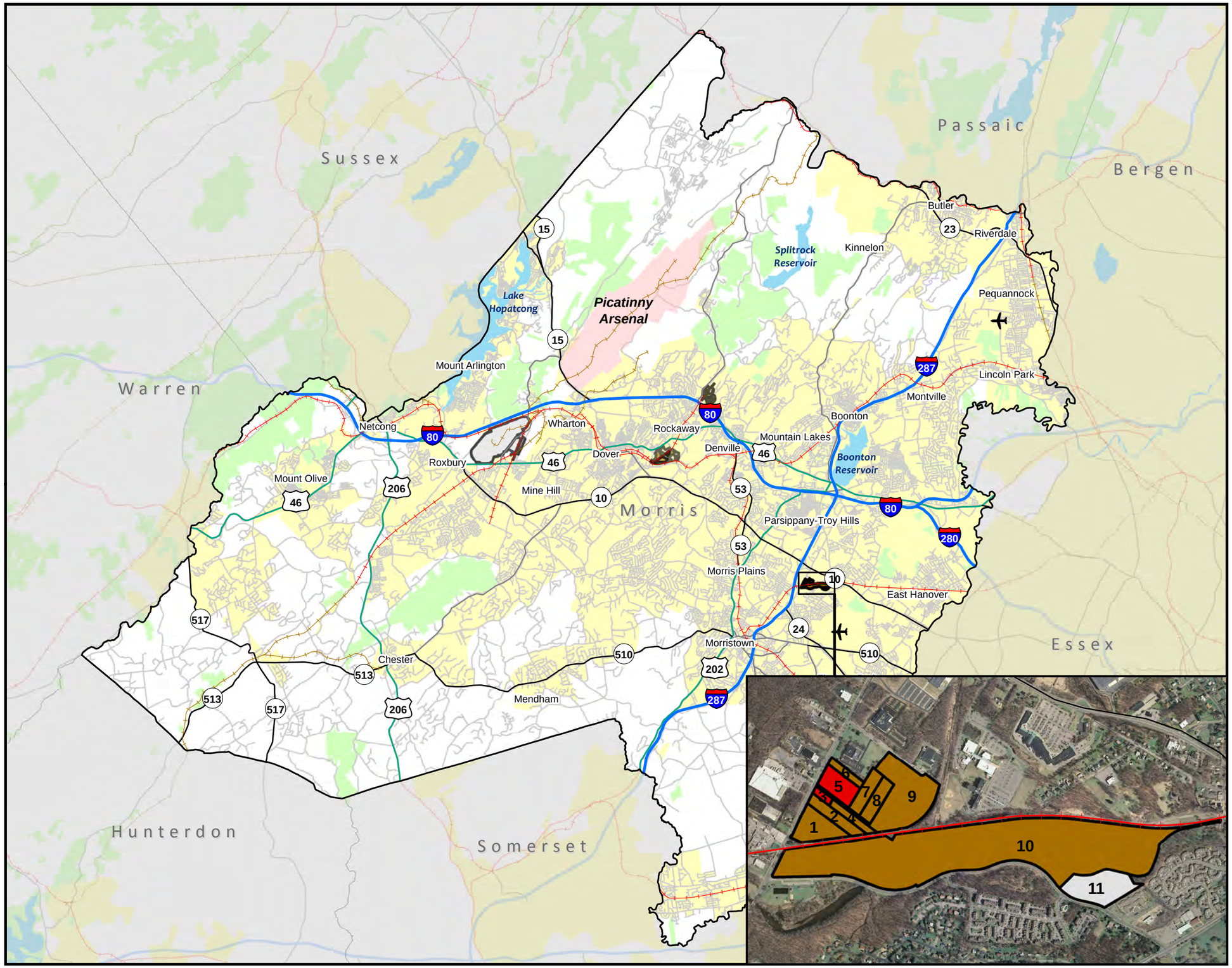
Morris County, NJ
Freight Plan

FIGURE 4-9C
Potential Freight Site III



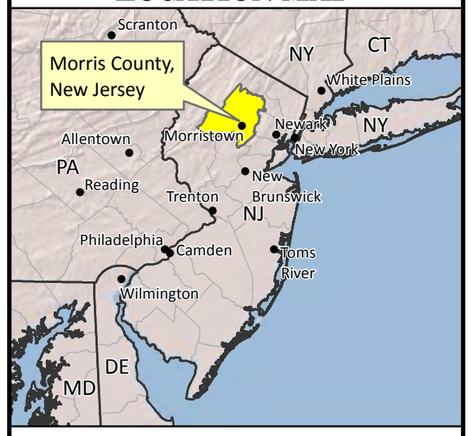
Map Legend

- Commercial
- Industrial
- Vacant land

Scale (Miles)

2.5 1.25 0 2.5 5

LOCATION MAP



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Source: 2008 Bureau of Transportation Statistics - National Transportation Atlas Database
New Jersey DEP - 2008
NJDEP TIGER Roads 2000 in Morris County, NJ

N

Morris County, NJ
Freight Plan

FIGURE 4-9D
Potential Freight Site IV

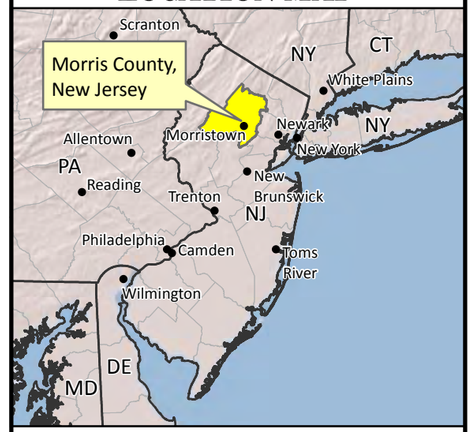
Map Legend

- Commercial
- Industrial
- Vacant land

Scale (Miles)

2.5 1.25 0 2.5 5

LOCATION MAP



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Source: 2008 Bureau of Transportation Statistics - National Transportation Atlas Database
New Jersey DEP - 2008
NJDEP TIGER Roads 2000 in Morris County, NJ

N

5.0 Infrastructure Improvements and Needs

5.1 Introduction

The primary focus of the Morris County Freight Infrastructure & Land Use Analysis is an assessment of the rail and roadway infrastructure in the County used for freight movement, along with recommendations for improvements to support effective, efficient and, safe movement of freight to, from and through the County. This report reflects the baseline transportation data and land use analysis of Sections 2 and 4, with infrastructure improvements aimed at meeting the objectives listed above and defined below, while supporting the general recommendations for economic development as outlined in Section 3.

The general objectives for infrastructure improvements as defined in this document are as follows:

1. Minimize highway capacity expansion to the extent possible.
2. Protect and enhance freight rail service in the County on the three County-owned alignments as well as local customers on the NJ TRANSIT, New York., Susquehanna & Western (NYS&W), and Morristown & Erie (M&E) systems.
3. Promote rail-oriented industrial development on existing or inactive rail rights-of-way, and protect intact abandoned rights-of-way to the extent possible.
4. Enhance truck access to the major regional highway system in ways that minimize future community impacts and reduce existing impacts to the extent possible where local needs are identified.
5. Address existing inefficiencies in the County's freight system in a cost-effective manner that minimizes community impacts and addresses quality-of-life issues.
6. Enhance the County's forecasting capability for truck traffic by developing enhanced data elements and forecasting tools for itself and its municipalities.

5.2 Local Transportation Impacts of Freight-Related Development

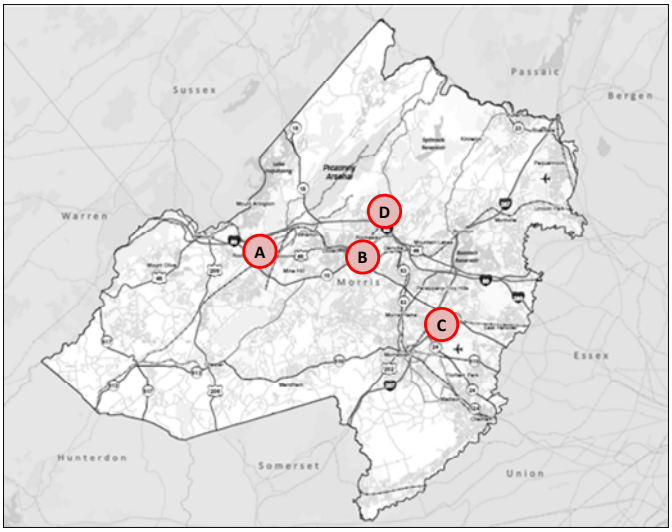
While the availability of freight rail service is a major consideration for industrial development in Morris County and was a key element of the site selection process documented in Section 4, any industrial development is likely to generate some level of local truck activity. An assessment of potential impacts of industrial development was conducted to determine some order-of-magnitude estimates for site-generated truck traffic for the ten detailed industrial sites identified for potential industrial development in Section 4. This assessment, in turn, is used to inform some of the infrastructure improvements identified later in this section.

Detailed analyses of site-generated traffic for a proposed development project are typically done using standard industry publications such as the Institute of Transportation Engineers' document *Trip Generation*. This publication contains extensive documentation of daily and peak period traffic generation rates for various land uses. While suitable for assessments of general traffic impacts for these land uses, this approach tends to be focused primarily on site-generated auto traffic and therefore do not adequately cover some wide variations in trucking activity for industrial land uses.

For this effort, a preliminary estimate of site-generated truck traffic for a number of key industrial properties identified in Section 4 was calculated using truck trip generation rates for different industrial land uses as documented in *NCHRP Synthesis 298: Truck Trip Generation Data*. Average daily truck trip rates per 1,000 square feet of industrial space[33] were developed from this resource for eight different industrial land uses and daily truck estimates computed for each of the ten industrial sites under review. Peak hourly truck trip rates were calculated based on a general peaking factor of 0.10 (i.e., 10% of the daily truck trips would occur in the busiest hour of the day).

The results of these calculations are shown in **Table 5-1**, with a dozen parcels grouped according to their four general areas as described in Section 4. These include the following areas in the county identified in Section 4 as prospective industrial development sites:

- Area A: Roxbury/Kenvil
- Area B: D&R Railroad alignment (Dover and Rockaway)
- Area C: East Hanover and Whippany
- Area D: Green Pond Road (Rockaway and Denville Townships)



Detailed maps of these areas are shown later in this document in **Figures 5-3** through **5-6**.

The information presented in **Table 5-1** indicates a very wide range of potential traffic impacts associated with truck activity at individual industrial sites, with daily truck trip rates per 1,000 square feet of gross floor area ranging from 0.180 for an industrial park to 2.363 for a truck terminal. The intent of this effort is not to conduct a detailed traffic analysis for these sites, but to provide a sense of the order of magnitude of estimated trucking activity associated with various industrial land uses. These figures also provide a general sense of other industrial land parcels of similar size that are not included among these ten sites but represent other industrial development opportunities.

As can be seen from **Table 5-1**, the sheer size of the Hercules site in Roxbury Township (parcel A-2) would result in a substantial volume of truck traffic on the local and regional roadway system under full development at a Floor Area Ratio (FAR) of 0.2. The truck volumes shown for that site indicate that some additional capacity would likely be needed on the local roads that would provide the best access to and from the site, particularly Howard Boulevard to the west and Berkshire Valley Road to the east. Potential options for improvements at this location are discussed in Section 4.

[33] Estimated floor area ratio (FAR) – the ratio of a building's floor area to the size of the parcel of land on which it is constructed – was used to estimate truck traffic associated with various types of industrial development. A maximum FAR of 0.3 was used for all industrial development sites with the exception of the Hercules site in Kenvil (A-2 in Table 1). Due to the size of the site and potential issues with hilly terrain and wetlands, the maximum FAR for the Hercules site was reduced to 0.2.

The implicit assumption in the calculations shown in **Table 5-1** is that each of the sites would be developed in their entirety in a homogenous manner with a single industrial use. This would likely be the case for smaller parcels, but for larger sites (e.g., the Hercules site) the likelihood is that different types of industrial uses would be developed. In addition, the highest truck trip estimates are found in the "Truck Transportation" column. While these estimates are reasonable, it should be noted that even a large industrial site in Morris County is not likely to be suitable for use as a truck terminal due to the high property acquisition costs. One exception to this might be a major overnight delivery company such as UPS or FedEx, who both have a number of terminal locations throughout the New York metropolitan region.

The estimated hourly truck volumes shown in **Table 5-1** indicate that for most of the sites in the four general development areas, truck traffic associated with typical manufacturing, general light industrial and warehousing land uses can be expected to be manageable. Therefore, the focus of infrastructure improvements related to these development areas should be on minimizing impacts in residential areas not suited for heavy truck activity.

Table 5-1

Truck Trip Generation Estimates for Industrial Land Uses

					Manufacturing	Industrial - Heavy	Industrial - Light	Industrial Park	Truck Transportation	Warehouse - Heavy	Warehouse - Light	Wholesale Trade
		Average Daily Truck Trip Rates (per 1000 sq. ft.)[34]			**0.385**	**0.280**	**0.300**	**0.180**	**2.363**	**0.185**	**0.185**	**0.224**
Parcel	*Total Acreage*	*Classification*	*FAR*	*Building Area (Est.)*	*Daily Truck Volumes*							
A-2	903.60	Vacant	0.2	7,872,000	3,030	2,200	2,360	1,420	18,600	1,460	1,460	1,760
A-3	74.02	Vacant	0.3	967,000	370	270	290	170	2,290	180	180	220
A-4	23.15	Vacant	0.3	303,000	120	80	90	50	720	60	60	70
A-5/6	16.14	Industrial	0.3	211,000	80	60	60	40	500	40	40	40
B-3	30.09	Vacant	0.3	393,000	150	110	120	70	930	70	70	90
B-5	17.31	Industrial	0.3	226,000	90	60	70	40	530	40	40	50
C-9	12.82	Industrial	0.3	168,000	60	50	50	30	400	30	30	40
C-10	67.79	Industrial	0.3	886,000	340	250	270	160	2,090	160	160	200
D-4	22.72	Vacant	0.3	297,000	110	80	90	50	700	50	50	70
D-5	13.29	Industrial	0.3	174,000	70	50	50	30	410	30	30	40
D-8	18.65	Industrial	0.3	244,000	90	70	70	40	580	50	50	50
Parcel	*Total Acreage*	*Classification*	*FAR*	*Building Area (Est.)*	*Peak Hourly Truck Volumes*							
A-2	903.60	Vacant	0.2	7,872,000	303	220	236	142	1,860	146	146	176
A-3	74.02	Vacant	0.3	967,000	37	27	29	17	229	18	18	22
A-4	23.15	Vacant	0.3	303,000	12	8	9	5	72	6	6	7
A-5/6	16.14	Industrial	0.3	211,000	8	6	6	4	50	4	4	4
B-3	30.09	Vacant	0.3	393,000	15	11	12	7	93	7	7	9
B-5	17.31	Industrial	0.3	226,000	9	6	7	4	53	4	4	5
C-9	12.82	Industrial	0.3	168,000	6	5	5	3	40	3	3	4
C-10	67.79	Industrial	0.3	886,000	34	25	27	16	209	16	16	20
D-4	22.72	Vacant	0.3	297,000	11	8	9	5	70	5	5	7
D-5	13.29	Industrial	0.3	174,000	7	5	5	3	41	3	3	4
D-8	18.65	Industrial	0.3	244,000	9	7	7	4	58	5	5	5

[34] *NCHRP Synthesis 298: Truck Trip Generation Data*

5.3 Proposed Infrastructure Improvements and Policy Initiatives

A number of potential infrastructure improvements and policy initiatives are proposed in this study, based on the extensive data review documented in Section 2, the land use constraints and other factors identified in Section 4, and the economic goals of the County as documented in Section 3. Some of these improvements are outside the jurisdiction of the County and therefore would involve actions and cooperation from other agencies, including NJ TRANSIT, NJDOT and local municipalities. One improvement in particular involves the elimination of bridge clearance constraints on a privately-owned railroad, so the cooperation of the railroad would be necessary for implementation.

The proposed improvements and initiatives are presented through a hierarchical approach, with system-wide issues, policy initiatives, and improvements that deal with issues outside the County included among regional considerations. Local improvements are grouped into the four geographic areas described in the land use analysis (Section 4) and documented in **Table 5-1** according to their "A" through "D" designations. Some of the figures include proposals for short-term and long-term improvements. Depending on funding options and prioritization of projects by implementing agencies, the short-term improvements correspond to projects that can likely be done within the next one to three years. Planning-level cost estimates for infrastructure improvements are based on an assumed project midpoint of 2015.

5.3.1 Regional Improvements and Policy Initiatives

A number of regional infrastructure improvements and policy initiatives are proposed that address system-wide needs. Some of these cannot be implemented by Morris County government alone, but the County has a vested interest in pursuing these and playing an active role in supporting them and moving them forward. These include the following:

1. **Support an initiative to address bridge clearances along the Morristown Line to accommodate Plate F (17'-0") rail cars.** An explanation of the height restriction in Morris County can be found in Section 2.6. This effort would be aimed primarily at raising the height limit on the Norfolk Southern Washington Secondary and the NJ TRANSIT Morristown Line west of Dover from 16'-6" to 17'-0", thereby allowing the interchange of Plate F cars between most of the Morris County rail system (including the three County-owned lines) and Norfolk Southern. Preliminary research indicates that the current 16'-6" limit is based on the clearance of the South Main Street bridge over the Washington Secondary in Phillipsburg, while the height of the Allen Road bridge in the northeastern corner of Mansfield Township (is listed at 16'-10" in Conrail track charts dating back to the 1970s. In addition, NJ TRANSIT has a posted overhead clearance of 16'-6" between Netcong and CP Bill in Hackettstown. A detailed investigation is recommended to determine if the remaining overhead bridges west of Dover can accommodate the 17'-0" rail car height (see **Figure 5-1**). This project should be a joint effort between NJDOT and Norfolk Southern, Morris County, Warren County, with Mansfield Township and the Town of Phillipsburg also serving as key players due to their jurisdiction over the local roads on one or more of these overhead bridges.

   There are some possible options for addressing the South Main Street bridge clearance issue without making any changes to the bridge itself, by relocating the connection point between the Washington Secondary and Norfolk Southern's Lehigh Line to a point east of the bridge.

This would enable trains accessing the Washington Secondary to pass under South Main Street on the Lehigh Line track where the bridge clearance is high enough to accommodate taller Norfolk Southern intermodal and automotive trains traveling to and from northern New Jersey. NJ TRANSIT concerns would need to be addressed in this scenario, since Norfolk Southern operates its Lehigh Line service through this area on the NJ TRANSIT-owned former alignment of the Central Railroad of New Jersey (CNJ). This arrangement exists to this day as a result of an agreement between NJDOT, Conrail and NJ TRANSIT that dates back to the late 1980s when a segment of the former Lehigh Valley Railroad main line was taken out of service and Conrail began operating trains on a short segment of the former CNJ line.[35] Norfolk Southern acquired this portion of the Conrail system in 1999. This segment of the CNJ line is of particular interest to NJ TRANSIT because it represents a potential long-term option for a future extension of Raritan Valley Line service to Phillipsburg.

The Washington Secondary is primarily a single track line, approximately 22.2 miles in length and located between CP Bill near Hackettstown to the east and Phillipsburg to the west. Rail operations between CP Bill and Phillipsburg are controlled by Norfolk Southern. Maximum allowable speed over the NS Washington Secondary is 25 MPH, except for the last 0.5-mile segment in Phillipsburg and at Washington where the maximum allowable speeds are 10 MPH. At Phillipsburg, the Washington Secondary connects directly to the NS Lehigh Line at an interlocked, powered turnout designated CP Phillipsburg.

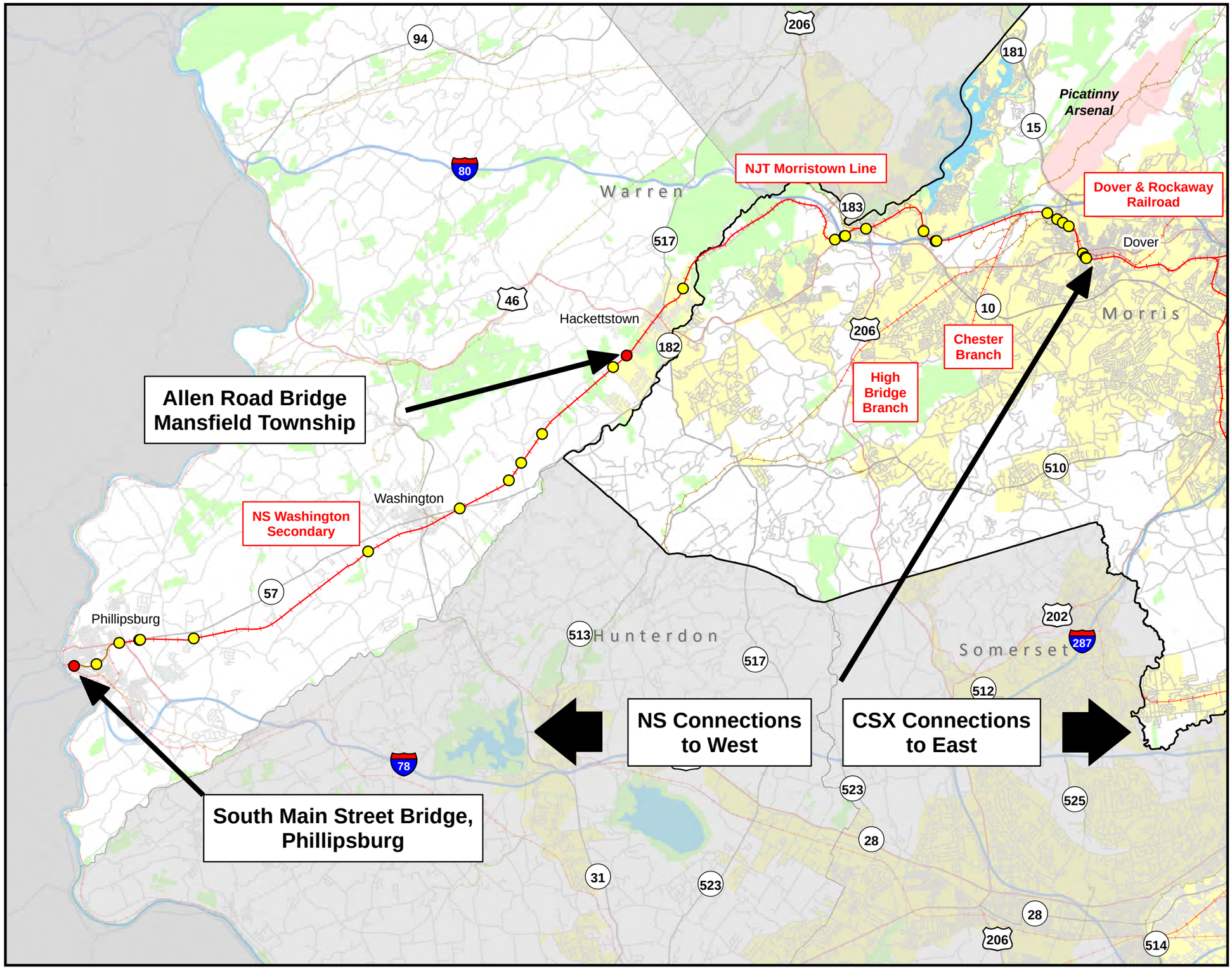
An important consideration in the recommended investigation of the Washington Secondary corridor is the discrepancy between actual and posted bridge heights. The height and widths of the various standard railcar configurations do not take into account dynamic movement due to rail car suspension condition, wheel wear, and track conditions. Dynamic considerations add another three or four inches to the vertical clearance required in addition to maximum height for each "Plate." Furthermore, track maintenance considerations in ballasted track territory usually require an additional three to four inches to provide the additional vertical clearance due to future ballast and surface operations. Therefore, an additional six to eight inches is provided above the Plate maximum height, to account for dynamic and track maintenance considerations.

While a detailed investigation of the Washington Secondary and Morristown Line corridor west of Dover is recommended in this study, preliminary research has been done and planning-level cost estimates have been developed for some potential improvements along this corridor. These are described in detail below.

[35] Before the establishment of Conrail in the mid-1970s, the Lehigh Valley Railroad (LVRR) and Central Railroad of New Jersey (CNJ) alignments ran through Phillipsburg on roughly parallel alignments and crossed the Delaware River on adjacent bridges. The LVRR alignment became part of the Conrail system, while the former CNJ main line is owned by NJ TRANSIT and is used for the agency's Raritan Valley Line service as far west as High Bridge. After a structural problem was identified on the LVRR bridge over the Delaware River, Conrail and NJ TRANSIT signed a lease agreement and Conrail constructed a connection in 1987 between the former LVRR and CNJ lines about 1.2 miles east of the South Main Street bridge along the CNJ alignment. This enabled Conrail trains operating on their Lehigh Line to use the more modern CNJ bridge over the Delaware River.

Morris County, NJ Freight Plan

FIGURE 5-1
Rail Overhead Clearances



Below 17' 0"

Height to be investigated

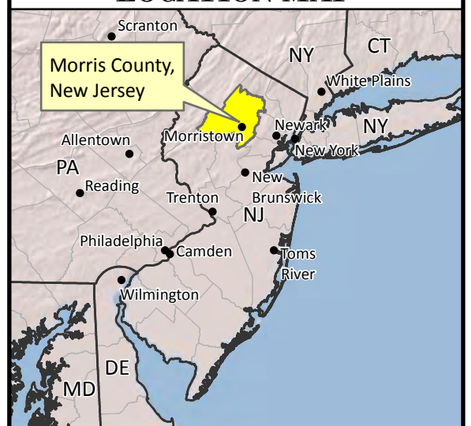
Abandoned Railroad

Active Railroad

Scale (Miles)

2.5 1.25 0 2.5 5

LOCATION MAP



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New Jersey DEP - 2008
NJDEP TIGER Roads 2000 in Morris County, NJ

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Allen Road Bridge (NS Bridge 58.20)

Allen Road is a local, two-lane road that is grade-separated from the single-track Washington Secondary. Conrail track charts issued in 1986 indicate that the Allen Road overhead bridge has a limiting vertical clearance of 16' – 10"; no records have been found to indicate that the limiting clearance was subsequently improved. The following information and data is summarized from *Conrail Philadelphia Division, List of Overhead and Undergrade Structures*, dated January 1, 1996:

- Type Bridge / Bridge Deck: Precast Concrete / Concrete
- No. of Tracks: 1
- No. of Spans / Length of Span / Total length: 1 / 36 ft. / 36 ft.
- Date Built: 1913
- Substructure Maintenance: By Others (i.e., not NS)
- Superstructure Maintenance: By Others (i.e., not NS)
- Remarks: Leased to NJ TRANSIT
- Track alignment: Left-hand curve, 1D-30M, 0" superelevation, transitioning into tangent track
- Track grade: 0.86%, ascending southward to a grade break at Mile Post 58.5
- Maximum allowable speed (NS): 25 MPH

Before any improvement program can be developed, the lease agreement between Norfolk Southern and NJ TRANSIT should be reviewed to determine responsibilities and restrictions. NS bridge drawings need to be reviewed to determine substructure and superstructure design and construction details.

With regard to improving vertical clearances at overhead bridges, current railroad industry preference is to lower the existing track profile rather than re-building the existing bridge. The following design and construction sequence is envisioned:

a. The existing railroad and overhead bridge would be surveyed and mapped. Details, such as culverts, drainage ditches, utilities, mile posts, etc., would also be located.

b. Existing subsurface and aerial utilities would need to be located and possibly relocated to accommodate the proposed railroad alignment. If present, third party fiber optic lines located in railroad right-of-way typically cannot be relocated. Significant penalties may be assessed if third party fiber optic lines buried in railroad right-of-ways are disturbed or damaged.

c. A subsurface investigation will be required to determine current geotechnical conditions and to provide recommendations regarding railroad subgrade construction and temporary support of bridge foundations. If founded on rock, the existing foundations at Bridge 58.20 may not require temporary support during excavation of the new track roadbed.

d. Conrail's 1996 track charts indicate that the track at Bridge 58.20 is constructed of jointed rail, rather than continuous welded rail. If so, the existing track can be removed as track panels and stockpiled nearby, rather than completely disassembling the track to facilitate excavation. If the track is to be moved as panels, it may be necessary to install several new

ties and rail anchors per track panel in order to hold the track together while the panels are being removed. The track approaches to the bridge are also removed to facilitate the design clearance and design track profiles.

e. After the track is removed, the existing track ballast, sub-ballast and subgrade are excavated out and stockpiled, typically using a dozer. The new railroad subgrade is compacted before new ballast is installed. Filter fabric and drainage pipes are also installed if recommended by the geotechnical report.

f. The track panels are re-installed and the track lined and surfaced.

The current vertical clearance at Bridge 58.2 is estimated to be 16'-10"; Plate F car height is 17'-0" above top of rail. The proposed undercutting would provide a vertical clearance of 17'-6" to 17'-8". The additional 6"-8" provides for both rail car dynamics and future track ballast and surfacing associated with maintenance operations.

A planning-level cost estimate for this effort is $200,000. This includes estimated costs for site investigation, engineering, and permitting. Additional cost items not included in this figure include: (1) payments to NS for review of plans, right-of-entry fee, training and other site investigation work; (2) additional geotechnical work if bedrock is encountered where the track is to be lowered; and (3) remediation of any contaminated materials that require excavation, handling, or disposal.

South Main Street Bridge (NS Bridge 80.23)

South Main Street a local, two-lane road that is grade-separated from the single-track Washington Secondary. Information provided by NS indicates that the South Main Street overhead bridge has a limiting vertical clearance of 16'-6"; no records have been found to indicate that the limiting clearance was subsequently improved.

Two possible options to mitigate the clearance issue at South Main Street have been investigated in this study. One option involves lowering the track underneath the bridge, while the second option requires the construction of a new connection track between the NS Lehigh Line and the NS Washington Line. The proposed connecting track would diverge eastward from the Lehigh Line east of the South Main Street overhead bridge and connect to the Washington Secondary approximately 1,000 feet east of the existing bridge. A third option, not examined in this study, would require the raising of the South Main Street bridge over the Washington Secondary.

The following information and data is summarized from *Conrail Philadelphia Division, List of Overhead and Undergrade Structures*, dated January 1, 1996:

- Type Bridge / Bridge Deck: I-Beam / Concrete
- No. of Tracks: 1
- No. of Spans / Length of Span / Total length: 2 / 17 ft. (Wash. Sec.) and 31 ft. (no track) / 48 ft.[36]
- Date Built: 1911

[36] Photos indicate that the second bay is not 31 feet wide, but possibly only 10 feet.

- Substructure Maintenance: Unknown or Not Established
- Superstructure Maintenance: Unknown or Not Established
- Remarks: None
- Track alignment: Tangent transitioning into a left-hand curve, 3D-00M, 0“ superelevation
- Track grade: 1.37%, descending toward the Delaware River
- Maximum allowable speed (NS): 10 MPH

Before any improvement program can be developed, any agreements between Norfolk Southern, the New Jersey Department of Transportation, NJ TRANSIT and the Town of Phillipsburg should be reviewed to determine responsibilities and restrictions. NS bridge drawings need to be reviewed to determine substructure and superstructure design and construction details.

As with the Allen Road bridge, the current railroad industry preference would be to lower the existing track profile rather than rebuilding the existing bridge. In addition, the adjoining South Main Street bridge over the Lehigh Line would make any attempt to raise this structure a complex and expensive undertaking. As a result, the following design and construction sequence is envisioned for lowering the Washington Secondary rail bed under the bridge:

a. The existing railroad and overhead bridge would be surveyed and mapped. Details, such as culverts, drainage ditches, utilities, mile posts, etc., would also be located.

b. Existing subsurface and aerial utilities would need to be located and possibly relocated to accommodate the proposed railroad alignment. If present, third party fiber optic lines located in railroad right-of-way typically cannot be relocated. Significant penalties may be assessed if third party fiber optic lines buried in railroad rights-of-way are disturbed or damaged.

c. A subsurface investigation will be required to determine current geotechnical conditions and to provide recommendations regarding railroad subgrade construction and temporary support of bridge foundations. If founded on rock, the existing foundations at Bridge 80.23 may not require temporary support during excavation of the new track roadbed. However, without the benefit of test pits it is not known if lowering is possible due to bedrock beneath the track.

d. A visual inspection of the site indicated that the track at Bridge 80.23 is constructed of jointed rail, rather than continuous welded rail. Therefore, if bedrock does not preclude track lowering, the approach track can be removed as track panels and stockpiled nearby; the track under the bridge nay have to be completely disassembled. If the track is to be removed as panels, it may be necessary to install several new ties and rail anchors per track panel in order to hold the track together while it is being removed in panels. The track approaches to the bridge are also removed to facilitate the design clearance and design track profiles.

e. After the track is removed, the existing track ballast, sub-ballast and subgrade would be excavated and stockpiled. The new railroad subgrade would then be compacted before new ballast is installed. Filter fabric and drainage pipes are also installed if recommended by the geotechnical report.

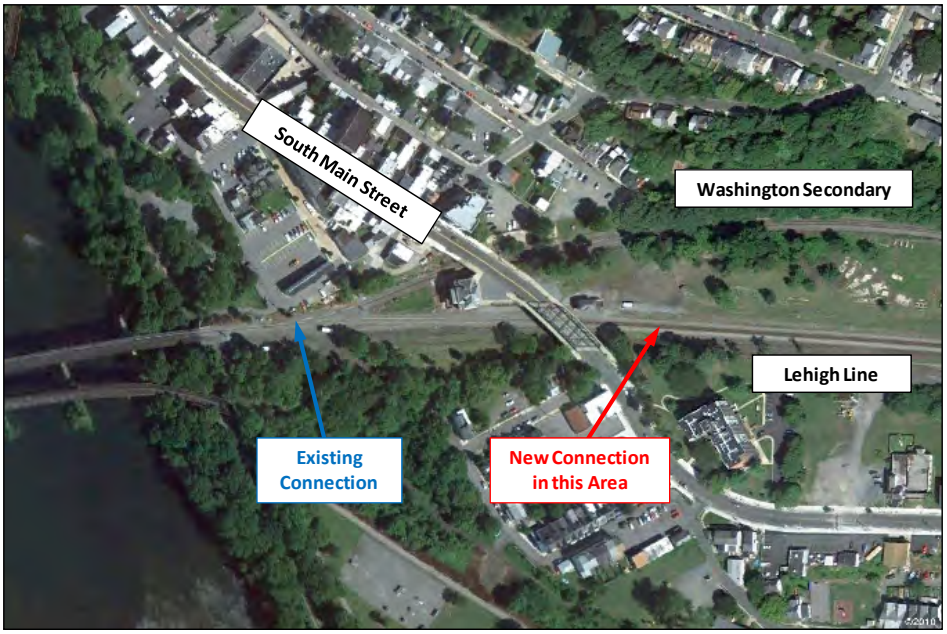
f. The track panels on the bridge approaches are re-installed, the track under the bridge is re-built and the track lined and surfaced.

The current vertical clearance at Bridge 80.23 is estimated to be 16'-6"; Plate F car height is 17'-0" above top of rail. The proposed undercutting would provide a vertical clearance of 17'-6" to 17'-8". The additional 6"-8" provides for future tracking surfacing associated with maintenance operations.

The horizontal clearance under Bridge 80.23 could be a future concern if longer rail cars become more common. The existing horizontal alignment consists of tangent track (east end of Bridge 80.23), transitioning thru a spiral (under the bridge) to a 3D-00M curve art the west side of the curve. The existing bridge opening is only 17 feet wide. On tangent track that would provide 8'-6" distance from centerline of track to face of abutment or pier. For a 10'-8" wide rail car, this would provide a clearance of 3'-2" between side of rail car to face of abutment/pier. On curves, this lateral clearance is reduced due to mid-body overhang and end overhang of rail cars. The clearance generally reduces as the length of the rail car increases.

A planning-level cost estimate for this effort is $205,000. This includes estimated costs for site investigation, engineering, and permitting. Additional cost items not included in this figure include: (1) payments to NS for review of plans, right-of-entry fee, training and other site investigation work; (2) additional geotechnical work if bedrock is encountered where the track is to be lowered; and (3) remediation of any contaminated materials that require excavation, handling or disposal.

The second option to address the South Main Street vertical constraint would be to relocate the connection between the Lehigh Line and the Washington Secondary from its existing location to a point further east of the South Main Street bridge and the former PU interlocking tower located adjacent to the bridge on its east side. This would allow trains using the Washington Secondary to pass under South Main Street on the Lehigh Line, where the vertical clearance is sufficient to accommodate double-stack containers. The proposed connecting track would diverge from the Lehigh Line east of South Main Street and is anticipated to tie into the Washington Secondary in the vicinity of Milepost 80, as shown in the figure below. The proposed connecting track would ascend eastward away from the Delaware River at an estimated grade of 1.4%.



The following design, construction and operating issues would need to be considered in advancing this option:

a. The proposed connecting track would pass through a parcel of open land on the north side of the Lehigh Line that is currently undeveloped. The east end of the site was a former locomotive servicing facility owned by the Central Railroad of New Jersey. The facility, consisting of a turntable, roundhouse, coaling facility and other structures, has since been removed; however, many of the foundations remain. The west end of the site was used to spoil excavated material from Conrail's original lowering of the Lehigh Line under South Main Street.

b. Several property owners may own portions of the proposed site including Norfolk Southern, the State of New Jersey, NJ TRANSIT, and the Town of Phillipsburg. The site has also been considered as a candidate site for a proposed state transportation museum. Property ownership and easements will need to be verified.

c. The site will need to be surveyed and mapped. Appropriate environmental documentation will also need to be generated. The foundations of the former engine servicing facility will need to be located; they could be considered a historical resource.

d. Existing subsurface and aerial utilities would possibly need to be relocated. If present, third party fiber optic lines located in railroad right-of-way typically cannot be relocated. Significant penalties may be assessed if third party fiber optic lines buried in railroad right-of-ways are disturbed or damaged. The NS Lehigh Line would also have to be evaluated at the site of the proposed connection for possible utility and buried fiber optic conflicts.

e. A subsurface investigation will be required to determine current geotechnical conditions and to provide recommendations regarding embankment construction and fill materials. The site may have to be investigated for hazardous materials.

f. The proposed connection to the NS Lehigh Line would consist of a new No. 10 or new No. 15 turnout. The turnout would be built immediately to the east of the former PU interlocking tower. The proposed turnout would be located on tangent track, which is preferred to locating the turnout on a curve. The new turnout could either be interlocked or an electric lock switch. This study assumes that the turnout will be interlocked. The existing turnout on the Lehigh Line would be removed after the new turnout is cutover.

g. It is anticipated that the connection between the proposed connecting track and the existing Washington Secondary would be made in the vicinity of Mile Post 80. The connection could be made by a cut and throw, in which the Washington Secondary track is cut and realigned to tie into the new connecting track. Infrastructure such as culverts, drainage ditches, utilities, mile posts, etc would also have to be located.

A planning-level cost estimate for this effort is $1.8 million. This includes estimated costs for site investigation, engineering and permitting. Additional cost items not included in this figure include: (1) payments to NS for review of plans, right-of-entry fee, training and other site investigation work; (2) remediation of any contaminated materials that require excavation, handling, or disposal; and (3) cost of property and right-of-way acquisition.

2. **Actively participate in efforts at the state level to increase the rail car weight limit on the Morristown Line from 263,000 to 286,000 pounds.** As discussed previously in Section 2.6.2 of this report, the Morristown Line is owned by NJ TRANSIT, a passenger railroad that operates with the 263,000-lb. weight limit that it inherited when it assumed the operation of commuter rail service in the early 1980s. The agency has no need to accommodate the 286,000-lb. rail cars that have become the standard rail car weight for much of the nation's rail system. To address local industry needs related to the 286,000-lb. rail car issue, it will be necessary to pursue potential improvements to the system using non-NJ TRANSIT funding. NJDOT, NJ TRANSIT, and the freight railroads are currently involved in an ongoing effort to determine the impacts of 286,000-lb. railcars on the rail network across the state, and Morris County is one area that would greatly benefit from the higher weight limit.

   Increasing the weight limit on the line would provide nearly 9% additional weight capacity per car for shippers whose loads are heavy enough that they are constrained by the 263,000-lb. limit. Some of the freight rail customers in Morris County must now receive rail cars that are designed for a 286,000 lb. gross rail load (GRL) but are loaded at lighter weights to meet the 263,000-lb. limit. Industries that receive bulk shipments (hopper cars) or lumber (center-beam cars) by rail are those directly impacted by this limit. These include the plastic manufacturers at the north end of the Dover & Rockaway Railroad alignment as well as lumber shippers (84 Lumber, Blue Ridge Lumber and Kuiken Brothers Company) that currently receive loads by rail or are expected to begin receiving rail shipments shortly.

   This measure should be pursued through a "core rail network" approach (see **Figure 5-2**), with first priority for any necessary improvements given to that segment of the rail system to the west of D&R Junction in Dover. Raising the weight limit on the segment of the line west of D&R Junction would allow the three County-owned railroads to meet the 286,000-lb. standard even if cost considerations preclude the entire Morristown Line from being done at once. Connecting service for this initial phase would be via the Norfolk Southern system through Phillipsburg to the west, which coincides with the segment identified for height clearance improvements in Item #1. A second phase of this effort might include raising the weight limit as far east as Morristown, thereby providing 286,000-lb. service to M&E customers on the Whippany Line as well as Norfolk Southern customers on the Morristown Line between Dover and Morristown. The ultimate goal would be the upgrade of the entire Morristown Line to the 286,000-lb. standard, thereby providing comparable weight restrictions for the County via either Class I railroad – Norfolk Southern to the west or CSX to the east.

Morris County, NJ Freight Plan

FIGURE 5-2
Core Rail System
(Goal: 286,000 lb. Limit)

NJT Morristown Line

Dover & Rockaway Railroad

NS Washington Secondary

Chester Branch

High Bridge Branch

Picatinny Arsenal

NS Connections to West

CSX Connections to East

Warren

Hackettstown

Washington

Phillipsburg

Hunterdon

Somerset

Morris

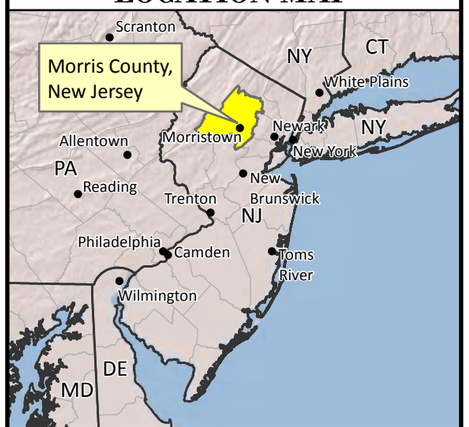
Dover

- Short Term Goal
- Long Term Goal
- Abandoned Railroad
- Active Railroad

Scale (Miles)

2.5 1.25 0 2.5 5

LOCATION MAP



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Source: 2008 Bureau of Transportation Statistics - National Transportation Atlas Database
New Jersey DEP - 2008
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3. **Document a truck route system in Morris County.** This is not intended to involve the formal adoption of a statutory truck network by the County, but is an informational resource for industrial developers, trucking companies and other interested parties to identify local and regional routes suitable for trucks of various sizes. Building upon the core truck access network established by the State of New Jersey in 2008 under N.J.A.C. 16:32, this resource would include documentation of local truck restrictions in the County's municipalities as well as applicable height and weight limits on the County's road network. This resource can be developed as both a web-based map as well as printed material for distribution through the County, its municipalities and the Morris County Economic Development Corporation (MCEDC).

4. **Enhance the County's traffic model to include expanded industrial land uses.** One module of the County's existing traffic model is a Truck Trip Generation Submodel that includes truck trip generation rates for three basic industrial land uses: truck terminal, warehouse and pipeline. Any future upgrades to this model should include some consideration for additional industrial land uses along the lines of what is presented in **Table 5-1**. At a minimum, manufacturing and special industrial uses that generate considerable truck traffic in the County (e.g., quarries and sand/gravel/concrete plants) should be considered as additional industrial land uses in this model. This will allow the County to test traffic impacts of various industrial development scenarios for different sites throughout the county, including those documented in this study.

5. **Support local efforts to enhance capabilities related to planning and zoning for industrial sites.** The previous recommendation is an example of a County tool that can be used to inform and support local planning efforts related to industrial land uses. Additionally, the *Municipal Guide for Freight Planning* developed as part of this study contains a number of recommendations for addressing issues related to transportation infrastructure needs, land use compatibility and other community impacts. One notable example of a local zoning and land use issue that should be addressed on a municipal level is the need for adequate on-site or "near-site" truck parking and staging areas for industrial sites as discussed in Section 5.2. To minimize the potential for truck parking and staging in local neighborhoods and on the regional highway system related to deliveries to local industrial sites, municipal planning for industrial development should include some consideration for on-site truck parking needs or nearby truck parking areas where multiple industrial parcels can have their truck parking needs "pooled" in a common area with highway-oriented retail sites and other support services for the trucking industry.

6. **Protect intact abandoned rights-of-way for potential future use as freight rail alignments.** This measure is consistent with one of the general mobility goals of the Highlands Regional Master Plan as previously documented in Section 4. The most prominent inactive rail alignment in Morris County is the Lackawanna Cut-Off, which does not border any industrial sites and therefore does not warrant further attention for potential freight service in this study.

   Other alignments worthy of attention include the intact segments of the Wharton & Northern (W&N) line from Lake Junction through the United States Army's Picatinny Arsenal, along with the remnants of the branch line that formerly accessed the Hercules site from Lake Junction. The Hercules spur provides freight rail access for future development at this site, while the W&N alignment does not serve any of the key industrial sites identified in this study but does

offer long-term potential for restoration of service to Picatinny if needed. Morris County should lead this effort through coordination with property owners (for the Hercules spur) and through its Park Commission, as the W&N rights-of-way may be an opportunity for rail-to-trail conversion as a long-term temporary use, though security issues could be a factor as a large part of the rail alignment resides in a United States Army facility. Additionally, the former Mount Hope Mineral Railroad has sections of right-of-way still intact, but the connection to the Morristown Line has been removed. Adjustments to the alignment could be explored to promote potential use by Tilcon and Mt. Hope Hydro, Inc.

In some cases, however, this may no longer be feasible. As mentioned in Section 2.5.5, the former High Bridge Branch has some discontinuous segments south of its current terminus in Flanders that make restoration unlikely, and there is no feasible economic reason to extend the Chester Branch Railroad south of Righter Road.

The New York, Susquehanna & Western (NYS&W) freight rail system includes a short industrial spur called the Pompton Industrial Track from Pompton Junction in Passaic County to Riverdale in Morris County. Morris County is in the process of developing the NYS&W Bicycle and Pedestrian Path along a 4.8 mile section of this alignment between Pequannock and NJ TRANSIT's Mountain View Station in Wayne. While there is no anticipation that freight rail service will be restored on this portion of the alignment in the future, this project serves as an excellent example of right-of-way preservation with a suitable public use.

5.3.2 Local Improvements – Roxbury/Kenvil Area

The Roxbury/Kenvil area has a number of prime industrial development sites, including the former Hercules site (Location A-2 in **Table 5-1**) that covers more than 900 acres in an area roughly bordered by the NJ TRANSIT Morristown Line to the north, Howard Boulevard to the west and Berkshire Valley Road to the east. The northwestern corner of this site is close to the Mount Arlington train station, and the entire parcel lies within the Highlands Planning Area. Wetlands and some hilly terrain on the property would limit development potential for parts of the site, but it still represents one of the largest vacant industrial properties in the region. A smaller 74-acre site on the east side of Berkshire Valley Road (Location A-3 in **Table 5-1**) is identified in Section 4 as a parcel with some strong industrial development potential. Additional industrial sites in this area include the Petillo property and Kenvil Newcrete site along the east side of the Chester Branch, between the rail alignment and North Dell Avenue.

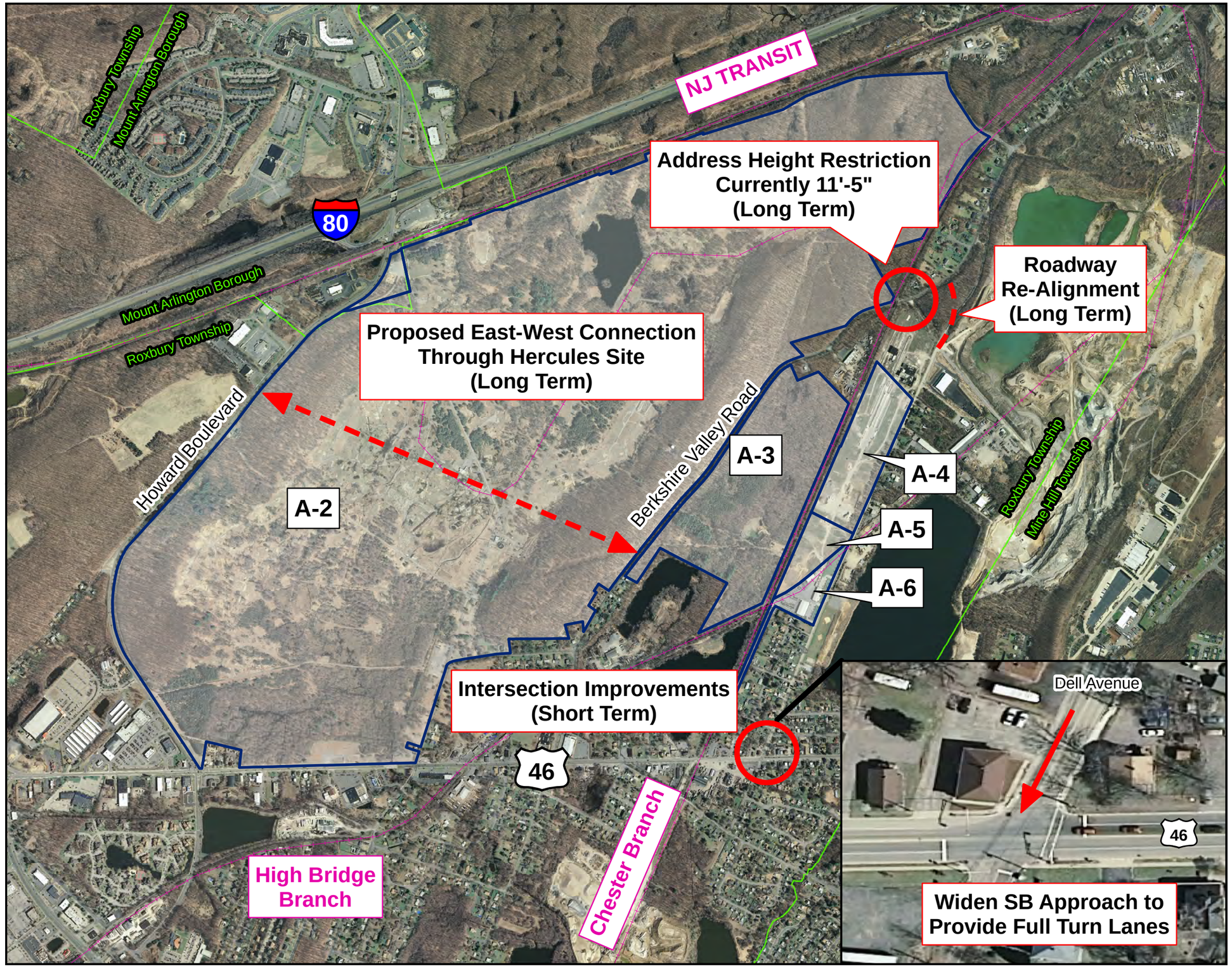
The industrial sites in this area, along with a series of proposed infrastructure improvements, are shown in **Figure 5-3**. Details of the proposed improvements are as follows:

- Currently, the Hercules site and the adjacent parcel across Berkshire Valley Road must use Hercules Road and US-46 to the south to access I-80. A more circuitous route to I-80 is available to the north on Berkshire Valley Road through Wharton, but trucks traveling on this route are impeded by the low (11'-5") overhead bridge clearance where the Chester Branch crosses over Berkshire Valley Road. As a result, trucks accessing these sites from US-46 to the south would have to pass through the small residential area of Kenvil north of US-46 along Berkshire Valley Road. Under a large-scale industrial scenario for the Hercules site and the 74-acre site to the east, the truck volumes presented in **Table 5-1** would adversely impact this area and might strain the capacity at the US-46 intersection with Berkshire Valley Road.

Morris County, NJ Freight Plan

FIGURE 5-3

Roxbury / Kenvil Area



Proposed Alignment

Industrial Site

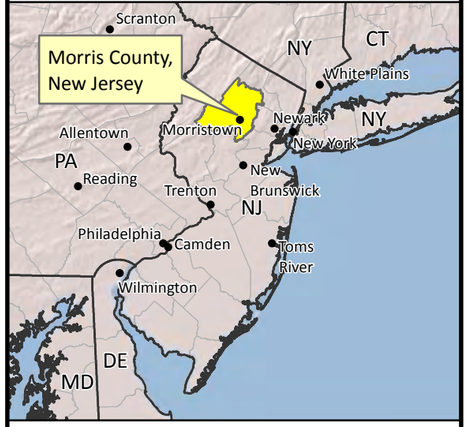
Identified Intersection

Existing Railroad

Scale (Miles)

0.1 0.05 0 0.1 0.2

LOCATION MAP



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Source: 2008 Bureau of Transportation Statistics - National Transportation Atlas Database
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To address these concerns, it is recommended that any industrial development for the Hercules site should include consideration for an east-west arterial roadway across the site to connect Howard Boulevard with Berkshire Valley Road. This would minimize truck activity in the residential area to the south and would provide a good connection between these industrial sites and I-80 via the Mount Arlington interchange (Exit 30). This proposed east-west roadway is shown conceptually in **Figure 5-3**; the exact alignment would depend heavily on the future layout of the Hercules site, grades through the property, and roadway geometry and sight distance considerations for new intersections on Berkshire Valley Road and Howard Boulevard. A planning-level cost estimate for this improvement would be approximately $15.5 million, while the actual cost would depend heavily on excavation requirements, cut/fill balance, and other factors associated with constructing a road through an area with substantial grades.

- The parcels that constitute the Petillo property and Kenvil Newcrete site along North Dell Avenue are separated from the two properties described above by the Chester Branch. This is more than just a physical separation of the sites, as nearly all of the trucks traveling to and from the industrial sites along North Dell Avenue must use US-46 to the south to access the regional highway system. The North Dell Avenue intersection on US-46 is marked by a narrow southbound approach on North Dell Avenue and buildings close to the intersection that limit potential widening options. Future industrial development along North Dell would likely require some short-term improvements at this intersection. Widening this southbound approach to accommodate two separate lanes for turning and through traffic (either a left/through and right configuration or a left and right/through configuration, depending on a detailed traffic engineering analysis) would provide additional capacity for future growth in truck traffic from the north. The estimated cost for this improvement would be about $160,000, which does not including property acquisition costs but includes the cost of demolishing structures in the widened right-of-way.

  The intersection improvement described above would be a short-term measure to enhance mobility for trucks. Since North Dell Avenue passes through a residential area just north of US-46, this is not an ideal route for heavy truck traffic. A longer-term solution would be to tie these industrial properties to the adjoining sites along Berkshire Valley Road through some long-term improvements to the north. These would include: (a) the re-alignment of North Dell Avenue to a new T-intersection at Berkshire Valley Road (the current configuration of this intersection makes it difficult for northbound traffic on either road to turn south onto the other); and (b) a project to increase the clearance under the Chester Branch bridge over Berkshire Valley Road to allow for at least 13’-6” of vertical clearance. In conjunction with potential development of the Hercules site to the west, these would allow truck traffic to and from these industrial sites to access I-80 using the proposed east-west roadway through the Hercules property.

  The re-alignment of North Dell Avenue to a new T-intersection at Berkshire Valley Road would cost approximately $150,000 (not including potential property acquisition costs). A project to raise the clearance under the Chester Valley Branch bridge over Berkshire Valley Road would cost less than $100,000 if it could be done by lowering the road bed under the bridge and making no changes to the bridge. This would be a more complex and costly effort if it requires changes to the bridge structure itself.

5.3.3 Local Improvements – D&R Railroad Sites in Southeastern Rockaway Township

There are a number of active industrial sites along the Dover & Rockaway Railroad alignment east of Dover. The most notable of these are the Alcoa-Howmet site east of Dover-Rockaway Road on the north side of the D&R line and the McWilliams Forge facility in the small industrial park east of the D&R Line that is accessed from Franklin Avenue. The land use analysis described in Section 4 identified a number of potential sites for industrial development in this area, including one large vacant parcel south of US-46 (identified as site B-3 in **Table 5-1**) and the McWilliams Forge tract that includes some vacant land in that industrial park (see B-5 in **Table 5-1**). A third parcel (B-11 in **Table 5-1**) was identified as a prime site for potential industrial development in this area, but its location in a narrow piece of land between the NJ TRANSIT Morristown Line and the Rockaway River seriously constrains roadway access and would make it highly difficult to develop the site.

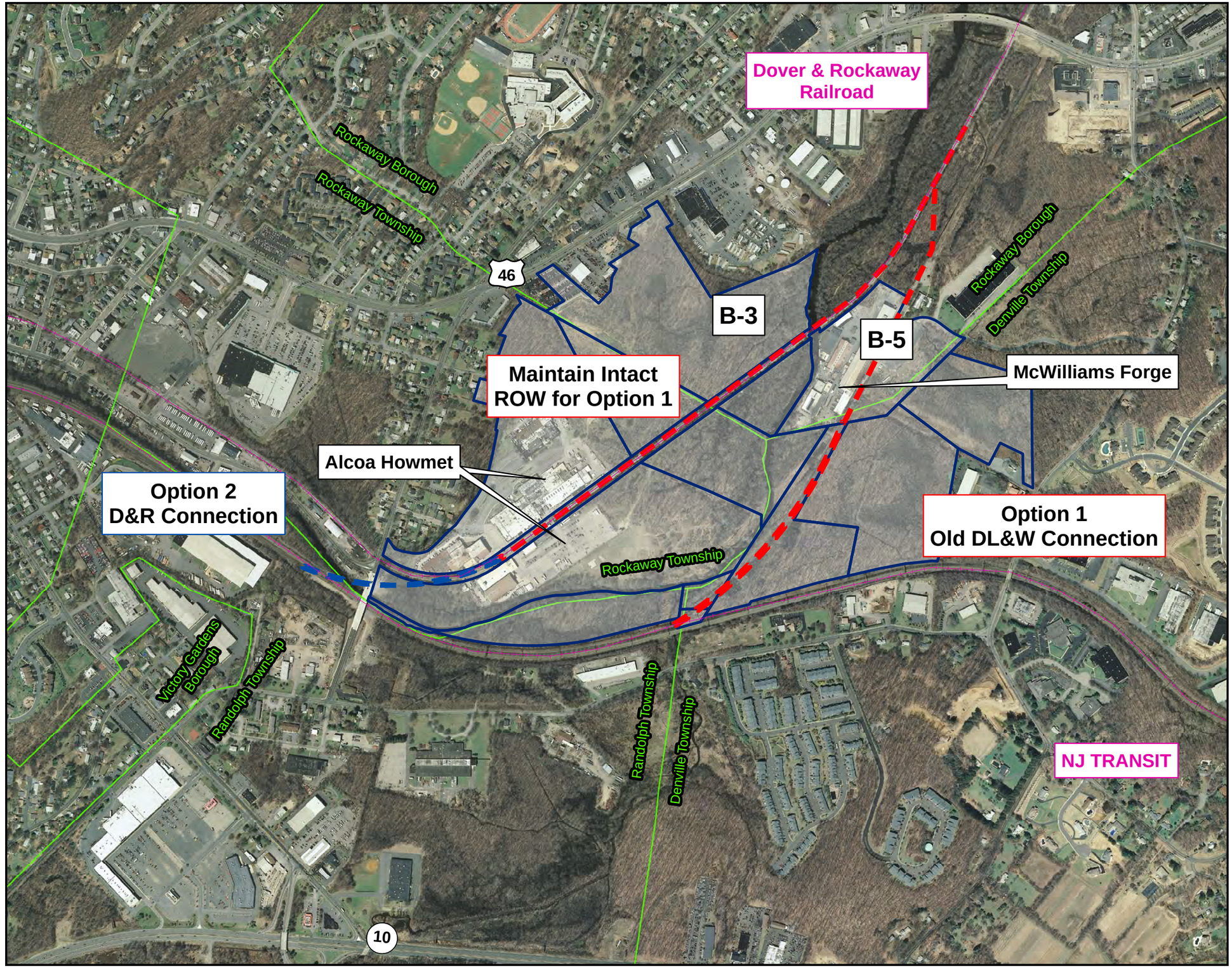
The industrial parcels in this area are shown in **Figure 5-4**, along with two options for a potential rail improvement that would help enhance the efficiency of freight rail service in this area, enhance service to other M&E customers further north on the D&R Railroad, and address a number of community impacts and safety concerns along the existing D&R alignment through downtown Dover. The general objective of the proposed improvement is to relocate the point where the D&R line connects with the Morristown Line, from its current location west of Dover to a point east of Dover where the D&R alignment turns north toward Rockaway Borough. This infrastructure improvement should be undertaken by the County as the owner of the Dover & Rockaway Railroad, with possible funding available from NJDOT or the Federal government through a grade crossing removal program for the segment of the line through Dover, since it would eliminate twelve crossings. Additional funding may be available from the NJ Department of Environmental Protection through the Morris County Park Commission for the establishment of a linear park or bicycle path along the D&R alignment through Dover.

- One alternative, shown conceptually as Option 1 in **Figure 5-4**, is to re-align the D&R line north of the McWilliams Forge property so it comes south on the old Delaware, Lackawanna, & Western (DL&W) right-of-way and connects to the Morristown Line south of McWilliams Forge. This option would require the acquisition of the right-of-way from its current owners, and would require substantial cooperation from the ownership of McWilliams Forge because of potential safety concerns with the D&R tracks running through the parking lot of the active industrial site. Another consideration for this option is that even with this new D&R Junction established via the old DL&W right-of-way, a portion of the current D&R alignment should remain in place through the Alcoa-Howmet site to provide freight rail service options in the future (Alcoa-Howmet is currently not an active M&E customer). A key advantage of this option is that it enables this connection to the Morristown Line to be established without crossing the Rockaway River, though it would require wetlands disturbance further north along the line. Another advantage is that the NJ TRANSIT catenary structures along this segment of the line appear to be designed to accommodate a connection along the old DL&W alignment.

Morris County, NJ Freight Plan

FIGURE 5-4

Potential Re-Alignment of D&R Junction



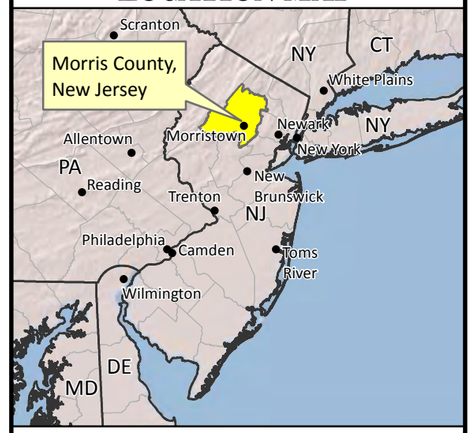
Legend

- Option #1 Alignment
- Option #2 Alignment
- Industrial Site
- Active Railroad

Scale (Miles)

0.1 0.05 0 0.1 0.2

LOCATION MAP



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Source: 2008 Bureau of Transportation Statistics - National Transportation Atlas Database
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This option involves the construction of approximately 3,500 lineal feet of new track on the former DL&W Rockaway Loop. The proposed alignment would start at a new connection on the NJ TRANSIT Morristown Line and proceed northward to a new connection with the existing D&R Railroad alignment north of McWilliams Forge. A highway-railroad grade crossing would be required for vehicles and employees accessing McWilliams Forge, and horizontal and vertical clearance constraints between the proposed rail alignment and the existing McWilliams Forge facilities would need to be identified and accommodated during design. The current DL&W roadbed and embankment are in poor condition and may need to be rebuilt to accommodate contemporary railroad loads and current engineering standards. A visual inspection of the original embankment indicates that it may have been built on rock fill or even logs.

The proposed new connection to the Morristown Line would consist of a new No. 10 or No. 15 turnout, to be built on a section of tangent track at approximately Milepost 36.2 on Track 1. This track is typically used by westbound NJ TRANSIT trains. Portal-type catenary structures support NJ TRANSIT's overhead electrification system. The portal structure cross spans at the proposed turnout location are very long and would not have to be modified to accommodate the new turnout connection.

Track 1 on the Morristown Line is currently signaled for bi-directional train operations. Therefore, freight trains moving to/from Rockaway via the new connection could operate over Track 1 with signal protection. The nearest power-operated crossover between Tracks 1 and 2 is located at Milepost 37.9, approximately 1.7 miles east of the proposed new connection. It is assumed that a new left-handed crossover from Track 2 to Track 1 would not be required due to the close proximity of the existing powered crossover in Dover. The new D&R turnout on Track 1 would be either a powered, interlocked turnout or an electric lock switch. The NJ TRANSIT signal system would have to be modified to account for this new mainline turnout.

The estimated cost for this improvement would be $7.4 million. This includes an allowance for site investigation, engineering and permitting, along with a substantial contingency factor due to the great number of unknowns. The estimate is also based on the assumption that the new connection would be a powered, interlocked turnout, and that 50% of the existing embankment along the DL&W alignment would need to be replaced. It is also assumed that none of this work would involve the excavation, handling or disposal of contaminated materials. It is also assumed that any utility work would be done by the owning utility, and all turnout and signal modification work on the Morristown Line would be done by NJ TRANSIT. All of these costs would be borne by the project. Costs for property and right-of-way acquisition are not included. A more accurate and realistic cost estimate would require surveying and mapping of the site, along with subsurface investigation, hydraulic analysis and preliminary engineering.

- A second alternative, shown conceptually as Option 2 in **Figure 5-4**, is to maintain the current D&R alignment through Alcoa-Howmet and simply extend it south to a new connection on the Morristown Line. This is a less complex option from the standpoint of property acquisition and D&R Railroad operations, but has the following added complications: (a) this connection requires a new crossing of the Rockaway River; (b) the connection may require an interlocking on a curved section of the Morristown Line; and (c) the lateral spacing between the abutments for the overhead Dover-Rockaway Road Bridge may be insufficient to accommodate a third

track. Additional considerations include property acquisition for the new right-of-way segment and the possible need to relocate some of the overhead catenary structures along the Morristown Line in this area to provide space for the connection.

This proposed connection would begin at the west end of the Howmet site, pass westward under the existing Dover-Rockaway Road Bridge, cross a new bridge to be constructed over the Rockaway River, and connect to the NJ TRANSIT Morristown Line. The proposed track would pass through an unoccupied bay of the overhead roadway bridge. As-built drawings of the bridge would need to be reviewed, and railroad loadings on the bridge substructure may need to be considered. Horizontal and vertical clearance constraints between the proposed railroad alignment and the existing bridge abutment, pier and bridge deck would need to be evaluated in detail.

Construction of the railroad embankment underneath this bridge would alter the floodway and 100-year flood plain of the Rockaway River. A hydraulic analysis would be required during the engineering phase to identify any significant adverse effects. A new bridge would be constructed over the Rockaway River west of the Dover-Rockaway Road overhead bridge. This bridge would be built on a skewed angle with the river rather than perpendicular. A study to determine the bridge type, size and location would need to be undertaken to determine the length and bridge type; a deck girder or through girder bridge is more common, but a through truss may be required for a longer span.

The proposed new connection to the Morristown Line would consist of a new No. 10 or No. 15 turnout, to be built at approximately Milepost 37.0 on Track 1 on a tangent track section. This track is typically used by westbound NJ TRANSIT trains. The proposed turnout on Track 1 should be located to avoid modifying any of the existing portal catenary structures. Signal protection for Track 1, and implications of this option on NJ TRANSIT operations, are similar to what has been described previously for Option 1.

The estimated cost for this improvement would be $7.5 million. This includes an allowance for site investigation, engineering and permitting, along with a substantial contingency factor due to the great number of unknown elements. Other relevant assumptions described for Option 1 would remain the same.

Both of these potential options would be ambitious efforts requiring the cooperation of the County, the operating railroad on the D&R line, and NJ TRANSIT. One important operational issue for both NJ TRANSIT and the freight railroad is that both of these connection points would lie east of Dover in the electrified territory of the Morristown Line. This is a potential operational concern for NJ TRANSIT because of their heavier passenger activity east of Dover. NJ TRANSIT currently operates 25-30 daily trains west of Dover and 95-100 trains east of Dover,[37] and any future rail freight activity on the Morristown Line would need to be accommodated within the agency's future operating plans with service extensions such as the Lackawanna Cut-Off in place. The re-aligned D&R Junction would also be situated in the electrified territory of the Morristown east of Dover, so vertical clearances under the overhead catenary wires would have to be verified. The latter point is important because the M&E can

[37] Both of these figures include revenue service as well as non-revenue equipment moves.

access the current Dover & Rockaway Railroad from Lake Junction Yard without operating in the electrified section of the Morristown Line. This would not be the case with the relocated D&R Junction unless a third track could be added along the north side of the Morristown Line and the actual connection established closer to Dover. Any potential change in the location of D&R Junction should be made with the height and weight improvements recommended earlier in this document in mind; one key goal to enhance rail freight service in the County is to establish a 17'-0" vertical clearance and 286,000-lb. weight limit at least as far east as D&R Junction, wherever that connection exists in the future.

5.3.4 Local Improvements – Hanover Township / Eden Mill Site

The land use analysis conducted in this study identified several industrial properties in Hanover Township along the M&E's Whippany Line. These sites are located east of Jefferson Road, across the road from the M&E's Cedar Knolls team track. This area of Jefferson Road is primarily a mix of office and light industrial land uses, though the area to the east along the Whippany Line hosted a number of heavy industrial sites in the past. Two particular parcels were identified for industrial development in this area; these are designated as C-9 and C-10 in **Table 5-1** and illustrated in **Figure 5-5**. Site C-10 offers some intriguing potential because it is large (more than 65 acres), is located directly along the M&E alignment, and was the site of the Whippany Paper Board Company's Eden Mill operations until it was shut down in the early 1980s. The Eden Mill site is the last industrial remnant of the three Whippany Paper Board facilities in this area.

There are several factors that make heavy industrial development in this area less attractive, including environmental considerations related to the Whippany River and nearby residential and recreational development across Eden Lane to the south. In addition, commercial development along the NJ-10 corridor has changed traffic patterns substantially over the years since industrial activity in this area began to diminish. The Eden Mill parcel has an elongated east-west configuration that is generally marked by Eden Lane and the Whippany River to the south and the M&E alignment to the north. Current roadway access to the site is highly constrained, as shown in **Figure 5-5**. One access point is a driveway that winds along the Whippany River and accesses Eden Lane across from a township park, while a second driveway to the east connects the site to busy Parsippany Road just south of NJ 10.

Despite these constraints, the Eden Mill site and the adjoining parcel (C-9) may offer some opportunities for rail-oriented industrial development that complements the surrounding residential and commercial land uses. The current access points shown in **Figure 5-5** would not be adequate for even some less-intensive industrial uses, due to the land uses to the south across Eden Lane and the geometric and operating constraints of Parsippany Road to the east. An extension of either Rosin Road or Apollo Drive into this parcel would provide access to this site from Jefferson Road to the west, thereby enabling trucks to travel to and from the parcel from a roadway that is suitable for truck traffic and already serves nearby light industrial sites. These two potential road extensions are shown in **Figure 5-5**.

The proposed road extensions should be designed as industrial roads whose primary purpose is to access the Eden Mill site. Planning-level cost estimates for the Rosin and Apollo Road extensions are $425,000 and $900,000, respectively. The Rosin Road extension would involve a new highway/railroad grade crossing on the M&E Whippany Line, while the Apollo Drive extension would require a new grade

crossing on the Whippany Line and a second crossing on the remaining segment of the Stony Brook Branch that branches off the Whippany Line to the north and marks the eastern edge of parcel C-9.

Any development in this part of Hanover Township should reflect improvements at the NJ-10 / Jefferson Road intersection to the north. An improvement project at this location has been programmed in the state TIP, but has not been funded for construction. The jughandle ramp configuration at this intersection is largely constrained by the horizontal spacing requirements along NJ-10 for the I-287 interchange to the west. Left turns from the westbound NJ-10 approach are accomplished via a forward jughandle ramp that deposits traffic onto Jefferson Road at a stop-controlled T-intersection just north of NJ-10. Left turns from eastbound NJ-10 are made via a reverse jughandle east of the intersection that passes around a small commercial property. This intersection configuration is inefficient for several reasons, including the constrained left-turn movement onto Jefferson Road from westbound NJ-10, the inherent inefficiency of a reverse jughandle ramp for eastbound left turns from NJ-10 (traffic turning left at the intersection from eastbound NJ-10 must go through the intersection twice), and the long signal cycle length needed to accommodate all of the conflicting movements.

5.3.5 Local Improvements – I-80 at Green Pond Road (CR-513)

The area in Denville and Rockaway Townships along Green Pond Road (CR-513) is currently home to several M&E customers at the northern terminus of the Dover & Rockaway Railroad (D&R). Several parcels along the east side of the D&R alignment were identified for potential development or redevelopment as industrial sites through the land use analysis in Section 4. These include those designated as D-4, D-5 and D-8 in **Table 5-1**. These parcels range from 13 to 23 acres, and would support industrial buildings of 175,000 to 300,000 square feet in size based on an estimated Floor Area Ratio (FAR) of 0.3. Research indicates that one or more of these sites may have had active sidings on the D&R Railroad at some point in the past.

These sites and one potential roadway improvement for further study are shown in **Figure 5-6**. The roadway system in this area is marked by the I-80 interchange at Exit 37. The interchange provides full access and egress between I-80 and Green Pond Road through a particular type of partial cloverleaf interchange sometimes known as a "folded diamond." The configuration of this interchange has nearly all of the I-80 exit and entrance ramps on one side of Green Pond road, and is typically used in locations where a nearby physical constraint (in this case, the railroad alignment) precludes the use of traditional highway interchanges with ramps in all four quadrants. An added complication at this location is the T-intersection where Morris Avenue meets Green Pond Road from the east adjacent to the I-80 westbound ramps. As a result of this configuration, Green Pond Road has three closely-spaced intersections (two of them signalized) within a very short distance, with a number of conflicting turn moves that present challenges for traffic circulation (see inset of **Figure 5-6**). Congestion is common at this location during peak periods even though traffic volumes do not appear to be high compared to other nearby interchanges along I-80.

Morris County, NJ Freight Plan

FIGURE 5-5
Hanover Township / Eden Mill Site

Access Location

Potential Roadway

Intersection Location

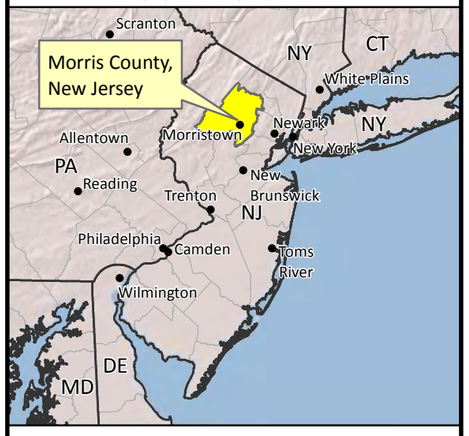
Industrial Site

Active Railroad

Scale (Miles)

0.08 0.04 0 0.08 0.16

LOCATION MAP



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Gannett Fleming

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July 2011

Source: 2008 Bureau of Transportation Statistics - National Transportation Atlas Database
New Jersey DEP - 2008
NJDEP TIGER Roads 2000 in Morris County, NJ

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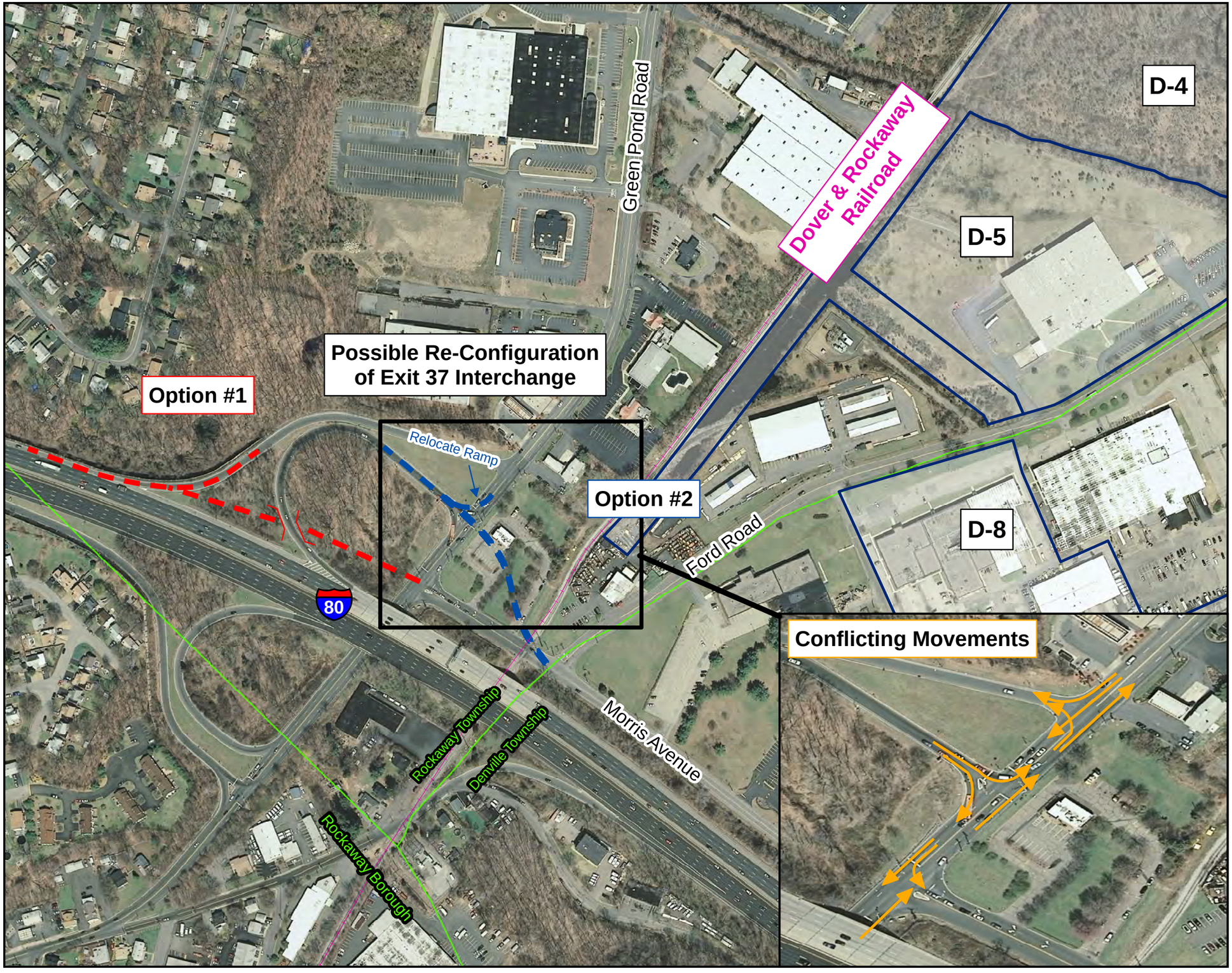
Morris County, NJ
Freight Plan

FIGURE 5-6
Rockaway / I-80 Exit 37



Conflicting Movements

Option #1 Alignment

Option #2 Alignment

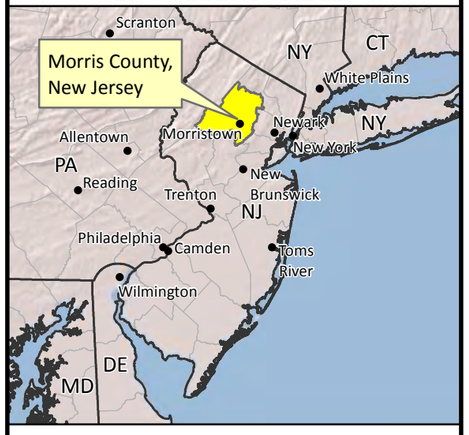
Industrial Site

Active Railroad

Scale (Miles)

0.04 0.02 0 0.04 0.08

LOCATION MAP



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July 2011

Source: 2008 Bureau of Transportation Statistics - National Transportation Atlas Database
New Jersey DEP - 2008
NJDEP TIGER Roads 2000 in Morris County, NJ

N

An interchange improvement at this location would improve circulation and enhance the overall mobility of trucks traveling to and from existing and potential new/redeveloped industrial sites along Green Pond Road and the parallel Ford Road where some office and industrial/flex sites are located. No particular modification to the interchange is recommended in this study, but a detailed traffic study and functional design for the interchange is recommended as a joint effort between NJDOT and Morris County. Two possible improvements aimed at reducing conflicting turning movements at the interchange are shown in **Figure 5-6**, but additional options would likely be considered as part of the planning/design process. Re-alignment of the Morris Avenue intersection as shown in **Figure 5-6** would likely be an expensive project involving a property taking east of Green Pond Road. Infrastructure costs for the two potential improvements illustrated in **Figure 5-6** would range from $550,000 to $1.0 million, not including property acquisition costs.

6.0 Summary

Morris County stands at an important crossroads in its growth and development. The area's extensive roadway system and rail transportation infrastructure have come under increased pressure due to regional growth in population and economic activity as well as the changing nature of freight transportation. As a "freight corridor" region the county is expected to experience increased congestion related to freight movement in the coming decades, with the interstate highways (I-80 and I-287) carrying substantial volumes of truck traffic through the region and intermediate roadways (Routes US-46, US-202 and US-206, and NJ-10, NJ-15, NJ-23 and NJ-24) accommodating increased traffic even as they continue to serve changing local land uses. Regional traffic volume forecasts – particularly in terms of the projected growth of truck traffic – indicate that future increases in demand on the highway system represent a challenge to the county and a potential threat to its economic viability and quality of life.

In the face of these challenges, Morris County has an opportunity to pursue a prudent, focused approach to land use planning and leverage its transportation assets to manage this growth in a manner that provides substantial economic benefits. These benefits can be in the form of increased employment in business sectors such as light manufacturing, transportation, warehousing & distribution, and value-added services that can replace the mining and heavy manufacturing industries that were important elements of the county's economy in the past. The county is host to a number of large brownfield sites in close proximity to major highways and active freight railroad alignments. Freight-oriented redevelopment of these sites could be enhanced through the possible restoration of freight rail service on several abandoned (but intact) railroad rights-of-way, and the combination of highway access and freight rail infrastructure in one of the world's largest consumer markets provides some interesting options for the exploration of concentrated freight-oriented development at various sites in Morris County.

Morris County still has a considerable employment base in businesses involved in manufacturing. Key manufacturing and warehouse/transportation industries produced a combined $17.9 billion in direct economic output in 2009, with the chemical manufacturing industry providing the largest share of that total ($16.1 billion). When indirect and induced output is added, these industry groups contribute to over $25.2 billion in economic output in Morris County. From this economic output, over $957 million was returned to state and local governments as tax revenue.

There is currently no substantial industrial development taking place in Morris County, or in the larger New Jersey market. There exists a several year supply of industrial space in Morris County, with no latent demand and no rental rate price appreciation. Land costs for industrial development are high, due primarily to the limited supply of land for industrial uses. But industrial space near rail lines becomes more attractive when energy prices rise.

Rail service is available to industrial customers on a number of railroad lines, including the NJ TRANSIT Morristown Line, the NYS&W Main Line, the M&E Whippany Line, and the three county-owned railroad alignments: the Dover and Rockaway Railroad, the High Bridge Branch and the Chester Branch. The Chester Branch, acquired in 2009, underwent a full rehabilitation under a Federal ARRA grant and was completed in early 2011. This line will also provide freight rail access to current and potential future businesses further south along the line in areas such as the BETA Corporate Park in Randolph Township.

One of the important elements of the regional rail system that adversely affects freight rail service in Morris County is the limitation on the size and weight of railcars moving to and from many industrial sites in the county due to height restrictions on the freight lines. This affects sites along the NJ TRANSIT Morristown Line as well as the three county-owned lines. Vertical clearance constraints hinder the movement of railcars on the rail system within and outside Morris County. Railcars moving to and from the east via CSX over the Morristown Line are subject to a 15'-5" vertical clearance restriction, a condition further complicated by the overhead catenary wire on this line. Railcars moving to and from the west via Norfolk Southern over the Morristown Line and Washington Secondary are subject to a 16'-6" restriction under the South Main Street bridge in Phillipsburg, Warren County.

In addition to these vertical constraints, the 263,000-lb. weight limit on the North Jersey rail system is also a limiting factor for the railroads as 286,000-lb. rail cars have become more common in the freight rail industry. This issue has been the subject of ongoing attention by NJDOT, NJ TRANSIT, and the freight railroads in recent years, and if the region is successful in upgrading key segments of the rail system to this 286,000-lb. standard in the future, many of the existing and vacant industrial properties in Morris County could become attractive locations sites for rail-oriented businesses.

A number of policy recommendations and infrastructure improvements are documented in the final study report. These were based on a series of general objectives for balancing freight-related transportation needs with local quality-of-life concerns, while at the same time protecting and enhancing industrial sites within the county. These objectives were:

1. Minimize highway capacity expansion to the extent possible.
2. Protect and enhance freight rail service in the county on the three county-owned alignments as well as on the NJ TRANSIT, New York, Susquehanna & Western (NYS&W), and Morristown & Erie (M&E) systems.
3. Promote rail-oriented industrial development on existing or inactive rail rights-of-way, and protect intact abandoned rights-of-way to the extent possible.
4. Enhance truck access to the major regional highway system in ways that minimize future community impacts and reduce existing impacts to the extent possible, where local truck access needs are identified.
5. Address existing inefficiencies in the county's freight system in a cost-effective manner that minimizes community impacts and addresses quality-of-life issues.
6. Enhance the county's forecasting capability for truck traffic by developing enhanced data elements and forecasting tools for itself and its municipalities.

Key recommendations for the Morris County Freight Infrastructure and Land Use Analysis include the following:

- Support an initiative to address bridge clearances along the Morristown Line and Washington Secondary to accommodate Plate F (17'-0") rail cars.
- Actively participate in efforts at the state level to increase the rail car weight limit on the Morristown Line from 263,000 to 286,000 pounds.

- Document a truck route system in Morris County as an informational resource for industrial developers, trucking companies and other interested parties to identify local and regional routes suitable for trucks of various sizes.
- Enhance the county's traffic model to include expanded industrial land uses.
- Promote rail-oriented industrial development on existing or inactive rail rights-of-way, and protect intact abandoned rights-of-way to the extent possible. Both of these are goals of the Highlands Regional Master Plan, which governs land use and future development for nearly 90% of the county's land area. The *Marketing Plan for Industrial Properties* developed for this study provides important guidance to the county and its partners for these efforts.
- Support local efforts to enhance capabilities related to planning and zoning for industrial sites by providing guidance to municipal governments for land use planning efforts to minimize local impacts of truck traffic and other community impacts related to industrial and other commercial development. The *Municipal Guide for Freight Planning* that was developed in this study is a valuable resource for local governing bodies, planning boards, and boards of adjustment for land use and infrastructure planning related to freight-oriented development.