NORTHWEST NEW JERSEY BUS STUDY

Final Report
Northwest New Jersey Bus Study

December 2010

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NJTPA NORTH JERSEY TRANSPORTATION PLANNING AUTHORITY

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Northwest New Jersey Bus Study - Assumptions Impacting Baseline Conditions
February 2011

The Northwest New Jersey (NWNJ) Bus Study was substantively completed in the spring of 2010. Prior to the completion of the final report in December 2010, there were several changes in the assumptions that went into the report that change some of the baseline conditions described in Chapter 2, but do not have a significant impact on the study's findings. The first was the reduction and elimination of certain transit services in the study area in the spring of 2010 due to severe fiscal challenges facing the state and local agencies. The second was the discontinuation of the Access to the Region's Core Project in the fall of 2010. Each of these changes and their impact on the study' findings are explained below.

In the spring of 2010, NJ TRANSIT proposed a system-wide set of fare increases and service reductions to address a severe budget deficit faced by the agency. As part of these cuts a number of local routes operating largely within Morris County were proposed for elimination based on low ridership, low farebox recovery and the withdrawal of local financial support for some routes. Routes originally proposed for elimination included the MCM1, MCM2, MCM3, MCM 4, MCM5, MCM7, 966, 967, and 973 bus lines. After extensive outreach, feedback and public hearings NJ TRANSIT discontinued the following routes: MCM4, MCM5, and MCM7 as of May 1, 2010 and the 967 and 973 were discontinued as of July1, 2010. The NWNJ Bus Study had noted all of these routes as weaker performing routes and identified them for either elimination or significant route restructuring.

The remaining Morris County local routes underwent significant restructuring to address regional needs. NJ TRANSIT staff started with reviewing the service recommendations from the NWNJ Bus Study. Not all Morris County-oriented recommendations from the NWNJ study were implemented due to budget constraints and feedback from local stakeholders in Morris County. In early October 2010, a final package of service changes were approved and a new set of local Morris bus routes 871, 872, 873, 874, 875, 878, 879 and 880 were implemented. In the balance of the study area including Sussex, western Passaic and northern Warren Counties, the discontinuation of the 976 and 973 minibus routes impacted some of the findings for shuttle restructuring and the elimination of some Montclair-Boonton Line trains west of Montclair may impact the scale of future transit hubs. The findings from the NWNJ Bus Study directly influenced the service restructuring and assisted NJ TRANSIT in maximizing resources and meeting service needs.

On October 27, 2010 New Jersey officially cancelled the Access to Region's Core (ARC) Project. The ARC project called for the construction of a new rail tunnel to New York City, which would have increased the number of trains into New York City from all over New Jersey, including some from the NWNJ study area. While ARC was considered in the assumptions for the NWNJ Bus Study, its discontinuation has little impact on the study's findings. While workers from the study area do travel to New York City, less than 5 percent of all work trips originating from the study area are destined to Manhattan. Commuter trips beginning and

ending entirely within the study area make up the largest overall market among workers, with a share of 75 percent. The cancellation of the ARC project generally does not impact the primary study findings which concentrate on improvements to local public transit services, upgrading and expanding bus facilities, and leveraging the existing interstate bus service to better serve the study area.

The findings of this study remain valid and create a blueprint for future bus improvements.

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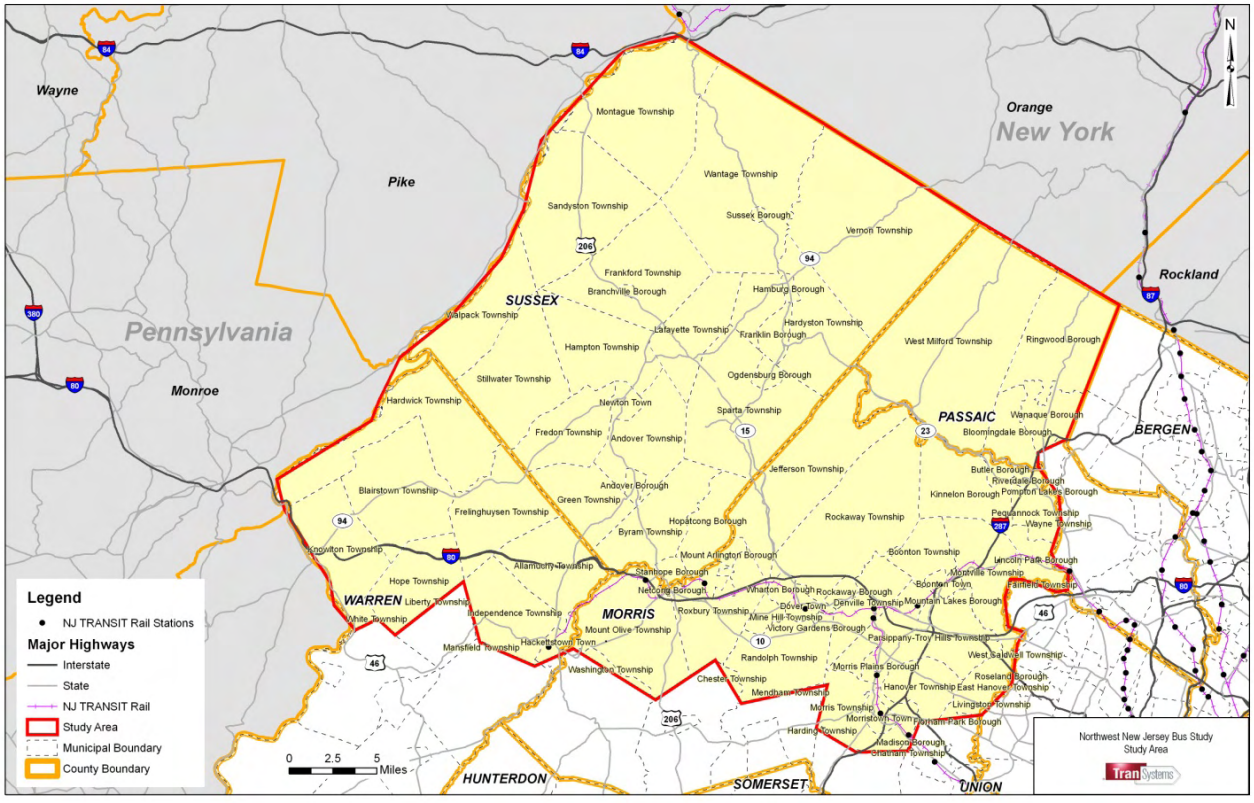
ES.1 Study Overview

The Northwest New Jersey Bus Study was initiated in order to address traffic congestion concerns and respond to requests for bus and shuttle service and facility improvements in a fast growing area of northern New Jersey. The study area (See Figure ES-1) consists of portions of four counties in the northwestern portion of New Jersey: Sussex County northern Morris County, western Passaic County (west of the I-287 corridor, including Wayne Township/Willowbrook Mall area) and northern Warren County (along and north of I-80 & US 46). The study also fills a need identified in North Jersey Transportation Planning Authority (NJTPA)'s *Regional Transportation Plan*, the *NJ Highlands Regional Master Plan* and *Report of Governor Christie's Subcommittee on Transportation* for short and medium-term proposals to improve mobility and access to jobs, education, tourism and other area destinations. Coordination with other transit studies took place over the course of this study, including the Greater Newark Bus System Study (GNBSS), the Northeast NJ Metro Mobility Study, Plan 2035 (NJTPA's Long Range Transportation Plan for the northern New Jersey region), the Mass Transit Tunnel Project (Access to the Region's Core), and the Lackawanna Cutoff Rail Service Restoration Project.

Figure ES-1: Northwest New Jersey Study Area



This study, which is the first comprehensive analysis of the intermodal transit network in the northwestern part the state, and identified a significant number of transit strategies that would:

- Restructure the bus and shuttle network through schedule adjustments, route realignment, extension or shortening.

- Increase coverage of the transit system to emerging markets through new or extended routes
- Increase service frequency to meet current needs
- Increase service span (hours and days of service) to meet current needs
- Modify fare policies to reduce the fares, simplify connections and improve ridership
- Implement improvements in passenger facilities and implement bus priority treatments to support service proposals

While this study identifies distinct sets of service, passenger facility and running way (bus preferential treatment) strategies, they are designed to work together in providing an improved customer experience and to work in concert with marketing, customer information and fare strategies. To facilitate understanding of the candidate improvements and their evaluation, the findings of this study have been organized according to major needs identified, grouped by major travel corridor and also correlated to account for synergies and dependencies among the improvements.

ES.2 Existing Transit Service in the Study Area

The study identified three categories of transit service: New York commuter bus service, local bus service and shuttle/circulator service. *Commuter bus service* from the study area to New York is provided by four separate carriers. NJ TRANSIT, New Jersey's statewide public transit agency, operates several routes that originate in the easternmost part of Sussex County, upper Passaic County, or northern Morris County and serve either the Willowbrook Mall or the Wayne Transit Center (both in Wayne, Passaic County) before operating express to New York City. Private carrier Lakeland Bus Lines provides commuter service to New York (with local stops on some trips) from Morris County and Sussex County. Private carrier Coach USA's Community Coach 77 provides a commuter bus route from Morristown and East Hanover to New York via Essex County. Private carrier Martz Trailways offers commuter service from Pennsylvania to New York City serving the Panther Valley Park-and-Ride lot in Allamuchy (Warren County). Several *local bus routes* are operated by NJ TRANSIT including buses 29, 73, 75, 79, 748 in Passaic County, and Morris County Metro buses 1, 2, 3,4,5,7 and 10. Lakeland also provides limited local service over its commuter routes in Sussex and Morris Counties. *Local shuttle/circulator* services include NJ TRANSIT's WHEELS shuttles in Hackettstown, Morris Plains and the NJ 15 Sparta to Parsippany corridor, while the Morristown Colonial Coach, Sussex County Transit Loop Routes, West Milford Township Bus, Morris on the Move Shuttle, and the Parsippany Free Transit System each provide a locally run circulator service tailored to specific travel needs within those communities.

ES.3 Summary of Transit Markets in the Study Area

Existing travel patterns and socioeconomic characteristics in the Northwest New Jersey study area were initially analyzed based on information from the 2000 Census. In addition, origin-destination information from the NJ TRANSIT and NJTPA regional travel models for the base year conditions (2000) and two forecast years for each model (2010 and 2020 for the NJTPA model and 2015 and 2030 for the NJ TRANSIT model) were examined for areas both within and outside the study area boundary. This was supplemented by a survey analysis of current transit rider travel patterns, opinions, and boarding/alighting activity. These analyses are described in Chapters 2 and 3 of the report.

Transit's current mode share is highest (58%) for work trips leaving the study area for jobs in New York City. The second highest transit mode share (only 0.6%) is for people who enter the study area from areas

of New Jersey to the east (most commonly from Newark and Paterson). The percent of transit use is even smaller (only 0.3%) among people who are both living and working within the study area, even though this is the study area's largest travel market.

The primary market for transit trips in the study area is trips to older central business districts, such as New York City or Newark, where the effect of parking costs and roadway delays can reduce the attractiveness of driving. Most trips access transit by car utilizing the area's park-and-ride lots. For other trips, local transit plays an important role for those who cannot drive or cannot afford a personal vehicle. Therefore, local transit is an important source of general mobility for both work and non-work trips. Travel to large attractions such as central business districts, regional shopping malls, big box retailers, hospitals, office parks, colleges, or rail stations are some of the more critical local transit destinations.

ES.4 Improvement Needs and Development of Findings

Based on the evaluation of the markets, several general strategies were developed to help identify specific candidate improvements. The major needs summarized below emerged out of an on-board survey of bus riders, an online survey of travelers using all modes in northwestern New Jersey, agency and stakeholder input, comments from bus drivers and agency staff, and analysis of running time and ridership data. Route-specific needs, analysis of strategies, and study findings are detailed in Chapters 3, 4, and 5 respectively.

Need 1: Strengthen transit service along the major study area corridors

The study analyzed service improvements in to four major corridors including:

- *Sussex – Passaic Corridor* – including the corridors along NJ Routes 23, 94, US 202, CR 504/Hamburg Turnpike, CR 511/Ringwood Avenue, CR 515, CR 683/Newark-Pompton Turnpike).
- *Sussex – Morris Corridor* – including the corridors along NJ Routes 15, US 206, CR 616 & 517/Newton Sparta Road.
- *Morris County Corridor* – including the corridors along NJ Routes 10, 15, 23, US 46, US 202 and I-80.
- *Morris-Warren Corridor* - including the corridors along US 46, NJ Route 57 (in Hackettstown/Mansfield), and I-80.

To enhance route connectivity and coverage and improve service efficiency in these major corridors, a variety of needs were identified including:

- *Extend New York City commuter routes* - into unserved or underserved parts of the study area.
- *Increase the frequency of off-peak service on commuter routes* - to meet a proposed guideline of hourly.
- *Restructure local routes in Morris County* - to achieve greater efficiency, greater coverage, and increased frequency.
- *Increase span and frequency key Morris County local routes* - Add evening and/or Sunday service and increase frequency from one to two trips per hour, to better serve key destinations.
- *Improve coverage* - by providing local service to shopping malls or other major travel generators that currently have little or no service.
- *Integrate local and New York commuter service* - by permitting local ridership on some New York service through fare policy changes, and small changes in routing, to the extent feasible.

Need 2: Improve connectivity through shuttles and linkages to rail stations, transit hubs, and employment centers

The following types of improvements should be considered:

- *Improve community circulators* – Existing irregularly-scheduled, locally-provided services could be restructured to improve service quality, efficiency, and passenger information. In some cases, new community routes can link unserved areas to existing public transit nodes.
- *Improve railroad station connections* – Improve the coverage of existing shuttles and add new and revived shuttles to provide connections between commuter rail stations and employment centers, education, health care facilities and residences.
- *Improve service to major transit hubs*. – Existing bus transfer hubs could be strengthened by adding direct express service from other hubs. Such new services could operate non-stop over existing highways for faster travel, yet still serve select office and retail centers along non-highway segments. Service can also be strengthened by allowing all buses to stop in a single location and by coordinating schedules of different routes.

Need 3: Integrate private carrier services and locally run services into the area's transit network through service and fare coordination and transit information improvements

Service, fare, and policy differences between the transit providers in the study area can make transit use confusing, expensive, or even impossible. There are a number of improvements that could integrate existing and proposed new service into a more unified network:

- *Accept local fares and passes on commuter buses operated by private carriers* – This change would make available new local connections between Morris County and major destinations in Wayne and Essex County and would help bring private carriers more into conformance with NJTRANSIT policy for its New York-oriented routes.
- *Integrate private carrier route, schedule and fare information with NJ TRANSIT* – NJ TRANSIT could produce public schedules for private carriers and incorporate the data into the NJ TRANSIT online trip planner to be made available to the public electronically.

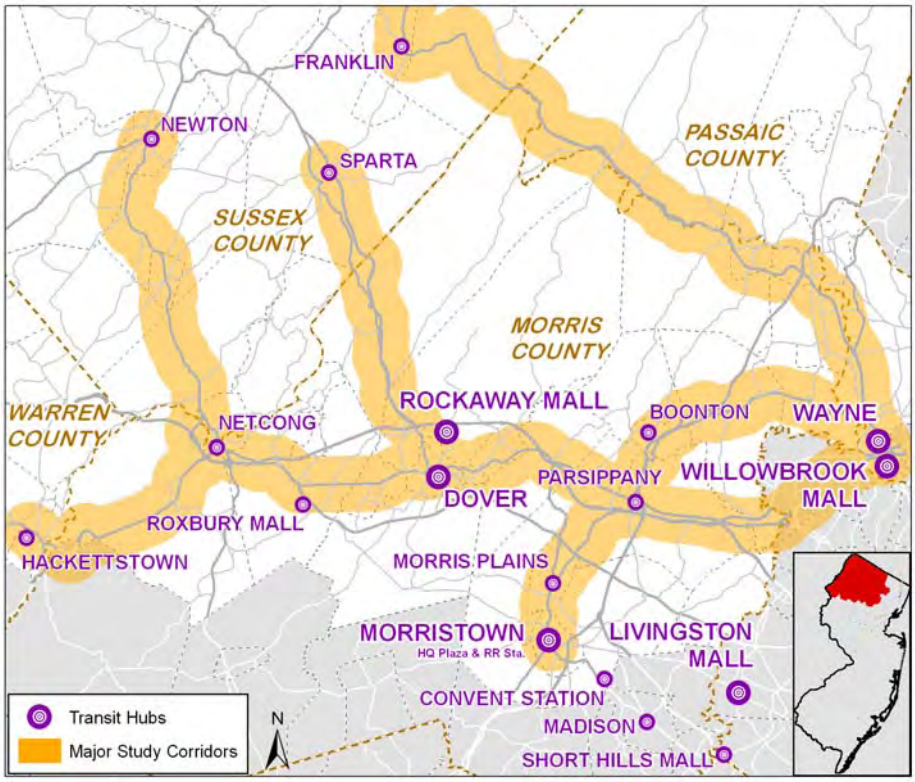
Need 4: Implement improvements to bus passenger facilities and running ways to support service proposals, upgrade system image and improve passenger comfort

The following improvements would complement the service proposals by improving the quality of existing passenger facilities and by providing opportunities for system expansion. Improvements to bus running ways (the roadways traversed along a bus route) in the form of bus bypass lanes and shoulders would be implemented as a pilot program in an effort to reduce delay due to traffic congestion.

- *Improve passenger information, safety and amenities at existing park-and-rides and major bus stops* – to encourage additional transit use and non-automotive access at existing facilities, the study identified a number of needs, including enhanced schedule and route information, bus shelters, seating, and in some cases bike racks, lighting, trash bins, signs, and pedestrian ramps.
- *Add commuter park-and-ride facilities and capacity* – Spaces would be added in newly-identified, existing privately-owned parking lots on or adjacent to existing New York City commuter bus routes, with the approval of property owners.

- *Initiate a bus bypass lanes pilot project* – Intersections in the study area were identified that have significant signal delay, substantial bus use, and an existing right-turn lane or shoulder that could be converted into a "bus bypass lane." Buses would be permitted to use the turn lane or shoulder to proceed straight through the intersection, generally to serve a bus stop at the far side, or otherwise to merge back into traffic after bypassing the queue at the signal. Initially, these bypass lanes would not require changes to existing signal timing, but at a future point, traffic signal priority for buses could be added, if the need arises. Conceptual engineering was performed for bus bypass shoulders at two locations -- on US 46 at New Road in Parsippany and on NJ 23 at Packanack Lake Road in Wayne. (See Appendix G)
- *Create new and enhanced transit hubs* – Existing nodes with a concentration of transit links would be strengthened through physical improvements that complement the proposed service improvements. These include improved passenger information, shelters, benches, and wayfinding signs. The study proposes development of such improved "transit hubs" throughout the study area. At the larger hubs, canopies with additional amenities are proposed, including lighting, heaters, fare vending machines, security cameras, and improved connections to building entrances (with the approval of property owners).

Figure ES-2: Study Corridors Showing Proposed Transit Hubs



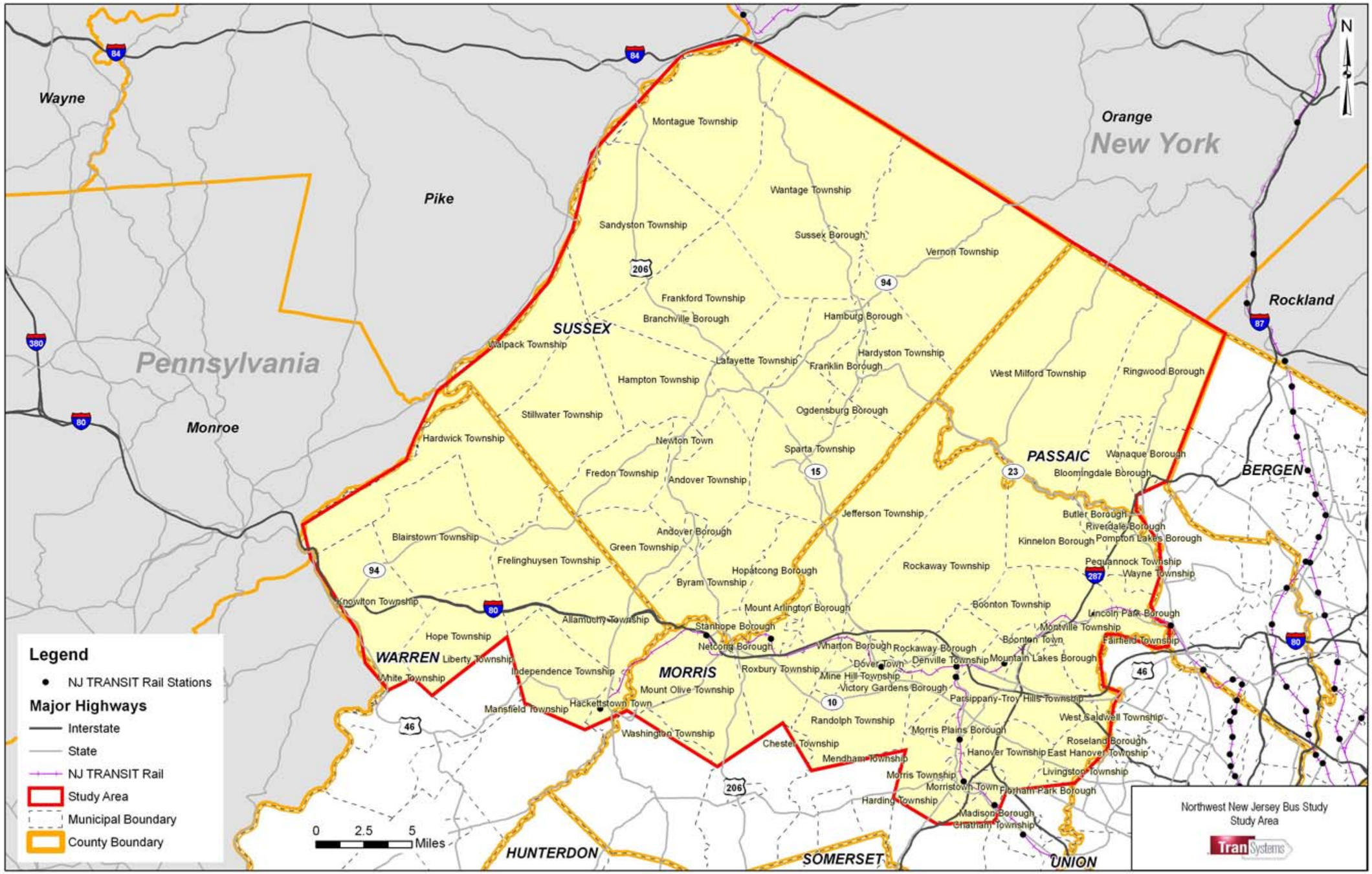
ES.5 Next Steps

Ultimately, the ability to implement improvements will depend on garnering the will and the funding required. Clearly collaboration will be required among a wide variety of stakeholders including NJ TRANSIT, NJDOT, the counties and municipalities and other stakeholders. To move forward, support from

multiple levels of government, elected officials and the public will need to be sought. Identifying sources of funding and obtaining funding commitments will be an important next step in the implementation process.

While the improvements are expected to add riders, they generally also add to the operating subsidy requirements, and in most cases require some capital investments. Although they address identified needs and opportunities and many may be deemed cost-effective and worthwhile, financial constraints may prevent some of them from being implemented in the near term. As noted by former Executive Director Richard Sarles in May 2009, NJ TRANSIT is severely constrained financially, facing a $62 million dollar shortfall in the Governor's proposed state budget. While federal grants and stimulus funds, Port Authority funds and other state funds will enable several major planned capital projects to continue to go forward, the budget would decrease the agency's operating budget by 17%. Although he indicated that eliminating train and bus routes is a last resort, and the agency is focusing on administrative and other ways to reduce spending it may be faced with service cuts to meet these budget constraints. The agency is currently focusing on ways to meet growing demand for bus and train service while keeping a lid on spending. For FY 2011, NJ TRANSIT is facing a projected $200 million budget shortfall.

Without additional funding from the State or federal government, NJ TRANSIT and other regional service providers will need to look for partnerships with the private sector and local governments for assistance and may find it particularly difficult to implement service expansion while facing major fiscal constraints. Since the private sector and local governments are also facing significant budget constraints, some and perhaps many worthwhile improvements will have to be deferred. This may require that the study findings be implemented a manner that is flexible and responsive to changing financial circumstances.


N
Wayne
Pike
Orange
New York
Rockland
Pennsylvania
Monroe
SUSSEX
WARREN
MORRIS
PASSAIC
BERGEN
HUNTERDON
SOMERSET
UNION
Montague Township
Wantage Township
Sandyston Township
Sussex Borough
Vernon Township
Frankford Township
Branchville Borough
Hamburg Borough
Walpack Township
Lafayette Township
Hardyston Township
Franklin Borough
Hampton Township
West Milford Township
Ringwood Borough
Stillwater Township
Ogdensburg Borough
Hardwick Township
Newton Town
Sparta Township
Fredon Township
Andover Township
Wanaque Borough
Bloomingdale Borough
Jefferson Township
Butler Borough
Riverdale Borough
Blairstown Township
Andover Borough
Kinnelon Borough
Pompton Lakes Borough
Green Township
Frelinghuysen Township
Hopatcong Borough
Rockaway Township
Pequannock Township
Wayne Township
Byram Township
Knowlton Township
Mount Arlington Borough
Boonton Township
Lincoln Park Borough
Allamuchy Township
Stanhope Borough
Montville Township
Hope Township
Netcong Borough
Wharton Borough
Rockaway Borough
Boonton Town
Fairfield Township
Liberty Township
Denville Township
Mountain Lakes Borough
White Township
Independence Township
Roxbury Township
Dover Town
Mine Hill Township
Victory Gardens Borough
Mount Olive Township
Parsippany-Troy Hills Township
Mansfield Township
Hackettstown Town
Randolph Township
West Caldwell Township
Washington Township
Morris Plains Borough
Roseland Borough
Chester Township
Hanover Township
East Hanover Township
Mendham Township
Livingston Township
Morris Township
Morristown Town
Florham Park Borough
Harding Township
Madison Borough
Chatham Township
Legend
NJ TRANSIT Rail Stations
Major Highways
Interstate
State
NJ TRANSIT Rail
Study Area
Municipal Boundary
County Boundary
0 2.5 5 Miles
Northwest New Jersey Bus Study
Study Area
TranSystems

1. Introduction

1.1 Study Purpose and Background

Northwestern New Jersey is a primarily rural region, but one that has been experiencing rapid development. From 1990 to 2000, population growth in Warren, Morris and Sussex counties was 10% to 12%, outpacing New Jersey's overall population growth of 9 percent. The growth in workers in these three counties was also significantly greater than the statewide growth. Population and employment growth led to increased traffic in the four counties that in turn resulted in longer commuting times. Between 1990 and 2000, the average commuting time within the study area increased by 15.6 percent.

With growth in housing and employment comes a need for enhanced public transportation, both to provide needed mobility for population segments that cannot drive, and also transportation options for those willing to leave their cars at home. Consistent with the State Plan, older Central Business Districts (CBDs) are experiencing redevelopment and attracting local commuters for both work and leisure purposes. Work trips in particular are becoming more intra-county focused which is a trip segment not well accommodated by present bus service. In fact, more than 40 percent of workers in each of the four study area counties are employed in their home county, and most of the remainder work in a county adjacent to their home county.

The region has public transportation service including routes operated by NJ TRANSIT, its contractors, private carriers, and municipalities. This combination of interstate, local bus and shuttle services are currently providing transportation to suburban employment sites in New Jersey and to New York City. Shuttle vans operate from commuter rail stations to serve nearby suburban employment centers.

The main goal of this study was to evaluate the current public transit system and look for opportunities for new or improved transit service in this rapidly changing area. A broad range of solutions was considered, not just traditional bus routes. Passenger and running way facilities that support the new services were examined, as well as improvements in customer information. This work was supported by a significant data collection effort, including counts and passenger surveys. The data was used to evaluate existing routes. Costs and benefits of the potential improvements were projected, and initial designs were developed for facilities.

The study fills a need identified in North Jersey Transportation Planning Authority (NJTPA)'s *Regional Transportation Plan*, the *Highlands Regional Master Plan*, and the *Report of Governor Christie's Subcommittee on Transportation* for short and medium-term proposals to improve mobility and access to jobs, education, tourism and other area destinations. The study was conducted within the context of an active on-going transportation planning program in the region. Several studies recently completed or underway served as building blocks for the current study. These include the *Northeast NJ Metro Mobility Study, Plan 2035 (NJTPA's Long Range Transportation Plan for the northern New Jersey region), the Greater Newark Bus System Study, the Bergen-Passiac Bus Study, the Lackawanna Cut-Off Environmental Assessment, the I-78 Corridor Transit Study,* and *The Highlands Regional Master Plan*.

1.2 Study Organization

The study was managed by the North Jersey Transportation Planning Authority (NJTPA) in coordination with New Jersey Transit (NJTRANSIT). TranSystems served as the prime contractor, leading a team that

included STV Incorporated, Radin Consulting and Gallop Corporation. The study consisted of five tasks as follows:

- *Task 1: Define Study Corridors and Phasing of the Corridor Analyses* – This task involved examining available information on travel patterns and socio-economic data to define the key study areas and areas of focus for the study.

- *Task 2: Data Collection* – This task involved the collection and analysis of boarding/alighting counts and passenger surveys on the various bus routes operated in the study area as well as assembly and analysis of available data on transit services and utilization, traffic congestion, land use and economic activity. The analysis of this data identified the problems to be addressed and the opportunities to serve potential markets.

- *Task 3: Analysis and Forecast Modeling* – This task involved developing service and facility improvement concepts and using the data and ridership forecasting methods to evaluate the potential effectiveness of the concepts. Network models and sketch planning techniques were used as appropriate. Also included in this task was conceptual level engineering and design of several facility improvements including environmental site assessments at the sites of selected facility improvements.

- *Task 4: Recommendations* – This task involved refinement of the improvement concepts and development of a prioritized and phased program of recommendations that can be implemented as funding permits.

- *Task 5: Public and Agency Outreach* – This task which was conducted over the entire course of the project involved the engagement of agency stakeholders and the public in the study.

1.3 Study Area and Key Corridors

The study area consists of portions of four counties in the northwestern portion of New Jersey, specifically:

- Sussex County
- Northern Morris County, including the NJ 10 and I-80 corridors
- Western Passaic County west of the I-287 corridor along Route 23
- Northern Warren County along and north of I-80 & US 46

As the study progressed, the focus was narrowed to four primary corridors based on the existing public transit services, roadway corridors and development:

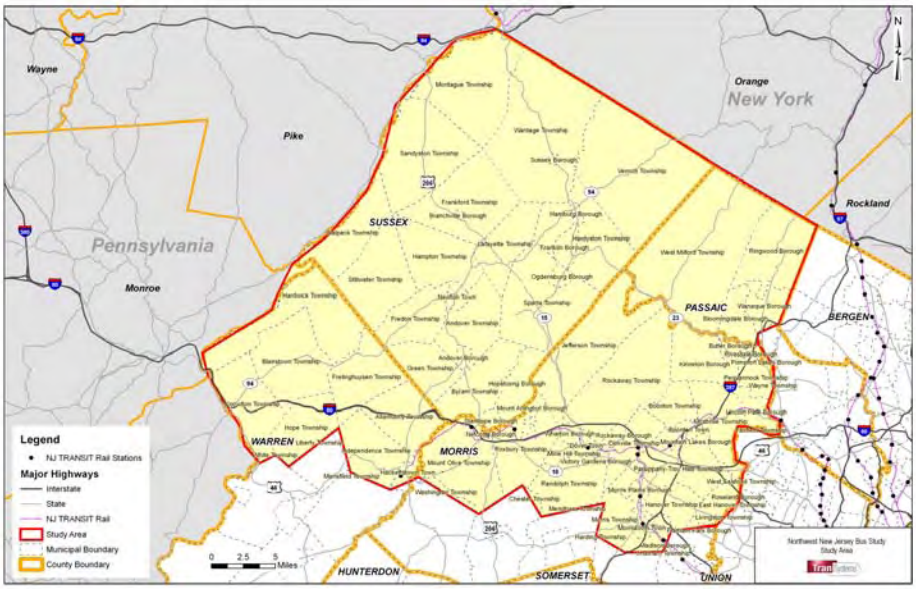
- *Sussex – Passaic Corridor* including corridors along NJ Routes 23, 94, US 202, CR 504/Hamburg Turnpike, CR 511/Ringwood Avenue, CR 515, CR 683/Newark-Pompton Turnpike).
- *Sussex – Morris Corridor* including corridors along NJ Routes 15, US 206, CR 616 & 517/Newton Sparta Road.
- *Morris County Corridor* including corridors along NJ Routes 10, 15, 23, US46, US 202 and I-80.
- *Morris-Warren Corridor* including corridors along US 46, NJ Route 57 [in Hackettstown/Mansfield], and I-80)

A large portion of land use in the study area is forest and agriculture, particularly at the western edge. In addition, there are important water resources and wetlands in the area. The east and south of the study area is the most urban part and extends along several roadway corridors to the west and north. The

Highlands Regional Master Plan, adopted in 2008 pursuant to the Highlands Act, is designed to preserve water and other key natural resources in the study area by guiding development. The overall Highlands district covers much of the study area except for a large strip along the western edge.

The study identified three categories of transit service: New York commuter bus service, local bus service and shuttle/circulator service. *Commuter bus service* from the study area to New York is provided by four separate carriers. NJ TRANSIT, New Jersey's statewide public transit agency, operates several routes that originate in the easternmost part of Sussex County, upper Passaic County, or northern Morris County and serve either the Willowbrook Mall or the Wayne Transit Center (both in Wayne, Passaic County) before operating express to New York City. Private carrier Lakeland Bus Lines provides commuter service to New York (with local stops on some trips) from Morris County and Sussex County. Private carrier Coach USA's Community Coach 77 provides a commuter bus route from Morristown and East Hanover to New York via Essex County. Private carrier Martz Trailways offers commuter service from Pennsylvania to New York City serving the Panther Valley Park-and-Ride lot in Allamuchy (Warren County). Several *local bus routes* are operated by NJ TRANSIT including buses 29, 73, 75, 79, 748 in Passaic County, and Morris County Metro buses 1, 2, 3, 4, 5,7 and 10. Lakeland also provides limited local service over its commuter routes in Sussex and Morris Counties. *Local shuttle/circulator* services include NJ TRANSIT's WHEELS shuttles in Hackettstown, Morris Plains and the NJ 15 Sparta to Parsippany corridor, while the Morristown Colonial Coach, Sussex County Transit Loop Routes, West Milford Township Bus, Morris on the Move Shuttle, and the Parsippany Free Transit System each provide a locally run circulator service tailored to specific travel needs within those communities.

Figure 1-1: Northwest New Jersey Bus Study Area



1.4 Overview of Study Outreach Process

The Bus Study's public outreach process occurred throughout the project's duration and involved coordination with, and input from, various government officials and agencies, as well as the general public. A public outreach plan was developed early in the study to facilitate outreach the key stakeholders and groups in all four counties that could potentially benefit from the results of this Bus Study. The plan was designed to inform, solicit input and solidify relationships with stakeholders. Public outreach initiatives focused on building community and political support to achieve consensus on the essential features of the region's bus services. The following were the general community outreach objectives:

- Inform the public, communities, and other stakeholders of findings, opportunities, and potential impacts;
- Identify and address any community concerns throughout the study;
- Incorporate community needs into the evaluation process before making any conclusions;
- Build a network of supporters to serve as advocates in local communities.

1.4.1. The Four Tier Approach

There was a four-tier approach to public outreach employed during the study that is reflected in the structure of committees developed to guide and advise the study process. These four tiers and a list of their respective participants are described below.

Tier 1: Core Group - This group, which functioned as a Steering Committee, was comprised of the project management staff from NJ TRANSIT/NJTPA and the Consultant Team. This group convened frequently in meetings and conference calls to discuss scheduling, analysis and draft projects or other technical management issues, as well as the conduct of public and agency outreach.

Tier 2: Technical Advisory Committee - This group was comprised of the representatives from the four study area counties and selected state and regional agencies (e.g., NJ Department of Transportation, Office of Smart Growth, Highlands Council, Delaware River Joint Toll Bridge Commission, TransOptions), as well as the Core Group members. This group met several times during the course of the study to review scheduling, analyses and interim products and to coordinate additional sub-area/local outreach efforts. TAC also assisted identifying/forming local stakeholder outreach groups, identifying issues and concerns, identifying sources of data and providing input on coordination with other planning efforts.

Tier 3: Meetings with Local Officials/Interest Groups - Study area counties invited their respective municipalities to participate in Tier 3 outreach. These meetings took the form of group meetings. This outreach tier included meetings over the course of the study with local stakeholders (mainly local officials) organized by sub-market and identified by the Core Group and TAC members. Meetings were timed to coincide with major study milestones and the release of information on improvement options.

Tier 4: Inter-Agency Outreach - The project team and representatives of the Core Group met individually or in groups with relevant agencies and major stakeholders to gather data/information and seek input on major study tasks. These included the private bus carriers, private businesses, local TMAs, and other interested parties. Planning agencies from counties adjacent to but external to the study area (i.e., Northeast Pennsylvania Alliance, Monroe County (PA) Planning Commission, Orange County (NY)

Planning Department), local agencies, private carriers were included. The members of each tier are included in Table 1-1.

1.4.2. Outreach Media

Various channels of conducting stakeholder and public outreach were used for this study. These included:

- Public Open Houses – To allow for broad public input, open house public meetings were held;
- Study Website – NJTPA maintained a website with current project information (www.nwnjbus.org). This website contained project information, announcements. The consultant project team assisted NJTPA in maintaining this site by preparing materials;
- Printed Materials – Fact sheets were developed at two stages of the study. These materials were distributed through mailings and at meetings, as well as via partners among the organizations represented in the various tiers described above.
- Mailing List/ Database – A database of stakeholders, interested individuals and groups that wish to stay informed of the Bus Study was maintained.
- Surveys – Surveys of riders and non-riders were part of the study effort and contributed to the outreach element of the study. The consultant team carried out on-board rider surveys that included questions addressing the rider perception of the quality of service provided and rider suggestions for improvements. On-board surveys were conducted on the following routes:

    - NJ TRANSIT: Routes 75, 79 , 193, 194, 195, 196, 197, 198, 324 (NJ TRANSIT Routes 29, 73 were surveyed by Greater Newark Bus System Study)
    - WHEELS: Routes 966, 967, 973
    - Morris County Metro: Routes 1, 2, 3, 4, 5, 7, 10
    - Lakeland Bus Lines: Line 46, 80 (and combined 46/80)
    - Community Coach: Line 77

    NJTPA conducted a web-based survey open to the public that permitted non-riders as well as riders to submit a survey response. The latter was used as general outreach since the sample was self-selected and did not represent a scientific random sampling that could generate statistically meaningful data.

1.4.3. Study Purpose and Goals

The purpose of the study was to:

- Address traffic congestion in a fast growing area of New Jersey, by identifying concept-level service and facility improvements to expand use of bus, shuttle and ridesharing;
- Respond to requests for short and medium-term improvements with a comprehensive transit needs analysis;
- Fill a need identified in NJTPA's Regional Transportation Plan for proposals to improve mobility and access to jobs and other area destinations.

The primary study goals were to:

- Examine opportunities to improve bus transit services and intermodal connectivity between buses and other transit modes;
- Improve mobility and access to job centers and other area destinations;
- Improve commuting options for residents who work in the northwestern counties, and

- Plan improved bus service that could be implemented prior to the increased commuter rail service that will be made possible with the opening of the Mass Transit Tunnel in 2017.

Through the extensive outreach process stakeholders identified the following concerns that should be addressed in the study:

- Limited bus service within the Study Area;
- Congestion on main highways;
- Need for additional park-and-rides;
- Long travel times to Manhattan;
- Need to inform residents of transportation options available;
- Need for affordable transportation options and stable and sustainable funding.

Specific objectives of the study work effort were to:

- Inventory conditions and travel needs
- Evaluate and propose bus transit service improvements
- Evaluate and propose facility improvements
- Estimate costs and ridership impacts
- Develop 10% designs
- Conduct environmental screening
- Involve stakeholders

1.5 Context: Relevant Past and Concurrent Studies and Efforts

This bus study in northwestern New Jersey is just one of several efforts to improve public transportation in northern New Jersey. Of particular relevance to this region are the following other studies and projects:

1.5.1. Bus Service and Facilities Related Studies and Projects

Greater Newark Bus System Study (GNBSS) - This study, led by NJ TRANSIT, began prior to the Northwest New Jersey Bus Study and is addressing routes that serve Newark and Essex County. Some of these routes serve northwest New Jersey as well. Coordination has taken place with the NJ TRANSIT project manager and consultant team for the GNBSS with both data collection and strategy development. Data on some bus routes in the northwest New Jersey study area derived from the GNBSS.

Bergen-Passaic Bus Study - This study, led by NJ TRANSIT, began after the Northwest New Jersey Bus Study. Routes that focus on Paterson and the eastern part of Passaic County which were not covered in the Northwest New Jersey Bus Study's data collection efforts are being addressed in Bergen-Passaic Study. Some service concepts developed in the Northwest New Jersey Bus Study were recommended for development by the Bergen-Passaic Bus Study to take into account the service needs and opportunities in the eastern portion of Passaic County.

Mass Transit Tunnel - This project, also known as ARC – Access to the Region's Core and THE TUNNEL, will double commuter rail capacity. This large service increase will provide more frequent trains, more express service, and for many residents, a direct (transfer-free) ride between their hometown and New York City. As a result of the Mass Transit Tunnel, direct (transfer-free) service to Manhattan will finally be provided on the Morristown Line (points west of Dover) and Boonton Line (points west of Montclair State University) as well as the Main Line, Bergen County Line, Pascack Valley Line, Raritan Valley Line, Port

Jervis Line, North Jersey Coast Line (points south of Long Branch). It will also allow more frequent and express service on the Morristown Line, Montclair Line, Gladstone Branch as well as the Northeast Corridor and North Jersey Coast Line. Until the expected opening of the Mass Transit Tunnel in 2017, commuter rail improvements are constrained, and thus any shorter-term improvements in service to meet existing or future demand will generally need to be met by bus service.

1.5.2. Commuter Rail Extensions

Lackawanna Cutoff Rail Service - NJ TRANSIT is conducting a study of restoration of passenger rail service along the Lackawanna Cutoff. The project includes complete reconstruction of the line including track and signal improvements to approximately 88 miles of right of way, new stations, parking facilities, a train storage yard and additional rail rolling stock. It is assumed that NJ TRANSIT would operate the new service. Proposed stations in New Jersey would serve Blairstown in Warren County and Andover in Sussex County. The line would extend to serve Scranton, Tobyhanna, Pocono Mountain, Analomink, East Stroudsburg, and Delaware Water Gap in Pennsylvania. The first phase of the project is a 7.3-mile segment from Port Morris Yard to a new passenger station at Andover, NJ. The first phase is fully funded using a combination of Federal Transit Administration (FTA) and state Transportation Trust Funds. The full project is not funded. NJ TRANSIT's Board of Directors authorized consultant work for conceptual design, completion of the environmental assessment (EA) and preparation of the documentation required by the Federal Transit Administration for new transit lines. The State of New Jersey completed the purchase of the Lackawanna Cutoff property in May 2001.

1.5.3. Plan 2035

NJTPA has completed Plan 2035 the Regional Transportation Plan for Northern New Jersey. It is the 2009 update of the NJTPA's Regional Transportation Plan (RTP) which is the federally mandated long-range transportation plan for the NJTPA's 13-county region. The plan was approved in August of 2009. It sets out a vision for development of the transportation system and serves as an investment guide for the region. The plan is updated every four years (see http://www.njtpa.org/plan/studies/).

1.6 Report Organization

This report is organized into five chapters. Chapter 1 is this introduction. Chapter 2 describes the existing and future conditions in the study area including socio-economic and land use characteristics, travel patterns, transportation services and utilization, and traffic conditions. Chapter 3 describes how problems and target markets were identified including the incorporation of input from stakeholders. Chapter 3 also includes overall strategies. Chapter 4 describes the development and evaluation of specific concepts for service, running way and passenger facility improvements as well as concepts for other supporting strategies. Chapter 5 describes the criteria used to evaluate improvements.

2. Existing and Baseline Future Conditions

This chapter describes the existing conditions with regard to population and land use, roadways, transit routes, trip flows, and transit trips within the study area. At the end of the chapter, the expected changes in total trips and transit trips are presented using NJTRANSIT and NJTPA model forecasts.

Note on the Study Area Boundaries

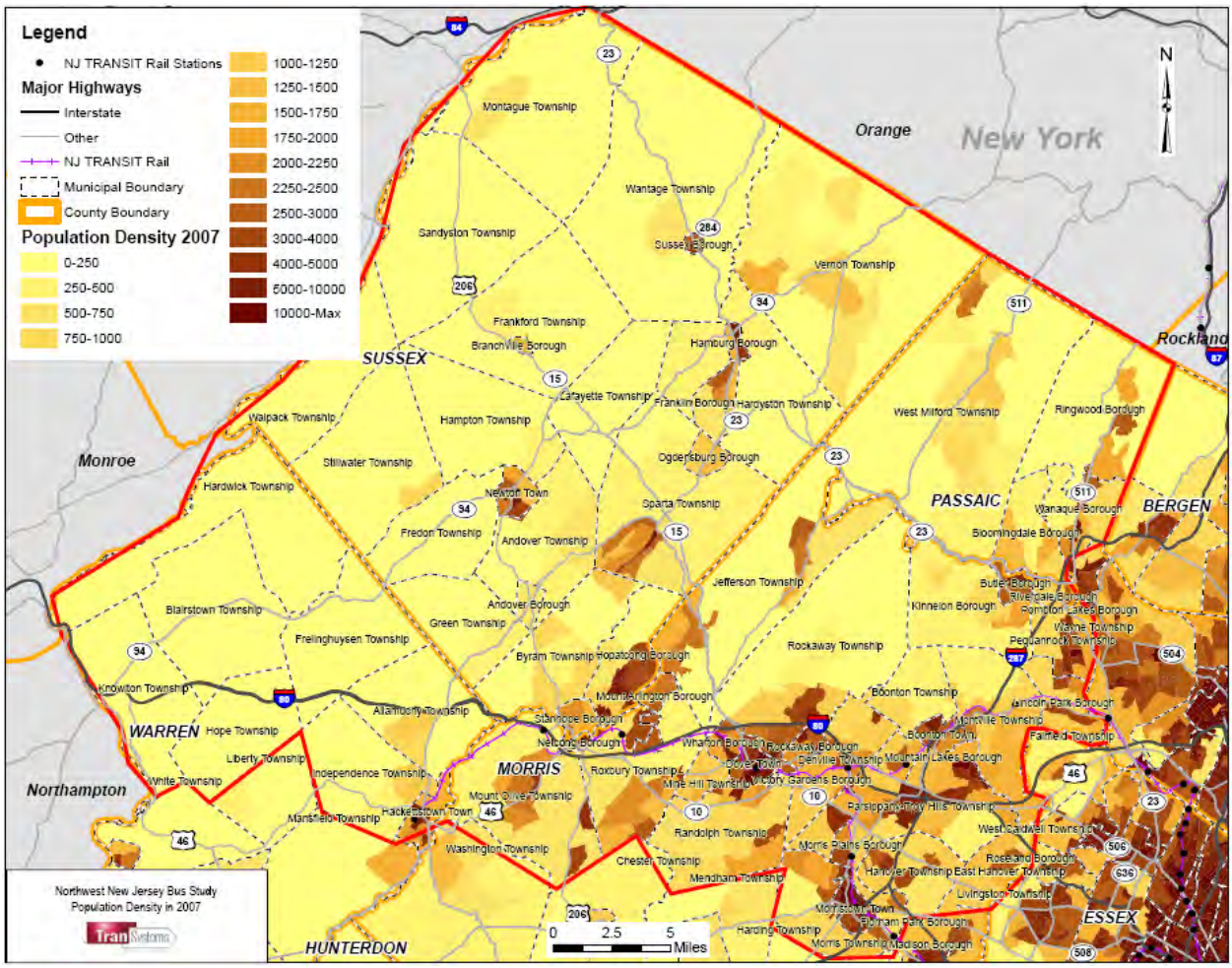
An initial study area boundary was proposed by NJTPA to include all of Sussex County and portions of Morris, Passaic and Warren Counties. The study area included northern Morris County and northern Warren County and western Passaic County. Note that eastern Passaic County is being addressed in a separate NJ TRANSIT Bergen-Passaic Bus Study. Pompton Lakes (in Passaic County) was initially omitted from the study area but subsequently included. Analysis of area characteristics was undertaken early in the study to better define the areas of focus. These area characteristics are discussed below.

2.1 Population

2.1.1. Population Density

Figure 2-1 shows the current (2007) population density of each township or borough ("Minor Civil Division" or MCD according to the Census Bureau) in the study area, as well as several surrounding areas. Most MCDs today have relatively low population densities – that is, 500 persons per square mile or less. MCDs with higher densities are generally found in the southern and eastern portions of the study area. Morris County MCDs with higher density are located along I-80 and/or the commuter rail lines (e.g. Dover and Morristown) or in the northeast of the county (Butler and Pequannock). In Passaic County, besides the more urbanized eastern section of the County located just outside the Study Area, MCDs near the intersection of I-287 and Route 23 have the highest population density, including Wayne and Pompton Lakes. In Sussex County, MCDs with higher density include Sussex, Newton, Sparta, Hamburg, and Hopatcong. In Warren County, only Hackettstown has higher density. In contrast to the relatively low densities in the Study Area, there is continuous dense suburban and urban development in all areas to the east of the Study Area, except for the Meadowlands.

Figure 2-1: Population Density in the Study Area in 2007



2.1.2. Employment

There is a similar pattern with respect to both attractions (job location) and productions (residence): where there is higher density for attractions, there is also a higher density for productions. In other words, the denser portions of the study area serve as both residential and employment centers. The density maps (see figures below) indicate that the southeastern part of the study area, primarily Morris County and the southeastern part of Passaic (where the state's third largest city, Paterson, is located), have higher concentrations of work trip productions and attractions. A few small areas in the northwestern part of the study area exhibit higher density, including the town of Newton, Sussex Borough, and Hamburg Borough. Figure 2-2 and Figure 2-3 show the density of workers by municipality of residence and by municipality of job location.

Figure 2-2: Density of Workers by Municipality of Residence

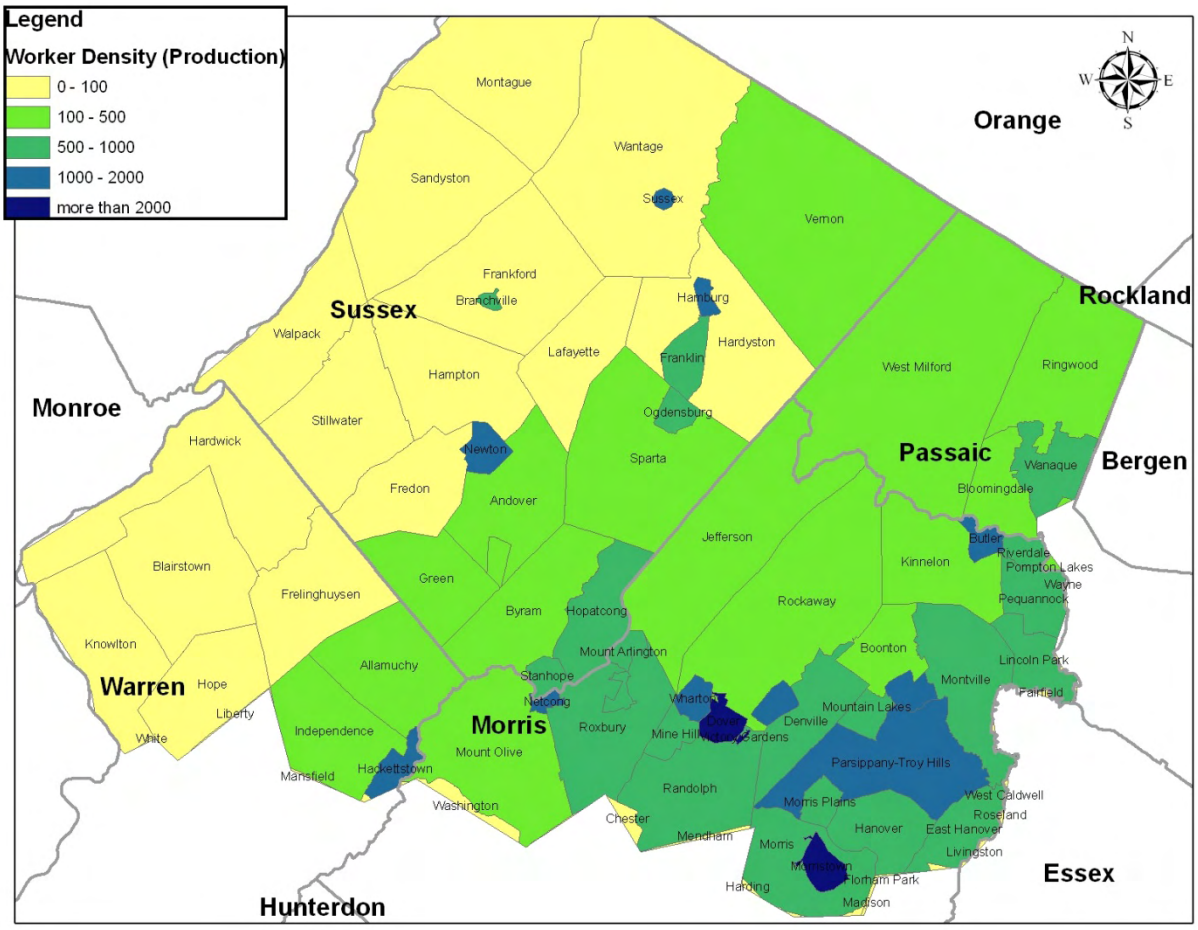


Figure 2-3: Density of Workers by Municipality of Workplace

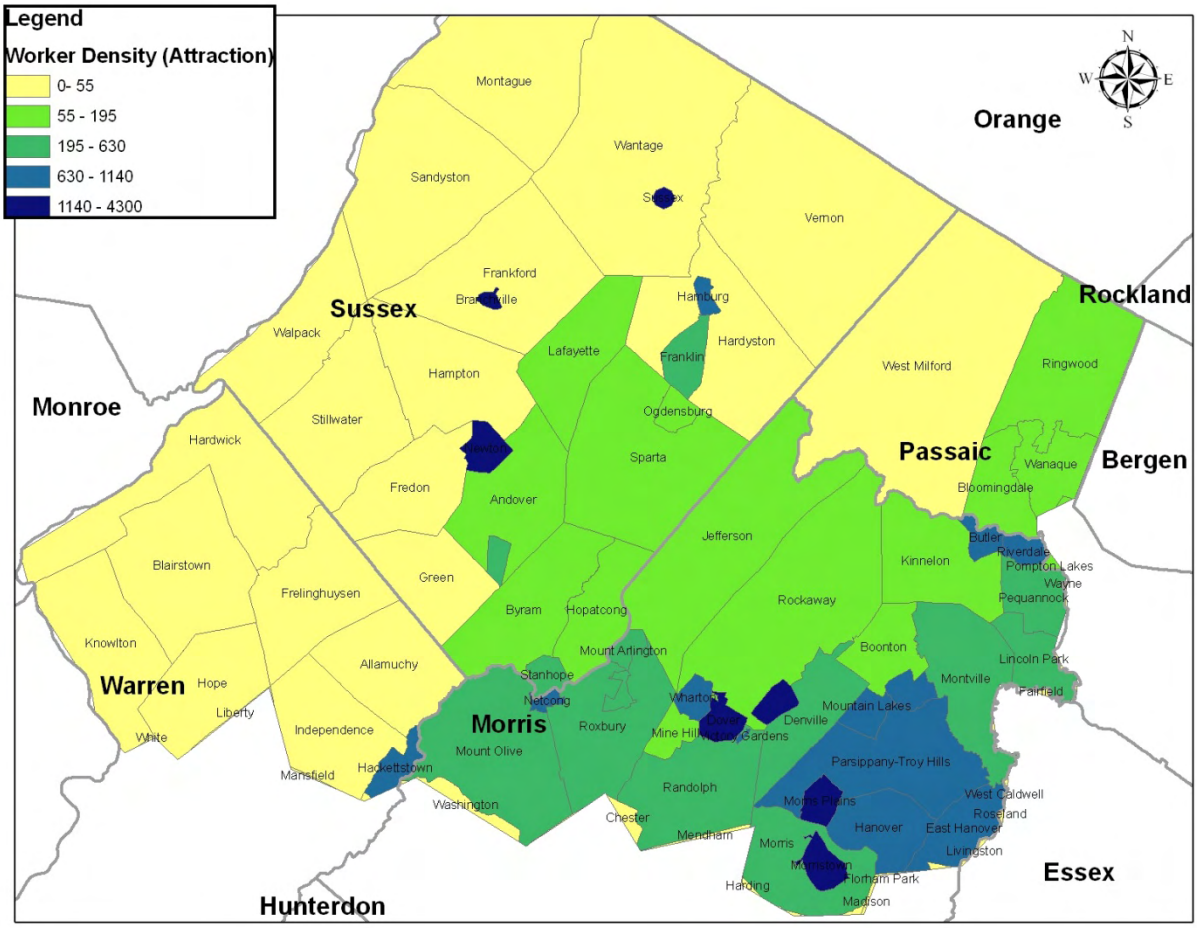
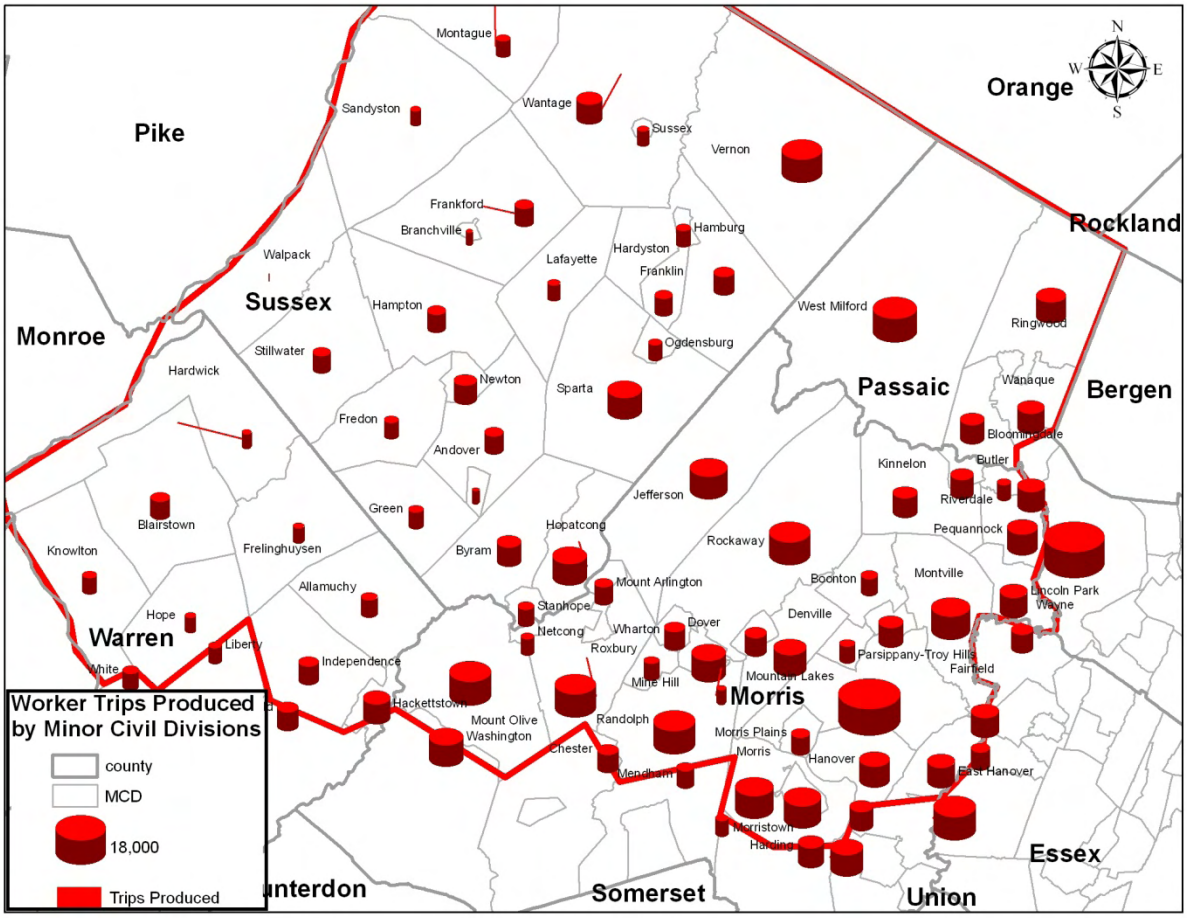


Figure 2-4 shows the number of workers by municipality of residence.The township of Parsippany-Troy Hills (in Morris County) is the municipality that is the biggest work trip generator (residential end) in the study area. It generates nearly 28,000 worker trips. The muncipalities that are the major generators of work trips (both inter- and intra-county) are listed and displayed below:

Table 2-1: Number of Workers by Municipality of Residence

County	No. of Workers	County	No. of Workers
Parsippany-Troy Hills Twp. Morris Co.	27,924	Vernon Twp. Sussex Co.	12,316
Wayne Twp. Passaic Co.	26,503	Rockaway Twp. Morris Co.	12,235
West Milford Twp. Passaic Co.	13,940	Montville Twp. Morris Co.	11,055
Mount Olive Twp. Morris Co.	12,778	Morris Twp. Morris Co.	10,914
Randolph Twp. Morris Co.	12,704	Jefferson Twp. Morris Co.	10,438
Roxbury Twp. Morris Co.	12,407	Morristown Morris Co.	10,209

Figure 2-4: Number of Workers by Municipality of Residence

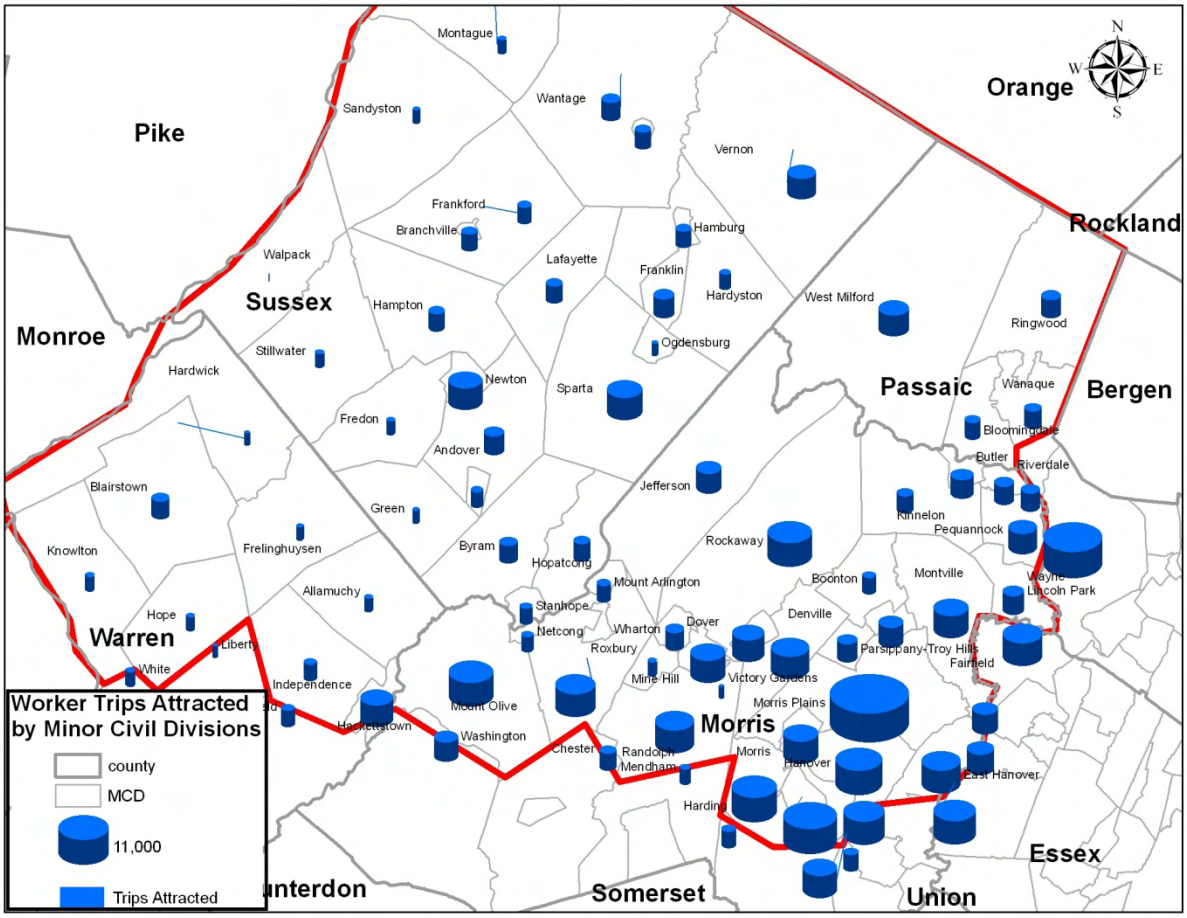


The township of Parsippany-Troy Hills is also the municipality that is the biggest work trip attractor (job location end). It attracts nearly 27,000 worker trips from other places (within and outside of the study area). The major worker trip attractors are listed below in Table 2-2. This is depicted graphically in Figure 2-5. More data from the U.S. Census and regional travel models about travel flows is presented later in this chapter and in Appendix A.

Table 2-2: Number of Workers by Municipality of Workplace

County	No. of Workers	County	No. of Workers
Parsippany-Troy Hills Twp. Morris Co.	26,989	Mount Olive Twp. Morris Co.	8,805
Wayne Twp. Passaic Co.	15,212	Roxbury Twp. Morris Co.	7,206
Morristown Morris Co.	12,604	Florham Park Bor. Morris Co.	7,093
Hanover Twp. Morris Co.	9,566	Randolph Twp. Morris Co.	6,890
Morris Twp. Morris Co.	9,028	Denville Twp. Morris Co.	6,357
Rockaway Twp. Morris Co.	8,901	East Hanover Twp. Morris Co.	6,307

Figure 2-5: Number of Workers by Municipality of Workplace



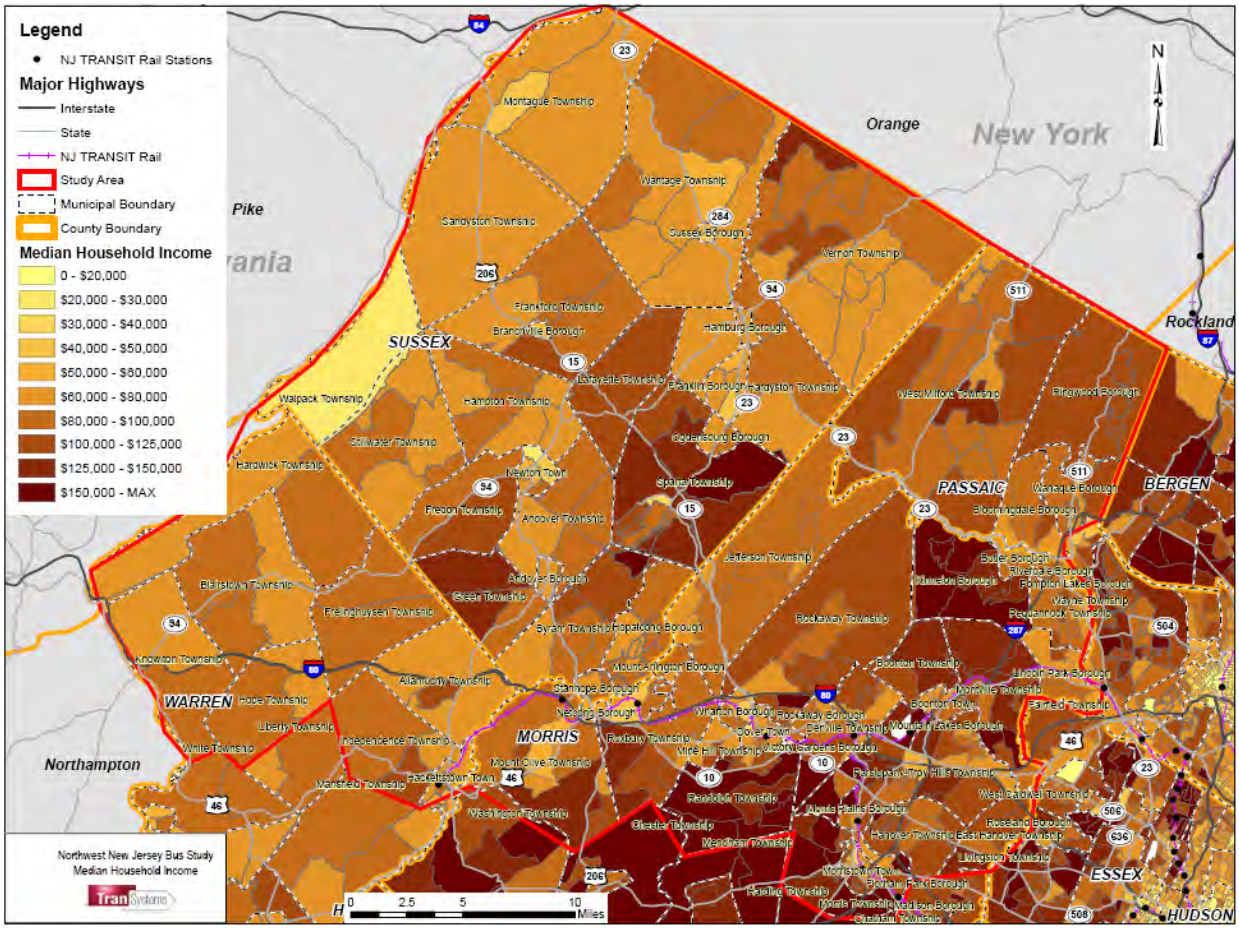
2.2 Demographics

Key indicators that relate to the demand for transit service include population and employment density (discussed above) and socio-economic characteristics such as income, automobile ownership, and aging. Selected maps of these demographic characteristics are shown below. Several of these measures have been combined into an index of transit demand, "Transit Score," following the accepted method used by NJ TRANSIT to assess transit feasibility. The Transit Score rating is based on population, employment, and no-car households, all per unit of land area i.e. density.

2.2.1. Household Income

Figure 2-6 shows median household income by municipality. Rural portions of the study area generally exhibit income levels of $50,000 and below, while suburban portions in the south and east of the study area generally exhibit somewhat higher incomes. Older urban areas tend to have lower median income. Lower-income areas include portions of Dover, Victory Gardens, Wharton, Netcong, Mt. Olive, Franklin, Sussex Borough, and Newton. High income areas include Randolph, Kinnelon, Mountain Lakes, Sparta, and some towns just south of the Study Area (Chester, Mendham, Harding, and Chatham).

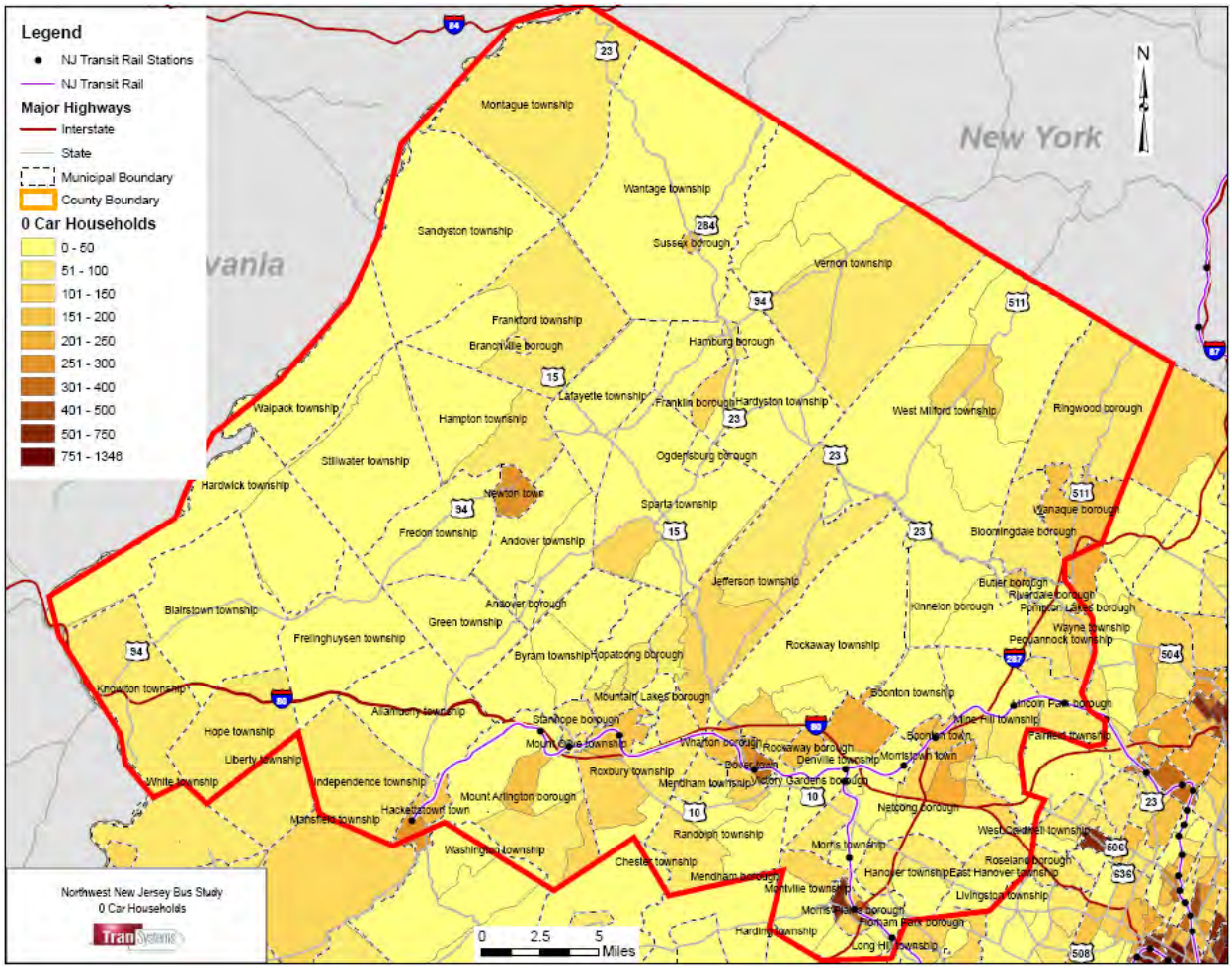
Figure 2-6: Median Household Income (2000 Census)



2.2.2. Households without Automobiles

Figure 2-7 shows the concentrations of households without cars. As expected, few municipalities in these predominantly suburban and rural areas are no car households. Communities with higher concentrations of no car households include Newton, Dover and Morristown.

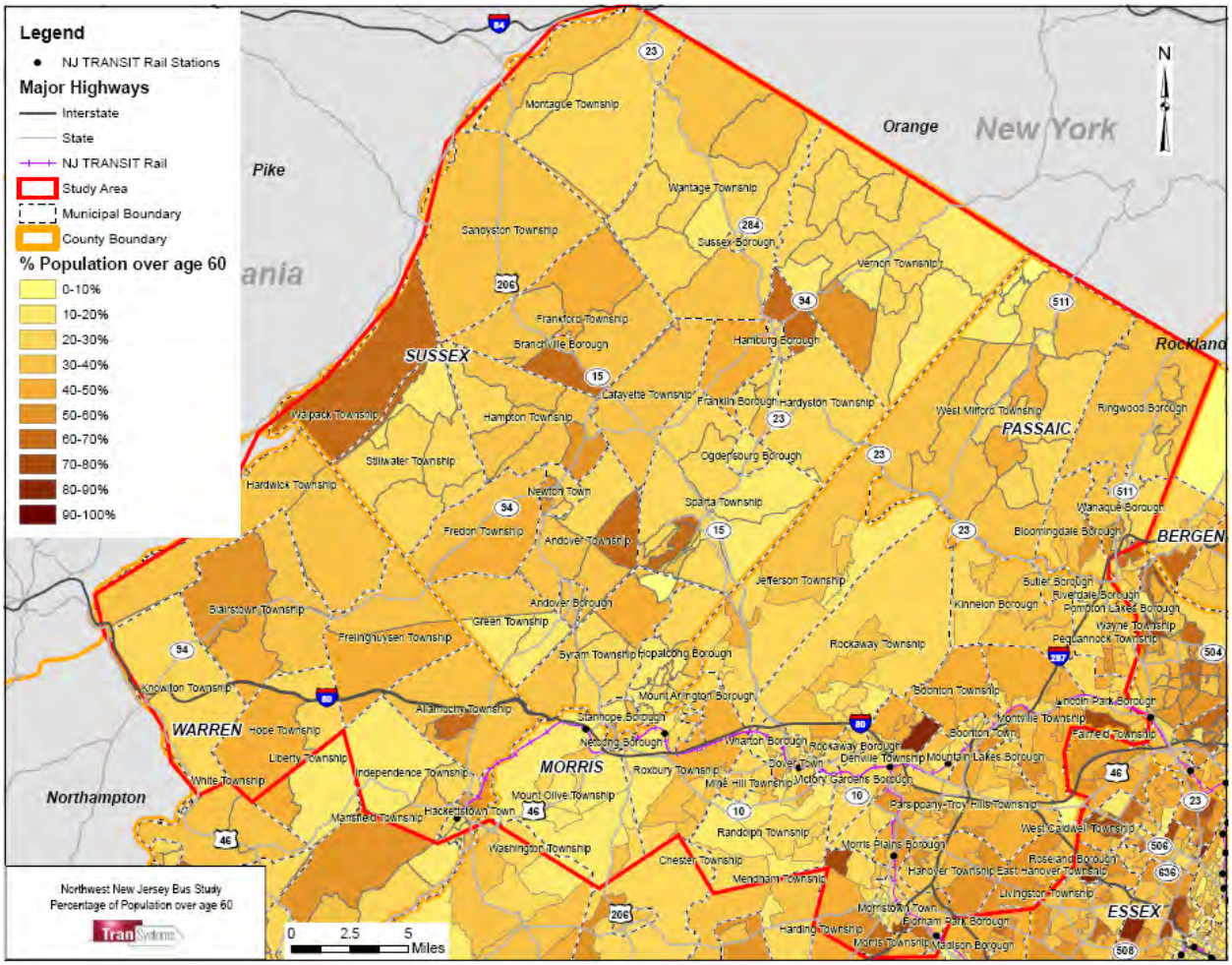
Figure 2-7: Households without Automobiles (2000 Census)



2.2.3. Aging

Figure 2-8 shows the share of population in each municipality age 60 and over. There are several pockets that exhibit higher shares of seniors. These include Morristown, Newton, Dover and Hackettstown among others, all older urban centers.

Figure 2-8: Share of Population Age 60 and Over (2000 Census)



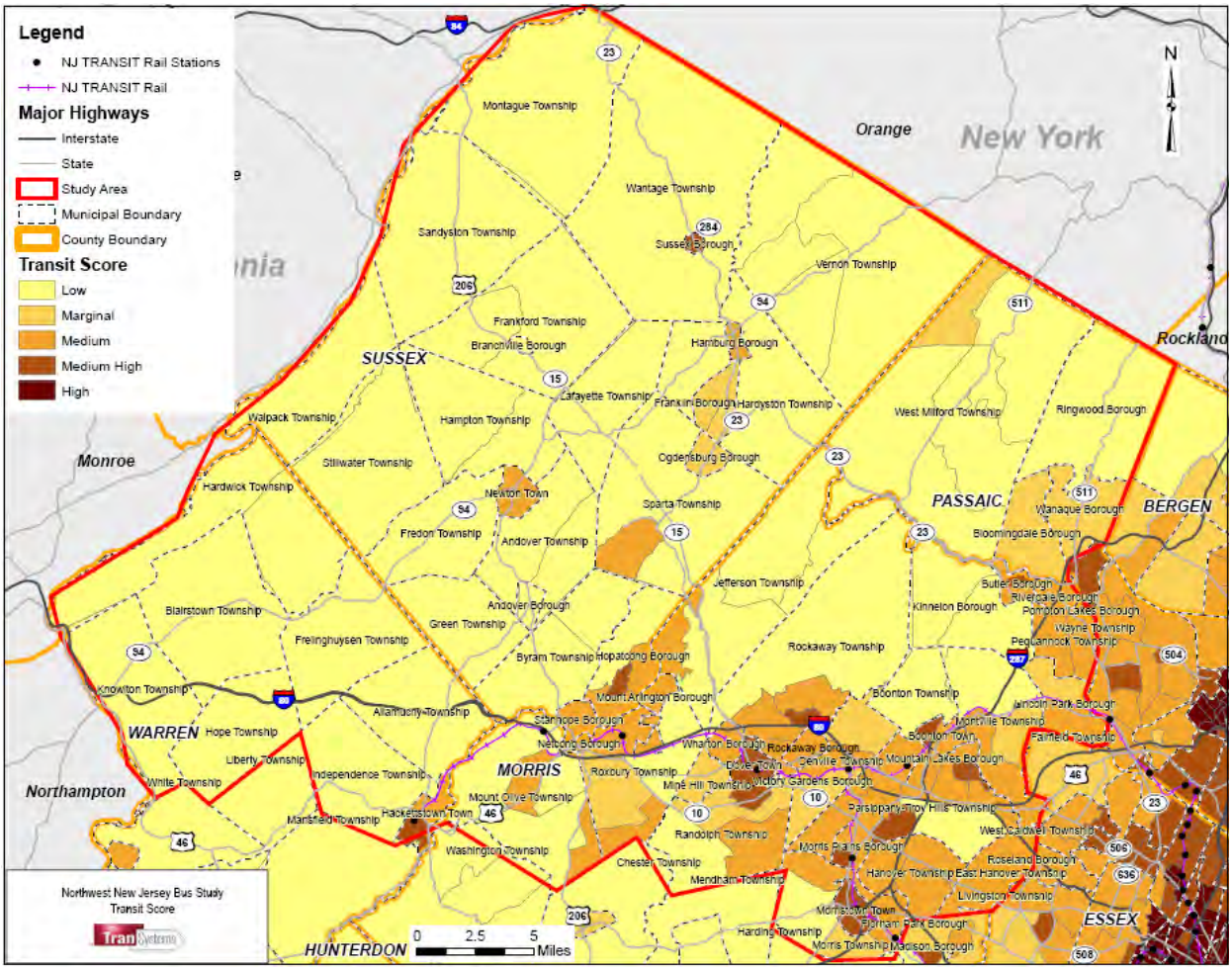
2.2.4. Transit Score

NJ TRANSIT uses a methodology known as "Transit Score" as a rough guide to the type of transit services that should be provided. The index is based on a combination of several demographic factors, specifically: population density, employment density, and density of households without automobiles. The five-category Transit Score is an indicator of the relative likelihood and potential for different types of transit usage in a geographic area. Higher score areas can potentially accommodate a greater range of types (modes) of transit service. Transit Score is used to identify where different types of transit investments may be appropriate, subject to available resources, provided certain criteria and conditions are met. The types of transit are fixed guideway (rail or busway), bus services (excluding busway), and access services such as paratransit and ridesharing. Technical Memorandum #1 prepared for this study includes excerpts from NJ TRANSIT's "2020 Transit Score Report" which provide more details about the method. According to this report,

> *"If the Transit Score and other criteria or conditions are met and a specific fixed guideway mode or transit service is an appropriate investment, a project or service can advance to more detailed feasibility studies. The Transit Score indicates the "order of magnitude" relationship to types of fixed guideway, bus service, and intermodal investments. However, more detailed study is necessary to provide ridership estimates, costs, benefits, environmental and engineering feasibility, and financial impacts. The more detailed studies will determine if the investment types outlined in the Transit Score are feasible. Conversely, not meeting the Transit Score criteria does not automatically indicate a project has no merit, but it does mean that the project fails to meet even a minimum level of justification. More detailed investigation or special circumstances can determine that a service is viable outside the Transit Score criteria. **In summary, the Transit Score is a planning tool that can be used as a guideline to transit investment and service analysis, especially for longer term future planning for growth and development. It is not a substitute for but a supplement to detailed feasibility studies and the overall on-going transportation planning process."***

Figure 2-9 shows the Transit Score tabulated for 2000 for each MCD in the study area as well as adjacent surrounding areas. As can be seen in the figure, the study area is predominantly ranked Low, indicating that only limited types of bus services may be applicable under the 2000 conditions, such as express bus with park-and-ride access and local circulator bus service with rural centers. There are several MCDs within Sussex or Warren Counties ranked above Low, including Sussex, Newton, Sparta, Hamburg, Franklin, Ogdensburg, Stanhope, Hopatcong, and Hackettstown. The largest clusters of MCDs with Medium or higher rankings are in Morris and Passaic Counties close to the interstate highways and the commuter rail lines. Several of the stakeholders involved in the development of this study expressed the opinion that the Transit Score rating should not limit the types of transit investments in the study area. The transit improvement concepts presented in this report do not necessarily reflect the categories defined in the Transit Score process.

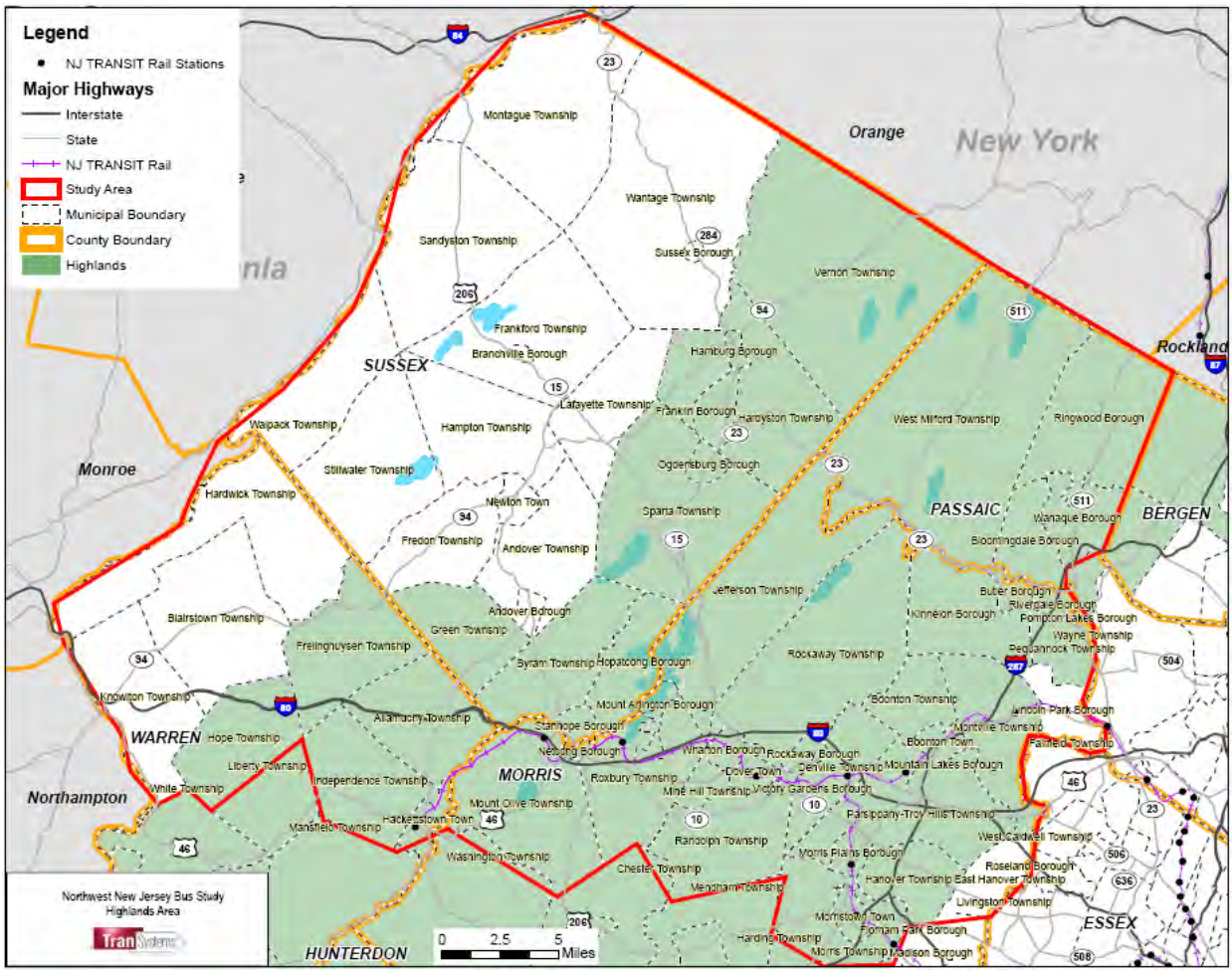
Figure 2-9: Transit Score by MCD (base data from 2000 Census)



2.2.5. Environment

The Highlands Regional Master Plan is designed to preserve water and other key natural resources in the study area by guiding development. The portion of the Highlands Region within the study area is shown in Figure 2-10. As can be seen in the map, the overall Highlands district covers much of the study area except for the western parts of Sussex and Warren Counties. The Highlands Regional Master Plan was adopted by the Highlands Council on July 17, 2008 and approved by the Governor on September 5, 2008. The impact of the Highlands Regional Master Plan on future population and employment growth is discussed in the final section of this chapter.

Figure 2-10: The Highlands Area



2.3 Existing and Baseline Future Transportation System

2.3.1. Roadway System

This section inventories the regional highways within the study area, including interstate, US, and state routes; only those county routes are included that experience congestion (i.e., roadway volume-to-capacity ratio in excess of 1.0)[1]. Technical Memo 1A prepared for this study provides more detailed tables of roadway characteristics[2] for these roadways (specifically, number of lanes, functional classification, speed limit, median type, average daily traffic (ADT) volumes, and locations of congested roadways by county). The major roadways within the study area include the following:

- Interstate 80 is an east/west rural/urban interstate highway that extends from Morris County to the east, through the southernmost end of Sussex County, to the New Jersey/Pennsylvania state line in Warren County to the west within the study area. In Morris County, I-80 primarily provides four travel lanes per direction. This eight-lane interstate narrows to six lanes in Sussex County, and then to four lanes in Warren County. Similarly, average daily traffic volumes range from a high of 159,100 vehicles in Morris County to 43,100 vehicles in Warren County. I-80 operates at or above capacity along most of its length through Morris County during the AM peak period[3].
- Interstate 280 is an east/west urban interstate highway that has a short three-mile segment east of I-80 in the study area, within Morris County. The interstate provides two travel lanes per direction, has an ADT of 59,000 vehicles, and operates at or above capacity along most of its length through Morris County during the AM peak period.
- Interstate 287 is a north/south urban interstate highway that serves Morris and Passaic counties within the study area. The interstate provides up to five travel lanes per direction within Morris County and three travel lanes per direction within Passaic County. ADT ranges from a high of 176,000 vehicles in Morris County to 87,200 in Passaic County. I-287 operates overcapacity in the vicinity of the I-80 interchange and operates at congestion conditions (i.e., volume-to-capacity [v/c] ratio between 0.5 and 1.0) along the remainder of its length through the study area during the AM peak period.
- US Route 46 is an east/west urban arterial within Morris County that becomes a rural minor arterial within Warren County within the study area. The roadway provides up to three travel lanes per direction within Morris County and narrows to a two-lane roadway in Warren County. ADT ranges from a high of 50,000 vehicles in Morris County to 4,100 in Warren County. US 46 operates overcapacity in the vicinity of the I-80 interchange and operates at congested conditions along the remainder of its length through the study area during the AM peak period.
- US Route 202 is a north/south urban arterial roadway that parallels I-287 for most of its length through the Morris County study area. US 202 provides up to three travel lanes per direction and its ADT ranges from 4,200 to 26,600 vehicles. US 202 operates overcapacity in the vicinity of I-80 and within Morristown, and operates at congested conditions along the remainder of its length through the study area during the AM peak period.

[1] Volume and capacity data were for the AM peak period were taken from the North Jersey Regional Transportation Model (NJRTM).
[2] Roadway characteristics and ADT were obtained from the NJDOT Straight Line Diagrams.
[3] Only AM peak period v/c ratios are available from the 2006 NJRTM.

- US Route 206 is a north/south principal arterial roadway through Morris and Sussex counties within the study area. The arterial provides up to three travel lanes per direction and its ADT ranges between 6,200 and 29,300 vehicles. US 206 operates above capacity in the vicinity of the I-80 interchange, within Branchville to the north, and in Mount Olive to the south. The remainder of US 206 through the study area operates at congested conditions during the AM peak period.
- NJ Route 10 is an east/west urban principal arterial roadway through Morris County within the study area. The arterial provides two to four travel lanes per direction and its ADT ranges between 31,800 and 60,800 vehicles. Most of NJ 10 operates overcapacity and the remainder of the roadway through the study area operates at congested conditions during the AM peak period.
- NJ Route 15 is predominantly a north/south principal arterial roadway that extends from US 46 in Morris County to US 206 in Sussex County within the study area. NJ 15 is characterized as an urban freeway/expressway for a three-mile segment within Jefferson Township in Morris County. Overall, NJ 15 provides one to three travel lanes per direction and its ADT ranges between 17,900 and 58,600 vehicles. Similar to NJ 10, most of NJ 15 operates overcapacity and the remainder of the roadway through the study area operates at congested conditions during the AM peak period.
- NJ Route 23 is a north/south principal arterial roadway that straddles the Passaic/Morris County border through the study area and extends through Sussex County to the New York State line. NJ 23 provides one to three travel lanes per direction and its ADT ranges between 2,400 and 91,300 vehicles. Nearly the entire length of NJ 23 through Morris and Passaic counties operates overcapacity and continues to operate overcapacity for the first ten miles into Sussex County during the AM peak period.
- NJ Route 24 is a ten-mile long east/west urban freeway/expressway that extends from I-287 to I-78 within Morris County. NJ 24 generally provides two travel lanes per direction and has an ADT of approximately 84,000 vehicles within the study area. The entire six-mile length of NJ 24 through Morris County operates overcapacity during the AM peak period.
- NJ Route 53 is a 4.5-mile long north/south urban principal arterial that extends from US 202 to I-80 within Morris County. NJ 53 provides one to two travel lanes per direction and has an ADT of approximately 15.800 vehicles. A portion of NJ 53 within Mount Tabor operates overcapacity and the remainder of the roadway operates at congested conditions during the AM peak period.
- NJ Route 94 is a north/south minor arterial that extends from US 46 to the New York State line in Sussex County. NJ 94 provides one to two travel lanes per direction and has an ADT ranging between 5,100 and 13,800 vehicles. Most of NJ 94 within Sussex County operates at congested conditions during the AM peak period.
- NJ Route 124 is an east/west urban arterial that extends from US 202 to the west to the Union County border on the east. NJ 124 provides one to two travel lanes per direction and has an ADT ranging between 12,300 and 21,600 vehicles. All of NJ 124 within the study area operates overcapacity during the AM peak period.
- NJ Route 181 is a 7.5-mile long north/south urban collector/minor arterial that parallels NJ 15 to the south in Morris and Sussex counties. NJ 181 provides one to two travel lanes per direction and has an ADT ranging between 6,400 and 14,900 vehicles. Nearly all of NJ 181 within the study area operates at congested conditions during the AM peak period.
- NJ Route 182 is a one-mile long north/south urban principal arterial that extends between NJ 57 and US 46 in Warren County. NJ 182 provides one travel lane per direction and has an ADT of

25,400 vehicles. All of NJ 182 within the study area operates overcapacity or at congested conditions during the AM peak period.

- NJ Route 183 is a two-mile long north/south urban principal arterial that extends between US 206, just north of I-80 in Morris and Sussex counties. NJ 183 provides one travel lane per direction and has an ADT ranging between 11,800 and 17,200 vehicles. All of NJ 183 within the study area operates overcapacity or at congested conditions during the AM peak period.
- County Route 510 is an east/west principal/minor arterial that extends from County Route 513 in Morris County to the west to the Essex County boundary to the east. Route 510 provides one to three travel lanes per direction and has an ADT ranging between 13,400 and 28,000 vehicles. Route 510 splits to become a one-way pair of westbound Lafayette Avenue and eastbound Morris Avenue within Morristown. All of Route 510 within the study area operates overcapacity or at congested conditions during the AM peak period.
- County Route 511A is a north/south principal/minor arterial that extends from US 202 to the south to the I-287 interchange near the Morris and Passaic County border. Route 511A provides one to two travel lanes per direction and all of its length within the study area operates overcapacity or at congested conditions during the AM peak period.
- County Route 515 is a north/south minor arterial/major collector roadway that extends between NJ 23 and NJ 94 in Sussex County. Route 515 provides one to two travel lanes per direction and has an ADT ranging between 1,000 and 23,000 vehicles.
- County Route 517 is a north/south minor arterial/major collector roadway that extends from Hackettstown in Warren County to the New York State line in Sussex County in the study area. Route 517 provides one to two travel lanes per direction and has an ADT ranging between 3,000 and 23,000 vehicles. Several sections of Route 517 within the study area operate overcapacity or at congested conditions during the AM peak period.
- County Route 521 is a north/south major collector that extends between Hope and Montague Townships in Warren County. Route 521 provides one travel lane per direction and has an ADT ranging between 3,400 and 8,400 vehicles. All of Route 521 within the study area operates overcapacity or at congested conditions during the AM peak period.
- County Route 617 (also known as Sussex Turnpike) is an east/west minor arterial that extends from NJ 10 and US 202 within Morris County. Route 617 provides one travel lane per direction and most of the route operates overcapacity or at congested conditions during the AM peak period.

2.3.2. Future Road Improvements

The following current and future roadway candidate projects have been identified through the metropolitan planning process in Northern New Jersey from *Plan 2035: The Regional Transportation Plan for Northern New Jersey*. Only projects located within the study area are included. The study area as includes all of Sussex County, the northern portion of Warren County from the I-80 corridor to the north, the northwest section of Passaic County west of the I-287 corridor, and most of Morris County north of Morristown, including the NJ 10 and I-80 corridors.

Proposed roadway improvement projects that appear in the *Conformity Determination on 2009 RTP and FY 2010-2013 TIP Final Project List* within the study area are listed below:

Interstate 80

- Route 80--Parsippany-Troy Hills Roadway Improvement Mile Posts: Route 80: 41.50 - 45.60; Route 287: 41.50 - 41.80
  The I-80 pavement will be reconstructed and the bridge decks for the I-80 eastbound structures over I-287 northbound and Smith Road will be replaced. An additional lane will be added to Ramp G (connecting I-80 eastbound with I-287 southbound) and the weaving distance between Ramp G and Ramp L (connecting the Littleton Road frontage road to I-80 eastbound) will be increased. A new ramp will be constructed to provide access from I-80 eastbound to Littleton Road eastbound. Ramp B at South Beverwyck Road will be widened to provide a right-turn lane. The slip ramp from I-80 eastbound to the eastbound local lanes will be relocated to the east in order to provide a longer weaving distance from Ramp I (connecting I-287 southbound to I-80 eastbound). Ramp J (connecting I-287 southbound to I-80 westbound) will be reconstructed. The bridge decks for the I-80 westbound structures over I-287 northbound and Smith Road will be replaced.
- Route 80, 15—Interchange Mile Posts: 33.80 - 34.15
  A project underway will recommend improvements to address congestion and safety-related problems due to missing movements relative to the interchange. Missing are links permitting movements from eastbound I-80 to Route 15 southbound and northbound, and from Route 15 northbound to I-80 westbound.

Interstate 287

- Route 287, 78--I-287/202/206 Interchange Improvements Mile Posts: Rt. 287: 20.9-22.4
  This project involves interstate interchange improvements at the I-78 and I-287 Interchange and at the Ramps from I-287 to the Route 202/206 interchange. The improvements will include widening of the I-287 SB Ramp to I-78 WB from one to two lanes and associated merging modifications with mainline I-78 WB and I-287 NB to I-78 WB Ramp. In addition the I-78 EB to I-287 NB Ramp will be shifted from a left-lane entrance onto I-287 NB to a right-lane entrance onto I-287 NB. This modification will eliminate the five-lane weave required for vehicles traveling on I-78 EB who use I-287 NB to access Route 202/206 (Pluckemin). Finally, the project will modify the interchange at Route 202/206 and I-287 by introducing a new ramp from 202/206 NB to I-287 SB requiring the shift in the I-287 SB to 202/206 NB & SB Ramp.

US Route 46

- Route 46--Route 46 & Industrial Ave
  This project proposes additional lanes/receiving lanes for turning movements.
- Route 46--Beaver Brook Bridge Replacement (WB) Mile Posts: 7.26
  This project will replace the entirety of the Route 46 WB structure over Beaver Brook in White Township, Warren County. In addition to replacing the superstructure with a multi-beam system, improvements will include driving new piles, repairing the abutment seats and replacing the existing bearings.
- Route 46--Hollywood Avenue Mile Posts: 53.90
  Route 46 at Hollywood Avenue has inadequate acceleration and deceleration lanes. The interchange ramps are undivided for the opposing traffic. These conditions create a safety problem for motorists. Standard acceleration and deceleration lanes will be provided along Route 46 east and west bound, the ramps with Hollywood Avenue will be signalized, Hollywood Avenue will be widened to provide a left-turn lane northbound, and the ramps will be widened to provide physical separation of traffic.
- Route 46--Passaic Avenue to Willowbrook Mall Mile Posts: 54.96 - 55.56

Route 46 will be widened between Passaic Avenue and Willowbrook Mall, from four lanes to six lanes using the existing shoulders as an additional travel lane. New shoulders will be constructed adjacent to the current shoulders; however, no right of way acquisition will be required. No widening will take place on the bridge structure; however, the existing shoulders will be used as an additional travel lane. This will include deck repair, repairs to the abutments, sidewalk and bridge railing. The bridge deck will be restriped to accommodate three traffic lanes. Four sign structures will also be constructed.

US Route 202

- Route 202, 202--Route 202, First Avenue Intersection Improvements Mile Posts: 23.90
  This study will improve the intersection to improve operation and reduce congestion.
- Route 202/206, 22--North Thomson Street to Commons Way, Operational and Safety Improvements Mile Posts: Rt. 202/206: 23.90-25.88; Rt. 22: 33.88
  This study will provide operational and safety improvements to the Route 202/206/22 Interchange complex from North Thomson Street to Commons Way. The improvements will focus on reducing the congestion and weaving problems that occur in the vicinity of Route 202/206 and Route 22 interchange.
- Route 202, 206--Local Improvements Mile Posts: 29.10 - 30.30
  This project provides for operational improvements along Route 202/206 from the vicinity of I-78 to I-287. Signal modifications, lane modifications; new local road around the historic Pluckemin District will improve the efficiency of the Washington Valley Road and Route 202/206 intersection.

US Route 206

- Route 206, 287--Route 206, Southbound Merge Improvements with I-287 Ramp Mile Posts: 24.14
  This study will provide operational and safety improvements to the substandard merge of Rt. 206 SB and the ramp from I-287 SB.
- Route 206, CR 514--Bypass, Contract A, Hillsborough Road to Amwell Road (CR 514) Mile Posts: 63.98 - 65.42
  This project is a breakout of the Route 206 Bypass project (DB#779). Contract A will provide for the construction of a segment of Route 206 on new alignment, bypassing a segment of existing highway that has serious congestion and safety problems. The new segment of roadway will consist of two 12-foot travel lanes, two 10-foot outside shoulders, two 3-foot inside shoulders, a 15-foot grass median and two 15-feet outside borders. Four new bridges will be constructed: Route 206 Bypass over Homestead Road; Route 206 Bypass over CSX Railroad; Route 206 over Royces Brook; and Amwell Road (CR 514) over Route 206 Bypass.
- Route 206--CSX Bridge Replacement Mile Posts: 62.3 - 62.9
  This project provides for the replacement of the existing 85-foot, single-span bridge with a new 138-foot, single-span structure. The improvements will include a realignment of Route 206 to the west with a roadway section that will provide for one 12-foot travel lane, 10-foot shoulder, and sidewalk in each direction. A new "T" intersection with traffic signal will be constructed for the relocated intersection of Route 206 and CR 601. The improvements will upgrade Route 206 and the adjacent roadways to improve their operational characteristics and safety throughout the project limits. The existing bridge will be open to traffic until the construction of the new structure is completed. This project will be bicycle/pedestrian compatible with shoulders and sidewalks provided on both sides of the roadway as well as crosswalks.

- Route 206--Crusers Brook Bridge (41) Mile Posts: 61.80
  This project will provide for the replacement of the existing structure which is in poor condition due to the condition of the superstructure and inadequate deck geometry. The structure will be widened from 30 feet to 44 feet to include full 10-foot shoulders instead of the current 3-foot shoulders. The piers and abutments will be founded on piles. The piers will be wide enough to accommodate a separate pedestrian walkway on the west side of the bridge.
- Route 206--Cherry Valley Road Intersection Improvements Mile Posts: 57.23
  This project will address proposed intersection improvements. It is reported that this intersection is heavily congested which is complicated by the configuration of the intersection.

NJ Route 10

- Route 10--Jefferson Road Mile Posts: 13.28
  This project will improve traffic flow and safety at the Rt. 10 & Jefferson Road intersection by extending the Rt. 10 EB auxiliary lane from the I-287 exit ramp further to the east of the existing jug handle. An auxiliary lane will be constructed on the South Jefferson Road approach to the intersection.
- Route 10, 53--Route 10/53 Interchange (2L 3J) Mile Posts: 10.40 - 10.90
  The existing ramps from Route 10 to Route 53 will be removed. Route 53 will have two new signals located at the ramps from Route 10, with 12-foot left-turn lanes at the signals. Route 53 will also have one 12-foot lane in each direction, with full 10-foot shoulders in both directions. In areas under the Route 10 structure, 15-foot bicycle compatible lanes will be provided.
- Route 10--Commerce Boulevard Improvements Mile Posts: 0.10 - 0.91
  Intersection improvements at Route 10 and Commerce Boulevard will include a relocated jug handle and traffic signal installation, operational and safety improvements.
- Route 10, 202--NJ 53 to Johnson Road, Operational Improvements Mile Posts: 10.66 - 11.67
  This is an operational improvement project to alleviate the congestion problem during the morning peak hour, especially on Route 10 EB. Widen Route 10 EB to three lanes from westerly terminus to the existing three lane section. Rebuild the southwest jug handle and build the Johnson Rd. connector ramp in lieu of the current forward jug handle from Route 10 EB to Route 202 NB. Widen Route 202 to provide additional through lanes.

NJ Route 15

- Route 15--Bridge over Beaver Run
  Bridge superstructure replacement and scour countermeasures for Structure # 1922-150.

NJ Route 23

- Route 23--Bridge over Pequannock River / Hamburg Turnpike
  The bridge is functionally obsolete with sufficiency rating of 49.1. Based on the latest inspection report condition of superstructure and substructure is listed as in fair condition. Also, the bridge is scour critical. Currently, the bridge is listed as Priority 3 in the ranking of Bridge Management System. The bridge needs major rehabilitation/replacement including improvements to substandard geometric features to address its marginal structural condition and functional obsolescence.

- Route 23--Sussex Borough Realignment & Papakating Creek Bridge Mile Posts: 38.98 - 40.18
  This project includes the construction of a new roadway that will connect the intersection of Lower Unionville Road and existing Route 23, utilizing existing Walling Avenue and improve the

intersection of Walling Avenue and Loomis Avenue and transition into the intersection of Bank Street and Newton Avenue. The roadway will be one 12-foot travel lane and one 10-foot shoulder in each direction. A far-side loop ramp will be constructed to provide local access to the shopping center and old Route 23 (Hamburg Avenue). The project will also include the replacement of the structure over Papakating Creek and roadway improvements along Route 23 south of Old Deckertown Road (MP 38.9) to improve vertical and horizontal geometry. This project is designed to be bicycle/pedestrian compatible.

- Route 23, 80--Long-term Interchange Improvements Mile Posts: 23: 5.1-5.7; 80: 52.8-53.75
  The proposed long-term improvements may involve a major construction project that addresses existing weekday and weekend congestion problems and provides for a critical missing link in the highway network. While the NJDOT's Interchange Study recommended several concepts for long-term improvements, the Routes 23/46/80 Task Force could not, based on the preliminary nature of such concepts, determine one concept to endorse. The Routes 23/46/80 Task Force agreed that the NJDOT should further develop four concepts to determine the most viable alternative to meet the needs of the interchange.

- Route 23--Hardyston Twp., Silver Grove Road to Holland Mountain Road Mile Posts: 26.80 - 31.80
  Safety, operational and drainage improvements are planned within three sections of Rt. 23 in Hardyston Township, Sussex County. The sections are: "Northern/Laceytown Road", extending from milepost 30.6 to 31.2; "Holland Mountain Road section", in the vicinity of the Holland Mountain Road intersection Improvements in the vicinity of milepost 30.9 will include the addition of shoulders as well as improving the horizontal alignment by straightening the reverse curves. In the vicinity of Lake Shore Road, improvements will include a two-way, left-turn lane and shoulder in each direction, with left-turn slots for turning movements to Lake Shore Road. At the request of the Township the left-turn lane will be extended to East Shore Trail. In the vicinity of Holland Mountain Road, Snufftown Road will be realigned to form a four-way, signalized intersection with Route 23 and Holland Mountain Road. The alignment will be upgraded to provide shoulder and adequate vertical sight distance and a left-turn slot will be provided for access to Holland Mountain Road and Snufftown Road as well as a two-way, left-turn lane. The Pacock Brook culvert will also be replaced. This project will be bicycle/pedestrian compatible.

NJ Route 183

- Route 183, 46--NJ TRANSIT Bridge/Netcong Circle Mile Posts: Rt. 183: 0.37 - 0.69; Rt. 46: 30.20 - 30.57
  The project will replace the existing bridge carrying Route 183 traffic over the NJ TRANSIT Morristown rail line. The new bridge will provide one lane northbound and two lanes southbound with shoulders and sidewalks adjacent to both directions of traffic. A new at-grade signalized intersection of Routes 46 and 183 will be constructed primarily within the land currently occupied by the existing Netcong Traffic Circle, which will be removed.

County Route 510 (Columbia Turnpike)

- Route CR 510--South Orange Avenue traffic, operational and roadway improvements Mile Posts: 22.10 - 23.52
  The project encompasses 1.6 miles of South Orange Avenue from Brookside Drive/Cherry Lane to Harding Drive. This section of roadway has many safety concerns associated with it. South Orange

Avenue is a four-lane highway (two lanes in each direction) separated by a concrete barrier with no existing shoulders. The roadway contains many sharp horizontal curves which are compounded by the presence of reverse super-elevation. Substandard placement of drainage structures, steep vertical grades, and substandard vertical curve lengths also exacerbate the safety problems. The county will investigate remedies for these problems as well as investigate the rehabilitation of an existing equine/pedestrian bridge which crosses South Orange Avenue and provides linkage to the South Mountain Reservation and existing bicycle pathways.

County Route 515

- Route CR 515--County Route 515, Vernon Township, Phases II, III, IV Mile Posts: 6.00 - 8.00
  The County will be making safety improvements to CR 515 in Vernon Township from State Highway 94 to CR 638. Proposed improvements include the addition of a 10-foot wide southbound shoulder to be utilized by slow moving traffic, the addition of 6-foot wide shoulder on the northbound side, an emergency escape ramp, modifications to the exiting roadway alignment, improving drainage, and modifications to the existing traffic signage.

County Route 517

- Route CR 517--County Route 517, Route 23 to Route 94 Mile Posts: 42.54 - 46.45
  This section of road has severe vertical and horizontal geometry. The roadway connects two main arteries in Sussex County and carries traffic to recreational facilities in the Crystal Springs complex in Hardyston Township and has frontage on and connects directly to the Mountain Creek Recreational Area in Vernon Township. The County is concerned with the ability of the roadway to carry the anticipated increased volumes of traffic to and from the identified recreational areas as well as the safety of those traveling this route.

2.3.3. Existing Commuter Rail System

NJTRANSIT operates two commuter rail lines in the study area, the Morristown Line and the Montclair-Boonton Line. Both are focused on serving trips to Newark and New York City-Penn Station. However, many locations within New Jersey are also served, and fares are based on distance travel within a zone system. The two lines serve different alignments between Denville and Newark Broad Street. Less frequent service is provided west of Dover.

The Montclair-Boonton Line serves the Wayne/Route 23 Transit Center and continues west to Boonton, Dover, Netcong and Hackettstown. Service within the study area is limited to peak hours and directions only, with most service having its western terminus at Montclair State University. Weekend service started in the fall of 2009 but terminates even farther east at Bay Street in Montclair. Passenger surveys completed in 2005 (prior to the opening of Wayne/Route 23 Transit Center) show that only 16 percent of trips on the Montclair-Boonton Line originated within the study area.

The Morristown Line provides daily service through Essex County and into Madison, Morristown, Denville, Dover, Netcong and Hackettstown. Off-peak service is generally hourly including on weekends. According to the 2005 passenger survey, 70 percent of trips are made in the peak hour and direction. Stations within the study area account for almost one-third of ridership on the Morristown Line.

2.3.4. Planned Commuter Rail Expansion

NJTRANSIT is planning to construct and begin service on the Lackawanna Cutoff, which will extend Montclair-Boonton Line rail service to Andover and Blairstown and into northeastern Pennsylvania. Initial

service will include nine round-trips between Scranton, Pennsylvania and Hoboken, with a connection available at Dover to "Midtown Direct" service. The Federal Transit Administration issued a revised Finding of No Significant Impact for this project in October 2009.

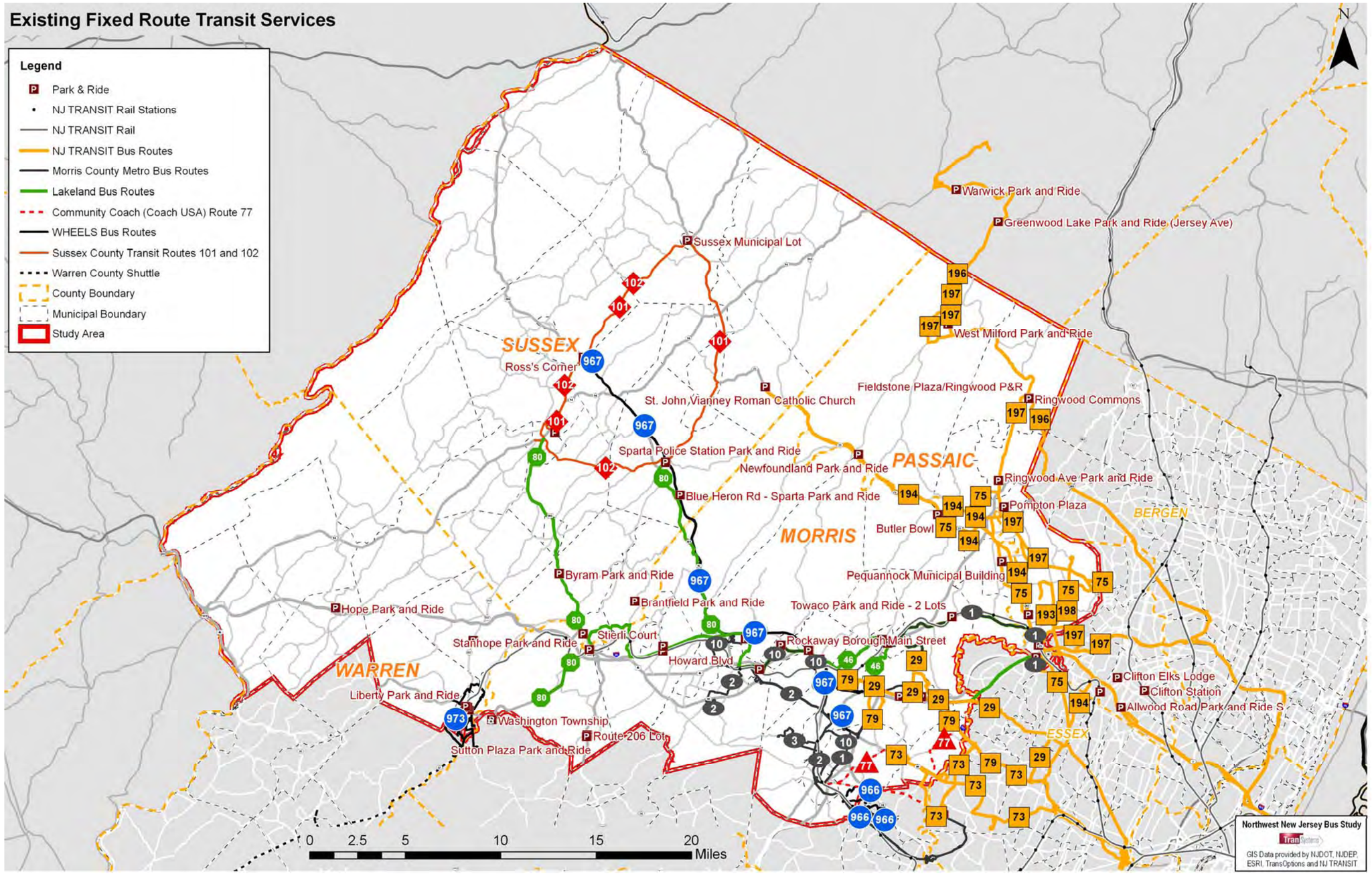
The planned Mass Transit Tunnel will double track capacity under the Hudson River, providing opportunities for increased service and more "Midtown Direct" trains. In addition to a new two-track tunnel, Pennsylvania Station in Manhattan will be expanded underneath the existing station in order to provide capacity for additional service.

Just to the east of the study area, NJ TRANSIT has proposed the construction of the "Bergen-Passaic Rail Link," a connection between the Main Line in Hawthorne and several new stations in Paterson, Elmwood Park, and Hackensack. This project will reintroduce passenger service on the New York, Susquehanna and Western Railway. Plans call for service to run from Hawthorne in Passaic County through Paterson to Hackensack in Bergen County using newly built, FRA-compliant diesel multiple unit rail cars. The line would use existing active freight right-of-way. New Jersey Transit has agreed to pay New York, Susquehanna and Western Railway for a 75-year easement that will allow passenger service on the freight railroad. Construction will take approximately three years.

2.4 Bus and Shuttle Services

Bus service in the study area is provided by a mix of public and private carriers. NJTRANSIT operates local and express bus service in Passaic County, extending to the southeast including Newark and New York City. Morris County Metro local bus service is funded by Morris County and NJTRANSIT and operated under contract by PABCO. Three private operators, Lakeland Bus Lines, Martz Trailways and Coach USA operate express service between the study area and New York City, with Lakeland also serving local trips within New Jersey. NJ TRANSIT operates several routes that serve either the Willowbrook Mall or the Wayne Transit Center (both in Wayne, Passaic County) before operating express to New York City. These routes originate in the easternmost part of Sussex County, upper Passaic County, or northern Morris County. Lakeland Bus Lines provides service from Morris County and southern Sussex County. Coach USA operates a single Community Coach route in the study area originating in Morristown, passing through East Hanover and Whippany in Morris County, and continuing through Essex County before operating express to New York City. Finally, Martz Trailways offers New York City service from a single park-and-ride lot in Allamuchy (Warren County). Within the study area there are also two Wheels shuttle routes (966 and 967) and one Wheels community circulator (973), which are funded by NJTRANSIT and operated under contract by First Student. Other county- and town-provided community circulators and shuttles operate in various locations throughout the study area (these include Sussex County Transit, Morris on the Move, Warren County 57B, Morristown Colonial Coach, West Milford Township Bus, and Parsippany Free Transit). The operations of all of these routes are described in some detail in the following section. A map of existing routes in the Northwest New Jersey Study Area is shown in Figure 2-11.

Figure 2-11: Existing Fixed Route Transit Services



As part of the current study, an on-board passenger survey and a manual count of riders ("ride checks") were conducted for most of the routes in the study area. These data are used in the route descriptions in the following sections. A full description of the results is contained in Appendix B (Passenger Survey) and Appendix C (Ride Checks).

2.4.1. Sussex – Passaic Corridors

Interstate Routes

NJ TRANSIT offers several interstate commuter routes to Port Authority Bus Terminal from the Willowbrook Mall or the Wayne/23 Transit Center, both in Wayne. These routes all have numbers in the 190s, except that the express service from the Wayne Transit Center to PABT is NJT 324. A map of these routes in Wayne, Pequannock, Butler, Pompton Lakes and vicinity is shown in Figure 2-12. These are the NJ TRANSIT New York City routes considered in this study:

NJT 191 and NJT 195 terminate at the Willowbrook Mall and make local stops between Willowbrook and New York City. Except for the stop at Willowbrook, they do not serve the study area and are therefore not discussed further.

NJT 193 Packanack Lake – Willowbrook – New York
The short version of NJT 193 provides express service from Willowbrook to PABT. The long version serves the Packanack Lake neighborhood of Wayne, in the peak periods only, in addition to serving Willowbrook. Most of the 1,636 boardings[4] on this route are on the "short" route from Willowbrook to New York; only a few trips serve the residential areas between Packanack Lake and Willowbrook. There were no intrastate trips recorded on this route in the passenger survey. At one time local service to Packanack Lake was more frequent, but it has been cut as park-and-ride service has increased.

NJT 194 Newfoundland – New York
NJT 194 operates in the NJ 23 corridor and has various longer and shorter variants. There is peak period only express service from Stockholm (Hardyston) in eastern Sussex County. All day service is offered from Newfoundland (West Milford, Passaic County) and Butler (northern Morris County) to Pequannock and Wayne (including the Wayne/23 Transit Center) and New York City. The route includes the following variants:

- Peak-period only express service between the Stockholm Park-and-Ride (Hardyston Township, Sussex County) and PABT stopping in Newfoundland (West Milford Park-and-Ride), Kinnelon Park-and-Ride), and Butler (Meadetown Shopping Center).
- Peak-period only express from Newfoundland (West Milford) to Mountainview (Wayne) omitting stops at Wayne/ Route 23 and Willowbrook park-and-rides.
- All-day service from Newfoundland to Butler on NJ 23, and then Paterson-Hamburg Turnpike and Newark-Pompton Turnpike from Butler to Wayne Transit Center via Riverdale and Pequannock. Most off-peak trips also serve Pompton Lakes.

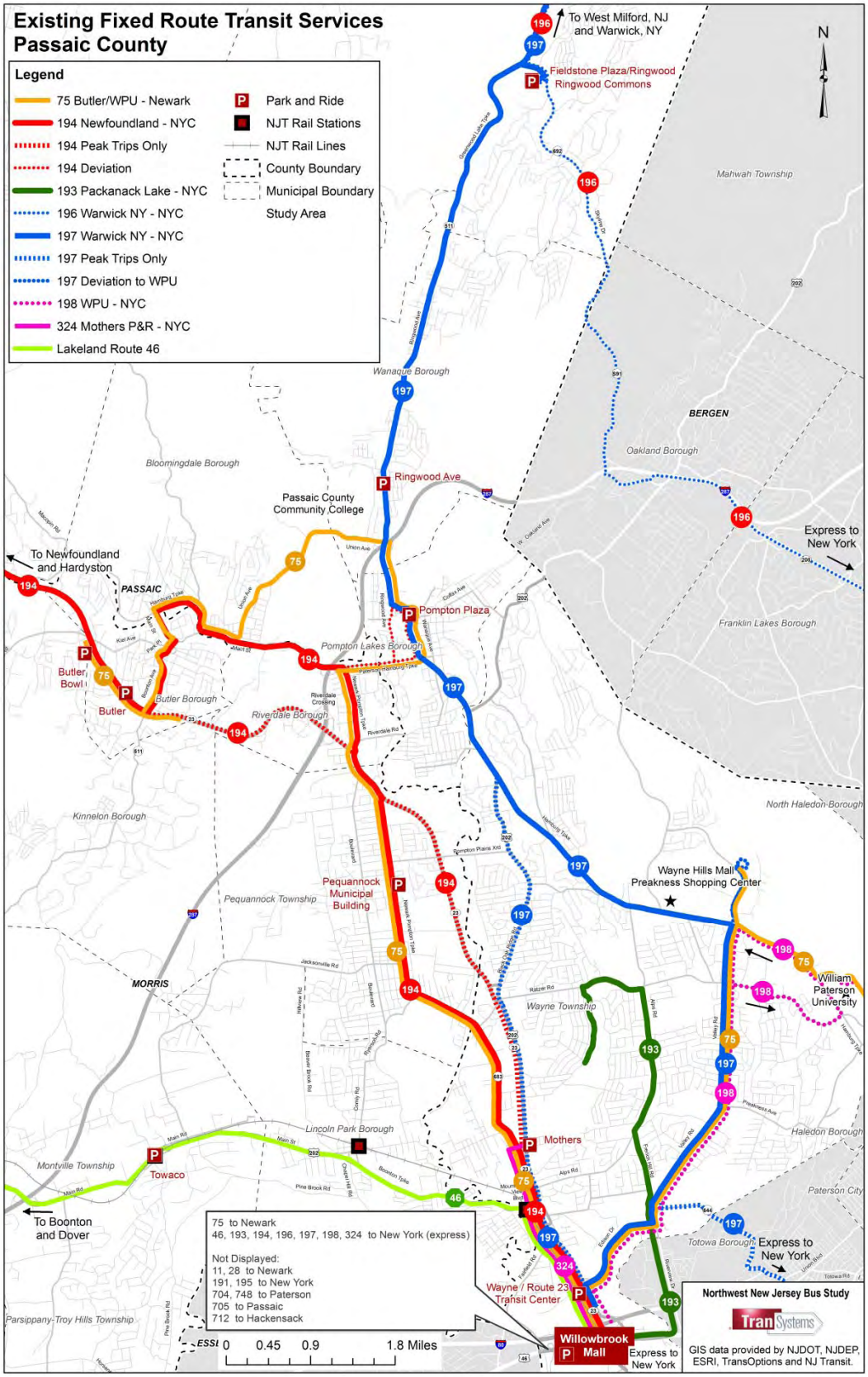
NJT 194 has a total of 1,913 daily boardings, 20% of which are intrastate trips.

[4]This and all subsequent ridership figures are estimates from the boarding counts conducted as part of this study in Spring 2008. Route 46/80, which is an extended version of the 46, has 1,040 boardings.

NJT 196 Warwick – New York (express)

NJT 196 provides peak-only service to the northernmost part of the NJT 197 route (Warwick, West Milford, and Ringwood), skipping the rest of the route and going express to New York City. This is a peak-hour express version of the NJT 197. Inbound trips originate in Warwick, NY, serve West Milford and Ringwood, and operate express to New York. Trips operate as frequently as every 8 minutes, but only for a short peak span. There were a total of 996 daily boardings, none of which were intrastate trips.

Figure 2-12: Existing Fixed Route Transit Services, Passaic County



NJT 197 Warwick – Willowbrook – New York

The long version of NJT 197 originates in Warwick, NY and heads south and east to West Milford, Ringwood, Wanaque, Pompton Lakes, and Wayne. After serving the Willowbrook Mall it continues express to New York City. A shorter version provides more frequent service from Pompton Lakes and Wayne. This heavily used route (2,227 daily boardings) has several major and minor variants. The base route from Pompton Lakes to Willowbrook via Hamburg Turnpike in Wayne serves many local trips, 20% of the total route boardings. A deviation to the William Paterson University business campus (Valley Road Facility) was eliminated in 2009 due to very low ridership, a decision which matches the results of the ride checks conducted as part of this study.

NJT 198 William Paterson University – Willowbrook – New York

NJT 198 was introduced in January 2008 to provide direct service from William Paterson University in Wayne to PABT via Willowbrook. This direct service from William Paterson University (WPU) to New York started in January 2008. Most of the 297 daily boardings are at the Willowbrook Mall Park-and-Ride, and 7% of the trips are intrastate.

NJT 324 Mothers Park & Ride/Wayne Route 23 Transit Center to NYC (express)

Route 324 is an express service from the Wayne Transit Center to PABT that started when the Wayne Transit Center opened in January 2008. The spring 2008 ridechecks found 1,883 daily boardings during the week, but weekend service was very lightly used. Later in 2008 weekend frequency was reduced from every 30 minutes to every 40 minutes at most times. As previously discussed, NJT 324 was moved in April 2009 to a separate platform than NJT 194 in the PM peak period in order to prevent overcrowding of NJT 194 trips at that time.

Local Routes

NJT 75 Newark – Butler/William Paterson University

NJT 75 operates express from Willowbrook to Newark. North of Willowbrook it has two branches, one to William Patterson University (WPU) and one to Butler. Each branch is served only twice per peak period. The spring 2008 ridechecks found 185 daily boardings.

NJT 748 Paterson – Wayne – Pompton Lakes/Willowbrook

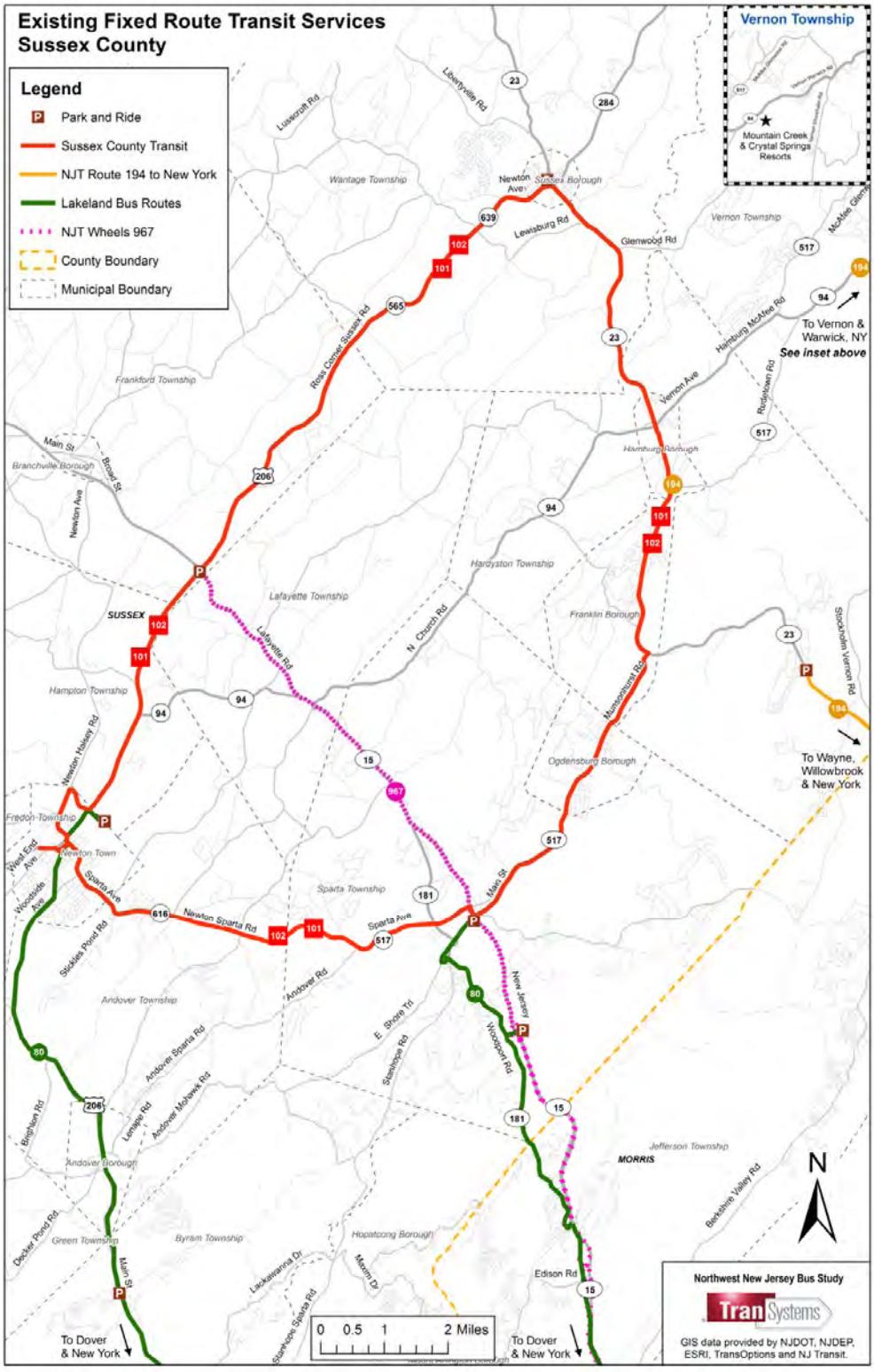
Much of this route provides local service in Wayne, which is in the study area, but it originates in Paterson, which is outside the study area. It was not included in the NWNJ study passenger survey or rider count, and no ridership statistics for the route were available. However, data are being collected as part of the Bergen-Passaic Bus Study beginning in 2009. One branch serves Pompton Lakes in the peak periods only and another branch serves the Wayne Regional Service Center of the Motor Vehicle Commission on NJ 23 in the off-peak. The Motor Vehicle Commission closed permanently in 2008, reducing demand for this branch of the route.

Sussex County Transit (SCT) 101 & 102

This long loop route provides the only fixed route service for much of Sussex County, serving both work and other trips (see
Figure 2-13). Six trips run in each direction on weekdays, with up to four vehicles operating at a time (three 24-seat Bluebird minibuses and one paratransit van). The service operates between 5:00 AM and 6:30 PM. The loop includes the densest areas in the county and most major retailers. It deviates up to ¾ mile with

advance notice and for an additional $1.00. The current fare of $0.50 is lower than the $1.35 NJ TRANSIT base bus fare, but not much lower than the $0.60 NJ TRANSIT senior fare.

Figure 2-13: Existing Fixed Transit Routes, Sussex County



West Milford Township Bus

This community route offers four daily trips between residential and shopping and other destinations during business (but not commuting) hours within the Township of West Milford. A connection is available to NJT 196/197 to Wayne and New York City. This route was not surveyed or counted as part of this study.

2.4.2. Sussex – Morris Corridors

Interstate Route

Lakeland 80 - Newton & Sparta to New York

This route was previously mentioned under Lakeland 80 service. It offers four AM and four PM peak period, peak direction trips between Newton and New York City and three AM and four PM peak period, peak direction trips between Sparta and New York City. There are additional reverse peak, off-peak and weekend trips, but service is infrequent at these times.

Local Route

Wheels 967 Ross Corner/Sparta to Parsippany

This commuter express route was designed to serve Sussex County residents working in office parks in Parsippany. It was originally intended to use the high-occupancy vehicle "diamond" lanes on I-80, but those lanes have since been converted into general purpose lanes. There are only two trips per day in each direction.

2.4.3. Morris County Corridors

Interstate Routes

Lakeland Bus Lines, a privately owned carrier, operates trips to New York along I-80 and along US 46. Lakeland's routes are shown on the map of existing Morris County routes, Figure 2-14.

Lakeland 46 Dover – New York

Lakeland Bus Lines provides half-hourly local service operating from Dover to the Willowbrook Mall and then express to New York City Port Authority Bus Terminal (PABT). The route is well used with 2,529 boardings per day. Lakeland inbound trips on US 46 start at Lakeland's terminal east of the center of Dover and make local stops on US 46 to the Willowbrook Mall[5], from where it runs express to New York. The main variant serves all of the park-and-ride lots on US 46 every hour. The second major variant deviates to Boonton and back before rejoining US 46 at the Waterview Park-and-Ride in Parsippany. These two variants have a combined headway of 30 minutes. In the peak period there are two trips which leave US 46 for Boonton, continue on US 202 instead of US 46, and rejoin the main route at US 46 near the Willowbrook Mall.

[5] Due to the delay involved going to and from the mall, Lakeland stops on the shoulder of US 46 near the mall, rather than stopping at either the park-and-ride stop or shopper's stop served by other routes. Crossing US 46 to get from the westbound stop to the mall involves either a dangerous dash across US 46 or a very long walk.

Lakeland 80

There are three main branches and two minor variants of the express Lakeland 80 service, which operates in peak hours in the peak direction only. All branches serve the Rockaway Mall just off I-80 and then run non-stop to New York City. There is a combined total of 1,476 daily boardings. During the off-peak, Lakeland trips to or from Sparta and Newton operate on US 46 to Willowbrook and then express to PABT; this "46/80 Local" route had an additional 1,040 boardings in the spring 2008 ridechecks. The specific routes are as follows:

- The Newton branch starts at the Newton park-and-ride and follows US 206, stopping in Andover, Byram, Stanhope and Netcong before entering I-80. It then stops at Mount Arlington Station (formerly known as Howard Boulevard Park-and-Ride) and Rockaway Mall before running express to New York City.
- The Sparta branch starts at the Sparta Police Station Park-and-Ride and travels along NJ 15 to I-80 and the Rockaway Mall before running express to New York City.
- The Budd Lake branch starts (in the inbound direction) in Mount Olive Township and follows US 46 to Netcong. It then travels through Stanhope to Hopatcong and Landing, then entering I-80. It serves the Mount Arlington and Rockaway Mall stops before running express to New York City. Service is offered in the peak period only.
- A fourth variant of the Lakeland 80 serves lower Manhattan (Wall Street) instead of the Port Authority Bus Terminal. It serves only the Mount Arlington, Rockaway Mall, Waterview, Smith Field and Beverwyck Park-and-Ride lots before running express to New York City. The inbound service operates along 9th and 7th Avenues in Manhattan and offers four trips in the AM and PM peak period and direction.
- There are three AM peak inbound trips that make stops in Midtown north and east of the Lincoln Tunnel exit, with the last stop on Madison Ave and 57th Street. There is no outbound service.

Community Coach 77 Morristown – New York

Coach USA operates "Community Coach" service from Morristown via NJ 10 and the Livingston Mall to New York City. Some trips originate in Morristown, some in Whippany, and a few in East Hanover (there are other trips which start outside the study area). There are trips every hour, generally meeting the span guideline of 6 am to 11 pm. Only 10% of the 1,628 inbound boardings on the Community Coach 77 are within the study area.

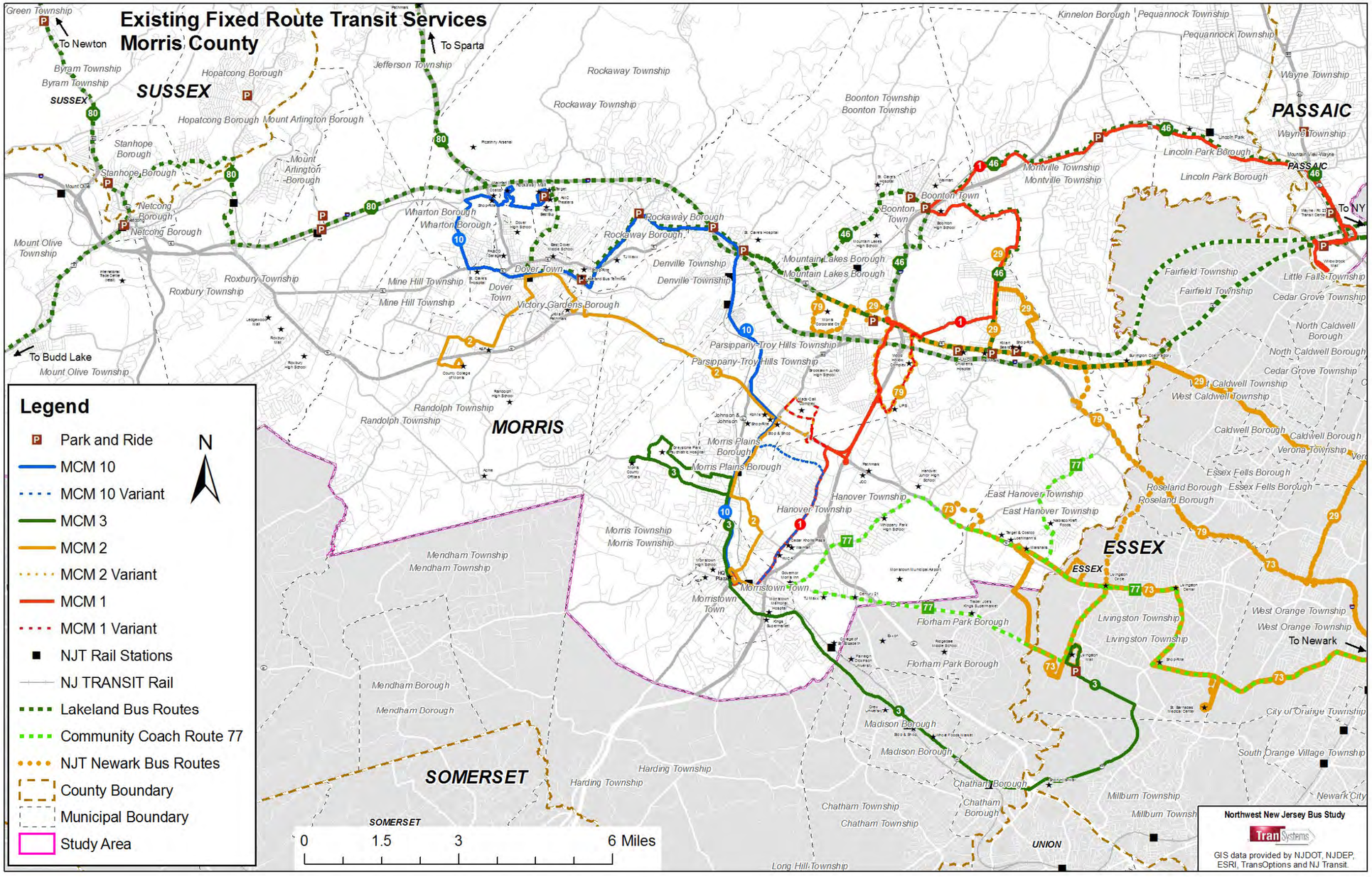
Martz Trailways (eastern Pennsylvania – New York)

Martz Trailways provides daily service from various points in eastern Pennsylvania (Scranton, the Poconos, and other points) to New York City, primarily serving commuting trips but also offering frequent off-peak and weekend service. Until November 2008, a few peak trips stopped in Hackettstown center. Martz continues to offer eight departures from Panther Valley Village Square Mall Park-and-Ride in Allamuchy to New York. This is the only existing transit service between Pennsylvania and the study area, though it is not designed for such a connection.

Rail Station Shuttle Buses

Parsippany and surrounding towns have a high concentration of jobs in office parks, but few of these are easily accessible by transit. The strongest market for transit riders to these office parks consists of 'reverse' commuters coming from New York City, Hoboken, Jersey City, or Newark. This market is typically served by bus shuttles designed to meet specific train arrivals and stopping at the front door of each office building.

Figure 2-14: Existing Fixed Route Transit Services, Morris County



Wheels 966

NJ TRANSIT operates a rail shuttle service from Convent Station consisting of two separate routes: Route 1 has 110 daily boardings and Route 2 has 70 daily boardings.

Until August 2009, TransOptions offered a different route from Convent Station to Giralda Farms with about 58 daily boardings and another from Morris Plains to the Mack-Cali complex with about 88 daily boardings. A revised version of the Giralda Farms route, serving only Maersk, is still in operation.

Local Routes

NJT 73 Newark – Orange – Livingston

NJT 73 provides regular service from Livingston and East Hanover to Newark, mostly along NJ 10 but with numerous fixed route deviations. A limited number of express trips are provided for the peak-hour reverse commute. The route has 2,265 daily boardings, although most of these are outside the study area.

NJT 29 Newark – Parsippany

NJT 29 provides frequent service on Bloomfield Avenue into Newark from as far west as the West Essex Mall in West Caldwell. A few NJT 29 trips extend west of the West Essex Mall to US 46 and the Lake Hiawatha neighborhood of Parsippany during the morning and evening peaks. There are 4,913 daily boardings on NJT 29, but most of these are outside the study area. There is no weekend service on NJT 29 in the study area.

NJT 79 Newark – Parsippany

NJT 79 offers trips outbound from Newark in the morning and inbound to Newark in the evening: it is intended to bring commuters from Newark and its suburbs to jobs in Parsippany. Most of the riders on NJT 79 are going to jobs at the UPS distribution center on Jefferson Road in Parsippany. UPS subsidizes a few trips to serve Sunday work shifts. There is no Saturday service on NJT 79.

MCM 1 Morristown – Parsippany – Boonton – Willowbrook Mall

Morris County Metro (MCM) is the name of local transit service in Morris County funded partly by Morris County and largely by NJ TRANSIT and operated by a contractor, PABCO. See Figure 2-14 for a map showing existing MCM routes. MCM 1 runs north from Morristown to the Morris County Mall (Wal-Mart), Parsippany, Lake Hiawatha, and Boonton, and then on most trips continues on US202 through Towaco and Lincoln Park to the Willowbrook Mall in Wayne.

MCM 2 Morristown – Dover – County College of Morris

MCM 3 was originally part of NJT 73 before it was cut back to the Livingston Mall in the 1970s. MCM 2 connects Morristown with the County College of Morris in Randolph via NJ 10 and Dover. It serves retail locations along NJ 10, including K-Mart on most trips, and provides a faster trip from Morristown to Dover than MCM 10. It has 344 boardings per day.

MCM 3 Livingston Mall – Morristown – Greystone Park Hospital/County Offices

MCM 3 operates inbound to Morristown from the Livingston Mall, heading non-stop to the Short Hills Mall and then following NJ 124 to Headquarters Plaza, Morristown. It continues beyond Headquarters Plaza on US 202 to Morris Plains and then heads west to the Greystone Park Hospital and the Morris County Offices (when the latter are open). There are 359 boardings per day.

MCM 4, 5, and 7 Morristown – Dover – Rockaway Mall – Milton/Jefferson

These routes offer very infrequent service to rural portions of Morris County. The three routes combined are operated with a single bus. The bus provides three morning peak trips and three afternoon peak trips (on route MCM 4). During the midday, the same vehicle provides one round trip (route MCM 5 on Mondays and Wednesdays; route MCM 7 Tuesdays and Fridays, and no midday service on Thursdays). Many parts of routes 4 and 5 are outside the project study area.

MCM 10 Morristown – Dover – Wharton – Rockaway Mall

MCM 10, the most heavily used of the group, originated as a streetcar route. MCM 10 operates between Morristown HQ Plaza and the Rockaway Mall, along the way serving Morris Plains, Mt. Tabor, Denville, Rockaway Borough, Dover, Wharton, and Rockaway Marketplace (Walmart). With 696 daily boardings, this route is by far the most heavily used Morris County Metro route. The service frequency is generally hourly but 45 minutes in the peak.

Morris on the Move

Morris on the Move (MOM) is a van service that operates with one vehicle, predominantly in the peak hours, from Dover west to Mount Olive. It is funded through a federal Job Access and Reverse Commute grant which may not be renewed. As a JARC service it is designed to assist low-income workers, but it is open to all. No fare is charged.

Morristown Colonial Coach

The "Colonial Coach" is a community route provided jointly by the Township of Morris and the Town of Morristown. Service is free, but open only to residents of the two communities. Service operates hourly, Monday through Saturday between 9 AM and 4 PM. There are two routes that serve different parts of the community. Route #76 operates on Monday, Wednesday, and Friday; route #77 operates on Tuesday, Thursday, and Saturday.

Parsippany Free Transit System

Two connecting community routes offer hourly service between residential areas and shopping and civic destinations during business (but not commuting) hours. Buses are coordinated to meet at the Morris Hills Plaza shopping center at the intersection of US 46 at US 202 (Parsippany Blvd).

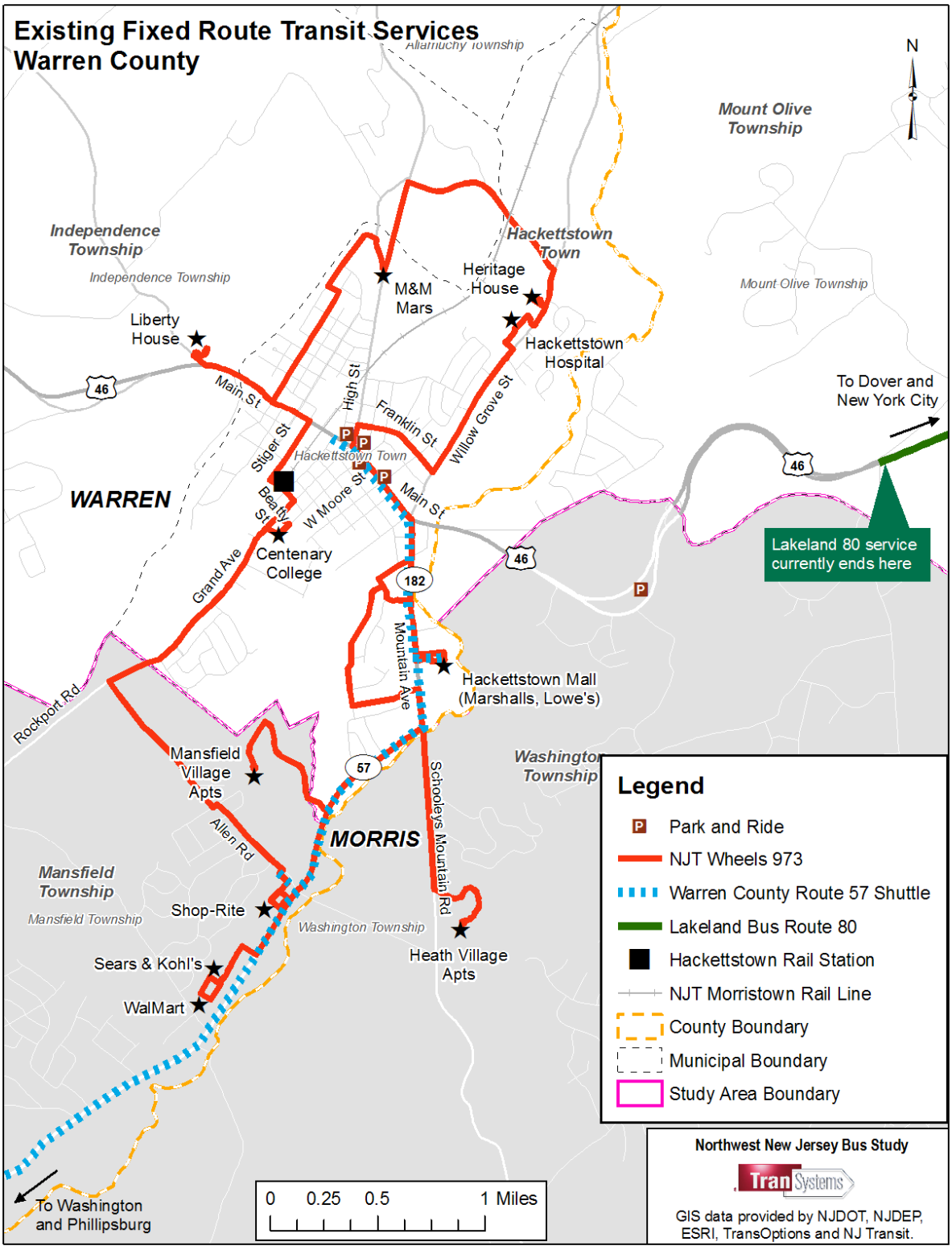
2.4.4. Warren-Morris Corridors

There is currently no bus service between Warren County and Morris County, although the Lakeland 80 Budd Lake branch comes close to Hackettstown in Warren County. Peak-period rail service is offered between Hackettstown and Morris County.

Wheels 973 Hackettstown Circulator

This local circulator serves Hackettstown and has about 86 boardings per day, or about 4 per trip. The route is shown in Figure 2-15. Two buses operate on a loop simultaneously in opposite directions, providing hourly service in each direction from 8 am to 6 pm Monday to Friday. Flex deviations may be requested (up to ¾ of a mile). Some of the route overlaps Warren County Route 57B (which is operated by Warren County). The township of Hackettstown provides additional operating subsidy to NJ TRANSIT sufficient to cap the state portion at 75% of operating costs (in other words, the sum of passenger revenues and town subsidy are at least 25% of the operating costs).

Figure 2-15: Existing Fixed Route Transit Services, Warren County



Warren County Route 57B

This county-operated local route is largely outside the study area, but does connect to Hackettstown, offering hourly service from 8:00 am to 4:30 pm (16 one-way trips per day). A portion of the route is shown in Figure 2-15. The passenger survey and boarding counts conducted for this study did not include this route. There are about 47 riders per day (an average of 3 per trip), according to ridership data supplied by the county.

2.5 Human Services Transportation

There are a variety of transportation options in the study area for seniors and persons with disabilities. In general, such services are not within the scope of this study because they are not open to the general public. In addition to NJTRANSIT's Access Link paratransit service, each county in the study area operates a demand response transportation service for seniors and disabled individuals.

Sussex County

Sussex County Transit operates paratransit service open to senior citizens, veterans, and people with disabilities; the service is also available to members of the general public going to work, school or training. Service is offered Monday to Friday, 5:30 A.M. to 6:30 P.M. No fare is charged, but donations are accepted. The service is available within Sussex County for local errands: nutrition, medical appointments, shopping, hairdresser appointments, banking, community services, education, training, and employment and to destinations outside of Sussex County for non-emergency medical appointments only. Sussex County Transit also operates a fixed-route loop bus service open to the general public; this route is described in the section below on existing bus routes.

Passaic County

The primary transportation service for seniors (older adults) and persons with disabilities in Passaic County is the Para-Transit System, a curb-to-curb service with approximately 2,000 active clients making about 155,000 annual trips. The Para-Transit System is operated by five different entities; four municipal-based providers (cities of Clifton, Passaic, Paterson, and the Township of West Milford), and the County Para-Transit Division which serves the remaining 12 suburban towns. In general, each provider is responsible for transporting eligible clients residing within their respective service area, regardless of the client's ultimate destination.

The Americans with Disabilities Act (ADA) requires complementary services in all areas where there are non-commuter fixed route transit service. NJ Transit provides this statewide service, known as Access Link which consists of curb-to-curb service to all persons who are ADA eligible. Passaic County is part of the Access Link Region 6 service area, along with Bergen and Hudson Counties. Access Link service is available to eligible clients who are making trips that fall within ¾ of a mile on either side of the 22 non-commuter NJ Transit bus routes that operate within or through Passaic County. Persons with disabilities are not automatically eligible to use Access Link service, but must go through an eligibility determination process administered by NJ Transit.

The Township of West Milford – Senior Services transportation program operates curb-to-curb service for eligible individuals from 7:00 am to 4:00 pm on weekdays. Most trips are within the county, but they will transport passengers to destinations as far away as Hackensack. The general principle is that given sufficient advance notice, they will provide service "anywhere within reason." There is no formal eligibility determination process. They accommodate all eligible passengers on a first come – first served "space

available" basis. There is no fare for the service, but there is a suggested donation of $1.00 per trip. The Township of West Milford also operates a modified fixed route bus service on weekdays from approximately 9:00 am to 5:00 pm. The service is open to the general public. The bus will deviate from the fixed route up to ¾ mile upon request; therefore this service meets the ADA requirements and substitutes for Access Link in West Milford. The service is described in more detail in the section below on existing bus routes.

The County Para-Transit Division Senior and Disabled Transportation Service is part of the County's Department of Senior Services, Disabled and Veteran's Affairs. They provide curb-to-curb service for eligible individuals from 6:00 am to 5:00 pm on weekdays. Most trips are within the county, but they will transport passengers to destinations as far away as New York City if the trip can be accommodated. For a trip to such a distant location, there has to be sufficient time in the schedule to allow the driver to wait until the passenger is ready to return. They will take trip requests up to a month in advance but they do not start scheduling trips until two weeks before. All trip requests are accommodated on a space available basis. There is no formal eligibility determination process. There is no fare for the service, but there is a suggested donation of $1.00 per trip.

Morris County

Morris County's elderly and disabled transportation agency is MAPS, Morris Area Paratransit Service. The program serves all municipalities within Morris County except for Jefferson Township, which has its own Dial-a-Ride subsidized by MAPS; as well as Butler, Pequannock, Riverdale, Kinnelon, and Lincoln Park, which serve the Five-Town Dial-a-Ride system. Those five towns receive funding through MAPS. All MAPS services operate Monday to Friday during daylight hours; the specific hours vary by jurisdiction. The fare is free, but a $1 donation per trip is suggested ($3 for evening and weekend trips).

Warren County

Warren County Transit provides paratransit service to county residents who are disabled, senior citizens, veterans, low-income, or who live in certain areas of the county. Transportation is provided Monday through Friday, excluding holidays, from 7:30 a.m. to 5:00 p.m. No fare is charged, but WCT suggests donations of $0.50 for trips within the county, $2.00 for trips less than 30 miles outside the county (only medical care trips are eligible), and $10.00 for trips more than 30 miles outside the county (only trips for specialized medical treatment are eligible). Trips must be reserved at least two working days in advance and no trips are guaranteed. Warren County also operates community bus routes; these are described in the section below on existing bus routes.

2.6 Current Ridesharing Programs

As the Transportation Management Association in the study area, TransOptions provides assistance to employers and commuters interested in ridesharing. In addition to matching potential carpool and vanpool users, TransOptions provides assistance to employers in operating shuttles and administers NJTRANSIT's Vanpool Sponsorship Program which reimburses vanpool groups up to $175 per month. Support increases to $325 per month if the vanpool travels on New Jersey's High Occupancy Vehicle (HOV) lanes on the New Jersey Turnpike.

TransOptions also offers an "Empty Seat Subsidy" for vanpools. If a rider drops out of a vanpool, the monthly fare for the remaining passengers increases unless the empty seats are filled. If a replacement rider cannot be found the vanpool may be dissolved. To mitigate this problem, TransOptions offers temporary empty-seat subsidies to qualified vanpools commuting into its service area.

For those interested in carpooling, TransOptions offers a free ride-matching service designed to pair commuters with similar work hours and home and work destinations. A list of park-and-ride lots is available on the TransOptions website.

2.7 Current Travel Patterns and Transit Share

2.7.1. Work Trip Travel Patterns

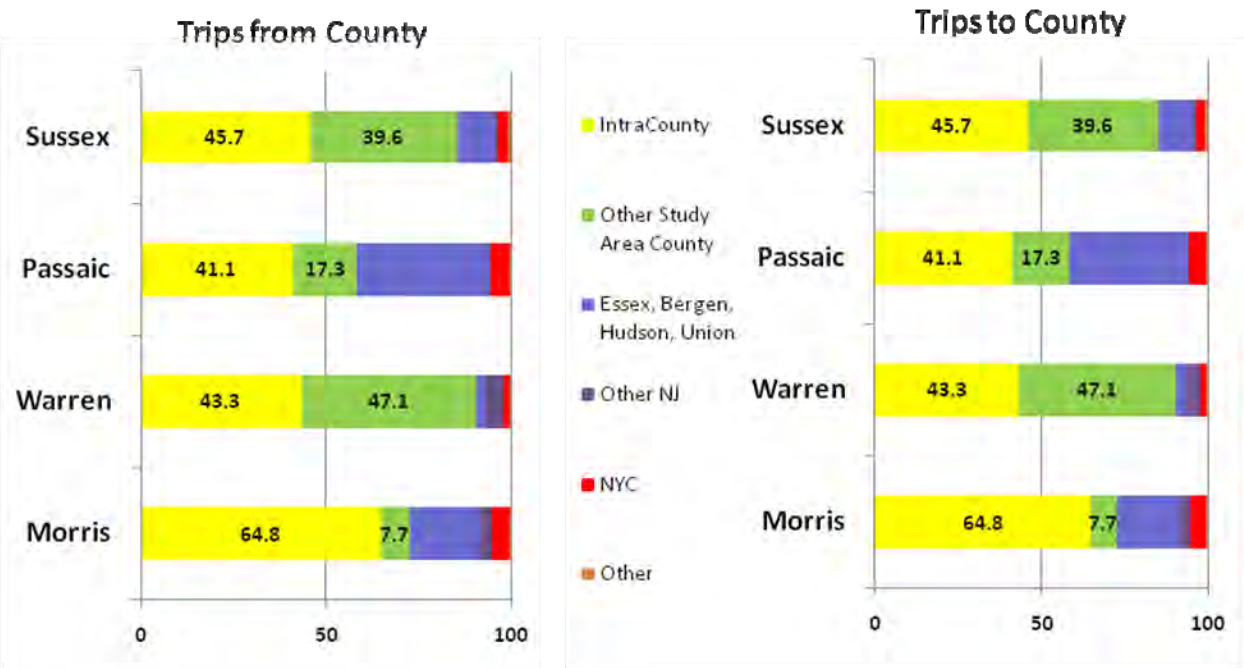
Journey to work data is available from the U.S. Census, the most recent of which was conducted in 2000. Work trip flows are first discussed at the county level, comparing the study area to adjacent areas. (More details concerning trip flows by county and MCD are contained in Appendix A.) As can be seen from

Figure 2-16, most work trips in the study area in 2000 were intra-county trips. While the study area does export workers to New York City, less than 5% of the work trips produced in the study area are destined to Manhattan. Morris County attracts many work trips from neighboring counties. Other New Jersey counties, such as Essex and Bergen Counties, also attract trips from the study area depending on the individual origin county. Because Morris County is so much larger in population and offers so many jobs, the intra-Morris County work trip travel is significantly greater than the other intra- and inter-county work trip travel in the study area.

Not surprisingly,the study area counties attract most of their workers from among those who live within their own county. Passaic County is somewhat of an exception, with as many of its workers living in Morris County as in Passaic County (this observation applies to the study area portion, which is the more rural, northwestern part). Commuting from Essex County is a significant factor only for adjacent Morris County.

Commuting patterns at the municipal level were also examinied. While intra-study area work trip travel is dispersed over many employment destinations, there are significant concentrations of employment of which Parsippany-Troy Hills is the largest. Several large work trip flows between municipalities were identified including between Morris Township and Morristown, and between Morristown, Randolph, Rockaway, Hanover and Parsippany-Troy Hills. Non-work travel also shows large flows among many of these communities in the southeast part of the region.

Figure 2-16: Distribution of Work Trips by County in the Study Area.
Source: 2000 US Census Data



Work trip patterns were analyzed at the Minor Civil Division (MCD) level for municipalities within the Study Area. Figure 2-17: Largest Flows of Trips from Home to Workplace Municipality shows the flows of trips between home and workplace municipality. The thickness of the lines corresponds to the size of the flow from home to workplace. The most intensive travel flows within the study area are between MCDs located in Morris County. There are five pairs of MCDs with flows of more than 1,500 daily workers (shown in Table 2-3), another six pairs of MCDs between 1,000 and 1,500, and 11 pairs of MCDs between 700 and 1,000. There are far more workers traveling within their counties than to places of work outside of the home counties. However, in some counties such as Sussex County and Warren County, the flows between municipalities are mostly less than 300 trips per day, with a few exceptions in Sussex County. These total flows are insufficient to generate significant transit demand given typical suburban transit mode shares.

Figure 2-17: Largest Flows of Trips from Home to Workplace Municipality

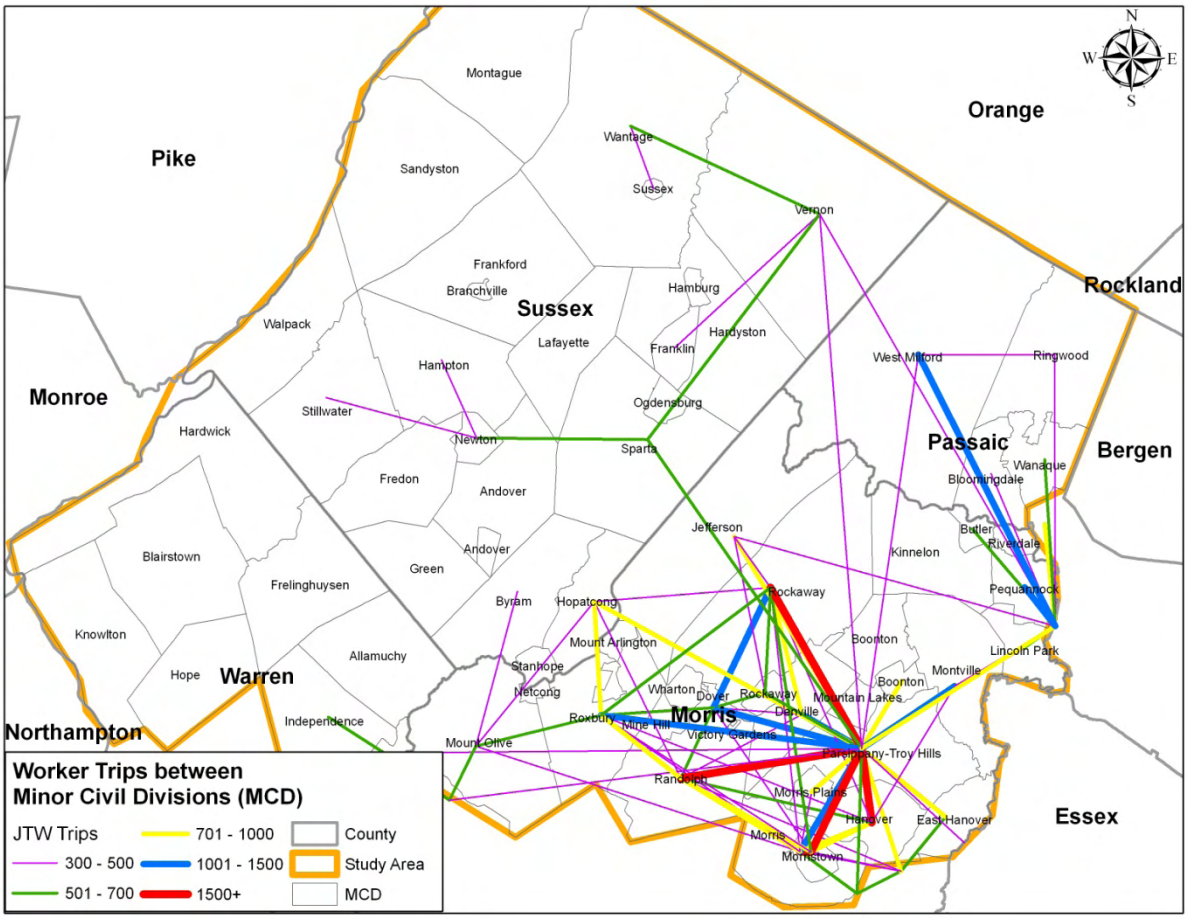


Table 2-3: Flows with 1,500+ Trips between Work and Residence Municipalities

Residence-Work Pairs	Total Worker Trips
Morris Township - Morristown	2,014
Morristown - Parsippany-Troy Hills	1,780
Hanover - Parsippany-Troy Hills	1,643
Parsippany-Troy Hills - Randolph	1,531
Rockaway-Parsippany-Troy Hills	1,525

*Sum of home-to-work trips in either direction

2.7.2. Work Trip Mode Share

The mode share of work trips was analyzed using the Census 2000 data (CTPP part 3). The 18 possible choices for Means of Transportation to Work were recoded as follows:

- Drive alone
- Carpool
- Bus
- Rail: railroad, subway or elevated
- Other: all other means, including ferryboat, bicycle, taxicab, motorcycle, and walk.

The “drive alone” share for work trips with origins within the study area is very high except for trips to New York City. Trips to Manhattan exhibit the highest transit mode share (58%) with over 29% by bus and over 28% by rail. Travel to other New York City boroughs also exhibits substantial transit shares and some large carpool shares. Within the study area, the transit shares were well below 1%. Transit volumes within the study area were highest to/from Morristown and Parsippany-Troy Hills.

Work trips *to* the study area show significant transit shares for trips from New York City (over 25% by transit from Manhattan), but the volume of these reverse travelers is very small. Essex County has a much larger number of both total trips and transit trips to the study area, with a transit share over 6%.

Table 2-4 shows trips from the study area to major destinations by mode. The auto shares (drive alone and car pooling) were very high: more than 80 to 90% of the trips originating in the study area were drive-alone trips, except those going out of state. Carpooling is generally about 6 to 10%. High carpool shares are observed to the outer boroughs of New York City and to Pennsylvania. The transit share was very low (mostly less than 0.5%), except for trips to New York City, especially Manhattan, which has 29% bus users and 28% rail users. Besides trips to Manhattan, transit plays a significant role for trips to Staten Island, Brooklyn, Hudson County and other NY and out of state locations not otherwise listed.

Table 2-5 shows work trips from major origins to the study area by mode. The auto shares were around 80%, but carpooling was higher than for trips from the study area. Transit use was very minimal except for trips from New York, e.g. 24.5% by bus and 3.8% by rail for trips from Manhattan, and 18.9% by bus from the Bronx. Rail plays a smaller role in trips to the study area, perhaps due to the limited accessibility of workplaces in the study area from rail stations. There is a significant share of bus use from Essex and Hudson Counties (about 5% and 4% respectively).

Table 2-4: Work Trips from Study Area by Means of Transportation

	Number of Trips					Percentage of Mode				
Destination	Drive Alone	Car Pool	Bus	Rail-road	Other	Drive Alone	Car Pool	Bus/ Trolley	Rail-road	Other
Morris Co. NJ	116,044	13,547	596	281	4,321	86.1%	10.1%	0.4%	0.2%	3.2%
Passaic Co. NJ	21,899	2,317	98	4	374	88.7%	9.4%	0.4%	0.0%	1.5%
Sussex Co. NJ	23,731	2,518	130	4	1,101	86.3%	9.2%	0.5%	0.0%	4.0%
Warren Co. NJ	5,468	691	16	4	530	81.5%	10.3%	0.2%	0.1%	7.9%
Bergen Co. NJ	13,582	1,429	14	0	22	90.3%	9.5%	0.1%	0.0%	0.1%
Essex Co NJ	20,923	2,004	70	180	71	90.0%	8.6%	0.3%	0.8%	0.3%
Hudson Co. NJ	3,738	428	8	262	4	84.2%	9.6%	0.2%	5.9%	0.1%
Union Co. NJ	3,558	313	14	28	29	90.3%	7.9%	0.4%	0.7%	0.7%
NJ Other	6,133	464	0	10	63	91.9%	7.0%	0.0%	0.1%	0.9%
Manhattan bor. NY	3,598	704	3,028	2,931	58	34.9%	6.8%	29.3%	28.4%	0.6%
Brooklyn bor. NY	330	45	117	57	0	60.1%	8.2%	21.3%	10.4%	0.0%
Bronx bor. NY	175	70	0	0	0	71.4%	28.6%	0.0%	0.0%	0.0%
Queens bor. NY	258	55	41	0	4	72.1%	15.4%	11.5%	0.0%	1.1%
Staten Is. Bor., NY	4	10	0	10	0	16.7%	41.7%	0.0%	41.7%	0.0%
Orange Co. NY	370	24	0	0	0	93.9%	6.1%	0.0%	0.0%	0.0%
NY Other	410	49	117	57	0	64.8%	7.7%	18.5%	9.0%	0.0%
Monroe Co. PA	55	0	0	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
Pike Co. PA	75	10	0	0	0	88.2%	11.8%	0.0%	0.0%	0.0%
PA Other	20	10	0	0	0	66.7%	33.3%	0.0%	0.0%	0.0%
Beyond NJ, NY, PA	35	15	15	10	8	42.2%	18.1%	18.1%	12.0%	9.6%

Table 2-5: Work Trips to Study Area by Means of Transportation

	Number of Trips					Percentage of Mode				
Origin	Drive Alone	Car Pool	Bus	Rail-road	Other	Drive Alone	Car Pool	Bus/ Trolley	Rail-road	Other
Morris Co. NJ	93,438	10,706	517	223	4,154	85.7%	9.8%	0.5%	0.2%	3.8%
Passaic Co. NJ	15,657	2,673	209	0	564	82.0%	14.0%	1.1%	0.0%	3.0%
Sussex Co. NJ	38,657	4,065	142	12	1,122	87.9%	9.2%	0.3%	0.0%	2.6%
Warren Co. NJ	10,842	1,571	4	8	552	83.5%	12.1%	0.0%	0.1%	4.3%
Bergen Co. NJ	4,375	488	28	20	8	88.9%	9.9%	0.6%	0.4%	0.2%
Essex Co NJ	14,062	2,579	931	247	247	77.8%	14.3%	5.2%	1.4%	1.4%
Hudson Co. NJ	2,502	615	133	66	72	73.8%	18.2%	3.9%	1.9%	2.1%
Union Co. NJ	5735	518	4	44	59	90.2%	8.1%	0.1%	0.7%	0.9%
NJ Other	13,012	745	39	33	65	93.7%	5.4%	0.3%	0.2%	0.5%
Manhattan bor. NY	524	136	246	38	62	52.1%	13.5%	24.5%	3.8%	6.2%
Brooklyn bor. NY	245	157	52	14	29	49.3%	31.6%	10.5%	2.8%	5.8%
Bronx bor. NY	105	20	30	0	4	66.0%	12.6%	18.9%	0.0%	2.5%
Queens bor. NY	275	69	19	0	8	74.1%	18.6%	5.1%	0.0%	2.2%
Staten Is. Bor., NY	230	44	0	0	0	83.9%	16.1%	0.0%	0.0%	0.0%
Orange Co. NY	588	112	0	0	0	84.0%	16.0%	0.0%	0.0%	0.0%
NY Other	414	157	52	14	29	62.2%	23.6%	7.8%	2.1%	4.4%
Monroe Co. PA	1,794	393	0	0	0	82.0%	18.0%	0.0%	0.0%	0.0%
Pike Co. PA	1,632	309	0	0	4	83.9%	15.9%	0.0%	0.0%	0.2%
PA Other	971	215	0	0	0	81.9%	18.1%	0.0%	0.0%	0.0%
Beyond NJ, NY, PA	15	0	0	0	0	100.0%	0.0%	0.0%	0.0%	0.0%

2.7.3. Transit Travel Patterns

The previous sections have presented information on work trips derived from the U.S. Census. Data on trips for all purposes are available from the New Jersey Regional Transit Model (NJRTME) . An origin-destination (O-D) matrix of transit trips for all purposes at the county level is shown in Figure 2-18. The O-D matrix gives a clear picture of the existing transit use: Morris County (the portion within the study area) generates considerbly more transit trips than any of the other counties under study, including more than 10,000 to Manhattan and more than 3,000 within Morris County. The portion of Passaic County within the study area generates more than 1,000 transit trips to Manhattan; Sussex County generates nearly 2,000 transit trips to Manhattan, and the small portion of Warren County within the study area produces more than 600 transit trips to Manhattan. However, there are few transit trips within these counties or to any other destination outside the county except Manhattan.

Figure 2-18: Total Daily Transit Trip O-D Matrix in County Level [1]

From \ To	Morris Co. NJ	Passaic Co. NJ	Sussex Co. NJ	Warren Co. NJ	Morris Co. NJ ext.	Passaic Co. NJ ext.	Sussex Co. NJ ext.	Warren Co. NJ ext.	Bergen Co. NJ	Essex Co NJ	Hudson Co. NJ	Union Co. NJ	NJ Other	Manhattan bor. NY	Brooklyn bor. NY	Bronx bor. NY	Queens bor. NY	Staten Is. Bor. NY	Orange Co. NY	NY Other
Morris Co. NJ	3,065	815	4	137	262	826	0	0	60	1,355	1160	2	6	10,432	649	145	595	13	0	1
Passaic Co. NJ	24	230	0	0	0	212	0	0	33	12	41	0	0	1,015	11	5	13	0	0	0
Sussex Co. NJ	169	50	92	13	10	50	0	0	2	118	187	1	0	1,953	91	18	98	1	2	0
Warren Co. NJ	70	25	1	5	4	25	0	0	1	53	74	47	0	635	36	6	39	0	0	0
Morris Co. NJ ext.[2]	458	0	0	0																
Passaic Co. NJ ext.	172	5	0	0																
Sussex Co. NJ ext.	0	0	0	0																
Warren Co. NJ ext.	19	0	0	17																
Bergen Co. NJ	10	0	0	0																
Essex Co NJ	313	0	0	0																
Hudson Co. NJ	18	0	0	0																
Union Co. NJ	86	0	1	63																
NJ Other	37	0	0	0																
Manhattan bor. NY	388	0	0	0																

[1]Passaic, Morris, and Warren are only counted for their part within the study area. As a result, the numbers shaded in yellow are trips that start and end within the study area.
[2] "ext." (external) indicates the portion of the county external to the study area.

Table 2-6 lists the transit trips to the study area counties (Sussex County, plus the portions of Morris, Passaic and Warren County in the study area) by transit mode and by origin county. The table shows that the majority of the transit trips entering the study area are bus trips. The table shows the high volume of transit trips entering Morris (compared with other parts of the study area), and especially high volumes (2,146 daily bus trips) for trips within the county, consistent with the greater amount of bus service currently provided in Morris County.

Table 2-6: Daily Transit Trips to the Study Area by Transit Mode

Destinations->	Morris*		Passaic*		Sussex		Warren*	
Origins	Bus	Rail	Bus	Rail	Bus	Rail	Bus	Rail
Morris Co. NJ	2,146	1,170	4	0	3	1	0	3
Passaic Co. NJ	195	1	23	0	0	0	0	0
Sussex Co. NJ	23	136	0	0	91	1	0	1
Warren Co. NJ	9	89	0	0	0	0	0	0
Bergen Co. NJ	8	2	0	0	0	0	0	0
Essex Co NJ	186	127	0	0	0	0	0	0
Hudson Co. NJ	10	8	0	0	0	0	0	0
Union Co. NJ	0	86	0	0	0	1	63	0
NJ Other	0	37	0	0	0	0	0	0
Manhattan bor. NY	200	188	0	0	0	0	0	0

*Only including those portions of the county in the study area

Table 2-7 lists the transit trips that originate in the study area by mode and destinations. The table shows that there are very high rail transit volumes from the study area to Manhattan; Morris County again shows large numbers of bus transit trips going to destinations within the county and to its neighboring counties, Passaic and Essex. Except for trips going to Manhattan, Hudson, Essex, Brooklyn, and Queens, the number of transit trips going outside the study area is small.

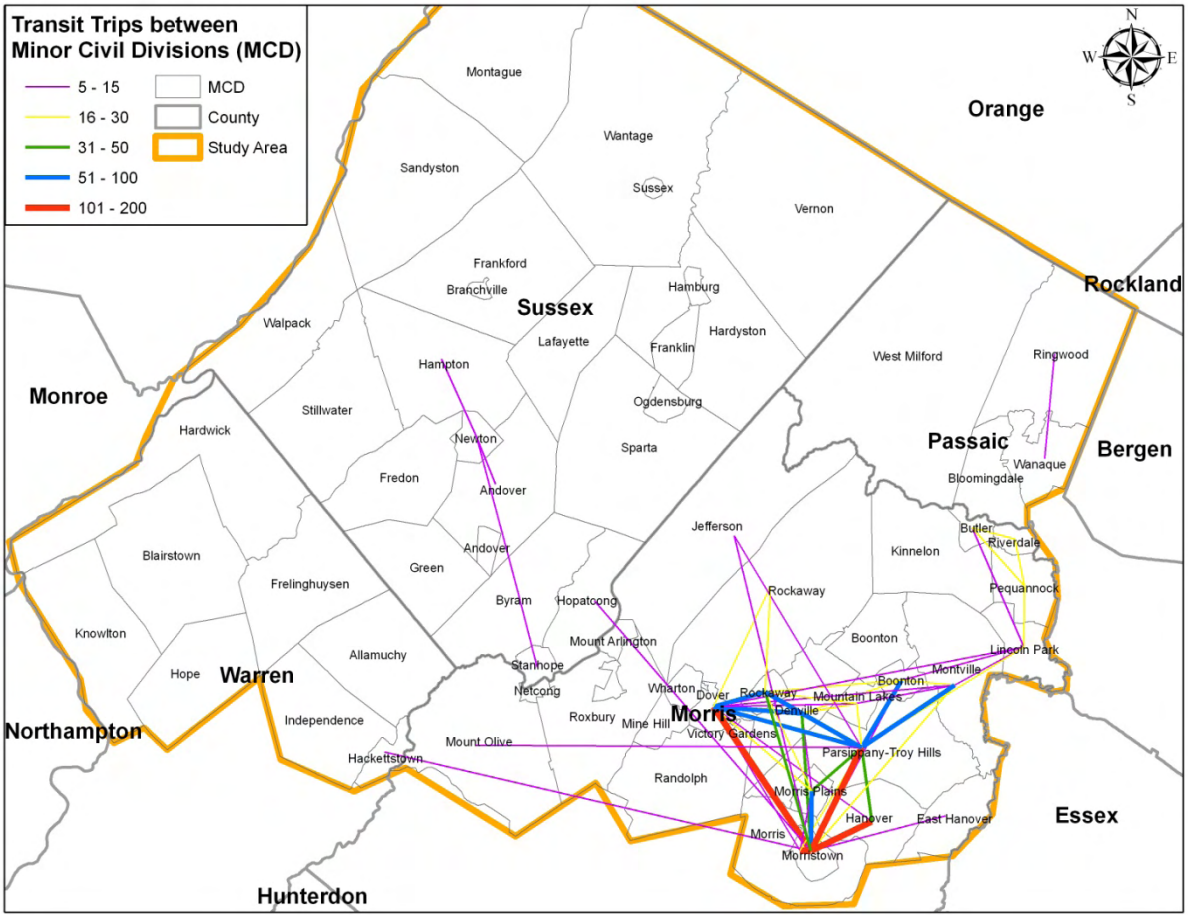
Table 2-7: Daily Transit Trips from the Study Area by Transit Mode

Origins->	Morris*		Passaic*		Sussex		Warren*	
Destinations	Bus	Rail	Bus	Rail	Bus	Rail	Bus	Rail
Morris Co. NJ	2,036	1,029	24	0	23	147	0	70
Passaic Co. NJ	613	202	207	23	4	46	0	25
Sussex Co. NJ	3	0	0	0	91	1	0	1
Warren Co. NJ	16	121	0	0	0	13	0	5
Bergen Co. NJ	44	16	11	22	1	2	0	0
Essex Co NJ	442	913	7	5	0	118	0	53
Hudson Co. NJ	72	1,088	6	35	5	182	1	73
Union Co. NJ	0	2	0	0	0	1	47	0
NJ Other	0	6	0	0	0	0	0	0
Manhattan bor. NY	2,778	7,654	517	497	555	1,398	169	465
Brooklyn bor. NY	232	417	9	2	51	40	14	22
Bronx bor. NY	67	79	5	1	12	6	3	3
Queens bor. NY	279	317	12	1	71	27	22	16
Staten Is. Bor. NY	1	13	0	0	0	0	0	0
Orange Co. NY	0	0	0	0	0	2	0	0

*Only including those portions of the county in the study area

Figure 2-19 illustrates the daily transit trip flows *within* the study area at the MCD level. This figure shows that the major transit activity within the study area occurs within Morris County. Overall, there are three flows between MCDs of over 100 trips; seven flows between 50 and 100 daily trips, and four flows between 30 and 50 trips.

Figure 2-19: Daily Transit Trips Between MCDs



Within the study area, most transit trips are either trips to Manhattan or within Morris County. While Manhattan is not the primary work location for study area residents, it receives the lion's share of transit trips from the study area (with over 10,000 one-way trips from Morris County, predominantly by rail). Another 3,600 trips occur between the rest of the study area and Manhattan. About 3,000 transit trips occur within Morris County. Very small numbers of transit trips occur between individual municipalities. More details concerning trip flows by county and MCD are contained in Appendix A.

2.8 Future Baseline Travel Patterns

The discussion in this chapter has previously been concerned with existing conditions. The expected future changes in travel should also be considered. Both NJ TRANSIT and NJTPA maintain long-range planning models. These models are used to make estimates of base-year travel flows, and can forecast future flows based on expected changes in population and employment (as well as improvements to the transportation system). Such base-case estimates were obtained from both agencies for the same base year (2000) and fore forecast years of 2010 and 2020 (in the case of the NJTPA model) and forecast years of 2015 and 2030 (in the case of the NJ TRANSIT model). The highway (automobile) and public transit (rail and bus) trip estimates from these models were summarized by county (or portion of a county, for the three counties that are only partially included in the study). As is the custom with regional models, all the trips presented are in one direction only, from a home end (or other origin) to a destination. The return trip is not counted. Thus each transit trip estimate from the model is equivalent to two transit boardings, one for the "away" trip and one for the "return" trip. (If the transit trip happens to involve more than one vehicle, there of course could be more than two boardings.)

The estimates are presented in three tables: trips from the study area (Table 2-14) with destinations elsewhere; trips originating elsewhere but going to the study area (Table 2-15); and trips completely within the study area (Table 2-16). Each of these flows is shown in the following three tables for the NJTPA model. The tables show the trip estimates for 2000, 2010, and 2020, the change in trips expected for the whole period, and the percent change. A summary of transit trips existing and forecast is shown in the subsequent table. A second set of four tables repeats the same figures using the NJ TRANSIT model estimates.

Table 2-8: NJTPA Model Forecast, Trips *from* the Study Area

	2000		2010		2020		2000-2020 change		2000-2020 % change	
Destination	Transit	Highway	Transit	Highway	Transit	Highway	Transit	Highway	Transit	Highway
Bergen County NJ	106	51,397	80	51,272	78	50,712	(29)	(685)	-27%	-1%
Essex County NJ	854	80,200	801	78,854	855	84,091	1	3,891	0%	5%
Hudson County NJ	806	30,871	2,063	36,982	2,330	41,219	1,524	10,348	189%	34%
New York City	9,656	17,022	17,328	29,471	21,311	33,766	11,655	16,743	121%	98%
Orange County NY	1	10,232	1	15,317	1	16,560	0	6,328	15%	62%
Other Morris County municipalities	149	27,547	118	26,404	125	28,366	(24)	819	-16%	3%
Other NJ counties	9	32,136	9	30,679	10	31,843	0	(293)	2%	-1%
Other NY counties	3	20,036	1	30,294	1	35,740	(2)	15,704	-80%	78%
Other Passaic County municipalities	494	50,640	393	49,763	397	52,545	(98)	1,905	-20%	4%
Other Warren county Municipalities	-	5,227	-	5,100	-	5,449	-	222	-	4%
Pennsylvania	-	10,751	-	14,903	-	14,164	-	3,413	-	32%
Rockland County NY	1	4,450	1	5,578	1	5,484	(0)	1,033	-2%	23%
Union County NJ	94	17,126	86	16,578	88	17,067	(5)	(58)	-6%	0%
TOTAL	12,174	357,635	20,880	391,196	25,196	417,007	13,022	59,372	107%	17%

Table 2-9: NJTPA Model Forecast, Trips *to* the Study Area

	2000		2010		2020		2000-2020 change		2000-2020 % change	
Origin	Transit	Highway	Transit	Highway	Transit	Highway	Transit	Highway	Transit	Highway
Bergen County NJ	51	25,620	31	22,866	31	23,991	(20)	(1,629)	-39%	-6%
Essex County NJ	229	39,728	171	35,318	175	36,198	(54)	(3,530)	-24%	-9%
Hudson County NJ	18	3,711	15	3,636	15	3,881	(4)	170	-20%	5%
New York City	150	2,283	560	1,970	554	1,745	404	(538)	269%	-24%
Orange County NY	1	2,648	0	2,540	0	2,869	(0)	221	-32%	8%
Other Morris County municipalities	262	41,578	309	39,524	306	39,816	44	(1,762)	17%	-4%
Other NJ counties	23	31,151	23	28,269	24	29,194	0	(1,956)	2%	-6%
Other NY counties		66		45		48	-	(18)	n.m.	-27%
Other Passaic County municipalities	436	30,586	333	28,511	349	30,498	(86)	(87)	-20%	0%
Other Warren County municipalities	8	7,639	10	7,792	14	8,912	6	1,273	74%	17%
Pennsylvania	0	16,224	0	18,580	0	23,451	0	7,227	n.m.	45%
Rockland County NY	0	2,773	0	2,164	0	2,355	(0)	(418)	-38%	-15%
Union County NJ	63	12,137	53	10,235	56	10,647	(7)	(1,490)	-11%	-12%
TOTAL	1,243	216,144	1,505	201,450	1,526	213,608	283	(2,536)	23%	-1%

Table 2-10: NJTPA Model Forecast, Trips *within* the Study Area

	2000		2010		2020		2000-2020 change		2000-2020 % change	
	Transit	Highway	Transit	Highway	Transit	Highway	Transit	Highway	Transit	Highway
Morris*	1,660	472,602	1,609	459,871	1,666	473,341	6	739	0%	0%
Passaic*	556	104,512	424	103,305	452	109,008	(105)	4,496	-19%	4%
Sussex	48	138,877	41	165,551	48	190,284	(0)	51,407	0%	37%
Warren*	-	57,683	-	60,625	-	69,435	-	11,752	n.m.	20%
TOTAL	2,264	773,674	2,074	789,352	2,165	842,068	(99)	68,394	-4%	9%

*Portion within study area only

These estimates suggest modest growth in automobile trip making over the entire 30-year period. Total travel growth is also expected to be modest (since automobile trips account for the vast majority of total trips). Trips based in the study area or wholly within the study are expected to grow, whereas trips to the study area from outside are expected to decline slightly.

Table 2-11: NJTPA Model Forecast Summary of Existing and New Transit Trips

	2000 Transit Trips	2020 Change	2020 % Change
From study area to NYC	9,656	+11,655	121%
From study area to other destinations	2,517	+1,367	54%
To study area	1,243	+283	23%
Within study area	2,264	-99	-4%
TOTAL	15,681	+13,206	84%

*All accounted for by trips to Hudson County, NJ

As shown in Table 2-32, about two-thirds of the existing public transit trips are based in the study area and going to New York City. The NJTPA model predicts a large increase in transit trips – close to double the year 2000 base by 2020. Virtually all of this increase in transit trips is accounted for by trips to New York City and Hudson County. The overall transit mode share would increase from 1.2% to 2.1% according to this forecast.

The NJ TRANSIT model predicts much more robust growth in automobile (and thus total) trips compared to the NJTPA model. Highway trips are expected to grow about 30% for trips from or within the study area and 20% for trips to the study area. Some of this discrepancy is the result of the additional 15-year length of the NJTRANSIT forecast period. The estimates are presented in Table 2-33 through Table 2-35. The results are summarized in Table 2-36.

Table 2-12: NJ TRANSIT Model Forecast, Trips from the Study Area

	2000		2015		2030		2000-2030 change		2000-2030 % change	
Destination	Transit	Highway	Transit	Highway	Transit	Highway	Transit	Highway	Transit	Highway
Bergen County NJ	38	45,659	46	54,815	52	61,216	14	15,557	38%	34%
Essex County NJ	529	75,442	691	83,982	850	91,923	321	16,481	61%	22%
Hudson County NJ	502	17,768	651	25,412	845	30,626	343	12,858	68%	72%
New York City	7,371	12,508	8,840	13,753	11,594	14,529	4,223	2,021	57%	16%
Other Morris County municipalities	84	18,661	84	21,532	98	24,052	14	5,391	16%	29%
Other NJ counties	4	26,873	8	37,419	19	41,796	15	14,923	379%	56%
Other NY counties	-	282	-	318	-	324	-	42	-	15%
Other Passaic County municipalities	199	28,433	219	30,757	258	33,545	59	5,112	-	18%
Other Warren County municipalities	-	7,860	-	8,593	-	13,721	-	5,861	-	75%
Union County NJ	93	13,280	88	15,635	106	16,904	13	3,624	14%	27%
TOTAL	8,820	246,767	10,629	292,216	13,823	328,636	5,003	81,869	57%	33%

Table 2-13: NJ TRANSIT Model Forecast, Trips *to* the Study Area

	2000		2015		2030		2000-2030 change		2000-2030 % change	
Origin	Transit	Highway	Transit	Highway	Transit	Highway	Transit	Highway	Transit	Highway
Bergen County NJ	71	31,785	68	31,259	71	34,585	-	2,800	0%	9%
Essex County NJ	469	66,338	473	65,695	497	72,487	29	6,149	6%	9%
Hudson County NJ	28	8,788	32	9,048	35	10,023	6	1,236	22%	14%
New York City	171	3,014	182	3,135	182	3,364	11	350	6%	12%
Orange County NY	1	1,703	1	2,102	2	2,522	1	819	43%	48%
Other Morris County municipalities	202	21,976	201	23,219	216	28,507	14	6,530	7%	30%
Other NJ counties	14	27,301	18	25,896	19	39,689	5	12,388	35%	45%
Other NY counties	-	559	-	559	-	567	-	8		1%
Other Passaic County municipalities	579	51,829	599	54,170	655	58,244	77	6,416	13%	12%
Other Warren County municipalities	4	4,310	4	5,106	6	7,562	1	3,252	34%	75%
Pennsylvania	0	26,469	0	32,631	8	37,474	8	11,005	n.m.	42%
Rockland County NY	-	1,072	-	1,159	-	1,189	-	117		11%
Union County NJ	77	12,927	83	12,646	81	14,535	4	1,608	6%	12%
TOTAL	1,617	258,072	1,661	266,624	1,773	310,749	156	52,677	10%	20%

Table 2-14: NJ TRANSIT Model Forecast, Trips within the Study Area

	2000		2015		2030		2000-2030 change		2000-2030 % change	
County	Transit	Highway	Transit	Highway	Transit	Highway	Transit	Highway	Transit	Highway
Morris*	1,100	357,181	1,137	389,577	1,297	440,212	197	83,031	18%	23%
Passaic*	362	84,183	389	89,025	445	97,759	83	13,576	23%	16%
Sussex	5	87,577	13	110,976	19	144,222	14	56,645	281%	65%
Warren*	-	10,980	-	11,403	-	17,700	-	6,721		61%
TOTAL	1,467	539,921	1,538	600,981	1,761	699,893	293	159,972	20%	30%

*Portion within study area only

Table 2-15: NJ TRANSIT Model Forecast Summary of Existing and New Transit Trips

NJT Model Summary			
	2000 Transit Trips	2030 Change	2030 % change
From study area to NYC	7,371	+4,223	57%
From study area to other destinations	1,449	+780	54%
To study area	1,617	+156	10%
Within study area	1,467	+293	20%
TOTAL	11,904	+5,452	46%

As shown in the summary table above, the NJ TRANSIT model predicts less growth in transit trips, even though the forecast year is 10 years later than that of the NJTPA model. Total transit growth is expected to be 46%, compared to 84% in the NJTPA model. (The 2000 base year transit trip estimates are also lower in the NJT model.) The models agree that transit ridership growth is expected to be much faster where it is currently strongest, for trips based in the study area. Both also agree that trips from the study area to New York City will account for the vast majority of the absolute growth in transit trips: 77% of the growth in trips in the NJ TRANSIT model or 88% in the NJTPA model. According to the NJ TRANSIT model, the transit mode share is expected to increase from 1.2% in 2000 to 1.5% in 2030 (compared to 2.1% in 2020 per the NJTPA model).

2.8.1. Impact of Highlands Master Plan on Future Travel Patterns & Transportation Projects

The travel forecasts discussed above are based on assumptions about future population and employment growth within the study area. These expectations may not be realized due to new building restrictions to accommodate environmental constraints. As noted at the beginning of this chapter, the State of New Jersey in 2008 adopted a Highlands Regional Master Plan designed to preserve open space and restrict growth in environmentally-sensitive regions, including a large part of the project study area. Conformance with the Regional Master Plan is required throughout the Preservation Area (which is designated by statue), and is voluntary within the Planning Area (see Figure 2-20 for a map showing both types of areas). Plan Conformance includes the revision of local master plans and development regulations, as applicable to the development and use of land, as may be necessary in order to make them conform to the goals, requirements, and provisions of the Regional Master Plan. In the development of the Regional Master Plan, the Highlands Council prepared a build-out analysis. The analysis assumes that municipalities will conform to the plan in Preservation Areas, as required by state law, but not necessarily in Planning Areas (where compliance is voluntary). To bracket the possible outcomes, the RMP build-out analysis produced two estimates of future population and jobs: one assuming no conformance in planning areas and one assuming complete conformance.

The population and job forecasts from the build-out analysis were compared to NJTPA population and job forecasts. A summary of these forecasts for municipalities within the study area is shown in Table 2-37. The NJTPA forecast for 2030 amounts to an 11% growth in both population and jobs in the study area compared to the 2005 base. The RMP analysis estimated the total amount of population and job growth possible (at some time in the future) under various land-use regulation scenarios. The first scenario is

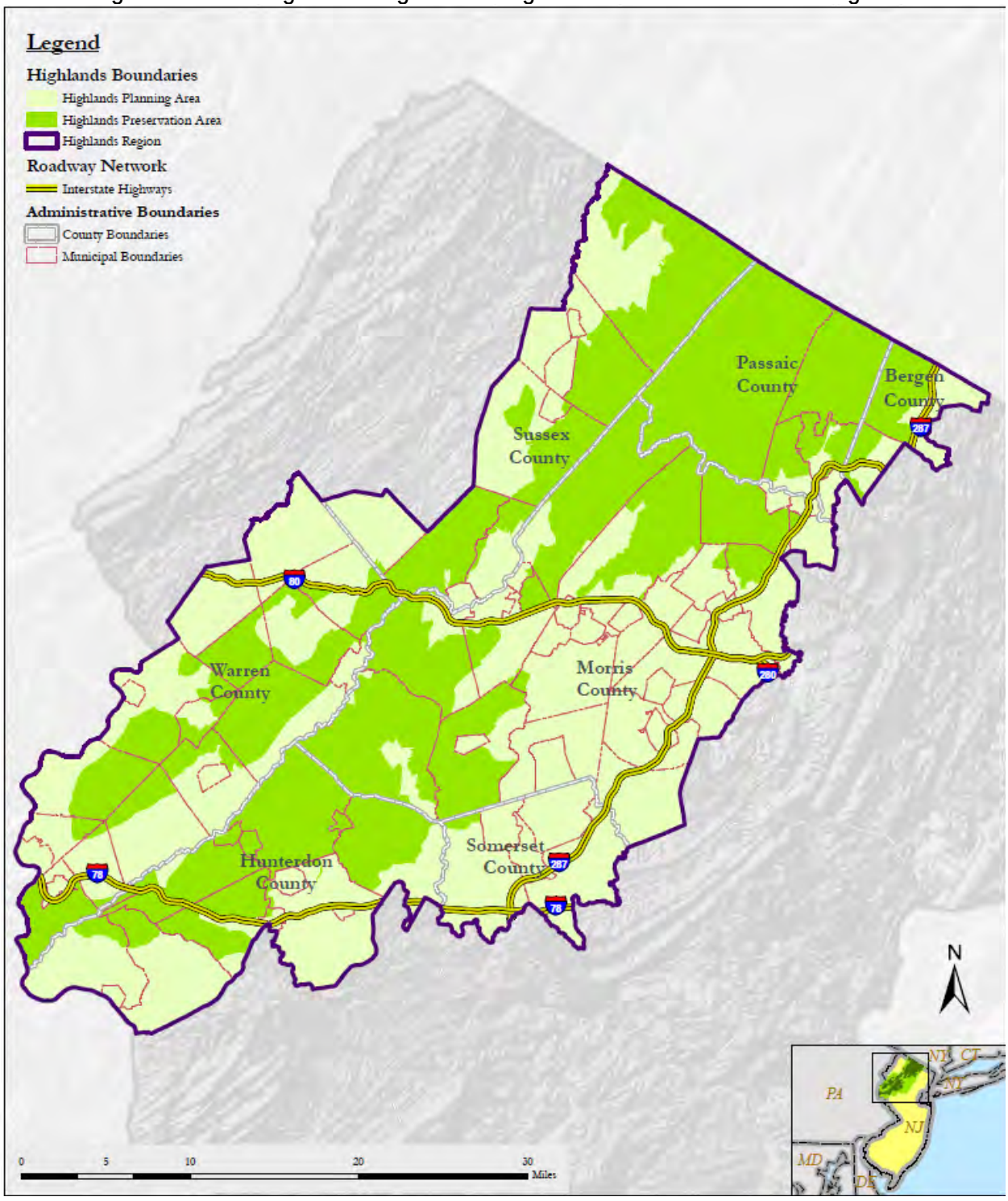
existing conditions (without the effect of the Highlands RMP). Even in this scenario, the analysis found that current zoning would restrict population growth in the study area to 49,000, compared to the 60,000 forecast by NJTPA. However, existing zoning would not restrict jobs compared to what is forecast—although it would quickly become binding after that, since the forecast growth is just slightly less than the number of jobs expected under build-out. The build-out analysis considered two scenarios with the Highlands regulations in place: no conformance in Planning Areas and complete conformance in planning areas. In the former scenario, the RMP would restrict population growth to less than half what it would be with existing regulations. Job growth would be only slightly constrained. In the 100% conformance scenario, both job and population growth would be severely constrained. However, because the base forecast of growth is only 9-11%, the total number of population and jobs in the region would not be that different with and without the Highlands Act. Moreover, because transit accounts for about 1% of trips currently and is forecast to increase to no more than 2%, growth in transit trips could come even with little or no growth in population – by shifts from auto or walking trips or by new ("induced") trips due to new service.

Table 2-16: Forecast Population and Job Change, NJTPA Regional Model and Highlands RMP Build-Out Analysis, for Project Study Area Municipalities

			% change 2005-30	
	Population	Jobs	Population	Jobs
NJTPA Model Base (2005)	566,241	289,421	-	-
NJTPA Model Forecast (2030)	626,548	350,514	-	-
NJTPA forecast change (2005 to 2030)	60,306	61,093	11%	11%
Forecast Build-Out without Highlands Regulations	49,183	62,088	9%	11%
Highlands, 0% Conformance in Planning Areas	23,475	51,825	4%	9%
Highlands, 100% Conformance in Planning Areas	10,954	11,000	2%	2%

Sources: a) Forecasts of the change in population and jobs Appendix A-1, A-2, A-3 of Highlands Build-Out Analysis. http://www.highlands.state.nj.us/njhighlands/master/build_out_analysis.html. b) NJTPA Forecasts for 2005 and 2030. The original data file was provided by Transportation Analysis Zone (TAZ) and later aggregated by town name. Since there was no indicator for the town suffix, two ambiguous town names were combined: Boonton Town and Boonton Township, and Rockaway Borough and Rockaway Township.

Figure 2-20: The Highlands Region Showing Preservation Area and Planning Area



3. Identification of Target Markets and Problems to be Addressed

The Northwest New Jersey Bus Study examined the characteristics of transit service and transit needs in Sussex County, western Passaic County, northern Morris County, and the Hackettstown area in Warren County. The study included a review of travel patterns, newly conducted surveys and counts of riders, a review of operating and ridership statistics, field observations, and discussions with representatives of stakeholder agencies, county planners and local stakeholders. This chapter describes how the various sources of information were used to identify the target markets and the problems to be addressed.

3.1 Summary of Transit Markets in the Study Area

As described in Chapter 2, transit service in Northwest New Jersey serves distinct markets based on the reason for using transit. For trips to older central business districts, the cost of parking and the potential for traffic congestion are frequently compelling reasons to take public transit. The majority (58%) of trips to New York City from the study area use transit, making it a clear example of the effects of parking costs and roadway delays on transit mode share. The second strongest transit destination for people residing in the study area is the cities in eastern New Jersey, particularly Newark. Since many of the above transit commuters have access to automobiles, they typically access transit by car; and they are well served by park-and-ride lots.

While trips within the study area and adjacent suburban areas heavily outnumber trips to New York and dense urban areas in northeastern New Jersey, the transit mode share for the former is very low. This is because where parking is inexpensive and traffic congestion less severe, the major market for transit consists of those who do not have access to a car either because they cannot drive or lack the means to afford one. By definition, then, most of these riders access transit by walking which limits service to areas of sufficient population density and key travel destinations. The transit market among those traveling within the study area or adjacent areas consists primarily of low-skilled, low-wage workers, who tend to be concentrated in retail, services, hospitality and technical medical occupations.

For those without access to cars, local transit is an important source of general mobility, including access to supermarkets, retailers, health care and government services. Local transit services in the study area typically operate hourly on weekdays, but service is not often available during evenings or on weekends. Paratransit service is often available but is generally restricted to older adults and persons with disabilities. Input from passengers and stakeholders helped to identify specific deficiencies in the existing network for each market.

3.2 Rider Opinions

Rider opinions were obtained through on-board surveys conducted as part of this study on most study area routes. The routes surveyed included:

- NJ TRANSIT Express Routes 193, 194, 195, 196, 197, 198, 324
- NJ TRANSIT Local Routes 75, 79 (29, 73 surveyed by Greater Newark Bus System Study)
- WHEELS: Routes 966, 967, 973
- Morris County Metro: Routes 1, 2, 3, 4, 5, 7, 10
- Lakeland Bus Lines: Routes 46, 80 (and combined 46/80)

- Community Coach (Coach USA): Route 77

Survey findings related to travel patterns and rider demographics were described in Chapter 2. In this chapter, the focus is on attitudinal information derived from the rider surveys. Note that besides the on-board survey, a web-based survey of the general public including non-riders as well as riders was conducted by NJTPA to provide additional outreach information.

3.2.1. 3.2.1 Service Quality

The on-board survey asked riders to rate the service quality of the bus for each of 10 different criteria. The respondent was asked to rate each attribute on a scale of 1 to 10, where 1 means "unacceptable", 5 is "acceptable" and 10 is "excellent." Respondents were also given the choice of "N/A," not applicable. Many riders chose this option for Parking Availability where no park-and-ride lots are available along a route, and for Saturday and Sunday service frequency where no service is offered on those days. The percent distribution reported below includes only those who gave a rating for the given attribute, excluding those who marked "N/A". Parking availability was rated negatively by 27% of NJ TRANSIT riders and 38% of Coach USA. By contrast, only 10% of Lakeland riders gave a negative rating. The MCM and Wheels routes do not cater to park-and-ride customers (many of these riders gave this characteristic a rating of Not Applicable). Higher levels of dissatisfaction were exhibited for off-peak and weekend service frequency. Many of the routes offer very limited or no service during these periods. Comparing the three interstate carriers, Lakeland rated consistently higher in all categories, followed by NJ TRANSIT and then Coach USA, the latter of which had negative ratings of 25% or more for many service quality categories. The lack of customer information stands out for Coach USA riders, with 40% giving a negative rating.The number of customers who gave negative overall satisfaction ratings to MCM and Wheels was 10% or less.

Figure 3-1 shows the sum of the percent of respondents giving the attribute a score less than 5. Since 5 was "acceptable," this statistic can be interpreted as the percent rating that characteristic less than acceptable.

Parking availability was rated negatively by 27% of NJ TRANSIT riders and 38% of Coach USA. By contrast, only 10% of Lakeland riders gave a negative rating. The MCM and Wheels routes do not cater to park-and-ride customers (many of these riders gave this characteristic a rating of Not Applicable). Higher levels of dissatisfaction were exhibited for off-peak and weekend service frequency. Many of the routes offer very limited or no service during these periods. Comparing the three interstate carriers, Lakeland rated consistently higher in all categories, followed by NJ TRANSIT and then Coach USA, the latter of which had negative ratings of 25% or more for many service quality categories. The lack of customer information stands out for Coach USA riders, with 40% giving a negative rating.The number of customers who gave negative overall satisfaction ratings to MCM and Wheels was 10% or less.

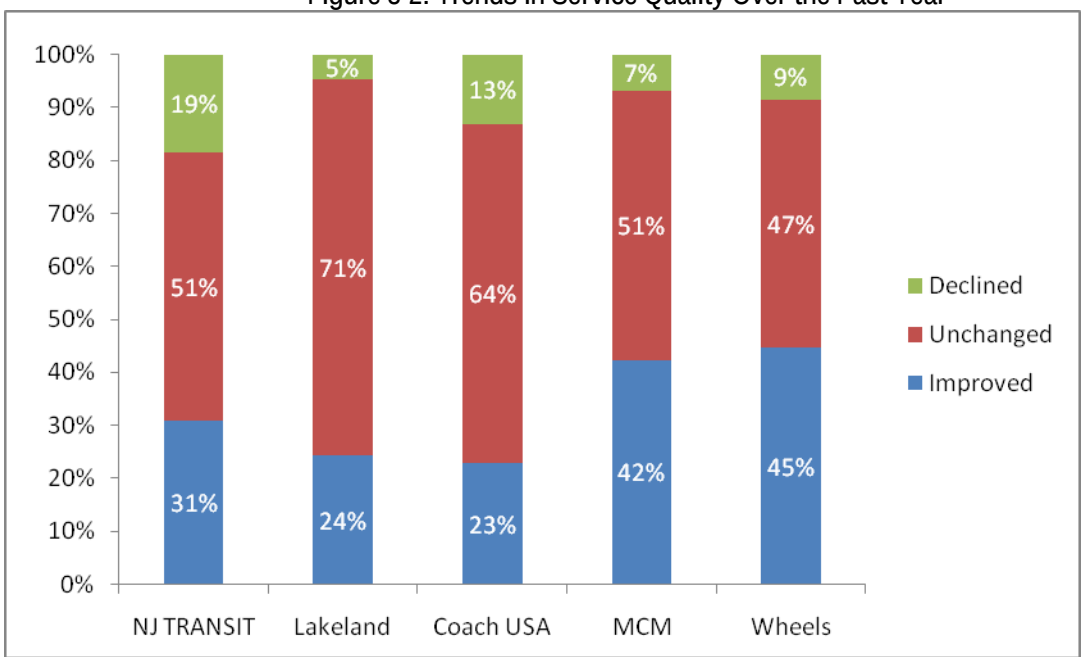
Figure 3-1: Service Quality Ratings: % Rating Characteristic Below 5 ("Acceptable").

Percent rating less than acceptable

Carrier	Bus Stop Condition	Parking Avail-ability	Frequency of Service: Weekday peak	Weekday off-peak	Saturday	Sunday	Infor-mation	On-time perfor-mance	Trip time	Overall satis-faction
NJ Transit	10	27	19	24	21	23	15	23	15	15
Lakeland	9	11	13	18	16	18	10	13	11	5
Coach USA	17	38	22	31	25	22	36	33	15	24
MCM	7	19	21	20	29	31	14	15	10	10
Wheels	3	10	22	19	25	21	12	11	5	9
Total	10	23	18	23	21	23	16	20	13	13

Riders were also asked to identify how service has changed in the past year. Perceptions of service were fairly stable with some tendency toward improvement, particularly on MCM and WHEELS. Figure 3-2 shows the responses.

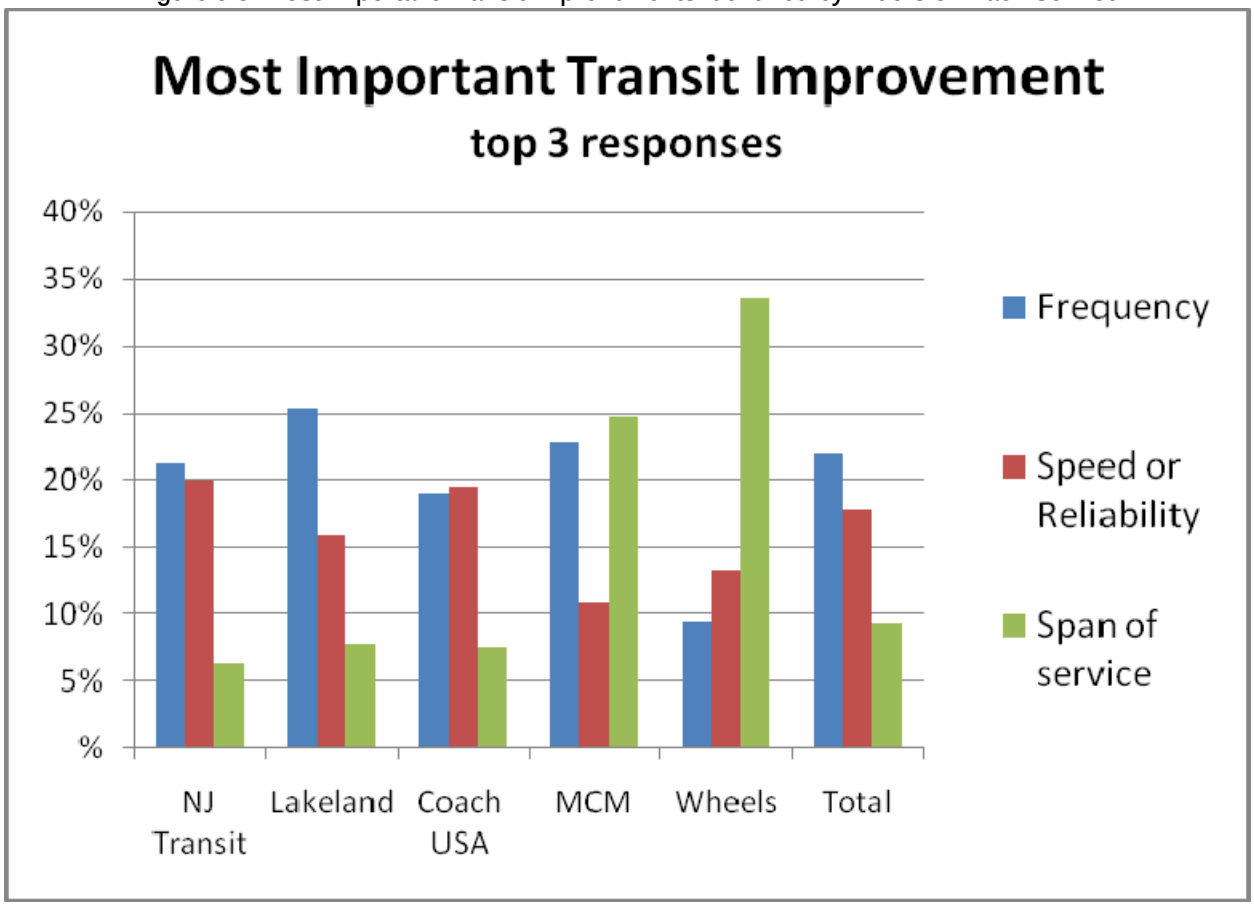
Figure 3-2: Trends in Service Quality Over the Past Year



3.2.2 Improvements Needed

Riders were also asked to identify the single most important improvement –as an open ended question. The riders identified frequency, speed or reliability and span of service as the most important. As shown in Figure 3-3, the primary emphasis was on span for riders on MCM and Wheels routes in the study area. Frequency was important for riders on all services but Wheels in the study area. Speed was the most important for riders on NJ TRANSIT, Coach USA and Lakeland routes in the study area.

Figure 3-3: Most Important Transit Improvements Identified by Riders on Each Service



3.3 Stakeholder Input

Three Technical Advisory Committee meetings were held to obtain feedback on needs and opportunities. Members identified the following general problems:

- Limited bus service within the study area, especially in Sussex County
- Low productivity on some routes
- Congestion on main highways
- Limited parking capacity at rail stations and express bus stops; need for additional park-and-rides
- Limited service and long travel times from Sussex County to Manhattan
- Need for affordable transportation options and stable and sustainable funding
- Need to inform residents of transportation options available

- Need to install shelters where feasible

Stakeholder meetings were conducted in May 2008 at two locations to obtain input from municipal officials. The primary problems identified in these meetings were:

- Limited bus service within the Study Area, especially in Sussex County
- Limited connectivity between regional hubs (Morristown, Parsippany, Wayne)
- Congestion on main highways; transit priority treatments necessary but expensive
- Long travel times especially to Manhattan
- Limited service to Newark, especially from Morristown (rail only)
- Limited parking capacity at rail stations and express bus stops; need for additional park-and-rides, as well as pedestrian amenities to encourage walk access; any park-and-rides unserved by transit
- Lack of feeder service to rail stations
- Many large existing and future development sites unserved or poorly served by transit
- Need to inform residents of transportation options available
- Limited funding; need for stable and sustainable transportation funding
- Existing services have limited span and frequency; evening and weekend service needed to accommodate non-traditional schedules (i.e. low-income workers)

3.4 Traveler Opinions from Web Survey

During the summer of 2008, the Transportation Management Association, *TransOption*s, hosted an online travel survey in an effort to gather general public feedback on the travel patterns and needs of both transit-users and non-transit users in the study area. The respondent data from the survey were subsequently analyzed by NJTPA and the results of this work are summarized below.

The Travel Survey was offered to the public via links from state and local agency websites, a press-release to local media, and survey postcards distributed at local and county offices, as well as at area park & ride facilities. The survey was available for 3 months. The first question asked the participants to "think about one direction of a trip that [they] currently make within or to/from Morris, Passaic, Sussex and Warren Counties that [they] would consider making by bus" and then asks what travel mode the respondent normally uses to make this trip. Answer options covered 14 travel modes, including several that were similar to the on-board questionnaire conducted by NJ Transit in the spring of 2008. The flow of the questions was organized such that the answer to the first question determined the following sequence of questions that the respondent received. A total of 444 respondents voluntarily completed the survey and as a result the data does not represent a random statistical sample due to self-selection bias.

Of key interest were findings regarding respondents whose current primary mode of travel was automobile. Figures 3.4 and 3.5 illustrate those results. Among respondents who currently drive direct to their destination or to a carpool lot, over 45% and 40% respectively, indicated that a bus is simply not a viable option for their trip because there are either no bus routes in their area or existing routes don't go to their destination. Similarly, 34% of respondents who currently drive or walk to a train station indicated that buses are not available to them or for their trip. It is important to keep in mind that buses may actually be a possible option for some of these people and these responses could indicate that there is a lack of information available to riders. Furthermore, a vast majority of respondents who currently drive direct to their destination or to a carpool lot indicated that more direct service and more frequent service would be a

very important factor in their decision to switch to a bus for their trip. Additional findings from the survey can be found in Appendix D.

Figure 3-4: Desired Bus Improvements, Auto Users

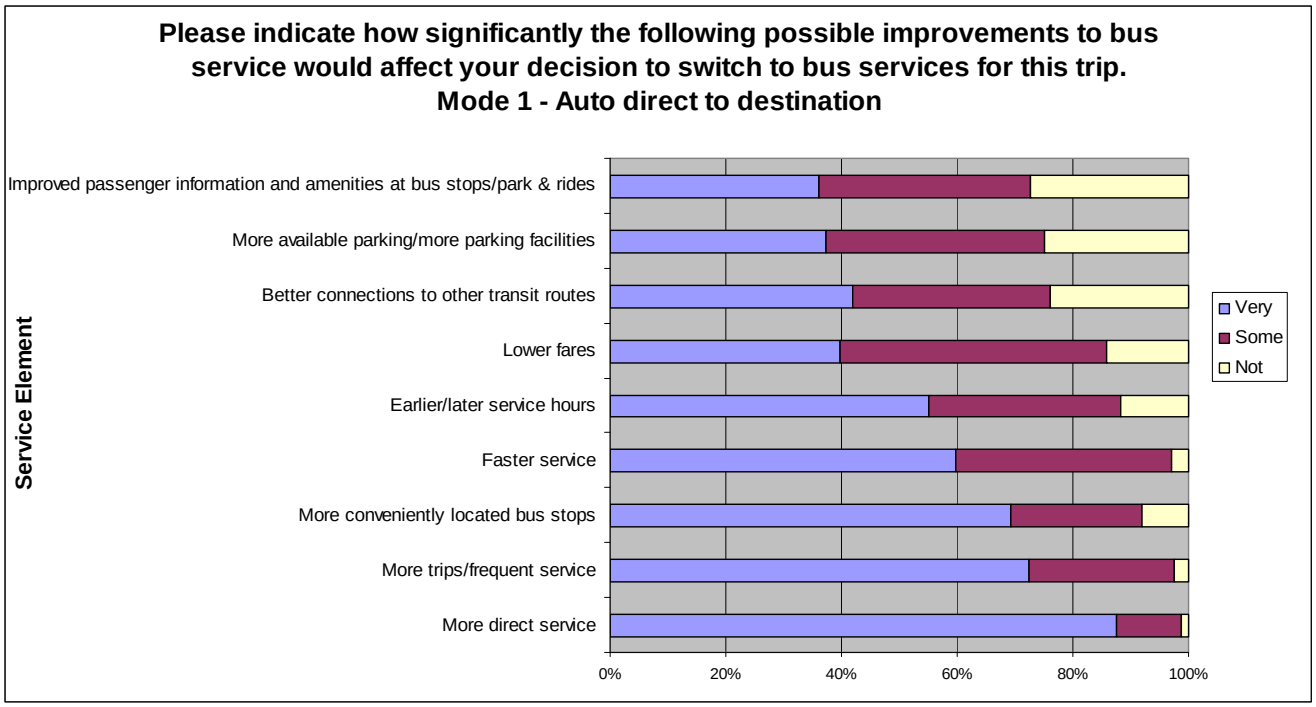
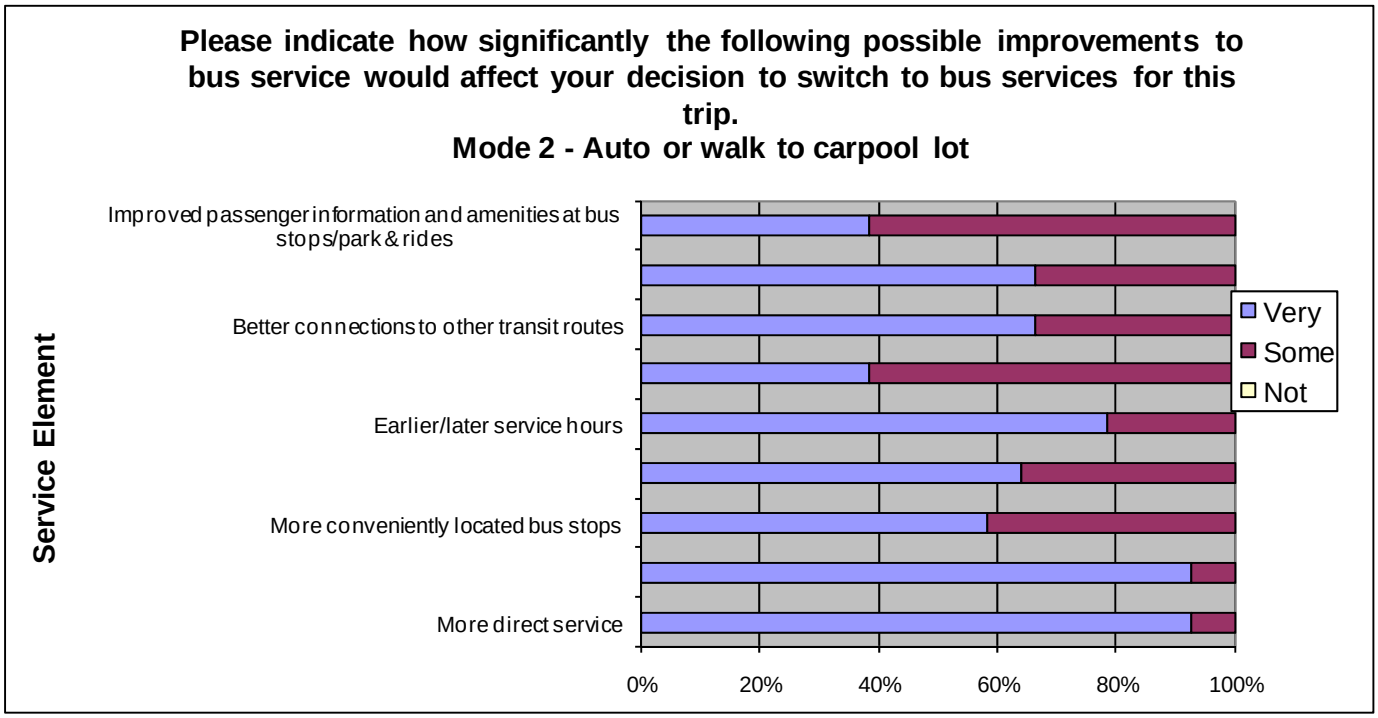


Figure 3-5: Desired Bus Improvements, Auto Users, Carpool Users



3.5 Improvement Needs

Using ride checks, passenger surveys and stakeholder input, major deficiencies of existing service were identified. This section summarizes these potential opportunities for improvements. Specific types of service strategies and improvements are discussed in the following sections and candidate proposals for improvements are listed in Chapter 4.

3.5.1 Service to New York City

The following are the key problems identified concerning service between the study area and New York City:

- Most park-and-ride lots served by commuter bus routes in the study area are operating at capacity, which may be a constraint on bus use and creates an inconvenience for passengers. In addition to the lack of park-and-ride capacity, most lots lack basic amenities such as shelters, seating, and waste receptacles. In 2008, NJ TRANSIT opened a new 1,000-space parking facility at Wayne/Route 23 Transit Center. Despite the addition of a charge for parking ($2 per day or $25 per month), both the Wayne/Route 23 Transit Center and nearby Willowbrook Mall lots regularly fill up. Mothers Park-and-Ride provides 350 spaces which serve as overflow parking in this area.
- However, overcrowding on buses is generally not a problem; only a few trips surveyed exceeding maximum load policies (these specific cases are discussed under Service Guidelines).
- Many park-and-ride lots do not have signs marking them as park-and-ride facilities, and very few have route and schedule information.
- Although bus service is frequent (typically at least every half hour) from Dover, along the U.S 46 corridor, and from the Wayne/Route 23 Transit Center and the Willowbrook Mall, outlying parts of the study areas have much less frequent service, in some cases little or none outside the peak period in the peak direction.
- There are recurring and sporadic congestion delays that lengthen travel times and negatively impact reliability. Some of this delay occurs on major corridors in the study area, such as I-80, I-280, and US 46.
- However, the most significant source of delay to bus passengers traveling to New York City occurs east of the study area. Most New York buses serving the study area use the frequently congested US 46 and NJ 3 between the Willowbrook Mall and the Lincoln Tunnel. The contraflow bus lane approaching the Lincoln Tunnel greatly aids in reducing congestion delays, but the lane operates only in the morning peak direction. At other times buses are subject to the same queues as other traffic. Because there is insufficient space to stage buses at Port Authority Bus Terminal (PABT) for the evening commute, some buses must deadhead from adjacent areas or from New Jersey. If they arrive too early they may be directed around the block, which can result in a late arrival at the gate. The difficulty in queuing buses at PABT means that there can be departure delays during the evening peak period.

3.5.2 Local Service

The following are the key problems identified concerning local service in the study area:

- Most local routes in the study area have infrequent service, with typical headways of one to two hours.
- Service span is limited, with no evening or Sunday service on most local routes.

- Some moderate density neighborhoods lack bus service or have only New York-oriented service which may not serve local trips.
- The private carriers operate service tailored to the New York market and charge a relatively high fare for local trips or do not permit local trips at all. There are no free or reduced-price transfers offered between different bus operators. NJ TRANSIT monthly bus passes are not accepted by private carriers or on rail service.
- Some routes use an insufficient number of vehicles to operate the schedule given the actual running times, and therefore have difficulty meeting scheduled departure times.
- Many routes are not well used relative to the capacity of the vehicles, suggesting that smaller vehicles could be used either at all times or at off-peak times.
- There are gaps in route coverage and some passengers face long walks, exacerbated by divided highways with limited numbers of safe crossings.
- Local bus schedules are not coordinated with commuter rail or express bus service, except for shuttle buses specifically designed to serve as feeders to rail stations.
- The transit network generally does not serve commutes very well between New Jersey communities outside of older cities, particularly for north-south trips.
- Several large shopping and employment centers are unserved or underserved.
- Few bus stops in the study area have shelters, benches, and posted system and schedule information.
- NJ TRANSIT tickets and passes are not widely available for sale within the study area, except at rail stations.

3.6 Improvement Concepts

The deficiencies and opportunities identified above can be grouped into four general needs, as described below.

3.6.1. 3.6.1 NEED 1: Strengthen transit service along the major study area corridors

Both local and New York-oriented bus services are concentrated in certain corridors and areas within the study area including the NJ 23, NJ10, US46 and I-80 corridors and eastern Morris County in general. Service needs in these corridors include increased frequency during off peak periods, extended service hours on weekday evenings and weekends, and increased coverage to growing areas. There are also opportunities to restructure existing services to enhance connectivity and coverage and improve efficiency. Both local and express bus services in the study area commonly lack customer information and amenities that are typically found on the rail transit network. Specifically, both local and New York-oriented bus service on the major existing corridors and their supporting facilities could be improved in the following ways:

- *Extend New York City commuter routes into unserved parts of the study area.*
- *Increase the frequency of off-peak service to meet a proposed guideline of hourly service (see proposed service guidelines in the next section).*
- *Restructure local routes in Morris County to achieve greater efficiency, greater coverage, and increased frequency.*
- *Add evening and Sunday service on key Morris County local routes and increase frequency from one to two trips per hour.*

- *Improve coverage by providing local service to shopping malls or other major travel generators that currently have little or no service.*
- *Integrate local and New York Service by permitting local use of New York service through fare policy changes and small changes in routing, to the extent feasible (see also Need 3).*

3.6.2. 3.6.2 NEED 2: Improve connectivity through shuttles and linkages to rail stations, transit hubs, and employment centers

Small buses can play an increased role in bringing people to and from the expansive rail network in the study area, thereby extending its reach and compensating for the shortage of parking at some rail stations. They can also be used to provide basic service to the more rural parts of the study area, to provide reverse commute connections, and to directly connect major transit hubs using express routes. The following types of improvements should be considered:

- *Improve community circulators* – Existing irregularly-scheduled, locally-provided services could be restructured to improve service quality, efficiency, and passenger information. In some cases, new community routes can link unserved areas to existing public transit nodes.
- *Improve railroad station connections* – Improve the coverage of existing shuttles and add new and revived shuttles to provide connections between railroad stations and employment centers (and in some cases, residences).
- *Improve service to major transit hubs*. – Existing bus hubs such as the Willowbrook Mall could be strengthened by adding direct express service from other hubs. Such new service could take advantage of existing expressways. Transit hubs can also be strengthened by making routes stop in the same location, coordinating schedules, and adding amenities (the last item is covered under Need 4).

3.6.3. 3.6.3 NEED 3: Integrate private carrier services and locally run services into the area's transit network through service and fare coordination and transit information recommendations

The service, fare, and policy differences among the several transit providers in the study area can make some potential transit trips confusing, expensive, or even impossible. There are a number of improvements that could integrate existing and proposed new service into a more unified network:

- *Accept local fares and passes on commuter buses operated by private carriers* – This change would make new local connections available between Morris County and major destinations in Wayne and Essex County and would bring the private carriers more into conformance with NJTRANSIT policy for its New York-oriented routes.
- *Integrate private carrier route, schedule and fare information with NJ TRANSIT* – NJ TRANSIT would produce public schedules for private carriers and the data would be provided electronically for incorporation into the NJ TRANSIT online trip planner.

3.6.4. 3.6.4 NEED 4: Implement improvements in passenger facilities and running ways to support service proposals and upgrade system image and passenger comfort

Both local and express bus services in the study area commonly lack amenities for passenger information and comfort that are typically found on the rail network. These proposals would complement the service proposals by improving the quality of existing passenger facilities and providing opportunities for system expansion. Improvements to bus running ways in the form of bus bypass lanes and shoulders would be implemented as a pilot program in an effort to reduce delay due to traffic congestion.

- *Improve information and amenities at existing park-and-rides and major bus stops* – This would include enhanced static information, shelters and benches, and in some cases bike racks, lighting, trash bins, signs, and pedestrian ramps, in accordance with guidelines developed as part of the study.
- *Add commuter park-and-ride facilities and capacity* – Spaces would be added in newly-identified, existing privately-owned parking lots on or adjacent to existing New York City commuter bus routes, with the approval of property owners.
- *Initiate a bus bypass lanes pilot project* – Intersections in the study area were identified that have significant signal delay, substantial bus use, and an existing right-turn lane or shoulder that could be converted into a "bus bypass lane." Buses would be permitted to use the turn lane or shoulder to proceed straight through the intersection, generally to serve a bus stop at the far side, or otherwise to merge back into traffic after bypassing the queue at the signal. In the first phase, these bypass lanes would not involve changes to existing signal timing.
- *Create comfortable, convenient transit hubs* – Existing nodes with a concentration of transit links would be strengthened through physical improvements that complement the proposed service improvements. These include improved passenger information, shelters, benches, and wayfinding signs. The study proposes a distribution of such improved "transit hubs" throughout the region. At the larger hubs, canopies with additional amenities are proposed, including lighting, heaters, fare vending machines, security cameras, and improved connections to building entrances (with the approval of property owners).

3.7 Development of Service Proposals

A number of specific service and facility proposals were developed to address the needs described above using field data, information provided by the operating agencies, and input from the Technical Advisory Committee and other stakeholders. To develop the service proposals in particular, the data collected from the passenger survey and the ride counts were analyzed. A number of standard public transit service planning improvements were considered; these types of improvements are described below. In many cases, these analyses need to fit within the context of a set of service guidelines, a proposed set of which is offered in the following section.

Restructure the Route Network

While transit agencies routinely make adjustments to schedules to address running time and crowding issues, more substantial route restructuring is needed periodically to meet changing needs. The result can be improved passenger service and reduced operating cost. Based on data from passenger surveys, it is possible to see if lengthening a route would reduce the need for many passengers to transfer or, conversely, if a route could be shortened without increasing the need to transfer. Routes can also be restructured with the aim of balancing passenger loads so that there is ridership in both directions. Route

realignments or deviations can be added to serve particularly promising locations, such as hospitals, large retailers, or low-cost apartment complexes. Conversely, routes can be streamlined to remove unproductive deviations from the direct route.

Increase Coverage Through New or Extended Routes

Major changes to bus routes generally occur infrequently, and often lag behind changes in land use. A study such as the present one gives an opportunity to examine the area to see if there are new destinations or developing ones that should be served by bus (e.g., a new mall or big box retailer) or residential areas that have, or are expected to have, sufficient population density to warrant fixed-route bus service. These new areas can be served by adding extensions or deviations to existing routes or by adding completely new routes. New expressways and road improvements may also present opportunities to provide express service.

Increase Service Frequency

One reason to increase service frequency is to reduce crowding on trips that are likely to be full or might even pass up passengers due to lack of space. The spring 2008 ridership counts did not find crowding to be a problem on local routes, and found only a few cases of trips operating in excess of loading standards, all of which were on routes serving New York City (details are provided under Service Guidelines). The other reason to increase frequency is to reduce waiting time and schedule delay (delay due to arriving earlier than intended for lack of a trip at the right time). Virtually all of the New York routes offer a high frequency of service in the peak hours in the peak direction. However, they typically have infrequent service at other times and in the reverse peak direction. The local routes in the study area have infrequent service at all times, operating at headways of one hour or more, with very few exceptions.

Increase Service Span

Another improvement considered is increasing the span of service hours. Both major markets served – trips to New York City and local trips made by those without cars – have demand for travel beyond the traditional 9 to 5 workday. Many workers, especially low-income workers in the service industry, have non-standard work shifts including evenings and weekends. Social, recreational, and shopping trips frequently occur in the evenings and weekends. Some of the New York service offers trips in the late evening and on Sundays. However, none of the local routes do.

Modify Fare Structure

The current study is not a comprehensive fare study. However, based on a review of existing service needs, some general proposals for altering fares are offered for some services. In general, neither the cost nor ridership impact of such changes has yet been estimated. Fare policy is discussed further in Chapter 4.

3.8 Service Guidelines

In order to develop candidate improvements to address service deficiencies in the study area, a set of service guidelines was proposed. Transit agencies develop service policies to ensure consistent service offerings across their service areas. These policies often take the form of guidelines to use as services are reviewed on a routine basis or in a comprehensive study of a service area or corridor. Service guidelines usually distinguish among types of service and types of service areas. NJ TRANSIT has been continuing to develop guidelines on an ongoing basis as part of its studies of service in different regions. Recently draft guidelines were developed for use in the Greater Newark Bus Study, a much more urbanized area than

Northwest New Jersey. The guidelines proposed below have taken into account work on guidelines in prior NJ TRANSIT studies but are specifically designed to address the Northwest New Jersey study area.

The guidelines are specific to the type of service provided. Service types in the study area include interstate service to New York City, local service within New Jersey, and shuttle services—short-distance connectors from residences or workplaces to commuter rail or bus serving New York City. There are three types of local service. Primary routes provide basic coverage seven days per week. Secondary routes have more limited span and frequency of service. Community Circulator routes are primarily designed to allow those without access to cars to access essential services and do not necessarily provide service during the peak commuting hours. Service guidelines for each type of service are proposed below for six service characteristics. In some cases the improvements presented later in this memorandum propose to increase service to the span and frequency labeled "desirable" in the tables below. In other cases, the proposals seek to meet just the "minimum" category. If these proposals are adopted and ridership meets expectations, further improvements to the span and frequency of service would be justified.

3.8.1. 3.8.1 Service Span

The length of the service day and the availability of weekend service is largely a policy decision balancing budget constraints and the desire to provide convenient service. Desirable and minimum service span by type of route is shown in Table 3-1. For local service, meeting the guidelines for primary routes (and in some cases, secondary routes) involves a significant increase over what is available today. Longer hours of service provide access to non-traditional employment shifts and provide insurance for passengers that they will not be stranded without a way home if unusual circumstances prevent them from leaving at their usual time. Thus increasing the span of service may increase ridership during times of the day that were already served prior to the increase in span.

Table 3-1: Span of Service Guidelines by Type of Service:
Desirable Span of Service (minimum in parentheses)

	Weekday	Saturday	Sunday
Local - primary route	5 am - 1 am (6 am to 11 pm)	6 am - 12 midnight (6 am to 11 pm)	7 am - 11 pm (8 am to 10 pm)
Local - secondary route	6 am - 11 pm	-	-
Community Circulator	9 am to 4 pm	-	-
Shuttle	Peak only	-	-
Interstate	5 am - 12 midnight (6 am to 11 pm)	6 am - 12 midnight (6 am to 11 pm)	7 am - 11 pm

3.8.2. 3.8.2 Service Frequency

Like service span, providing a minimum frequency of service is a policy decision based on the desire to reduce waiting time and schedule delay (wasted time due to the mismatch between desired and available arrival times). As shown in Table 3-2, primary local routes ought to have service at least every 30 minutes. In the peak period on high-ridership routes, frequency will be governed by the need to provide capacity rather than policy minimums. On the other hand, if frequency on lower-ridership routes is increased to meet the policy minimum, reducing the vehicle size should be considered if maximum loads suggest that full-size buses are not needed.

Table 3-2: Desirable Service Headway (maximum headway in parentheses)

	Weekday	Saturday	Sunday
Local - primary route	30	30 (60)	60
Local - secondary route	60	60	n/a
Community Circulator	60	-	-
Shuttle	no max.	-	-
Interstate	30 (120)	60 (120)	60 (120)

3.8.3. 3.8.3 Loading

Loading guidelines are applied on the one hand to address bus crowding, which can be remedied by adding trips or using larger vehicles. On the other hand, if vehicles are too empty, smaller vehicles or less frequent service may be warranted. The loading guidelines are based on the vehicle seated capacity and the feasibility of permitting standees. Standees should be avoided on high-speed express service. Table 3-3 shows all the routes among those counted in spring 2008 that had individual trips that exceeded the maximum load. Another useful metric is "maximum 30 minute load", which is the average of the maximum loads of trips during the busiest 30-minute period of the day (or of a particular time period). A maximum 30 minute load in excess of the desired maximum capacity indicates the need for more frequent service and/or larger vehicles.

Table 3-3: Trips Exceeding Maximum Load by Route

Route	Trips counted that exceeded the maximum load
NJT 193	1
NJT 194 – Sat	1
NJT 195	1
NJT 197	5 (3 midday, 1 Sat, 1 Sun)
NJT 198 – Sat	1
Lakeland 46 – Sat/Sun	3
Lakeland 46/80- Sun	1
Lakeland 80-Newton	1

Note: routes not listed did not have any trips exceeding the maximum load.
No loading data were available for Community Coach 77 or Newark routes (NJT 29, 73, 79).

3.8.4. 3.8.4 Service Coverage

Service coverage was examined using GIS and demographic and land use data to identify unserved markets for transit service. Local or shuttle bus service coverage was considered for business parks and concentrations of 500 or more employees, especially those with many service sector employees, such as hospitals and colleges; shopping centers or big box retailers with more than 250,000 square feet of floor area; and government service centers.

3.8.5. 3.8.5 Bus Stop Locations

Bus stops should be carefully spaced in order to balance passenger convenience and travel speed. Generally official stops should be marked, with signs indicating the routes which serve the stop. Highly visible stops make it easy for passengers to locate stops and increase awareness of bus service among the general public. Properly spaced stops permit the route to serve many passengers without having to stop frequently. Some municipalities in the study area do not permit bus stop signs, resulting in some locations with few or no marked bus stops. In low density areas with few walk-up passengers, it may be desirable to permit buses to make flag stops to pick up passengers at any safe location along the route. However, official stops should be installed instead if some locations are particularly unsafe for buses to stop, or if buses are making many flag stops in a short distance. NJ TRANSIT has a "Request a Stop" program that permits passengers to request the bus to stop anywhere on the route, between the hours of 7:00 pm and 7:00 am. The operator is instructed to honor the request if the location is safe and convenient. Private operators should consider adopting the same policy.

3.8.6. 3.8.6 Route Design

Route design guidelines are useful when reviewing existing routes and proposing new routes. The following guidelines help to ensure routes provide the greatest possible passenger benefit, while minimizing adverse reliability impacts.

- For local routes, one-way running time should be 30 to 60 minutes, and no more than 75 minutes.
- For express routes, one-way running time may be as much as two hours.
- A single route should not attempt to service too many markets or functions.
- Routes should have consistent and understandable patterns, with no more than 5 different variations (preferably no more than 3).
- Doubling back and retracing steps should be avoided.
- Where routes share a trunk portion, the headways should be coordinated so that trips are evenly spaced.

4. Technical Analysis/Development of Candidate Improvements

This chapter identifies specific improvements intended to address the market needs and opportunities discussed in Chapter 3. The candidate improvements are the product of iterative analysis by the consulting team and discussions with NJTPA, NJ TRANSIT, county planners and other key stakeholders. Following review and comment by the key stakeholders, the improvement strategies were refined and advanced to candidate strategies, discussed in Chapter 5.

Transit service improvements in each study area corridor were subjected to early qualitative screening to identify fatal flaws and other reasons why some candidate improvements should not be advanced into further analysis. Ridership and cost estimates were made for candidate service improvements that were advanced to quantitative evaluation. Facility strategies were evaluated based on feasibility and expected benefits. For each improvement strategy, this chapter provides descriptive information and evaluation criteria in a series of tables. In the case of both service and facility strategies, the improvements reflect the application of the service guidelines discussed in Chapter 3.

While there are distinct sets of service, passenger facility and running way strategies, the candidate improvements are designed to work together in providing an improved customer experience. These changes would be supported by marketing, customer information and fare strategies that are discussed at the end of this chapter (and mentioned where relevant in the discussion of candidate service and facility improvements). To facilitate understanding of the candidate improvements and their evaluation, the improvements were described by type in Chapter 3 but grouped by major travel corridor in this chapter. Tables listing the candidate improvements by corridor provide a summary of the improvements under consideration.

While the candidate improvements address identified needs and opportunities and many may be deemed cost-effective and worthwhile, financial constraints may limit the number of them that can be implemented in the near term (see discussion in Chapter 5).

4.1 Proposed Service Improvements

This section identifies problems and opportunities related to existing services or that suggest a need for new service and offers improvements. The candidate improvements were developed to be consistent with the general strategies and the service guidelines described in Chapter 3. Specific findings are presented by corridor below:

4.1.1. Service Concepts for the Sussex – Passaic Corridors

Concept: Increase NJT 194 Service in the Off Peak and Serve NJ23 in Riverdale

NJT 194 has a total of 1,913 daily boardings, 20% of which are intrastate trips, yet the off-peak service is infrequent (every two hours). Some new large retail and residential developments on NJ23 in Butler are not currently served. This concept would add new trips to provide hourly service between Butler and the Willowbrook Mall. Within Riverdale, trips would alternate between the current regular route via Main Street and NJ 23, the latter providing new service to Riverdale Crossing and Cedar Crest Village (see Figure 4-1). The bus would enter each of these developments. In the case of Cedar Crest, it would meet an internal shuttle bus at the entrance. It would then turn around and cross NJ 23 at a signalized intersection and

serve a proposed new park-and-ride (during commuting hours) either entering the lot or stopping in front of the entrance. With the cooperation of the owners, a park-and-ride could be developed at this or a nearby site (see proposed new Riverdale shared park-and-rides in the Passenger Facilities section). Since there are many off-peak NJT 324 trips (direct from Wayne Transit Center to PABT), the proposed new NJT 194 trips would essentially be extensions of these existing 324 trips, rather than completely new trips.

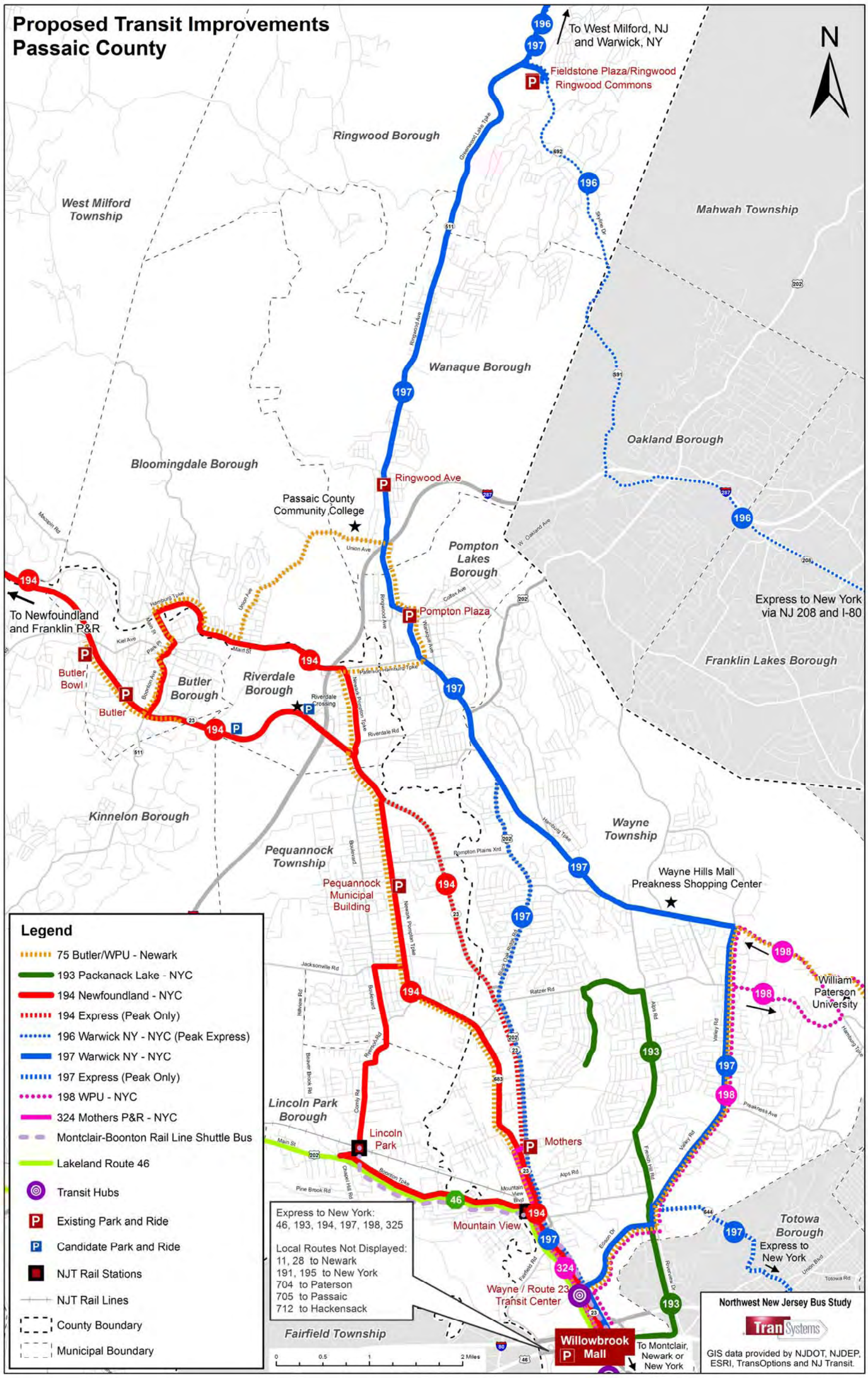
Concept: Extend Peak NJT 194 Trips to Franklin or Vernon

Extending NJT 194 farther into Sussex County could provide more park-and-ride capacity and create a connection to the Sussex County Transit loop bus. If extended to Franklin or Hamburg, which have relatively high population density, it would also serve some walk-access trips. The concept would extend select peak trips to Franklin or Vernon, if a suitable park-and-ride lot can be leased. Potential park-and-ride lots in Franklin are discussed in the Passenger Facilities section (4.3). Parking facilities at Mountain Creek in Vernon are available as weekday park-and-ride lots. Connections would be available in Franklin to Sussex County Transit loop routes.

Concept: Extend Off-Peak NJT 194 Trips to Franklin or Vernon

Currently there is only peak period, peak direction service to Stockholm (Hardyston Township), the only NJ TRANSIT service between Sussex County and New York City. Off-peak service operates every two hours to Newfoundland (West Milford Township), about five miles east of Stockholm. This concept would extend off-peak service 22 miles from Newfoundland to Stockholm and then via Franklin and Vernon to Warwick, NY. From Stockholm, the proposed route would continue on NJ23, then north on NJ94 to Warwick. It is also proposed that these extended 194 trips be “interlined” with 197 trips, which currently terminate in Warwick. This would enhance local service since passengers would then be able to travel in either direction between Warwick and Stockholm and would have access to any point along the existing NJT 194 and 197 routes.

Figure 4-1: Proposed Fixed Route Transit, Passaic County



Concept: Add Union City Stop on Reverse and Off-Peak NJT 197 Trips

NJT 195 stops on Bergenline Avenue in Union City to provide reverse-peak service, enabling residents of densely populated, low-income Union City and adjacent towns to travel to northwestern New Jersey destinations including the Willowbrook Mall. Adding similar stops on NJT 197 reverse peak trips would provide a faster trip to Willowbrook and one-seat access to many jobs and other opportunities in Wayne. Analysis of the regional model data shows that almost no Union City residents are currently going to Wayne or anywhere in the study area. However, there may be latent demand for such service that the model cannot be used to identify.

Concept: Provide Hourly Service, Extend Evening Span, and Limited Saturday Service on Sussex County Transit (SCT) 101 & 102

This long loop route provides the only fixed route service for much of Sussex County, serving both work and other trips. (See Figure 4-2.) Six trips run in each direction on weekdays, with up to four vehicles operating at a time (three 24-seat Bluebird minibuses and one paratransit van). The service operates between 5:00 AM and 6:30 PM on weekdays only. The current schedule is difficult to understand because it does not clearly show the start and end of trips and there is an overlap in the route (i.e., a single trip covers a segment a second time before beginning the next trip). In part because of this overlap, service does not operate hourly, even though the route distance, scheduled travel time and the number of vehicles available should permit hourly service. According to SCT, peak period trips are often full particularly the last trip of the day.

This concept would adjust the loop bus schedule to provide hourly service, preferably on clockface headway, by eliminating the existing route overlap within Newton. It is also proposed that the service span be extended from 6:30 PM to 8:00 PM to provide late afternoon and evening trips. New Saturday service is proposed to be provided on a linear route between Newton and Sussex Borough via Sparta and Franklin. Trips should be coordinated wherever possible to meet Lakeland service in Newton and/or Sparta, proposed extended NJT 194 service in Franklin, and the proposed new Franklin-Vernon route. NJ TRANSIT can provide technical assistance to Sussex County Transit in with scheduling and improving operation of the service.

Concept: Simplify the Route and Schedule for the West Milford Township Bus Service

The existing West Milford Township route is complex and the schedule is hard to understand. One branch operates only one day per week. There are opportunities for rationalizing and restructuring the route. NJ TRANSIT has already prepared a plan to rationalize the route structure and operation of the service. The concept would operate a consistent schedule each weekday and eliminate many circuitous deviations that are in the present route alignment (see Figure 4-3).

Figure 4-2: Proposed Transit Improvements, Sussex County

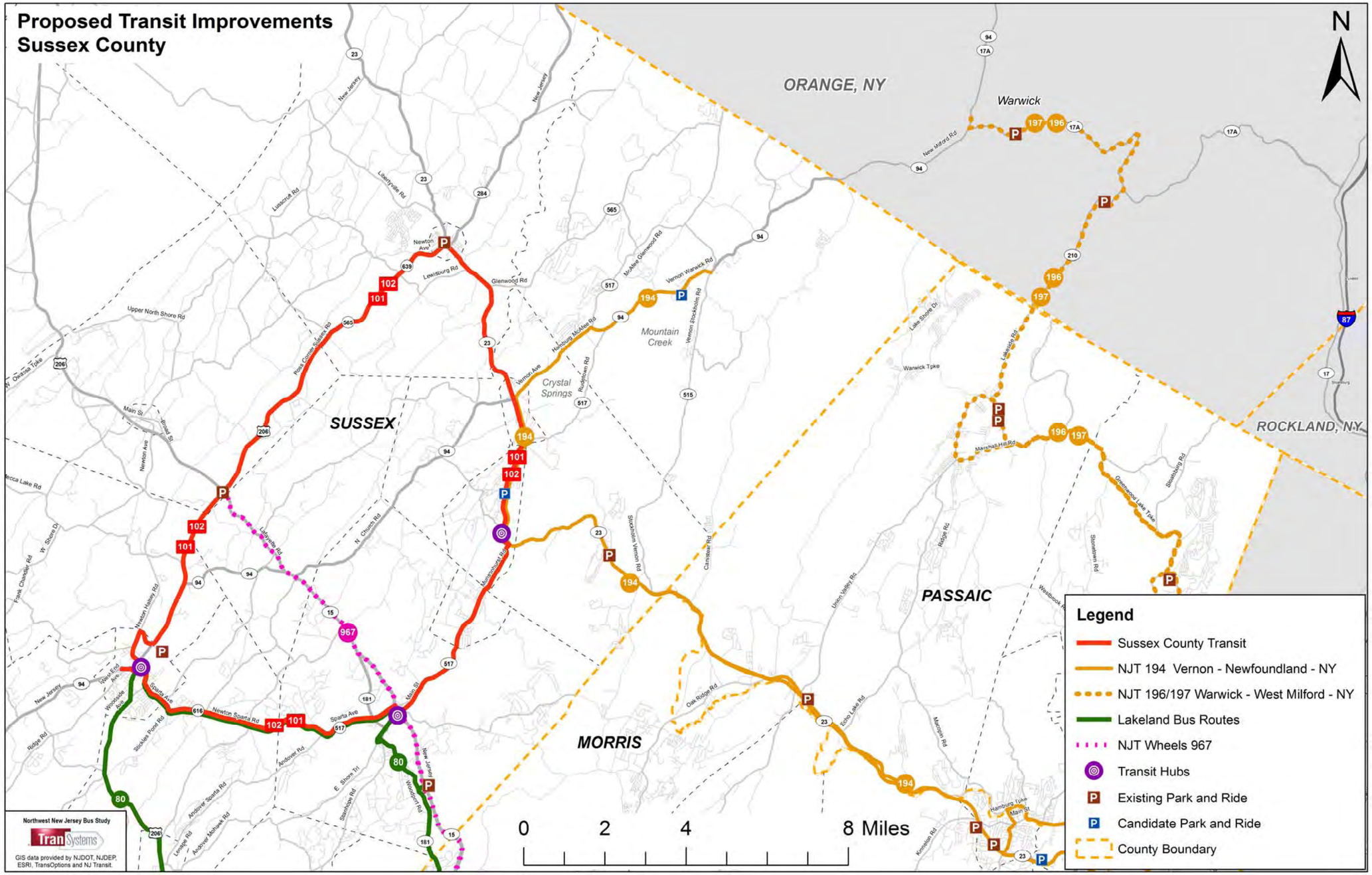
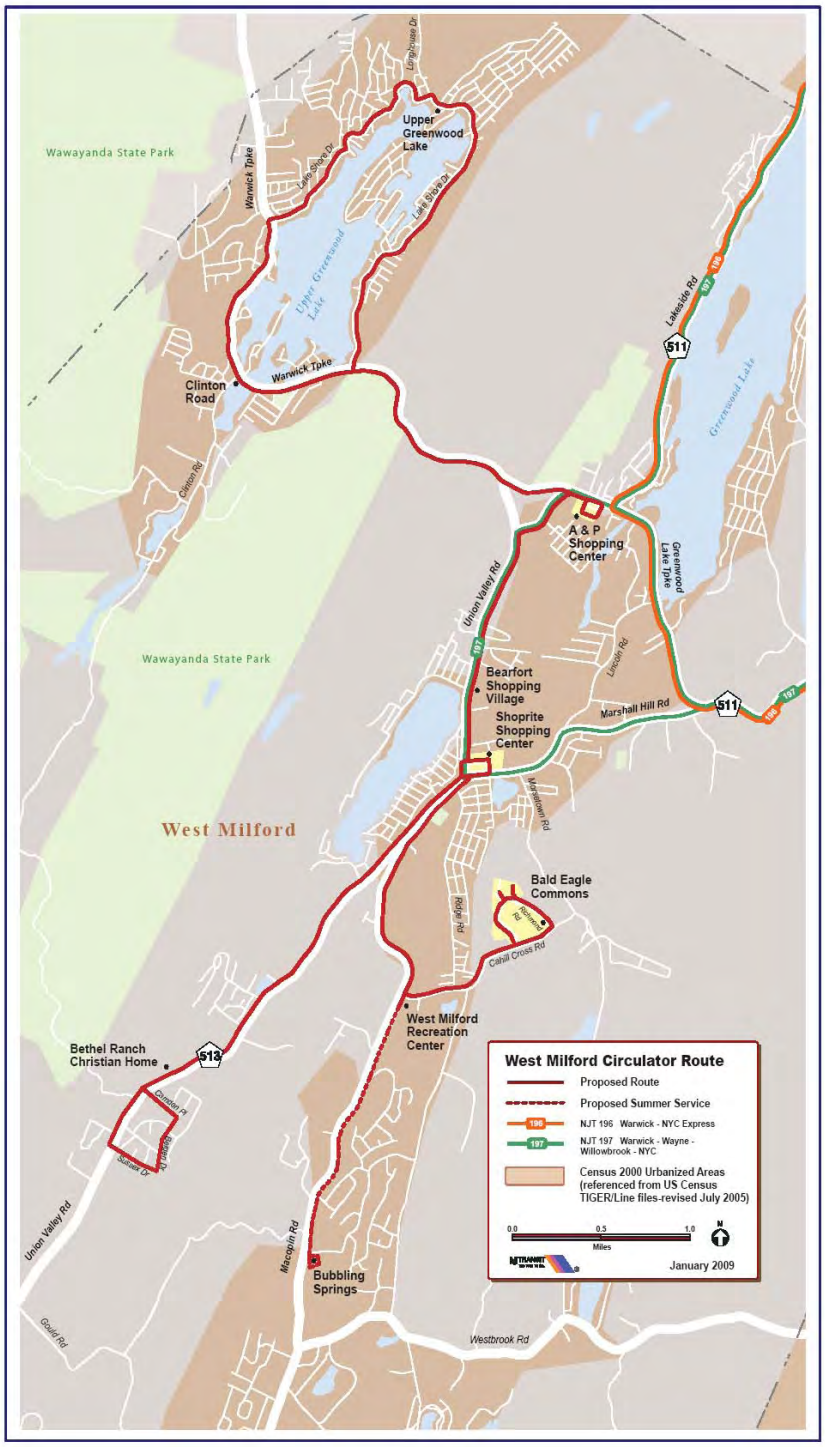


Figure 4-3: Proposed West Milford Circulator Route
Source: NJ TRANSIT



Concept: New Circulator Route Serving Franklin and Vernon

Vernon Township has two large employers concentrated in a small area -- Mountain Creek (a ski resort in the winter and a water park in the summer) and Crystal Springs (a golf resort). Together they provide

thousands of jobs and attract many recreational visitors. The resorts employ some low-wage workers who live in the Paterson area and other places where there is affordable housing, and who may not have access to automobiles. NJT operates an express service to Mountain Creek in the winter on weekends and holidays serving PABT and Wayne Transit Center. For commuters from Vernon Township, the only nearby transit alternatives for travel to New York City require driving to the Stockholm Park-and-Ride (served by NJT 194 in the peak period only), driving to Warwick, NY (served by NJT 197 and 196 in the peak period and 197 in the off-peak), or driving to Sparta to take the Lakeland bus. Since there is peak-season traffic congestion associated with the two resorts and the Township is very interested in public transit alternatives for this area.

Service between key points in Vernon (including the resorts) and Franklin could serve the following potential markets:

- Peak-period commuters wishing to access NJT 194 in Franklin (or possibly Stockholm, in snowy or icy weather when the coach buses are unable to serve Franklin). The bus would serve a new park-and-ride lot at Weis Market (see conceptual design in the Passenger Facility section) or Shop-Rite. This market is somewhat limited in that most commuters are expected to choose to park-and-ride instead of taking a feeder bus. Furthermore, this group might be better served by the proposed peak extension of NJT 194 to Franklin and Vernon, discussed previously.
- Vernon and Franklin employees, especially those at resorts, who live within walking distance of the shuttle service.
- Seniors, teens, and others without cars either making trips within Vernon or connecting to Franklin and the Sussex County Transit loop bus.
- Resort guests from New York City arriving via NJT 194, assuming reverse peak 194 trips were extended to Franklin on selected in-season weekdays. (Note that there are already direct NJ TRANSIT special trips on select weekends from PABT to Mountain Creek.) This group would be better served by the proposed off-peak NJT 194 service to Stockholm, Franklin, and Vernon, and new summer resort service, both also discussed previously.

Concept: Summer Season Special Service to Vernon Resorts

While bus service is provided to Vernon ski areas in the winter season, there is no bus service in the summer to the recreational sites located there (e.g., water park and golf resort). This concept would provide select weekend and holiday trips in the summer season from New York City to Vernon. Like the existing winter season trips, they would serve only PABT, Wayne Transit Center, and Vernon. There would be one morning westbound trip and one evening eastbound trip.

Three options have been developed for a new local circulator/shuttle to address these potential markets:

Option A. Short Route from Franklin to Vernon via Hamburg, Half Hourly Service

This proposed route would provide a loop shuttle from Franklin to the resorts in Vernon via Hamburg. The cycle time (loop round trip plus recovery) would be one hour. Two buses would be required to provide service every half hour. Passengers could transfer to the proposed extended NJT 194 in Franklin for service to New York City. (In snowy or icy conditions when the cruiser buses used on NJT 194 cannot serve Franklin due to the hilly topography, this route could be extended to Stockholm to maintain the connection to New York service.)

Option B. Short Route from Franklin to Vernon via Hamburg, Hourly Service

This option would use the same routing as Option A; however, service would be provided hourly using a single bus. This service frequency is comparable to that of the existing SCT Loop Bus.

Option C. Longer Route from Newton to Warwick via Franklin and Vernon

In this option, an extended form of the route described in Options A and B would connect to Newton via NJ94, which has some of the highest density and lowest income populations in Sussex County, as well as important services at the County Administration Building. In the other direction, the route would extend to Warwick, NY, which is the nearest small town and has existing NJ TRANSIT service to New York City (which, unlike the NJT 194 in Stockholm, offers off-peak trips).

TransOptions has received CMAQ funding for up to eight hours of day of bus service in Sussex County as a means of reducing traffic congestion on US-23. As of the writing of this report, they are planning a bus shuttle service in the Vernon area that will provide a peak-period connection to NJT 194 as well as local service immediately after the early-morning and before the evening New York City service. The bus would make a loop between the Stockholm Park-and-Ride and Vernon Center via County Route 515 and NJ-94. If NJT 194 is extended to Franklin, the route would be modified to serve the park-and-ride there instead of Stockholm.

Transit Hubs in Sussex-Passaic Corridors

The two major existing transit hubs in this corridor are the Willowbrook Mall and the Wayne/23 Transit Center, both in Wayne. Opened in 2008, the Wayne/23 Transit Center has taken over some of the park-and-ride role from Willowbrook; however, it is only served by three (NJT) bus routes and is not a major transfer point between bus routes (but rather between automobiles and transit). Willowbrook Mall is a major hub both for connections between bus routes and for park-and-ride. It has both a shopper's stop and a commuter stop located in its parking lot. Routes that serve Willowbrook Mall include NJT 191, 193, 194, 195, 197, 198 with service to New York and NJT 11, 704, 705, 712, 748 and MCM1 which provide intrastate service. Lakeland's 46 and 46/80 service, which is the only service in many locations in the study area, stops near the Willowbrook Mall but does not enter it because of the time delay involved. Other locations for transit hubs in this corridor were considered, however, there are few opportunities since few places are served by many routes and most routes are oriented to New York. Therefore, instead it is proposed to provide improved passenger amenities at the Willowbrook Mall Park-and-Ride and Shoppers Stop meeting the "transit center" guidelines (see the discussion in Passenger Facilities section (4.3)).

As discussed in the Passenger Facilities section, a new park-and-ride is proposed for Franklin. This could be designated as a transit hub since it would be served by the existing SCT loop bus and two proposed services: the extended route 194 to New York and the proposed new Franklin to Vernon community circulator route.

As also discussed in the Passenger Facilities section, it is proposed to create a minor transit hub in Newton to facilitate connections between Sussex County Transit and Lakeland 80. Possible locations for such a hub include the Sussex County Administrative Center, Shop Rite and the Newton Park-and-Ride lot.

Summary of Service Concepts for Sussex-Passaic Corridors

The concepts discussed above are summarized in Table 4-1. Note that the concepts that were considered and not advanced are not included in the table.

Table 4-1: Summary of Service Improvement Concepts, Sussex-Passaic Corridors

Candidate Improvement	Description	Need Addressed	Market/ Issue Addressed	Current Operator (if applicable)	New or Existing Service	Type of Improvement	Existing Vehicle Type	Existing Span	Existing Frequency (minutes)	Proposed Vehicle Type	Proposed Span	Proposed Frequency (minutes)	Operating Mode (Type of Route)	Proposed Fare	Facility Improvement Required
NJT 194 extension to Franklin, peak periods	Extend select peak trips to Franklin or at new park-and-ride	1-Strengthen Transit	New York City	NJ TRANSIT	existing	extend trips	cruiser	peak only	30-60	cruiser	peak only	30-60	express	NJT standard	Franklin P&R
NJT 194 extension to Vernon, peak periods	Extend peak trips to Franklin and Vernon, serving new park-and-rides in each location	1-Strengthen Transit	New York City	NJ TRANSIT	existing	extend trips	cruiser	peak only	30-60	cruiser	peak only	30-60	express	NJT standard	Franklin and Vernon P&R
NJT 194 Butler - increased frequency	Increase frequency from two-hourly to hourly; new trips will operate on NJ23 in Riverdale. Add deviation serving Lincoln Park and US-202.	1-Strengthen Transit	local	NJ TRANSIT	New	new service	cruiser	wkdy 7a-1a; Sat-Sun 9a-1a	120 (trunk)	cruiser	wkdy 7a-1a; Sat-Sun 8a-1a	60 (trunk), 120 (new)	local	NJT standard	
NJT 197-Union City	Add stop in Union City to service Hudson County residents going to Wayne, off-peak times only	1-Strengthen Transit	local	NJ TRANSIT	existing	Add stop	cruiser		30 off peak	cruiser	Would stop only reverse & off peak	30 off peak	express	NJT standard	
Summer Weekend Vernon Express	Serve Vernon resorts on summer weekends (similar to existing winter service)	1-Strengthen Transit	New York City			Add charter service				cruiser	1 trip per direction per day	n/a	Express	Same as winter service	
SCT Sussex Loop bus	Extend span; increase frequency. Schedule coordination with NJT 194 and Lakeland 80.	2-Improve Connectivity	local	Sussex County	existing	increase span & frequency	minibus	wkdy 5a-6p	120-150	minibus	wkdy 5a-8p; Sat 9a-5p	60	local	NJT standard	
Vernon-Franklin (half-hourly)	New route from Vernon to Franklin	2-Improve Connectivity	local	n/a	new	add new route	-	-	-	minibus	wkdy 6a-8p	30	local	NJT standard	Franklin or Vernon P&R
Vernon-Franklin (hourly)	New route from Vernon to Franklin	2-Improve Connectivity	local	n/a	new	add new route	-	-	-	minibus	wkdy 6a-8p	60	local	NJT standard	Franklin or Vernon P&R
Newton- Franklin-Vernon-Warwick (hourly)	New route from Warwick NY to Franklin and Newton.	2-Improve Connectivity	local	n/a	new	add new route	-	-	-	minibus	wkdy 6a-8p	60	local	NJT standard	Franklin or Vernon P&R
Restructure West Milford Circulator	Rationalize service and restructure community route	2-Improve Connectivity	local	West Milford	existing	restructure	minibus	Wkdy 9-4	60	minibus	Wkdy 9-4	60	local	existing	

4.1.2. Service Concepts for the Sussex – Morris Corridors

Concept: Add Off-Peak Trips to Lakeland 80 (Newton & Sparta to New York)

During off peak periods there are currently few (Lakeland route 80 or 46/80) trips between Sparta and Newton and other places in Sussex County and New York City. In addition, as noted, the existing Lakeland fare structure makes short local trips expensive compared to NJ TRANSIT standard fares.

This concept would add or extend midday trips west of Dover to provide service approximately every hour to Newton and Sparta. The new midday extended trips would serve Newton and then head east on Newton-Sparta Road to Sparta, and then follow the current route to Rockaway Mall, Dover Center, and the Lakeland bus terminal, picking up the existing Lakeland 46 local route to New York. *These added trips would supplement, but not replace, the existing Newton and Sparta off-peak trips.* Reverse peak service could be added by converting existing "deadhead" trips to revenue service trips. The specific trips to be added are as follows:

- Weekdays, eastbound
    - Add a new 8:30 AM express trip serving Newton, Sparta, and Roxbury Mall.
    - Extend four midday Lakeland 46 trips to Newton and Sparta (combined route).
    - Extend three evening peak Lakeland 46 trips to Newton and Sparta (combined route) - This may require additional buses.
    - Extend one night Lakeland 46 trip to Newton and Sparta (combined route) – Specifically the trip departing Dover at 9:55 PM).
- Weekdays, westbound
    - Extend five midday trips (9:00 AM to 12:00 noon hourly departures from PABT) to terminate in Sparta and Newton (combined). This adds 80 to 90 minutes to the cycle time.
    - Add a late evening express trip (departing NYC at 10 PM).

Based on a customer request from the passenger survey, this concept would also restore a bus stop on the Sparta route at Prospect Point Road, Woodport.

Concept: Convert Wheels 967 Ross Corner/Sparta to Parsippany into Dover Railroad Station Shuttle

This commuter express route designed to serve Sussex County residents who wish to commute to jobs in Parsippany was originally intended to use the high-occupancy vehicle "diamond" lanes on I-80 that since been converted into general purpose lanes. There are only two trips per day in each direction. Sussex to Parsippany is a very challenging market to serve, and as a consequence, very few boardings on Wheels 967 were recorded in the ride checks (an average of only 2.5 per trip). The goal of the route, to provide job access, may be achieved by revising it to serve somewhat different markets in the area. This concept would modify the route to link Sussex County with Dover Station where trains can offer connections to many job locations. The two vehicles assigned to the existing Wheels 967 route, currently making one long trip each, would instead make two trips each to meet train departures or arrivals in each peak period. These trips would provide access to the Midtown Direct NJ TRANSIT rail service to New York, as well as to other rail service to New Jersey destinations east or west of Dover. Most trips would originate in Ross's Corner, but some trips would originate in Sparta (so that more trains can be met). The shuttle would serve 4,000-employee Picatinny Arsenal on the return trip, providing a "last mile" shuttle connection from Dover Station.

Transit Hubs in Sussex-Morris Corridors

The following existing and proposed transit hubs would be strengthened by the service concepts described above and the passenger facilities described later in this chapter:

- The Rockaway Mall is the major existing hub in this corridor. All Lakeland bus trips from Sussex County serve this Mall, and in the peak period continue non-stop from there to New York. The Rockaway Mall would be improved as a transit hub by providing shelters, information, landscaping, and other amenities. Depending on the future location of the transit hub at the mall, local bus service could serve the hub only or could also stop at the door of the mall, as it does today. See discussion in the Passenger Facilities section (4.3). Bus service to the mall would be improved by increasing the frequency of MCM 10 and adding a new local route MCM 5 to the Roxbury and Ledgewood Malls via Dover Center.
- The existing Sparta Police Station Park-and-Ride could become a small transit hub by adding a shelter and passenger information and improving the span of service of the Sussex County Transit loop bus (as proposed).
- Create a New Small Hub at the Newton Town Hall
- This would include installation of a shelter, information, and other amenities. The hub would be served by the existing Sussex County Transit loop bus, Lakeland 80 to New York, and the proposed extended Newton-Franklin-Vernon shuttle.

With the proposed revised Wheels 967 rail shuttle described earlier that would provide bus access from Sussex County to Dover Station, the latter would become more of a hub for this corridor than at present.

Summary of Service Concepts for the Sussex-Morris Corridors

The concepts discussed above are summarized in Table 4-2. Note that the concepts that were considered and not advanced are not included in the table.

Table 4-2: Summary of Concepts, Sussex-Morris Corridors

Candidate Improvement	Description	Need Addressed	Market Issue Addressed	Current Operator	New or Existing Service	Type of Improvement	Existing Vehicle Type	Existing Span	Existing Frequency (minutes)	Proposed Vehicle Type	Proposed Span	Proposed Frequency (min)	Operating Mode (Type of Route)	Proposed Fare
Lakeland 80 - Newton and Sparta	Add midday trips to Newton via Sparta; extend existing midday Sparta branch trips to Newton.	1 – Strengthen Transit	New York City	Lakeland	existing	add trips	cruiser	9:30 am to 3:10 pm	120	cruiser	6a-12a	120	express	New local fare
Wheels 967 - shuttle to Dover	Convert into Dover RR station shuttle serving Sussex residents and Picatinny Arsenal employees.	2 – Improve Connectivity	New York City	First Student	existing	change route	minibus	peak only	two daily round trips	minibus	Peak only	meet 3 trains in each peak period	commuter shuttle	NJT standard

4.1.3. Service Concepts for the Morris County Corridors

Concept: Develop New Shared-Use Park-and-Ride Lots in the I-80/US46 Corridor
All park-and-ride lots east of Netcong are close to or at capacity, which appears to inhibit further ridership growth on the Lakeland 46 and 80 routes. At some lots, such as Rockaway Mall, the number of boardings greatly exceeds the number of official park-and-ride spaces. If property owners consent, the number of spaces designated for park-and-ride use at existing park-and-ride lots should be expanded. Potential sites for new shared-use park-and-ride lots are proposed under the Passenger Facilities section of this document.

Concept: Improve Local Connections to Lakeland 46

Lakeland Route 46 starts at the Lakeland Terminal in Dover, a few miles east of the center of town. Although the MCM 10 stops near the terminal, starting the 46 local in the center of town would permit connections with the MCM 2, the "Morris on the Move" shuttle to Mount Olive (which is proposed for expansion in this study), and NJ TRANSIT rail. Moreover, the town center is much more convenient to the desired destinations of most local transit users. A related issue is that the Lakeland 46 stops on US 46 near Willowbrook Mall but does not enter the mall due to the time delay involved. Willowbrook Mall is a popular destination both because it is a large regional mall and because of the many bus transfer opportunities. The walk to the Mall from the New York-bound bus stop on US 46 near Willowbrook is inconvenient. The walk to the westbound stop is not only inconvenient but also hazardous because there is no safe place to cross US 46 without a very long detour. Transit riders are tempted to run across US 46, which is a high-speed, limited access, divided highway in this location.

To improve the use of Lakeland 46 to travel within New Jersey, this concept would have the Lakeland 46 add a stop inside the Willowbrook Mall transit hub and start trips at Dover center (with town cooperation) to permit walk access and transfers from local routes. Since both of these changes would increase running time, they would be most feasible in off-peak periods when demand is lower and traffic congestion less severe. During peak periods, a separate Dover center to Willowbrook Mall Shoppers Stop route is proposed, to be operated by Lakeland Bus Lines, in order to serve local trips without delaying through trips by having the 46 enter the Mall.

Concept: Provide Lakeland 80 Service to a New Park-and-Ride at the Roxbury or Ledgewood Malls

This concept would extend selected existing Lakeland 80 trips that begin/terminate at Rockaway Mall, Mount Arlington or Dover Terminal (evenings after peak only) to a new Lakeland "overflow" park-and-ride lot at the Roxbury (or Ledgewood) Mall (assuming it is not possible to sufficiently increase parking at Mount Arlington and/or the Rockaway Mall). It is also recommended that one morning eastbound new trip and two evening westbound new trips be added in order to provide a sufficient span and frequency of peak-hour trips (assuming room is available at PABT). This addition may require a few extra peak vehicles and is contingent upon securing a park-and-ride facility at the Roxbury or Ledgewood Mall (see discussion in Passenger Facilities section).

Concept: Add Several Trips to Community Coach 77 Morristown – New York

Only 10% of the 1,628 inbound boardings on the Community Coach 77 are within the study area. The service frequency and span on this bus route in the study area are less than Lakeland 46 or NJ TRANSIT Morris & Essex line commuter rail service but generally meet the service guidelines described in the previous chapter. The passenger survey conducted for this study found that the average rating of service

quality was lower for this operator than for the others, across all measures of quality. The route does not currently serve any park-and-ride lots in the study area, although it does serve park-and-ride lots at the Livingston Mall and South Mountain Arena in West Orange. Although it is the only transit service in some parts of the study area, no local (intrastate) trips are permitted. The route serves areas which the Morris County Development Review has identified as new mixed-use developments or sites planned for redevelopment. This is also the only route in the study area that receives no public subsidies.

This concept would enhance the 77's convenience to study area riders. It would add earlier morning trips on weekends to meet span guidelines. Although passenger counts indicate excess capacity even on peak trips, a few additional peak trips may be required to serve new park-and-ride customers if such facilities are developed as proposed in the Passenger Facilities section (4.3) of this report. Trips would be added at times when there currently is no service: between 7:45 and 8:45 am and between 4:00 and 4:30 pm.

Two complementary concepts to this service improvement are proposed. Fare and operating policy should be changed to permit local trips and offer a local fare structure similar to NJ TRANSIT standards. This would offer new service in areas not currently served by any route. As discussed in the Passenger Facilities section, new park-and-ride lots were evaluated along NJ 10 in Whippany and East Hanover.

Concept: Introduce Shuttle Bus Service for Rail Stations between Lincoln Park and Montclair State University Station

The Montclair-Boonton Line rail service west of Montclair State University is very infrequent during the off-peak, and in the reverse peak direction. Under contract to NJ TRANSIT, Lakeland has operated substitute bus service from Dover to Montclair at times when the rail line was temporarily out of service west of Montclair. A similar connecting service could be offered at times when trains do not operate west of Montclair, thereby increasing the span and frequency of service to meet the proposed standard for interstate bus service. This concept would provide a weekday bus connection serving the railroad stations between Lincoln Park and Montclair to meet New York-bound trains at Montclair State University. Buses would also stop at the Willowbrook Mall to enhance local connectivity and increase transfer opportunities. Because stations farther to the west have low ridership, it is recommended that the eastbound service on the proposed shuttle would start at Lincoln Park and serve Mountain View, Wayne/Route 23, Willowbrook Mall, Little Falls, Great Notch, and then connect to New York-bound trains at Montclair State University. The new bus connection would offer two morning reverse peak trips westbound, four afternoon and evening eastbound trips, and several trips between existing train trips to improve frequency of service. The new bus trips would be shown on the train schedule and the fare policy would be exactly the same as the rail fare policy.

Concept: Restore Morris Plains Rail Station Shuttle Bus

Parsippany and surrounding towns have a high concentration of jobs in office parks, but few of these are easily accessible by transit. The strongest market for transit riders to these office parks consists of 'reverse' commuters coming from New York City, Hoboken, Jersey City, and Newark. This market is best served with "last mile" bus shuttles designed to meet specific train arrivals and stopping at the front door of each office building. NJ TRANSIT operates a shuttle service from Convent Station (Wheels 966). It consists of two separate routes: Route 1 has 110 daily boardings and Route 2 has 70 daily boardings. TransOptions offered another route from Convent Station to Giralda Farms with 58 daily boardings and one from Morris Plains to the Mack-Cali complex with 88 daily boardings, until late 2009 when funding expired. While the Morris Plains shuttle no longer exists (except for a private shuttle to Johnson & Johnson), the Giralda

Farms shuttle was modified slightly to serve only one employer, Maersk (which is willing to pay for the service and had previously accounted for the vast majority of riders).

This concept would restore the Morris Plains shuttle as a joint operation of TransOptions and NJ TRANSIT. It would offer the same fare policy as Wheels 966: cash payment of the NJ TRANSIT transfer fare (currently $0.65) or free with a NJ TRANSIT rail pass. Although it would be open to the public, the route would only serve the front doors of employers who agree to provide a matching payment to TransOptions.

Concept: Modify Wheels 966 Convent Station Shuttle Route

As mentioned above, NJ TRANSIT operates two shuttles from Convent Station (Wheels 966). Route 1 offers six trips from the station in the morning and five trips to the station in the evening. Route 2 offers five trips in the morning and four in the evening. The Wheels 966 shuttle has sufficient ridership to justify the service, particularly on Route 1. In this concept, a few unserved office complexes on Park Avenue would be added to the route. The two 966 routes are completely separate and should be numbered separately. The route should be rebranded as a rail connection shuttle (distinct from other types of Wheels service which typically are local community circulators). The service should be noted on the Morristown Line train schedule. The new schedule for the service should include arrival and departure times of connecting rail trips at Convent Station.

Concept: Introduce a New Denville Station Shuttle

To identify locations for potential additional shuttles, the office parks in Morris County (based on data obtained from the Morris County Economic Development Corporation) were mapped and grouped into clusters, and the number of rented square feet of office space was summed by cluster (see Figure 4-4). The following major clusters of office parks in the study area lacking any transit shuttle service were identified:

- Morris Corporate Center (Walsh Dr, Cherry Hill Rd and Interpace Pkwy), Parsippany
- Waterview Blvd, Parsippany
- Littleton Road, Parsippany
- South Street and Madison Avenue, Morristown

(This list does not include Mack-Cali and other office parks near Morris Plains Station that already had service at the time the analysis was conducted.) The first three clusters could be served by a new shuttle from Denville Station. The last cluster could be served by a new shuttle from Morristown (see concept below).

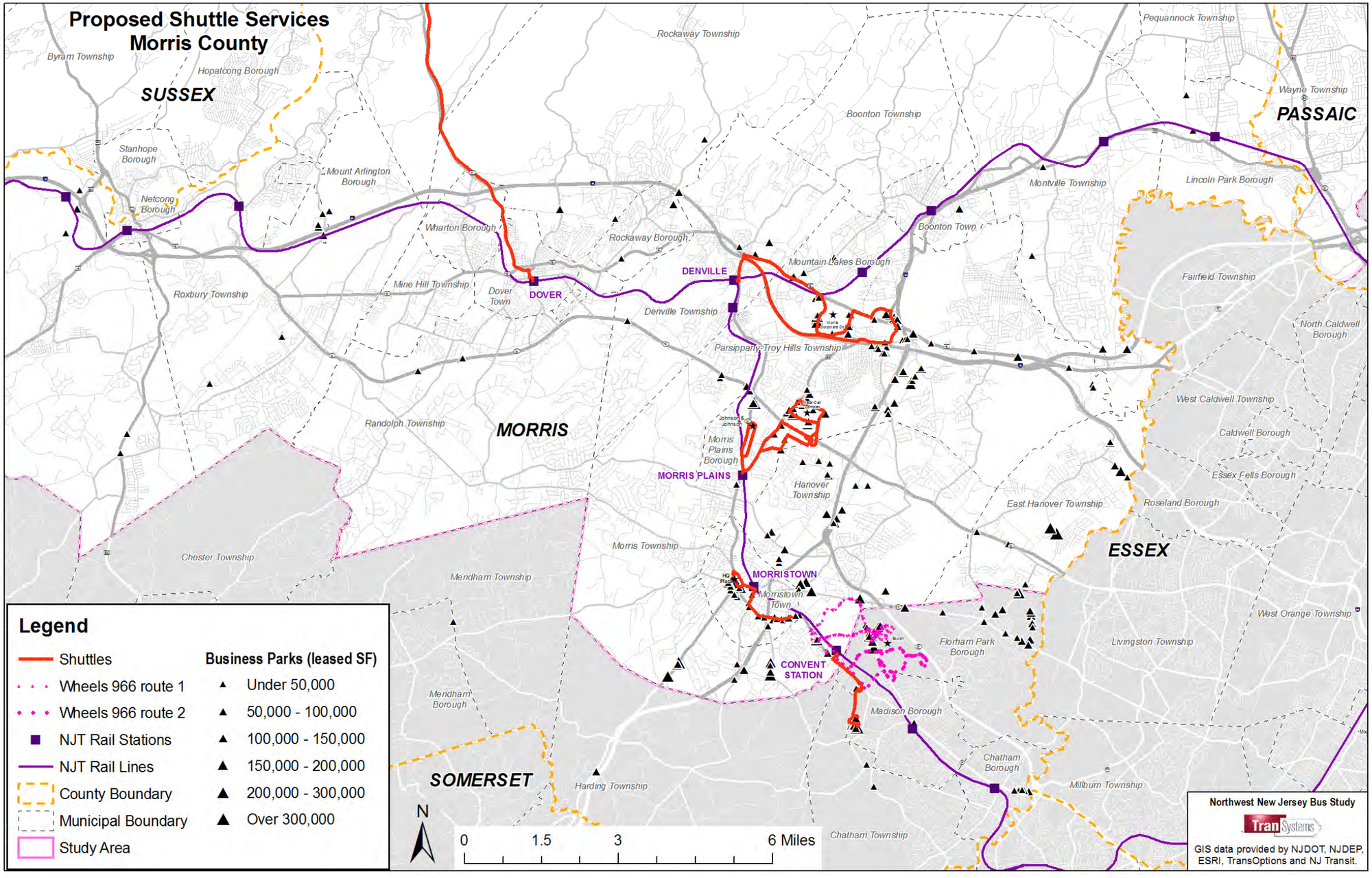
This concept would create a new shuttle from Denville Station to office parks at Morris Corporate Center (Walsh Drive, Cherry Hill Road and Interpace Parkway), Waterview Boulevard and Littleton Road (see Figure 4-4). These three centers combined have about 3.7 million square feet of leased space, about the same as the Mack-Cali complex. This shuttle would serve the three areas in this order and return to Denville via I-80. The time to complete the loop would be about 20 minutes in favorable traffic conditions.

Concept: New Morristown Rail Station Shuttle

Based on the analysis described in the previous concept, a shuttle service from Morristown Station could serve a cluster of office parks which have little or no transit connection to the station. This concept would create a new shuttle service from Morristown Railroad Station (see Figure 4-4). Two loops are envisioned. One long loop (20 minutes cycle time) would serve South Street and Madison Avenue (which have many office buildings), and the Morristown Memorial Hospital. A short loop (10 minutes cycle time) would serve

Headquarters Plaza. Service would use a single vehicle alternating between the two loops, serving both loops every 30 minutes with shuttle departures and arrivals coordinated with the train schedule. The offices served by this shuttle have more than two million square feet of space; with the same number of riders per square foot as the Convent Station (loop 1) shuttle, 43 riders (86 trips) per day could be expected. Unlike the other rail shuttles proposed in this report, this service would operate all day. Between 9 am and 4 pm the route would be modified to serve social service, shopping, and recreational destinations, rather than offices, while keeping the three core stops (Headquarters Plaza, Railroad Station, and Memorial Hospital). It could potentially replace the existing infrequent "Colonial Coach" community circulator with a simplified route structure and offering flex deviations on request. It could also potentially replace the existing hospital employee shuttle. NJTRANSIT would work with Morris County to identify key destinations and develop a detailed service plan for this new route.

Figure 4-4: Proposed Shuttle Services, Morris County



Concept: Divide NJT 73 into Two Branches and Extend Both to Morristown

NJT 73, which operates from Newark to the study area, has many part-time and full-time deviations, which makes the schedule difficult to understand. The route was counted and analyzed as part of the Greater Newark Bus System Study (GNBSS); most of the 2,265 daily boardings are outside the study area. Before the 1970s NJT 73 continued from the Livingston Mall to Morristown, but this route segment was deleted and then covered by Morris County Metro route 3. NJT 73 operates mostly along NJ 10, which has a large amount of retail activity but is not transit-friendly and lacks many pedestrian amenities. To the west of the existing route coverage area, there is no service on a four-mile segment of NJ 10 in Hanover, and on a six-mile segment of Columbia Turnpike (CR-510) between Morristown and Florham Park. The Morris County Development Review supports initiating transit service along these corridors, noting that at least one major employer has relocated out of the area due to the lack of transit service to transport employees from the east. The Greater Newark Bus System Study (GNBSS) has proposed to split the current NJT 73 into a northern branch (still called 73) and a southern branch (temporarily designated WE-1). The revised NJT 73 would be extended along NJ 10 into Parsippany and continue to Morristown via Tabor Road (Route 53) and Speedwell Avenue (US 202). This route would provide a connection from Morristown and Morris Plains to jobs and retail in the NJ 10 corridor and would also provide service to the Mack-Cali complex. The new route WE-1 would provide a faster connection from Morristown to the Livingston Mall than the MCM 3. Additionally, it would serve some retail and employment sites on Columbia Turnpike (CR-510), including the Exxon redevelopment site. These suggestions have been coordinated with this study.

Concept: Increase Service Span and Frequency of NJT 79 Newark – Parsippany

Two NJ TRANSIT routes -- NJT 29 and NJT 79 -- connect Newark and its suburbs to Parsippany but do not serve Morristown. Within the study area, service on these routes is infrequent. Only a few NJT 29 trips extend into the study area to serve the Lake Hiawatha neighborhood of Parsippany during the morning and evening peaks. NJT 79 is designed to bring commuters from Newark and its suburbs to jobs in Parsippany; most riders are going to jobs at the UPS distribution center on Jefferson Road in Parsippany. UPS subsidizes a few Sunday trips to serve work shifts. There is no Saturday service on NJT 79, and no weekend service on NJT 29 in the study area.

The Greater Newark Bus System Study proposes to make the Essex Mall (West Caldwell) the western terminus of all NJT 29 trips, thus eliminating its service to the northwest New Jersey study area, to be replaced by an enhanced NJT 79 which would expand to offer hourly, bidirectional service. Peak service on the NJT 79 would follow the current NJT 79 routing, which exits I-280 at New Road to US 46 (this is called “79X” in the concept).This concept would serve commuters living in Parsippany and working in Newark, including service to park-and-ride lots on US 46, while providing an alternate trip to Manhattan via PATH or NJ TRANSIT trains in Newark. Off-peak service on the NJT 79 would be local, exiting I-280 at Pleasant Valley/Lakeside Ave and then serving Bloomfield Avenue and the Essex Mall on the way to US 46. The new local NJT 79 would also serve trips between Parsippany and the Essex Mall.

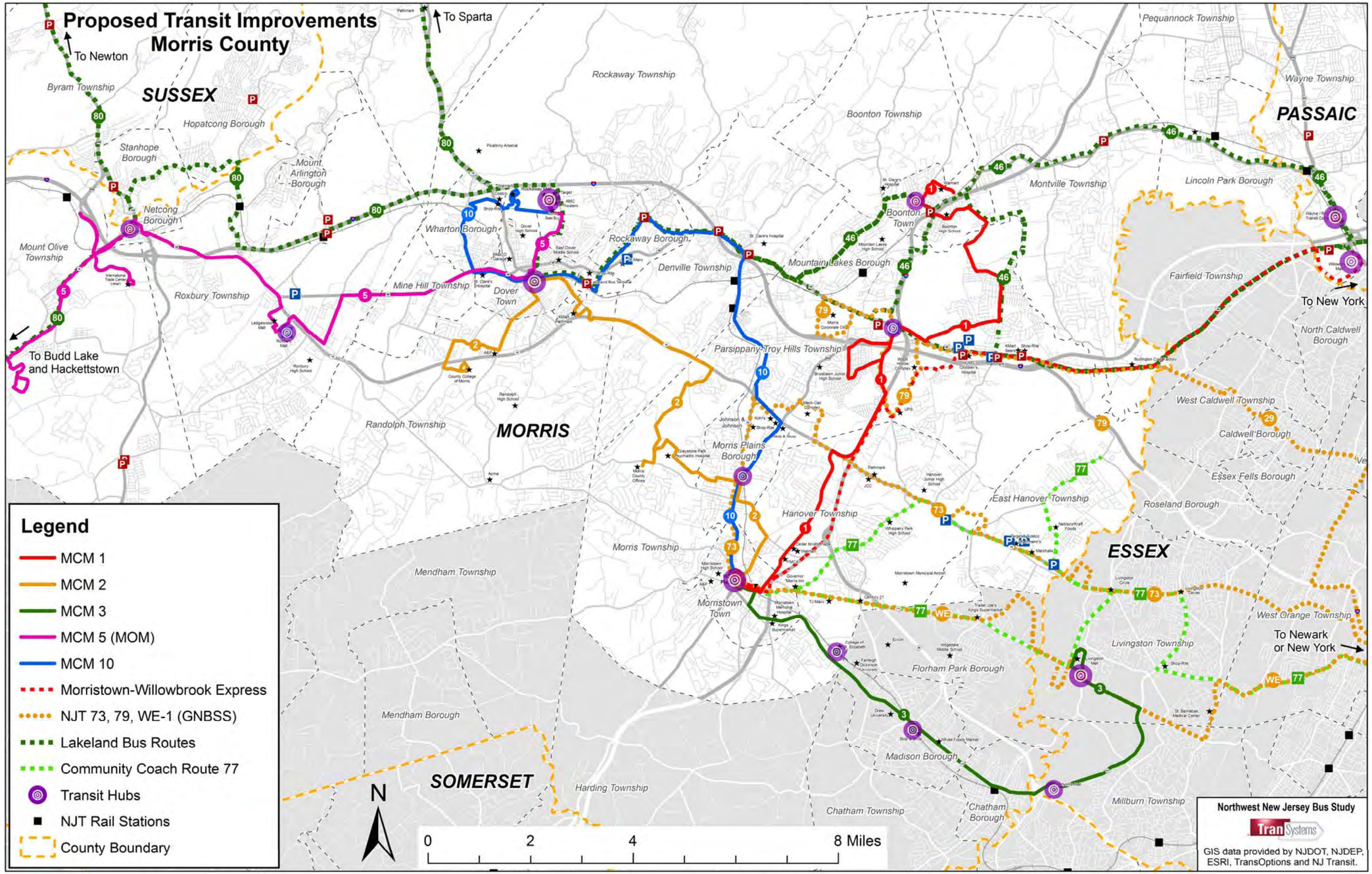
Concept: Increase Scheduled Time on MCM 1 Morristown – Parsippany – Boonton – Willowbrook Mall and Interline with Proposed Morristown-Willowbrook Express Route

Based on running time collected as part of the ride checks, the current scheduled running time on MCM 1 insufficient. In order to reliably meet the current schedule, the cycle time should increase from 150 minutes to 180 minutes (90 minutes in each direction, including recovery time). The checks conducted for this study found 323 boardings per day, however, there were only 30 boardings counted at Willowbrook and less than 10 on US202 east of Boonton (all of which were east of Lincoln Park).

In order to efficiently use vehicles and drivers, this route should be interlined with the proposed new express service between Morristown and the Willowbrook Mall via I-287 and US46 (see description below). The latter service would have a 30 minute running time. Therefore the combined cycle time of the two routes is thus 120 minutes (2 hours). This service could be provided hourly using two buses.

This concept would include a minor rerouting in the Lake Hiawatha area to improve service coverage within this dense neighborhood. The revised route would run outbound from North Beverwyck Road: left on Longview Avenue, right on Lake Shore Drive, right on Greenbank Road, left on Vreeland Road; the same roads would be used in the opposite direction. In order to streamline operations, this concept would eliminate the Jefferson Road deviation (see Figure 4-5). The ride checks found no boardings on the single MCM 1 afternoon inbound trip that operates on this segment, which is also covered by the existing NJT 79 route from Newark (proposed for increased service by the GNBSS) and the proposed Morristown-Willowbrook express route.

Figure 4-5: Proposed Morris County Transit Routes



Concept: Eliminate the Mack-Cali Deviation on MCM 2 (Morristown – Dover – County College of Morris)

Based on ridechecks conducted for this study, the current scheduled cycle time is generally adequate. Two trips in the peak period deviate to serve the Mack-Cali Complex, and are sometimes delayed by heavy congestion in that area. This concept would eliminate the Mack-Cali deviation due to low ridership and traffic congestion. Service to Mack-Cali would be more appropriately provided by the proposed restored Morris Plains shuttle and proposed extended NJT 73. It may be necessary to wait until these alternate services have been put in place before eliminating Mack-Cali deviation from the MCM 2.

Concept: Move Morristown-Greystone Segment from MCM 3 to MCM 2

Under this concept, MCM 2 in the base period on weekdays (instead of serving Speedwell Avenue in Morris Plains), would serve the Morris County offices and Greystone Hospital via West Hanover Avenue, and then travel on Old Dover Road and South Powder Mill Road to NJ 10, where it would resume the existing route (see Figure 4-5). The new route would have the same cycle time as the existing route. The purpose of this change is to permit the MCM 3 to be truncated at Morristown, which would facilitate increasing the frequency of the remaining portion of MCM 3. Morristown HQ Plaza would become the northern terminal for MCM 3. The MCM 3 route would be modified to serve Morristown Station via Morris Street and Elm Street. This will improve connectivity between the railroad station and the NJ 124 corridor without negatively impacting through passengers or running times. (See the next concept for a complete description of the changes to the MCM 3.)

Almost the entire deleted segment of the existing MCM 2 (Morris Plains to NJ 10) is served by the MCM 10, which would offer more frequent service based on the concept presented below. The southern terminus of the MCM 2 would be moved from HQ Plaza to Morristown Station in order to enable the route to make a rail connection (since the proposed revised route will not serve Morris Plains Station). Late evening and Saturday trips would omit the deviation to the Morris County offices (which are closed at those times) and follow the current route. However, Saturday trips would serve Greystone Park Hospital on selected trips.

Concept: Increase Frequency and Span on MCM 3 (Livingston Mall – Morristown)

MCM 3 currently provides hourly service, however land uses in the corridor should support service every half hour. (In fact, Lakeland Bus Lines provided local and New York service on NJ 124 before it was discontinued.) Based on ride checks conducted in spring 2008, the current scheduled running time appears to be insufficient; if no other changes were made, the cycle time should be increased from the current 120 minutes to 140 minutes to improve reliability. Fortunately, there is an opportunity to shorten the route so that the cycle time could be maintained at 120 minutes. Data shows that few MCM 3 riders wish to go from south of Morristown to north of Morristown. Shifting the Greystone Hospital segment of MCM 3 to MCM 2 (as described in the prior concept) will not force many new transfers and will provide the opportunity to provide more frequent and reliable service on the remainder of MCM 3. This concept would also increase service frequency to 30 minutes on weekdays by adding two buses (cycle time 120 minutes). It is also proposed that hourly service be maintained on Saturday, and that new hourly service be added on Sunday.

Concept: Add a Bus to Saturday Service on MCM 10 (Morristown – Dover – Wharton – Rockaway Mall)

With 696 daily boardings, this route is by far the most heavily used Morris County Metro route. The service frequency is generally hourly (45 minutes in the peak), and no evening or Sunday service is provided. The current scheduled running time is insufficient but the layover and resulting cycle times are sufficient on

weekdays; if no other changes were made, schedules should be adjusted to reflect actual running times on weekdays. On Saturdays, there is insufficient cycle time for the two buses operating, and therefore, it is recommended that one bus be added to the route.

Concept: Increase Frequency of MCM 10 (Morristown – Dover – Wharton – Rockaway Mall)

As noted above, MCM 10 operates every 45 minutes during weekday peak hours and every hour in the off peak and on Saturdays. In order to substantially improve service on this well-used route, it is proposed that service frequency increase to 30 minutes at most times by adding one bus on weekdays and two buses on Saturdays, for a total of four buses serving the route (cycle time remains unchanged at 150 minutes).

Concept: Add Evening Trips to MCM 10 (Morristown – Dover – Wharton – Rockaway Mall)

Currently, the MCM 10 offer service until 7:30 on weekdays and until 6:30 on Saturdays. Based on the need to serve late-hour shoppers and workers and the proposed service guidelines, it is recommended that evening trips be added to service Monday through Saturday.

Concept: Add Sunday Trips to MCM 10 (Morristown – Dover – Wharton – Rockaway Mall)

Currently there is no Sunday service on any of the MCM routes. It is recommended new hourly service be added on Sundays to provide a basic level of mobility on Sundays along the most popular local route.

Concept: Add a New MCM Route: Dover to Mount Olive via Roxbury & Ledgewood Malls, Netcong and International Trade Center

The existing Morris on the Move (MOM) route from Dover west to Mount Olive operated by Morris County using one minibus offers limited service , predominantly in the peak hours,. It does not meet minimal standards for local secondary service. No fare is charged for the route, which is funded through a federal Job Access and Reverse Commute (JARC) grant which may not be renewed. Most of the route, which serves two major shopping malls (Roxbury and Ledgewood) as well as other retail and employment sites, has no other service (except one MCM 5 round trip per day on Mondays and Wednesdays and a short portion west of Dover center served by MCM 10). According to TransOptions, most trips are at or near capacity, and some passengers have been passed up due to lack of standing room.,

The concept would increase the span and frequency to meet secondary route guidelines, and add Sunday service. The frequency would be increased to every 60 minutes using three vehicles at all times (cycle time of 180 minutes). The route would also be extended to Rockaway Mall via Mount Hope Road, and follow the proposed MCM 10 route within the Mall (see Figure 4-5). This would adds a third major mall to the route and provide service to a part of Dover previously unserved by local transit. The new coverage would include West Clinton Street between Rockaway Mall and Dover on some trips, Dover High School, and the residential area bounded by the high school and railroad tracks making the existing service inaccessible. From Dover, the route would continue west on US 46 and follow the existing route of MCM 5 to the Roxbury Mall and then into Netcong. Continuing west on US 46, the route would deviate into the International Trade Center retail area (except selected peak hour trips coordinated with employee shifts which would instead serve the International Trade Center employment area west of US 46 S), and follow the existing MOM route to the terminus at Eagle Rock Village in Mount Olive.

Concept: Introduce a New Intrastate Express Route from Morristown to Willowbrook (via US 46)

Morristown is a major transit hub in the study area, and its role as such will be strengthened by increasing the frequency of local bus routes serving Headquarters Plaza and by improving passenger facilities there. Willowbrook is a major hub in Wayne, as well as an important destination. Currently there is no direct route between the two hubs. New service between these two hubs via I-287 and US 46 can provide an express connection from Morristown to US 46 retail and employment sites and the Willowbrook Mall.

This concept would create a new express route that would start at Headquarters Plaza in Morristown, stop at the Railroad Station, and then enter I-287. The bus would exit at Jefferson Road and head to US 46 via Mazdabrook Road, Troy Road and Baldwin Road, stopping at UPS and one or more of the office parks, retail sites and hotels in that area. Once on US 46 it would make the same stops as the current Lakeland service and terminate at the Willowbrook Mall. Service would operate hourly, 6:30 am to 7:30 pm, Monday to Saturday, and could be extended to late evenings and Sundays if it is successful. This would meet the Local Secondary service guidelines. Although not part of the current concept, the route could be extended via I-80 to Paterson (outside the Northwest New Jersey study area) where it would stop at the Broadway Bus Terminal and Paterson Station. As the third-largest city in the state, Paterson is home to a large number of low-income residents and is a major employment destination and bus transfer point. It is recommended that this concept be explored further in the recently initiated Bergen-Passaic Bus Study which is addressing needs in Paterson.

4.1.4. Service Concepts for the Warren – Morris Corridors

Concept: Extend Selected Lakeland 80 trips to Hackettstown

The Budd Lake branch of Lakeland 80 begins its eastbound route just a few miles east of Hackettstown and operates in the peak period only. NJ TRANSIT operates diesel commuter rail service from Hackettstown, but trips to Manhattan from Hackettstown require a transfer to a New York-bound train at Dover or Secaucus Junction, or to a PATH train or ferry at Hoboken. This concept would make bus service an additional option for Hackettstown residents. It would extend five morning peak eastbound and five evening peak westbound Lakeland 80 Budd Lake branch trips to the Hackettstown Mall (which would be used as an informal park-and-ride for an estimated 15 round trip passengers per day), with a stop in Hackettstown center. (A stop at the Railroad Station was initially proposed Fare and schedule information displays would be added to the two new stops: one at the intersection of US-46 and NJ Route 182 at the edge of downtown Hackettstown, and one at the Hackettstown Mall shared with the existing Wheels 973 route.

Concept: Streamline the Wheels 973 Hackettstown Circulator

This town-subsidized local circulator has about 86 boardings per day, or only about 4 per trip. Two minibuses operate on a loop simultaneously in opposite directions. Some of the route overlaps Warren County Route 57B (which is operated by Warren County). Most passenger activity on the route was observed between the shopping areas in Mansfield, Hackettstown Mall, and downtown Hackettstown. The route may be able to be reconfigured to be more. Based on observed ridership (4 boardings per trip on average), a wheelchair-accessible vehicle with capacity for 10 passengers would be sufficient to operate the service.

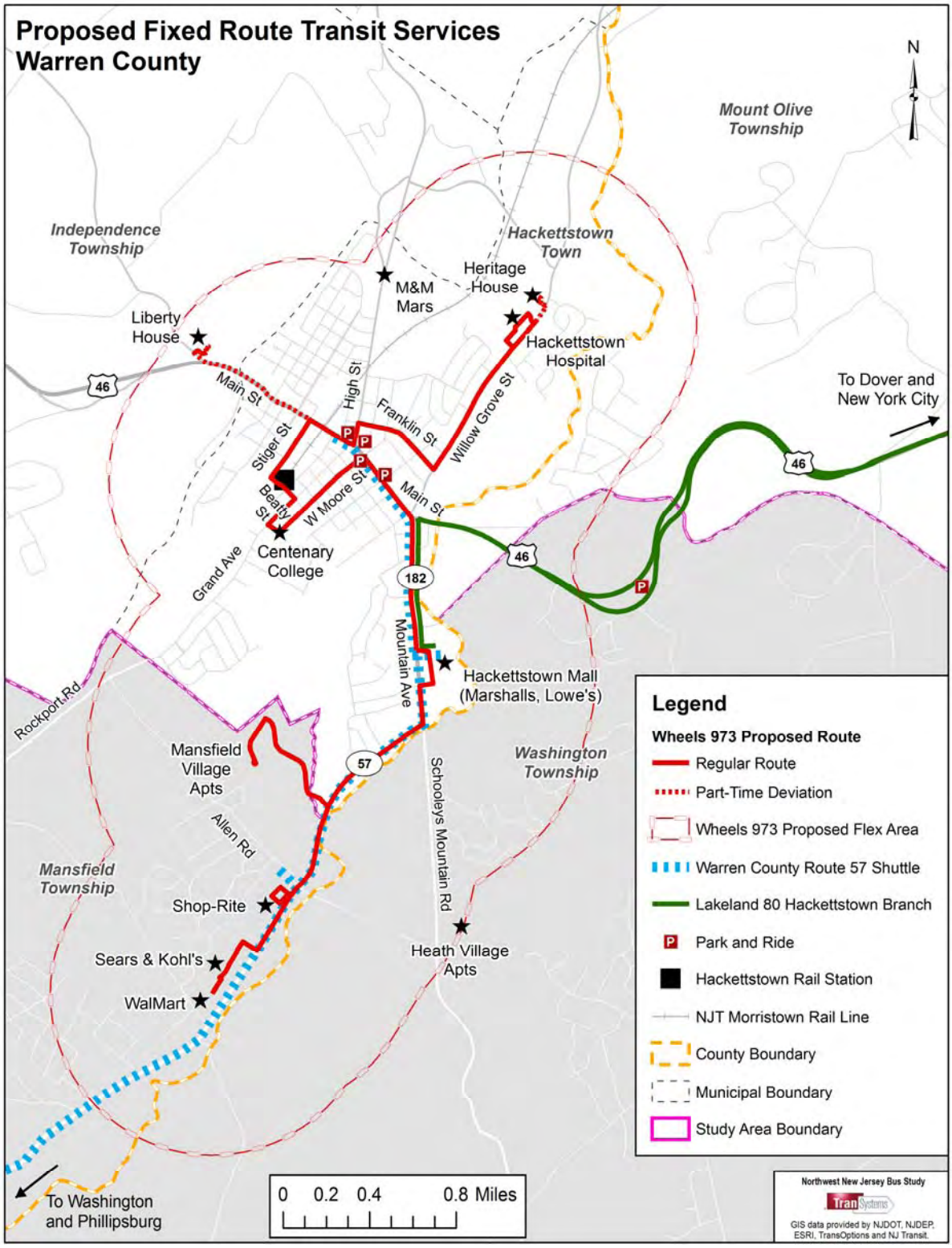
In this concept, the route would be consolidated into one simplified line route, using the existing resources to increase frequency. The proposed routing, shown in Figure 4-6, is as follows:

- Starting at Wal-Mart, serve Shop-Rite and Weis supermarkets and continue north on NJ 57, deviating to serve Mansfield Village Apts. After serving Hackettstown Mall, continue north on NJ 57, left on Main Street (US 46), left on Moore Street, right on Beatty Street, right on Valentine Street, right on Main Street, left on High Street, right on Franklin Street, left on Willow Grove Street. Terminate at Hackettstown Hospital and the adjacent Heritage House. It is estimated that the cycle time (round trip plus recovery) would be about 70-80 minutes, which would allow service every 40 minutes.
- To address locations no longer served by the fixed route, it is recommended that flex deviations be allowed to be requested to any location within ¾-mile of the route (this is actually permitted on the existing service). Note that the entire town of Hackettstown is within ¾ of a mile of the proposed route.
- It is recommended that bus stop signs be installed at bus stops in Hackettstown center and at apartment developments and retail sites and that route and schedule information displays and shelters be installed at the major stops.

Concept: Extend Warren County Route 57B to Hackettstown and Interline with Route 57A

This county-operated local route is largely outside the study area, but does offer service to Hackettstown. A portion of the route is shown in Figure 4-6. While the passenger survey and boarding counts conducted for this study did not include this route, data from Warren County show that Route 57B carries about 47 riders per day (an average of only 3 per trip). Although the route overlaps with Wheels 973 in order to serve shopping centers just outside Hackettstown, it does not enter Hackettstown center. This concept would extend the 57B from its current terminus at the Hackettstown Mall to downtown Hackettstown to improve regional connectivity. This could be achieved without any additional resources by interlining 57B and 57A to take advantage of the latter's excess layover time. A direct connection to Hackettstown center would enable riders to connect to rail service.

Figure 4-6: Proposed Fixed Route Transit Services, Warren County



Transit Hubs in Morris County and Warren-Morris County Corridors

The following existing and proposed transit hubs would be strengthened by the service concepts described above and the passenger facilities described later in this chapter:

- The Willowbrook Mall is an existing hub for some Morris County routes (having direct service only from MCM 1, and nearby service from Lakeland 46). In addition to the concepts for physical improvements discussed in the facilities section, this concept would strengthen this hub by adding a new express service between Morristown (serving both the proposed HQ Plaza and Railroad Station hubs) and Willowbrook Mall (serving the park-and-ride and shoppers stops).
- Morristown Railroad Station would also become more of hub by rerouting MCM 2 and MCM 3 to stop at the station and by increasing the frequency and span of service of MCM 1 and MCM 3. The proposed Morristown shuttle bus would provide a "last mile" connection to employment places and would also provide a connection between the station and Headquarters Plaza
- The existing Morristown Headquarters Plaza would become more of a transit hub under these concepts as well, by increasing the frequency and span of routes MCM 1, 3, and 10, and by providing a shelter, system information, and other passenger amenities (see the description in Passenger Facilities).
- The Rockaway Mall is also an important hub, as described previously under Morris-Sussex Corridors.
- Dover Center would also become more of a transit hub by improving bus stops, adding a new shuttle bus from Sussex County (modified Wheels 967), and adding a new expanded MOM route serving Netcong and Mount Olive.
- Boonton would be strengthened as a minor transit hub by posting information about transferring from rail to bus at the nearby rail and bus stops, and upgrading stop amenities.
- Morris Plains Station would be strengthened as a transit hub by increasing the frequency of MCM 10, providing local bus information at the rail station, and restoring the Mack-Cali shuttle.
- Convent Station would be improved as a transit hub by increasing the frequency of MCM 3 and relabeling and extending the Wheels 966 shuttle.
- Madison Station would be improved as a transit hub by increasing the frequency of MCM 3 and improving passenger amenities.
- A new transit hub could be created in Parsippany. The central location of Parsippany and its many retail and employment sites make it an ideal location for a transit hub, although the dispersion of travel generators makes it difficult to develop a single hub. The intersection of US 46 and US 202 (Parsippany Blvd) was identified as a potential hub, as several routes pass through this intersection, but the lack of safe pedestrian access presents a significant obstacle to develop a hub at this location. However, the Morris Hills Plaza shopping center (southwest corner of this intersection) is being proposed as a shared-use park-and-ride and has potential to become a future hub if pedestrian amenities are added.

Summary of Service Concepts for the Morris Corridors (Including Warren-Morris Corridors)

The concepts discussed above are summarized in Table 4-3. Note that the concepts that were considered and not advanced are not included in the table.

Table 4-3: Summary of Concepts for the Morris and Morris-Warren Corridors

Candidate Improvement	Description	Need Addressed	Market/Issue Addressed	Current Operator (if applicable)	New or Existing Service	Type of Improvement	Existing Vehicle Type	Existing Span	Existing Frequency (minutes)	Proposed Vehicle Type	Proposed Span	Proposed Frequency (minutes)	Operating Mode (Type of Route)	Propose d Fare	Facility Improve-ment Required
Lakeland 46 trips – extend to Dover center	Extend Lakeland off-peak local service to Dover (new Transit Center); new peak local service from Rockaway Mall to Willowbrook Mall; NJT local fare	2 – Improve Connectivity	local	Lakeland	existing	extend route; reduce local fares	cruiser	n/a	n/a	cruiser	M – Sat 6a-11p; Sun 8a-8p	60	local	NJT local fare	-
Lakeland 80 - Roxbury or Ledgewood Malls	Extend some peak trips to Roxbury and/or Ledgewood Malls, if P&R spaces available, and if P&R expansion not feasible at Rockaway Mall and Mount Arlington.	1 – Strengthen Transit	New York City	Lakeland	existing	add deviation	-	-	-	cruiser	Peak only	15-30	express	Lakeland fare	Roxbury or Ledgewood Mall P&R
Lakeland 80 - extend to Hackettstown center & mall	Extend select trips to Hackettstown Mall to provide more express service options; add a few new trips.	1 – Strengthen Transit	New York City	Lakeland	existing	extend route	cruiser	peak only (rail); wkdy only (bus)	3 peak train; 3 peak bus (Budd Lake)	cruiser	Peak only	120	express	Lakeland new local fare	-
Coach 77 - add trips and P&R spaces; local service	Add one or more P&R lots; add a few peak trips. Permit local trips at NJT local fares.	1 – Strengthen Transit	New York City	Community Coach	existing	add trips; add P&Rs; local fares	cruiser	6 am to 8:45 pm in; 7 AM to 11:15 pm out	60 off-peak; 10-30 in peak	cruiser	6a-12a	30 (peak), 60 (off-peak)	express	New local fare	-
Montclair-Boonton rail line off-peak bus service	Operate shuttle bus service from Lincoln Park to MSU to meet off-peak trains in Montclair. Operate weekend service to interline with 193 or 324 trips.	1 – Strengthen Transit	New York City	-	new	Supplement rail trips; new local connections	-	-	-	cruiser	6a-12a	120	local	NJT standard	-
Wheels 966 Convent Station shuttles (two routes)	Split into two routes; add stops for new Park Ave offices.	2 – Improve Connectivity	shuttle	First Student	existing	Adjust routes.	minibus	peak only (7-9:30 am; 4 pm to 6 pm)	10 or 11 trips per route	30' bus or smaller	Peak only	Meet peak trains	commuter shuttle	NJT shuttle	-
Morris Plains-Mack-Cali RR shuttle	Restore previous shuttle service to major concentration of office parks	2 – Improve Connectivity	shuttle	-	new	New shuttle service	-	-	-	minibus	Peak only	Meet peak trains	commuter shuttle	NJT shuttle	-
Denville RR station shuttle	New shuttle to 3.7 million square feet of office space.	2 – Improve Connectivity	shuttle	-	new	new shuttle service	-	-	-	minibus	Peak only	Meet peak trains	commuter shuttle	NJT shuttle	-
Morristown RR shuttle	One loop to HQ plaza; one loop to South St, Madison Av, & Hospital; meet alternating trains with one vehicle. Operate a modified midday route.	2 – Improve Connectivity	shuttle	-	new	new shuttle service	-	-	-	minibus	Peak only	Meet peak trains	commuter shuttle	NJT shuttle	-
MCM 1 improvements	Operate all trips between Morristown and Boonton. Extend span; increase frequency.	1 – Strengthen Transit	improve local	PABCO	existing	frequency adjustment	30' bus	6:40 am to 7:30 pm	60 am peak; 90 midday	minibus	M-Sat 6a-11p, Sun 8a-10p	60 (base), 90 (eve)	local	NJT standard	-
MCM 2 improvements	Add Morris County Offices & Greystone Park Hospital (now MCM3). Extend span.	1 – Strengthen Transit	improve local	PABCO	existing	route consolidation	30' bus	6:30 am to 6:30 pm	60	minibus	wkdy 6a-11p, Sat 6a-7p	60 (base), 100 (eve)	local	NJT standard	-
MCM 3 improvements	Operate all trips between Morristown and Livingston. Extend span; increase frequency.	1 – Strengthen Transit	improve local	PABCO	existing	increase frequency & span	30' bus	6:30 am to 6:00 pm	60	minibus	M-Sat 6a-11p, Sun 8a-10p	30 (wkdy), 60 (Sa-Su), 90 (eve)	local	NJT standard	-
MCM 10 improvements	Extend span; increase frequency.	1 – Strengthen Transit	improve local	PABCO	existing	increase frequency & span	30' bus	6:40 am to 7:30 pm	60 min base; 45 min peak	minibus	M-Sat 6a-11p, Sun 8a-10p	30 (base), 90 (eve)	local	NJT standard	-
Morris on the Move (MOM) (New MCM route)	Convert to secondary local route; increase span and frequency.	3 – Integrate Private & Local	improve local	State Shuttle	existing	increase frequency & span; adjust	minibus	peak only (5 trips /direction)	1 hr 40 min	minibus	M-Sat 6a-11p, Sun 8a-	50	local	NJT standard	-

Table 4-3: Summary of Concepts for the Morris and Morris-Warren Corridors

Candidate Improvement	Description	Need Addressed	Market/Issue Addressed	Current Operator (if applicable)	New or Existing Service	Type of Improvement	Existing Vehicle Type	Existing Span	Existing Frequency (minutes)	Proposed Vehicle Type	Proposed Span	Proposed Frequency (minutes)	Operating Mode (Type of Route)	Propose d Fare	Facility Improve-ment Required
						route					10p				
Morristown-Willowbrook Express	New express route (I-287, US-46).	2 – Improve Connectivity	new intrastate express	-	existing	add new route	30' bus	6:40 am to 7:30 pm	-	minibus	M-Sat 6a-11p, Sun 8a-10p	60	intrastate express	NJT standard	-
Wheels 973 Hackettstown	Consolidate service area into a simple line route offering flex deviations.	2 – Improve Connectivity	local circulator	First Student	existing	Consolidate	minibus	7:30 am to 6 pm M-F	60 each direction	van	wkdy 8a-6p	40	circulator	NJT standard	-
Warren County Route 57B Shuttle	Extend to Hackettstown center.	2 – Improve Connectivity	local circulator	Warren County	existing	restructure route	minibus	wkdy 8a-5p	60	van	8a-5p	60	circulator	free	-

4.1.5. Evaluation of Proposed Service Improvements

Ridership Forecasting Methodology

The ridership impacts of each improvement were estimated using sketch planning techniques described below. These sketch planning methods can be applied using spreadsheets and do not require the extensive level of effort needed to apply regional network models. Network models are typically applied to investigate the ridership potential of major capital investments. They are rarely used to evaluate bus route changes or new bus routes and they are not typically calibrated to accurately reflect current bus ridership. As a result, they are not typically very reliable for forecasts for individual routes.

The specific sketch planning techniques applied varied depending on the type of service improvement. Generally, these techniques are empirically-based, that is, they are based on the experience of bus service in the region and across the U.S. They include two primary sources of such information -- comparison with other similar routes in the study area and existing national research on traveler response to service changes (the seminal research was done in the 1970s and 1980s). The latter, called the elasticity method, is a widely used method for predicting the effect of changes in frequency, travel time, and fare on existing services. Analogous route experience was particularly useful for examining span of service changes, including adding weekend service. NJ TRANSIT's Quickshare spreadsheet model was also used in some cases, particularly where new service is introduced or service is extended into new geographic areas. Quickshare is a spreadsheet version of NJ TRANSIT's regional "four-step" network-based forecasting model. It allows the analyst to estimate the number of trips made by mode given defined trip flows (origin to destination) and modal characteristics. The transit modes available in the Quickshare model include bus (walk access and drive access) and rail. However, the Quickshare model does not allow the representation of multiple bus route options available to the traveler simultaneously (e.g. direct bus trip compared to bus trip with transfer required). The method used for each type of service improvement is explained further below:

Change in frequency of service

For changes in frequency of service within a given time period, the change in ridership was estimated using the elasticity method. The elasticity used was based on published estimates of the elasticity of boardings with respect to changes in service[1]. The elasticities contained within the Quickshare model were also examined for comparison (See Table 4-4). In both the literature and in the Quickshare model, elasticity is higher (in absolute value) when the initial headways are high (50 minutes or more) and lower when they are low (10 minutes or less). In other words, the value to the customer of increasingly frequent service diminishes as the existing frequency increases, and thus the ridership response is less if frequency is already high. The Quickshare elasticities were lower than those reported in the literature, although generally within one standard deviation of the mean estimate. This means that the QuickShare model would typically yield a smaller ridership increase as a result of a particular service improvement or fare reduction. (Note that all elasticities are calculated based on the midpoint of the before and after headways; this measure is also called arc elasticity).

[1]In other words, the percent change in service divided by the percent change in boardings, calculated using empirical data from various transit systems. An elasticity of 1.0 means that an increase of x% in service quality would yield an increase of x% in ridership. Typically, elasticities are less than 1. A negative elasticity is used where the increase in the service measure represents a degradation of service as is the case with measures of travel time, waiting time, headway and fare.

Table 4-4: Comparison of Elasticities, Quickshare and Literature Summary

Existing Headway (min)	Proposed Headway (min)	Elasticity		
			Summary of 23 studies*	
		Quickshare	Mean	Standard deviation
9	4	-0.16	-0.22	0.1
20	10	-0.28	-0.46	0.18
30	15	-0.28	-0.46	0.18
45	30	-0.23	-0.46	0.18
60	30	-0.29	-0.58	0.19
70	60	-0.41	-0.58	0.19
90	60	-0.47	-0.58	0.19
120	60	-0.57	-0.58	0.19

* Lago, Mayworm, and McEnroe, Journal of Transport Economics and Policy, May 1981.

Two more recent studies reported in TCRP 95 found elasticities above 1.0 for a reduction in headways from 60 to 30 minutes on a group of routes in an area.[2] A summary published by Fearnley and Bekken (2005) reports a short run vehicle mile elasticity of 0.43 and long run vehicle mile elasticity of 0.75. Given these other findings in the literature, the somewhat higher elasticities based on national research as summarized above were used instead of the Quickshare model.

Adding a few trips

When adding a few trips during a period when there is irregular and infrequent service, the elasticity method is not applicable because it assumes a mostly even spacing of trips in each particular period before and after the improvement. In some cases only a few trips needed to be inserted in order to provide service at a target frequency. The method used in this case was to extrapolate productivity. The base used was the productivity (riders per trip) of trips in a similar period, based on ridecheck data. In general, the new trips will have somewhat lower ridership per trip than the existing average (which is also the assumption implicit in using an elasticity smaller than 1.0 in absolute value).

Change in span of service

Neither the elasticity method nor the Quickshare model was used for estimating changes in service span. For adding additional service at times when service is currently not provided, the preferred method is to find a comparable route and calculate the ratio of ridership in the unserved period (e.g. Sunday or evening) to the base period, and then apply this ratio to the route under study. The ratio of Sunday to weekday and Saturday ridership was calculated for all routes in the study area that have Sunday service. For local routes, evening and Sunday ridership per trip was generally calculated based on a fraction of average counted midday ridership per trip.

[2] TCRP Report 95, Traveler Response to Transportation System Changes, Chapter 9—Transit Scheduling and Frequency. Transportation Research Board, 2004.

New route or extension of an existing route to a previously unserved area

The Quickshare model was used to estimate ridership for new or extended routes. Elasticities cannot be used to address this type of improvement. The first step in using the Quickshare model is to determine the traffic analysis zones (TAZ) served by the proposed service. Note that TAZs can be large outside of urban areas. The model requires an estimate of the share of origins (generally residences) and destinations (generally commercial buildings) in each TAZ served that is within a modeler-specified walking time. The location of the proposed route was compared to the TAZ boundaries, the street network, and land uses based on satellite images of the TAZ to roughly estimate the percent within a mean walking distance of 5 minutes. A weighted average share within walking distance for the new service area as a whole was created by weighting the results for each TAZ by population (for origins) and employment (for destinations).

The next step was to look up (in the modal trip tables) the 2000 trip flows (by all modes) for peak and off-peak periods by purpose (home-based work, home-based shopping, home-based other, and non-home based). The NJTPA model zonal origin-destination matrix was used for this purpose. For new routes, the matrix of zone-to-zone trips for the TAZs served by the proposed service was summed, except that trips made within a zone (the diagonal of the matrix) were generally excluded. The reason for exclusion is that it was thought that for intrazonal trips the walk trip to and from the bus route would be longer than the trip on the bus, and that most people would find it more convenient to walk the entire distance. In rural areas, where the zones were several miles wide, some intrazonal trips were included in the estimate.

For route extensions, only trips either within the new zones or between the new zones and the old zones were included (trips completely within previously served zones were excluded). As with new service, intrazonal trips were generally excluded, on the assumption that such short trips would walk.

The Quickshare model requires several other assumptions about transit and auto characteristics. Auto operating costs were assumed to be $0.50 per mile, and parking costs and tolls were assumed to be zero. The ratio of transit trip distance to auto trip distance was assumed to be 1.2. The mean auto trip distance varied based on the length of the route and the trip patterns expected. The default transit fare structure contained within the model was used. For most routes, bus travel speeds of 25 or 30 mph were assumed rather than the default of 12 mph, given that most routes modeled were operating on high-speed roads or in rural areas. The Quickshare model also requires the selection of a geographic market based on the type of destination. For intra-New Jersey trips, the “To New Jersey CBDs” option was selected, based on the recommendation of NJ TRANSIT modeling staff. In most cases, the assumed household income selected was the $35,000 to $50,000 category.

Shuttle connection to commuter rail or bus

The ridership on new shuttle connections to commuter rail or bus was estimated by using an analogous service approach, i.e., factoring ridership on existing shuttle routes (such as Wheels 966 and the “Last Mile” shuttles) by a ratio of the square footage of occupied office space served by the proposed and existing shuttle services. Thus, proposed shuttle services were projected to have roughly the same number of riders as existing services serving a similar sized group of office buildings.

Changes in travel time

Strategies such as bus use of shoulders and queue jumpers are intended to reduce mean travel time (increase in mean operating speed). The travel time elasticity estimates from ten projects reported in four express bus studies averaged -0.35 +/- 0.21 (Lago, Mayworm, and McEnroe). Reliability should also

improve as a result of reduced congestion delays. The ridership impact of improved reliability of travel time was not estimated due to a lack of published information about ridership response to changes in reliability.

Cost Estimation Methodology

There are two elements to the cost estimates: an estimate of the change in the number of buses required, which drives the capital cost of acquiring vehicles, and an estimate of the change in the number of vehicle hours, which is used to estimate the change in operating cost.

The vehicle requirement is derived by dividing the cycle time (round trip running time plus layover time) by the headway for each period of the day, and rounding up to the nearest whole number of buses. The highest number required during any service period (typically either the morning or evening peak) is the number of buses required for that route.

The vehicle hour estimate is based on the cycle time multiplied by the number of one-way trips in each period, and then summed over all periods in the day. The vehicle hour estimate is multiplied by 1.1 to account for scheduling errors and the difference between platform hours and pay hours. The resulting adjusted vehicle hour estimate is multiplied by an assumed cost per hour. The operating cost used for 40 foot buses was the current NJ TRANSIT rate of $82.88 per hour. For minibuses it is assumed to be $60 per hour based on current contract costs. Note that these hourly rates do not include the capital cost of the bus, only the operating cost.

Evaluation Metrics

One of the evaluation criteria derived from the ridership and cost estimates is cost-effectiveness; it may be defined as the change in operating cost per additional rider. Cost-effectiveness is calculated by dividing the projected change in annual operating costs by the projected change in annual ridership. Annual statistics were tabulated since that is the effect on the budget, however it should be noted that some services do not operate on Sundays or holidays. Boardings and vehicle hours are annualized assuming 255 weekdays, 52 Saturdays, and 58 Sundays or holidays per year, as appropriate to the service schedule. The estimated change in ridership and vehicle operating costs for each concept is shown in Table 4-5. In cases where columns relating to existing service are left blank, either there is no existing service or the concept has been modeled based on incremental changes to existing service.

Table 4-5: Ridership and Cost Estimates of Service Concepts

		Peak Bus Requirement			Daily Rev Veh Hrs-Existing			Daily Rev Veh Hrs-Proposed			Annual Rev Veh Hrs		Boardings - Existing			Boardings - Proposed			Methods Used										
Corridor	Description	Existing	Proposed	Change	Wkdy	Sat	Sun	Wkdy	Sat	Sun	Existing	Proposed	Wkdy	Sat	Sun	Wkdy	Sat	Sun	Quickshare	Elasticity	Sun or Eve Ratio	Add trips	Shuttle Ratio	Other	Cost per Vehicle Hour	Change in Veh Rev Hrs	Change in Platform Hours	Change in Operating Cost	Change in Annual Boardings	Ad'l Oper Cost per New Boarding
Sussex-Passaic	NJT 194 peak extension to Franklin	0	1	0	0	0	0	3	0	0	0	689	0	0	0	34	0	0							82.88	689	757	$20,606	8,670	$2.38
Sussex-Passaic	NJT 194 peak extension to Vernon	0	3	0	0	0	0	9	0	0	0	2,219	0	0	0	34	0	0							82.88	2,219	2,440	$160,093	8,670	$18.47
Sussex-Passaic	NJT 194- Butler increased frequency	1	2	1	10	19	0	16	27	0	3,538	5,484	73	226	0	108	277	0		X					82.88	1,946	2,141	$122,789	11,597	$15.30
Sussex-Passaic	SCT Sussex Loop bus 101 & 102	4	4	0	30	0	0	56	18	0	7,650	15,216	312	0	0	355	228	0		X	X				60	8,586	9,445	$555,273	22,805	$24.35
Sussex-Passaic	Vernon-Franklin (half-hourly)	0	2	2	0	0	0	28	0	0	0	7,140	0	0	0	120	0	0	X						60	7,140	7,854	$455,940	30,600	$14.90
Sussex-Passaic	Vernon-Franklin (hourly)	0	1	1	0	0	0	14	0	0	0	3,570	0	0	0	98	0	0	X						60	3,570	3,927	$223,125	24,990	$8.93
Sussex-Passaic	Newton-Franklin-Warwick (hourly)	0	2	2	0	0	0	56	0	0	0	14,280	0	0	0	104	0	0	X						60	14,280	15,708	$929,220	26,520	$35.04
Sussex-Morris	Lakeland 80 - Newton and Sparta	0	0	0	0	0	0	16	0	0	0	4,123	0	0	0	124	0	0				X			82.88	4,123	4,535	$167,148	31,620	$5.29
Sussex-Morris	Wheels 967 - shuttle to Dover	2	2	0	6	0	0	12	0	0	1,581	3,047	10	0	0	56	0	0						X	60	1,466	1,613	$73,313	11,730	$6.25
Morris	Lakeland 46 local service	0	2	2	0	0	0	34	34	24	0	11,830	0	0	0	221	102	56		X					82.88	11,830	13,013	$818,889	64,907	$12.62
Morris	Lakeland 80 - Roxbury and Ledgewood Malls	0	2	2	0	0	0	10	0	0	0	2,486	0	0	0	151	0	0				X			82.88	2,486	2,735	($27,467)	38,505	($0.71)
Morris	Coach 77 local service with NJT fare	0	0	**	0	0	0	**	**	**	0	0	0	0	0	86	23	21		X					82.88				24,344	n/a
Morris	M&B Line Off-Peak Bus Service	0	1	1	0	0	0	15	18	16	0	5,689	0	0	0	133	135	120				X			82.88	5,689	6,258	$470,760	47,895	$9.83
Morris	Wheels 966 Convent Station	2	2	0	5	0	0	6	0	0	1,148	1,530	180	0	0	200	0	0					X		60	383	421	$24,735	5,100	$4.85
Morris	Denville RR station shuttle	0	1	1	0	0	0	7	0	0	0	1,785	0	0	0	56	0	0					X		60	1,785	1,964	$116,382	14,280	$8.15
Morris	Morristown RR shuttle, 2 loops	0	1	1	0	0	0	11	0	0	0	2,882	0	0	0	75	0	0					X	X	60	2,882	3,170	$188,267	19,125	$9.84
Morris	MCM 1 truncate, increase frequency	2	2	0	20	12	0	25	25	0	5,826	7,675	322	187	0	338	206	0		X					60	1,849	2,034	$114,939	5,068	$22.68

Table 4-5: Ridership and Cost Estimates of Service Concepts

		Peak Bus Requirement			Daily Rev Veh Hrs-Existing			Daily Rev Veh Hrs-Proposed			Annual Rev Veh Hrs		Boardings - Existing			Boardings - Proposed			Methods Used										
Corridor	Description	Existing	Proposed	Change	Wkdy	Sat	Sun	Wkdy	Sat	Sun	Existing	Proposed	Wkdy	Sat	Sun	Wkdy	Sat	Sun	Quickshare	Elasticity	Sun or Eve Ratio	Add trips	Shuttle Ratio	Other	Cost per Vehicle Hour	Change in Veh Rev Hrs	Change in Platform Hours	Change in Operating Cost	Change in Annual Boardings	Ad'l Oper Cost per New Boarding
Morris	MCM 1 evening	2	2	0	20	12	0	28	20	0	5,826	8,282	322	187	0	371	235	0			X				60	2,456	2,702	$141,109	14,991	$9.41
Morris	MCM 1 Sunday	2	2	0	20	12	0	20	12	21	5,826	7,044	322	187	0	322	187	144			X				60	1,218	1,340	$68,695	8,352	$8.23
Morris	MCM 2 modify route	2	2	0	23	0	0	29	25	0	5,865	8,695	307	0	0	330	211	0		X					60	2,830	3,113	$163,065	16,939	$9.63
Morris	MCM 3 truncate, increase frequency	2	4	2	20	15	0	51	25	0	5,875	14,305	315	188	0	466	188	0		X					60	8,430	9,273	$502,486	38,505	$13.05
Morris	MCM 3 evening	2	4	2	20	15	0	28	23	0	5,875	8,331	315	188	0	359	232	0			X				60	2,456	2,702	$143,185	13,508	$10.60
Morris	MCM 3 Sunday	2	4	2	20	15	0	20	15	21	5,875	7,093	315	188	0	315	188	132			X				60	1,218	1,340	$69,670	7,656	$9.10
Morris	MCM 10 improve reliability	4	4	0	32	20	0	32	22	0	9,073	6,693	763	571	0	763	571	0							60	221	243	$14,593		
Morris	MCM 10 increase frequency	4	5	1	30	21	0	64	64	0	8,742	19,571	763	571	0	1,037	845	0		X					60	10,829	11,912	$588,696	84,023	$7.01
Morris	MCM 10 evening	4	4	0	30	21	0	42	33	0	8,742	12,426	763	571	0	826	668	0			X				3,684	4,052	20,961	$211,702	20,961	$10.10
Morris	MCM 10 Sunday	4	4	0	30	21	0	30	21	32	8,742	10,584	763	571	0	763	571	343			X				1,842	2,026	19,894	$91,698	19,894	$4.61
Morris	Morris on the Move (new MCM 5)	1	3	2	12	0	0	41	41	21	2,933	13,682	256	0	0	433	216	141		X	X				60	10,750	11,825	$619,117	64,545	$9.59
Morris	Morristown-Willowbrook Express	0	2	2	0	0	0	34	34	28	0	12,062	0	0	0	208	166	104	X						60	12,062	13,268	$677,574	67,725	$10.00
Warren-Morris	Lakeland 80 - extend to Hackettstown	0	0	1	0	0	0	1.5	0	0	0	383	0	0	0	30	0	0				X			82.88	383	421	($15,618)	7,650	($2.04)
Warren-Morris	Wheels 973 Hackettstown	2	2	0	20	0	0	20	0	0	5,100	5,100	192	0	0	180	0	0						X	60	0	0	($5,483)	10,965	($0.50)
Warren-Morris	Warren County 57B	Minimal impact on cost and ridership.																											
		**May need to add service and peak vehicles if local ridership is heavy in peak periods.																											

4.2 Candidate Running Way Improvements

4.2.1. Types of Improvements

Introduction

Traffic congestion is one of the major factors that delay transit vehicles and result in longer travel times for passengers. A variety of roadway bus preferential treatments have been developed in urban and suburban settings to make bus transit more competitive with private automobile use and to provide a higher quality of service for passengers. Bus preferential treatments attempt to offset the delays caused by traffic and aim to improve schedule adherence and reduce travel times/delays for transit users. The benefits of improved service include attracting new riders, increasing transit capacity, and improving transit quality of service.

At times, recurring congestion leads to reactive measures by transit agencies to add more buses to a specific route in order to maintain headways or reduce the length of the transit route to reduce overall travel time. These measures can become costly as higher operating costs occur due to additional buses operating on the route or due to the extension of other bus routes to cover the roadway segments no longer served by a congested bus route.

Bus preferential treatments offer the potential to reduce the delays experienced by buses operating in mixed traffic by separating buses from the general traffic and prioritizing their movements at congested locations, thereby making buses operate similar to rail services. Bus preferential treatments are generally defined as a range of techniques designed to speed up transit vehicles and improve overall system efficiency.[3] The treatments include physical improvements, operating changes, and regulatory modifications. Examples of bus preferential treatments include exclusive busways, bus lanes, transit signal priority, queue jumps, curb extensions, and parking restrictions. These are described in the next section.

Bus preferential treatments can provide a cost-effective way of improving transit service based on a focused, one-time capital investment as opposed to increased service that requires annual operating funding. Bus preferential treatment measures should be cost-effective and will be more acceptable to roadway users and decision-makers when the improvements to transit operation do not create undesirable traffic disruptions.

Bus priority treatments have been successfully developed in various locations around the country, such as:

- New York – New York City Transit and New York City Department of Transportation have implemented the Select Bus Service along Fordham Road in the Bronx, which incorporates exclusive bus lanes, transit signal priority, and curbside parking/delivery restrictions.
- Minnesota – The Minnesota Department of Transportation has provided more than 250 miles of bus-only shoulders that have resulted in travel-time savings of up to ten minutes and an increase in ridership.
- New Jersey – New Jersey Department of Transportation reconstructed the shoulders for a three-mile section of Route 9 to provide peak period bus lanes within the shoulders.
- Oregon – Eugene, Oregon's EmX BRT service provides exclusive bus lanes and transit signal priority, which have provided six-minute travel-time savings in the peak periods.

[3] Transportation Research Board's *Transit Capacity and Quality of Service Manual* was used as a reference guide for identifying appropriate bus preferential treatments for the Northwest New Jersey Bus Study corridors.

To address NEED 4 – Implement improvements in passenger facilities and running ways to support service concepts, Bus Preferential Treatments for running ways were investigated for applicability to the study area corridors.

Types of Bus Preferential Treatments and Their Applicability to the Study Area Corridors

There are four types of bus preferential treatments that may have application in the Northwest New Jersey Bus Study corridors:

A median busway along one of Vancouver's BRT routes.

1. Busways provide a segregated right-of-way for buses to operate on a higher-speed, uncongested facility, which promote transit efficiency and improved travel time reliability. Busway facilities range from bus lanes in the median of urban streets to exclusive bus roads with grade-separated interchanges.

   This capital-intensive measure would not be appropriate for the Northwest New Jersey study corridors given the roadway right-of-way requirements and limited availability within the more densely developed urban/suburban sections of Morris County. Given the unavailability of adjacent land for providing a busway, this measure was determined to not be suitable for the Northwest New Jersey corridors and further assessment of this bus preferential treatment would not be required. Furthermore, NJ TRANSIT's *Transit Score* criteria indicate that exclusive bus lanes are appropriate for "High" and "Medium-High" transit score areas, which are not predominant within the Northwest New Jersey study area.

NYCT/NYCDOT Fordham Road bus lane in the Bronx.

2. Exclusive Bus Lanes are travel lanes dedicated to buses along an arterial street that can provide a separate right-of-way. The advantages of an arterial street bus lane as compared to a mixed-use lane for buses include:
   - Reduced conflicts with on-street parking maneuvers
   - No bus re-entry delays at bus stops
   - Reduced vehicle queues at intersection approaches
   - Better vehicle detection at signalized intersections
   - Reduced conflicts with left-turning traffic blocking shared lane

   Bus lanes can be created through various means, such as:
   - Re-designating an existing travel lane as a bus only lane,
   - Narrowing existing lanes to provide an additional bus only lane,

- Widening the street to add a new bus only lane, and
- Restricting on-street parking (part- or full-time) to provide a bus only lane

A variation of exclusive bus lanes is bus use of shoulder lanes (also known as Bus Bypass Shoulders [BBS] or Bus-Only Shoulders). BBS is an exclusive bus lane policy that permits buses to use roadway shoulders to bypass roadway congestion during the peak periods and in the peak travel direction. Minnesota has one of the most extensive Bus-Only Shoulder operations with over 250 miles of roadway shoulder designated for bus-only use. The Minnesota transit operation guidelines for Bus-Only Shoulders indicate that buses:

Minnesota bus shoulder lanes.

- Must not use the shoulder when mainline speeds are greater than 35 mph.
- May not exceed the speed of traffic by more than 15 mph (the maximum allowable speed on the shoulder is 35 mph).
- Must yield to any vehicle that enters the shoulder as well as any vehicle merging or exiting at an interchange ramp or intersection.
- Must re-enter the mainline at exception areas and in places where the shoulder is obstructed (i.e., parked vehicle, debris, etc.).

NJDOT constructed bus shoulder lanes for a three-mile section of Route 9 in Middlesex County. The policies for the NJDOT bus shoulders are as follows:

New Jersey Route 9 bus shoulder lanes.

- Hours of operation are 5-9 AM northbound and 4-8 PM southbound (i.e., peak period and peak direction only).
- Maximum bus travel speed of 35 mph on shoulders
- No limiting speed differential between buses and general traffic flow.
- Bikes may share shoulders with buses.
- Shoulders are for New Jersey Transit or commuter buses only, not for school buses, coaches, or charter buses.
- The Route 9 shoulders were completely reconstructed for bus use and the total project construction cost was $6.43 million.

NJ TRANSIT's Transit Score Criteria indicates that exclusive bus lanes and peak direction bus use of shoulders are applicable to limited-access roads within "High" transit score areas and are conditional

within "Medium-High" areas assuming more than 40 buses per hour in the peak direction and the road connects to a regional center with more than 60,000 jobs. *TCRP Report 118 – Bus Rapid Transit Practitioner's Guide* cites that generally, at least 25 buses should use the bus lanes during the peak hour to give buses a steady presence in the bus lane.

I-80 is the primary limited-access road in the study area, which does not traverse through any "High" transit score areas and a very short "Medium-High" area within Rockaway Township that is less than a mile in length. The applicability of exclusive bus lanes is "conditional" on arterials through "High" transit score areas, which do not exist in the study area.

Despite the Transit Score criteria, Bus Bypass Shoulders is a candidate initiative that has precedence within New Jersey and is evaluated further in the following sections.

3. Traffic Signal Priority (TSP) corresponds to active strategies that provide preferential signal timings to buses once a bus is detected approaching an intersection. These treatments may be unconditional (i.e., provide priority whenever a bus arrives) or conditional (i.e., provide priority when a bus is behind schedule). Conditional priority requires information from the automatic vehicle location (AVL) equipment on the approaching bus to determine if transit signal priority is necessary.

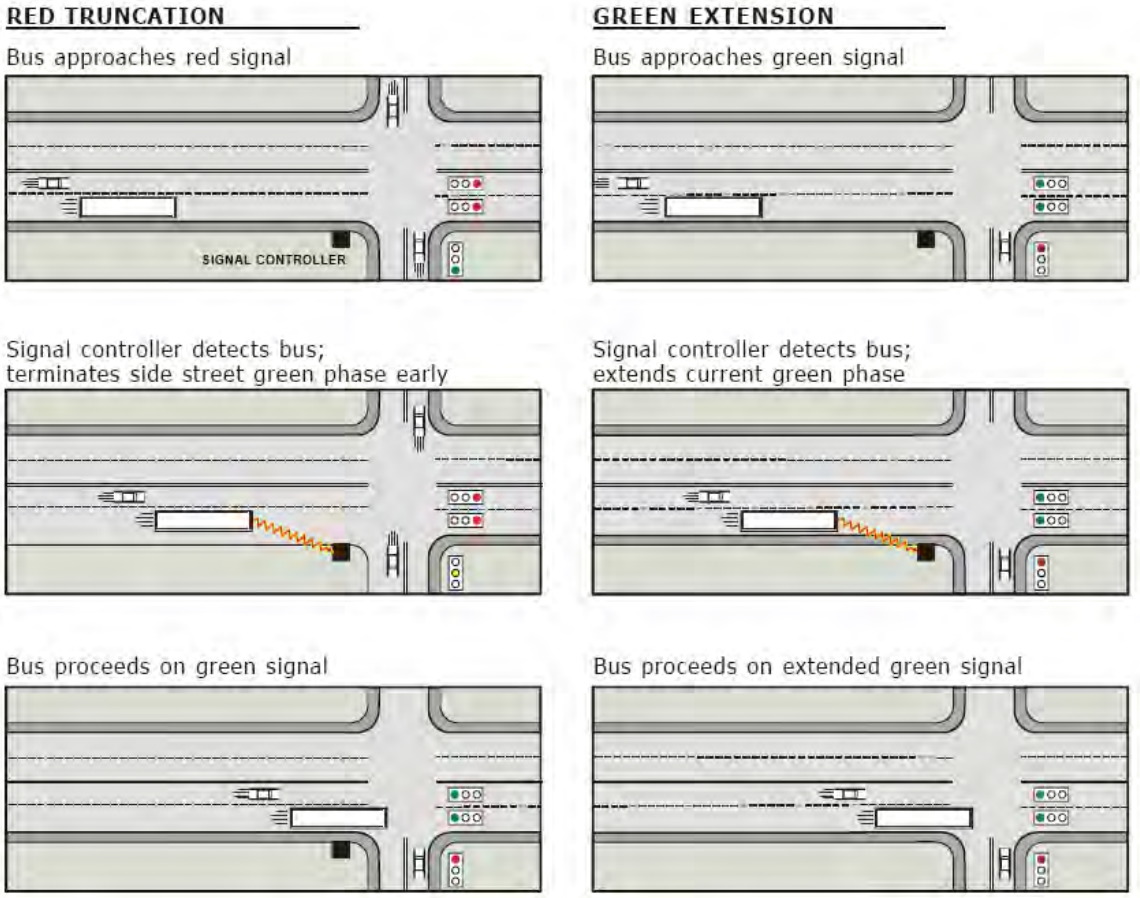
   Active TSP measures typically include either an extension of a current green phase to accommodate approaching buses or an early start/red truncation, which reduces the green time for other signal phases to return the green to buses earlier (see Figure 4-7). The benefit of these TSP measures is that they could shift green time within an existing signal cycle length without the need to change cycle lengths and thereby jeopardize existing traffic signal progression along a corridor.[4]

   Automated TSP systems that do not require bus operator intervention are preferable, and when coupled with AVL equipment, can be set to activate TSP only when a bus meets certain priority conditions. The bus-mounted AVL equipment can transmit a request for priority to the signal controller, which would truncate cross-street red time or extend corridor green time to allow the bus through the intersection and minimize signal delay. Other vehicles on the same approach as the bus would experience the same travel time benefits as the bus during bus TSP activation as the traffic signal indication controls bus and general traffic movements concurrently.

   Bus TSP could be provided only when needed and only for the duration of time needed for the bus to pass through a selected intersection. The efficiency of ending the priority as soon as the bus clears the intersection could be provided by the bus AVL equipment, which would transmit a second request to the traffic signal controller that it has cleared the intersection and that continuing the TSP phase is no longer necessary.

[4] TSP is different from traffic signal *preemption*, which interrupts the normal signal operations to accommodate a special event, such as an approaching emergency vehicle responding to an incident. Traffic signal preemption is not a preferred treatment for buses as it creates potential pedestrian crossing safety concerns; therefore, the current practice is to provide TSP, which provides buses with preferential treatment and is balanced against the other roadway user needs.

Figure 4-7: Bus Signal Priority Treatments – Red Truncation and Green Extension



Source: Transit Capacity and Quality of Service Manual, 2nd Edition

The activation of bus signal priority can also be conditional based on current traffic operations so as to minimize impacts to minor cross-streets. Specifically, the algorithm that controls the TSP activation would be based on real-time traffic information obtain from existing roadway traffic detectors. NJ TRANSIT's Transit Score criteria indicate that bus priority treatments such as transit signal priority and bus queue jumps (to be discussed in the following section) are conditional in "Medium-High" areas assuming that there are more than six buses per hour. Within "Medium" score areas, bus priority treatments are limited to primary arterials that operate at LOS D or worse during the peak hour.

Studies have shown that TSP is most effective at signalized intersections operating at LOS D and E conditions with volume-to-capacity (v/c) ratio between 0.8 and 1.0. There is limited benefit implementing TSP under acceptable LOS A through C conditions. Under oversaturated LOS F conditions, long vehicle queues prevent buses from getting to the intersection soon enough to take advantage of TSP without disrupting general traffic operations.

TSP is most effective when bus stops are located on the far side of signalized intersections so that a bus activates the priority to travel through the intersection and then make a stop. Recent studies indicate that TSP typically reduces transit travel times by eight to twelve percent[5].

4. Bus Queue-Jump/Bypass Lanes are short bus lanes at signalized intersection approaches that allow buses to avoid long mixed traffic queues and/or obtain a head start over adjacent traffic. A bus queue-jump lane and a bus bypass lane function differently to improve bus operations as follows.
    - Bus queue-jump lanes provide buses with a special right-lane signal that provides a short advanced green indication for the bus before traffic in the adjacent through lanes proceeds. This advanced green is typically only three to five seconds long, and can occur concurrently with the through green time given to the opposing traffic stream (see Figure 4-8). Bus queue-jump lanes are typically used with near-side bus stops so that as the bus exits the right lane, it can merge left into the general traffic lane ahead of the other traffic that is stopped at the signal.
    - Bypass lanes are similar to a queue-jump lane; however, the bus does not receive a separate signal phase. The bypass lane simply allows buses to avoid long queues of vehicles at signalized intersections and can be used with near- or far-side bus stop locations.

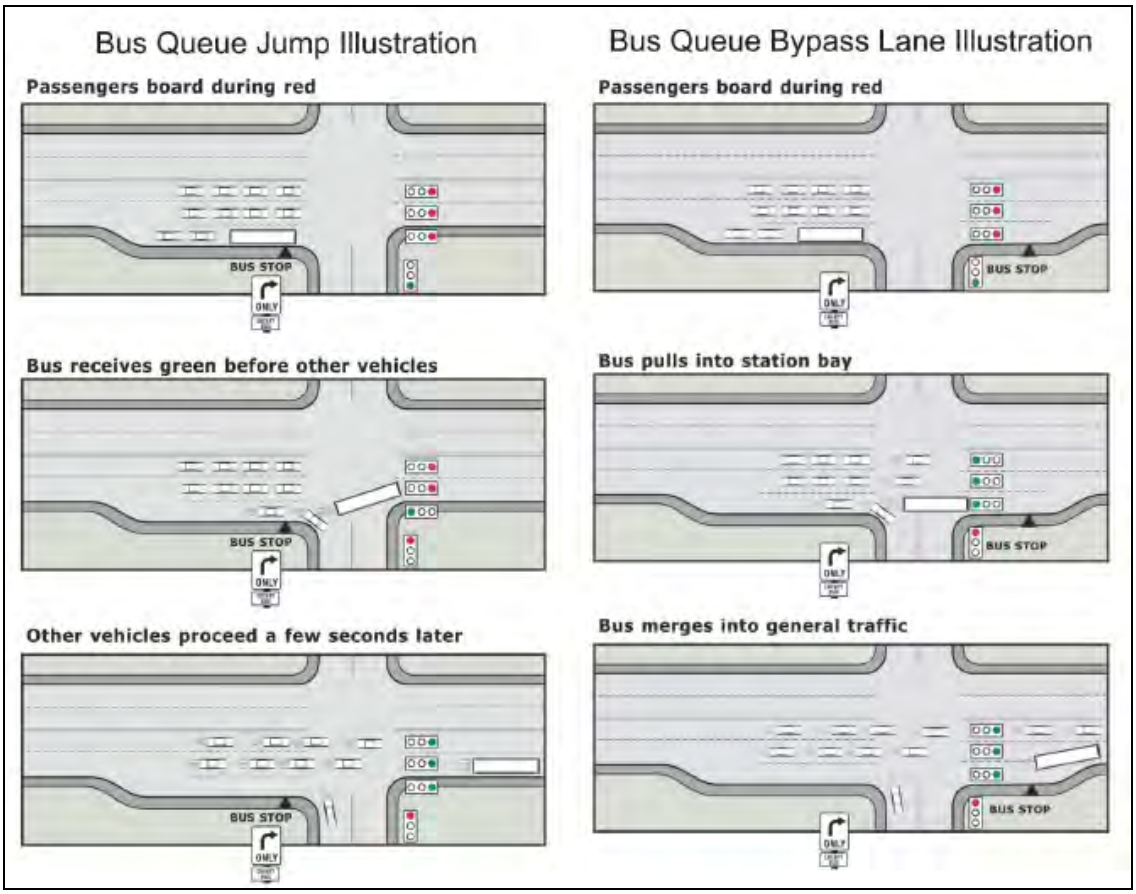
    Unlike bus queue-jump lanes, which require TSP (and therefore bus AVL equipment or another mechanism to trigger a request to the signal and likely upgrades to the local intersection traffic signal controller), bus bypass lanes can be quickly implemented or tested within a pilot program using the existing the shoulder or outside travel lane width. For this reason, bus bypass lanes are a candidate initiative for the Northwest New Jersey Bus Study and the methodology for selecting/evaluating potential signalized intersections for bus bypass lanes will be evaluated further in the following sections.

    Far-sided bus stops are preferable for bus bypass lanes to reduce conflicts with right-turning traffic. If the bus bypass lane is within a right-turn lane, the bus may occasionally block right-turn-on-red (RTOR) traffic during the red signal phase. The delay impact of this condition to the overall intersection operation should be minor given that the bus bypass lane would only affect one intersection turning movement during a portion of the red time.

    Near-sided bus stops are recommended for bus queue-jump lanes as the signal queue-jump would be activated after the bus serves the stop. Near-sided bus queue jumps within right-turn lanes would not increase right-turning traffic delays as buses would currently need to block this lane to serve the stop, regardless if a queue-jump signal is provided. If a cross street allows RTORs that conflict with an arterial's through bus queue-jump movements, it is recommended that the cross-street RTOR be restricted so that a vehicle does not turn in front of a bus during the bus's queue-jump phase.

[5] Source: *TCRP 118 – BRT Practitioner's Guide*

Figure 4-8: Bus Queue Jump/Bypass Illustrations



Source: TCRP Report 118 – Bus Rapid Transit Practitioner's Guide

4.2.2. Evaluation of Running Way Improvements

Highway Bus Bypass Shoulders and arterial bus bypass lanes at signalized intersections were preliminarily identified as the two bus preferential roadway improvements that should be examined further given that these are two initiatives that could initially be tested as part of a relatively low cost pilot program before permanent roadway improvements are installed. These pilot initiatives would require minimal capital cost to test as they would be implemented within the existing right-of-way and not require special ITS equipment on the bus or traffic signal controller. As NJ TRANSIT installs AVL equipment on their buses, opportunities to further reduce bus travel times within these congested study corridors by implementing transit signal priority could be implemented[6].

The following discussion presents the methodology used to: 1) identify roadway segments for implementing BBS or the signalized intersections for providing bus bypass lanes and transit signal priority, and 2) estimate the potential travel time savings these roadway improvement measures could achieve, as well as the results of the evaluation.

[6] NJ TRANSIT anticipates installing AVL detection equipment on their buses in six years. The cost associated with upgrading a traffic signal controller is approximately $15,000 per intersection and the cost for the TSP firmware is approximately $100,000 per traffic signal controller type.

Bus Bypass Shoulders

The following is the methodology used to identify roadway segments within the four-county study area (i.e., Sussex, Warren, Morris, Passaic counties) that might be considered candidates for BBS:

- First, all roadway segments at congested conditions (i.e., volume-to-capacity ratios greater than 1.0) during the AM peak period based on NJDOT's 2003 CMS data were identified.
- Second, those congested highway segments that provided shoulders widths of at least ten feet were identified using NJDOT's Straight-Line Diagrams.
- Next, study area bus route information was then integrated with the roadway geometric data to identify bus corridor segments with congestion and with shoulder widths greater than ten feet.
- Finally, these study corridors were then narrowed down by:
    a. highway segment length (i.e., minimum continuous segment length of two miles to achieve meaningful travel time benefits),
    b. bus service frequency (NJ TRANSIT recommended minimum bus service headways of ten minutes or less during the peak periods in the peak direction for implementation of BBS), and
    c. NJ TRANSIT's *Transit Score* criteria.

Only the I-80 segment satisfies the NJ TRANSIT criterion of 10 minute or better headway (6 buses per peak hour) for the AM and PM peak period bus service frequency in the peak direction (see Table 4-6 and Figure 4-9 for aerial of corridor segment). NJ TRANSIT guidelines indicate that bus lanes are applicable for limited-access roadways for "High" and "Medium-High" transit score categories only, although it is not clear that the "bus lane" standard applies to bus use of shoulders. Only a half-mile segment of I-80 through Rockaway Township qualifies for bus lanes as it traverses through a "Medium-High" transit score area. Arterial bus service frequencies are significantly less than the Transit Score criteria guideline of 40 buses per hour in the peak direction for bus lanes.

There are a few proposed service changes that would, if implemented, impact the possible number of buses using these corridors:

- I-80 Corridor: The WHEELS 967 route is proposed to be removed from I-80, but this route has only two morning and two evening peak trips. The MCM 7 route is proposed for deletion, but it operates only one trip per week, off-peak, and only a short distance on I-80.

- US 46 Corridor: Additional Lakeland 46 trips are recommended, but mostly in the off-peak. Only one new peak period trip (from Hackettstown) is recommended in each direction, which would operate on US 46 from Hackettstown to Netcong. The MCM 5 route is proposed to be converted into an all-day service with a 50-minute headway operating mostly on US 46 between Dover Center and Netcong. This would add three peak period trips in each direction on this section of US 46.

- NJ 23 Corridor: The concept calls for extending existing peak-period trips along NJ 23 from Stockholm to Franklin or Vernon, but without adding additional trips unless warranted by overcrowding. Adding off-peak trips is also proposed for this corridor.

Regardless of the Transit Score criteria, average travel speeds along the 15-mile segment of I-80 extending from US 206 to the west to just west of US 202 interchange in Parsippany were examined for BBS. The

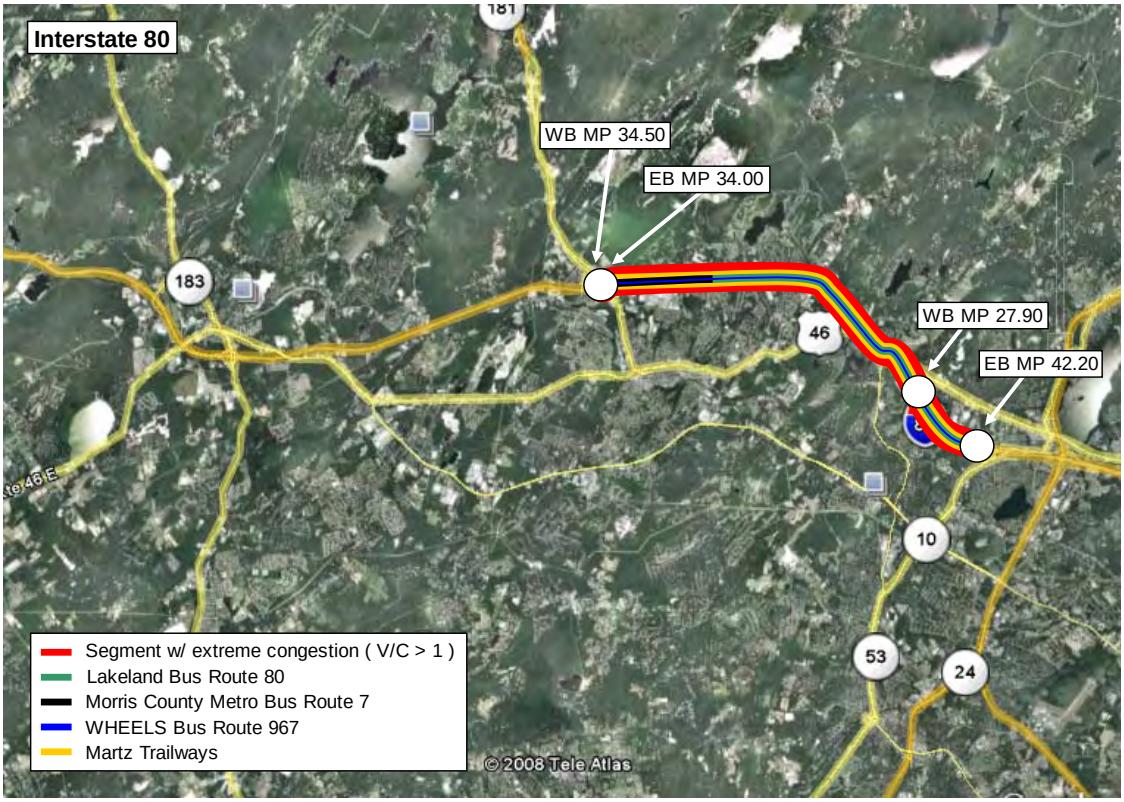
BBS was identified to terminate at US 202 to the east since it is not desirable to extend a BBS across two-lane exit ramps due to potential conflicts between buses and exiting vehicles.

Table 4-6: Study Corridors Identified as Potential Bus Use of Shoulder Candidates

Corridor	Roadway	Direction	Segment		Shoulder Width (ft)	V / C > 1.0	Bus Routes	Combined Peak Period Trips[1]	
			Start MP	End MP				AM	PM
Morris	I-80	EB	34.00	42.20	12	Yes	Martz Trailways, Lakeland Bus 80	51	0
		WB	27.90	34.50	12	Yes	WHEELS 967 MCM 7	0	49
Morris	US 46	EB	45.85	49.10	10	Yes	Lakeland Bus 46 MCM 5 NJT 29, 79	18	11
		WB	23.00	26.25	10	Yes		17	16
Sussex-Passaic	NJ 23	EB	9.45	17.00	12	Yes	NJT 75, 194	11	2
			22.60	26.20	12				
		WB	35.35	38.85	12	Yes		3	16
			39.70	42.55	12				

[1] AM peak period 6-9 AM; PM peak period 4-7 PM

Figure 4-9: Morris Corridor (I-80) Identified as Potential Bus Use of Shoulder Candidate



The shoulder on the left-hand side of I-80 was also examined for its potential to be a BBS. The benefit of a left-shoulder BBS system is that the bus would not conflict with ramp traffic merging on or diverging off of the interstate. A left-shoulder BBS program was not considered a viable alternative for I-80 as the left shoulder did not continuously provide the required minimum ten-foot width due to the number of roadway overpass bridge abutments located in the center median of the interstate that narrowed the should width to less than ten feet.

Travel-time benefits from a potential I-80 BBS initiative were estimated based on average travel speed data obtained from the New Jersey Institute of Technology (NJIT).[7] First, the highway segments within the proposed BBS area that operated with average highway travel speeds of less than 35 mph were identified, as these would be the roadway segments and operational conditions when the a bus could use the shoulder in a BBS system.

The NJIT travel speed data indicated that average travel speeds on I-80 are higher than 35 mph along the proposed BBS segment. These travel speeds indicate that there is no roadway congestion that would result in the need for a bus to use the shoulder to bypass traffic congestion based on the travel speed data (see Appendix E).

It is recommended that additional travel speed data be collected to verify the level of congestion on I-80 and determine the potential benefit of implementing BBS. If a BBS were provided and assuming that general traffic was moving at 20 mph and the buses traveling at 30 mph on the shoulder, then a bus would experience a travel time savings of one minute per mile as compared to using the general traffic lanes. If a more severe, non-recurring incident occurred that resulted in stop-and-go traffic conditions moving at 10 mph along the interstate, the buses, operating at 20 mph (i.e., 10 mph speed differential from general traffic) would experience a travel-time savings of three minutes per mile.

These preliminary evaluations are based on existing travel times. If future travel time/speed information becomes available (it was not for this analysis), these segments could be re-evaluated. At this time, the segment of I-80 that traverses a "Medium-High" transit score area is relatively short, and unless this area expands, providing an exclusive bus shoulder lane would likely not be justified.

Bus Bypass/Queue-Jump Lanes

Following is the methodology used to identify signalized intersections within the study area that might be considered candidates for bus bypass lanes.

- First, all signalized intersections along existing bus routes with a high transit ridership and service frequency, specifically, the Sussex-Passaic (NJ 23), and Morris (US 46 and NJ 10) corridors, were identified.
- Second, those signalized intersections that provide a shoulder, right-turn, or parking lane available for a queue-jump lane was identified. This curb lane width would need to be maintained through the intersection to the far side of the intersection.
- Finally, the intersections located on congested highway segments (i.e., volume-to-capacity ratios greater than 1.0) during the AM peak period based on NJDOT's 2003 CMS data were then progressed for further evaluation.

[7] NJIT is examining the congested I-80 corridor between mileposts 27.5 and 47.3 (i.e., between Exit 27 [US 206] and Exit 47 [I-280]) to help identify ITS solutions. As part of this study, multiple travel speed runs were performed on I-80 during October, November, and December 2007 during the AM and PM peak periods.

Tables 4-7, 4-8 and 4-9 provide a summary of the signalized intersections along the three study corridors and identifies if there may be candidate bus queue jump locations. Appendix F provides more detailed descriptive information and evaluation findings.

The 2006 CMS database provides average vehicle approach delays during the peak periods and this information was used to estimate the potential benefits of the bus bypass lane locations. Locations with approach delays less than 35 seconds indicate acceptable traffic level-of-service conditions (i.e., LOS C or better), and would not justify the need for a bus priority treatments as per the NJ TRANSIT's criteria for area's with "Medium" Transit Scores. Those locations with longer approach delays that may benefit from the short bus bypass lanes at intersections include:

- US 46 at New Road (Parsippany)
- NJ 10 at Shopping Center / Yacenda Drive (Parsippany)
- NJ 23 at Packanack Lake Road (Wayne)
- NJ 23 at Black Oak Ridge Road (Wayne)
- NJ 23 at Alexander Avenue (Pequannock)
- NJ 23 at Jackson Avenue (Pequannock)
- NJ 23 at Newark Pompton Turnpike (Pequannock)
- NJ 23 at Morse Avenue (Butler)
- NJ 23 at jug handle south of Cascade Way (Butler)

Assuming an average per lane queue of ten vehicles at these intersection approaches, a 250-foot bus queue jump lane could save approximately 25 seconds per intersection. However, the existing bus service frequency at each of these intersections is less than six buses per hour in the peak direction during the peak periods, and would not justify the need for bus priority treatment as per NJ TRANSIT's criteria for "Medium-High" and "Medium" Transit Score areas. As a comparison, the Route 9 shoulders in Middlesex County were designed to accommodate 150 buses during the peak periods.

A review of all the signalized intersections along US 46, NJ 10, and NJ 23 indicate that these intersections currently do not have the peak-period peak-direction service frequency of six or more buses per hour to justify bus priority treatments, which include bus bypass lanes and transit signal priority. These findings are based on existing transit frequencies and intersection approach delays. As noted under Bus Use of Shoulders, there are a few proposed service changes that would, if implemented, impact the possible number of buses using these corridors:

- US 46 Corridor: Additional Lakeland 46 trips are recommended, but mostly in the off-peak. Only one new peak period trip (from Hackettstown) is recommended in each direction, which would operate on US 46 from Hackettstown to Netcong. The MCM 5 route is proposed to be converted into an all-day service with a 50-minute headway operating mostly on US 46 between Dover Center and Netcong. This would add three peak period trips in each direction on this section of US 46.

- NJ 23 Corridor: The concept calls for extending existing peak-period trips along NJ 23 from Stockholm to Franklin or Vernon, but without adding additional trips unless warranted by overcrowding. Adding off-peak trips is also proposed for this corridor.

4.2.3. Summary of Findings

Various roadway bus preferential treatments were evaluated for the Northwest New Jersey Study Area. Bus Bypass Shoulders (BBS) were identified as a potential improvement measure for I-80; however, existing travel time data obtained from NJIT and the Transit Score area type did not justify its application. Similarly, intersection bus bypass lanes, queue-jump lanes, and TSP were considered for US 46, NJ 23, and NJ 10; however, the existing bus service frequency (less than six buses per hour in the peak direction during the peak hours) and/or intersection levels of service (LOS) did not justify their applicability. Therefore, the following running way improvement procedure should be considered as a methodology for systematically implementing bus priority treatments on one of the preferred arterial corridors (US 46, NJ 23, or NJ 10) as NJ TRANSIT increases service frequencies or seeks to consolidate bus service to a specific transit corridor. Conceptual engineering was performed for bus bypass shoulders at two locations -- on US 46 at New Road (Parsippany) and on NJ 23 at Packanack Lake Road (Wayne); these are presented in Appendix F.

1. Implement bus bypass lanes using available shoulder width at key intersections as a pilot program to test and evaluate their effectiveness.
2. If the bus bypass lane program proves effective, incrementally reconstruct these existing bus bypass lanes to better accommodate the bus traffic, and build new bus bypass lanes at other key intersections where existing shoulder width is not available.
3. As AVL equipment becomes installed on the buses, additional bus travel time savings could be achieved by installing a bus queue-jump signal phase at the bus bypass lanes locations that have near-side bus stops and TSP can be provided to bus bypass lanes with far-side bus stops.

Table 4-7: Sussex-Passaic Corridor (NJ 23) Candidate Queue-Jump Locations

No.	Municipality	NJ 23 Intersection @	Queue Jump Potential?	Comments
1	Wayne	Packanack Lake Rd	Northbound only	Shoulder width = 12 feet
2	Wayne	Black Oak Ridge Road	Northbound only	Shoulder width = 12 feet
3	Pequannock	Alexander Avenue	Southbound only	Shoulder width = 12 feet
4	Pequannock	Jackson Avenue	Northbound only	Shoulder width = 12 feet
5	Pequannock	Newark Pompton Tpk	Southbound possible	SB QJ in right-turn lane
6	Pequannock	Boulevard	Yes	Shoulder width = 12 feet
7	Riverdale	Windbeam Road	Northbound only	Shoulder width = 12 feet
8	Riverdale	Cotluss Road	No	No shoulder
9	Butler	Morse Avenue	Southbound only	Shoulder width = 12 feet
10	Butler	Boonton Avenue	No	No shoulder
11	Butler	Jug handle S/O of Cascade Way	Yes	Shoulder width = 12 feet
12	Butler	Kiel Avenue	No	No shoulder
13	Butler	Center Court	Yes	SB QJ in right-turn lane

Note: Only potential queue jump locations are shown.

Table 4-8: Morris Corridor (US 46) Candidate Queue-Jump Locations

No.	Municipality	US 46 Intersection @	Queue Jump Potential?	Comments
1	Denville	Franklin Road	No	No shoulder
2	Denville	West Main Street	No	No shoulder
3	Denville	Bloomfield Avenue	Yes	Shoulder width = 10 feet
4	Mountain Lakes	Fox Hill Road	Yes	Shoulder width = 10 feet
5	Mountain Lakes	Mountain Lakes Boulevard	Yes	Shoulder width = 10 feet
6	Mountain Lakes	Lackawana Avenue	Eastbound only	Shoulder width = 10 feet
7	Parsippany	Cherry Hill Road	Eastbound only	Shoulder width = 12 feet
8	Parsippany	Waterview Boulevard	Eastbound only	Shoulder width = 10 feet
9	Parsippany	Parsippany Boulevard	No	No shoulder
10	Parsippany	Smith Road	Yes	Shoulder width = 10 feet
11	Parsippany	Vail Road	Yes	Shoulder width = 10 feet
12	Parsippany	Baldwin Road	Yes	Shoulder width = 10 feet
13	Parsippany	Beverwyck Road	Eastbound only	QJ in EB / WB right-turn lane
14	Parsippany	Arlington Plaza	Westbound only	Shoulder width = 10 feet
15	Parsippany	New Road	Eastbound only	Shoulder width = 12 feet
16	Pine Brook	Hook Mountain Road	Westbound only	Shoulder width = 10 feet
17	Fairfield	Clinton Road	Yes	Shoulder width = 10 feet

Note: Only potential queue jump locations are shown.

Table 4-9: Morris Corridor (NJ 10) Candidate Queue-Jump Locations

No.	Municipality	NJ 10 Intersection @	Queue Jump Potential?	Comments
1	Denville	Franklin Road	No	No shoulder
2	Denville	Mt. Pleasant Tnpk	No	No shoulder
3	Parsippany	Shopping Center / Yacenda Dr	Eastbound only	Shoulder width = 12 feet
4	Parsippany	Powder Mill Road	No	No shoulder
5	Parsippany	Littleton Road	No	No shoulder
6	Hanover	Ridgedale Avenue	Westbound only	Eastbound QJ in right-turn lane
7	Hanover	Jefferson Road	No	Shoulder width = 8 feet
8	Hanover	Pine Plaza Shopping Center	No	Shoulder width = 8 feet
9	Whippany	Whippany Road	No	Shoulder width = 5 feet
10	Whippany	Troy Hills Road	No	Shoulder width = 5 feet
11	Whippany	Algonquin Pkwy	No	Shoulder width = 8 feet
12	East Hanover	Ridgedale Avenue	No	No shoulder
13	East Hanover	Shopping Center U-Turn / Faranella Dr	Eastbound only	Shoulder width = 12 feet
14	East Hanover	New Murray Road	No	Shoulder width = 8 feet
15	East Hanover	River Road	No	Shoulder width = 8 feet

Note: Only potential queue jump locations are shown.

4.3 Candidate Passenger Facilities

This section describes the identification and evaluation of candidate improvements to passenger facilities, both existing and new, along the study corridors in Northwest New Jersey. These improvements include upgrades to existing bus park-and-ride (and transit hub) facilities, identification of sites for new shared park-and-ride facilities and transit hubs, and bus stop modifications/enhancements. These address NEED 4 – Implement improvements in passenger facilities and running ways to support service concepts. They are directly related to the service improvement strategies discussed in previously. Where applicable, specific passenger candidate improvement strategies are matched to corresponding service improvement concepts described in Section 4.1.

4.3.1. Types of Passenger Facilities

Bus passenger facilities in the study area include park-and-ride lots, transit hubs, and bus stops. (Note that some of these are co-located with NJ TRANSIT train stations).This section assesses the condition of existing passenger facilities and proposes both new facilities and improvements to existing facilities.

Park-and-Ride Lots - Park-and-ride lots are facilities where motorists (and, less frequently, bicyclists) may park and transfer to public transportation or other shared ride modes (i.e., carpool or vanpool) to continue their journey. Park-and-ride lots include *dedicated* facilities i.e., whose sole purpose is to provide parking for commuter needs and *shared-use* parking lots i.e., parking facilities primarily used for a purpose other than commuting. Dedicated park-and-ride lots are generally owned by NJ DOT, NJ TRANSIT, or a local government. A formal shared-use park-and-ride lot has a lease with the property owner that sets aside sections of parking spaces for commuters. Other parking lots may be used informally by commuters, although such use may not be desired or permitted by the property owner. There are 52 existing official park-and-ride lots in the study area. Of these, five have no transit service (they are used to facilitate ridesharing).[8] The remaining 47 lots have bus or rail service or both.

Transit Hubs - *Transit hubs* are places where transit routes converge to facilitate transfers. The concept of "transit hub" refers to the function of the area, not the physical facilities available. A Transit Center (such as Wayne/ Route 23) has a high level of amenities but may or may not function as a transit hub in terms of the amount of transfer activity. (Several bus stops in regional malls, rail stations, or town centers function as transit hubs and/or could be improved to function better as transit hubs. As described in the Service Planning section (Section 4.1 of this chapter), this study examined possibilities for making these places function more like transit hubs by co-locating nearby stops of different routes, as well as expanding the amount and type of service offered, including adding new routes. Improving transfers may include both coordinating the times and places of transit service arrivals and departures[9] and also upgrading physical facilities to improve comfort, information, and access for passengers. Because they generally have more passenger activity, including transfers, transit hubs ought to have a higher level of amenities than ordinary bus stops or park-and-ride lots (see the discussion of required and desirable amenities under the subsequent section entitled Strategies for Existing Passenger Facilities). Where the higher level of amenities is provided, the transit hubs are often designated Transit Centers. Regional shopping malls often

[8]These five are Mount Olive A&P lot, Sussex Borough municipal parking lot, Hopatcong Brantfield lot, Hope Park-and-ride, and Washington Park-and-ride (Rt. 46).

[9]Passive schedule coordination, where schedules are adjusted to provide some reasonable transfer opportunities, is what is suggested. In a full timed transfer system, by contrast, all routes are coordinated to arrive and depart at the same time, and bus drivers will hold the bus in order to insure the connection is made.

function well as hubs due to the availability of shared-use parking spaces and the high demand for transit service to the site. However, since shopping malls are privately owned, making such improvements relies on the cooperation of the property management. Transit hubs are discussed following the sections on existing and new park-and-ride lots.

Bus Stops - Bus stops are the most common type of passenger facilities, and are typically served (in the Northwest New Jersey Study Area) by only one or a small number of routes. Fixed-route services typically serve designated stops, identified by bus stop signs, to reduce the number of stops buses must make and to ensure that passenger boardings and alightings take place in safe and appropriate locations. The sidewalk adjacent to the bus stop is frequently used as the passenger waiting area. Depending on passenger volumes at the stop, additional passenger amenities may include a bench, shelter, and static informational signage.

Table 4-10 describes analyses of passenger facility needs conducted as part of this study and the purpose of each. The following sections present the analyses conducted and their findings by type of facility.

Table 4-10: Overview of Passenger Facility Analysis

Passenger Facility Strategies Considered	Purpose
Assessment of existing park-and-rides by corridor	To identify needs and deficiencies at existing park-and-ride facilities and to develop specific strategies to improve their functionality.
Identification of new park-and-ride facilities by corridor	To identify opportunities for shared park-and-rides to support proposed service expansions and to meet existing parking demand where parking capacity is near or at capacity for existing facilities.
Identification of transit hubs by corridor	To identify needs and opportunities for transit hubs arising from proposed service expansions.
Assessment of bus stops	To evaluate the safety and operational characteristics of a representative number of bus stops and to provide guidance for evaluating other bus stop locations and a recommended list of standard improvement measures.

4.3.2. Assessment of Existing Park-and-Rides (by corridor)

Existing Conditions

To address the need for improved conditions at bus commuter facilities, an assessment of conditions at existing park-and-ride facilities was undertaken to identify needs and deficiencies at these facilities, and to develop concepts to improve their functionality. Existing park-and-ride facilities were identified thorough the NJDOT and TransOptions websites and discussions with NJ TRANSIT, NJTPA, and county planning departments.

The characteristics of existing park-and-ride lots in the study area vary widely. For example, some lack asphalt pavement, directional signage, passenger amenities (shelters, passenger information, seating), adequate curbs and sidewalks, and pavement markings. Several lots are at or near capacity. Each park-and-ride facility was assessed to obtain the following information:

- Hours of operation
- Proximity to nearest major highways
- Is park-and-ride served by transit?

- Is pedestrian access available? (i.e., availability of sidewalks/crosswalks)
- Does and/or can a bus circulate within P&R?
- Are there bus stops near P&R?
- Is the park-and-ride facility attended?
- What amenities are present?
  - signs
  - shelter
  - seating
  - schedule
  - lighting
  - paved
  - heating
  - restrooms
  - trash bins
- Are there parking fees?
- Are there parking restrictions?
- Number of available/unused parking spaces
- Are bicycle racks and/or lockers available?
- Parking usage
- Is park-and-ride facility shared (i.e., with a business or other use) or exclusive (solely for commuters)?
- Name of owner and contact information of manager (if available)

The results of the condition assessment for all 52 facilities are included in a table format in Appendix H. While conditions vary by location and corridor, a number of issues concerning existing park-and-rides emerged regardless of their type, jurisdiction, and location. Most notably, the vast majority of these passenger facilities lack even basic bus schedule information for the routes serving them. This lack of information may discourage potential users because trips cannot be properly planned, inconveniencing both existing and potential users. In addition, most facilities lack bicycle parking (racks or lockers), discouraging a segment of potential users. More than half of the park-and-ride lots (including adjacent bus stops) either have no bus shelters or have shelters in need of repair. The lack of shelters may discourage potential users and create uncomfortable conditions for existing users. Finally, fewer than half of the facilities surveyed have complete signage (trailblazer signs leading to the site, entrance signs, and route information signs at passenger waiting areas). This lack of information presents an obstacle to potential new users who may not be aware of these transit services and facilities. Table 4-11 summarizes the most common areas of need across all facilities surveyed.

Table 4-11: Most Common Needs at Existing Passenger Facilities for All Corridors

Most Common Deficiencies	% of Lots Surveyed
Lacking bus schedules	85%
No bicycle racks or lockers	81%
No posted hours of operation	67%
No shelters or shelters in need of repair	62%
No trash bins	62%
Incomplete signage (trailblazers, entrance signs, bus route signs)	52%
No seating	48%
Insufficient lighting	37%
In need of repairs to pavement or restriping	33%
No marked bus stop (site served by bus)	31%
No sidewalks or crosswalks or sidewalk repairs needed	29%

For each of the corridors, park-and-rides were prioritized by those nearing or at capacity (defined as being at or above 75 percent of capacity) and by level of need, and recommended improvements for these facilities were developed. (In Warren County, there were only two park-and-rides at or above 70 percent capacity. These facilities were grouped with the Morris County Corridor analyses.) These facilities are recommended to be considered first in terms of investments in improvements as they provide the most return on the investment of capital funds.

Sussex-Passaic Corridor

The most highly used facilities in the Sussex-Passaic Corridor are located primarily in Wayne Township in Passaic County. They include the following facilities: (See Table 4-12.)

- Willowbrook Mall Park-and-Ride – Approximately 800 spaces are reserved for commuters (indicated with green pavement markings), although the parking lot has a capacity of 1,885 spaces. This facility is served by NJ TRANSIT bus routes 11, 28, 75, 191, 193, 194, 195, 197, 198, 704, 705, 712, and MCM 1. These bus routes serve New York City, Newark, Paterson, Passaic, Wayne, Hackensack, and Morristown.

- Mothers Park-and-Ride – This 400-space facility is served by NJ TRANSIT bus routes 194 and 324 serving New York City. It serves as overflow parking for the Route 23 Wayne Transit Center and the Willowbrook Mall.

- Route 23 Wayne Transit Center –This facility, with approximately 1,000 spaces, is served by the NJ TRANSIT Montclair-Boonton Line and NJ TRANSIT bus routes 75, 194, 198, 324, 748 serving New York City, Newark, Ridgewood, Pompton Lakes, and Paterson.

- Montville Park-and-Ride (NJ TRANSIT Towaco Station) – This 220-space facility is served by the NJ TRANSIT Montclair-Boonton Line and Lakeland 46 and MCM 1 bus routes.

- Newfoundland Park-and-Ride – This 160-space facility is served by NJ TRANSIT bus routes 194 serving New York City.

- West Milford Park-and-Ride – This 200-space facility is served by NJ TRANSIT bus routes 196 and 197 serving New York City.

Table 4-12: Highest Utilized Passenger Facilities in the Sussex-Passaic Corridor

Passenger Facility	Type	% Occupied	Capacity
Wayne Park-and-Ride (Route 23 Transit Center)	Transit Center	100%	1,000
Wayne Park-and-Ride (Willowbrook Mall)	Shared P&R	100%	800 (reserved) 1,885 (total)
Wayne Park-and-Ride (Mothers Park-and-Ride)	Dedicated P&R	100%	400
Montville Park-and-Ride (NJT Towaco Station)	Rail Station	89%	220
Newfoundland park-and-ride	Dedicated P&R	83%	160
West Milford park-and-ride	Dedicated P&R	66%	200

In general, the facilities on Route 23 in Wayne are in good condition and have many amenities except for bicycle parking. However, the Newfoundland and West Milford park-and-rides (see Figure 4-10) each have numerous needs. At these two facilities there are a lack of pedestrian amenities, shelters in need of repair or maintenance, no bus schedules, minimal lighting, poor pavement conditions, and a lack of bicycle parking.

Figure 4-10: Pavement in Need of Repair (West Milford Park-and-Ride).

Sussex-Morris Corridor

Park-and-rides in Sussex-Morris Corridor are primarily located along NJ 15 and US 206. The most highly used park-and-rides on the Sussex-Morris Corridor are Frankford, Sparta Main Street, and Blue Heron. (See Table 4-13)

- Frankford (Ross's Corner) park-and-ride – This facility is primarily a ridesharing lot. It is also served by Wheels 967 to Parsippany, which has about six daily boardings.

- Sparta Main Street park-and-ride – This facility is served by Wheels 967 to Parsippany and Lakeland Bus 80 to New York City.

- Sparta Blue Heron park-and-ride – This facility is served by Lakeland Bus 80 to New York City and Wheels 967.

The needs at these three facilities include bus shelters, posted bus schedules, and bicycle parking.

Table 4-13: Highest Utilized Passenger Facilities in the Sussex-Morris Corridor

Passenger Facility	Type	% Occupied	Capacity
Frankford (Ross's Corner) park-and-ride	Dedicated P&R	99%	100
Sparta Main Street park-and-ride	Shared P&R	96%	26
Sparta Blue Heron park-and-ride	Dedicated P&R	90%	50

The Newton park-and-ride is the largest facility in Sussex County with approximately 200 spaces, but is among the least used facilities (ten percent utilized). The low use may be due in part to difficulty in finding this facility. (See Figure 4-11.) While there is some limited trailblazer signage, there are no signs in the vicinity of the park-and-ride. This problem is compounded by the fact that the lot is not easily seen from the adjacent roadway. This park-and-ride is served by Lakeland Bus 80 to New York City, although there is no information regarding available transit services.

Figure 4-11: Access Road Leading into Newton Park-and-Ride

Lack of trailblazer signage and a location far from the main road make this location difficult to find.

Morris County Corridor (including Warren County)

The Morris County Corridor has the most park-and-ride lots nearing or at capacity. This includes both bus and carpool park-and-ride lots as well as commuter rail stations served by bus. The most highly used park-and-ride lots in the Morris County Corridor are shown in Table 4-14.

Along NJ 10, other than the parking lots at the rail stations on the NJ TRANSIT Morris and Essex Line, there are only two park-and-ride facilities -- the Chatham Station park-and-ride on Route 124 served by MCM 3 and the Mendham park-and-ride on Route 510 served by MCM 3 and 4. Neither facility lacks parking capacity. These facilities are in excellent physical condition and have few needs aside from posting hours of operation and bus schedules. On the other hand, the insufficient quantity of parking is the primary problem at the rail stations. This problem is expected to increase when construction of Mass Transit Tunnel is complete.

Table 4-14: Highest Utilized Passenger Facilities in Morris County Corridor

Passenger Facility	Type	% Occupied	Capacity
NJT Chatham Station	Rail Station	100%	247
NJT Madison Station	Rail Station	100%	421
NJT Convent Station	Rail Station	100%	534
NJT Morris Plains Station	Rail Station	100%	117
Parsippany park-and-ride (Arlington Plaza)	Shared P&R	100%	180
Mount Arlington park-and-ride (Howard Boulevard)	Rail Station	100%	205
Dover park-and-ride (Dover NJT Station)	Rail Station	100%	837
Parsippany park-and-ride (Smithfield Lot 1 & 2)	Shared P&R	94%	100
Parsippany park-and-ride (Waterview)	Dedicated P&R	93%	270
Parsippany park-and-ride (Beverwyck)	Dedicated P&R	93%	240
Dover park-and-ride (Lakeland Terminal)	Dedicated P&R	88%	40
Rockaway Townsquare Mall park-and-ride	Shared P&R	85%	210
Allamuchy park-and-ride (Panther Valley) (I-80)	Shared P&R	73%	100
Hope park-and-ride (I-80)	Dedicated P&R	70%	50

Note: The Morristown Station park-and-ride is currently under construction.

In the Morris County Corridor, the majority of the most heavily used passenger facilities (including Arlington Plaza, Smithfield Lot 1, Waterview, and Beverwyck) are located along the eastern end of the study area. This corridor is served principally by the Lakeland 46 bus to New York City, and also by NJT 29 Newark-West Caldwell – Parsippany and NJT 79 Newark–Parsippany.

Dover Station is served by two NJ TRANSIT commuter rail lines -- the Morristown Line and the Montclair-Boonton Line -- as well as bus routes MCM 2 and MCM10. Some Lakeland 46 trips also stop on Blackwell Street near the rail station.

The Rockaway Townsquare Mall shared-use park-and-ride lot, adjacent to Interstate 80, is primarily served by Lakeland 80 bus, offering non-stop trips to New York City. Local service to the Mall is provided by MCM 10 to Dover and Morristown. Routes MCM 5 and MCM 7 also provide a very limited number of trips to the Mall.

These facilities are lacking in basic amenities such as posted hours of operation, bus schedules, trailblazer signs and entrance signs, bus shelters, trash bins, and bicycle parking. Without these amenities, new users may experience confusion in finding park-and-ride lots (due to inadequate roadside signage) and may be unaware of the bus departure times. All users may experience discomfort in cases where shelters and seating are not provided at waiting areas. Pavement quality is poor in some facilities, as in the Dover lot, shown in Figure 4-12, one of several dedicated lots serving the train station.

Figure 4-12: Poorly Paved Parking Lot (NJT Dover Station)

Mount Arlington Station (opened in January 2008) has the most amenities of any park-and-ride facility in the study area and can serve as a model for future park-and-rides and transit hubs (see Figure 4-13). There are passenger amenities at Mount Arlington Station such as bus-only lanes leading to the bus stop, bus shelters and schedules, and there are amenities shared with the rail station (because the bus stop is located at the front door of the station) such as parking, pedestrian crosswalks, benches, telephones, canopies, bike racks, etc. NJTRANSIT has examined the feasibility of increasing parking capacity at this major park-and-ride and will continue to monitor its usage. It is prepared to do expand the park-and-ride when capital funding becomes available.

The Waterview park-and-ride in Parsippany, a dedicated facility, was recently constructed and is in excellent condition. It has a shelter, but no passenger information.

Figure 4-13: Examples of Amenities at NJT Mount Arlington Station Bus Passenger Waiting Area

Pedestrian crosswalks, bus-only lanes, shelters, bicycle racks, benches, lighting, and trash bins

There are park-and-ride facilities in Warren County that were assessed as part of this effort. The most highly used park-and-rides in Warren County are at Panther Valley Village Square Mall (approximately 100 spaces) and at Hope (approximately 50 spaces). Parking use at these facilities was 73 and 70 percent of capacity. Both facilities are located on the Interstate 80 corridor. Panther Valley Village Square Mall is the only New Jersey stop served by Martz Trailways bus service from Pennsylvania to New York City. The Hope park-and-ride is not served by transit. The needs at these two facilities include posted hours of operation, bus schedules, bus shelters, seating, improved lighting, trash bins, and bicycle parking.

Parking capacity is not a problem for Warren County lots, as all lots are well below capacity. The parking lot at the Hackettstown Rail Station (the terminus for both the Morris-Essex Line and the Montclair-Boonton Line) has 100 spaces and is just above 50 percent used. The remaining parking lots in Hackettstown and Hopatcong vary in size from 15 spaces (Hackettstown Municipal Lot #4) to 120 spaces (Phillipsburg Mall park-and-ride). Parking utilization rates at these lots range from 11 to 38 percent of capacity (despite, in many cases, being shared with parking for local businesses). In Hackettstown, bus service is limited to local routes Wheels 973 (Hackettstown circulator) and Warren County Route 57B.

The Phillipsburg Mall in Lopatcong includes 120 commuter-only parking spaces on its property, and is served by two bus routes, TransBridge to New York City and Warren County Route 57B. However, use of these spaces is extremely low (11 percent). One reason for the low use may be difficulty in finding these commuter spaces within the mall. There are no trailblazer signs leading to the park-and-ride from outer or

interior roadways. Two small signs are provided at the commuter parking area identifying commuter parking spaces and the bus stop, but these signs are difficult to see.

4.3.3. Strategies for Existing Passenger Facilities

The lack of amenities at park-and-ride lots can be an impediment to potential use and an inconvenience to existing users. Some of the needed amenities, such as signs, cost little to install and require little or no maintenance. Other amenities would require some maintenance. There should be a minimal standard of amenity provision (see Table 4-15 for suggested guidelines). Schedules, signage, lighting, shelters, and seating are minimal amenities that should be present at all park-and-rides. More expensive amenities are desirable at smaller park-and-rides but should be required at larger park-and-rides and transit centers. These include fare vending machines, heated shelters, security cameras, real-time transit arrival information, restrooms, and food and drink vending. Required amenities are noted by the letter R in the table, while desirable amenities are noted by the letter D. Examples of schedules and trailblazer signs are shown in Figures 4-14 and 4-15 respectively. Figure 4-16 shows the high level of amenities at the Route 23 Wayne Transit Center.

Appendix H presents recommended improvements for each of the 52 facilities based on the needs identified as part of the Assessment of Existing Park-and-Rides. The data are organized by corridor, facility name, facility type (i.e., dedicated park-and-ride, shared park-and-ride, rail station, or transit center), and recommended improvements.

Figure 4-14: Posted Transit Schedule (Mother's P&R)

Figure 4-15: Trailblazer Sign

Figure 4-16: Two Views of the Route 23 Wayne Transit Center Showing Amenities
Custom shelter with system information, benches, fare vending machines, and heaters

Table 4-15: Required and Desirable Amenities by Passenger Facility Type

Parameters and Amenities	Bus Stop	Major Bus Stop	Small P&R	Large P&R	Transit Center
Minimum Number of Weekday Bus Boardings	n/a	40	n/a	100	150
Minimum Number of Transit Routes	1	1	1	1	3
Minimum Number of Parking Spaces	n/a	n/a	50	100	150+
Hours of Operation Signs	n/a	n/a	R	R	R
Entrance/Trailblazer Signs	n/a	n/a	R	R	R
Bus Route Signs	R	R	R	R	R
Schedule of Service	D	R	D	R	R
System Information	D	R	R	R	R
Shelter	D	R	R	R	R
Seating	D	R	R	R	R
Lighting	R	R	R	R	R
Trash bins	D	R	R	R	R
Bicycle rack		D	R	R	R
Fare vending machines		D	D	R	R
Bicycle lockers or cage			D	R	R
Heated shelters		D	D	R	R
Security cameras			D	R	R
Telephone			R	R	R
Scheduled or real-time transit arrival display		D	D	D	R
Public art					D
Restrooms *				D	D
Drink, food and newspaper vending machines *					D
News and coffee shop *					D

* May be located within an adjacent site such as within a shopping mall.

The result of a lack of amenities at park-and-rides could be an impediment to unrealized potential use (translating to a need for additional park-and-ride capacity and/or unnecessary private automobile use) and an inconvenience to existing users.

Park-and-ride lots with the greatest amount of passenger activity (boardings and alightings) should be considered first in terms of investments in improvements as they provide the most return on the investment of capital funds. However, a program to implement basic, low-cost improvements such as shelters and passenger information (bus route and schedules, hours of operation, trailblazer signage, hours of operation) could be implemented quickly and inexpensively for all park-and-rides in the study area.

Longer-term, higher-cost improvements such as repaving and restriping parking lots, improving lighting, and constructing sidewalks and crosswalks are subject to availability of capital funds. These types of improvements will increase convenience for existing users and enhance the attractiveness of transit as an alternate travel option for potential users.

4.3.4. New Shared-Use Park-and-Ride Lots (by corridor)

The lack of capacity at existing park-and-ride lots in some corridors, and the need to provide additional facilities to support service expansion, has resulted in the need to identify new or expanded park-and-ride lots. As part of the "*Strengthen Transit Corridors*" strategy, three specific corridors in the study area were identified through the service planning effort as corridors where existing bus services may be improved or new bus routes may be implemented to address potential unmet demand: the Sussex-Passaic Corridor, the Sussex-Morris Corridor, and the Morris County Corridor. An analysis of park-and-ride opportunities along these corridors was undertaken to complement the service improvement strategies.

Due to the limited availability of capital funding and the restrictions on new impermeable surfaces included in the Highlands Regional Master Plan, the search for new park-and-ride capacity was restricted to sharing existing parking lots as transit park-and-rides. Shared-use park-and-rides are parking lots used for adjacent buildings which are also used by transit customers, typically from the start of the morning peak period to the end of the evening peak period. The likelihood of available space for parking is greatest where the peak parking demand for the primary use is in the evenings and weekends. Examples include shopping centers, churches, recreational centers, professional sports facilities, and movie theaters. There are several benefits associated with shared-use park-and-rides:

- Cost. There are cost savings associated with using an existing facility as opposed to purchasing land and constructing a new facility.
- Flexibility. Transit agencies may relocate shared-use park-and-rides more easily if customer demand or routes change.
- Security. A shared-use park-and-ride has more activity and traffic during the day than a traditional park-and-ride, providing increased security and protection from theft and vandalism.
- Environment. No new impermeable surfaces are created. Shared-use parking also facilitates more compact development.
- Transit service. Locating park-and-rides at major trip generators such as regional malls means that transit can serve both park-and-ride commuters and shoppers.

On the other hand, the principal disadvantage of this approach is that negotiation with of the property owner is required to lease spaces for transit users. The owner may not agree to a reasonable lease fee, or may not agree to the number of spaces requested, or may not permit the installation of amenities such as passenger information and shelters.

Methodology

This section describes the methodology used to identify shared-use park-and-ride candidates. Four roadway corridors in the study area were surveyed:

1. NJ10 from Livingston Circle west to Roxbury and Ledgewood Malls in Morris County. The portion of this corridor in Hanover, East Hanover, and Livingston is served by Community Coach Route 77 to New York. There are no official park-and-ride lots in this corridor. The Livingston and East Hanover portion has a high concentration of commercial uses and is served by NJ TRANSIT 73 from Newark.
2. NJ15 between the Sparta Main Street Park-and-ride and the intersection of Interstate 80 and NJ15 in Sussex County. This corridor is served by Lakeland 80 to New York City and Wheels 967 to Parsippany. The existing park-and-rides are mostly small and near or at capacity.

3. NJ23 from Mothers park-and-ride (NJ 23/US 46) to Franklin. This corridor is served by NJ TRANSIT 194 from New York City to Stockholm (Hardyston Township). An extension of the route to Franklin, Hamburg, or Vernon has been requested and a service concept was developed to do so (see Section 4.1). The analysis for identifying potential park-and-rides included sites in Hamburg and Vernon.[10]
4. US 46 from Roxbury in Morris County to Fairfield in Essex County. This corridor is served by Lakeland 46. All the existing park-and-ride lots are at capacity.

Following the identification of candidates on the corridors, the study team met with representatives from each of the county planning departments to review the potential candidates and to identify additional candidates that might be feasible even though they are not located directly on the study corridors.

The first step in the process of identifying shared-use park-and-ride candidates was to identify land uses in the study corridor where parking demand from the start of the morning peak period to the end of the evening peak period (approximately 8 AM to 6 PM) is low. The following land uses were considered as viable candidates:

- Churches
- Bowling alleys
- Movie theaters
- Restaurants
- "Big-box" retailers
- Shopping malls
- Supermarkets
- Municipal properties (i.e., town halls, libraries, recreational centers)
- Civic group halls (VFW, Elks Club, etc.)
- Social service centers
- Senior centers
- Office parks with excess parking capacity
- Excess NJDOT properties (NJDOT was contacted regarding the availability of vacant properties that might be available for new park-and-rides. All potential properties are already in use as park-and-rides.)
- Other locations recommended by county planning representatives

Once the list of candidates was identified for each of the corridors, these locations were initially evaluated using available internet aerial photography (i.e., Google Map and Google Earth) and were mapped. A minimum of 50 vacant spaces during business hours was chosen as the threshold for further consideration of a candidate site. Within the study area, a total of 77 candidates were identified in the corridors that met the land use criteria listed above. The breakdown by corridor was as follows: 32 candidate sites on NJ 10, three candidates on NJ 15, 18 candidates on NJ 23, and 24 candidates on US 46. All of the shared-use park-and-ride candidates that were considered are listed by corridor in Appendix I.

[10] Mountain Creek resort has recently indicated a willingness to provide park-and-ride spaces if NJT 194 were extended to Vernon. However, this information became available late in the study and could not be included in the identification and analysis of potential shared-use park-and-ride candidates.

Table 4-16: Potential Shared-Use Park-and-Ride Candidates for Sussex-Passaic Corridor

Park-and-Ride Candidate	Municipality	Nearest Intersection
Packanack Wayne Shopping Ctr	Wayne	NJ 23 & Packanack Lake Rd
Brentwood Plaza	Wayne	NJ 23 & Jug handle N/O Plaza
Kohl's Lot	Wayne	NJ 23 & Ratzer Rd
Jackson Ave Shopping Ctr	Pompton Lakes	NJ 23 & Jackson Ave
Wanaque Ave & Lakeside Ave	Pompton Lakes	Wanaque Ave & Lakeside Ave
Home Depot / Staples	Riverdale	NJ 23 & Cotluss Rd
Cedar Crest Senior Housing	Riverdale	NJ 23 & Cotluss Rd
Lowes	Butler	NJ 23 & Morse Ave
Shopping Center	Butler	NJ 23 & Kiel Ave
Maple Tree Plaza	Stockholm	NJ 23 & Snufftown Rd
Skyland's Ice World	Stockholm	NJ 23 & Snufftown Rd
Weis Supermarket	Franklin	NJ 23 & South Rutherford Ave
Shop Rite Shopping Center	Franklin	NJ 23 & Ridgewood Rd
Hamburg Mountain State Park	Vernon	CR 515
McAfee Bible Church	Vernon	NJ 94 & CR 517
DPW Building - 16 Wallkill Ave	Hamburg	NJ23 & Walkill Ave
Hamburg Fireman's Pavilion	Hamburg	Urban St & King Kole Rd

Table 4-17: Potential Shared-Use Park-and-Ride Candidates for Sussex-Morris Corridor

Park-and-Ride Candidate	Municipality	Nearest Intersection
VFW - 66 Main St	Sparta	Main St & Old Forge Rd
Pathmark	Lake Hopatcong	NJ 15 & Bowling Green Pkwy
Costco	Wharton	NJ 15 & E Dewey Ave

Table 4-18: Potential Shared-Use Park-and-Ride Candidates for Morris County Corridor

Park-and-Ride Candidate	Municipality	Nearest Intersection
Ledgewood Plaza	Roxbury	US 46 & Howard Blvd
Church	Dover	US 46 & S Main St
St Claire's Hospital	Dover	US 46 & Elk Ave
Shop Rite Shopping Ctr	Dover	US 46 & Shop Rite Dwy
Dover Town Hall	Dover	US 46 & Sussex St
Fitness Factory	Rockaway	US 46 & Boro Plaza Dwy
World Gym	Rockaway	US 46 & Mannino Dr
Denville Town Hall	Denville	US 46 & Savage Rd
Zeris Inn Banquet / Chrisandis Restaurant	Denville	US 46 & Fox Hill Rd
South City Grill	Mountain Lakes	US 46 & Lackawanna Ave
Lutheran Church	Mountain Lakes	US 46 & Lackawanna Ave
Morris Hills Plaza	Parsippany	US 46 & US 202
IMS Office Complex	Parsippany	US 46 & US 202
Parsippany Church	Parsippany	US 46 & Vail Rd
Cost Cutters Shopping Ctr	Parsippany	US 46 & Baldwin Rd
St. Peter the Apostle Church	Parsippany	US 46 & Baldwin Rd
Troy Hills Plaza	Parsippany	US 46 & Beverwyck Rd

Table 4-18: Potential Shared-Use Park-and-Ride Candidates for Morris County Corridor

Park-and-Ride Candidate	Municipality	Nearest Intersection
Office Complex	Parsippany	US 46 & Beverwyck Rd
VFW Hall -220 Troy Rd	Parsippany	US 46 & Baldwin Rd
Office Complex	Pinebrook	US 46 & Chapin Rd
Home Depot	Pinebrook	US 46 & Bloomfield Ave
Business Complex	Fairfield	US 46 & Clinton Rd
VFW Hall (45 Plymouth Street)	Fairfield	US 46 & Clinton Rd
Business Complex	Fairfield	US 46 & Law Dr
Staples Lot	Livingston	NJ 10 & Walnut St / Daven Ave
VFW Hall - 95 W Mount Pleasant Ave	Livingston	Mitchell Ave & Mt Pleasant Ave
Castle Ridge Plaza	East Hanover	NJ 10 & River Rd
Daffy's Lot	East Hanover	NJ 10 & River Rd
Marshalls Lot	East Hanover	NJ 10 & New Murray Rd
Home Depot	East Hanover	NJ 10 & New Murray Rd
Costco	East Hanover	NJ 10 & Faranella Dr
Target	East Hanover	NJ 10 & Faranella Dr
Babies R' Us	East Hanover	NJ 10 & Faranella Dr
East Hanover Public Works Department	East Hanover	NJ 10 & Ridgedale Ave
Hanover Municipal Building	Hanover	NJ 10 & Ridgedale Ave
Signature Fitness	Hanover	NJ 10 & Ridgedale Ave
PC Richards & Sons	Hanover	NJ 10 & Algonquin Pkwy
Hometown Hearth & Grill Lot	Hanover	NJ 10 & Algonquin Pkwy
Recreational Center - 1000 State Route 10	Hanover	NJ 10 & N Jefferson Rd
Hanover Twp Public Works - 25 N Jefferson Rd	Hanover	NJ 10 & N Jefferson Rd
Pine Brook Plaza	Hanover	NJ 10 & Pine Brook Plaza Dwy
Chase Office Complex	Hanover	NJ 10 & US 202
Kohl's Lot	Hanover	NJ 10 & US 202
Powder Mill Plaza	Morris Plains	NJ 10 & Yacenda Dr
VFW Hall - 45 Tabor Rd	Morris Plains	NJ 10 & Littleton Rd
Shoppes at Union Hill	Denville	NJ 10 & Union Hill Shops Dwy
K-Mart Lot	Randolph	NJ 10 & S Salem St
Lakeview Cardiology Center	Randolph	NJ 10 & Millbrook Ave
College Plaza	Randolph	NJ 10 & Center Grove Rd
Meadow Wood Manor	Randolph	NJ 10 & Center Grove Rd
A & P Lot	Randolph	NJ 10 & Center Grove Rd
Bethlehem Church	Randolph	NJ 10 & Dover Chester Rd
Baseball Field Lot	Roxbury	NJ 10 & Green Ln
Time Out Adult Care Center	Roxbury	NJ 10 & Hillside Ave
Roxbury Mall	Roxbury	NJ 10 & Commerce Blvd
Ledgewood Mall	Roxbury	NJ 10 & Mary Louise Ave

Following the identification of shared-use parking candidates, field surveys were conducted to verify existing conditions at these sites. The information collected included:

- Type of use (i.e., church, bowling alley, movie theater, etc.)
- Total parking capacity
- Presence of pedestrian amenities (e.g., curb cuts, pedestrian signals and buttons, crosswalks, and crosswalk pavement markings)
- Presence of existing bus stops
- Presence of adjacent shoulder lanes and their widths (to accommodate buses)
- Opportunities for buses to circulate within the site in cases where shoulder lanes are not available
- Potential issues or concerns that may eliminate a candidate from consideration as well as opportunities

Evaluation of Candidate Shared-Use Park-and-Ride Lots

The data collected were summarized into matrices listing the characteristics of the candidate locations. All of the potential shared-use park-and-ride candidates considered for each corridor and the results of qualitative evaluations are presented in Appendix I. The evaluation was based on the following criteria:

- *Strong candidates* have most or all of the following features: significant total parking capacity; at least 50 vacant parking spaces at the time of the field visit; proximity to a signalized intersection with pedestrian amenities (curb cuts, visible crosswalks, pedestrian signals and button), adequate shoulder space to allow for a bus to stop on the roadway, potential for a transit bus and/or shuttle bus to enter and exit the site, and/or existing bus stops.

- *Potential candidates* exhibit some but not all of these desirable attributes or may have potential problems such as parking availability during peak holiday periods, snow removal, or no nearby safe way for pedestrians to cross the street (assuming that the return trip would serve the other side of the street). In addition, there are cases where two candidates are located close together and one candidate has more or all of the features of a strong candidate.

- *Sites eliminated from further consideration* have fatal flaws such as no traffic signal and/or no pedestrian amenities at all, excessive and/or difficult and/or unsafe walking conditions to and from the nearest signalized intersection (e.g., a distance of 700 feet or more), a lack of shoulder lanes in one or both directions, potential conflicts between parking demands for the existing land use and commuter parking demands, presence of a stronger site adjacent to the candidate, a lack of available parking space at the time of the field visit, or a property owner that has specifically stated their refusal to consider shared parking.

For ease of understanding the information presented the following tables, symbols were used to show the presence or absence of elements at a specific park-and-ride site.

Strong Shared-Use Park-and-Ride Lot Candidates

A total of sixteen sites are identified as strong candidates for shared-use park-and-ride lots (the VFW Hall in Livingston would make a strong candidate for a shared-use park-and-ride, however, it is located outside of the boundaries of the study area and does not have any service improvement concepts associated with it). The candidate sites are listed in Table 4-25. The table lists the estimated catchment area population based on GIS analysis of 2000 Census data. The analysis is based on a Seattle study which found that 50% of the demand comes from a 2.5 mi radius.[11] Thus the size of the total catchment area was estimated by doubling the population within a 2.5 miles radius.[12] This figure is just a rough indicator of the market area population which does not take into account competing options, recent population changes, travel patterns, demographics, etc. and is subject to a lack of precision based on the coarse level of Census geography in the study area.

Table 4-19: Strong Candidates for Shared-Use Park-and-Ride Lots

Park-and-Ride Candidate	Municipality	Related Service Improvement	Estimated Catchment Area Population
Sussex-Passaic Corridor (NJ 23)			
Riverdale Crossing	Riverdale	NJT 194 concept	77,000
Home Depot / Staples	Riverdale	NJT 194 concept	71,000
Weis Supermarket	Franklin	NJT 194 concept	20,000
Shop Rite Shopping Center	Franklin	NJT 194 concept	25,000
Morris County Corridor (US 46)			
Ledgewood Plaza	Roxbury	Lakeland 80 extension	44,000
Fitness Factory	Rockaway	Expansion of service on NJT 29 & 79	101,000
Morris Hills Plaza	Parsippany	Lakeland 46 local service Expansion of service on NJT 29 & 79	89,000
Cost Cutters Shopping Ctr	Parsippany	Lakeland 46 local service concept Expansion of service on NJT 29 & 79	72,000
St. Peter the Apostle Church	Parsippany	Lakeland 46 local service Expansion of service on NJT 29 & 79	85,000
Troy Hills Plaza	Parsippany	Lakeland 46 local service Expansion of service on NJT 29 & 79	85,000
Morris County Corridor (NJ 10)			
Castle Ridge Plaza/Daffy's	East Hanover		57,000
Marshalls/Home Depot	East Hanover		46,000
Costco	East Hanover		56,000
PC Richards & Sons/ Hometown Hearth & Grill	Hanover		44,000
Roxbury Mall	Roxbury	Lakeland 80 Budd Lake Branch concept	44,000

Each of the promising sites in each corridor is described below in terms of existing conditions and needed amenities, existing and potential transit services, and the number and location of *potentially* available commuter parking spaces based on observations made at time of fieldwork.

[11] Parsons Brinckerhoff Quade & Douglas, Inc., Park-and-Ride Demand Estimation Study: Final Report and Users Manual, King County Department of Metropolitan Services, Seattle, WA (1995).

[12] The population within a 2.5 mile radius was estimated by summing the total population in Census block groups whose centroids were within that distance from the park-and-ride.

Graphics showing the locations of promising candidates and potential locations of shared parking spaces are shown in this section. *These graphics are for illustrative purposes only. If a promising site is eventually used as a shared-use park-and-ride, the number and location of commuter spaces are subject to agreement by the property owner and the park-and-ride sponsor.*

Strong Shared-Use Park-and-Ride Candidates in the Sussex-Passaic Corridor

Riverdale Crossing (See Figure 4-17)

Riverdale Crossing located in Riverdale is a strong candidate for a large shared-use park –and-ride. This site would require internal circulation by buses as there are no pedestrian amenities present (i.e., curb cuts, crosswalks, pedestrian signal and button) and no shoulders. The site is not currently served by transit, although it is proposed to be served by a new NJT 194 variant offering additional trips. Parking spaces along the northeast portion of the property appears to be available and could be used for approximately 110 commuter parking spaces.

If advanced as a park-and-ride site, required amenities would include: hours of operation signs, entrance/trailblazer signs, bus route signs, schedule of service, system information. The following required items would be subject to the terms of the agreement with the property owner; shelter, seating, lighting, trash bins, bicycle rack, and heated shelters.

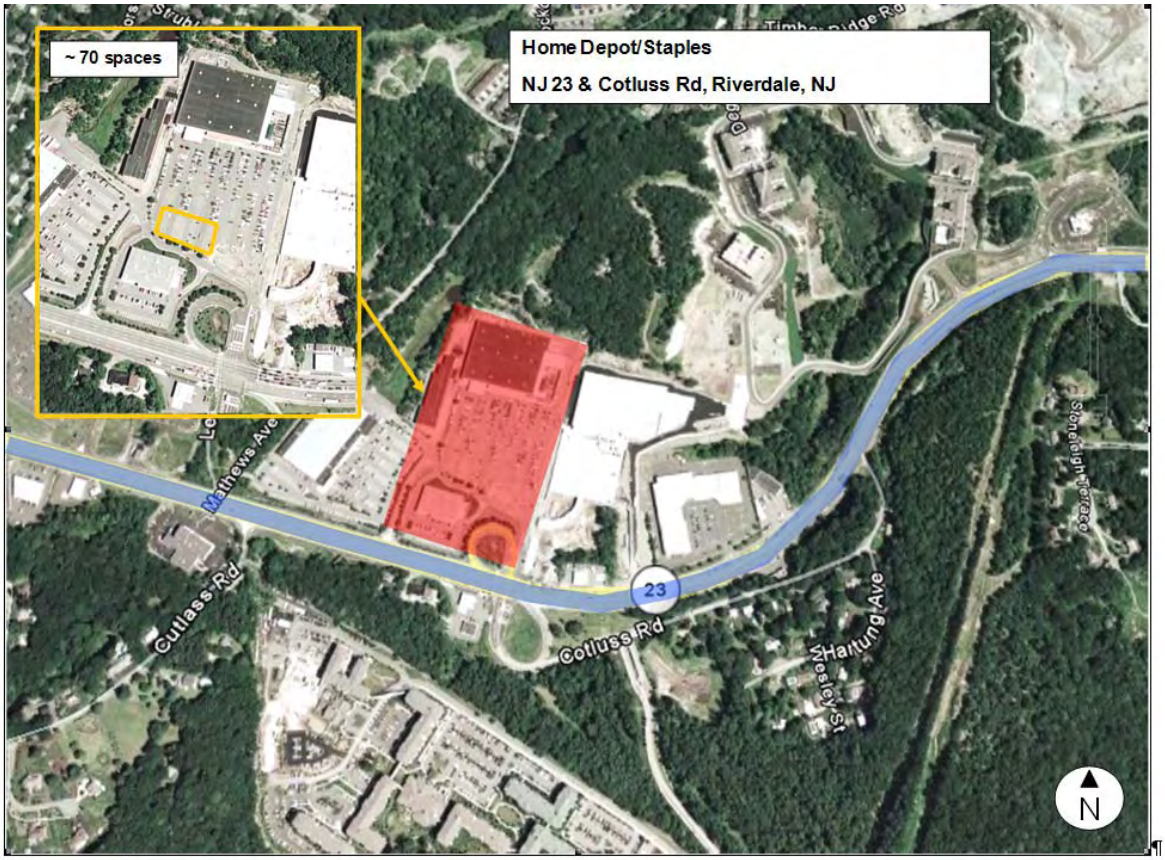
Figure 4-17: Riverdale Crossing - Potential Shared-Use Park-and-Ride on NJ 23 Corridor

Home Depot / Staples (See Figure 4-18)

The Home Depot/Staples lot located in Riverdale is a strong candidate for a small shared-use park –and-ride. There are pedestrian amenities present (i.e., curb cuts, crosswalks, pedestrian signal and button) at the intersection of NJ 23 and Cotluss Road, short segments of shoulder lanes for buses to stop on NJ 23 on the near sides of the intersection, and the lot may be accessed by smaller transit vehicles. The site is not currently served by transit, although it may be served as part of the new NJT 194 service improvement concept. Parking spaces along the southwestern edge of the property appears to be available and could be used for approximately 70 commuter parking spaces.

If advanced as a park-and-ride site, required amenities would include: hours of operation signs, entrance/trailblazer signs, bus route signs, schedule of service, system information. The following required items would be subject to the terms of the agreement with the property owner; shelter, seating and lighting. Desirable amenities would include: trash bins, bicycle rack, and heated shelters.

Figure 4-18: Home Depot/Staples - Potential Shared-Use Park-and-Ride on NJ 23 Corridor



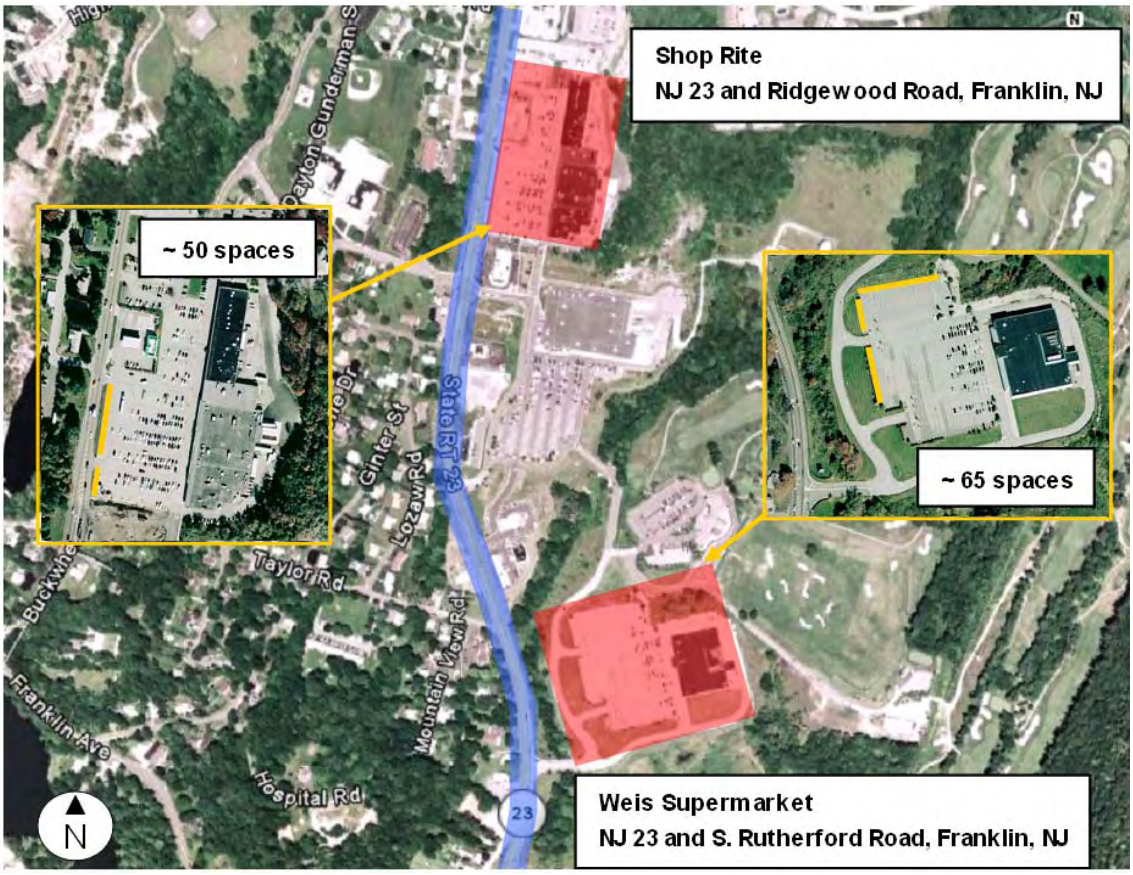
Weis Supermarket / Shop Rite Shopping Center (See Figure 4-19)

The Weis Supermarket / Shop Rite Shopping Center lots located in Franklin are both strong candidates for small shared-use park –and-rides. The Weis Supermarket has an internal road on the west portion of the property that may be used for accessing and circulating within the property. The site is not currently served by transit; development of the site is predicated on a decision to extend NJT 194 to Franklin, as described in the service concepts. Parking spaces along the northern and western edges of the property appears to

be available and could be used for approximately 65 commuter parking spaces. Conceptual engineering design was completed for this site and is provided in Appendix G.

At the Shop Rite Shopping Center, there are pedestrian amenities present (i.e., curb cuts, crosswalks, pedestrian signal and button) at the intersection of NJ 23 and Rutherford Avenue, adequate shoulder lanes for buses to stop on NJ 23, and the lot may be accessed by smaller transit vehicles. The site is not currently served by transit, although it may be served as part of the new NJT 194 concept service improvement concept. Parking spaces along the southwestern edge of the property appears to be available and could be used for approximately 50 commuter parking spaces. If advanced as a park-and-ride site, required amenities would include: hours of operation signs, entrance/trailblazer signs, bus route signs, schedule of service, system information. The following required items would be subject to the terms of the agreement with the property owner; shelter, seating and lighting. Desirable amenities would include: trash bins, bicycle rack, and heated shelters.

Figure 4-19: Weis Supermarket / Shop Rite Shopping Center - Potential Shared-Use Park-and-Ride on NJ 23 Corridor



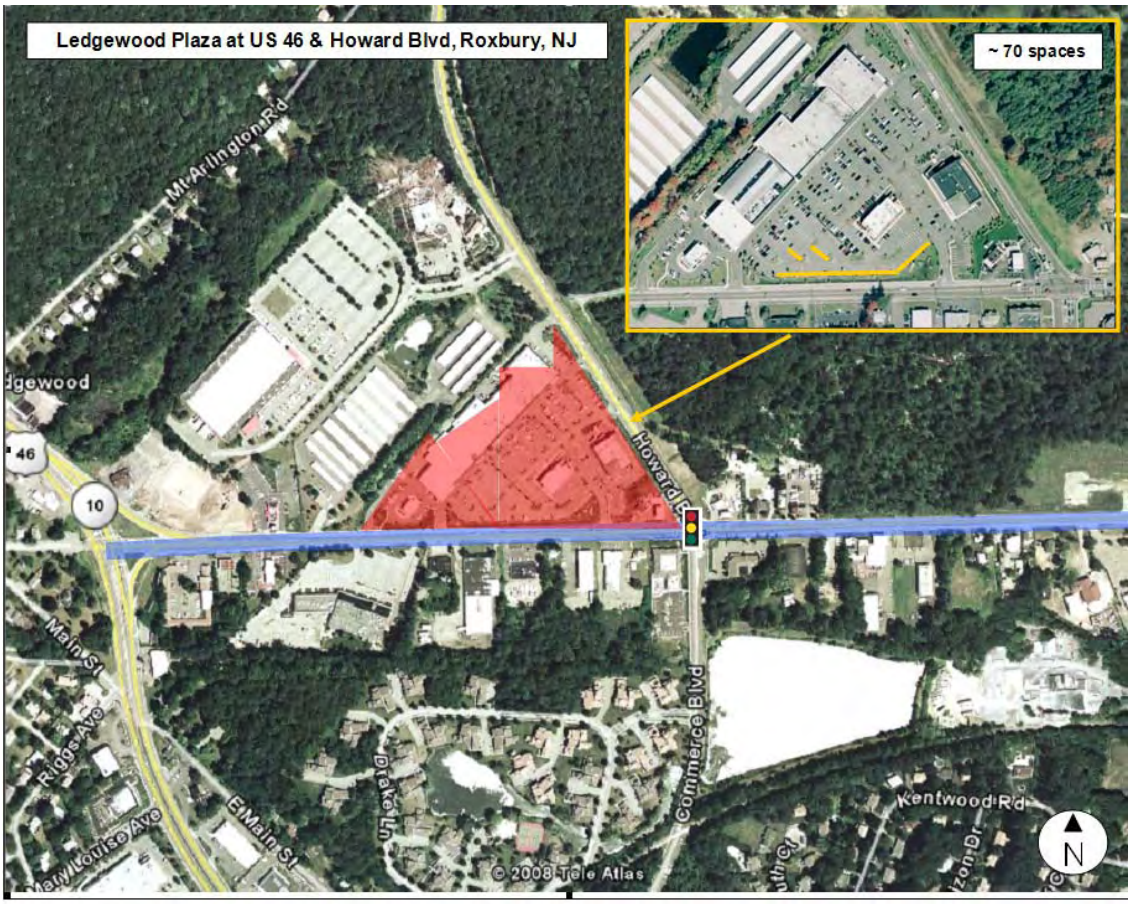
Strong Shared-Use Park-and-Ride Candidates in the Morris County Corridor (US 46)

Ledgewood Plaza (See Figure 4-20)

Ledgewood Plaza is located in Roxbury and is a strong candidate for a small shared-use park–and-ride. There are pedestrian amenities present (i.e., curb cuts, crosswalks, pedestrian signal and button) at the intersection of US 46 and Howard Boulevard, shoulder lanes for buses to stop on US 46, and the lot may be accessed by smaller transit vehicles. The site is not currently served by transit, although it may be served as part of the Lakeland 46 local service concept, Lakeland 80 (Budd Lake branch) service concept, Community Coach 77 service concept, Expansion of service on NJT 29 & 79 service concept and the New MCM route serving Ledgewood Mall. Parking spaces along the southern edge of the property appears to be available and could be used for approximately 70 commuter parking spaces.

If advanced as a park-and-ride site, required amenities would include: hours of operation signs, entrance/trailblazer signs, bus route signs, schedule of service, system information. The following required items would be subject to the terms of the agreement with the property owner; shelter, seating and lighting. Desirable amenities would include: trash bins, bicycle rack, and heated shelters.

Figure 4-20: Ledgewood Plaza - Potential Shared-Use Park-and-Ride on Morris County Corridor (US 46)

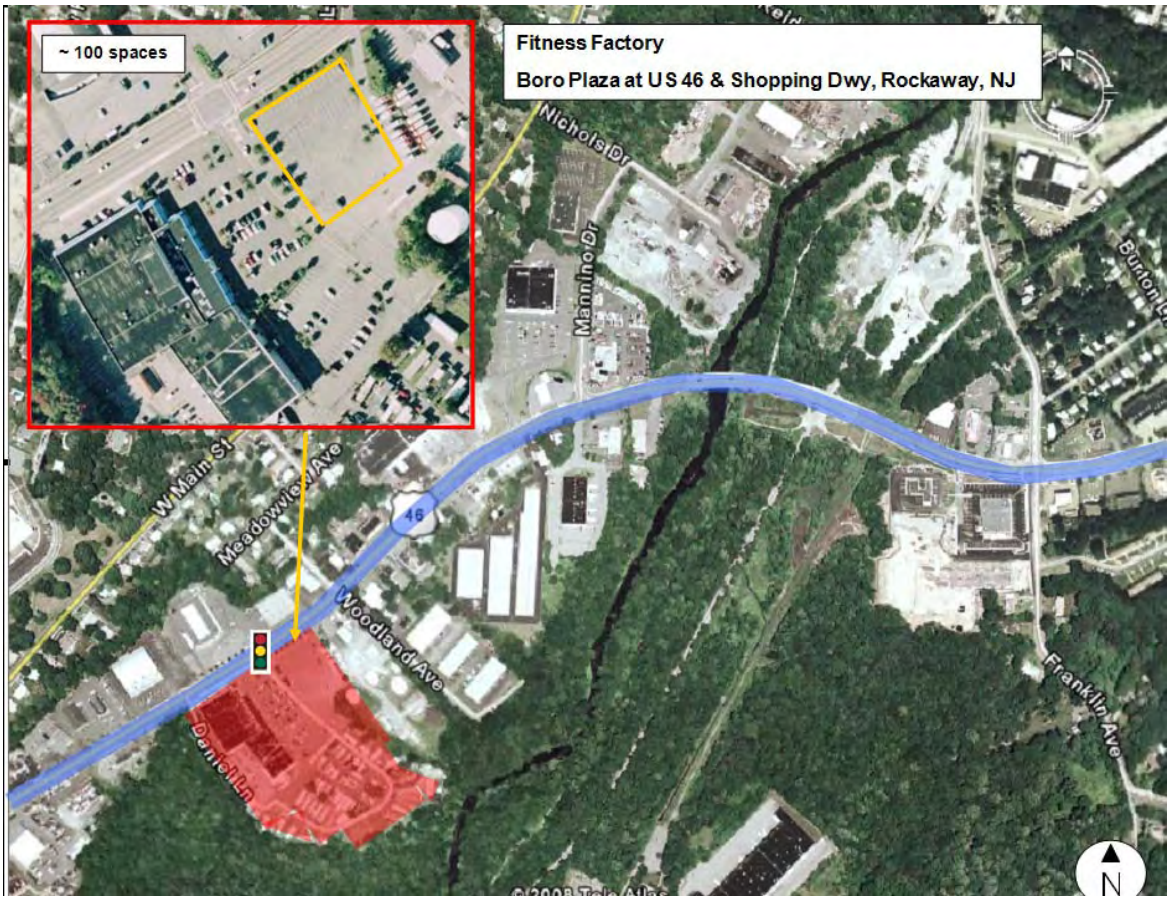


Fitness Factory (See Figure 4-21)

The Fitness Factory is located in Rockaway and is a strong candidate for a large shared-use park–and-ride. There are pedestrian amenities present (i.e., curb cuts, crosswalks, pedestrian signal and button) at the intersection of US 46 and Charles Street, shoulder lanes for buses to stop on US 46, and the lot may be accessed by smaller transit vehicles. The site is not currently served by transit, although it may be served as part of the Lakeland 46 local service concept, Community Coach 77 service concept, and Expansion of service on NJT 29 & 79 service concepts. Parking spaces within the northeastern portion of the property appears to be available and could be used for approximately 100 commuter parking spaces.

If advanced as a park-and-ride site, required amenities would include: hours of operation signs, entrance/trailblazer signs, bus route signs, schedule of service, system information. The following required items would be subject to the terms of the agreement with the property owner; shelter, seating, lighting, trash bins, bicycle rack, and heated shelters.

Figure 4-21: Fitness Factory - Potential Shared-Use Park-and-Ride on Morris County Corridor (US 46)



Morris Hills Plaza (See Figure 4-22)

Morris Hills Plaza is located in Parsippany and is a strong candidate for a small shared-use park –and-ride. There are pedestrian amenities present (i.e., crosswalks, pedestrian signal and button) at the intersection of US 46 and Parsippany Boulevard, shoulder lanes for buses to stop on US 46, and the lot may be accessed by smaller transit vehicles. The site is currently served by NJT 29 and Lakeland 46 buses in the eastbound direction and NJT 29 and MCM 1 buses in the westbound direction. This site may be included as part of the Lakeland 46 local service concept, Community Coach 77 service concept, and Expansion of service on NJT 29 & 79 service concepts. Parking spaces within the northern portion of the property appears to be available and could be used for approximately 50 commuter parking spaces.

There are already established bus stops at Parsippany Boulevard that may be used in conjunction with a shared park-and-ride. If advanced as a park-and-ride site, crosswalks and curb cuts would be needed at this location. In addition, required amenities for bus stops such as bus route signs and schedules, and lighting would be needed (desirable amenities such as system information, shelter, seating, and trash bins may be included, if conditions allow).

Figure 4-22: Morris Hills Plaza - Potential Shared-Use Park-and-Ride on Morris County Corridor (US 46)

Cost Cutters Shopping Center/Troy Hills Plaza)

Cost Cutters Shopping Center and Troy Hills Plaza, both located in Parsippany, and are strong candidates for shared-use park–and-rides.

For the Cost Cutters site (See Figure 4-23), pedestrian amenities present (i.e., crosswalks, pedestrian signal and button) at the intersection of US 46 and Parsippany Boulevard, shoulder lanes for buses to stop on US 46, and the lot may be accessed by smaller transit vehicles. The site is currently served by NJT 29 and 79 buses. This site may be included as part of the Lakeland 46 local service concept, Community Coach 77 service concept, and Expansion of service on NJT 29 & 79 service concepts. Parking spaces within the southeastern and southwestern portions of the property appears to be available and could be used for approximately 60 commuter parking spaces. This site could be used in conjunction with the existing Smithfield park-and-rides.

Troy Hills Plaza (See Figure 4-24) has pedestrian amenities present (i.e., curb cuts, crosswalks, pedestrian signal and button) at the intersection of US 46 and Beverwyck Road, shoulder lanes for buses to stop on US 46, and the lot may be accessed by smaller transit vehicles. The site is not currently served by transit, but may be included as part of the Lakeland 46 local service concept, Community Coach 77 service concept, and Expansion of service on NJT 29 & 79 service concepts. Parking spaces within the northeastern and northwestern portions of the property appears to be available and could be used for approximately 60 commuter parking spaces. This site could be used in conjunction with the existing Beverwyck park-and-ride.

For Cost Cutters, there are already established bus stops at Baldwin Road that may be used in conjunction with a shared park-and-ride. If advanced as a park-and-ride site, crosswalks and curb cuts would be needed at this location. In addition, required amenities for bus stops such as bus route signs and schedules, and lighting would be needed (desirable amenities such as system information, shelter, seating, and trash bins may be included, if conditions allow).

Figure 4-23: Cost Cutters Shopping Center- Potential Shared-Use Park-and-Ride on Morris County Corridor (US 46)

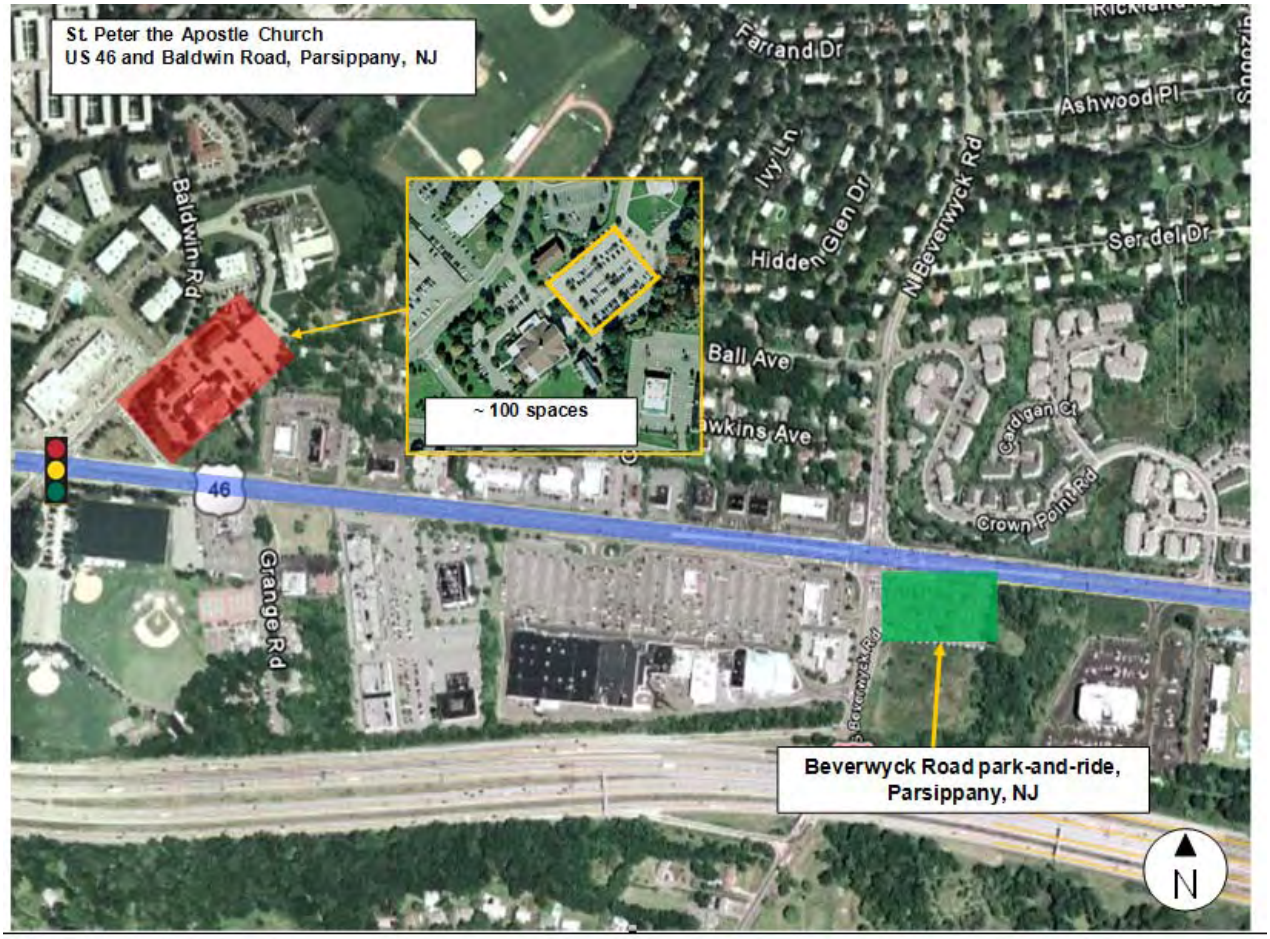
Figure 4-24: Troy Hills Plaza- Potential Shared-Use Park-and-Ride on Morris County Corridor (US 46)

St. Peter the Apostle Church (See Figure 4-25)

St. Peter the Apostle Church is located in Parsippany and is a strong candidate for a large shared-use park –and-ride. There are pedestrian amenities present (i.e., curb cuts, crosswalks, pedestrian signal and button) at the intersection of US 46 and Baldwin Road, shoulder lanes for buses to stop on US 46, and the lot may be accessed by smaller transit vehicles. The site is currently served by NJT 29 and NJT 79. This site may be included as part of the Lakeland 46 local service concept, Community Coach 77 service concept, and Expansion of service on NJT 29 & 79 service concepts. Parking spaces within the northeastern portion of the property appears to be available and could be used for approximately 100 commuter parking spaces. This site could be used in conjunction with the existing Beverwyck Road park-and-ride.

If advanced as a park-and-ride site, required amenities would include: hours of operation signs, entrance/trailblazer signs, bus route signs, schedule of service, system information. The following required items would be subject to the terms of the agreement with the property owner; shelter, seating, lighting, trash bins, bicycle rack, and heated shelters.

Figure 4-25: St. Peter the Apostle Church- Potential Shared-Use Park-and-Ride Morris County Corridor (US 46)



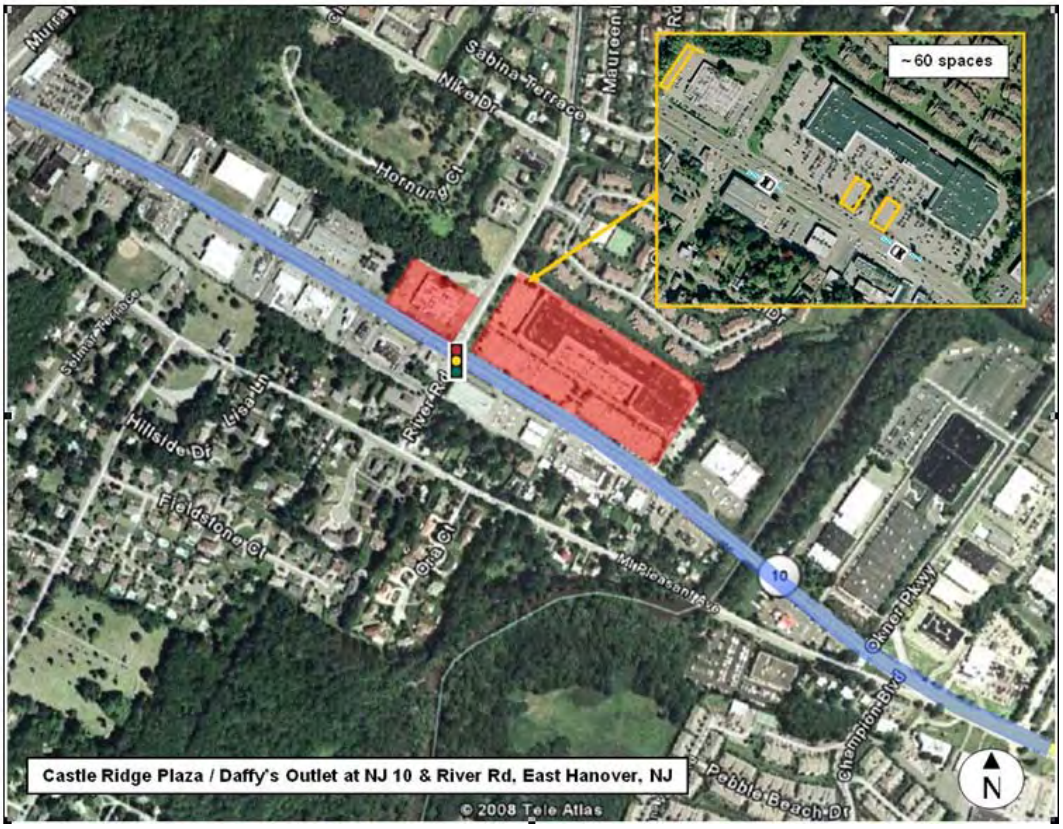
Strong Shared-Use Park-and-Ride Candidates in the Morris County Corridor (NJ 10)

Castle Ridge Plaza/Daffys (See Figure 4-26)

The Castle Ridge Plaza and Daffy's parking lots in East Hanover are both strong candidates for small, shared-use park–and-rides. At this site, there are pedestrian amenities (i.e., pedestrian signal and button); adequate shoulder lanes for buses to stop on NJ10, and both lots may be accessed by smaller transit vehicles. The site is already served by the NJT 79 and may be served as part of the Community Coach #77 service improvement concept. Approximately 60 parking spaces for commuters may be provided at these two parking lots (as outlined in yellow in the inset photo of the following figure). Parking spaces along the perimeters of these properties adjacent to Route 10 appear to be available and could be used for commuter parking.

There are already established bus stops east of River Road that may be used in conjunction with a shared park-and-ride. If advanced as a park-and-ride site, crosswalks and curb cuts would be needed at this location. In addition, required amenities for bus stops such as bus route signs and schedules, and lighting would be needed (desirable amenities such as system information, shelter, seating, and trash bins may be included, if conditions allow).

Figure 4-26: Castle Ridge Plaza and Daffy's – Potential Shared-Use Park-and-Ride on Morris County Corridor (NJ 10)

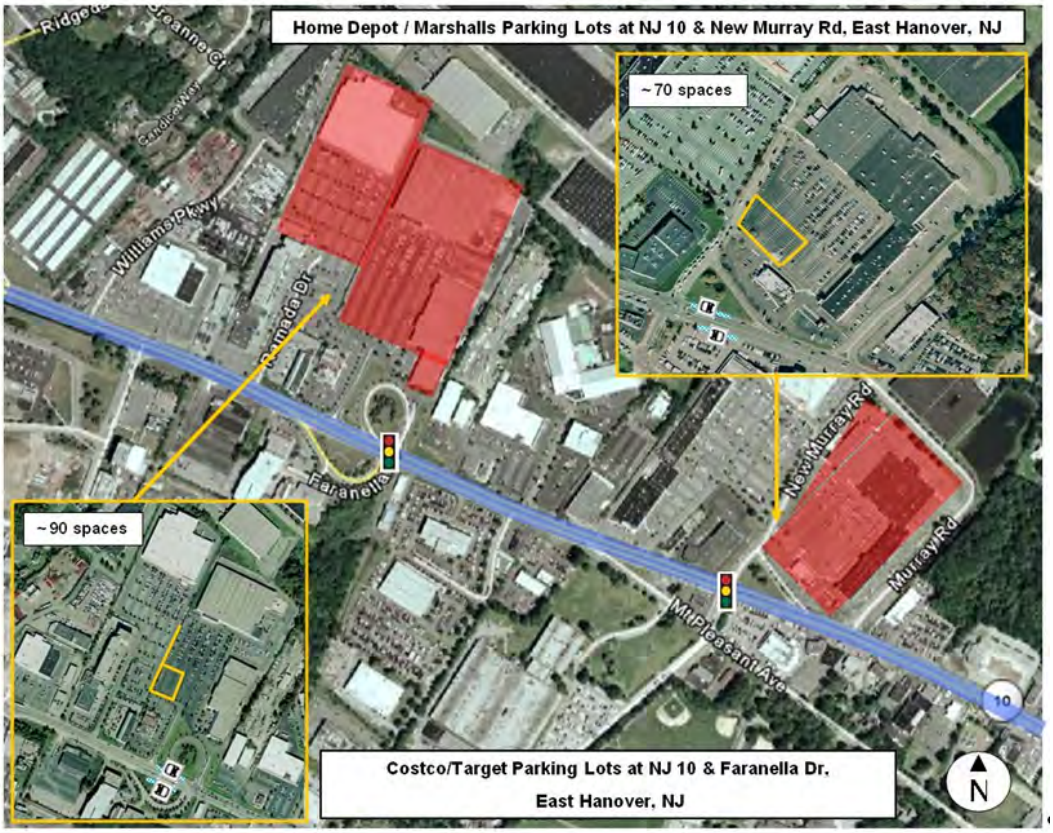


Marshalls/Home Depot/Costco (See Figure 4-27)

These three sites also located in East Hanover are each strong candidates for shared-use park–and-rides. At the Marshalls/Home Depot site, there are pedestrian amenities present (i.e., crosswalks, pedestrian signal and button), adequate shoulder lanes for buses to stop on NJ10, and both lots may be accessed by smaller transit vehicles. The site is already served by the NJT 79 and may be served as part of the Community Coach #77 service improvement concept. Parking spaces along the perimeters of these properties appear to be available and could be used for commuter parking Approximately 70 parking spaces for commuters may be provided in the southwest quadrant of the site. Curb cuts are needed at this location, if advanced as a park-and-ride site. At the Costco site, all of the required pedestrian amenities present, there is adequate shoulder lanes for buses to stop, and both lots may be accessed by smaller transit vehicles. The site is already served by the NJT 79 and may be served as part of the Community Coach #77 service improvement concept. Approximately 90 parking spaces for commuters may be provided at this location along Ramada Drive.

There are already established bus stops at New Murray Road and in the jug handles west of Faranella Drive that may be used in conjunction with a shared park-and-ride. For all of the sites required amenities for bus stops are recommended such as bus route signs and schedules, and lighting are needed (desirable amenities such as system information, shelter, seating, lighting and trash bins may be included, if conditions allow).

Figure 4-27: Marshalls/Home Depot/Costco –Potential Shared-Use Park-and-Ride on Morris County Corridor (NJ 10)

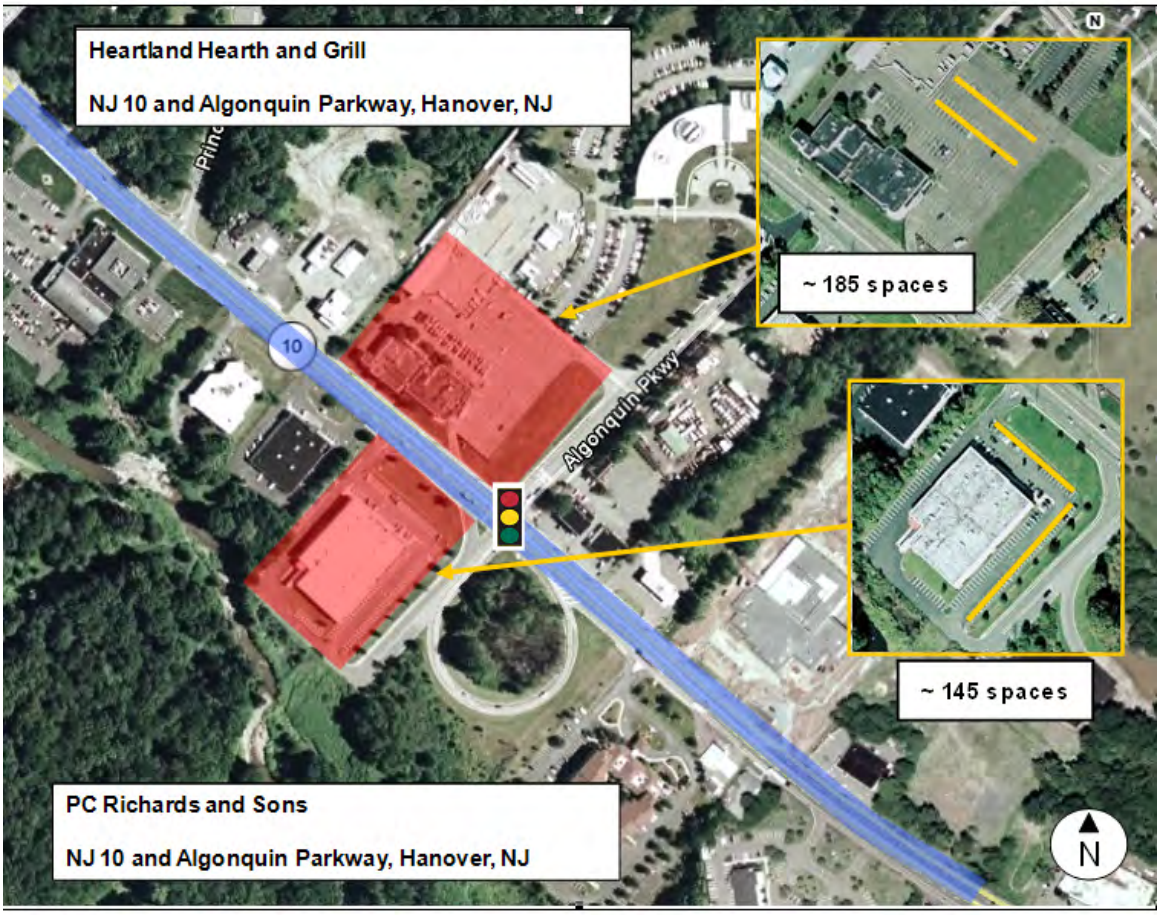


PC Richards & Sons/ Hometown Hearth & Grill Lot (See Figure 4-28)

The PC Richards & Sons/ Hometown Hearth & Grill Lot located in Hanover are strong candidates for large shared-use park–and-rides. There are pedestrian amenities present (i.e., curb cuts, crosswalks, pedestrian signal and button); adequate shoulder lanes for buses to stop on NJ10, and both lots may be accessed by smaller transit vehicles. The sites are not currently served by transit, although they may be served as part of the Community Coach #77 service improvement concept. Parking spaces along the perimeters of these properties appear to be available and could be used for commuter parking. The Heartland Hearth and Grill can accommodate approximately 185 parking spaces for commuters and P.C. Richards can accommodate approximately 145 parking spaces.

If advanced as a park-and-ride site, required amenities would include: hours of operation signs, entrance/trailblazer signs, bus route signs, schedule of service, system information. The following required items would be subject to the terms of the agreement with the property owner; shelter, seating, lighting, trash bins, bicycle rack, and heated shelters.

Figure 4-28: PC Richards & Sons/ Hometown Hearth & Grill Lot - Potential Shared-Use Park-and-Ride on Morris County Corridor (NJ 10)



A & P Lot (See Figure 4-29)

The A&P lot located in Randolph is a strong candidate for a small, shared-use park–and-ride. There are pedestrian amenities present (i.e., curb cuts, crosswalks, pedestrian signal and button); adequate shoulder lanes for buses to stop on NJ10, and the lot may be accessed by smaller transit vehicles. The site is not currently served by transit, although it may be served as part of the new MCM route serving Roxbury Mall service improvement concept. Parking spaces along the southeast quadrant of the property appears to be available and could be used for commuter parking. The A&P lot can accommodate approximately 70 parking spaces for commuters.

If advanced as a park-and-ride site, required amenities would include: hours of operation signs, entrance/trailblazer signs, bus route signs, schedule of service, system information. The following required items would be subject to the terms of the agreement with the property owner; shelter, seating and lighting. Desirable amenities would include: trash bins, bicycle rack, and heated shelters.

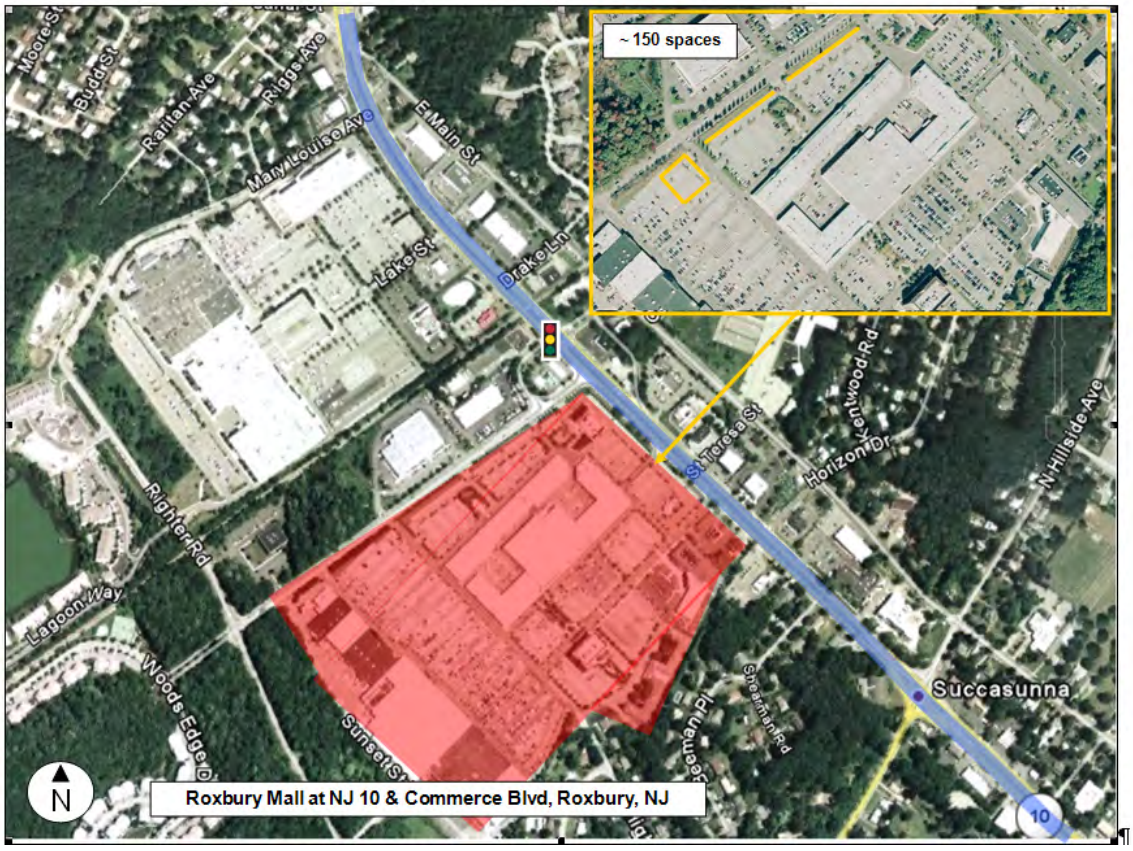
Figure 4-29: A & P /Meadow Wood Manor Lots - Potential Shared-Use Park-and-Ride on Morris County Corridor (NJ 10)

Roxbury Mall (See Figure 4-30)

The Roxbury Mall located in Roxbury is a strong candidate for a large, shared-use park–and-ride. There are pedestrian amenities present (i.e., curb cuts, crosswalks, pedestrian signal and button) at the intersection of NJ 10 and Commerce Boulevard (and sidewalks leading to the Mall are present), adequate shoulder lanes for buses to stop on NJ10, and the lot may be accessed by smaller transit vehicles. The site is not currently served by transit, although it may be served as part of the Lakeland 80 Budd Lake Branch and New MCM route serving Roxbury Mall service concepts. Parking spaces along the northern edge of the property appears to be available and could be used for approximately 150 commuter parking spaces.

If advanced as a park-and-ride site, required amenities would include: hours of operation signs, entrance/trailblazer signs, bus route signs, schedule of service, system information. The following required items would be subject to the terms of the agreement with the property owner; shelter, seating, lighting, trash bins, bicycle rack, and heated shelters.

Figure 4-30: Roxbury Mall - Potential Shared-Use Park-and-Ride on Morris County Corridor (NJ 10)



4.3.5. Transit Hubs

Transit hubs are places on the network where riders can conveniently transfer between transit routes, potentially including rail and shuttles as well as bus routes. They may be located on-street, off-street, or in park-and-ride lots. The concept of "transit hub" refers to the function of the area, not the physical facilities available. They typically have a higher level of passenger amenities than an ordinary bus stop, and the larger, enhanced facilities provided are often known as *Transit Centers*. Ideally, transit hubs have walk access to popular destinations such as shopping malls, retail concentrations, or major institutions. Transit hubs can be strengthened by making routes stop in the same location, coordinating schedules, and adding amenities. Shuttles to existing rail (or in some cases, bus) lines can be added.

Hubs should be located in strategic locations throughout the transit network. Both large and small hubs are proposed. Small hubs have less current passenger activity, but they have an important geographic role in the current and future projected transit network. Proposed large hubs include regional shopping malls in Wayne, Livingston and Rockaway, as well as town centers in Dover and Morristown. Smaller hubs in Morris County are proposed for Boonton, Morris Plains Station, Convent Station and the Short Hills Mall. Small hubs are also proposed for Netcong, Hackettstown, Newton, Sparta and Franklin. A map of the study area showing the proposed transit hubs is in Figure 4-31.

The list of new and existing park-and-rides and bus stops that should become transit hubs is in Table 4-20. Making these areas into transit hubs includes both a service component (relocating stops, increased frequency and span of service, and new routes) and a facility component. In several cases it is proposed to relocate or combine existing bus stops (Willowbrook Mall, Rockaway Mall) in order to facilitate transfers. In other cases it is sufficient to provide information at nearby bus and rail stations about how to walk from one service to the other (Boonton, Morristown, Morris Plains, Dover). Additionally, NJTRANSIT should work with counties and municipalities to ensure redevelopment plans facilitate the proposed improvements.

Transit hubs typically feature a greater level of amenities than bus stops or small park-and-rides, such as an indoor waiting area (or heated shelters) with restrooms, newspaper and food/drink vending machines, telephones, security cameras and bicycle lockers for long-term parking. Transit hubs should have paper schedules and system maps for all routes and may also offer real-time transit arrival displays. Small transit hubs have fewer passenger boardings and amenities while still serving an important connectivity function. The amenities should be upgraded to meet the guidelines in Table 4-15. Generally, large transit hubs will qualify as "Transit Centers" in that table. Smaller hubs should at least meet the amenities listed under "Major Bus Stops."

As part of this study, conceptual design was performed for six of the transit hubs listed in Table 4-20: Headquarters Plaza, Morristown Railroad Station, Dover Railroad Station, Rockaway Townsquare Mall, Willowbrook Mall and Weis Supermarket. These are discussed in Appendix G.

Table 4-20: Proposed Transit Hubs in the Study Area

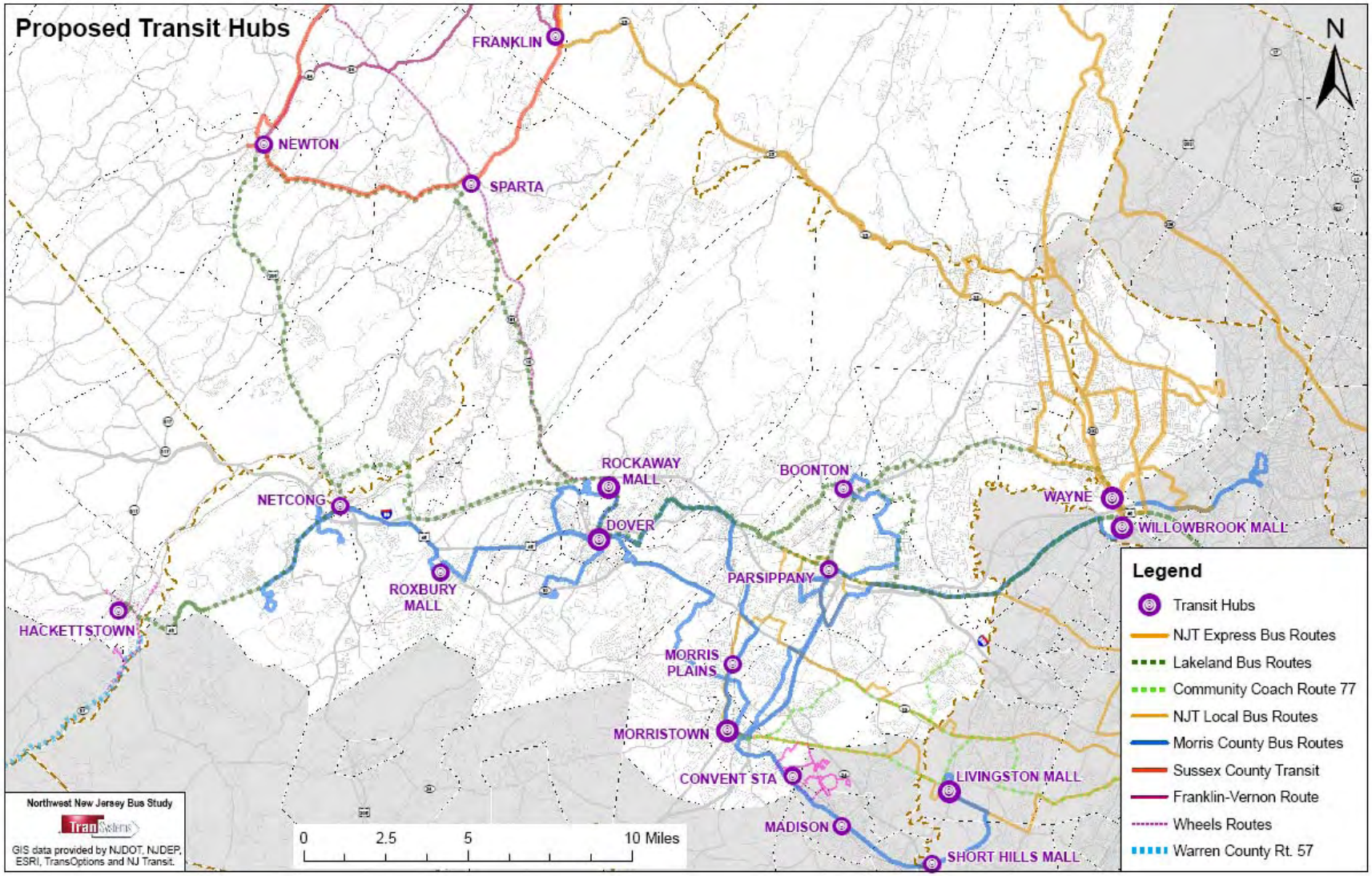
Corridor	Name	Existing Services	Bus Board-ings	Rail Board-ings	Size	Proposed Service Changes	Proposed Facility Changes
Sussex - Passaic	Franklin - new shared-use P&R on Rt 23	Sussex County Transit (SCT)	-	-	Small	Extend 194. New Franklin-Vernon shuttle. Improve span of SCT.	New P&R
Sussex - Passaic	Main St. @ Sparta Police Sta. P&R	80, 967, SCT	33	-	Small	Improve span of SCT. Add off-peak Lakeland trips.	Add shelter and information.
Sussex - Passaic	Wayne/Route 23 Transit Center	194, 324, RR	n/a	n/a	Large	None	None.
Sussex – Morris and Passaic - Morris	Willowbrook Mall (P&R & Shoppers Stop)	1, 11, 28,191, 193, 194,195, 197, 198,704, 705, 712	>1000	-	Large	New express route from Morristown.	Upgrade to Transit Center standard.
Sussex - Morris	Netcong RR station and bus stops	80, MOM, RR	38	166	Small	Merge and relocate Lakeland stops to serve rail station. New local route 5.	Add shelter and information.
Sussex - Morris	Newton Town Hall	80, SCT	n/a	-	Small	Improve span of SCT. Add off-peak Lakeland trips.	Add shelter and information.
Sussex - Morris	Rockaway Mall	10, 80	544	-	Large	Add new route to Roxbury and Ledgewood Malls. Increase span and frequency of MCM 10.	Upgrade to Transit Center standard.
Morris	Roxbury/Ledgewood Malls - new P&R	-	-	-	Small	New local route from Dover. New express bus stop.	New P&R
Morris	Convent Station	3, 966, shuttle, RR	102	977	Small	Relabel and re-organize 966 shuttle. Increase frequency of 3.	None.
Morris	Morris Hills Plaza, Parsippany	1, 29,79, 46, PFTS	60	-	Small	Increase frequency of 1, 29 & 79. Re-route to enter new hub.	Create new P&R with amenities.
Morris	Main St. Opposite Post Office, Boonton	1, 46, RR	60	45	Small	Increase frequency of route 1.	Post information at RR station about bus stop location. Add bus shelters.
Morris	Madison RR station	3, RR	23	1066	Small	Improve frequency and span of route 3.	Improve bus stop and information; add bicycle parking and trash bin.
Morris	Morris Plains RR station	2, 3, 10, shuttle, RR	23	652	Small	Improve frequency and span of routes 3 and 10.	Improve bus access & information.

Table 4-20: Proposed Transit Hubs in the Study Area

Corridor	Name	Existing Services	Bus Board-ings	Rail Board-ings	Size	Proposed Service Changes	Proposed Facility Changes
Morris	HQ Plaza, Morristown	1, 2, 3, 10, 77	270	-	Large	New express route to Willowbrook Mall. Increase frequency and span of 1, 3, and 10.	Add shelters and information, extended bus stop and layover area.
Morris	Morristown RR Station	1, 2, 77, RR	89	1389	Large	New express route to Willowbrook Mall. Increase frequency and span of route 1.	Add shelters, wayfinding and information.
Morris	Dover Center (Blackwell St at S Morris St) and RR station	2, 10, 46, MOM, RR	68	1070	Large	Relocate MCM stops at railroad station. Add new route to Roxbury and Ledgewood Malls. Increase span and frequency of route 10.	Add shelters, wayfinding and information.
Warren - Morris	Hackettstown center	973, RR	8	87	Small	Extend some peak Lakeland 80 trips.	New downtown express bus stops.
Morris – Essex*	Livingston Mall - P&R	3, 70, 73, 77	80 (Rts 3 & 70 counts only)	-	Large	Improve frequency of route 3. (Outside study area.)	Improvements planned per 2008 agreement between property owner and NJT.

*outside the defined study area

Figure 4-31: Proposed Transit Hubs



4.3.6. Assessment of Existing Bus Stops

Bus stops are one of the most common types of transit stop in the study area, and are frequently served by only one or a small number of routes. Fixed-route services typically serve designated stops, identified by bus stop signs, to manage the number of stops buses must make and to ensure that passenger boardings and alightings take place in safe and appropriate locations. The sidewalk adjacent to the bus stop is frequently used as the passenger waiting area. Depending on passenger volumes at the stop, additional passenger amenities could include a bench, shelter, and static informational signage.

The following discussion highlights the methodology used to evaluate the safety and operational characteristics of a representative number of bus stops within the Northwest New Jersey Bus Study area. Guidelines for recommended bus stop passenger amenities and provisions are presented, and examples of acceptable and unacceptable bus stop applications are highlighted based on field reconnaissance of Northwest New Jersey bus stops.

Evaluation Methodology

There are hundreds of bus stops in the Northwest New Jersey Bus Study area, and performing a detailed field evaluation for each bus stop would be a time consuming and costly task. Therefore, an assessment of conditions at a selected set of existing bus stops was undertaken to identify needs and deficiencies at those facilities and to develop concepts to improve their safety and/or operation. This assessment can then be used as a guide for evaluating other bus stop locations within the study area, and establishing a recommended list of standard improvement measures.

Consultant staff conducted field visits to 34 bus stops in the study area to assess existing conditions and to identify any safety and operational needs. This group of bus stops examined included locations:

- identified as having a deficiency by drivers, riders, or stakeholders based on feedback received from surveys conducted for this study, and
- Having daily boardings/alightings in excess of 50 persons based on New Jersey Transit's Bus Load Profiles.

The Easter Seals Project ACTION (Accessible Community Transportation In Our Nation) *Toolkit for the Assessment of Bus Stop Accessibility and Safety* was used as a guide for performing the bus stop inventories. The development of this toolkit was funded by the U.S. Department of Transportation, Federal Transit Administration, and Project ACTION to promote cooperation between the transportation industry and the disability community to increase mobility.

Each existing bus stop was assessed to obtain the following information:

- Bus route served and direction of travel
- Stop area location – within travel lane, pull-off area, parking lane, etc.
- Intersection location – near-side, far-side, or mid-block
- Stop Indication – sign post, bus sign on utility pole, bus shelter
- Landing position – sidewalk, off-road/no sidewalk, shoulder
- Landing area material – concrete, grass, dirt
- Pedestrian crossing amenities provided – traffic light, pedestrian crossing signal, crosswalks, corner curb ramps/cuts

- Adjacent land uses – residential, shopping center, restaurants, church, etc.

A few of the high ridership locations identified were transit hubs or park-and-rides and a more detailed evaluation of these locations is presented in those sections of this document.

Existing Conditions

The results of the condition assessment for all the bus stops examined are included in table format in Appendix J and a brief description of each stop with supporting pictures follow the summary table.

Following is a summary of bus stop findings by category.

1. Bus Stop Area Type – There are no standard design guidelines for locating where a bus stop should be placed. Various bus stop configurations are possible to accommodate passengers, and the preferred type of bus stop to have at a particular location is dependent on traffic conditions, bus priority needs, right-of-way space availability, and number of passengers.

   The buses, at most of the stops surveyed, stop in the rightmost travel lane along the roadway. Curbside stop locations are common since they are simple in design and generally inexpensive to install. Within suburban areas, such as Northwest New Jersey, the curbside stop is generally located in a travel lane as the street may not provide curbside parking. A curbside stop location would block traffic from using the outermost travel lane when buses are at the bus stop; however, by stopping *in* the travel lane, buses do not experience travel delays from having to merge back into the traffic stream from a shoulder lane, parking lane, or bus stop pull-out area.

   Alternatively, bus bays provide a protected area for buses to leave the travel lanes to pick up or alight passengers (see Figure 4-32). However, bus bays may increase travel time delays as the bus may need to wait to merge back into the adjacent travel lanes.

Figure 4-32: Eastbound Bus Bay at Paterson Hamburg Turnpike and Berdan Avenue

Conversely, bus bulbs are an extension of the sidewalk to the edge of the travel lane, through the parking or shoulder lane. Bus bulbs provide additional waiting space for riders and allow bus drivers to pull in flush to the curb; however, constructing bus bays is more expensive than a typical curbside stop. A summary of the advantages and disadvantages of bus stop locations is provided in Table 4-21.

Table 4-21: Bus Stop Area Types

Bus Stop Area Type	Advantages	Disadvantages
Curbside	• Provides access to bus stops • Simple in design and inexpensive for transit agency to install	• Presents difficulties for drivers to pull in flush to curb if not enough entering clearance is given due to parked cars • Difficult for drivers to reenter traffic, especially during peak traffic volume periods if the stop is not in travel lane
Bus Bay	• Allows passengers to board and alight out of the travel lane • Provides protected area away from traffic for stopped bus and patrons • Minimizes delay to through traffic • Most appropriate where traffic volumes are high and travel at high speed	• Difficult for drivers to reenter traffic, especially during peak traffic volume periods • Expensive to install compared to curbside stops • Difficult and expensive to relocate
Bus Bulb	• Allows drivers to pull in flush to curb • Results in minimal delay to the bus • Allows more waiting room for bus patrons separated from other pedestrian flow with space for amenities	• Can cause traffic queue behind bus, causing delay • Expensive to install compared to curbside stops • Difficult and expensive to relocate

Source: Toolkit for the Assessment of Bus Stop Accessibility and Safety

2. Bus Stop Location – On-street bus stops are generally located curbside in one of three locations:
    a. Near-side: bus stops immediately prior to an intersection
    b. Far-side: bus stops immediately after an intersection
    c. Mid-block: bus stops in the middle of the block between intersections

Several factors influence bus stop locations, including: conflicts with other vehicles operating on the street, transfer opportunities, passenger walking distances, locations of passenger generators, signal timing, driveway locations, physical obstructions, and the implementation of bus preferential treatment measures. For example, near-side stops allow buses to use the intersection itself to merge back into the general traffic lanes, while far-side bus stops minimize conflicts with right-turning vehicles. A summary of the advantages and disadvantages of different bus stop locations is provided in Table 4-32, and Figure 4-33 presents an example of a near-side and far-side bus stop.

Table 4-22: Advantages and Disadvantages of Far-Side, Near-Side, and Mid-Block Bus Stops

Stop Location	Advantages	Disadvantages
Far-Side	• Minimizes conflicts between right-turning vehicles and buses • Provides additional right-turn capacity by making curb lane available for traffic • Minimizes sight distance problems on intersection approaches • May encourage pedestrians to cross behind bus, depending on distance from intersection • Creates shorter deceleration distances for buses, since the intersection can be used to decelerate • Buses can benefit from gaps in traffic flow created at signalized intersections • Facilitates bus signal priority operation, as buses can pass through intersection before stopping	• Could result in traffic queued into intersection when a bus stops in travel lane • May obscure sight distance for crossing vehicles • May increase sight distance problems for crossing pedestrians • Can cause a bus to stop far side after stopping for a red light, interfering with both bus operations and overall traffic • May increase the number of rear-end crashes since drivers may not expect buses to stop again after stopping at a red light
Near-Side	• Minimizes conflicts when traffic is heavy on the far side of the intersection • Allows passenger access to bus close to crosswalk • Intersection width available for bus to pull away from the curb • Eliminates potential for double stopping • Allows passengers to board and alight while bus stopped for red light • Allows driver to look for oncoming traffic, including other buses with potential passengers	• Increases conflicts with right-turning vehicles • May result in stopped buses obscuring curbside traffic control devices and crossing pedestrians • May cause sight distance to be obscured for side street vehicles stopped to the right of the bus • Increases sight distance problems for crossing pedestrians • Complicates bus signal priority operation, may reduce effectiveness or require a special queue-jump signal if the stop is located in the parking lane or a right-turn lane
Mid-Block	• Minimizes sight distance problems for vehicles and pedestrians • May result in passenger waiting areas experiencing less pedestrian congestion	• Requires additional distance for no-parking restrictions • Encourages passengers to cross street mid-block (jaywalking) • Increases walking distance for passengers crossing at intersections

Figure 4-33: Bus Stops at Paterson Hamburg Turnpike and Alps Road

3. Bus Stop Identification – All of the bus stops surveyed are identifiable by a New Jersey Transit sign, usually located on a dedicated post/pole or attached to a nearby utility pole (see Figure 4-34).

Figure 4-34: Bus Stops Identification Examples

The bus stop sign generally includes the bus route number and destination, but does not include an operating schedule. Some bus stop locations are also identifiable by a bus stop shelter or bench; however, schedules are generally not posted in the bus shelter either. As discussed in the park-and-ride section of this chapter, posted bus schedules are a minimum amenity that should be provided at all bus stop locations.

When bus schedules are provided in bus shelters or at stops, they should be designed so as not to reduce visibility or security and be printed in a large and easy-to-read text. As AVL equipment is implemented on the bus fleets, there will be opportunities to install real-time information display boards (dynamic message signs) at key stops to give riders up-to-the-minute information on bus arrival times.

Double-sided signs for visibility from both directions are recommended, and attaching signs to large utility poles that obstruct the visibility of the sign from one direction should be discouraged.

With regard to installing bus shelters, following is a guideline that represents a composite of prevailing practices based on boarding levels by area type:

Location	Minimum Boardings to Warrant a Shelter
Rural	10 boardings per day
Suburban	25 boardings per day
Urban	50 to 100 boardings per day

Source: Toolkit for the Assessment of Bus Stop Accessibility and Safety

Benches are a low-cost alternative to installing shelters and also help to identify a stop location while offering some degree of comfort to the passengers. The guidelines cited above should be used for installing benches if bus shelters cannot be provided at bus stops with high passenger boarding volumes. Both bus shelters and benches require regular maintenance to ensure their cleanliness and deter vandalism.

4. Accessibility – Physical barriers or missing links were identified at several of the bus stops surveyed that reduce the accessibility and attractiveness of using bus transit. Minimum ADA requirements[13] for new or relocated stops must include:
    - A firm, stable surface;
    - A minimum clear length of 96 inches, measured from the curb or vehicle roadway edge and a minimum clear width of 60 inches, measure parallel to the vehicle roadway;
    - A maximum slope of 1:50 (2 percent) for water drainage; and
    - Connection to streets, sidewalks, or pedestrian paths by an accessible route.

    It is recommended that these minimum access requirements be provided for all bus stop locations, and then regularly monitored to ensure access. Frequently, accessibility may initially be provided at a stop, but over time, accessibility and safety may decrease due to construction activities, unregulated placement of newspaper vending boxes, or poor maintenance. Figures 4-35 through -4-39 present bus stops with varying levels of access.

[13] Source: http://www.access-board.gov/adaag/html/adaag.htm#10.2.1(1)

Figure 4-35: Eastbound Bus Stop at US 46 and US 202

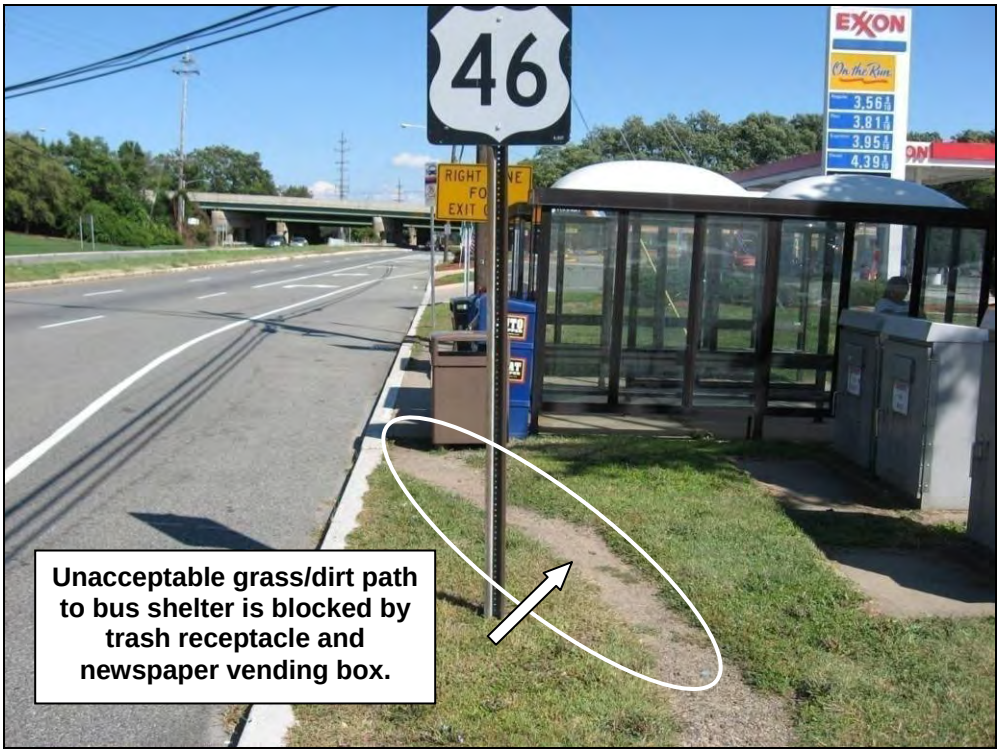


Figure 4-36: Westbound Bus Stop at Ringwood and Wanaque Avenues

Figure 4-37: Westbound Bus Stop at Paterson Hamburg Turnpike and Valley Road

Figure 4-38: Eastbound Bus Stop at Paterson Hamburg Turnpike and Alps Road

Figure 4-39: Northbound Bus Stop at Valley Road and MacDonald Drive

At a minimum, a 5-foot by 8-foot concrete platform should be provided at each bus stop with a 5-foot wide concrete walkway connection to the adjacent sidewalk. Pedestrian accessibility should extend to the nearest intersections via a sidewalk network. At the intersections, curb ramps should be provided from the intersection corners, and pedestrian push buttons, crossing signals, and visible crosswalks should be provided to facilitate pedestrian crossing movements.

5. Other Considerations

- Bicycle Storage Facilities: The recent movement to encourage "green" and sustainable transportation alternatives is increasing the number of people who ride bicycles and use transit. Bike storage is recommended at stops where demand exists or at stops near bike trails/routes. Providing bike racks is a low-cost, low-maintenance improvement that could accommodate several bikes within a relatively small space.
- Lighting: Providing lighting increases visibility, comfort, and security of bus stops; however, it would require regular maintenance and have installation and ongoing costs. Solar-powered lighting is now an option for transit agencies to illuminate bus shelters.

Recommended Bus Stop Provisions/Amenities Guidelines

Guidelines for the provision of bus stops and associated amenities were developed for the study area based on the field reconnaissance of existing bus stops and the Easter Seals Project ACTION *Toolkit for the Assessment of Bus Stop Accessibility and Safety*. The guidelines summarized in Table 4-23 have been developed and categorized according to the number of passengers boarding or alighting. A *major bus stop* is one with more than 40 daily boardings or alightings. The major bus stop category was further categorized according to whether the threshold is met for boardings or alightings. Stops with many alightings but few boardings do not need amenities such as shelters and benches, but must meet accessibility requirements.

Table 4-23: Recommended Bus Stop Provisions and Amenities

Amenity / Provision	Facility Type		
	Bus Stop	Major Bus Stop (40 or more alightings)	Major Bus Stop (40 or more boardings)
Bus Route Sign	R	R	R
Schedule of Service	D	R	R
System Information	D	D	R
Shelter	D	D	R
Seating	D	D	R
5' x 8' Clear Concrete Sidewalk Waiting Area	D*	R*	R*
Sidewalk Connection to Accessible Route/Street	D*	R*	R*
Curb Ramps at Nearest Intersection	R	R	R
Crosswalks at Nearest Intersection	R	R	R
Ped. Signals at Nearest Intersection	R	R	R
Ped. Push Buttons at Nearest Intersection	R	R	R
Lighting	D	D	R
Trash Bins	D	D	R
Bicycle Rack	D**	D**	D**
Fare Vending Machine	D	D	D
Real-time Transit Arrival Display	D	D	R

Notes:
R = Recommended
D = Desirable
*Required for new or disclosed stops
**Recommended if stop located within a mile of a bike trip generator (e.g., college/university)

Bus Stop Improvements

The following improvements for the bus stops evaluated in the Northwest New Jersey Bus Study were developed based on the guidelines listed in the previous section. This same procedure can be applied to the other bus stop locations in the study area. The bus stops that need to be examined and then potentially improved should be prioritized based on daily boarding and alighting volumes. This study has taken the first step by evaluating most of the major bus stops in the study area.

Specific improvements for each of the bus stop examined are summarized in Appendix J. Some of the predominant ideas include:

- Providing service schedules – This information was not provided at most of the bus stop locations surveyed. Because schedules may change quarterly, providing up-to-date information at the thousands of bus stops in New Jersey is not cost-effective. However, in some cases it may be possible to provide a summary of service (days of operation, daily span of service, approximate frequency) that is expected to remain constant for several years while schedules may vary. More detailed schedules could be provided at major bus stops. In all cases, a phone number should be provided where updated schedule information can be received.
- Providing a bus shelter and seating at major bus boarding stops such as: Blackwell Street at Morris Street in Dover, Speedwell Avenue at Sussex and Cattano Avenues in Morristown.
- Providing a 5' x 8' clear concrete waiting area adjacent to the curb with a sidewalk connection to the nearest accessible route/street. Examples of stops needing these provisions include the bus stops on: 1) Paterson Hamburg Turnpike at Alps Road in Wayne (see previous Figure 4-38) 2) US 46 at US 202 in Parsippany (see previous Figure 4-35), 3) US Route 46 at Hook Mountain Road in Pine Brook and 4) NJ 23 at Kiel Avenue in Butler.

Pedestrian crossing amenities such as curb cuts, pedestrian signals, push buttons, and crosswalks were generally provided at the adjacent or nearby intersections. Exceptions to this condition include:

- No visible crosswalks at the unsignalized intersection of North Main Street and Harry Shupe Boulevard in Wharton.
- Crosswalks needed at US 46 and Mount Olive Road in Budd Lake.
- Missing curb cuts at the intersection of US46 and US 202/Parsippany Boulevard in Parsippany

4.4 Complementary Strategies

4.4.1. Fare Integration

NJ TRANSIT offers rail monthly passes and bus monthly passes at a significant discount to customers over the cash or ticket price. Unlimited trips can be made and rail-to-rail or bus-to-bus transfers are free up to the number of fare zones on the pass (a step up fare for additional zones traveled must be paid in cash upon boarding). In addition, rail monthly pass holders can transfer for free to NJ TRANSIT buses up to the number of fare zones specified on the rail pass (e.g., a five-zone rail pass is also good for five zones on the bus). Shuttle services such as Wheels 966 are free for all rail pass holders.

There are several concerns regarding current fare policies and payment methods and how they affect bus ridership in the study area:

- Bus pass holders must pay a full rail fare if they wish to change to rail for part of the trip. Those paying cash on buses can pay the standard transfer fare of $0.65 for a one-zone trip on a connecting bus. A more integrated rail and bus system would help customers use both as one system. For example, bus can be used as an access or egress mode to rail. Increased use of buses as feeders to rail could reduce the need for additional park-and-ride spaces. In some cases express bus and rail can be complementary, together providing a greater range of trip options (such as using the other mode for a return trip).

- Private bus carriers do not offer passes, although they do provide multiple ticket discounts. NJ TRANSIT passes are not valid on private carriers (buses or shuttles). In Hudson and Essex Counties, several private carriers have been accepting NJ TRANSIT monthly bus passes under a fare sharing agreement called the “Bus Card” program. Although not widely advertized, NJ TRANSIT monthly bus pass holders there are eligible to ride almost any local bus regardless of the operator. Those private carriers record Bus Card usage, and in turn, receive a subsidy from NJ TRANSIT for a percentage of each cash fare that was lost to use of an NJ TRANSIT monthly pass.

- There are no 10-trip discount tickets offered for bus zones 1 and 2.

- The local fares on private carriers can be three times the NJ TRANSIT base fare. For longer trips, the difference is not as extreme.

NJ TRANSIT’s zone system can be complicated for customers. In particular, long local bus trips may not be priced attractively. For example, the bus fare from Morristown to Dover is higher than the rail fare. However, NJ TRANSIT is planning to reduce or eliminate this type of disparities as fares are modified over time.

Concepts

- Currently NJ TRANSIT passes and tickets are available for sale in study area only at rail stations and the Willowbrook Mall. More sales points should be added by installing more fare vending machines, and developing a partnership with one or more retail networks, such as convenience stores or the state lottery, to make fare media available at retail outlets.

- NJ TRANSIT should continue to work with Coach USA (operators of the Community Coach 77 Route) to see a change in fare and operating policy to permit local trips on that route using a local

fare structure similar to NJ TRANSIT standards. This change would in some parts of the study area provide local service in areas currently with no local transit.

- The fare for local trips on Lakeland routes is high compared to the NJ TRANSIT local fare. Lakeland's route 46 and 80 could attract more local trips (currently 8% of the total)14 by charging a fare lower than the current $4 to $6. NJ TRANSIT should continue to work with Lakeland Bus Lines to seek local fares similar to those charged on other routes in the area. The Lakeland management has indicated that it does not support reducing cash fares, but would consider honoring NJ Transit bus passes on its routes for local trips (those not going to or from Port Authority Bus Terminal).

- NJ TRANSIT should conduct a comprehensive fare integration study to propose improvements to fare policy and technology that will unify the system, improve the customer experience, and build ridership. MetroNorth's "Uniticket" program with local carriers is one model that should be examined. In both Washington DC and San Francisco there are efforts to provide unified fare collection media across different carriers. These and other models should serve as examples. New technology such as smart cards can improve the convenience of paying fares and potentially set prices more in proportion to costs. In the Washington, DC area, fare integration among carriers began with a regional bus transfer and later extended to the common use of a smart card. Fare policy and payment technology should consider not only the carriers included in this study but also New York City Transit, PATH, and others. Fare enhancements and policy may need to be addressed at a system-wide level rather than within the context of a single subarea or corridor study.

4.4.2. User Information and Branding

All of the transit service in the study area should appear to be a unified system from the users' point of view, even if there continue to be multiple operators. In fact, virtually all of the service in the region is subsidized by NJ TRANSIT. The consistent information and graphics should be used at bus stops, on the Internet, and in published materials. High quality scale maps of the route network should be created. As discussed in the passenger facilities section, route, schedule, and system information should be much more available at bus stops and transit hubs. Although service should appear to be part of a coherent network, there should be distinct sub-brands. For example, "last mile" type shuttles should have a consistent branding. NJ TRANSIT's "GoBus" is an example of branding higher quality local bus service.

Concepts

- NJ TRANSIT should develop branding options that can be implemented given the mix of operators and services in the Northwest New Jersey study area with the intent of enhancing public image and understanding of all transit services provided. However, this issue needs to be addressed on a systemwide basis, including both bus and rail, in order to develop a consistent strategy and consistent sub-brands; such an effort is beyond the scope of the current study.

- Currently, the Morris County Metro vehicles and bus stop signs are branded as "NJ TRANSIT." "MCM" appears to be merely part of the route name. The service should be consistently branded, possibly using a new local basic route sub-brand for these and other local routes.

[14] The 8% figure is based on the passenger survey conducted for this study. Lakeland reports about 90 to 100 daily local riders, which amounts to 4% of the 2,500 daily boardings.

There are both short and long versions of NJ TRANSIT route 193. The short version is a frequent shuttle between the Willowbrook Mall Park-and-Ride and Port Authority Bus Terminal (PABT). The long version operates between Packanack Lake and PABT via Willowbrook Mall and offers three morning and six evening trips (in the peak direction only). Differentiating these services with different route names would aid customer understanding. The Willowbrook to New York express service (currently the "short" NJT 193) should be renamed using available numbers 323 or 325 (since routes 321 and 324 are both similar park-and-ride to PABT shuttles).

5. Findings and Next Steps

The service and facility improvement concepts described in Chapter 4 reflect several general strategies to respond to identified needs and opportunities discussed in Chapter 3. This chapter summarizes the findings from the study.

5.1 Introduction

The combination of service and facility concepts offered in this study builds on the strengths of existing transit services in the study area, extending the reach of the rail system with shuttles and improving the quality of service of the bus system for local and interstate travel. Existing commuter services would be leveraged where possible to provide better local service. The suggestions for service, passenger and running way facility and informational improvements taken together would greatly improve the quality of transit service throughout the study area. Note that while the candidate improvements are expected to add riders, they generally also add to the operating subsidy requirements, besides requiring some capital investments in some cases.

While this study has identified a wide range of possible improvements designed to enhance transit service coverage, connectivity, span, frequency, information and amenities in the Northwest New Jersey study area, the study must also acknowledge that the dispersed pattern of development in this part of the state makes it very difficult to provide convenient transit service within the typical transit system budget. The effects of the traditional suburban pattern are low density of demand, dispersed travel patterns and transit-unfriendly designs of office, commercial and residential development. As a result, fixed route bus service has been limited to selected corridors where there is substantial demand for commuter service to high-density urban employment centers (like New York and Newark) and to older urban areas with a higher than average share of low income residents. This report has highlighted where incremental improvements can be made to address the existing and highest potential opportunities for expanding the market as well as to increase the network connectivity to facilitate trips to and from other places with smaller markets for transit.

The current economic and fiscal situation exacerbates the situation, making funding scarce and making service expansion concepts compete with existing services, whose budgets have been under pressure. In addition to these items, the study identified a number of service improvements to local bus routes and extensions of commuter bus routes. Without additional funding from the State or federal government, NJ TRANSIT and other regional service providers will need to look for partnerships with the private sector and local governments for assistance and may find it particularly difficult to implement service expansion while facing major fiscal constraints.

Besides contributing some funding for improvements, partnerships need to garner public support and enable cooperative arrangements for both services and facilities. Land use policy should be modified to encourage development that can more easily be served by transit, including concentrating uses near transit stations and major corridors and implementing transit-friendly design of commercial and residential development (reflecting NJ TRANSIT's Transit Friendly Design Guidelines). Cooperative arrangements for services may include employers operating their own shuttles or municipalities coordinating their demand-responsive transit services with NJ TRANSIT services and to address unserved markets where fixed route service is not feasible.

While the improvements are expected to add riders, they generally also add to the operating subsidy requirements, and in most cases require some capital investments. Although they address identified needs and opportunities and many may be deemed cost-effective and worthwhile, financial constraints may prevent some of them from being implemented in the near term. As noted by former Executive Director Richard Sarles in May 2009, NJ TRANSIT is severely constrained financially, facing a $62 million dollar shortfall in the Governor's proposed state budget. While federal grants and stimulus funds, Port Authority funds and other state funds will enable several major planned capital projects to continue to go forward, the budget would decrease the agency's operating budget by 17%. Although he indicated that eliminating train and bus routes is a last resort, and the agency is focusing on administrative and other ways to reduce spending it may be faced with service cuts to meet these budget constraints. The agency is currently focusing on ways to meet growing demand for bus and train service while keeping a lid on spending. For FY 2011, NJ TRANSIT is facing a projected $200 million budget shortfall.

Since the private sector and local governments are facing budget constraints, many worthwhile improvements will have to be deferred. The study identifies early-action, low-cost improvements that could be implemented relatively easily. Other improvements are listed separately.

5.2 Evaluation of Service and Facility Projects

The service and facility concepts presented in the previous chapter were subjected to several levels of screening and review. Conceptual estimates of benefits and costs were estimated for those projects that were not eliminated from consideration in earlier screening.

5.2.1. Criteria for Evaluating Projects

Project priorities were based on the following criteria:

- *User Benefits* were evaluated using different measures for each type of improvement:
  - Projected annual transit ridership market for service improvements
  - Facility users for park-and-ride lots and transit hubs
  - Travel time savings for bus bypass lanes.
- *Costs* were evaluated using several measures:
  - Projected change in annual net operating costs (operating subsidy) was estimated for service projects and bus bypass lanes, and also for passenger facilities if the projected increase was deemed more than minimal.
  - Cost-effectiveness was estimated for service projects as additional operating subsidy per additional rider.
  - Projected change in capital costs was estimated based on the number of additional buses required for service projects, or the cost of implementing facility improvements for transit hubs, park-and-ride lots, and bus bypass lanes.
- *Feasibility* reflects the likelihood of winning institutional support from relevant stakeholders (as applicable, NJ TRANSIT, private bus operators, County and local governments, property owners, and/or NJDOT) and potential availability of relevant funding. Projects with obvious environmental concerns or other (e.g., regulatory) barriers to implementation were assigned a lower priority or are Not Recommended.
- *Geographic Diversity* reflects consideration of the diversity of communities and markets served by the overall package of improvements in the priority group.

- *Interdependent Strategies*: Some concepts require or benefit from simultaneous implementation of improvements in service, running ways, facilities or other strategies. These interdependencies are considered in the packaging of improvements.

5.2.2. Evaluation Results

The metrics described above are shown in the following tables of project by type (Table 5-1 for service improvements, Table 5-2 for park-and-ride facilities, and Table 5-3 for transit hubs). The tables show the measures of usage, cost (where available), and feasibility. Geographic diversity and interdependence among strategies were considered. The goal for the early-action projects was to identify proposals that are of high priority based on effectiveness and stakeholder support yet relatively inexpensive and easy to implement. The emphasis on small, lower-cost projects is also of importance given that the climate for increasing public transit spending will likely remain unfavorable for the near future. It is assumed that in this period not only will there be little new transit money available but also that the demand for transit will grow slowly. The remaining projects would be considerably larger in scope (and thus operating and capital costs), since it is assumed that it would be implemented after the fiscal climate has improved, transit demand is increasing, and a stronger consensus around specific projects has been built among key stakeholders.

5.2.3. Service Concepts

Table 5-1 summarizes the results for the service improvement concepts. The capital cost estimates for the service improvement concepts are based on the number of new buses required to provide the proposed service and the following rough estimates of the purchase price by type of vehicle: $150,000 for a 20-passenger cutaway minibus and $350,000 for a 30-foot transit bus. “Cost-effectiveness” was defined as the additional operating subsidy per additional rider and does not include capital cost. “Operating subsidy” was defined as the proposed additional operating cost per rider less the assumed additional revenue per rider. The revenue per rider was based on 2008 actual revenue data provided by NJ TRANSIT, except for the Wheels and Last Mile shuttle routes, where data were not available. For the rail shuttle routes, it was assumed that the average fare collected is $0.10, because many riders use passes or have free access via their employers. For some concepts, the change in ridership and cost is expected to be minimal and is so noted in the tables.

Table 5-1: Evaluation of Service Concepts

			User Benefits	Cost		Cost-Effectiveness	
#	Corridor	Description	Additional Annual Riders	Operating Subsidy	Capital Cost	Subsidy per New Rider	Feasibility
S1	Sussex-Passaic	NJT 194 extension to Franklin, peak periods	8,670	$62,769	$500,000	$2.38	Requires new P&R
S2	Sussex-Passaic	NJT 194 extension to Vernon, peak periods	8,670	$202,256	$900,000	$18.47	Low cost-effectiveness
S3	Sussex-Passaic	NJT 194 Butler-NY, increase frequency, off peak	11,597	$122,789	$0	$10.59	
S4	Sussex-Passaic	SCT Sussex Loop bus - increase span & frequency	30,762	$483,975	$150,000	$15.73	Existing service
S5	Sussex-Passaic	Vernon-Franklin (hourly)	12,495	$229,373	$150,000	$18.36	TransOptions has CMAQ grant
S6	Sussex-Passaic	Vernon-Franklin (half-hourly)	15,300	$463,590	$150,000	$30.30	Less cost-effective
S7	Sussex-Passaic	Newton-Franklin-Warwick (hourly)	26,520	$929,220	$300,000	$35.04	Less cost-effective
S8	Sussex-Morris	Lakeland 80 - Newton and Sparta	31,620	$167,148	$0	$5.29	No advocates identified
S9	Sussex-Morris	Wheels 967 - shuttle to Dover	14,280	$68,213	$0	$4.78	Current 967 riders may object
S10	Morris	Lakeland 46 - Dover Center	Not estimated	Not estimated	Not estimated	Not estimated	Lakeland and Dover not supportive
S11	Morris	Lakeland 46 local service	64,907	$818,889	$1,000,000	$12.62	High capital & operating cost
S12	Morris	Lakeland 80 - Roxbury and Ledgewood Malls	38,505	($27,467)	$500,000	($0.71)	Lakeland does not support
S13	Morris	Coach 77 additional peak trips and local service/fares	24,344				Coach USA has not yet responded to concept
S14	Morris	Montclair-Boonton Line Off-Peak Bus Shuttle Service, Lincoln Park to MSU	47,895	$470,760	$350,000	$10.83	Substitute bus shuttle previously operated

			User Benefits	Cost		Cost-Effectiveness	
#	Corridor	Description	Additional Annual Riders	Operating Subsidy	Capital Cost	Subsidy per New Rider	Feasibility
S15	Morris	Restore Morris Plains - Mack-Cali Shuttle	28,560	$92,570	$0	$3.24	Re-instate prior service
S16	Morris	Wheels 966 Convent Station	5,100	$24,735	$0	$4.85	Minor change to existing
S17	Morris	Denville RR station shuttle	14,280	$116,382	$150,000	$8.15	Needs employer match
S18	Morris	Morristown RR shuttle	19,125	$188,267	$150,000	$9.84	Needs employer match
S19	Morris	MCM 1 - increase scheduled time	-	-	-	-	To be interlined with new Morristown-Willowbrook express*
S20	Morris	MCM 1 evening service	14,991	$141,109	$0	$9.41	Expand existing service
S21	Morris	MCM 1 Sunday service	8,352	$68,695	$0	$8.23	Expand existing service
S22	Morris	MCM 2 - modify route	16,939	$163,065	$0	$9.63	Requires MCM 3 modification
S23	Morris	MCM 3 - truncate, increase frequency	38,505	$502,486	$700,000	$13.05	Requires MCM 2 modification
S24	Morris	MCM 3 - evening service	13,508	$143,185	$0	$10.60	Expand existing service
S25	Morris	MCM 3 - Sunday service	7,656	$69,670	$0	$9.10	Expand existing service
S26	Morris	MCM 10 - increase frequency	84,023	$588,696	$350,000	$7.01	Expand existing service
S27	Morris	MCM 10 - evening service	20,961	$211,702	$0	$10.10	Expand existing service
S28	Morris	MCM 10 – Sunday service and add a bus Saturday	19,894	$91,698	$0	$4.61	Expand existing service
S29	Morris	Morris on the Move (new MCM 5)	64,576	$619,117	$525,000	$9.59	Greatly expands existing route
S30	Morris	Morristown-Willowbrook Express	67,725	$677,574	$700,000	$10.00	Should be implemented with MCM 1 interlining
S31	Warren-Morris	Wheels 973 Hackettstown	10,965	($5,483)	$0	($0.50)	Requires greater consensus
S32	Warren-Morris	Warren County 57B	Minimal	$0	$0	$0	Schedule change using no

			User Benefits	Cost		Cost-Effectiveness	
#	Corridor	Description	Additional Annual Riders	Operating Subsidy	Capital Cost	Subsidy per New Rider	Feasibility
							additional resources
S33	Warren-Morris	Lakeland 80 - extend to Hackettstown	7,650	($15,618)	$500,000	($2.04)	No additional operating subsidy needed, but requires a new bus.

*The headway and route would be essentially unchanged. The improved reliability due to more scheduled running time is expected to increase ridership, but no specific estimate of this effect was made. The cost of the additional running time is included in the cost of the new Morristown-Willowbrook express.

5.2.4. Bus Bypass Lanes

Several potential locations for bus bypass lanes were identified in Chapter 4. The initial candidates were screened to identify locations where the implementation cost would be low and the benefits (number of bus trips) would be significant. Two of the candidate areas, described below, were further developed as examples. The complete conceptual engineering for these sites is contained in Appendix G.

US 46 at New Road, Parsippany

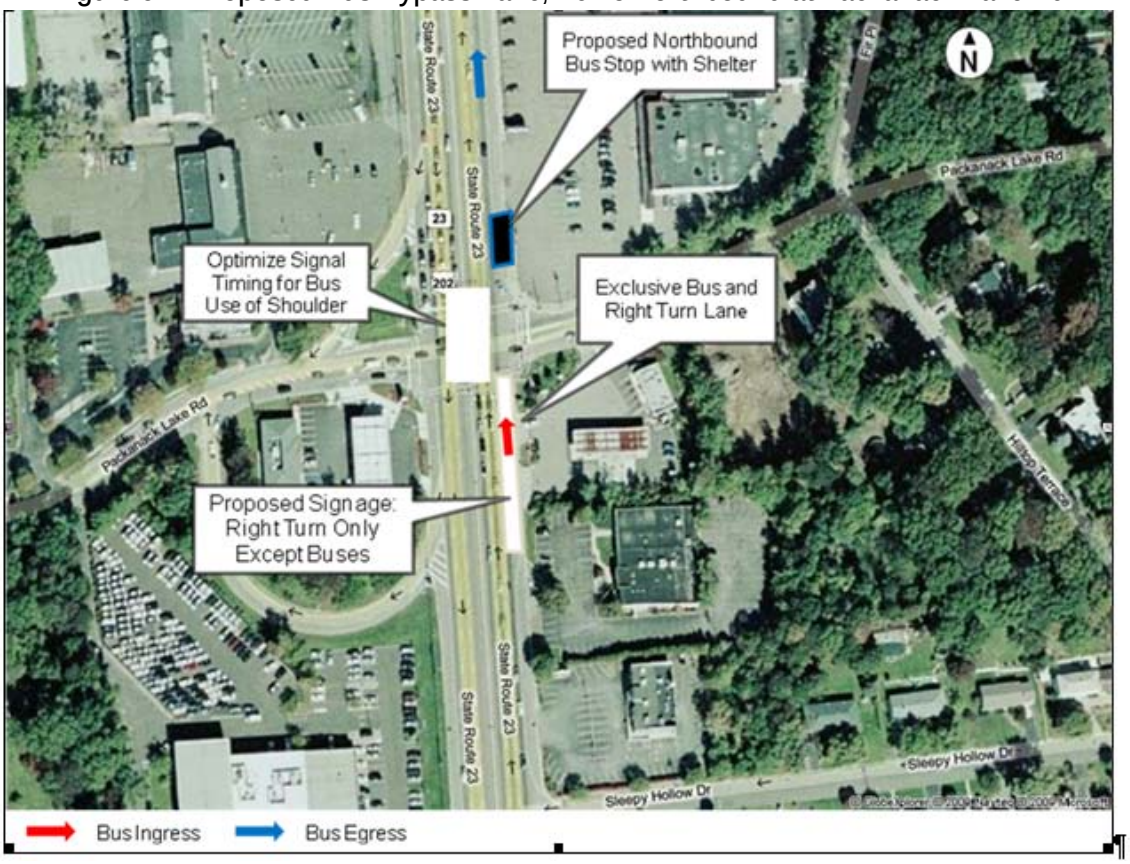
The creation of bus bypass lane at this intersection would require reconstructing the existing shoulder lane with full depth pavement for a length of 400 feet to allow exclusive bus use of the shoulder. The existing signal timing at this intersection is proposed to remain unchanged. A new "Bus May Use Shoulder" sign would be installed adjacent to the gore area at the intersection approach on eastbound US 46 alerting drivers that buses would be using the shoulder lane. On northbound New Road, "No Turn on Red" signs would be added to prevent conflicts between through bus movements on US 46 and right-turning vehicles on northbound New Road. There is an existing bus stop on eastbound US 46 located 150 feet east of New Road which could be improved by adding a shelter, seating, lighting, and passenger information. The intersection of US 46 and New Road has crosswalks, but there is no sidewalk connecting the bus stop to the intersection. It is proposed that a sidewalk be added between the bus stop and the intersection. The property adjacent to the bus stop appears to be vacant. An alternate approach to constructing a sidewalk is to move the stop closer to the intersection, allow transit riders to more conveniently use the existing crosswalk to cross US 46. The estimated cost of the project is $111,000, including full-depth pavement reconstruction of the shoulder, sidewalks, signs, and pavement markings.

Figure 5-1: Proposed Bus Bypass Lane, U.S. 46 Eastbound at New Road

NJ 23 at Packanack Lake Rd, Wayne

In the proposed bus bypass lane configuration, buses would be permitted to share the existing right-turn lane on northbound Route 23 to continue to the bus stop north of Packanack Lake Road. Right turning vehicles on northbound Route 23 would continue to turn right on that signal phase; however, only buses would be allowed to make the through movement. The approach lane would be better marked for right turns only, with an "Except Bus" plaque added to the right turn only signs. The existing signal timing may have to be modified to optimize bus and right turn movements. The north side of the intersection would be restriped to remove the taper and to mark the shoulder immediately beyond the intersection as a bus stop, which would be relocated from the north side of the shopping center driveway. A "No Turn on Red, 4 PM to 7 PM, Mon-Fri" sign would be added to the Packanack Lake Road westbound approach. The estimated cost of pavement markings, signs, and signal optimization is $19,000. Adding a lighted bus shelter, and upgraded signal controller would cost an additional $181,000.

Figure 5-2: Proposed Bus Bypass Lane, NJ 23 Northbound at Packanack Lake Rd



5.2.5. New Shared Park-and-Ride Facilities

The study analyzed several locations for potential shared park-and-ride facilities for commuters using existing parking lots at retail/commercial properties; many candidate locations were eliminated from consideration in earlier screening due to observed lack of available spaces, difficult pedestrian access, or lack of bus access. The remaining strong candidate locations are summarized in the Table 5-2. The sites are grouped by area because several potential sites serve essentially the same location. It would be desirable to open only one new lot per location at a time, waiting until the new lots achieve 85% occupancy before leasing more park-and-ride spaces in the same area. A standard package of improvements, including bus shelter, bench, bike rack, lighting, trash bin, signs and pedestrian ramps is estimated to cost $80,000 per site including installation. The capital costs would be approximately the same at each location, except at locations already served by on-street bus stops with shelters.

Table 5-2: Evaluation of Potential New Shared Park-and-Ride Lots

Area #	Road-way	Municipality	Potential Site(s)	Proposed Spaces	Est. Daily Use*	Est. Operating Cost per year**	Feasibility
PR1	NJ-10	East Hanover	Castle Ridge Plaza/Daffys	60	51	$21,600	Any of these would be good first official P&R in the area serving Coach 77
			Marshalls/Home Depot	70	60	$25,200	
			Costco/Target	90	77	$32,400	
PR2	NJ-10	Hanover	PC Richards & Sons	185	157	$66,600	Too far from road to serve without entering site.
			Heartland Hearth & Grill Lot	145	123	$52,200	Difficult parking layout
PR3	NJ-10 / US-46	Roxbury	Roxbury Mall	150	128	$54,200	Requires new service. Could capture significant share of Mt Arlington P&R bus riders.
			Ledgewood Plaza	70	60	$25,200	
PR4	NJ-23	Riverdale	Riverdale Crossing	110	94	$39,600	Butler P&Rs currently have excess capacity
			Home Depot / Staples	70	60	$25,200	
PR5	NJ-23	Franklin	Weis Market, 140 State Route 23	65	55	$23,400	Requires extended bus route.
			Shop Rite Shopping Center	50	43	$18,000	
PR6	US-46	Rockaway	Fitness Factory	100	85	$36,000	Main St, Rockaway P&R has capacity.
PR7	US-46	Parsippany	Morris Hills Plaza	50	43	$18,000	All could be served with on street-stops.
			Cost Cutters Shopping Center	60	51	$21,600	
			St. Peter the Apostle Church	100	85	$36,000	
			Troy Hills Plaza	60	51	$21,600	

*Based on 85% assumed use. **Based on an estimated lease rate of $1.50 per day per space for 240 work days per year.

5.2.6. Transit Hubs

Table 5-3 summarizes the characteristics of the 13 proposed transit hubs in the study area. A standard package of improvements, including bus shelter, bench, bike rack, lighting, trash bin, signs and pedestrian ramps is estimated to cost $80,000 per site including installation. For the largest hubs such as Rockaway and Willowbrook Malls, the cost would be greater, as indicated in the following sections. The study developed conceptual facility design plans for six of the 13 proposed transit hub facilities in the project study area. The improvements proposed in these conceptual plans are intended for further refinement through discussion with property owners, local stakeholders and implementing agencies, and also serve as a model for similar facility needs identified elsewhere in the study area. *It should be noted that all conceptual design drawings are for **illustrative purposes only**. The property owner has not been approached at this stage and their support for these improvements on their property is not yet known.*

Table 5-3: Evaluation of Transit Hubs

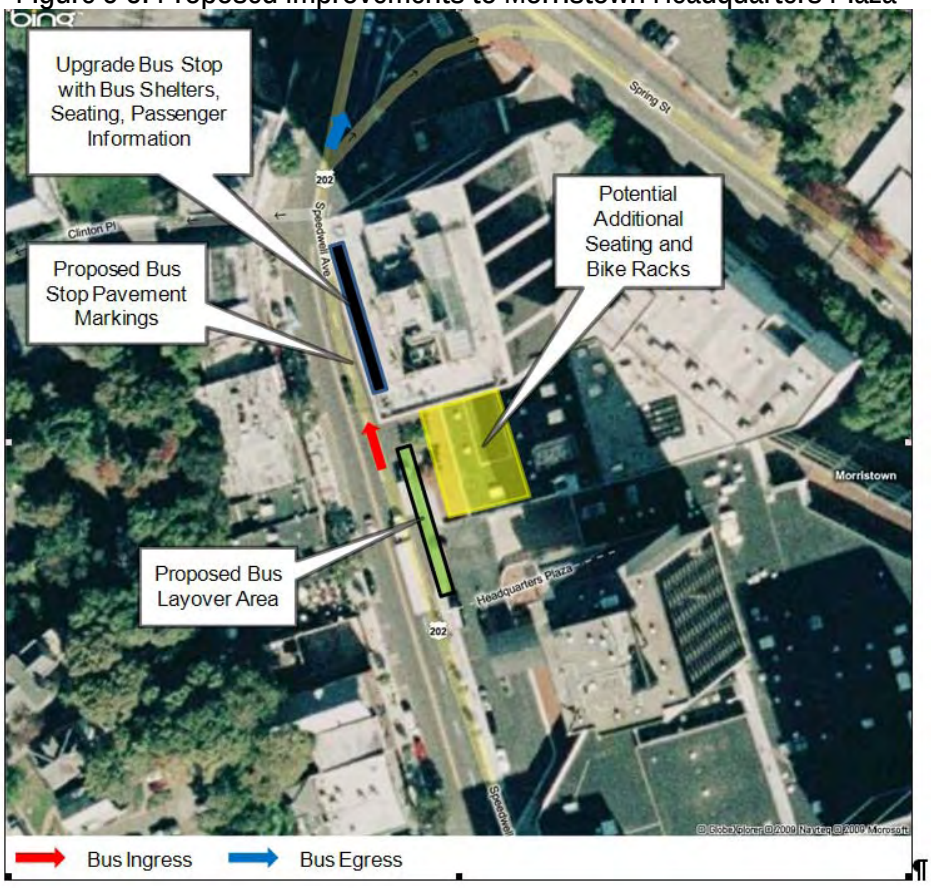
#	Corridor	Name	Existing Transit Services	Current Weekday Bus Boardings	Current Weekday Rail Boardings	Existing Parking Spaces
TH1	Sussex and Morris	Rockaway Mall	MCM 10, Lakeland 80	544	-	210
TH2	Sussex and Passaic	Willowbrook Mall P&R, Wayne	MCM 1, NJT 11, 28, 191, 193, 194, 195, 197, 198, 704, 705, 712	> 1000	-	1901
TH3	Morris	HQ Plaza, Morristown	MCM 1, 2, 3, & 10; Coach 77	266	-	3500 (total)
TH4	Morris	Morristown RR Station	MCM 1, 2 NJT Rail	89	1389	1135 (under construction)
TH5	Morris	Dover Center (Blackwell St at S. Morris St) and RR Station	MCM 2 & 10, Lakeland 46, NJT Rail	68	1070	883
TH6	Sussex and Passaic	Franklin - new shared use P&R on Rt 23	none	-	-	50
TH7	Morris	Roxbury/Ledgewood Malls - new P&R	none	-	-	150
TH8	Morris	Railroad Station, Boonton	MCM 1; Lakeland 46, NJT Rail	60	45	71
TH9	Sussex and Morris	Netcong RR station and bus stops	Lakeland 80, MOM, NJT Rail	38	166	249
TH10	Sussex and Passaic	Main St., Sparta Police Station P&R	Lakeland 80, Wheels 967, SCT	33	-	26
TH11	Morris	Morris Plains RR	MCM 2, 3, & 10,	67	652	196

#	Corridor	Name	Existing Transit Services	Current Weekday Bus Boardings	Current Weekday Rail Boardings	Existing Parking Spaces
		station	NJT Rail			
TH12	Warren and Morris	Hackettstown center	Wheels 973, NJT Rail	8	87	103
TH13	Sussex and Morris	Newton Town Hall	Lakeland 80, SCT	n/a	-	none

Morristown Headquarters Plaza Transit Hub

The Headquarters Plaza bus stop is the terminal stop for most Morris County Metro routes and many Community Coach 77 trips. There are currently no amenities at this location. The existing sidewalks appear to have sufficient space to accommodate proposed 5-foot by 8-foot bus shelters. Additional seating and bike racks could be provided in the existing plaza area. Bus stop pavement markings would be added to clearly delineate exclusive bus use of the bus stop and layover area. A bus layover area could be provided just south of the proposed shelters since several bus routes terminate at this stop. The cost of the project, including four lighted shelters, a fare vending machine, real-time message sign, pavement markings, signs, trash receptacle, and bike rack, is estimated to be $254,000.

Figure 5-3: Proposed Improvements to Morristown Headquarters Plaza



Morristown Railroad Station Transit Hub

The proposed improvements to this location include improved amenities such as schedule information and seating at the train station and an upgrade of the bus shelter at the eastbound Morris Street at Elm Street bus stop. A bench would be provided at the train station to better accommodate passengers using existing buses and shuttles. The estimated cost of both a bench and signage at the station and an upgraded shelter across the street (with variable message display and lighting) is $59,000. (The work at the station itself is only $2,000 of this total.)

Figure 5-4: Proposed Improvements to Morristown Railroad Station

Dover Railroad Station

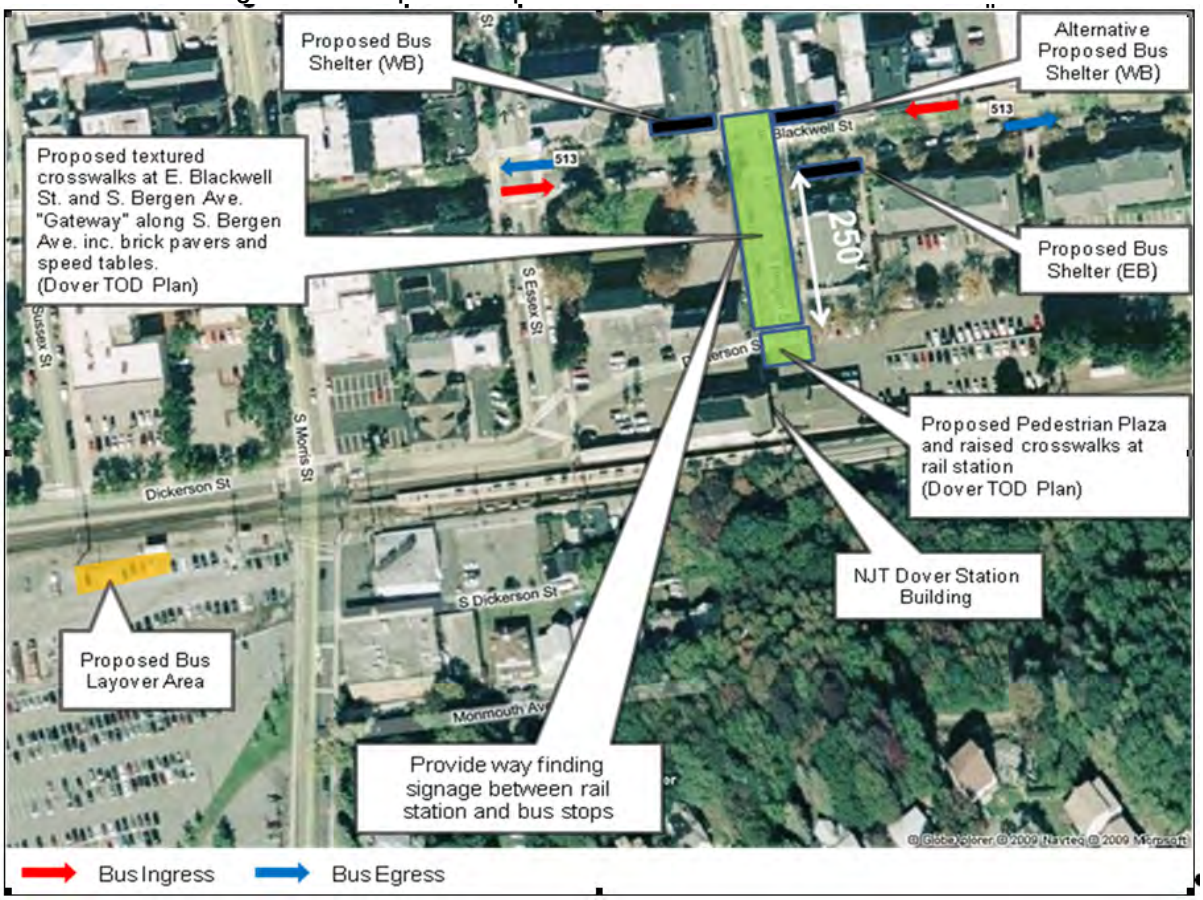
Installation of bus shelters at the eastbound and westbound bus stops is recommended. According to the ridership counts performed as part of this study, here were 68 daily boardings at Dover. The existing sidewalks seem to have sufficient space to accommodate 5-foot by 8-foot bus shelters; however, if sidewalk width is an issue, it may be possible to construct a curb extension to provide the necessary space. An alternative location for the westbound bus shelter could be on the 'near-side' corner to avoid obstructing the existing store front on the 'far-side' corner. A bus layover area could be provided in the existing parking lot along Dickerson Street which would require the removal of approximately 10 existing commuter parking spaces. Wayfinding signs along E. Blackwell Street and S. Bergen Avenue are proposed to improve connectivity between the railroad station and bus stops on E. Blackwell Street. Specific recommendations affecting the proposed improvements under this study include:

- Provide textured crosswalks and paving including E. Blackwell Street and S. Bergen Avenue.

- Raised crosswalks in strategic locations to calm traffic including the Dover Station Area.
- Landscaping, including street trees and planters for aesthetics and safety including E. Blackwell Street and S. Bergen Avenue.
- Pedestrian plaza designed at Dover Station
- Consider removing "Right-turn on red" in the Downtown.

The cost of the project, including two lighted shelters, a fare vending machine, real-time message sign, pavement markings, signs, trash receptacle, and bike rack, is estimated to be $147,000.

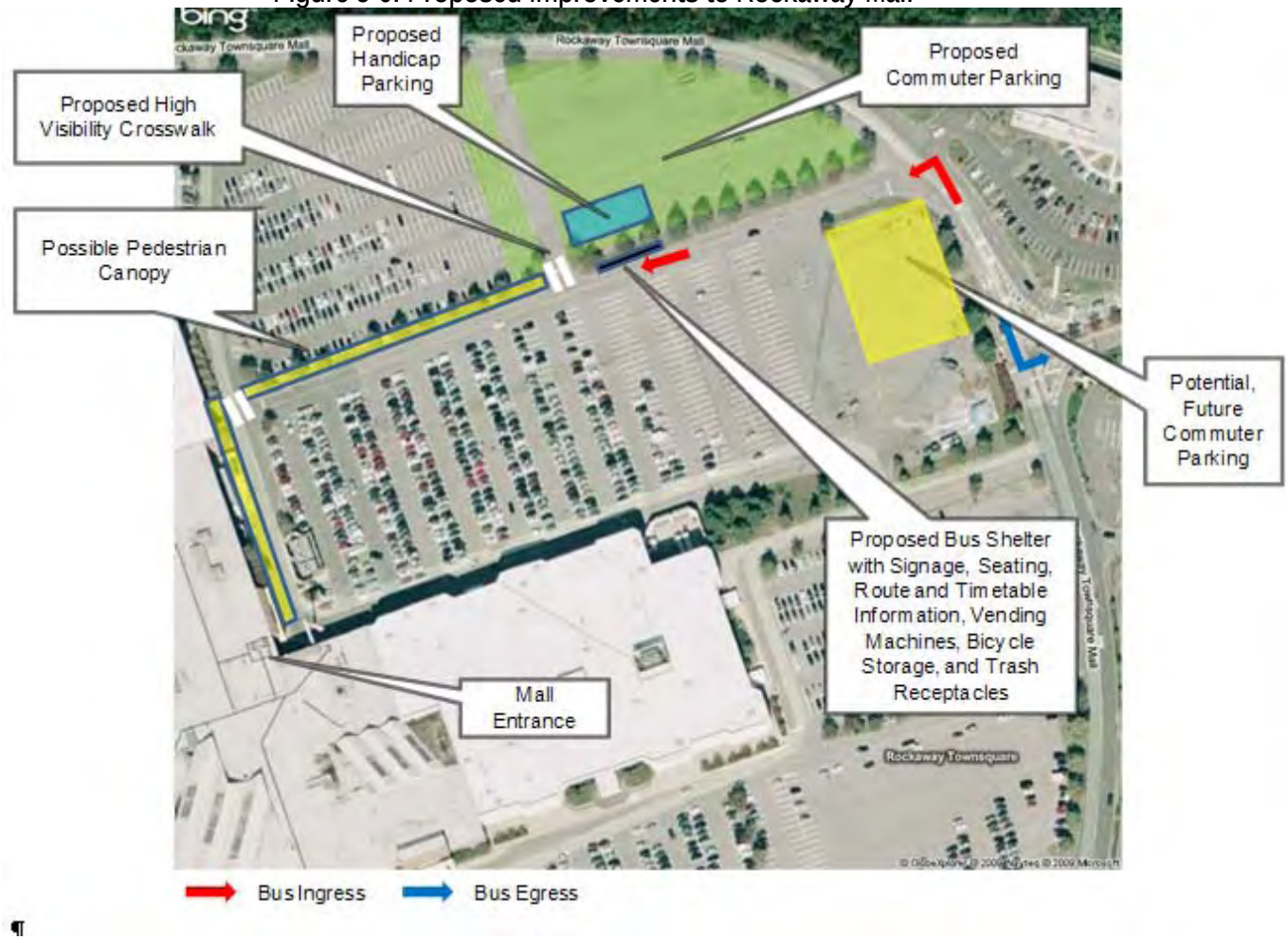
Figure 5-5: Proposed Improvements to Dover Railroad Station



Rockaway Townsquare Mall

A combined transit hub and shared-use park and ride facility is proposed to be relocated to the northeast portion of this mall in order to minimize bus travel within the mall parking areas, which can become congested at certain times. The new location would provide approximately 400 parking spaces from among those that are currently seldom used by mall customers. An additional 200 underused parking spaces nearby could be leased when demand for the existing spaces exceeds supply. The installation of a new bus shelter and parking for people with disabilities would require the removal of 50 existing customer parking spaces (representing 0.6% of total parking capacity). High-visibility crosswalks and a canopy would be used to connect the passenger waiting area to the mall entrance. The cost of the proposed improvements is estimated at $118,000, including a bus shelter, a fare vending machine, real-time message sign, pavement markings, signs, trash receptacle, pedestrian canopy and bike rack.

Figure 5-6: Proposed Improvements to Rockaway Mall



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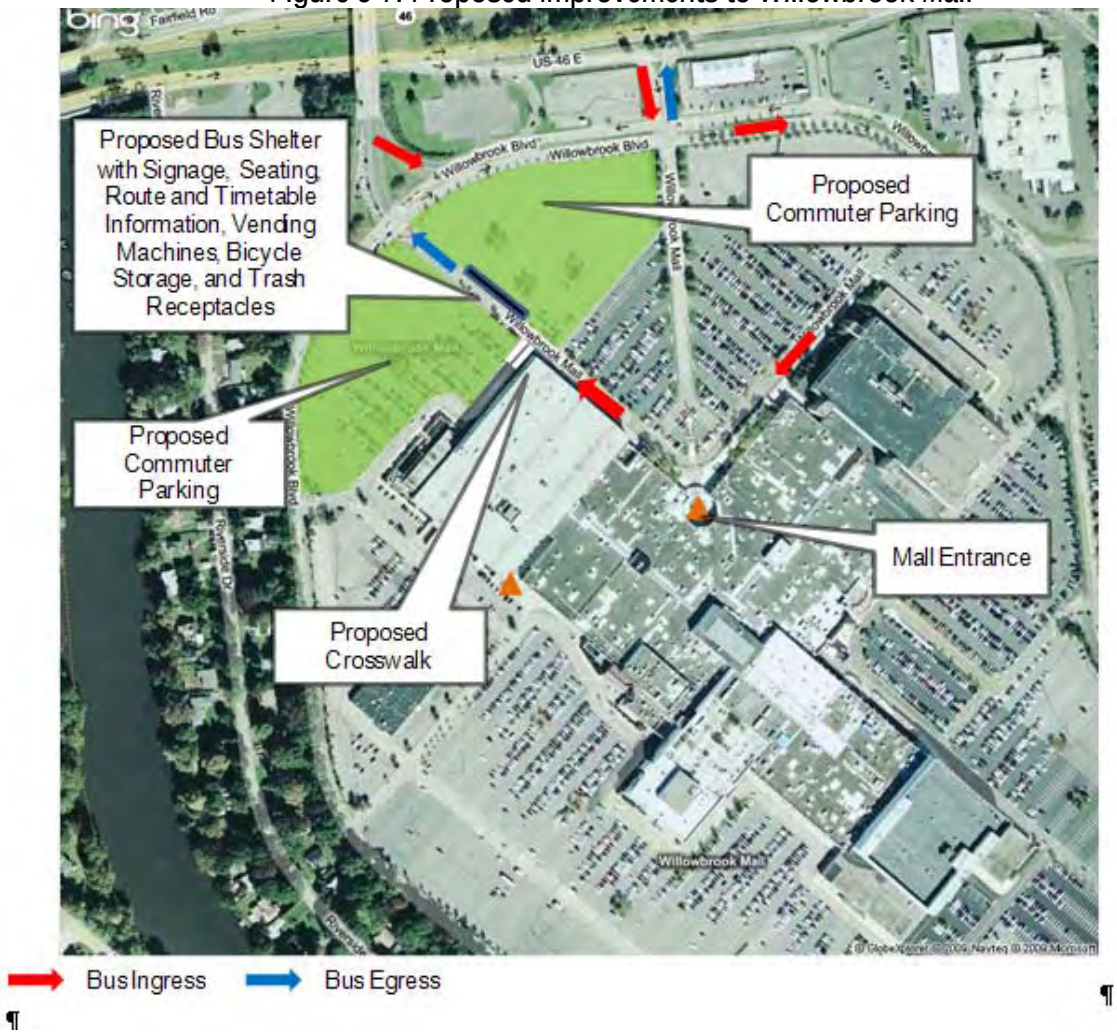
Willowbrook Mall, Wayne

A combined shoppers and commuter bus stop and park and ride area is proposed to be relocated to the northwest corner of the mall, closer to US 46 than the existing stops. The new combined Transit Hub would facilitate transfers between local and commuter buses for both inbound and reverse commute travelers. The eleven existing bus routes would continue to serve this transit hub with the possibility of three additional bus routes, for a combined total of 14 bus routes. A new bus waiting platform would be created with a continuous covered canopy, heated passenger shelters, seating, information, fare vending machines, trash receptacles, and security cameras. The waiting platform would be linked to the mall entrance via crosswalks and covered canopies. The cost of the proposed improvements is estimated at $270,000, including four bus shelters, a fare vending machine, real-time message sign, pavement markings, signs, trash receptacle, pedestrian canopy and bike rack.

Figure 5-7: Proposed Improvements to Willowbrook Mall

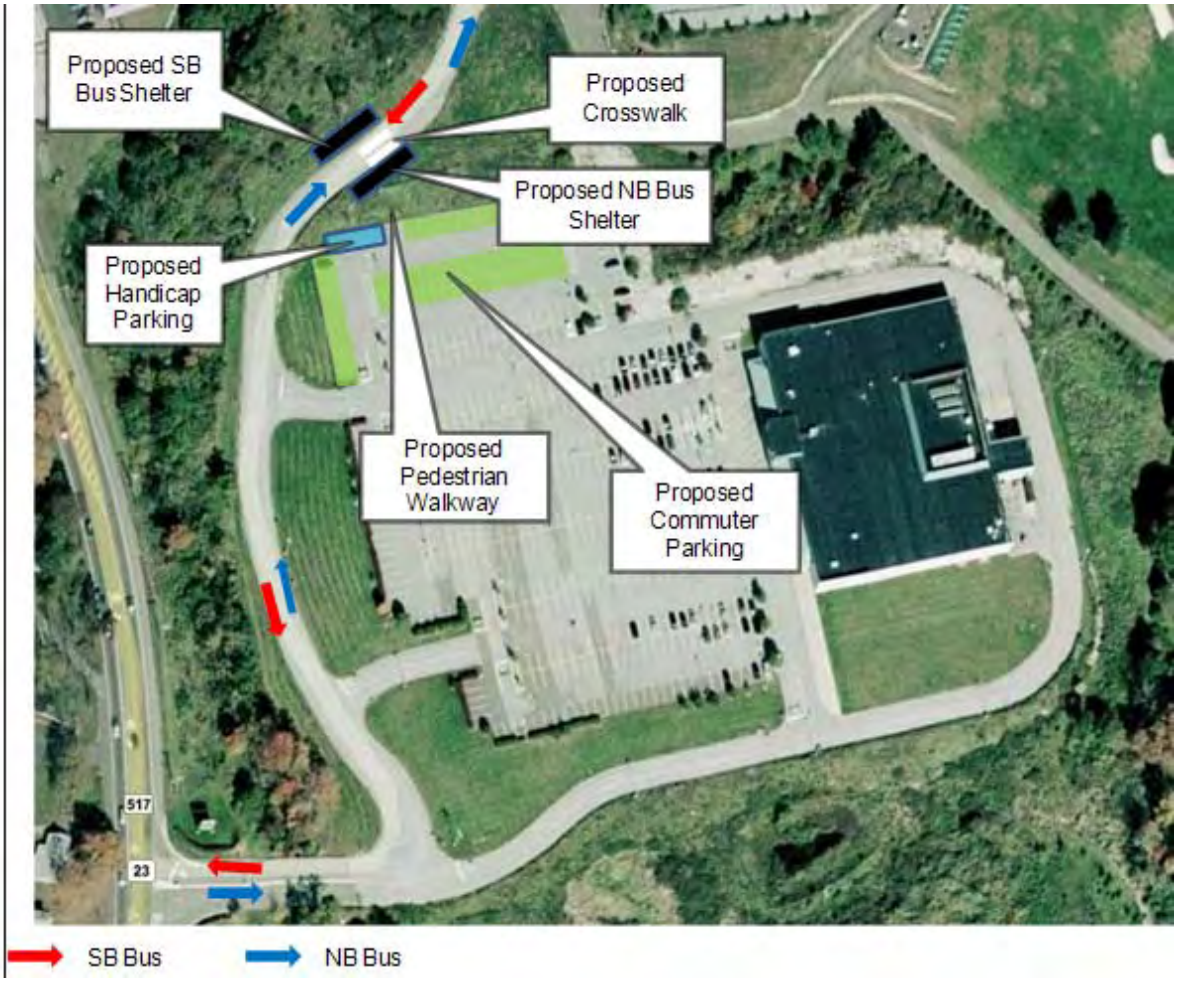


Weis Supermarket, Franklin

The bus stops at this location are proposed to be located on either side of the access road, rather than in the parking lot, to minimize bus running time and maximize convenience for bus passengers arriving by automobile (see illustration). The proposed improvements to this location include shelters, seating and schedule information, in both the northbound and southbound direction. Approximately 60 commuter parking spaces, including handicap parking, would be provided in the vicinity of the bus shelters using existing but underused shopping spaces (shoppers would be able to use these spaces when they are not occupied by commuters). Pedestrian access from the parking lot to the new bus shelters would be via a new pedestrian walkway and crosswalk. Traffic patterns within the existing parking lot would remain unchanged.

The southbound bus would access the Weis Supermarket park-and-ride by traveling south on Route 23 to Washington Avenue. The bus would turn right onto Washington Avenue and go straight to Cpl. Paul B. Madden Lane. The bus would turn on right on Cpl. Paul B. Madden Lane and continue south to the service road leading to Black Bear Golf Club and Weis Supermarket. After loading and unloading passengers, the bus would continue south along the access road and turn right into the Weis Supermarket driveway leading southbound Route 23. The northbound bus would access the Weis Supermarket park-and-ride by traveling north on Route 23 and turning right on the Weis Supermarket driveway. The bus would turn left on the

access road and head north to the bus stop. After loading and unloading passengers, the bus would continue north along the access road, past BlackBear Golf Club and follow the service road to its end at northbound Route 23. The cost of the proposed improvements is estimated at $130,000, including two bus shelters, a fare vending machine, real-time message sign, pavement markings, signs, trash receptacle, pedestrian walkway, and bike rack.



5.3 Summary of Projects

The service and facility improvement projects listed in the previous section should be deployed in phases with the specific timing of any projects depending on funding availability. The following sections list the projects proposed for early action and those proposed for later efforts based on the evaluation described in Section 5.2.

5.3.1. Easy to Implement Projects

The proposed projects in the list below may be easier to implement based on the following results from the evaluation:

- User benefits high relative to costs
- Low or moderate total costs
- Strong institutional support from all stakeholders
- No obvious barriers to implementation
- Geographic diversity
- Higher interdependency with other strategies

These projects are organized by "need" in the following sections.

Need 1: Strengthen transit service along the major study area corridors

MCM 10: add Sunday service and add a bus on Saturday (S28)
Adding Sunday service to MCM route 10 is cost-effective (less than $5 additional operating subsidy per new boarding) compared to other proposed improvements and has a low total subsidy cost ($92,000 per year). No additional buses are required to provide expanded weekend service. A related concept would add a bus and operator on Saturdays to provide the same service as weekdays (the current Saturday schedule does not have sufficient running and recovery time to provide reliable service).

Extend NJT 194 to Franklin (S1)
This project would extend New York commuter bus service further into Sussex County during peak periods only. It would require development of a new park-and-ride, such as the one proposed for the Weis Market (see Appendix G for detailed conceptual engineering of the site). It would be complemented by the proposed shuttle service to Vernon.

Need 2: Improve connectivity through links to rail stations, transit hubs, and employment centers.

Vernon-Franklin Shuttle (hourly) (S5)
This concept would extend basic transit service between the job concentrations of Vernon Township and Franklin Township, where a connection could be made to the Sussex County Loop Routes (and to NJT 194 service, when the latter is extended to Franklin, as proposed in this study). Although the cost per new rider for this project was found to be higher than some other projects, this concept would extend service to a previously unserved area. Grant funding obtained by TransOptions for a Sussex County shuttle service could be used to support this project.

Wheels 966 Convent Station Shuttle (S16)

This change consists of relabeling the two existing Convent Station routes, adding information about these and other shuttles to Morris-Essex Line train schedule information, and minor changes in routes to better serve newly occupied office buildings.

Wheels 967 Conversion to Dover Rail Station Shuttle (S9)

This concept would re-purpose an existing poorly used route connecting Sussex County and Parsippany to become a shuttle from Sussex County to Dover Station. Demand for the shuttle is expected to be significant because Dover Station has frequent service to several destinations, including Midtown Direct rail service to New York City, and because its parking lots are operating at capacity. In addition, the shuttle would be designed to serve as a "last mile" shuttle for (reverse) commuters to Picatinny Arsenal, the largest employer in the study area.

Restore Morris Plains – Mack-Cali Shuttle (S15)

This concept would revive the "Last Mile" shuttle from the Morris Plains Railroad Station discontinued in August 2009 when CMAQ funding expired. The projected subsidy per rider is among the lowest of the concepts. Employers would be required to provide a minimum level of contribution in order to have door-to-door service.

Need 3: Integrate private carriers and locally run services into the area's transit network through service and fare coordination and transit information concepts.

Lakeland Customer Information

Integrate Lakeland route, schedule and fare information into NJ TRANSIT passenger information. NJ TRANSIT's scheduling unit would produce public schedules for Lakeland with the same design as other NJ TRANSIT bus schedules. The schedule data would be provided electronically for incorporation into the NJ TRANSIT online trip planner.

Lakeland Fare Policy

Accept NJTRANSIT local bus fares and monthly bus passes on Lakeland service within New Jersey only. It is expected that additional riders would be accommodated primarily in empty seats of existing trips, and that therefore there would be no additional operating cost. If the policy leads to overcrowding, it could be modified to permit local fares and NJTRANSIT passes only in off-peak times.

Warren County Route 57B (S32)

This no-cost concept would interline routes 57A and 57B and use the savings in layover time to provide a connection to the center of Hackettstown, rather than terminating the route at the Hackettstown Mall. This change is expected to increase ridership, but no formal estimate was made of the effect.

Simplify the Route and Schedule for the West Milford Township Bus Service

There are opportunities for rationalizing and restructuring the route. NJ TRANSIT has already prepared a plan to rationalize the route structure and operation of the service. The concept would operate a consistent schedule each weekday and eliminate many circuitous deviations that are in the present route alignment.

Need 4: Implement improvements in passenger facilities and running ways to support service concepts and upgrade system image and passenger comfort.

Bus Bypass Lanes Pilot Project

Implement the first (pilot) phase of a project to permit buses to bypass queues of traffic at selected traffic signals. All proposed locations were identified based on the possibility of creating a bypass lane without significant construction costs, generally by permitting buses to use existing accessory lanes as bypass lanes via pavement markings and signage. The locations were also screened for a significant number of bus trips (at least 6 per peak period). The priority projects are those identified in the study to have significant traffic delay and significant bus ridership including: 1) US 46 at New Road, Eastbound (Parsippany, Morris County); 2) NJ 23 at Jackson Avenue, Northbound (Pequannock, Morris County); and 3) NJ 23 at Packanack Lake Road, Northbound (Wayne, Passaic County). The first phase would seek to establish bypass lanes at all three locations and monitor results.

Major Transit Hub, Willowbrook Mall, Wayne (TH2)

This project would relocate the existing Willowbrook Mall commuter park-and-ride stop and "Shopper's Stop" and provide a package of passenger amenities. The existing separate stops currently have shelters but no other amenities, and require a long and circuitous routing. The conceptual design also includes new heated shelters, security cameras, real time information, and a reconfigured bus berth layout to improve operations and facilitate transfers. The project requires the cooperation of the private owners of the facility, and is discussed further in Appendix G.

Morristown Headquarters Plaza Transit Hub Improvements (TH3)

This project would upgrade this major transit hub by providing passenger amenities and improving bus operations. Despite serving several bus routes, this facility currently lacks even basic passenger amenities. The conceptual design for this facility includes shelters, seating, route and schedule information, and marked bus layover and loading areas. This project requires the cooperation of the Morristown and Morris County, and is discussed further in Appendix G.

NJ 10 Park-and-Ride (PR1)

NJ 10 is served by Community Coach route 77 from Morristown to New York City. There are no designated park-and-ride locations to support this route in Morris County (other than the privately-owned, pay parking structure at Headquarters Plaza in Morristown). The study has identified three strong candidate shared-use park-and-ride locations in East Hanover and two in Whippany. All of these locations would require some changes either to bus stop locations or to bus routing (in order to serve a park-and-ride directly). The Castle Ride Plaza location could be served by making only a small change to existing bus stops, and therefore would be relatively easy to implement. The Costco/Target site would require the addition of a bus stop along NJ 10. The concurrence of the operator (Coach USA) with proposed route adjustments would be needed for some of the other candidate locations; these include suggestions to have the buses enter the sites to make it much more convenient for passengers who would otherwise need to have to walk to bus stops along the road, which would require a long walk and, in one travel direction, a crossing of NJ 10.

US 46 Shared Park-and-Ride (PR7)

The three existing park-and-rides on US 46 in Parsippany have 677 parking spaces, and occupancy ranges from 93% to 100%, based on the February 2009 surveys conducted by TransOptions. Four strong candidate shared-use, park-and-ride locations have been identified in this study that could handle overflow from the existing lots. One or two of these locations could be made available for commuters, depending on the amenability of property owners to making spaces available for lease. The other proposed sites could provide further expansion when the new and existing Parsippany park-and-rides are collectively above 85% use.

Improved Information and Amenities at Existing Park-and-Rides and Major Bus Stops

Park-and-rides and bus stops with more than 40 boardings daily should be equipped with at least a minimum level of amenities, including static passenger information and shelters. Locations with the highest number of boardings should be completed first. Table 5-4 shows the 13 park-and-rides that are not Transit Hub candidates but have 40 or more boardings.[1] There were 11 bus stop locations in the study area that are not park-and-rides or Transit Hub candidates that have at least 40 daily boardings, as shown in Table 5-5 below. Thus, there are a total of 24 locations to be equipped with basic passenger amenities. The Greenwood Lake and Warwick Park-and-Rides, and the Oakland Avenue at Orchard Street bus stop are located in New York. Providing amenities at these stops would require the cooperation of New York State DOT as well as local authorities. A standard package of improvements, including bus shelter, bench, bike rack, lighting, trash bin, signs and pedestrian ramps is estimated to cost $80,000 per site including installation.

Table 5-4: Park-and-Rides with 40 or More Bus Boardings

Transit Stop Location	Existing Services	Bus Boardings
Waterview P&R, Parsippany	NJT 29/79, Lakeland 46	345
Beverwyck P&R, Parsippany	NJT 29/79, Lakeland 46	290
Arlington P&R, Parsippany	NJT 29/79, Lakeland 46	210
Ringwood P&R, Ringwood	NJT 196, 197	204
Smith Field P&R, Baldwin Road., Parsippany	NJT 29/79, Lakeland 46	200
Lakeland Bus Terminal, Dover	MCM 10, Lakeland 46	184
Mount Arlington P&R – Mt Arlington	Lakeland 80	164
Newfoundland P&R, West Milford	NJT 194	133
Greenwood Lake Turnpike P&R, West Milford	NJT 196, 197	123
Warwick P&R, NY	NJT 196, 197	72
Butler Bowl P&R, Kinnelon	NJT 75, 194	63
Stockholm P&R @ Rt 515	NJT 194	45
Greenwood Lake P&R, NY	NJT 196, 197	41

Table 5-5: Bus Stops with 40 or More Bus Boardings

Direction	Transit Stop Location	Existing Services	Bus Boardings
East	Rt. 46 at Hook Mt. Road., Pine Brook	NJT 29/79, 46	105
South	Valley Road @ Macdonald Dr, Wayne	NJT 197, 198	96
North	Speedwell Avenue @ Sussex Avenue, Morristown	MCM 3, 10	77
South	Valley Road @ Preakness Avenue, Wayne	NJT 197, 198	76
South	Hamburg Tpke @ Alps Road, Wayne	NJT 197	66
East	Rt. 46 @ Rt. 202 (Parsippany Road) - Morris Hills Plaza, Parsippany	MCM 1, NJT 29/79, Lakeland 46	60
South	Wanaque Avenue @ Ringwood Avenue, Pompton Lakes	NJT 75, 194L, 197	59
South	Wanaque Avenue @ Cannon Ball Road, Pompton Lakes	NJT 75, 194L, 197	54
South	Oakland Avenue at Orchard St, Warwick NY	NJT 196, 197	49

[1] The Smith Field location is no longer an official park-and-ride.

South	Speedwell Avenue @ Sussex Avenue, Morristown	MCM 3, 10	46
South	Valley Road @ Lancaster Ct, Wayne	NJT 197, 198	44

5.3.2. Future Needs

The projects listed below are recommended as future needs to be completed after the "early-action" projects previously described.

Need 1: Strengthen transit service along the major study area corridors

NJT 194 Butler – New York City: Increase Frequency Off-Peak (including NJ-23 in Riverdale) (S3)
This concept would increase the frequency of off-peak service between Butler and New York City from every two hours to every hour. The new service would be routed on NJ-23 in Riverdale, where it would provide access to the new "big box" retail.

Lakeland 80, Newton and Sparta to New York City - Increase Frequency Off-Peak (S8)
This concept would provide hourly off-peak and reverse-peak service to these Sussex County communities. The combined trips to Newton and Sparta would be in addition to the existing trips.

MCM 10 - Increase Frequency (S26)
This concept would increase service frequency on the most heavily used MCM route from once to twice an hour. The concept would be rated a higher priority but for the large increase in cost.

MCM 10 - Add Evening Service (S27)
This concept would serve workers with non-traditional work hours by adding service from 7:30 to 11 pm.

Lakeland 80 Service to Roxbury or Ledgewood Malls (S12)
This concept would increase parking capacity for Lakeland 80 service by extending some trips that currently end at Mount Arlington Station or Rockaway Mall to a new park-and-ride, if sufficient additional parking spaces are not available at those locations. Some new trips would be added to accommodate the expected ridership growth, and some evening local trips currently terminating at the Lakeland Bus Terminal in Dover would be extended here as well (via Rockaway Mall and Mount Arlington). This concept requires the development of a new park-and-ride, as described below under Need 4.

Lakeland 80 Extension from Budd Lake to Hackettstown (S33)
This concept would extend existing peak-period service from or to Budd Lake. The route would be extended a few miles, stopping in Hackettstown (US-46 and NJ-182) and then the Hackettstown Mall.

Community Coach 77 Additional Service (S13)
This concept would provide a minor increase in service to meet service frequency and span guidelines.

Modify MCM 2 and MCM 3 Routing and Increase Frequency of MCM 3 (S22 and S23)
Shortening the MCM 3 route would allow more reliable and frequent service. A portion of the MCM 3 route would be shifted to MCM 2.

Add Union City Stop on Reverse and Off-Peak NJT 197 Trips
This concept would add a stop near Bergenline Avenue in Union City, adjacent to Route 3. NJT 197

reverse peak trips would provide more and faster service to Willowbrook than the current weekend-only service, permitting access to many jobs and other opportunities in Wayne.

Summer Weekend Express Service to Vernon Resorts

This concept would provide select weekend and holiday trips in the summer season from New York City to Vernon. Like the existing winter season trips, they would serve only PABT, Willowbrook Mall, and Vernon. There would be one morning westbound trip and one evening eastbound trip.

Need 2: Improve connectivity through links to rail stations, transit hubs, and employment centers.

Sussex County Transit Loop Bus – Increase Span and Frequency (S4)

This concept would increase the frequency on the existing loop routes to hourly service, extend service into the evening, and introduce limited Saturday service on part of the route. An additional bus would be required to provide at least the four needed to operate service, with existing demand-response vehicles serving as spares. There would be a significant increase in operating costs.

Morristown Railroad Station Shuttle (S18)

This connecting service to Morristown Station would continue the existing temporary Headquarters Plaza parking lot shuttle after the latter is discontinued when the new rail station parking deck is completed. It would also provide "last mile" service to offices and businesses along Madison Avenue in Morristown.

MCM 1 - Add Evening Service; Add Sunday Service

This concept would serve shoppers and workers with non-traditional work hours.

MCM 1 – Increase Schedule Time (S19)

Additional running time would be added to the MCM 1 schedule to improve reliability. The MCM 1 would be interlined with the proposed new express (see next concept). Thus the two must be implemented at the same time.

Morristown-Willowbrook Express (S30)

This route would provide a fast trip from Morristown to the US-46 area in Parsippany and the Willowbrook Mall. It could be extended to Paterson later. The concept entails a substantial increase in operating costs.

Montclair-Boonton Line Off-Peak Bus Connector, Lincoln Park-MSU (S14).

This bus connector would supplement existing rail trips along the Montclair-Boonton Line, providing off-peak and reverse peak connections, and building support for a possible increase in train service at those times.

Denville RR Station Shuttle (S17)

This concept would link Denville RR station to the Cherry Hill, Waterview, and Littleton clusters of office parks near US-46 in Parsippany. It has significant ridership potential because it would serve 3.7 million square feet of office space, roughly the same amount as the Morris Plains Last Mile shuttle or the Wheels 966 Convent Station shuttle. However, the complete loop from the station may be somewhat longer than those routes. The concept would require cooperation and financial support from employers to be served by the new shuttle, and the likelihood of obtaining such cooperation is considered to be low at the present time.

Lakeland 46 to Dover Center (S10)

This concept would extend selected Lakeland 46 trips so that they begin and end in the center of Dover, rather than at Lakeland's terminal several miles to the east of town. The change would improve connections for those who live or work in Dover. It would also improve connections between Lakeland bus service and both local buses (MCM and MOM) and NJ TRANSIT rail.

Need 3: Integrate private carriers and locally run services into the area's transit network through service and fare coordination and transit information concepts.

Convert Morris on the Move to regular MCM route (S29)

This concept would provide a major expansion of regular MCM service west of Dover. However, it carries a significant increase in operating cost and would require the purchase of two new buses.

Wheels 973 Hackettstown – Convert to Linear Route (S31)

This concept would streamline the existing service by converting it to a linear route, increasing frequency on the most-used portion and providing on-demand service on the remaining portion of the existing loop route. The increased frequency is expected to increase ridership with no change in operating cost. Greater consensus on this concept among stakeholders is needed prior to implementation.

Community Coach Local Fares

Offer local fares and honor NJ TRANSIT monthly bus passes on Community Coach service within New Jersey only. This concept would open the existing Community Coach 77 route to local users. It not proposed for early implementation because the proposed expansion and extension of NJT 73 would cover much of the same area, if it is implemented. Also, the operator (Coach USA) has not identified its interest in this change or provided information to the study effort.

Need 4: Implement improvements in passenger facilities and running ways to support service concepts and upgrade system image and passenger comfort

Franklin Park-and-Ride and Transit Hub (TH7 and PR5)

This project involves leasing 50 to 60 park-and-ride spaces along NJ-23 in Franklin in one of two possible shared-use park-and-ride locations have been identified in this study. The new park-and-ride would be the terminus of an extended NJT 194. (The park-and-ride concept requires the adoption of the service extension concept.) If the new lot and service are sufficiently used by Vernon riders, extending service to a new park-and-ride in Vernon should be considered subsequently. A conceptual design for a park-and-ride at Weis Market is included in Appendix G.

Bus By-Pass Lanes – Second Phase

This project would be a continuation of the deployment of bus-bypass lanes, assuming that the effectiveness and safety of these improvements are demonstrated during the pilot program. The locations would be selected either from those identified in this study or other locations, depending on lessons learned from the pilot program.

Park-and-Ride Lot Improvements – Second Phase

This project would provide information and amenities at an additional 8 stops that would be selected from those park-and-ride lots and bus stops with 40 or more boardings a day that were not completed as early-action items. If additional locations are needed, the park-and-ride lots shown in Table 5-6 below could be added to the list, although that have fewer than 40 bus boardings per day (some are also used for carpools). For capital cost budgeting purposes it is assumed that 8 locations would be completed at a cost of $80,000 per location.

Table 5-6: Park-and-Rides with Fewer than 40 Bus Boardings in the Study Area

Transit Stop Location	Existing Services	Bus Boardings
Butler P&R (NJ-23 and Valley Road), Butler	NJT 194	31
Bloomfield Avenue P&R, Denville	Lakeland 46	29
Blue Heron Road P&R, Sparta	Lakeland 80, Wheels 967	28
Broadway P&R, Denville	Lakeland 46	28
Newton P&R, S. Park St, Newton	Lakeland 80	18
Ross's Corner P&R, Augusta	Wheels 967	3

Second Overflow Park-and-Ride Lot on US 46 in Parsippany (PR7)

This project would consist of one or more additional shared-use park-and-ride lots from among those identified as strong candidates that were not already developed as early-action items. It would be developed assuming that the existing lots on US 46 are averaging 85% or more usage.

Major Transit Hub, Rockaway Townsquare Mall, Rockaway Township, Morris County (TH1)

This project would integrate local and express services at a new bus stop with passenger information and amenities. The conceptual engineering proposes a combined stop in a more favorable location within the Mall property to improve operations and facilitate transfers. The project requires the cooperation of the private owners of the facility as is discussed further in Appendix G.

Major Transit Hub, Dover RR Station, Dover, Morris County (TH6)

This project would upgrade existing bus stops on East Blackwell Street in Dover center by adding passenger information and amenities and providing wayfinding signage to passengers transferring between local buses and the rail station one block away. The proposed improvements would be coordinated with Dover Township's plans to develop a transit-oriented development project in the town center, and are discussed in Appendix G.

Major Transit Hub, Morristown RR Station, Morristown (TH5)

Morristown Station is currently served by MCM 1 and MCM 2. This study proposes increasing bus activity at the station by modifying MCM 3 to stop at the station, as well as implementing a new express route from Morristown to Willowbrook Mall and retaining the existing Headquarters Plaza parking lot shuttle as a "last mile" reverse commuter shuttle and community circulator. This project would provide passenger amenities and information on bus and shuttle connections both within the station and at the adjacent on-street bus stops, including wayfinding signage to assist passengers transferring between services. The project may require coordination with Morristown for the on-street stops, as is discussed further in Appendix G.

Roxbury or Ledgewood Mall Shared Use Park-and-Ride Lot (PR3)

This facility would serve as an "overflow" park-and-ride for the Lakeland 80 trips proposed to be extended westward (S14). It should also attract new transit customers due to the new spaces, both at the proposed lot and those vacated by diverted existing users. The project should be pursued only if and when parking capacity cannot be increased to meet passenger demand at Mount Arlington and Rockaway Mall. Additionally, Lakeland has not embraced the concept, and it is not feasible without Lakeland's cooperation.

Park-and-Ride at NJ-23 in Riverdale (PR4)
Two possible locations were identified for a new shared-use park-and-ride in this area (currently served by peak hour buses only, but proposed to have off-peak service). There are no existing park-and-rides in the vicinity. These new lots could potentially intercept commuters who would otherwise board in Wayne. However, the two park-and-rides in Butler, a few miles west on NJ-23, currently have excess capacity. Thus developing a Riverdale facility should be delayed until demand is demonstrated by the lack of available space at the Butler locations.

Minor Transit Hubs - Boonton (TH9), Netcong (TH10), Sparta (TH11), Morris Plains (TH12), Newton (TH14)
This concept would provide information and amenity improvements at a number of emerging transit hubs in the region. In addition to providing the same amenities expected for major bus stops and park-and-rides, changes in bus stop location or the creation of new bus berths may be required in order to improve facilitate transfers between buses or between bus and rail.

Hackettstown Transit Hub (TH13)
A hub at Hackettstown Station is not recommended because the existing station is in a residential area and the town is concerned about the impacts of expanding bus service to this area. Extended Lakeland service is instead proposed to stop at the edge of Hackettstown center and continue to a new terminus at the Hackettstown Mall, which is served by local routes Wheels 973 and Warren County 57B. Passenger information and amenities should be provided at this location. However, if the railroad station is relocated in the future, the transit hub should be moved to that location.

5.3.3. Not Recommended

The projects below were including as candidate concepts in Chapter 4 but are not recommended due to:

- User benefits low relative to costs;
- Institutional support unlikely; and/or
- Significant barriers to implementation.

Numerous candidate improvements were considered and dropped from further analysis in early sceening reviews. These include bus use of shoulders on I-80, bus bypass lanes at intersections with less delay, potential park-and-ride sites that did not meet criteria for pedestrian and bus access or potential parking availability, and service projects that were replaced with improved concepts or dropped due to fatal flaws. In addition, the following projects were considered candidates until late in the study and are described in Chapter 4 but have not been recommended following further refinement of the concepts and consideration of additional factors, such as stakeholder support.

Vernon-Franklin Shuttle (half-hourly) (S6) and Newton-Franklin-Warwick (hourly) (S7)

These concepts are not recommended due to their high cost per new boarding and high total cost. The proposed extension of NJT 194 to Franklin would instead provide improved New York service for those coming from this area, and the proposed hourly Vernon-Franklin shuttle (S6) would provide a connection to employment sites in Vernon.

Extend NJT 194 to Vernon (S2)

The ridership model found no additional trips for a Park-and-Ride in Vernon compared to one in Franklin. Therefore this extension is not recommended.

Lakeland 46 Local Service, Rockaway Mall to Willowbrook Mall (S11)

This concept would provide an overlay local service that would make a direct connection to the shoppers stop at the Willowbrook Mall. It has high total costs and moderate cost-effectiveness, and alternate service is available for such trips via Lakeland 46 off-peak New York service (or by transferring to Lakeland 46 peak trips in Dover), though the latter requires a significant walk for Willowbrook-bound passengers because it stops on route 46 rather than entering the mall property.

5.4 Summary of Costs

Table 5-7 summarizes the operating costs (net of expected fare revenue) and capital costs for the concepts summarized in the previous section. These estimates are conceptual. The "easy-to-implement" concepts have a relatively modest total cost because they include projects that are of high priority yet inexpensive and easy to implement. The emphasis on small, lower-cost projects is of importance given that that there will be less transit funding available in the near-term period, and also that the demand for transit is expected to grow slowly.

Table 5-7: Summary of Estimated Operating and Capital Costs

Easy-to-Implement Concepts	Operating Subsidy	Capital Cost
Service Improvements	$1,032,751	$350,000
Bus Bypass Lanes Pilot (3 locations)	n/a	$15,000
Transit Hub (2 locations)	*	$160,000
New Park and Ride Lots (2 locations)	$54,000	$160,000
Existing Park-and-Rides and Major Bus Stops	*	$640,000
Subtotal	*$1,086,751*	*$1,325,000*
Other Concepts		
Service Improvements	$5,706,669	$6,275,000
Bus Bypass Lanes (3 locations)	n/a	$15,000
Transit Hubs (9 locations)	*	$720,000
New Park and Ride Lots (4 locations)	$126,000	$400,000
Existing Park-and-Rides and Major Bus Stops	*	$1,280,000
Subtotal	*$5,832,669*	*$8,690,000*
Total	$6,919,421	$10,015,000

* It is anticipated that there will be a small maintenance cost associated with the new shelters and other amenities.

5.5 Next Steps

Ultimately, success depends on garnering the will and the funding to make the desired improvements. Clearly collaboration will be required among a wide variety of stakeholders including NJ TRANSIT, NJDOT, the counties and municipalities and other stakeholders. To move forward, support from multiple levels of government, elected officials and the public will be sought. Identifying sources of funding and obtaining funding commitments will be an important next step in the implementation process.

A. Appendix A: Travel Patterns from Census and Travel Model Data

A.1 Detailed Travel Patterns

A.1.1. County Level Analysis of Work Trips

This analysis examines travel by all modes for the journey to work. The analysis begins with a summary of trips by workers residing in the four Study Area counties, that is Morris, Warren, Passaic, and Sussex. For each county, a pie chart is provided showing this disribution of worker job locations by county. Surrounding counties are included as well as summary categories for more remote areas of New Jersey, New York and Pennsylvania.

As shown in Figure A-1, about 65% of all work trips originating in Morris County end within the county. More than 11% of the trips end in neighboring Essex County; next is 6.5% to Passaic and 3.7% to Bergen. Of the four counties, Morris County has the largest share exported to Essex County and the largest intra-county share. Manhattan is the workplace for less than 5% of the trips.

As shown in Figure A-2, about 43% of all work trips originating in Warren County end within the county. About 42% end in adjacent Morris County. Only a small share, or about 2%, end in Essex County and just over 1% end in Manhattan. This is not unexpected given Warren County's westernmost location. Nevertheless, despite its location near the Pennsylvania state line, few trips are destined to Pennsylvania.

Figure A-1: Destination Distribution of Work Trips from Morris County

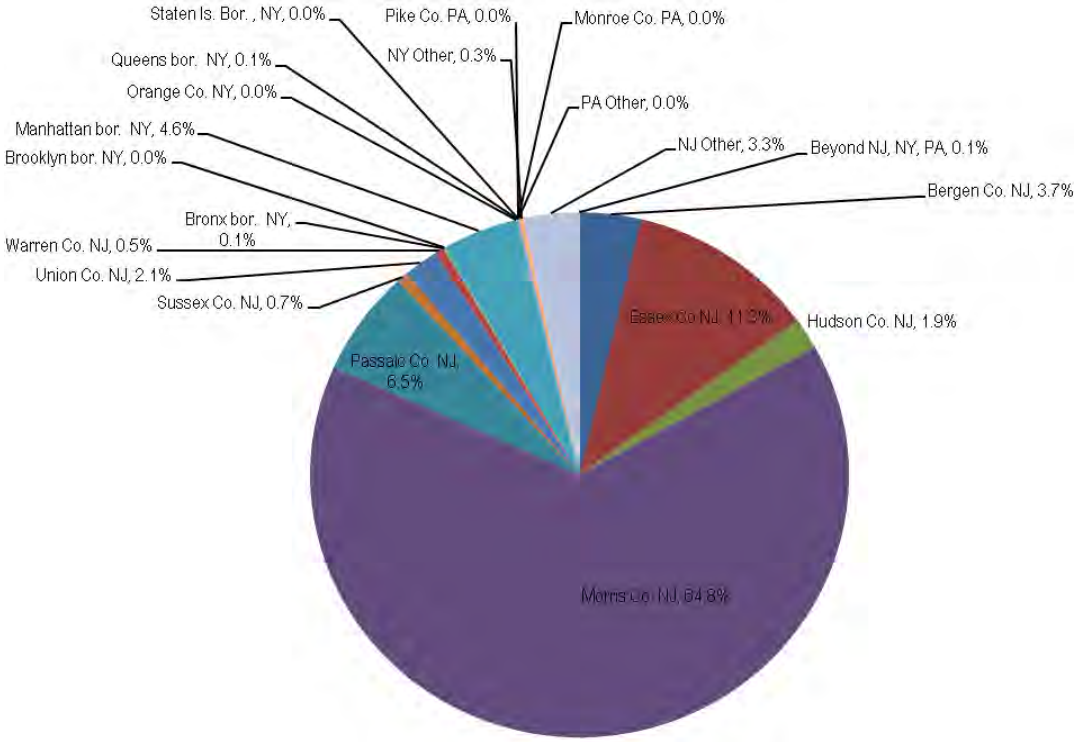
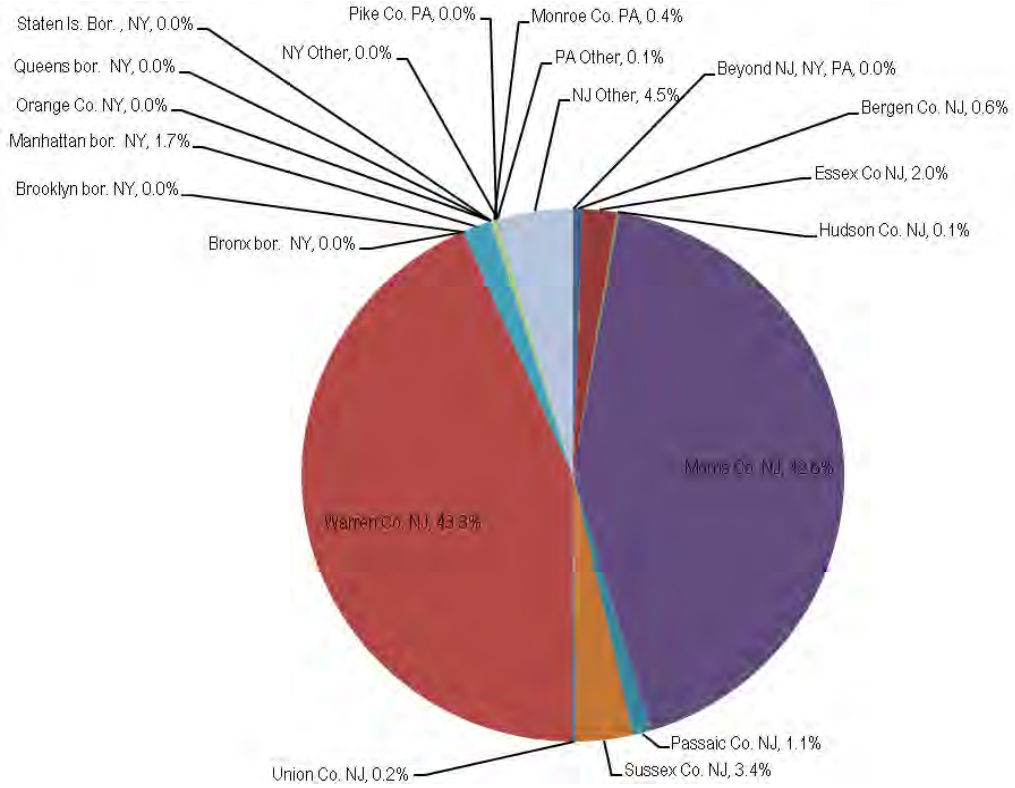
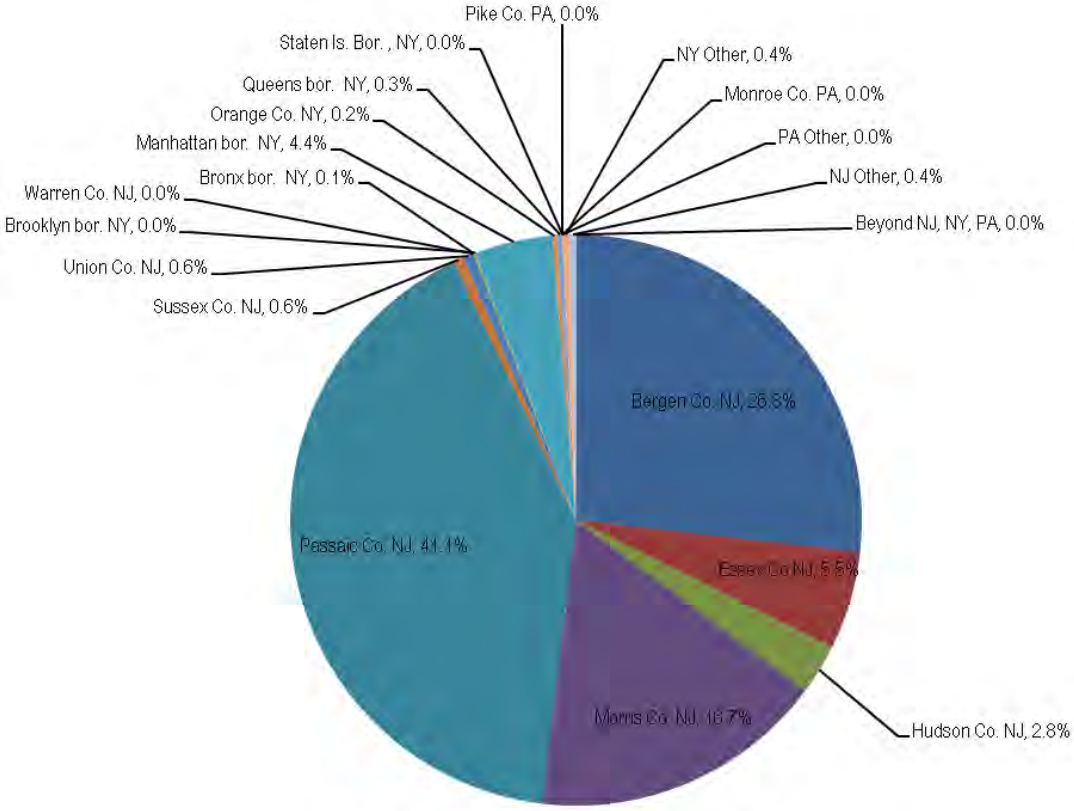


Figure A-2: Destination Distribution of Work Trips from Warren County



As shown in Figure A-3, over 41% of all work trips originating in Passaic County end within the county. The next largest shares go to two neighboring counties that have large employment centers: 27% to Bergen and 17% to Morris. Almost 6% of trips end in Essex County. These shares are understandable given that most of the Passaic towns (and population) in the study area border Bergen or Morris counties. Passaic County also has the largest share exported to Manhattan, at just over 4%.

Figure A-3: Destination Distribution of Work Trips from Passaic County



As shown in Figure A-4, about 46% of all work trips originating in Sussex County stay within Sussex County. The next largest share, 32%, ends in Morris County. Each of Essex and Passaic attracts more than 5% of the trips. Bergen attracts more than 3% of trips, and Manhattan attracts more than 2% of trips. In each of the study area counties, the largest share of resident workers works in their home county. However, each county also exports large shares to adjacent counties, particularly Morris, Bergen and Essex.

Figure A-5 shows the same information in a bar chart format that enables one to see the absolute values. Clearly, Morris County has the largest number of resident workers besides the largest number of intra-county workers. The number of Morris County intra-county workers dwarfs the other work trip flows. Morris County is the second highest destination for Warren and Sussex working residents and third highest for Passaic. As a result, the volume of trips into Morris County from study area counties is by far the largest inter-county trip flow.

Figure A-4: Destination Distribution of Work Trips from Sussex County

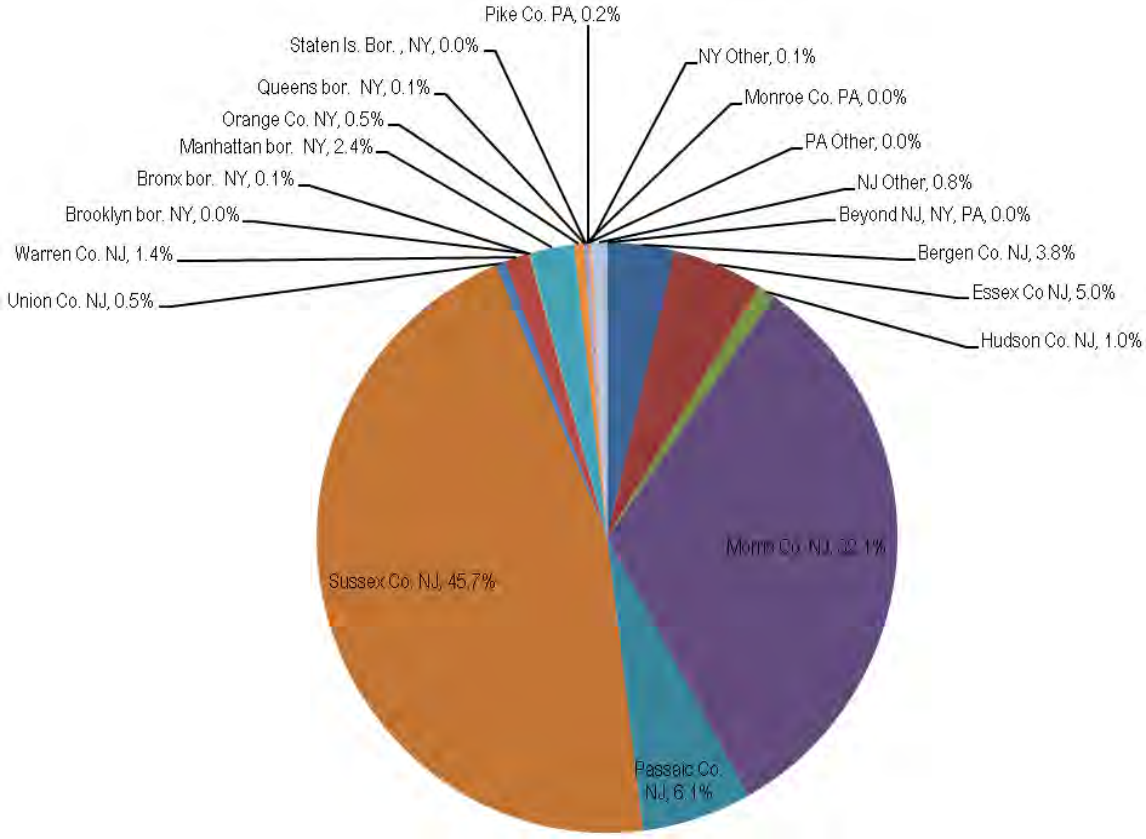
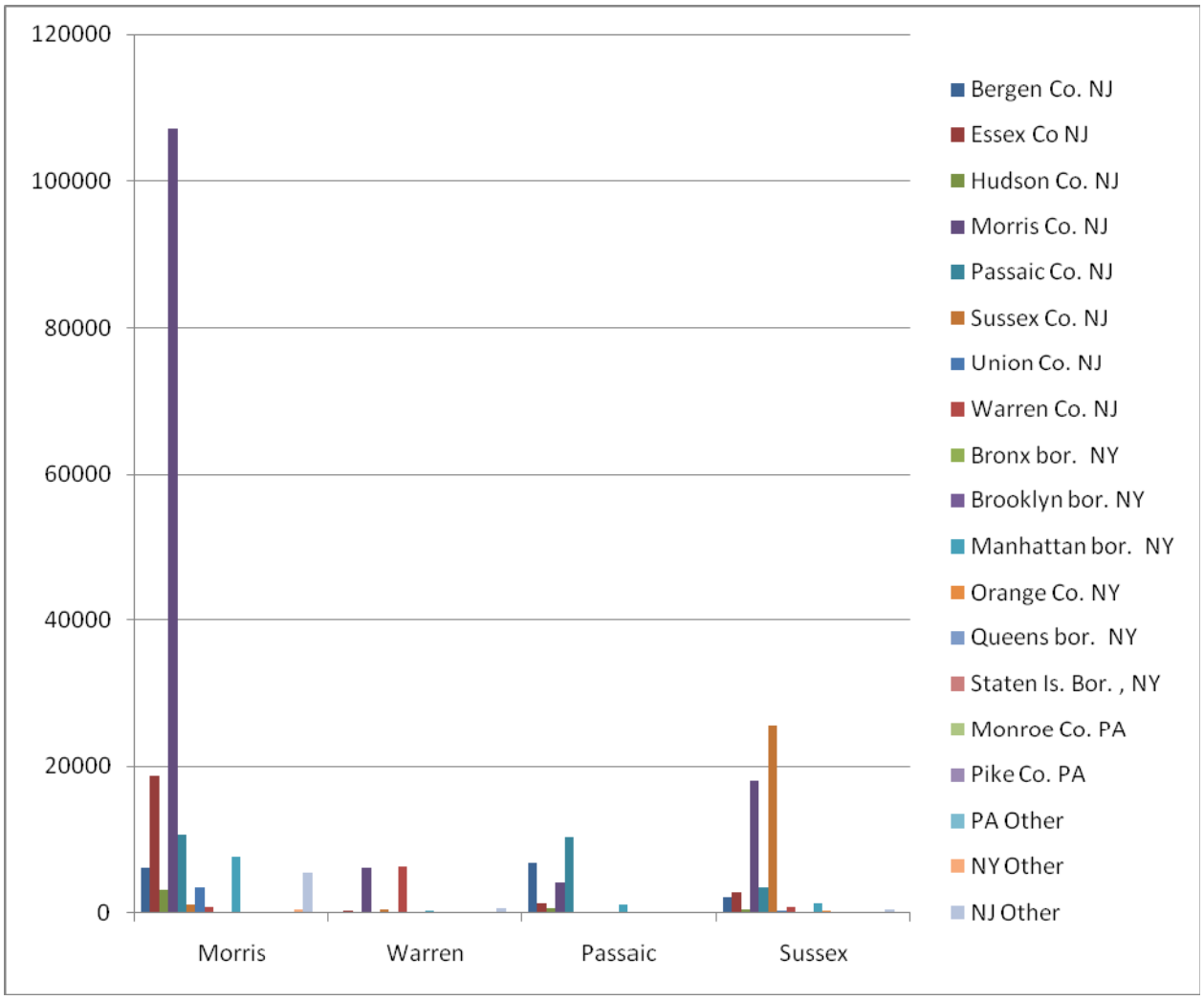
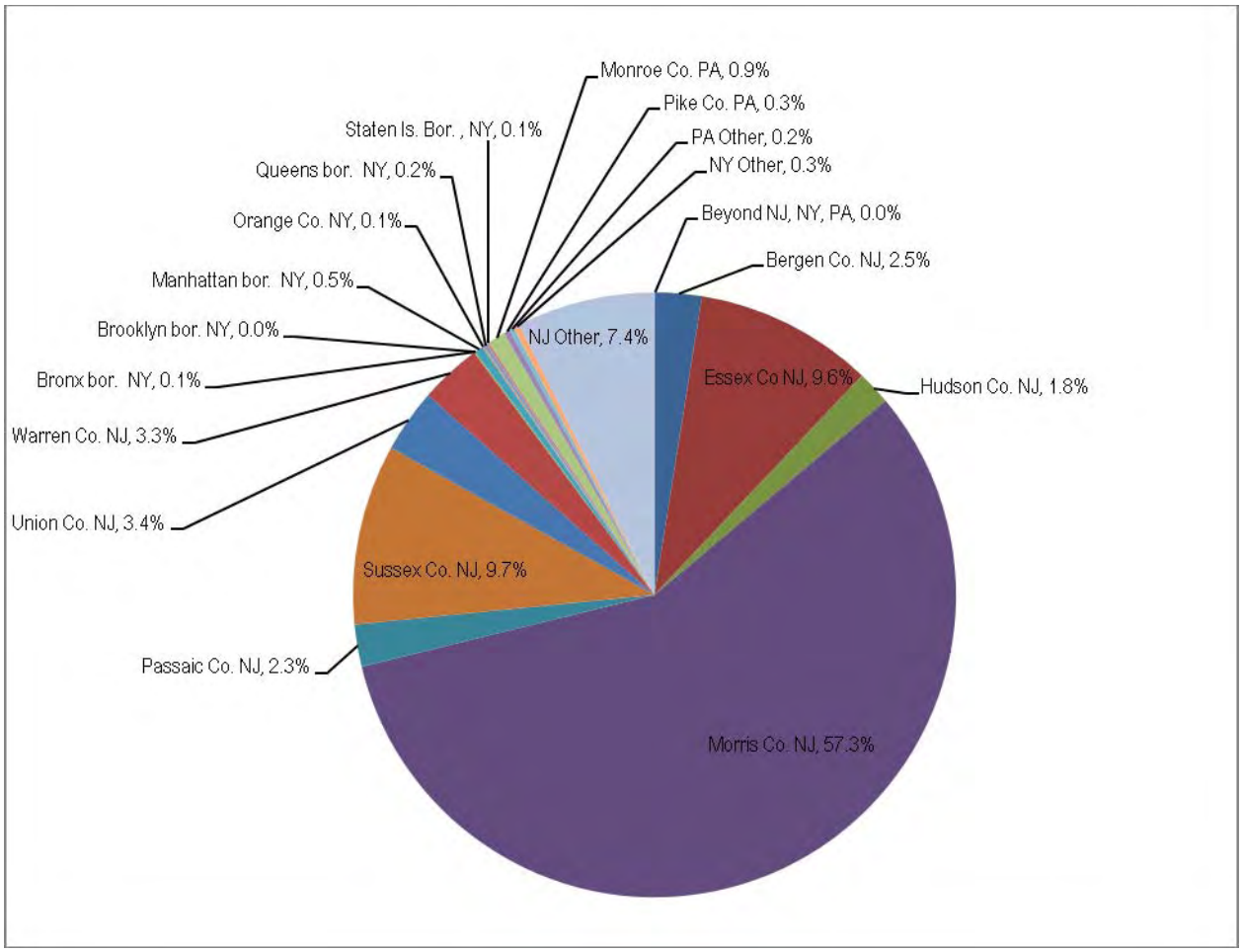


Figure A-5: Comparison of Destinations of Work Trips from the Four Counties



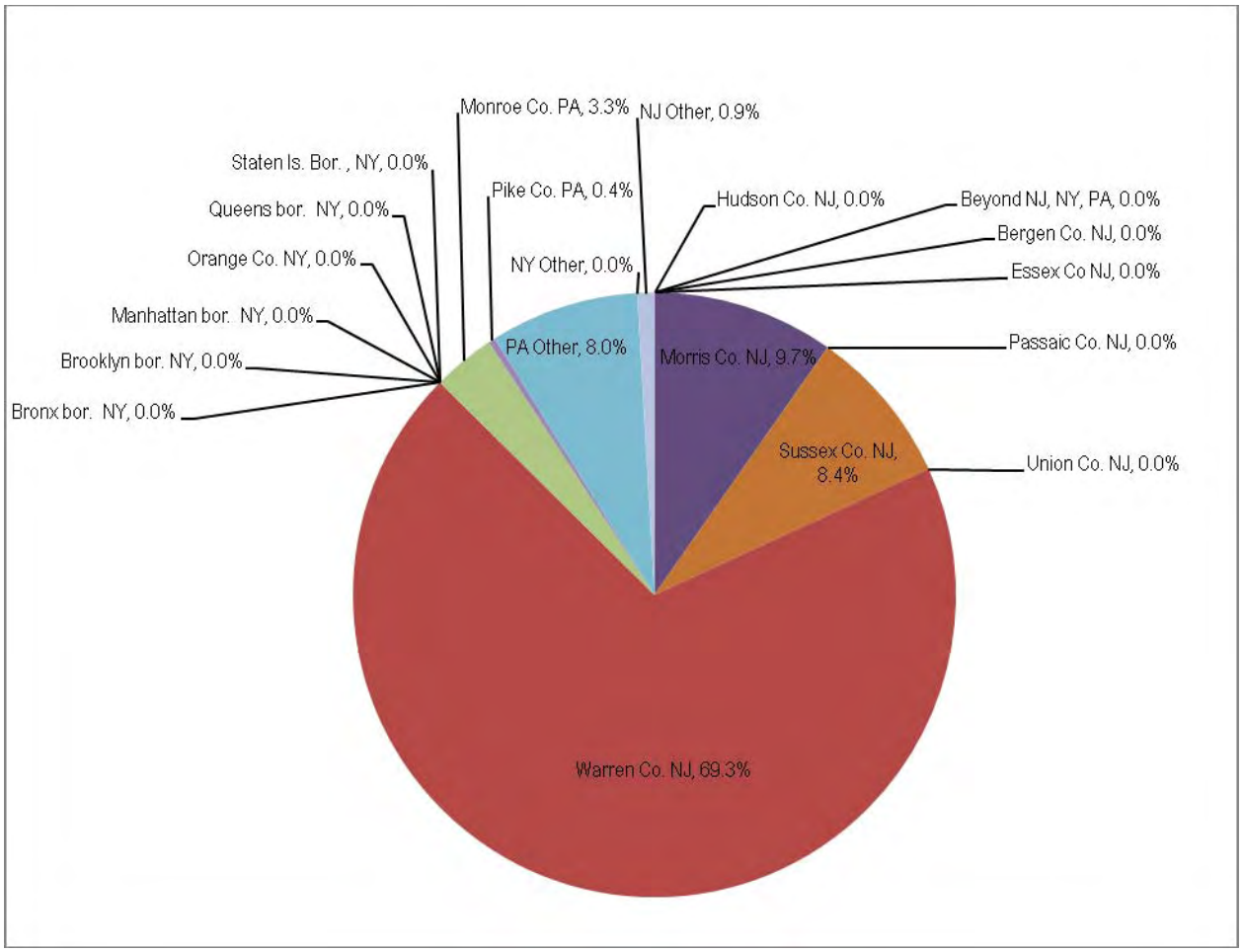
The origin of work trips to the four study area counties (full county or study-area portion) are also compared. Figure A-6 through Figure A-9 show the origin distribution of work trips that enter the study area counties.

Figure A-6: Origin Distribution of Work Trips to Morris County



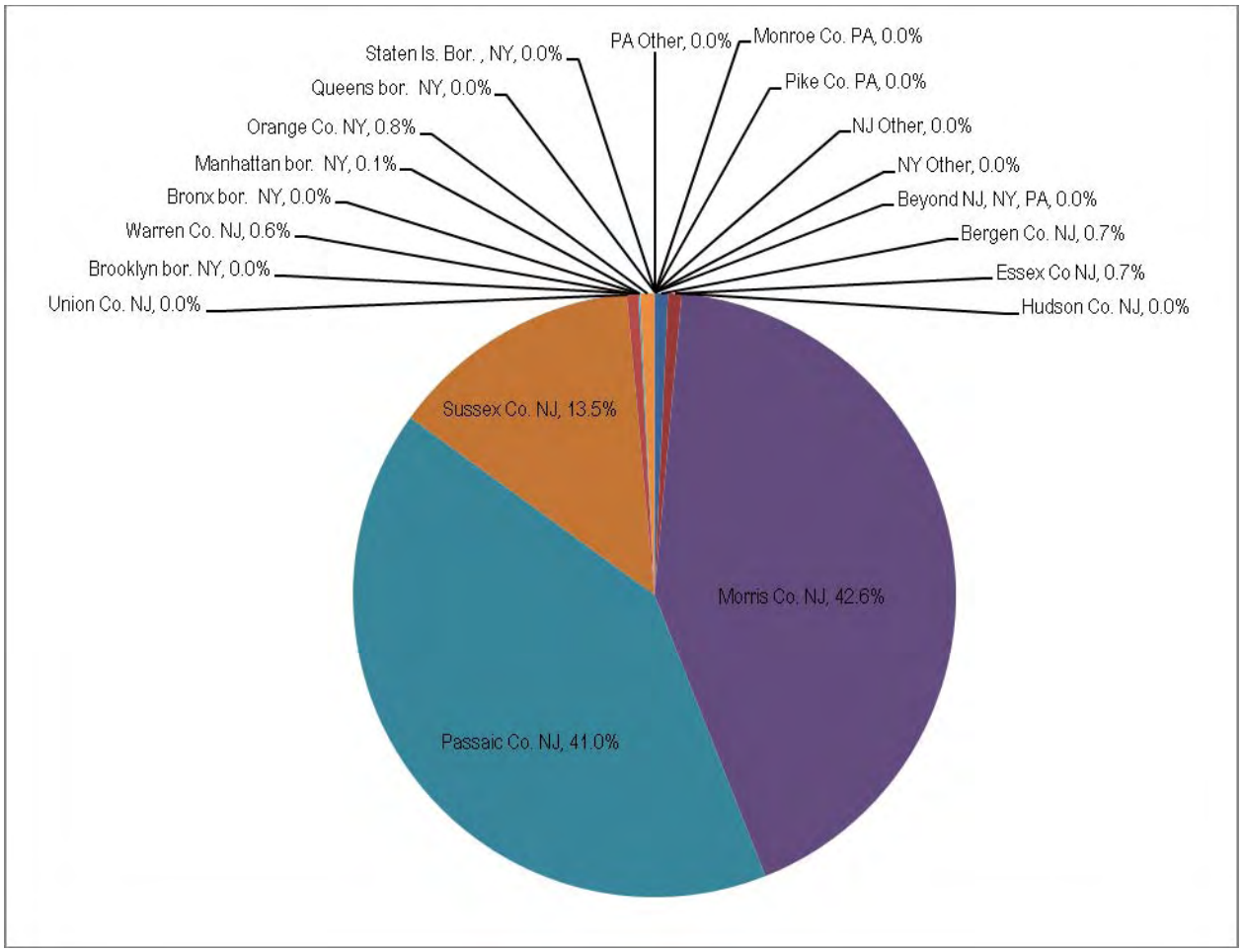
As shown in Figure A-6, about 57% of all work trips ending in Morris County start from within the county. Neighboring Essex and Passaic each contribute more than 9%; other counties in New Jersey also contribute more than 7%. There is a small share of just 5% coming from Manhattan.

Figure A-7: Origin Distribution of Work Trips to Warren County



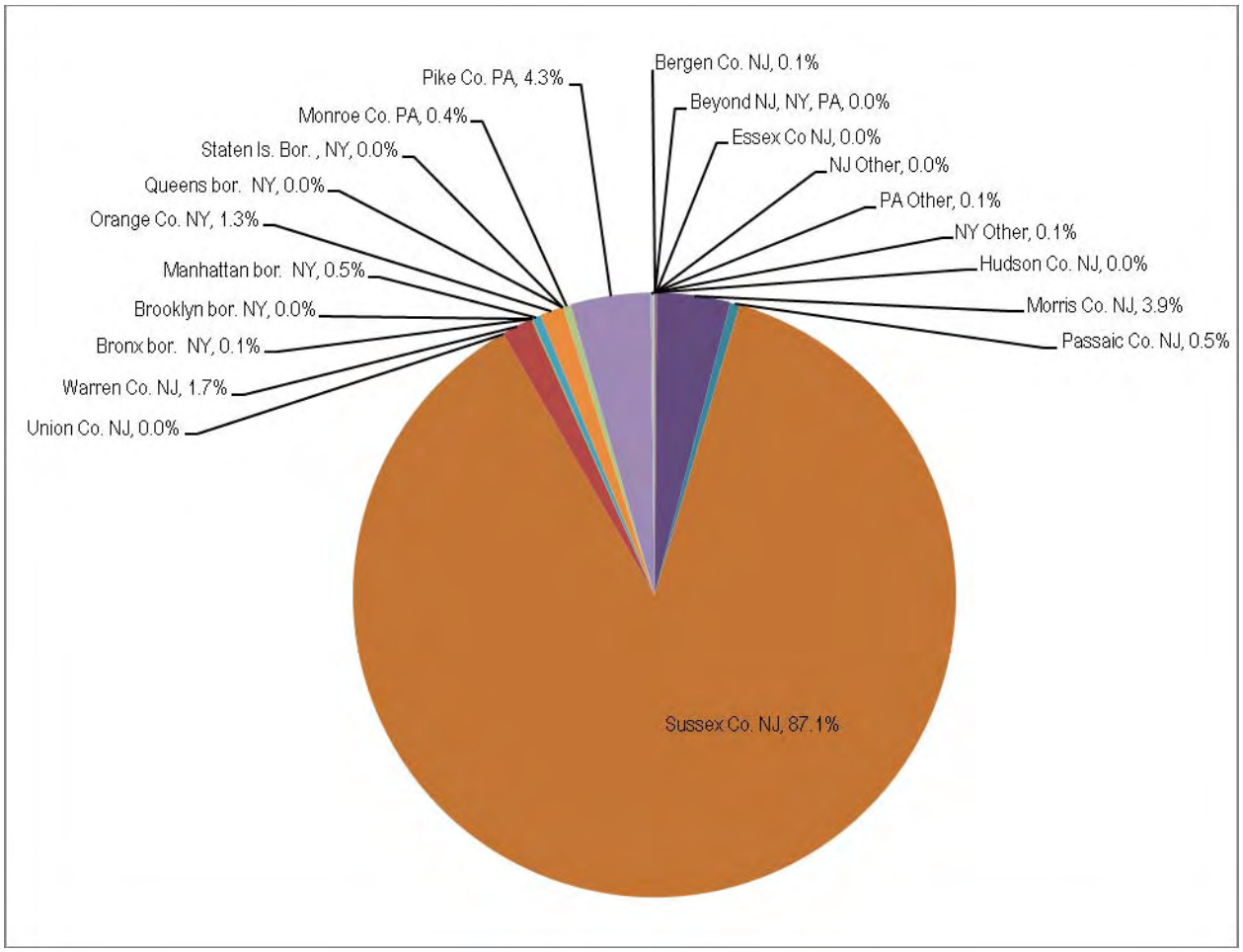
As shown in Figure A-7, about 69% of all work trips ending in Warren County start from within the county. More than 8% come from Sussex and Morris; more than 11% come from Pennsylvania, which is understandable since the county in on the state line.

Figure A-8: Origin Distribution of Work Trips to Passaic County



As shown in Figure A-8 over 41% of all work trips ending in Passaic County start from places in the county. Morris County produces 43% of the trips, contributing slightly more trips than Passaic itself. Neighboring Sussex County also generates more than 13% of the total trips to Passaic.

Figure A-9: Origin Distribution of Work Trips to Sussex County



As shown in Figure A-9, about 87% of all work trips ending in Sussex County come from within the county. The next largest shares are from Morris County and Pike County, Pennsylvania.

Similar to work trips originating from the study counties, work trips destined to the counties are mostly from the counties themselves (except Passaic). The next largest shares are from the neighboring counties. The next figure (Figure A-10) shows the same information in a bar chart format that enables one to see the absolute values. Clearly, Morris County attracts the largest number of resident workers besides the largest number of intra-county workers. Again, the number of Morris County's intra-county workers dwarfs the other work trip flows.

Figure A-10: Comparison of Origins of Work Trips to the Four Counties

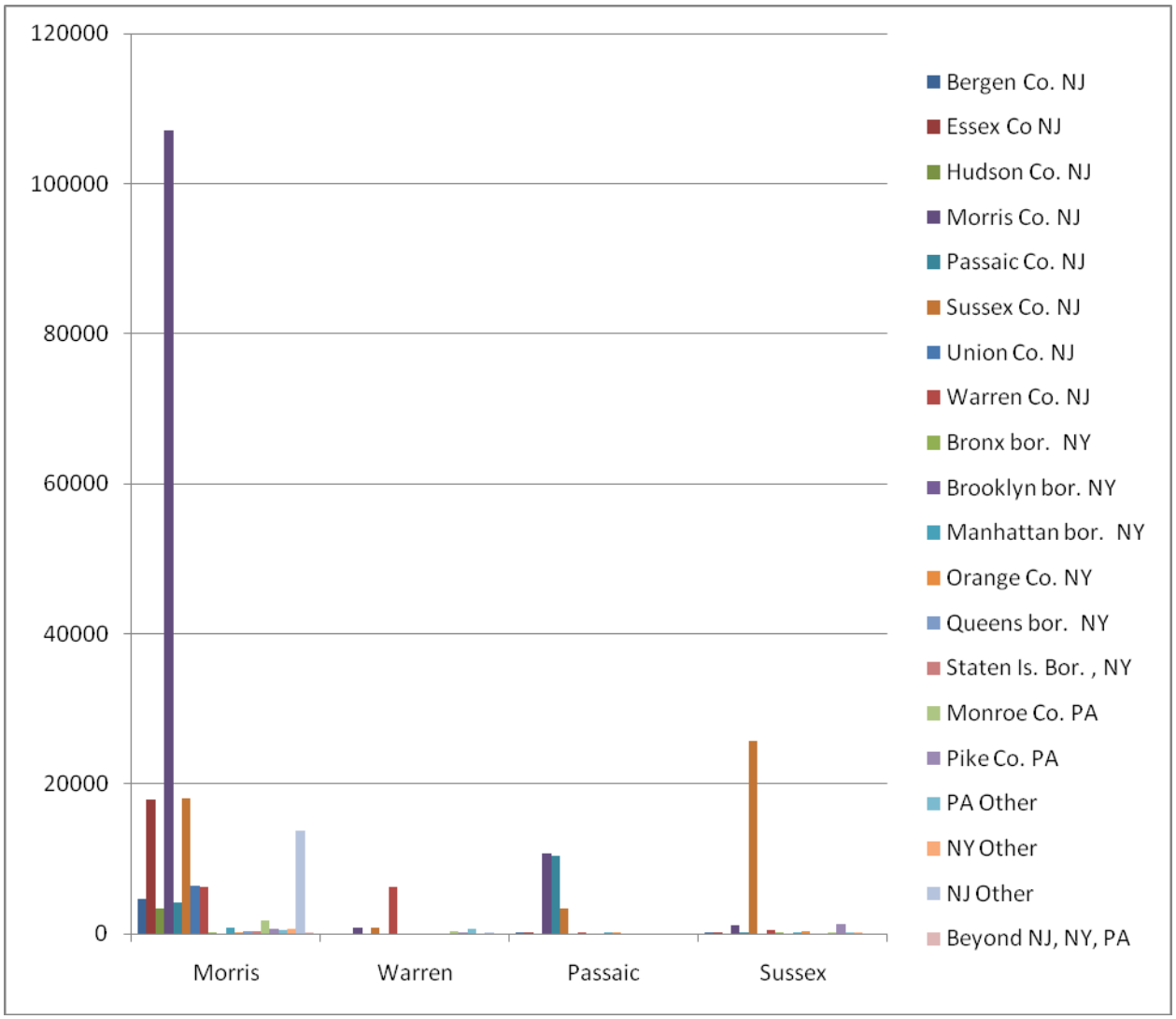


Table A-1 below shows the distribution of trips from the four counties by destination location. Once again, it is clear that from the trip production (residential end) point of view, Morris is the biggest trip generator, followed by Sussex, Passaic, and then Warren. Sussex County is much larger in area than Passaic or Warren, so the larger number of trip productions does not translate into higher residential density; in fact, Sussex has the lowest residential density. As a percentage of all work trips generated by the four counties within the study area, the shares are 63.3%, 21.5%, 9.6%, and 5.6%, respectively.

Table A-1: Volume of JTW Trips from the Four Counties by Destination

Destination Counties (Total County)	Origin Counties (Study Area Portion Only)				
	Morris	Warren	Passaic	Sussex	Total
Morris Co. NJ	107,149	6,186	4,216	18,076	135,627
Passaic Co. NJ	10,757	159	10,355	3,421	24,692
Sussex Co. NJ	1,155	493	149	25,707	27,504
Warren Co. NJ	883	6,288	0	765	7,936
Bergen Co. NJ	6,096	82	6,753	2,116	15,047
Essex Co NJ	18,732	295	1,399	2,822	23,248
Hudson Co. NJ	3,148	20	713	559	4,440
Union Co. NJ	3,461	30	145	306	3,942
NJ Other	5,452	647	98	473	6,670
Manhattan bor. NY	7,584	249	1,113	1,373	10,319
Brooklyn bor. NY	0	0	0	0	0
Bronx bor. NY	165	0	30	50	245
Queens bor. NY	216	4	83	55	358
Staten Is. Bor. , NY	0	0	0	24	24
Orange Co. NY	25	0	60	309	394
NY Other	456	0	94	83	633
Monroe Co. PA	0	55	0	0	55
Pike Co. PA	0	0	0	85	85
PA Other	20	10	0	0	30
Beyond NJ, NY, PA	83	0	0	0	83
Total	165,382	14,518	25,208	56,224	261,332

Note that the actual volume of one-way trips on a daily basis is approximately twice the numbers shown in these tables since workers typically travel back home each day.

Table A-2 below shows the distribution of trips to the four counties by origin location. Similarly to the trip production, from trip attraction (work end) point of view, Morris County is the biggest trip attactor, followed by Sussex, Passaic, and Warren Counties. As a percentage of all work trips attracted by the four counties within the study area, the shares are 74.5%,11.8%, 10.1%, and 3.6%, respectively.

Table A-2: Volume of JTW Trips to the Four Counties by Origin

Origin Counties (Total Counties)	Destination Counties (Study Area Portion Only)				
	Morris	Warren	Passaic	Sussex	Total
Morris Co. NJ	107,149	883	10,757	1,155	119,944
Passaic Co. NJ	4,216	0	10,355	149	14,720
Sussex Co. NJ	18,076	765	3,421	25,707	47,969
Warren Co. NJ	6,186	6,288	159	493	13,126
Bergen Co. NJ	4,711	0	183	25	4,919
Essex Co NJ	17,870	0	182	14	18,066
Hudson Co. NJ	3,388	0	0	0	3,388
Union Co. NJ	6,360	0	0	0	6,360
NJ Other	13,811	83	0	0	13,894
Manhattan bor. NY	846	0	23	137	1,006
Brooklyn bor. NY	0	0	0	0	0
Bronx bor. NY	139	0	0	20	159
Queens bor. NY	371	0	0	0	371
Staten Is. Bor. , NY	274	0	0	0	274
Orange Co. NY	136	0	190	374	700
NY Other	638	0	0	28	666
Monroe Co. PA	1,759	304	0	124	2,187
Pike Co. PA	651	33	0	1,261	1,945
PA Other	429	723	0	34	1,186
Beyond NJ, NY, PA	15	0	0	0	15
Total	187,025	9,079	25,270	29,521	250,895

A.1.2. Analysis of Non-Work Trips

County Level Non-Work Trip Analysis

Since the U.S. Census only collects information about work trips, data on trips for other purposes were derived from NJTPA's Regional Transit Demand Model ("NJRTME 2000"). Note that transit trips were not available by trip purpose; an analysis of transit travel for all purposes follows this section. The model data were organized as origin-destination (OD) matrices (as opposed to production-attraction matrices). The auto trips are one-way vehicle trips and are divided into single- and high-occupancy vehicle trips by purpose and by time of day. The purposes for non-work trips include home-based shopping (HBS), home-based other (HBO), and non-home-based (NHB) trips. The overall daily non-work one-way auto trips were extracted from the vehicle trip matrices, and then converted into person trips using an estimated average vehicle occupancy of 1.6.

MCD Level Non-Work Trip Analysis

Like the JTW trip analysis, the MCD level non-work trip analysis was focused on trips that both originate and are destined within the study area. Figure 2-30: Large Non-Work Auto Trip Flows between MCDs in Vehicle Trips shows the major origin and destination pairs with more than 1,000 non-work auto trips. Parsippany-Troy Hills is clearly the largest origin as well as destination municipality. Three of its neighboring municipalities, Montville, Denville, and Hanover are the largest origins and largest destinations for trips to and from Parsippany-Troy Hills respectively with more than 3,500 daily non-work auto trips each way (to and from Parsippany). Another large trip MCD pair is between Mount Olive and Roxbury, with more than 3,500 daily trips in each direction. Most of the large flows occur within Morris County, followed by Sussex and Passaic. Warren has only one MCD pair with daily trips over 500.

Table A-3 below shows the total volumes of person trips by auto from the four counties by destination. It shows that a significant proportion of the non-work auto trips are intra-county, as was observed for work trips. Morris County again is the origin of the largest number of non-work auto trips, then Passaic, Sussex, and Warren, respectively. Except for the four counties, other major destinations for the trips originating in the study area are: Essex, Bergen, and Union Counties, Manhattan and Orange County (NY), etc.

Table A-4 shows the volumes of person trips that are destined to the four counties. Since the data was from balanced O-D matrices, the intra-county trips are the same as in Table 2-8, except for the effect of limiting either the origin or the destination area of each county to the portion within the study area boundary. The largest numbers of inter-county trips occur between neighboring counties, such as Essex to Morris, Passaic to Morris, Bergen to Passaic, etc.

The non-work trip volumes are not directly comparable with the JTW trips listed in Tables 2-19 and 2-20 given the fact that the Census data counts each individually surveyed work trip as one trip while the O-D matrix of the model represents it as two trips (one to work and one return trip). Furthermore, transit trips are not included in the non-work trip matrices provided. However, a simple comparison between work trips and non-work trips indicates that there are far more non-work trips produced by these four counties than work trips.

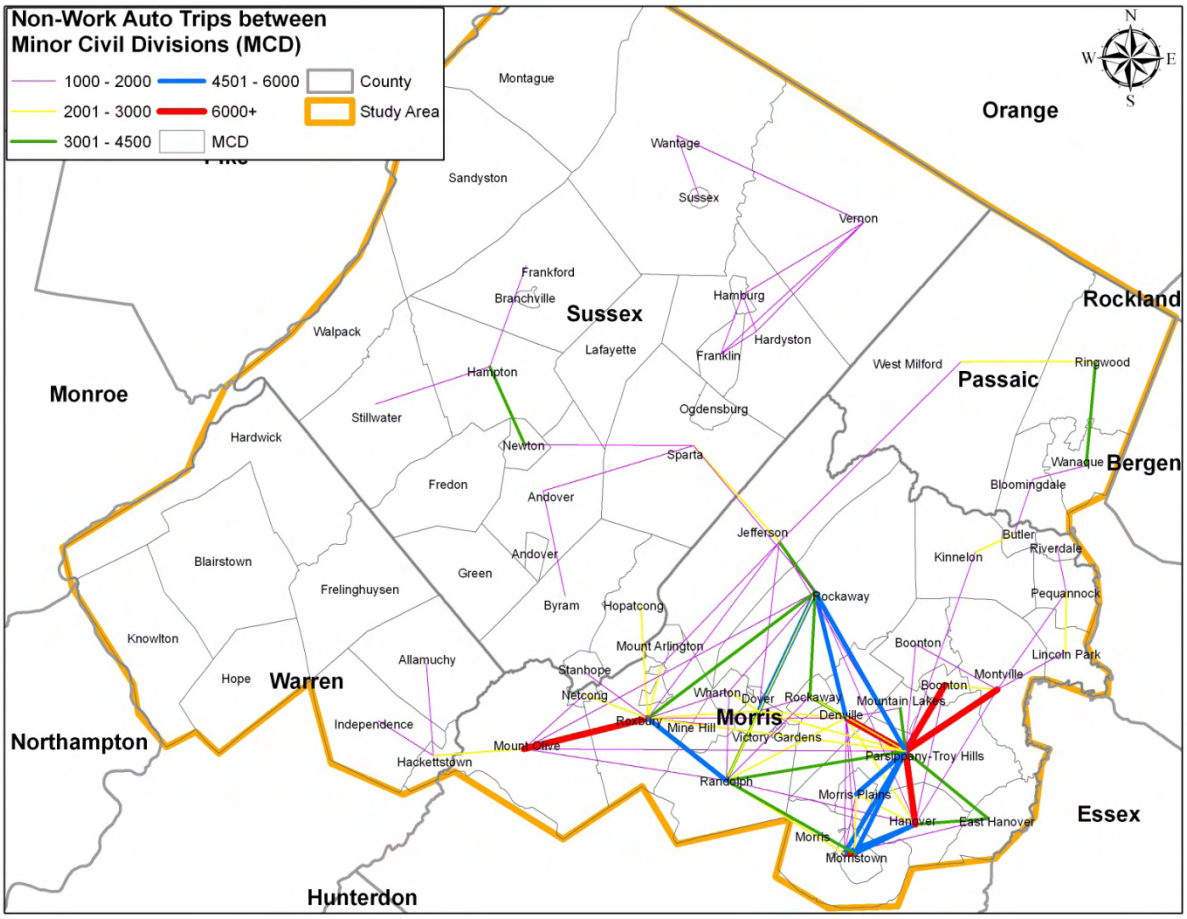
Table A-3: Destinations of Non-Work Person Trips by Auto from the Four Counties

	Origin Counties				
Destination Counties	Morris	Passaic	Sussex	Warren	Total
Morris Co. NJ	745,659	12,417	27,651	11,794	797,522
Passaic Co. NJ	61,001	67,026	5,208	549	133,784
Sussex Co. NJ	25,511	1,653	197,972	2,349	227,485
Warren Co. NJ	7,505	65	2,690	39,433	49,693
Bergen Co. NJ	21,698	7,791	3,356	534	33,379
Essex Co NJ	73,142	2,200	4,851	1,244	81,437
Hudson Co. NJ	12,145	1,074	5,978	1,359	20,556
Union Co. NJ	18,039	281	446	157	18,922
NJ Other	28,364	416	1,312	2,153	32,245
Manhattan bor. NY	3,307	1,057	1,647	514	6,526
Brooklyn bor. NY	402	25	206	89	722
Bronx bor. NY	323	54	159	34	570
Queens bor. NY	723	74	634	221	1,650
Staten Is. Bor. , NY	371	11	183	55	619
Orange Co. NY	827	2,904	5,890	177	9,799
NY Other	5,908	4,039	4,988	888	15,824
Monroe Co. PA	1,367	20	502	3,148	5,037
Pike Co. PA	411	68	3,610	111	4,200
PA Other	1,003	21	322	1,698	3,043
Total	1,007,706	101,194	267,605	66,507	1,443,012

Table A-4: Origins of Non-Work Person Trips by Auto to the Four Counties

Destination Counties	Origin Counties				
	Morris	Passaic	Sussex	Warren	Total
Morris Co. NJ	745,367	12,533	28,297	12,264	798,461
Passaic Co. NJ	61,202	67,161	5,172	590	134,125
Sussex Co. NJ	24,936	1,746	197,972	2,375	227,029
Warren Co. NJ	7,116	57	2,689	39,359	49,221
Bergen Co. NJ	22,271	8,053	3,380	554	34,259
Essex Co NJ	72,717	2,227	4,895	1,291	81,130
Hudson Co. NJ	12,116	1,101	5,860	1,347	20,425
Union Co. NJ	17,901	278	453	168	18,800
NJ Other	28,859	406	1,369	2,296	32,930
Manhattan bor. NY	2,350	1,111	1,425	340	5,226
Brooklyn bor. NY	597	41	210	94	942
Bronx bor. NY	351	56	160	36	603
Queens bor. NY	593	61	615	214	1,483
Staten Is. Bor. , NY	302	8	174	52	537
Orange Co. NY	772	3,039	5,867	177	9,856
NY Other	5,315	3,705	5,219	916	15,155
Monroe Co. PA	1,206	13	453	3,009	4,680
Pike Co. PA	398	68	3,443	114	4,024
PA Other	924	13	321	1,656	2,914
Total	1,005,293	101,678	267,977	66,852	1,441,799

Figure A-11: Large Non-Work Auto Trip Flows between MCDs in Vehicle Trips



B. Appendix B: Passenger Survey Results

B.1 Methodology

The following routes were surveyed through this study effort:

- NJ TRANSIT Express Routes 193, 194, 195, 196, 197, 198, 324
- NJ TRANSIT Local Routes 75, 79 (survey only)
    - 29, 73 surveyed by Greater Newark Bus System Study
- WHEELS: Routes 966, 967, 973
- Morris County Metro: Routes 1, 2, 3, 4, 5, 7, 10
- Lakeland Bus Lines: Routes 46, 80 (and combined 46/80)
- Community Coach (Coach USA): Route 77

The passenger survey asked customers about their origin and destination, trip purpose, service quality, desired improvements, and passenger demographics and characteristics. The complete survey instrument and description of methodology and response rates are contained in Technical Memorandum 2.

B.2 Passenger Demographics

The populations served by the local (MCM and Wheels) and interstate carriers (NJ TRANSIT, Lakeland, and Coach USA) are different. Riders using the MCM local routes are more likely to be female, younger or older, non-white, and Hispanic (see Figure B-1) compared to riders on the carriers predominantly serving New York City trips. Riders on MCM are much less likely to have managerial or professional jobs Table B-1) and have much lower household income (Figure B-2) compared to riders on NJ Transit, Lakeland, and Coach USA. Since the Wheels routes serve both reverse commuters connecting from commuter rail to office parks and local trips, the demographics of their riders falls between those of MCM and the New York-bound routes. Although 28% of Wheels riders were in the lowest income group, more than 10% had household incomes of $100,000 or more.[1] The large difference in household income between the passengers that use interstate and intrastate service is illustrated in Figure B-3.

[1] The confidence in the estimates for Wheels is lower than for the other carriers because the sample size was only 54.

Figure B-1: Percent Hispanic Riders by Route

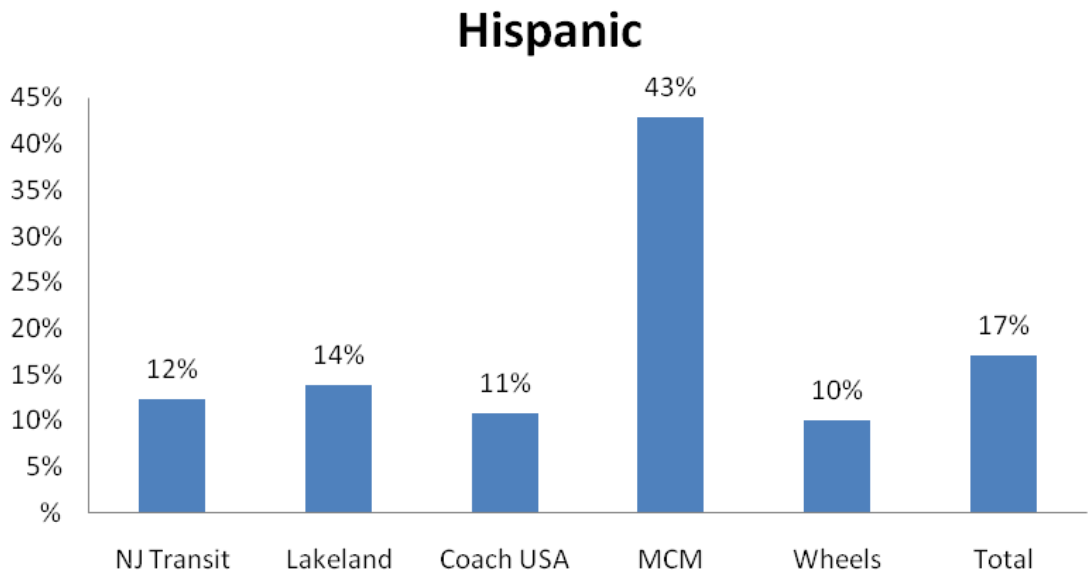


Table B-1: Occupation of Passengers

	Manager / Professional	Technical / Skilled	Health Care	Retail	Service	Food Service	Clerical	Domestic	Other	Homemaker	Student	Retired	Total
NJ TRANSIT	47.4%	11.4%	4.4%	3.9%	3.3%	3.6%	3.4%	.3%	11.3%	.8%	7.3%	2.9%	100%
Lakeland	48.2%	12.6%	4.4%	2.9%	3.9%	2.5%	1.6%	1.3%	13.4%	1.3%	4.1%	3.8%	100%
Coach USA	58.5%	3.8%	5.1%	2.5%	2.8%	2.9%	3.3%	1.4%	6.9%	1.6%	5.2%	6.0%	100%
MCM	7.8%	7.7%	4.2%	9.3%	11.2%	8.5%	4.7%	3.4%	21.7%	4.1%	10.7%	6.8%	100%
Wheels	21.1%	10.5%	1.6%	7.4%	1.6%	1.6%	15.8%	-	16.8%	16.3%	3.2%	4.2%	100%
Total	43.0%	10.4%	4.4%	4.3%	4.5%	3.9%	3.3%	1.0%	12.8%	1.6%	6.7%	4.0%	100%

Figure B-2: Annual Household Income of Passengers

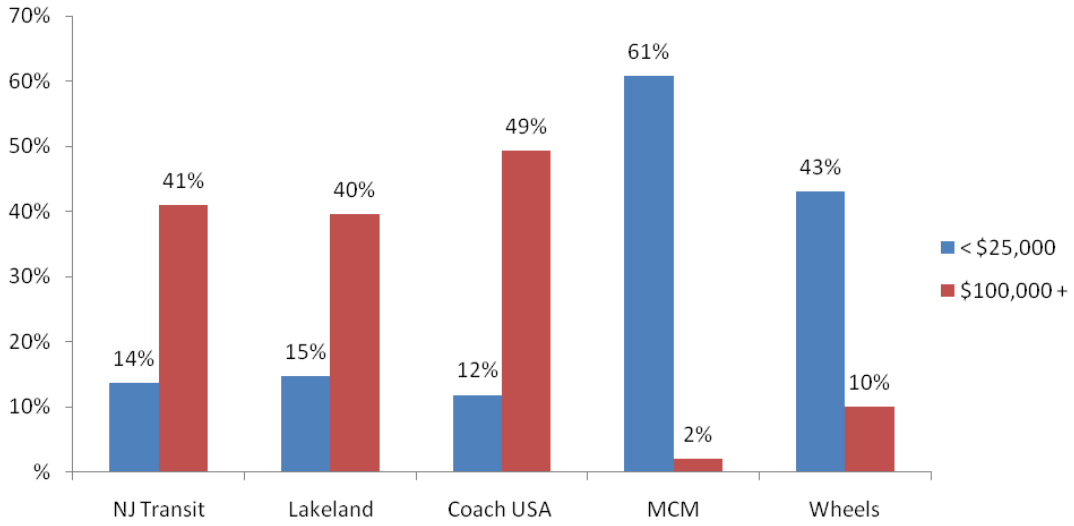
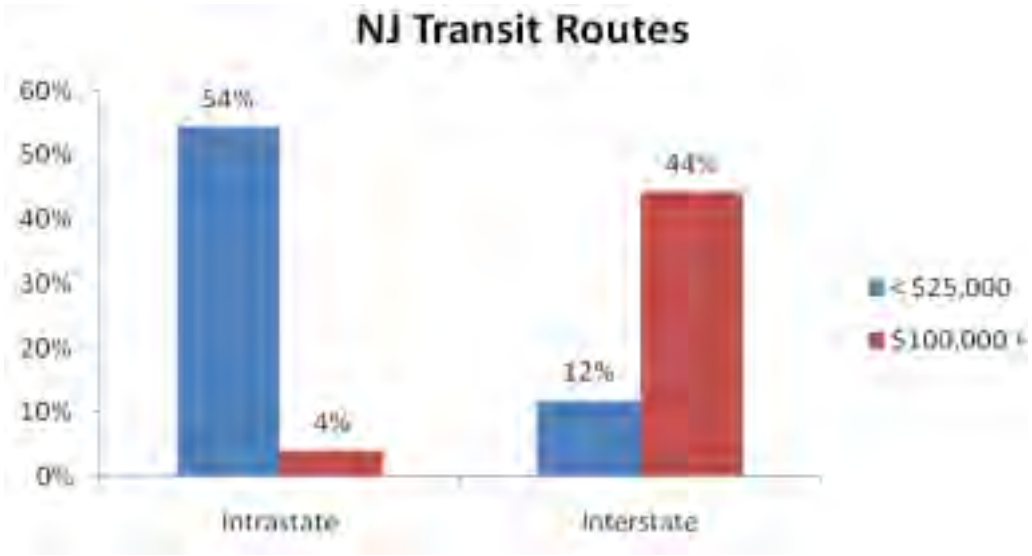


Figure B-3: Annual Household Income of Passengers Using NJ Transit Routes



B.3 Trip Purpose

Survey respondents were asked to give their type of origin and destination. Most origins were home (Table B-2) and most destinations were work (Table B-3). The reason that the survey includes mostly home-to-work trips (as opposed to work-to-home trips) was that the New York-bound routes were surveyed only in the New York-bound direction, which consists almost entirely of home-based trips. We created a recoded "trip purpose" based on the type of origin and destination (Figure B-4 and Table B-4). Trips with a home end were coded as having the purpose of the other end; other trips were coded as "non-home-based". Using this recoded purpose, we found that 65% of surveyed trips were work trips, ranging from 47% of trips for the MCM routes to a high of 78% for the Wheels routes. The MCM routes also had higher shares of

shopping, school, and non home-based trips. “Social-recreational” was the second most common trip purpose for NJ TRANSIT and Lakeland, reflecting the popularity of trips to Manhattan for those purposes.

Figure B-4: Trip Purpose Based on Passenger Survey Response

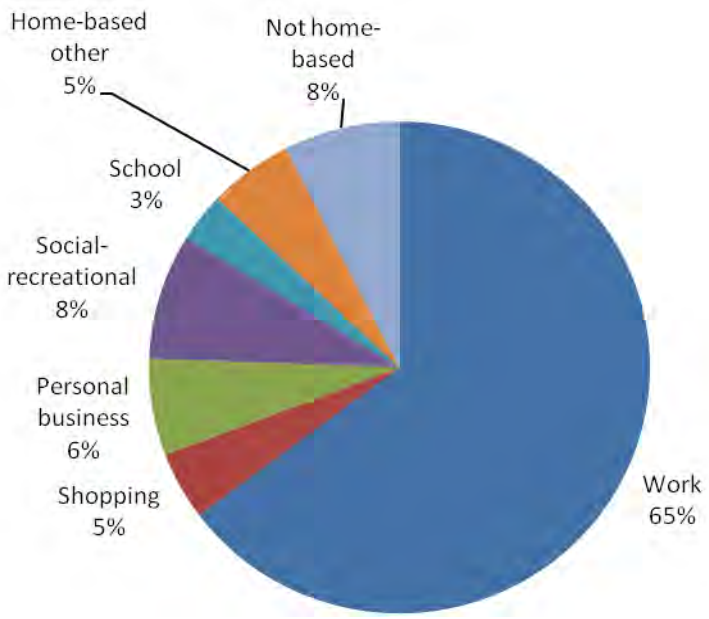


Table B-2: Trip Origin by Carrier (% Distribution)

	Q3: Trip Origin									
	Home	Work	Shopping	Personal Business	Medical Dental	Social / Recreational	School (K-12)	College or University	Other	Total
NJ TRANSIT	82.8%	7.4%	1.6%	1.8%	.2%	2.4%	.2%	.7%	3.1%	100%
Lakeland	84.1%	6.0%	.3%	2.6%	.2%	3.5%	.4%	.3%	2.6%	100%
Coach USA	81.5%	8.8%	.4%	2.3%	.4%	1.7%		.3%	4.7%	100%
MCM	65.5%	17.2%	6.7%	3.6%	.5%	.5%	1.0%	2.3%	2.6%	100%
Wheels	90.6%		3.3%						6.1%	100%
Total	80.7%	8.4%	1.8%	2.2%	.3%	2.3%	.3%	.7%	3.1%	100%

Table B-3: Trip Destination by Carrier (% Distribution)

	Q10: Trip Destination									
	Home	Work	Shopping	Personal Business	Medical Dental	Social / Recreational	School (K-12)	College or Universit	Other	Total
NJ TRANSIT	14.6	61.6	3.8	4.2	0.6	7.6	0.5	2.2	4.9	100
Lakeland	14.6	60.8	3.0	4.4	0.7	8.5	0.4	1.9	5.7	100
Coach USA	14.8	59.7	3.2	7.0	2.0	7.5	0.2	1.4	4.0	100
MCM	21.0	43.2	13.5	6.1	2.9	1.2	2.0	5.0	5.1	100
Wheels	10.3	68.6	7.6		9.2				4.3	100
Total	15.4	58.8	4.9	4.7	1.2	6.9	0.7	2.4	5.0	100

Table B-4: Trip Purpose (Recoded) by Carrier

	Purpose							
	Work	Shopping	Personal business	Social-recreational	School	Home-based other	Not home-based	Total
NJ TRANSIT	67.9%	3.8%	4.9%	9.4%	2.9%	5.5%	5.6%	100.0%
Lakeland	65.8%	2.7%	6.3%	10.1%	2.8%	6.2%	6.1%	100.0%
Coach USA	66.9%	2.4%	9.9%	7.1%	1.3%	5.2%	7.2%	100.0%
MCM	47.1%	12.6%	9.5%	2.0%	7.1%	3.9%	17.7%	100.0%
Wheels	78.3%		5.3%			5.3%	11.2%	100.0%
Total	64.8%	4.5%	6.4%	8.3%	3.2%	5.4%	7.5%	100.0%

B.4 Access to and Egress from the Bus

There are significant differences in the means riders used to get to the bus, reflecting the differences in availability of park-and-ride lots and the type of service provided (Table B-5). Park and ride access was the most common mode for NJ TRANSIT and Lakeland riders, used by more than half the riders in the sample. Nearly one third of Coach USA riders used park-and-ride access, but a majority walked to the bus stop. Drop off or carpool accounted for a significant share of riders for the three New York-serving carriers. The vast majority of MCM riders walked to the bus stop, although some transferred from other transit services. Half of Wheels riders transferred from a NJ TRANSIT train and most of the rest walked to the bus stop; however, almost all of the 966 Convent Station shuttle riders transferred from the train and almost all of the passengers on other routes walked to the station.

Table B-5: Access Mode by Carrier

	Q5: Access mode									
	Walk	Park & Ride	Carpool or Drop Off	Another bus	Subway	NJ TRANSIT train	Bike	Taxi	Other	Total
NJ TRANSIT	29.8%	54.9%	11.1%	2.2%	.2%	.4%	.3%	.1%	1.0%	100.0%
Lakeland	19.5%	62.4%	14.0%	.5%	.2%	.1%		1.6%	1.6%	100.0%
Coach USA	50.4%	32.0%	15.4%	.4%				1.4%	.4%	100.0%
MCM	81.3%	.1%	2.8%	6.6%		7.1%		.8%	1.4%	100.0%
Wheels	45.9%			5.1%		49.0%				100.0%
Total	36.7%	46.1%	10.9%	2.2%	.2%	1.9%	.1%	.7%	1.2%	100.0%

Note: Excludes respondents on NY routes who said they boarded at PABT or elsewhere in NY (about 7% of the total).

Most riders using NJ TRANSIT, Lakeland, and Coach USA were going to Manhattan and either walked or took the subway to their final destination (Table B-6). Most using Wheels and MCM walked to their final destination, although some transferred to other transit services.

Table B-6: Mode to Final Destination by Carrier

	Walk	Park & Ride	Carpool or Drop Off	Another bus	Subway	NJ TRANSIT train	Bike	Taxi	Other	Total
NJ TRANSIT	51.9%	.5%	.5%	7.1%	34.9%	.3%	.1%	3.9%	.8%	100.0%
Lakeland	55.9%	1.1%	.4%	4.5%	32.0%	.4%		4.4%	1.2%	100.0%
Coach	42.8%	.9%		6.9%	38.7%	1.7%		5.7%	3.3%	100.0%
MCM	89.0%		1.3%	6.7%	.2%	2.6%			.1%	100.0%
Wheels	76.4%			11.5%		6.6%			5.5%	100.0%
Total	57.5%	.6%	.5%	6.5%	29.3%	.9%	.0%	3.6%	1.1%	100.0%

Note: Excludes respondents on NY routes who said they boarded at PABT or elsewhere in NY (about 7% of the total).

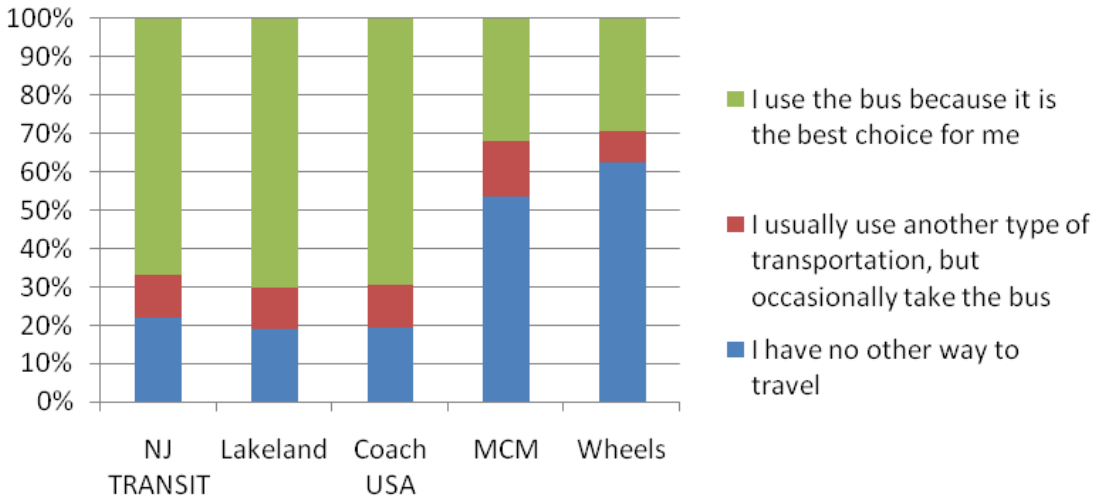
B.5 Dependence on Transit

The passenger survey contains additional information about the transit dependency of riders. Riders were asked to select among the following three reasons for using the bus:

- I have no other way to travel
- I usually use another type of transportation, but occasionally take the bus
- I use the bus because it is the best choice for me

As shown in Figure B-5, the MCM and Wheels riders were much more likely to say they had no other way to travel, whereas 66% to 70% of the riders on the New York-bound routes said they use the bus because it is the best choice.

Figure B-5: Reasons for Riding the Bus



The survey also asked if a motor vehicle was available to the passenger for that trip (Figure B-6). Two thirds to three quarters of the riders on the New York routes said they had a vehicle available, but only 27% of the MCM riders had a vehicle available. Vehicle availablity among passengers using NJ Transit Routes by intrastate or interstate routes is also shown in Figure B-7.

Figure B-6: Personal Vehicle Availability

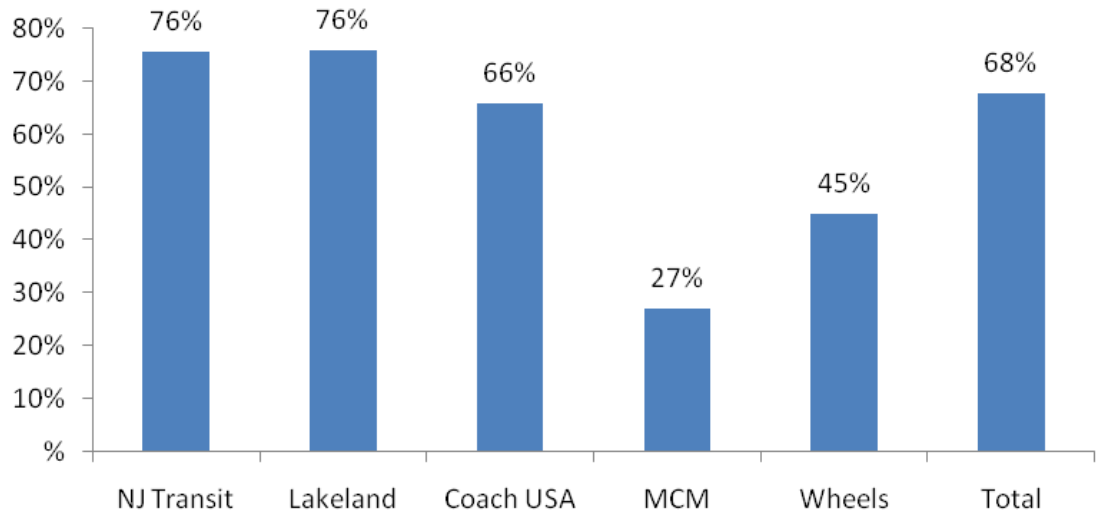
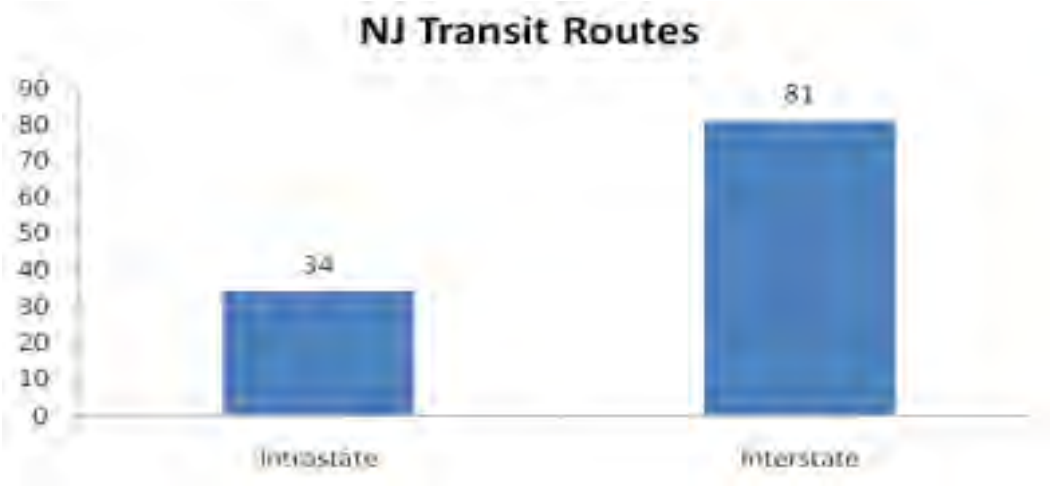
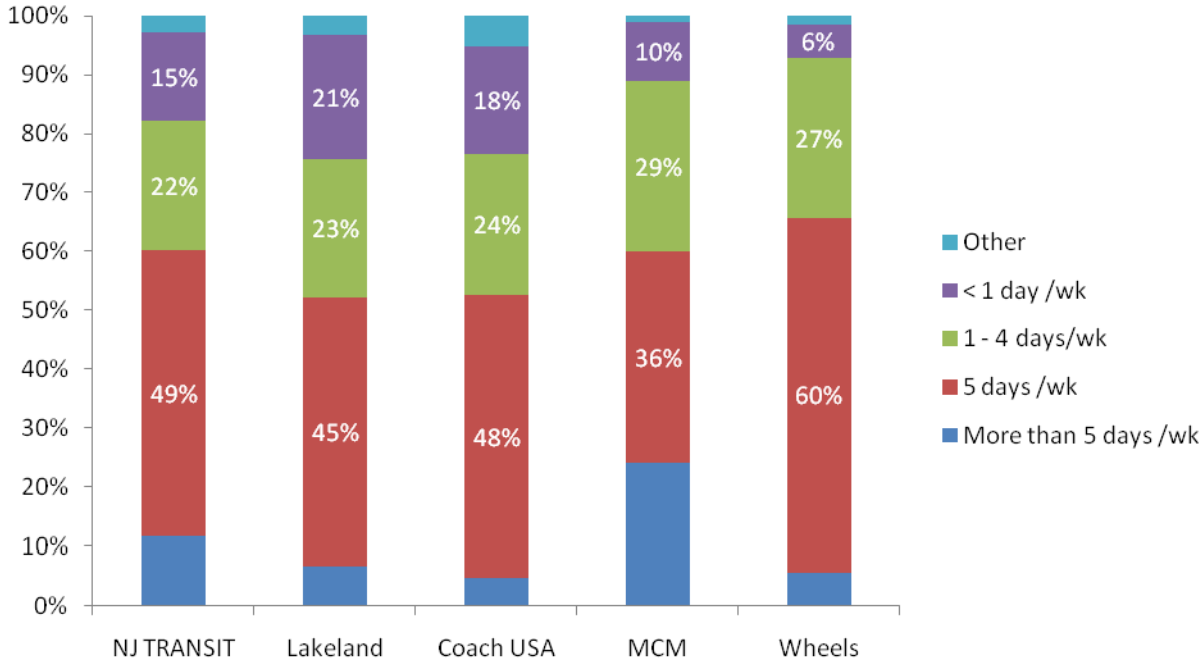


Figure B-7: Vehicle Availability for Passengers Using NJ Transit Routes



The survey also asked how often the rider uses the bus route they were using when surveyed (Figure B-8) The most common answer for all carriers was five days a week, reflecting the use of the bus for commute trips. However, almost one quarter rode 1 to 4 days per week. Infrequent ridership was most common on the Lakeland lines, where more than 20% said they rode 2 days per month or less. The corresponding figure was 15% for NJ TRANSIT and 18% for Coach USA. These results may reflect the use of the bus for social and recreational trips to Manhattan (see discusion below of off-peak and weekend ridership).

Figure B-8: Frequency of Bus Use



The survey also asked riders to specify how long they had been using the particular route they were taking that day. The results (Table B-7) show that there is a high percentage of long-term riders. Those riding five

years or more make up more than 36% of riders surveyed, with the highest share of such riders exhibited by the Coach USA route. At the other extreme, about a quarter of riders had been using the bus for a year or less.

Table B-7: Years Using the Bus Route

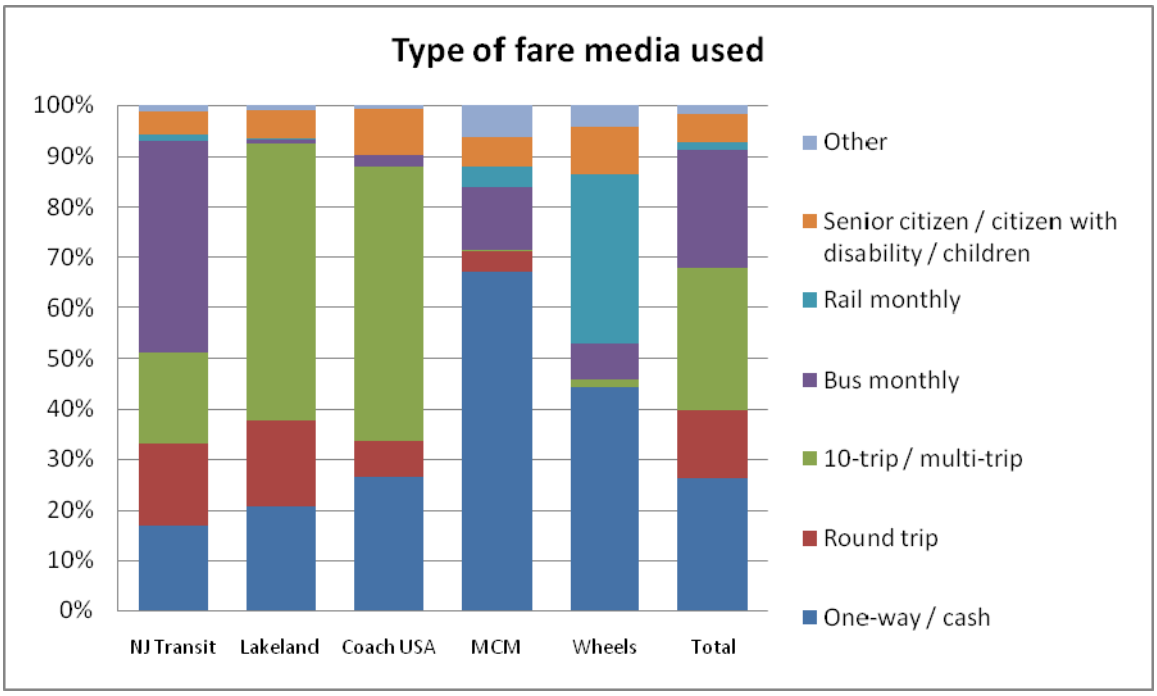
	Q15: How long have you been riding?						
	Less than 6 months	6 months to 1 year	1 to 2 years	2 to 5 years	5 to 10 years	10 years or more	Total
NJ TRANSIT	16.5%	9.0%	13.8%	23.8%	15.9%	20.9%	100.0%
Lakeland	15.3%	10.7%	16.7%	20.9%	16.8%	19.6%	100.0%
Coach USA	17.3%	5.8%	11.0%	19.2%	17.4%	29.3%	100.0%
MCM	17.4%	13.7%	20.3%	22.6%	9.5%	16.5%	100.0%
Wheels	11.8%	13.3%	14.4%	27.7%	26.2%	6.7%	100.0%
Total	16.3%	9.8%	15.1%	22.6%	15.6%	20.7%	100.0%

The type of fare media used varies signficantly by carrier, in part because of the different fare options offered. NJ TRANSIT operates a zone fare system (including MCM and Wheels service). The zone 1 cash fare is currently $1.35; zone 2 is $2.15, and zone 3 is $2.65. Discounted ten-trip tickets are offered at a 30% discount for travel greater than two zones, but are valid for only 20 days. Monthly passes are available at all zone levels. More than 43% of riders on NJ TRANSIT routes surveyed used a bus monthly pass (Table B-8 and Figure 2-37). Neither Lakeland nor Coach USA offer a monthly pass, but they do have discounted multi-trip tickets; these are used by more than half their riders. NJ TRANSIT Rail passes are valid on NJ TRANSIT bus lines (including MCM and Wheels). These were heavily used on Wheels, reflecting those riders using the Convent Station shuttle (route 966). The cash fare on Wheels 966 is $0.65, which is the usual price for a bus-to-bus transfer. Reduced-price transfer privileges are not available for passengers wishing to use a combination of NJ TRANSIT (including MCM and Wheels routes) and the other carriers (Lakeland and Coach USA), nor are NJ TRANSIT passes valid on the routes of the latter two operators. The fare on Wheels route 967, the Sparta Diamond Express, from Sussex County to Parsippany is currently $3.45 or $3.20 with ten-trip and pass discounts available. Within Parsippany riders pay the zone 1 base fare of $1.35. The vast majority of MCM riders pay the base cash fare, whereas most riders on the other carriers pay a discounted fare.

Table B-8: Ticket Type Used

	Q13: Ticket Type Used								
	One-way / cash	Round trip	10-trip / multi-trip	Bus monthly	Rail monthly	Senior, disabled or child	Student fare	Other	Total
NJ TRANSIT	17.9%	14.5%	17.6%	43.4%	1.2%	4.4%	1%	.8%	100.0%
Lakeland	21.3%	15.3%	56.9%	1.4%	1%	4.9%		.1%	100.0%
Coach USA	27.2%	7.3%	54.2%	3.0%		8.2%		.2%	100.0%
MCM	70.0%	4.2%	.3%	12.9%	4.5%	6.4%	.4%	1.2%	100.0%
Wheels	45.0%		1.7%	7.2%	33.9%	9.4%		2.8%	100.0%
Total	26.8%	12.4%	28.5%	24.6%	1.6%	5.3%	.1%	6%	100.0%

Figure B-9: Type of Fare Media Used



B.6 Trip Origins and Destinations

The survey asked about passenger origins and destinations. Address data are being geocoded by NJ TRANSIT for future detailed analysis. This memo provides some general data on origins and destinations. As shown in Table B-9, more than 80% of riders on NJ TRANSIT, Lakeland, and Coach USA routes disembark at the Port Authority Bus Terminal in Manhattan. None of the MCM and Wheels riders used PABT, since those routes do not serve Manhattan.[2] Some of the NJ TRANSIT routes surveyed (23, 73, 75 and 79) serve Newark, not Manhattan. This accounts for some of the 17% of NJ TRANSIT riders disembarking at other locations. However, some of these riders transfer to train service to Manhattan at Newark. Some Lakeland trips serve Wall Street or Midtown locations instead of PABT.

Table B-9: Disembark at Port Authority Bus Terminal

	B.7 Q7: Disembark at Port Authority Bus Terminal?		
	Yes, Port Authority Bus Terminal	Other Location	Total
NJ TRANSIT	82.6%	17.4%	100.0%
Lakeland	81.8%	18.2%	100.0%
Coach USA	92.3%	7.7%	100.0%
MCM	2.1%	97.9%	100.0%
Wheels		100.0%	100.0%
Total	71.9%	28.1%	100.0%

[2] The 2.1% of MCM riders who claimed to disembark at PABT either use MCM to transfer to a New York-bound bus or gave an erroneous answer.

Although the study surveyed only inbound trips on routes serving New York City, we believe that some passengers held on to the survey and completed it based on their outbound trip. This would explain why 6% of those surveyed claimed to have *boarded* at PABT – the final destination of most of the New York-bound bus trips (Table B-10).

Table B-10: Board at Port Authority Bus Terminal

	B.8 Q6: Board at Port Authority Bus Terminal?		
	Yes, Port Authority Bus Terminal	Other location	Total
NJ TRANSIT	8.1%	91.9%	100.0%
Lakeland	5.9%	94.1%	100.0%
Coach USA	5.0%	95.0%	100.0%
MCM	.5%	99.5%	100.0%
Wheels		100.0%	100.0%
Total	6.1%	93.9%	100.0%

Of particular interest in this study are the destinations of those riders not going to Manhattan (that is, intrastate riders)

Table B-11 shows the destinations reported for people not going home and not going to or from New York City (intrastate trips). (Note that the percents reported are for the two-thirds of trips where we were able to identify an origin and destination town from the survey information.) The most common destination towns were Parsippany, Morristown, Wayne, Rockway, and Dover. These four destinations account for almost half the total. The top eight destinations collectively accounted for two-thirds of the total.

Table B-11: New Jersey Non-Home Destinations

	Frequency	Percent	Cumulative Percent
Parsippany	282	13.5	13.5
Morristown	234	11.2	24.7
Wayne	205	9.8	34.6
Rockaway	167	8.0	42.6
Dover	134	6.5	49.0
Denville	116	5.6	54.6
Morris Plains	112	5.4	60.0
Randolph	85	4.1	64.1
Cedar Knolls	57	2.7	66.8
Florham Park	49	2.4	69.2
Pompton Lakes	45	2.2	71.4
Wharton	39	1.9	73.2
Paterson	38	1.8	75.0
Livingston	36	1.7	76.8

	Frequency	Percent	Cumulative Percent
Newark	35	1.7	78.4
Boonton	34	1.6	80.1
Madison	33	1.6	81.6
Ringwood	27	1.3	82.9
Pine Brook	24	1.2	84.1
Hackettstown	20	1.0	85.0
Fairfield	20	.9	86.0
Passaic	13	.6	86.6
Pequannock	13	.6	87.2
Lake Hiawatha	13	.6	87.8
Pompton Lakes	12	.6	88.4
Whippany	12	.6	89.0
Hoboken	11	.5	89.5
All other in New Jersey	218	10.5	100.0
TOTAL	2084	100.0	100.0
Missing	1013		

C. Appendix C: Ride Check Results

C.1.1. Ride Checks

Bus ridership was manually counted for most of the bus routes serving the study area that were not being counted by another contemporaneous study. The counts required riding the vehicles for each trip served during the course of a day. Although every scheduled trip was checked (with a few exceptions), they were not all counted on the same day. Thus the counts represent a synthetic, typical day. The counting period was March to May, 2008. The following routes were checked:

- NJ TRANSIT Express Routes 193, 194, 195, 196, 197, 198, 324
- NJ TRANSIT Local Routes 29, 73, 79 (by Greater Newark Bus System Study)
- WHEELS Routes 966, 967, 973
- Morris County Metro: Routes 1, 2, 3, 4, 5, 7, 10
- Lakeland Bus Lines: Routes 46, 80 (and combined 46/80)
- Community Coach (Coach USA): Route 77

Total boardings in both directions are shown in Table C-1 for New York City routes and inTable C-2 for local routes. The bulk of local ridership is on routes 29 and 73, which were not counted in the ridechecks conducted for the current study because they were counted by the Greater Newark Bus System Study. The boardings data for routes 29 and 73 shown in the table are from NJ TRANSIT's winter 2008 boardings data. Note that only a small portion of these two routes are within the study area. Other than these two routes, the highest-ridership local routes are NJT 79 and Morris County Metro routes 1, 2, 3, and 10. Complete data for each route, showing ridership, productivity, and reliability by time period are shown in Technical Memorandum 2.

Table C-1: Total Boardings, Routes Serving New York City

Route	Weekday	Saturday	Sunday
NJT 193	1,636	-	-
NJT 194	1,913	626	576
NJT 195	863	575	413
NJT 196	996	-	-
NJT 197	2,227	1,708	1,054
NJT 198	297	362	245
NJT 324	1,883	223	198
Lakeland 46	2,529	1,152	638
Lakeland 80	1,476	-	-
Lakeland 46/80	1,040	564	537
Coach USA 77	2,245	608	554
TOTAL	17,105	5,818	4,215

Table C-2: Total Boardings, Local Routes

Route	Weekday	Saturday	Sunday
NJT 29	4,913	3,394	1,945
NJT 73	2,265	387	288
NJT 75	185	-	-
NJT 79	638	-	149
WHEELS 966 Rt 1	110	-	-
WHEELS 966 Rt 2	70	-	-
WHEELS 967	10	-	-
WHEELS 973	86	-	-
MCM 1	323	187	-
MCM 2	344	-	-
MCM 3	359	204	-
MCM 4	16	-	-
MCM 5	13	-	-
MCM 7	7	-	-
MCM 10	696	569	
TOTAL	10,035	4,741	2,382

One measure of the use or "productivity" of a transit route is the average number of boardings per trip. Boardings per trip can be high because the bus is filled and then runs express (as in the case of the New York routes). Short passenger trips and frequent turnover can also produce a high number of boardings per bus trip. The average number of boardings per trip is shown in Table C-3 for the New York routes and Table C-4 for the local routes. The New York routes have average boardings per trip generally between 30 and 40, depending on the time period. The weekend NJT 324 service is an exception (route 324 was started on April 5, 2008, during the ridecheck period). Productivity on the Newark-bound NJ TRANSIT local routes is similar to the New York service for NJT 29, 73 and 79, but somewhat lower for route 75. The Wheels routes use 27-seat minibuses. The average number of boardings on the Wheels routes ranges from 11 per trip (966 Convent Station shuttle Route 1) to 2.5 per trip (967 Sparta-Parsippany Express). The Morris County Metro route 10 has weekday productivity of 25 passengers per trip, a bit more than NJT 75, less than NJT 29, 73, and 79, but much higher than the other MCM routes. MCM routes 1, 2, and 3 have about half the number of boardings per trip. MCM routes 4, 5, and 7, which serve rural areas, offer few trips and have few riders per trip.

Table C-3: Route Productivity (Boardings per Trip), New York Routes

Route	AM Peak	Weekday Total	Saturday	Sunday
NJT 193 Packanack Lake	47.5	43.1	-	-
NJT 193 Willowbrook	37.5	33.1	-	-
NJT 194	34.2	36.1	34.8	32
NJT 195	35.4	32	33.8	27.5
NJT 196	38.6	39.8	-	-
NJT 197	38	37.7	35.6	31.9
NJT 198	7.5	18.6	24.1	16.3
NJT 324	35.4	25.8	6.6	6.2
Lakeland 46	34.7	32.4	30.3	29
Lakeland 80	40.7	39.9	-	-
Lakeland 46/80	19.3	34.7	33.2	31.6
Coach USA 77	32	29.9	19	18.5

Table C-4: Route Productivity (Boardings Per Trip), Local Routes

Route	AM Peak	Weekday Total	Saturday	Sunday
NJT 29	NA	42.4	50.7	42.3
NJT 73	NA	35.8	33.7	34.9
NJT 75	25.3	23.1	-	-
NJT 79	NA	30	-	30
WHEELS 966 Rt 1	12.8	11.0	-	-
WHEELS 966 Rt 2	7.0	6.4	-	-
WHEELS 967	3.0	2.5	-	-
WHEELS 973	3.8	4.1	-	-
MCM 1	20.8	15.4	11.7	-
MCM 2	23	14.3	-	-
MCM 3	16.2	15.6	12	-
MCM 4	3.7	2.7	-	-
MCM 5	4	6.5	-	-
MCM 7	3.5	3.5	-	-
MCM 10	35.5	25.8	25.9	-

On-time performance was calculated by time period for trips that were checked. An outbound departure or inbound arrival was considered “on time” if it was neither early nor more than 5 minutes late, except that trips arriving early in New York City were considered on time. Because some routes make few trips in the off-peak period, reliability is reported for the entire day, based on all trips surveyed, as well as for the peak periods. The survey was not primarily designed to measure reliability, which varies from day to day. As shown in Table C-5, the morning peak trips on New York routes were more likely to be on time than the afternoon peak trips. Few or none of the surveyed trips were on-time for all the MCM routes (except MCM 2) and for Wheels 967, as shown in Table C-6.

Table C-5: Percent of Trips on Time, Weekdays, New York Routes

Route	AM Peak	PM Peak	All Day
NJT 193	100	25	38
NJT 194	64	43	49
NJT195	100	17	64
NJT 196	36	29	43
NJT 197	47	31	48
NJT 198	50	25	46
NJT 324	NA	NA	NA
Lakeland 46	67	64	68
Lakeland 80	47	62	49
Lakeland 46/80	67	0	45

Table C-6: Percent of Trips on Time, Weekdays, Local Routes

Route	AM Peak	PM Peak	All Day
NJT 75	25	100	63
WHEELS 966	*	50	50
WHEELS 967	0	0	0
WHEELS 973	100	40	67
MCM 1	17	0	14
MCM 2	57	75	57
MCM 3	17	40	17
MCM 4	33	0	17
MCM 5	0	No service	0
MCM 7	No service	No service	0
MCM 10	50	50	36

*Although none of these trips were on time, this may be due to the need to meet late arriving trains.

D. Appendix D: Online Travel Survey Results

D.1 Introduction

During the summer of 2008, the NJTPA and the Transportation Management Association, *TransOption*s, hosted an online travel survey in an effort to gather general public feedback on the travel patterns and needs of both transit-users and non-transit users in the study area. The respondent data from the survey were subsequently analyzed by NJTPA and the results of this work are summarized below.

The Travel Survey was offered to the public via links from state and local agency websites, a press-release to local media, and survey postcards distributed at local and county offices, as well as at area park & ride facilities. The survey was available for 3 months. The first question asked the participants to "think about one direction of a trip that [they] currently make within or to/from Morris, Passaic, Sussex and Warren Counties that [they] would consider making by bus" and then asks what travel mode the respondent normally uses to make this trip. Answer options covered 14 travel modes, including several bus and shuttle routes that were not included in an on-board passenger survey conducted by in the spring of 2008. Of key interest were findings regarding respondents whose current primary mode of travel was automobile and also those who utilized bus and shuttle routes that were not included in the on-board survey. Questions asked in this survey were generally similar to the on-board questionnaire conducted by NJ Transit. The flow of the questions was organized such that the answer to the first question determined the following sequence of questions that the respondent received. A total of 444 respondents voluntarily completed the survey and as a result the data does not represent a random statistical sample due to self-selection bias.

The following travel mode choice responses were isolated for further analysis:

Mode Choice 1 = "Automobile Direct to Destination"
Mode Choice 2 = "Automobile to Carpool Lot"
Mode Choice 3 = "Automobile or Walk to Train Station"
Mode Choice 8 = "Martz Trailways Bus"
Mode Choice 10 = "Warren Co. Route 57 Shuttle Bus"

The responses to certain survey questions were selected for a more detailed analysis as well. The specific questions that were analyzed, according to Mode Choice, were:

1. When does this trip normally occur? [Modes 1, 2, 3]
2. Why do you not currently use bus service for this trip? [Modes 1, 2, 3]
3. Please indicate whether the following possible improvements to bus service would affect your decision to switch to bus services for this trip. [Modes 1,2]
4. When you travel for this trip, on which of these major roads do you regularly experience congestion? [Modes 1, 2, 3]
5. What time do you normally board the bus for this trip? [Modes 8, 10]

D.2 Summary of Responses To Selected Questions

Question: When does this trip normally occur? (Choose all that apply)
This was a multiple choice question that pertained to Modes 1, 2 & 3:

Among respondents who indicated they currently drive direct to their destination:

- 214 (59.3%) respondents indicated that the trip normally occurs during the weekday *peak* periods,
- 56 (15.5%) respondents indicated that the trip normally occurs during the weekday *midday* periods.

Among respondents who indicated they currently drive to a carpool lot:

- 11 (61.1%) respondents indicated that the trip normally occurs during the weekday peak periods.
- 3 (16.7%) respondents indicated that the trip normally occurs on Saturdays.

Among respondents who indicated they currently drive or walk to a train station:

- 20 (58.8%) respondents indicated that the trip normally occurs during the weekday peak periods.
- 5 (14.7%) respondents indicated that the trip normally occurs on Saturdays.

Question: Why do you currently not use bus service for this trip? (check all that apply)
This was a multiple choice question that pertained to modes 1, 2 & 3:

Among respondents who indicated they currently drive direct to their destination:

- Over 45% of Mode 1 respondents indicated that there are no buses in their area or buses don't go to their particular destination.
- 154 (24.8%) respondents indicated that there is no bus where their trip originates and 127 (20.4%) respondents indicated that buses do not go where they need to go.
- Another 63 (10.1%) respondents indicated that they don't have enough information or don't know about available bus services.
- Finally 56 (9%) respondents indicated that bus service is too infrequent.

Among respondents who indicated they currently drive to a carpool lot:

- Again, a large percentage of respondents, 9 (over 40%) indicated that there are no buses in their area or they don't go to their particular destination.
- Another 3 (13.6%) respondents indicated that they don't have enough information or don't know about available bus services.
- Finally 3 (13.6%) respondents indicated that bus service is too infrequent.

Among respondents who indicated they currently drive or walk to a train station:

- And again, a large percentage of respondents, 16 (34%) indicated that there are no buses in their area or they don't go to their particular destination.
- Another 6 (12.8%) respondents indicated that bus service is too infrequent.
- Finally 6 (12.8%) respondents indicated that bus service does not operate early/late enough or on days they need it.
- Interestingly, 5 (10.6%) respondents indicated "other" and 3 of those responses were that the train is either more convenient or relaxing.

Question: Please indicate the importance of the following service elements in getting you to switch to a bus, assuming that a bus route was available between your origin and destination. (check one box on each line)

This question was answered only by respondents who chose modes 1 & 2:

Among respondents who indicated they currently drive direct to their destination:

- 227 (87.6%) respondents indicated that "more direct [bus] service" would very much affect their decision to switch to a bus for their trip.
- 184 (72.4%) respondents indicated that "more trips/frequent [bus] service" would very much affect their decision to switch to a bus for their trip.
- 137 (55%) respondents indicated that "earlier/later [bus] service hours" would very much affect their decision to switch to a bus for their trip.
- "Improved passenger information and amenities at bus stops/park & rides" was the factor that had the highest percentage of respondents, 65 (27.3%), that indicated that it would *not* affect their decision to switch to a bus for their trip.

Among respondents who indicated they currently drive to a carpool lot:

- 13 (92.9%) respondents indicated that "more direct [bus] service" would very much affect their decision to switch to a bus for their trip.
- 13 (92.9%) respondents indicated that "more trips/frequent [bus] service" would very much affect their decision to switch to a bus for their trip.
- 11 (78.6%) respondents indicated that "earlier/later [bus] service hours" would very much affect their decision to switch to a bus for their trip.
- "Improved passenger information and amenities at bus stops/park & rides" was the factor that had the highest percentage of respondents, 8 (61.5%), that indicated that it would *somewhat* affect their decision to switch to a bus for their trip.

Question: When you travel for this trip, on which of these major roads do you regularly experience congestion? (Check all that apply)

This question was a multiple choice question that pertained to modes 1, 2 & 3:

Among respondents who indicated they currently drive direct to their destination:

- 115 (28%) respondents indicated that when they travel for this trip, they regularly experience congestion on I-80.
- The other routes that received double digit percentage responses were I-287, US Route 46, State Route 10 and State Route 23.

Among respondents who indicated they currently drive to a carpool lot:

- 6 (30%) respondents indicated that when they travel for this trip, they regularly experience congestion on I-80.
- 5 (25%) respondents indicated that when they travel for this trip, they regularly experience congestion on US Route 46.

Among respondents who indicated they currently drive or walk to a train station:

- 7 (35%) respondents indicated that when they travel for this trip, they regularly experience congestion on I-80.

Question: What time do you normally board the bus for this trip? Please indicate exact time as well as AM or PM.

This question was answered only by respondents who chose modes 8 & 10:

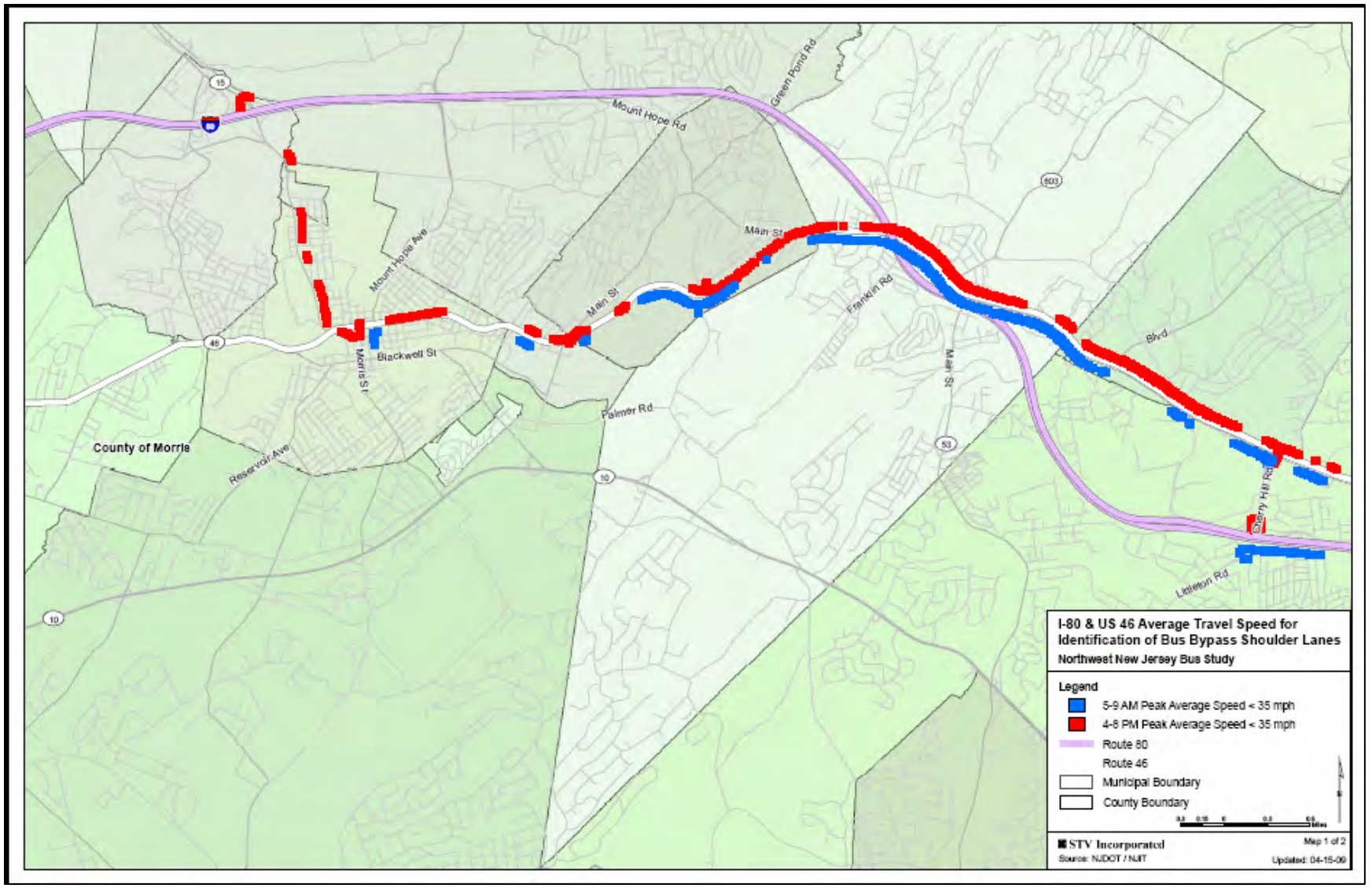
Among respondents who indicated they currently use a Martz Trailways Bus:

- All respondents (19) indicated that they normally board the bus for this trip between 5:10 and 6:30 AM. Of these 6 respondents specifically indicated they board at 6:00 AM.

Among respondents who indicated they currently use a Warren Co. Route 57 Shuttle Bus:

- Of the 3 respondents, 1 respondent indicated that they normally board the bus for this trip at 7:15 AM and 2 respondents indicated that they normally board at 4:00 PM.

E. Appendix E: Identification of Locations for Bus Bypass Lanes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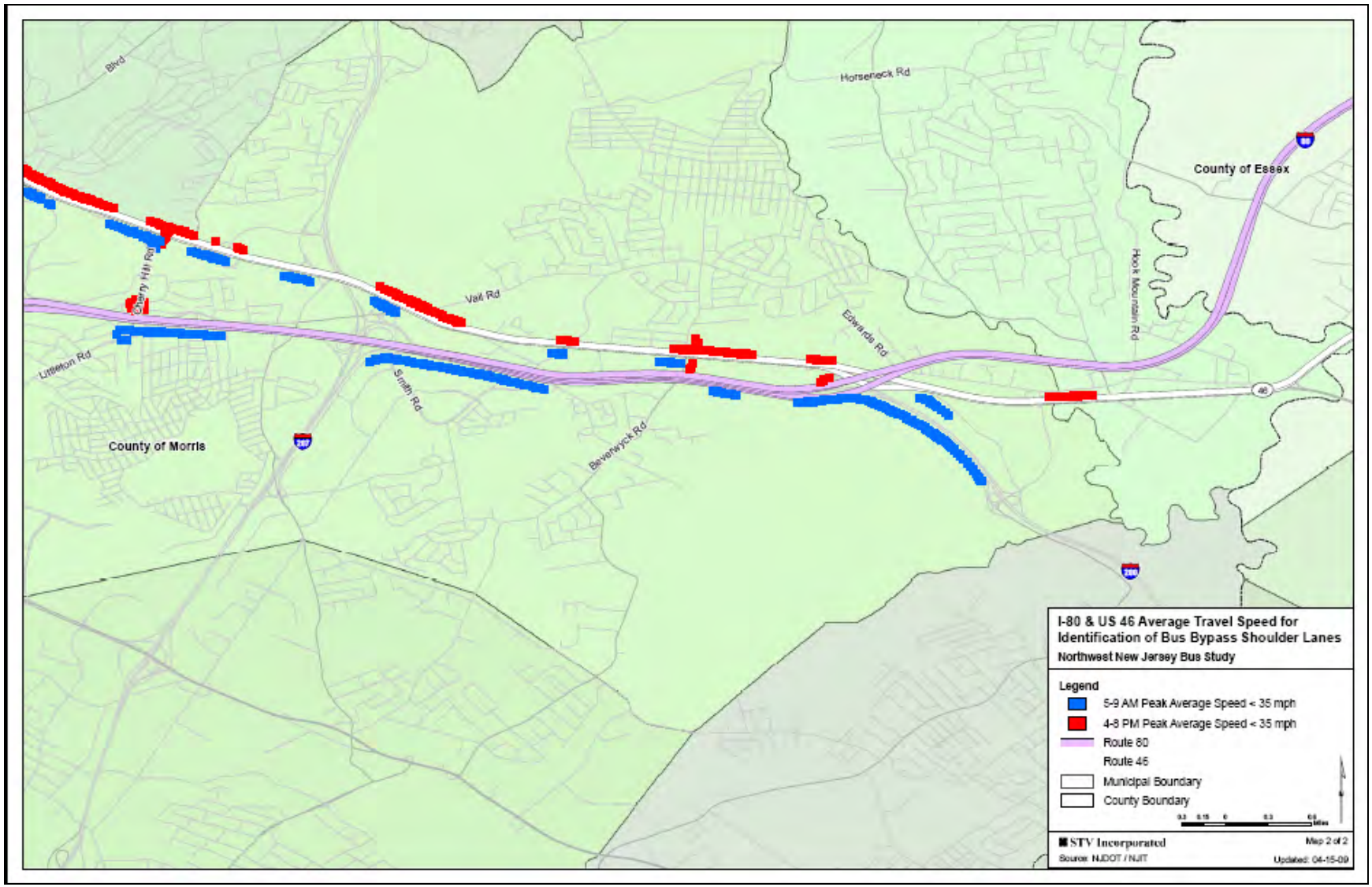
Green Pond Rd
Main St
Mount Hope Ave
Main St
Franklin Rd
Blackwell St
Morris St
Palmer Rd
Main St
Blvd
County of Morris
Reservoir Ave
Sherry Hill Rd
Littleton Rd
I-80 & US 46 Average Travel Speed for Identification of Bus Bypass Shoulder Lanes
Northwest New Jersey Bus Study
Legend
5-9 AM Peak Average Speed < 35 mph
4-8 PM Peak Average Speed < 35 mph
Route 80
Route 46
Municipal Boundary
County Boundary
STV Incorporated
Source: NJDOT / NJIT
Map 1 of 2
Updated: 04-15-09


Blvd
Horseneck Rd
County of Essex
Cherry Hill Rd
Vail Rd
Hook Mountain Rd
Edwards Rd
Littleton Rd
Smith Rd
County of Morris
Bevenwyck Rd
I-80 & US 46 Average Travel Speed for Identification of Bus Bypass Shoulder Lanes
Northwest New Jersey Bus Study
Legend
5-9 AM Peak Average Speed < 35 mph
4-8 PM Peak Average Speed < 35 mph
Route 80
Route 46
Municipal Boundary
County Boundary
STV Incorporated
Source: NJDOT / NJIT
Map 2 of 2
Updated: 04-15-09

F. Appendix F: Assessment of Candidate Bus Bypass Lane Locations

Table F-1: Detailed Description of Bus bypass Lane Locations

ID #	Improvement	Market/Issue Addressed	Roadway Location or Limits	Municipality	County	Mile-post	Travel Direction	Roadway Jurisdiction	Existing Physical Dimensions (Shoulder Width)	Type of Traffic Control	Transit Routes Served	Meets Required LOS/ Frequency	Other screening factors
1	Intersection Bus Bypass Lane	Travel Time Savings	Intersection	Denville	Morris	43.45	E, W	US 46 @ Bloomfield Avenue	10'	Signalized	NJT 79 Lakeland 46	No	No
2	Intersection Bus Bypass Lane	Travel Time Savings	Intersection	Mountain Lakes	Morris	43.93	E, W	US 46 @ Fox Hill Road	10'	Signalized	NJT 79 Lakeland 46	No	No
3	Intersection Bus Bypass Lane	Travel Time Savings	Intersection	Mountain Lakes	Morris	44.18	E, W	US 46 @ Mountain Lakes Boulevard	10'	Signalized	NJT 79 Lakeland 46	No	No
4	Intersection Bus Bypass Lane	Travel Time Savings	Intersection	Mountain Lakes	Morris	44.83	E	US 46 @ Lackawanna Avenue	10'	Signalized	NJT 79 Lakeland 46	No	No
5	Intersection Bus Bypass Lane	Travel Time Savings	Intersection	Parsippany	Morris	45.46	E	US 46 @ Cherry Hill Road	12'	Signalized	NJT 79 Lakeland 46	No	No
6	Intersection Bus Bypass Lane	Travel Time Savings	Intersection	Parsippany	Morris	45.84	E	US 46 @ Waterview Boulevard	10'	Signalized	NJT 79 Lakeland 46	No	No
7	Intersection Bus Bypass Lane	Travel Time Savings	Intersection	Parsippany	Morris	46.80	E, W	US 46 @ Smith Road	10'	Signalized	NJT 79 Lakeland 46	No	No
8	Intersection Bus Bypass Lane	Travel Time Savings	Intersection	Parsippany	Morris	47.00	E, W	US 46 @ Vail Road	10'	Signalized	NJT 79 Lakeland 46	No	No
9	Intersection Bus Bypass Lane	Travel Time Savings	Intersection	Parsippany	Morris	47.76	E, W	US 46 @ Baldwin Road	10'	Signalized	NJT 29, 79 Lakeland 46	No	No
10	Intersection Bus Bypass Lane	Travel Time Savings	Intersection	Parsippany	Morris	49.02	W	US 46 @ Arlington Shopping Center	10'	Signalized	NJT 79 Lakeland 46	No	No
11	Intersection Bus Bypass Lane	Travel Time Savings	Intersection	Parsippany	Morris	50.29	E	US 46 @ New Road	12'	Signalized	NJT 79 Lakeland 46	No	No
12	Intersection Bus Bypass Lane	Travel Time Savings	Intersection	Pine Brook	Morris	50.71	W	US 46 @ Hook Mountain Road	10'	Signalized	NJT 29 Lakeland 46	No	No
13	Intersection Bus Bypass Lane	Travel Time Savings	Intersection	Fairfield	Essex	52.47	E, W	US 46 @ Clinton Road	10'	Signalized	NJT 29 Lakeland 46	No	No
14	Intersection Bus Bypass Lane	Travel Time Savings	Intersection	Parsippany	Morris	9.35	E	NJ 10 @ Shopping Center / Yacenda Drive	12'	Signalized	MCM 2	No	No

ID #	Improvement	Market/Issue Addressed	Roadway Location or Limits	Municipality	County	Mile-post	Travel Direction	Roadway Jurisdiction	Existing Physical Dimensions (Shoulder Width)	Type of Traffic Control	Transit Routes Served	Meets Required LOS/ Frequency	Other screening factors
15	Intersection Bus Bypass Lane	Travel Time Savings	Intersection	Hanover	Morris	15.80	W	NJ 10 @ Ridgedale Avenue	12'	Signalized	NJT 73	No	No
16	Intersection Bus Bypass Lane	Travel Time Savings	Intersection	East Hanover	Morris	16.47	E	NJ 10 @ Shopping Center U-Turn / Faranella Drive	12'	Signalized	NJT 73 Community Coach	No	No
17	Intersection Bus Bypass Lane	Travel Time Savings	Intersection	Wayne	Passaic	8.45	N	NJ 23 @ Packanack Lake Rd	12'	Signalized	NJT 75, 194	No	No
18	Intersection Bus Bypass Lane	Travel Time Savings	Intersection	Wayne	Passaic	9.48	N	NJ 23 @ Black Oak Ridge Road	12'	Signalized	NJT 75, 194	No	No
19	Intersection Bus Bypass Lane	Travel Time Savings	Intersection	Pequannock	Morris	10.10	S	NJ 23 @ Alexander Avenue	12'	Signalized	NJT 75, 194	No	No
20	Intersection Bus Bypass Lane	Travel Time Savings	Intersection	Pequannock	Morris	10.95	N	NJ 23 @ Jackson Avenue	12'	Signalized	NJT 75, 194	No	No
21	Intersection Bus Bypass Lane	Travel Time Savings	Intersection	Pequannock	Morris	11.90	S	NJ 23 @ Newark Pompton Tpk	12'	Signalized	NJT 75, 194	No	No
22	Intersection Bus Bypass Lane	Travel Time Savings	Intersection	Pequannock	Morris	12.27	N, S	NJ 23 @ Boulevard	12'	Signalized	NJT 75, 194	No	No
23	Intersection Bus Bypass Lane	Travel Time Savings	Intersection	Riverdale	Morris	12.48	N	NJ 23 @ Windbeam Road	12'	Signalized	NJT 75, 194	No	No
24	Intersection Bus Bypass Lane	Travel Time Savings	Intersection	Butler	Morris	14.59	S	NJ 23 @ Morse Avenue	12'	Signalized	NJT 75, 194	No	No
25	Intersection Bus Bypass Lane	Travel Time Savings	Intersection	Butler	Morris	15.25	N, S	NJ 23 @ Jug handle s/o of Cascade Way	12'	Signalized	NJT 75, 194	No	No
26	Intersection Bus Bypass Lane	Travel Time Savings	Intersection	Butler	Morris	16.45	N, S	NJ 23 @ Center Court	12'	Signalized	NJT 75, 194	No	No

N.A. = not available

(1) = These bus priority treatments do not meet LOS and/or bus frequency criteria as per Transit Score guidelines, but could be considered for a pilot program.

Table F-2: Detailed Evaluation of Bus Bypass Lane Locations

ID #	Existing Number of Bus Trips[1] and/or Passengers who would benefit	Projected Number of Bus Trips and/or Passengers who would benefit	Average Bus Travel Time Savings per Intersection based on Published Reports (secs)	Projected Capital Cost	Ridership Impact of Time Savings	Traffic Impacts*	Safety Issues	Environmental Issues	Any Barriers to Implementation?	Recommended?	Phasing?
1	14	N.A.	<= 5	$500-$2,000	TBD	(2)	(3)	None	None	As a pilot	Pilot
2	14	N.A.	<= 5	$500-$2,000	TBD	(2)	(3)	None	None	As a pilot	Pilot
3	14	N.A.	<= 5	$500-$2,000	TBD	(2)	(3)	None	None	As a pilot	Pilot
4	14	N.A.	<= 5	$500-$2,000	TBD	(2)	(3)	None	None	As a pilot	Pilot
5	14	N.A.	<= 5	$500-$2,000	TBD	(2)	(3)	None	None	As a pilot	Pilot
6	14	N.A.	<= 5	$500-$2,000	TBD	(2)	(3)	None	None	As a pilot	Pilot
7	14	N.A.	<= 5	$500-$2,000	TBD	(2)	(3)	None	None	As a pilot	Pilot
8	14	N.A.	<= 5	$500-$2,000	TBD	(2)	(3)	None	None	As a pilot	Pilot
9	16	N.A.	<= 5	$500-$2,000	TBD	(2)	(3)	None	None	As a pilot	Pilot
10	12	N.A.	<= 5	$500-$2,000	TBD	(2)	(3)	None	None	As a pilot	Pilot
11	14	N.A.	10	$500-$2,000	TBD	(2)	(3)	None	None	As a pilot	Pilot
12	10	N.A.	<= 5	$500-$2,000	TBD	(2)	(3)	None	None	As a pilot	Pilot
13	13	N.A.	<= 5	$500-$2,000	TBD	(2)	(3)	None	None	As a pilot	Pilot
14	3	N.A.	10	$500-$2,000	TBD	(2)	(3)	None	None	As a pilot	Pilot
15	5	N.A.	<= 5	$500-$2,000	TBD	(2)	(3)	None	None	As a pilot	Pilot

ID #	Existing Number of Bus Trips[1] and/or Passengers who would benefit	Projected Number of Bus Trips and/or Passengers who would benefit	Average Bus Travel Time Savings per Intersection based on Published Reports (secs)	Projected Capital Cost	Ridership Impact of Time Savings	Traffic Impacts*	Safety Issues	Environmental Issues	Any Barriers to Implementation?	Recommended?	Phasing?
16	9	N.A.	<= 5	$500-$2,000	TBD	(2)	(3)	None	None	As a pilot	Pilot
17	14	N.A.	10	$500-$2,000	TBD	(2)	(3)	None	None	As a pilot	Pilot
18	14	N.A.	<= 5	$500-$2,000	TBD	(2)	(3)	None	None	As a pilot	Pilot
19	10	N.A.	<= 5	$500-$2,000	TBD	(2)	(3)	None	None	As a pilot	Pilot
20	14	N.A.	<= 5	$500-$2,000	TBD	(2)	(3)	None	None	As a pilot	Pilot
21	10	N.A.	<= 5	$500-$2,000	TBD	(2)	(3)	None	None	As a pilot	Pilot
22	14	N.A.	<= 5	$500-$2,000	TBD	(2)	(3)	None	None	As a pilot	Pilot
23	14	N.A.	<= 5	$500-$2,000	TBD	(2)	(3)	None	None	As a pilot	Pilot
24	10	N.A.	<= 5	$500-$2,000	TBD	(2)	(3)	None	None	As a pilot	Pilot
25	14	N.A.	<= 5	$500-$2,000	TBD	(2)	(3)	None	None	As a pilot	Pilot
26	14	N.A.	<= 5	$500-$2,000	TBD	(2)	(3)	None	None	As a pilot	Pilot

[1]Service frequency is defined as the total number of bus arrivals, either during the 6-9 AM or 4-7 PM peak period. The frequencies provided corresponds to peak period and direction

(2) = Traffic impacts are expected to be minor/negligible and limited to the right-turn movement only. Detailed traffic analyses should be performed prior to implementation.

(3) = Twelve-foot shoulder width is desirable. Ten-foot shoulder width could be used; however, historical studies indicate an increase in crash frequency.

G. Appendix G: Conceptual Design

To support the service enhancement strategies identified in the final report, the Northwest New Jersey Bus Study has developed eight conceptual facility design plans for bus priority roadway treatments and transit hub facilities in the project study area. These concept plans are focused in two areas: the development of new or upgraded facilities for points where bus routes will connect and/or where significant volumes of customers make use of park and ride opportunities, and the use of roadway treatments such as bus bypass lanes near major intersections that will allow transit vehicles to bypass recurring traffic congestion.

It is important to note that the improvements proposed in these conceptual plans are intended for further refinement through discussion with property owners, local stakeholders and implementing agencies, and can also serve as a model for similar facility needs identified elsewhere in the study area.

It should be noted that all conceptual design drawings are for ***illustrative purposes only****. The property owner has not been approached at this stage and their support for these improvements on their property is not yet known.* All proposals are subject to a final evaluation of alternatives and dependent on the availability of funding.

G.1 Existing Conditions

G.1.1. Location and Land Use

The proposed bus bypass lane with traffic signal priority is located at the signalized intersection of eastbound US 46 and New Road in Parsippany-Troy Hills Township in Morris County (see Figure G-1). The proposed bus bypass lane would be established in the existing shoulder lane. The surrounding land uses are low-density, automobile-oriented commercial and retail uses, common to this section of US 46.

Eastbound US 46 exit only lane and shoulder looking towards New Road.

G.1.2. Existing Facilities

The intersection approach at this location has an exit-only lane that provides access to a slip lane used to complete right or left turns. Beyond the exit-only lane there are gore markings and a wide paved shoulder. No turns from this approach are permitted at the intersection proper. At the far side of the intersection the shoulder area is used as an acceleration zone for right turns, and then tapers into a shoulder. There is a bus stop with a shelter at the far (east) side of the intersection in the shoulder. The parcel adjacent to the intersection is vacant and appears to be a former gas station. There is no sidewalk between the intersection and the bus stop.

G.1.3. Current Bus Routes Served

This location on US 46 eastbound is served by Lakeland 46 (Dover to New York City), NJT 29 (Parsippany to Newark) and NJT 79 (Parsippany to Newark). Considering these three routes combined, there are 18 eastbound trips during the AM peak period (6-9 AM) and 11 eastbound trips during the PM peak period (4-7 PM).

G.1.4. Problems Identified with Current Facilities

This segment was selected as a candidate for a bus preferential treatment, specifically, a bus bypass lane because this intersection experiences delays resulting from traffic congestion on US 46. Traffic congestion causes delay to buses resulting in longer and less predictable travel times for passengers.

A variety of roadway bus preferential treatments have been developed in urban and suburban settings to make bus transit more competitive with automobile use and to provide a higher quality of service for passengers. Bus preferential treatments attempt to offset traffic delay, improve schedule adherence, and reduce travel times. The benefits include attracting new riders, increasing transit capacity, reducing operating costs, and improving transit quality of service. Bus bypass lanes can be quickly implemented or tested within a pilot program using the existing the shoulder or outside travel lane width.

G.2 Proposed Plan[1]

G.2.1. Proposed New or Adjusted Routes Served

This study proposes a new Morristown-Willowbrook express route and endorses the Greater Newark Bus System Study (GNBSS) proposal to increase the frequency of NJT 79 service and extend the route to Morristown. Each of these routes would provide hourly service along US 46 at this location.

G.2.2. Proposed Access and Operations:

The proposed operational improvements to this location would include:

- Implementation of a bus bypass lane. Bus Bypass Lanes are short bus lanes at signalized intersection approaches that allow buses to avoid long mixed traffic queues and/or obtain a head start over adjacent traffic. In a bus bypass lane, the bus does not necessarily receive a separate signal phase nor is signal priority required[2]. The bypass lane simply allows buses to avoid long queues of vehicles at signalized intersections and can be used with near- or far-side bus stop locations.

- Reconstruction of shoulder lane. The creation of bus bypass lane at this intersection would require reconstructing the existing shoulder lane with full depth pavement for a length of 400 feet to allow exclusive bus use of the shoulder.

- Changes to traffic patterns. The existing signal timing at this intersection is proposed to remain unchanged.

[1] Note: Conceptual plan illustrations are for illustrative purposes only. Support for these improvements by property owner has yet to be determined.

[2] Active bus preferential treatments such as Traffic Signal Priority is an option, however, this requires changes to the traffic signal timings and additional equipment for the traffic signals and vehicles. Based on guidance provided by the project sponsors, less expensive passive preferential treatments are recommended.

A new "Bus May Use Shoulder" sign would be installed adjacent to the gore area at the intersection approach on eastbound US 46 alerting drivers that buses would be using the shoulder lane. On northbound New Road new "No Turn on Red" signs would be added to alert drivers that this move is no longer allowed. This will ensure the safety of the bus and other vehicles by eliminating any vehicular conflicts that could occur between through bus movements on US 46 and right turning vehicle on northbound New Road.

- Traffic Signal Priority. A longer term option for this location would be the introduction of Traffic Signal Priority (TSP).

  TSP is an Intelligent Transportation Systems strategy that provides preferential signal timings to buses once a bus is detected approaching an intersection. These treatments may be unconditional (i.e., provide priority whenever a bus arrives) or conditional (i.e., provide priority when a bus is behind schedule). Conditional priority requires information from automatic vehicle location (AVL) equipment on the approaching bus to determine if TSP is necessary.

  Active TSP measures typically include either extending the current green phase to accommodate approaching buses or providing an early start/red truncation; both TSP measures reduce the green time for other signal phases. The benefit of these TSP measures is that they can be accommodated by shifting green time within an existing signal cycle length and not require changes to cycle lengths that may interrupt existing traffic signal progression along a corridor3.

G.2.3. Proposed Facilities and Amenities:

There is an existing bus stop on eastbound US 46 located 150 feet east of New Road. The following improvements can be made to the bus stop, although these improvements are not required for the implementation of the bus bypass lane.

The following upgrades improvements and amenities are recommended for this stop:

- Bus shelters. A bus shelter provides protection from the elements and seating while waiting for a bus. Bus shelters should be designed with transparent sides for visibility and safety. Bus shelters provide an opportunity to provide amenities such as transit route maps, schedules, and seating. Heated shelters at high ridership stops may be considered. In addition, a bus shelter is a highly visible indication that transit service is available along a route and a specific destination.
- Seating. Seats provide comfort to waiting customers and increase the attractiveness of the bus service, especially for those with mobility impairments. Patrons who have difficulty

[3] TSP is different from traffic signal preemption, which interrupts the normal signal operations to accommodate a special event, such as an approaching emergency vehicle responding to an incident. Traffic signal preemption is not a preferred treatment for buses as it creates potential pedestrian crossing safety concerns; therefore, the current practice is to provide TSP, which provides buses with preferential treatment and is balanced against the other roadway user needs.

standing will benefit from seating and will more likely use transit services. Seating located in the shelter should leave clear space for patrons with wheelchairs to use the shelter.

- Lighting. Lighting affects bus patrons' perception of safety and security at a bus stop, as well as the use of the site by non-bus patrons. Sufficient lighting can enhance a waiting passenger's sense of comfort and security; insufficient lighting may encourage unintended use of the facility by non-bus patrons, especially after hours. Lighting is particularly important in climates where patrons may arrive and return to the stop in darkness during the winter season. Many new bus shelter designs include panels with backlighting.
- Route and timetable information. Providing information on bus arrival time and route allows riders to use the system more effectively and increases the convenience and attractiveness of transit to potential users. Information displays should be permanent features of the bus shelter and can be incorporated into the panels of the shelter. Temporary methods for displaying information (such as tape mounting) create a cluttered, unsophisticated appearance at the bus stop. As Global Positioning Systems and Automated Vehicle Location systems on buses become more common for transit systems, real time information display boards may be installed at stops to give patrons up to the minute information on bus arrival times and delays.
- Signage. Proper signage at bus stops is an important element of good transit service. Signs serve as a source of information to patrons and operators regarding the location of the bus stop and are effective marketing tools to promote transit use.
- Trash receptacles. Trash receptacles can improve the appearance of a bus stop by providing a place to dispose of trash.
- Pedestrian Improvements. The intersection of US 46 and New Road features crosswalks, however, the bus stop is located approximately 150 feet east of the intersection. There is currently no sidewalk connecting the bus stop to the intersection. It is proposed that a sidewalk be added between the bus stop and the intersection.

  It appears that the property adjacent to the bus stop is vacant. An alternate approach to constructing a sidewalk from the existing bus stop location would be to moving the stop closer to the intersection in conjunction with future property redevelopment. This will allow transit riders to more easily use the existing crosswalk to cross US 46.

Figure G-1: US 46 and New Road – Existing Conditions

Legend

- Proposed Commuter Parking
- 400' Radius around Proposed Commuter Parking
- Highways
- Local Streets

Source: NJDEP GIS

100 0 100 200 300 Feet

N

Figure 1 Project Location

Northwest New Jersey Bus Study
NJ TRANSIT & NJTPA

Figure G-2: US 46 and New Road – Roadway Geometry

G.3 Cost Estimate (based on 10% design)

Order-of-magnitude capital cost estimates were developed for the proposed improvement, reflecting the conceptual level of engineering. These estimates include costs for major proposed elements and a 30% contingency to account for items such as maintenance of traffic, construction layout, escalation, and mobilization.

Description	Quantity	Unit	Unit Cost	Total Cost
Seating (Optional)	1	EA	$2,000	$2,000
Pavement Excavation	300	CY	$25	$7,500
Full Depth Pavement	400	LF	$155	$62,000
Signage	25	SF	$50	$1,250
Pavement Markings (Letters and Line Markings)	16	EA	$500	$8,000
Sidewalk Construction	300	SF	$15	$4,500
				$80,250

Contingencies (30%) = $25,575
Total = $110,825
SAY $111,000

The following are additional elements that are not included in the cost of implementing a bus bypass lane cost estimate.

Optional Elements

Description	Quantity	Unit	Unit Cost	Total Cost
Bus Shelter (inc. bench and lighting)	2	EA	$20,000	$40,000
Bus Shelter Pad	1000	SF	$20	$20,000
Bus shelter (installation)	2	EA	$5,000	$10,000
Bus shelter (electrical work)	2	EA	$9,000	$18,000
Real-time Message Sign	2	EA	$8,000	$16,000
Ticket Vending Machine	2	EA	$12,000	$24,000
Trash bin	2	EA	$500	$1,000
Upgraded Signal Controller	1	EA	$5,000	$5,000
Signal Controller Receiver Interface	1	EA	$5,000	$5,000

$139,000

Contingencies (30%) = $41,700
Total = $180,700
SAY $181,000

Grand Total = $291,525
SAY $292,000

The above total does not include any ongoing operations and maintenance costs.

G.4 Key Issues to Resolve

- Determine New Jersey Department of Transportation interest in proposed improvements. Obtain agreement on the types and scope of improvements.

- Conduct further design and engineering and perform necessary environmental assessments.

- Conduct detailed traffic study of the need for and impacts of traffic signal priority or leading signal phase at this intersection.

G.5 Existing Conditions

G.5.1. Location

The proposed bus bypass lane is located at the signalized intersection of northbound N.J. Route 23 and Packanack Lake Road in Wayne Township in Passaic County (See Figure G-3). This intersection is located on a congested roadway segment where volume-to-capacity ratios are greater than 1.0 in the AM peak based on NJDOT's 2003 Congestion Management System database.

G.5.2. Existing Facilities

Currently the segment of roadway is used as a right-turn only lane at the intersection approach and as a shoulder lane on N.J. Route 23 before the turn lane and beginning shortly after the north side of the intersection. There is an existing bus stop at the far side of the intersection in the shoulder lane, beyond the entrance to the parking lot of the Packanack Shopping Center.

N.J. 23 at Packanack Lake Road looking north

G.5.3. Current Bus Routes Served

N.J. Route 23 northbound in this location is served by local bus route 748 from Paterson to Ridgewood. It is also served by evening peak-only variants of two NJTRANSIT express bus routes from New York: NJTRANSIT 197 to Warwick via Black Oak Ridge Road and NJTRANSIT 194 to Newfoundland, express trips only. NJTRANSIT 748 serves this stop twice in the morning peak (defined as 6:00 am to 9:00, although the first arrival is 8:11). The local route also serves the stop three times in the evening peak (4:00 to 7:00 pm), and a fourth time at 7:11 pm. In addition, there are six westbound NJTRANSIT 194 trips and three westbound NJTRANSIT 197 Black Oak Ridge Rd trips during the PM peak period (4:00 to 7:00 PM) that pass through this intersection. In total, there are two morning peak trips and 12 evening peak trips at this location. However, the proposed bypass lane

may speed bus service at other times. Route 748 makes nine stops at this location weekdays at off-peak hours, and an additional 12 stops on Saturdays.

G.5.4. Problems Identified with Current Facilities

This segment was selected as a candidate for a bus preferential treatment, specifically, a bus bypass lane because this intersection experiences delays resulting from traffic congestion on Route 23. Traffic congestion causes delay to buses resulting in longer and less predictable travel times for passengers.

A variety of roadway bus preferential treatments have been developed in urban and suburban settings to make bus transit more competitive with automobile use and to provide a higher quality of service for passengers. Bus preferential treatments attempt to offset traffic delay, improve schedule adherence, and reduce travel times. The benefits include attracting new riders, increasing transit capacity, reducing operating costs, and improving transit quality of service. Bus bypass lanes can be quickly implemented or tested within a pilot program using the existing the shoulder or outside travel lane width.

G.6 Proposed Plan

G.6.1. Proposed New or Adjusted Routes Served

There are no proposed new or adjusted routes serving this location. This improvement would benefit existing bus routes.

G.6.2. Proposed Access and Operations

The proposed operational improvements to this location would include:

- Implementation of a bus bypass lane. Bus Bypass Lanes are short bus lanes at signalized intersection approaches that allow buses to avoid long mixed traffic queues and/or obtain a head start over adjacent traffic. In a bus bypass lane, the bus does not necessarily receive a separate signal phase nor is signal priority required[4]. The bypass lane simply allows buses to avoid long queues of vehicles at signalized intersections and can be used with near- or far-side bus stop locations.

- Changes to traffic patterns. It is proposed that buses would be permitted to share the existing right-turn lane on northbound Route 23 to continue to the bus stop north of Packanack Lake Road. Right turning vehicles on northbound Route 23 would continue to turn right on that signal phase; however, buses will be allowed to make the through movement. The approach lane would be better marked for right turns only, with an "Except Bus" plaque added to the right turn only signs.

[4] Active bus preferential treatments such as Traffic Signal Priority is an option, however, this requires changes to the traffic signal timings and additional equipment for the traffic signals and vehicles. Based on guidance provided by the project sponsors, less expensive passive preferential treatments are recommended.

The existing signal timing may have to be modified to optimize bus and right turn movements

At the far side of the intersection, the shoulder lane would be used for buses. The north side of the intersection would be restriped to remove the taper, and to mark the shoulder immediately beyond the intersection as a bus stop (stop to be relocated from the north side of the shopping center driveway).

A "No Turn on Red, 4 PM to 7 PM, Mon-Fri" sign would be added to the Packanack Lake Road westbound approach.

- Traffic Signal Priority. A longer term option for this location would be the introduction of Traffic Signal Priority (TSP).

  TSP is an Intelligent Transportation Systems strategy that provides preferential signal timings to buses once a bus is detected approaching an intersection. These treatments may be unconditional (i.e., provide priority whenever a bus arrives) or conditional (i.e., provide priority when a bus is behind schedule). Conditional priority requires information from automatic vehicle location (AVL) equipment on the approaching bus to determine if TSP is necessary.

  Active TSP measures typically include either extending the current green phase to accommodate approaching buses or providing an early start/red truncation; both TSP measures reduce the green time for other signal phases. The benefit of these TSP measures is that they can be accommodated by shifting green time within an existing signal cycle length and not require changes to cycle lengths that may interrupt existing traffic signal progression along a corridor[5].

G.6.3. Proposed Facilities and Amenities

There is an existing bus stop on eastbound US 46 located 150 feet east of New Road. The following improvements can be made to the bus stop, although these improvements are not required for the implementation of the bus bypass lane.

The following upgrades improvements and amenities are recommended for this stop:

- Bus shelters. A bus shelter provides protection from the elements and seating while waiting for a bus. Bus shelters should be designed with transparent sides for visibility and safety. Bus shelters provide an opportunity to provide amenities such as transit route maps, schedules, and seating. Heated shelters at high ridership stops may be considered.

[5] TSP is different from traffic signal preemption, which interrupts the normal signal operations to accommodate a special event, such as an approaching emergency vehicle responding to an incident. Traffic signal preemption is not a preferred treatment for buses as it creates potential pedestrian crossing safety concerns; therefore, the current practice is to provide TSP, which provides buses with preferential treatment and is balanced against the other roadway user needs.

In addition, a bus shelter is a highly visible indication that transit service is available along a route and a specific destination.

- Seating. Seats provide comfort to waiting customers and increase the attractiveness of the bus service, especially for those with mobility impairments. Patrons who have difficulty standing will benefit from seating and will more likely use transit services. Seating located in the shelter should leave clear space for patrons with wheelchairs to use the shelter.
- Lighting. Lighting affects bus patrons' perception of safety and security at a bus stop, as well as the use of the site by non-bus patrons. Sufficient lighting can enhance a waiting passenger's sense of comfort and security; insufficient lighting may encourage unintended use of the facility by non-bus patrons, especially after hours. Lighting is particularly important in climates where patrons may arrive and return to the stop in darkness during the winter season. Many new bus shelter designs include panels with backlighting.
- Route and timetable information. Providing information on bus arrival time and route allows riders to use the system more effectively and increases the convenience and attractiveness of transit to potential users. Information displays should be permanent features of the bus shelter and can be incorporated into the panels of the shelter. Temporary methods for displaying information (such as tape mounting) create a cluttered, unsophisticated appearance at the bus stop. As Global Positioning Systems and Automated Vehicle Location systems on buses become more common for transit systems, real time information display boards may be installed at stops to give patrons up to the minute information on bus arrival times and delays.
- Signage. Proper signage at bus stops is an important element of good transit service. Signs serve as a source of information to patrons and operators regarding the location of the bus stop and are effective marketing tools to promote transit use.
- Trash receptacles. Trash receptacles can improve the appearance of a bus stop by providing a place to dispose of trash.
- Pedestrian Improvements. No pedestrian improvements are proposed as the intersection of Route 23 and Packanack Lake Road features crosswalks and a sidewalk connecting the bus stop to the intersection.

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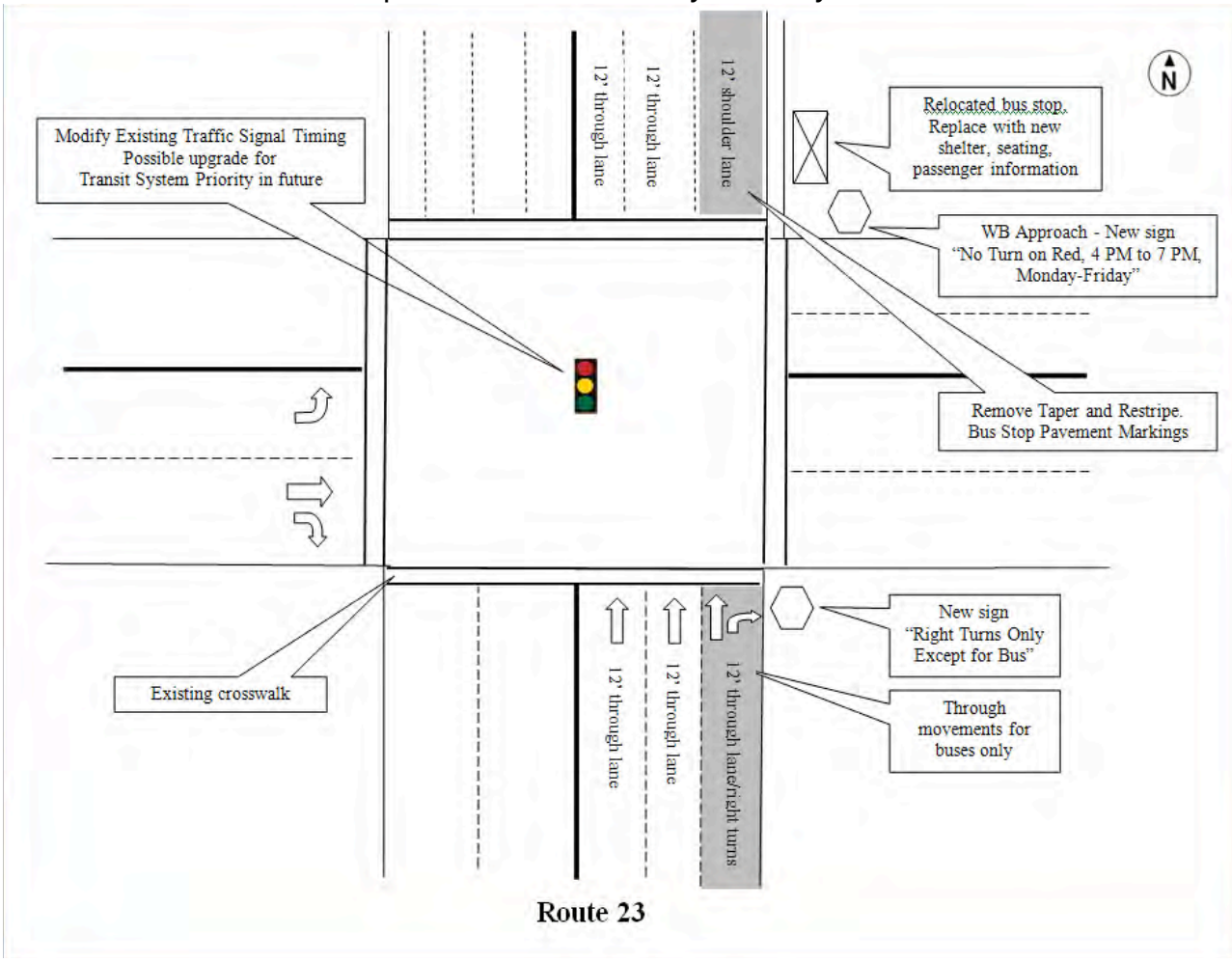
Figure G-3: N.J. 23 and Packanack Lake Road – Existing Conditions

Figure G-4: N.J. 23 and Packanack Lake Road – Proposed Improvements

Figure G-5: N.J. 23 and Packanack Lake Road, Wayne Township Proposed Bus Bypass Lane Improvements and Roadway Geometry



G.7 Cost Estimate (based on 10% design)

Order-of-magnitude capital cost estimates were developed for the proposed improvement, reflecting the conceptual level of engineering. These estimates include costs for major proposed elements and a 30% contingency to account for items such as maintenance of traffic, construction layout, escalation, and mobilization.

Description	Quantity	Unit	Unit Cost	Total Cost
Signal Optimization	1	LS	$5,000	$5,000
Signage	25	SF	$50	$1,250
Pavement Markings (Letters and Line Markings)	16	EA	$500	$8,000
				$14,250

Contingencies (30%) = $4,275
Total = $18,525
SAY $19,000

The following are additional elements that are not included in the cost of implementing a bus bypass lane cost estimate.

Optional Elements

Description	Quantity	Unit	Unit Cost	Total Cost
Bus Shelter (inc. bench and lighting)	2	EA	$20,000	$40,000
Bus Shelter Pad	1000	SF	$20	$20,000
Bus shelter (installation)	2	EA	$5,000	$10,000
Bus shelter (electrical work)	2	EA	$9,000	$18,000
Real-time Message Sign	2	EA	$8,000	$16,000
Ticket Vending Machine	2	EA	$12,000	$24,000
Trash bin	2	EA	$500	$1,000
Upgraded Signal Controller	1	EA	$5,000	$5,000
Signal Controller Receiver Interface	1	EA	$5,000	$5,000
				$139,000

Contingencies (30%) = $41,700
Total = $180,700
SAY $181,000
Grand Total = $199,225
SAY $200,000

The above total does not include any ongoing operations and maintenance costs.

G.8 Key Issues to Resolve

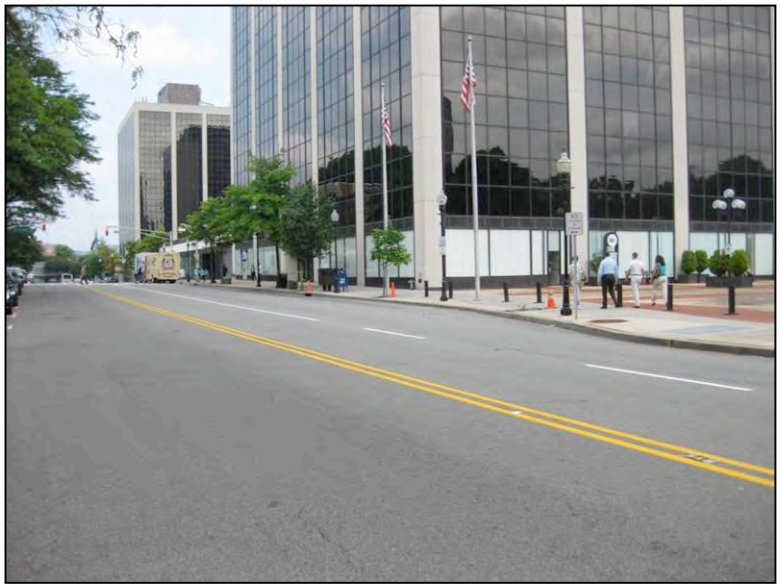
- Determine New Jersey Department of Transportation interest in proposed improvements. Obtain agreement on the types and scope of improvements.

- Conduct further design and engineering and perform necessary environmental assessments.

G.9 Existing Conditions

G.9.1. Location and Land Use

Headquarters Plaza is located at 28 Speedwell Avenue (US 202) in the central business district of the Town of Morristown in Morris County, NJ (see Figures G-6 and G-7). The block containing Headquarters Plaza is zoned UR-159 meaning it is an Urban Redevelopment zone. Land uses in the adjacent area is zoned CBD-2 which contains uses such as retail establishments, office buildings, financial institutions, hotels, entertainment and cultural facilities, and civic buildings. The bus stop is located adjacent to an office building.



Headquarters Plaza is served by numerous bus routes, but it lacks even basic passenger amenities.

G.9.2. Existing Bus Stop Facility Description

Headquarters Plaza is served by eight bus routes: MCM 1 (Morristown to Willowbrook Mall), MCM 2 (Morristown to County College), MCM 3 (Morristown to Livingston Mall), MCM 4 (Dover to Honeywell), MCM 10 (Morristown to Rockaway Mall) Colonial Coach 76 and 77 (Morristown loop) and Community Coach 77 (Morristown to New York). Approximately 270 riders per day board buses at this stop.

The MCM 1, MCM 2 and MCM 3 routes operate hourly Monday to Friday, with the MCM 1 and MCM 3 route also providing service on Saturdays. The MCM 4 operates weekdays only with three trips in each direction. The MCM 10 route operates hourly Monday to Saturday.

Colonial Coach is a free transportation service provided by the Township of Morris and the Town of Morristown. Residents of the Township or Town are eligible to utilize the service. The routes operate Monday through Saturday (excluding Public Holidays) between the hours of 9:00 AM and 4:00 PM. Bus route #76 operates on Monday, Wednesday, and Friday and Bus route #77 operates on Tuesday, Thursday, and Saturday.

Figure G-6: Headquarters Plaza and Vicinity

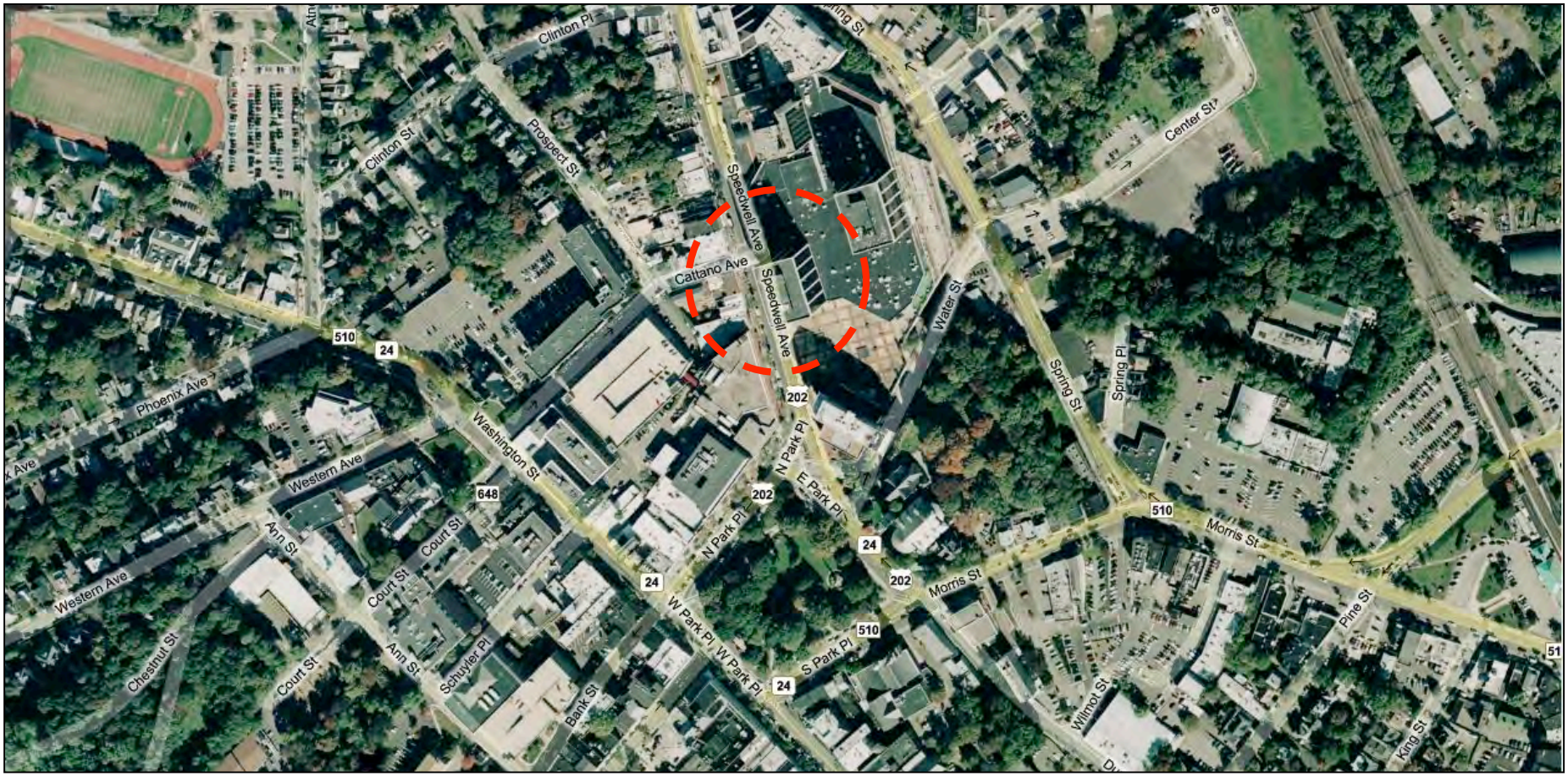
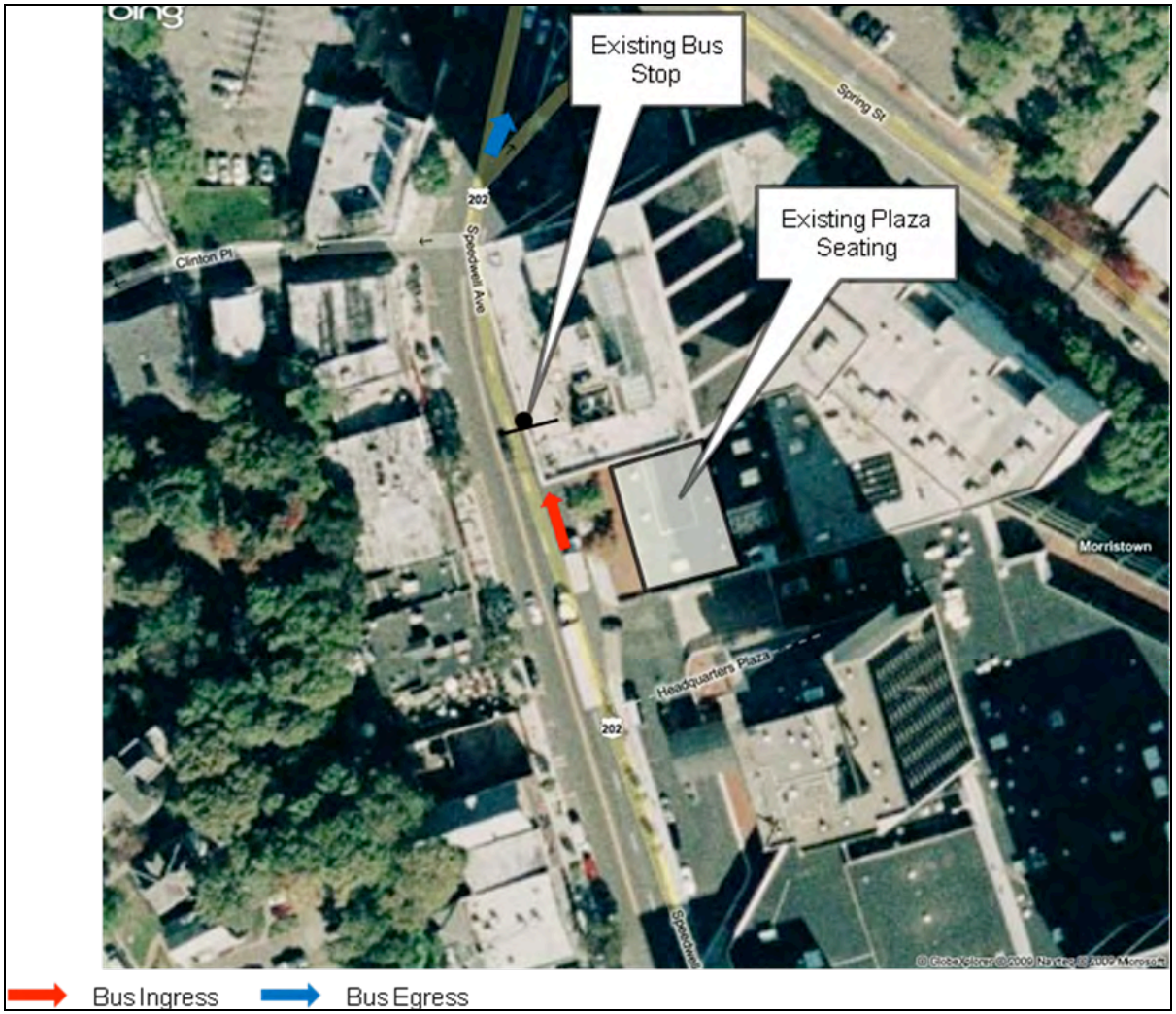


Figure G-7: Aerial View of Headquarters Plaza



Community Coach 77 operates hourly Monday to Friday and every 75 minutes on the weekend.

Beginning at Headquarters Plaza, Speedwell Avenue flares to provide a bus bay that can accommodate three buses. Following the bus stop, this area becomes a parking lane.

Other than a posted bus stop sign identifying the location of the bus stop, there are no amenities for passengers. Parking is provided in the privately owned Headquarters Plaza parking structure.

G.9.3. Problems Identified with Current Bus Stop Facilities

Although Headquarters Plaza is a major bus terminus and transfer point, it lacks passenger amenities that may be an impediment to potential users and an inconvenience to existing users. For both the Headquarters Plaza bus stop, the following needs were identified:

- Lack of visibility of the bus stop. The awareness of the availability of transit service begins with the ability to see that bus service is available along a route and that particular destinations are served.
- Lack of signage. This is related to the visibility issue. Signage is important in advertising the location of a bus stop as well as encouraging connections between the available bus services.
- Lack of passenger information. This is a particular concern as the MCM 4 and Colonial Coach bus routes run at limited times (i.e., once an hour or once in the morning and once in the afternoon) and for some routes only during certain days of the week.
- Lack of shelter and seating for waiting passengers. This creates an unpleasant environment for existing bus passengers and may discourage potential users.
- Personal safety concerns. The lack of shelter, information, and comfortable waiting areas can combine to create negative perceptions about transit service.

The proposed improvements would increase passenger comfort and convenience, as well as improve the connectivity between bus routes.

G.10 Proposed Plan

G.10.1. Proposed New or Adjusted Routes Served

Bus service improvements to Headquarters Plaza include the proposals made in this study to increase service frequency on MCM 1, 3 and 10, and to add a new express route operating between this terminus and the Willowbrook Mall. The study also proposes to permit local trips at NJTRANSIT fares on the Community Coach 77, which was increased the number of boardings on this route. A new shuttle would replace the existing Colonial Coach circulator while also providing "reverse commute" service from the Morristown Railroad Station to Headquarters Plaza and nearby employment sites.

G.10.2. Proposed Access and Operations:

Based on guidance by NJTRANSIT, the existing bus stop pattern would remain and a need for bus layover space was identified.

The eight existing bus routes (MCM 1, MCM 2, MCM 3, MCM 4, MCM 10, Colonial Coach 76/77 and Community Coach 77) will continue to serve this transit hub via Speedwell Avenue. Installation of bus shelters at the bus stop is recommended. According to the ridership counts performed as part of this study, there were 270 daily boardings at Headquarters Plaza. Based on the guidelines, *TCRP Report 19: Guidelines for the Location and Design of Bus Stops*, in urban locations such as Morristown, boarding levels of 50 to 100 boardings per day justify the installation of bus shelters.

It is anticipated that the existing sidewalks have sufficient space to accommodate 5-foot by 8-foot bus shelters. Additional seating and bike racks could be provided in the existing plaza area. Bus stop pavement markings would be added to clearly delineate exclusive bus use of the bus stop and layover area. A bus layover area could be provided just south of the proposed shelters since several bus routes terminate at this stop.

G.10.3. Proposed Passenger Facilities and Amenities:

At the Headquarters Plaza bus stop on Speedwell Avenue, the following improvements and amenities are recommended:

- Bus shelters. A bus shelter provides protection from the elements and seating while waiting for a bus. Bus shelters should be designed with transparent sides for visibility and safety. Bus shelters provide an opportunity to provide amenities such as transit route maps, schedules, and seating. Heated shelters at high ridership stops may be considered. In addition, a bus shelter is a highly visible indication that transit service is available along a route and a specific destination.
- Seating. Seats provide comfort to waiting customers and increase the attractiveness of the bus service, especially for those with mobility impairments. Patrons who have difficulty standing will benefit from seating and will more likely use transit services. Seating located in the shelter should leave clear space for patrons with wheelchairs to use the shelter.
- Lighting. Lighting affects bus patrons' perception of safety and security at a bus stop, as well as the use of the site by non-bus patrons. Sufficient lighting can enhance a waiting passenger's sense of comfort and security; insufficient lighting may encourage unintended use of the facility by non-bus patrons, especially after hours. Lighting is particularly important in climates where patrons may arrive and return to the stop in darkness during the winter season. Many new bus shelter designs include panels with backlighting.
- Route and timetable information. Providing information on bus arrival time and route allows riders to use the system more effectively and increases the convenience and attractiveness of transit to potential users. Information displays should be permanent features of the bus shelter and can be incorporated into the panels of the shelter. Temporary methods for displaying information (such as tape mounting) create a cluttered, unsophisticated appearance at the bus stop. As Global Positioning Systems and Automated Vehicle Location systems on buses become more common for transit systems,

real time information display boards may be installed at stops to give patrons up to the minute information on bus arrival times and delays.

- Signage. Proper signage at bus stops is an important element of good transit service. Signs serve as a source of information to patrons and operators regarding the location of the bus stop and are effective marketing tools to promote transit use.
- Vending machines. Vending machines can provide passengers with reading material while they wait for the bus. However, the placement of vending machines should be carefully considered as they may reduce the amount of room for mobility and waiting and create trash and be subject to vandalism.
- Bicycle storage. Bicycle storage facilities, such as bike racks, may be provided at bus stops for the convenience of bicyclists using transit. Designated storage facilities discourage bicycle riders from locking bikes onto the bus facilities or on an adjacent property. Proper storage of bicycles can reduce the amount of visual clutter and ensure a clear pathway.
- Trash receptacles. Trash receptacles can improve the appearance of a bus stop by providing a place to dispose of trash.
- Pedestrian improvements. No pedestrian improvements are proposed as the intersection of Route 23 and Packanack Lake Road features crosswalks and a sidewalk connecting the bus stop to the intersection

This rendering illustrates the current direction in bus shelter design. This type of bus shelter incorporates many of the proposed improvements including shelter, seating, lighting, and passenger information.

Figure G-8: Headquarters Plaza – Proposed Improvements

G.11 Cost Estimate (based on 10% design)

Order-of-magnitude capital cost estimates were developed for the proposed improvements, reflecting the conceptual level of engineering. These estimates include costs for major proposed elements and a 30% contingency to account for items such as maintenance of traffic, construction layout, escalation, and mobilization.

Description	Quantity	Unit	Unit Cost	Total Cost
Pavement Markings (Letters and Line Markings)	16	EA	$500	$8,000
Bus Shelter (inc. bench and lighting)	4	EA	$20,000	$80,000
Bus shelter (installation)	4	EA	$5,000	$20,000
Bus shelter (electrical work)	4	EA	$9,000	$36,000
Real-time Message Sign	4	EA	$8,000	$32,000
Ticket Vending Machine	1	EA	$12,000	$12,000
Trash bin	2	EA	$500	$1,000
Bike rack	4	EA	$1,500	$6,000
Signage (2 bus stop information signs)	2	TOTAL	$200	$400
Subtotal				$195,400

Contingencies (30%) = $58,620
Total = $254,020
SAY $254,000

The above total does not include any ongoing operations and maintenance costs.

G.12 Key Issues to Resolve

- Determine Town of Morris and Morris County interest in proposed improvements. Obtain agreement on the types and scope of improvements.

- Conduct further design and engineering and perform necessary environmental assessments.

G.13 Existing Conditions

G.13.1. Location

NJ TRANSIT Morristown Railroad Station is located at 122 Morris Street in the Town of Morris in Morris County, NJ (see Figures G-9 and G-10). The station, platforms and right-of-way is owned by NJT. The station is located in a dense, urban environment surrounded by commercial land uses, and is zoned Transit Village Core (Figure G-11).

A total of 579 commuter parking spaces are provided in three lots primarily for the use of commuter rail passengers.

Lot 1 at Morris Street has 63 spaces; with parking fees. Parking is available by permit only and the fee is $160/month. The lot is owned by NJ TRANSIT and operated by Standard Parking. Lot A is accessed by the station driveway.

Lot 2 at Lackawanna Place and Lafayette Avenue provides 101 daily and permit spaces with parking fees. Daily and permit fees are $3/day or $55/month. The lot is owned by the Town of Morristown and operated by the Morristown parking Authority. A taxi stand is located behind the station building in Lot 2.

Lot 3 is a parking garage located at Morris Street and Lafayette Avenue with 415 spaces. Daily and permit fees are 46/day or $100/month. The lot is owned by NJ TRANSIT and operated by Standard Parking.

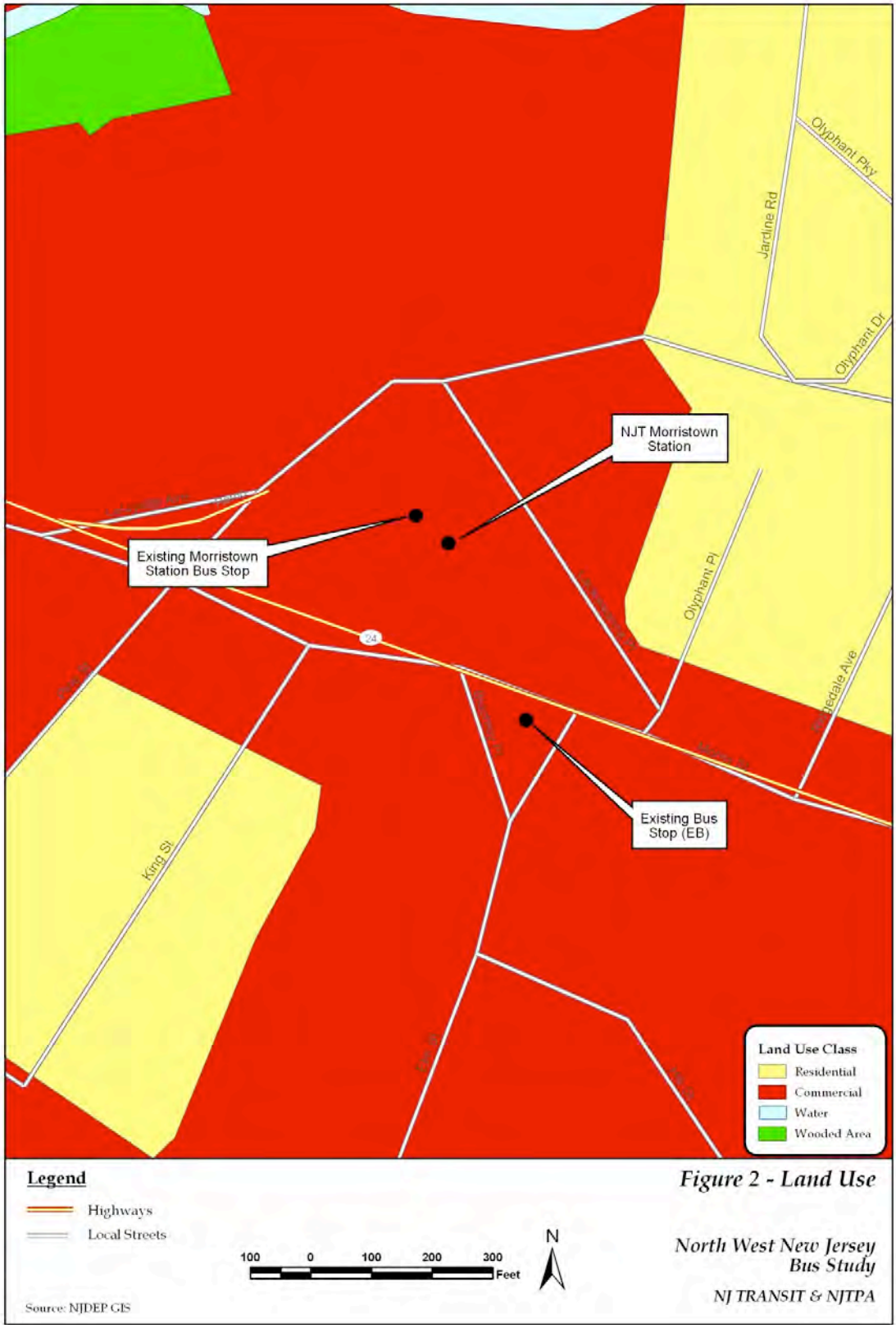
NJ TRANSIT Morristown Station building

Bus stop at NJTRANSIT Morristown Station

Figure G-9: Project Location

Figure G-10: Existing Conditions

Figure G-11: Land Use



G.13.2. Existing Bus Stop Facility Description

Morristown Station is a multi-modal transit facility served by Morris & Essex Line trains, interstate land local buses and local shuttles and, taxis. The parking lots are oriented towards serving the rail station. Los 1 and 2 are adjacent to the rail station. Lot 3 is just north and west of the rail station across Lafayette Avenue. Two bus stops are located to at the intersection of Morris and Elm Streets and one bus stop is located in front of the station building. Sidewalks and crosswalks are present at both the station plaza, the station driveways, and at the intersection of Morris and Elm Streets.

Four local bus routes serve Morristown Railroad Station area, the MCM 1 (Morristown to Willowbrook Mall), MCM 2 (Morristown to County College), MCM 4 (Dover to Honeywell), and MCM 5 (Morristown to Dover/Rockaway Mall). The MCM 1 and MCM 2 routes operate hourly Monday to Friday, with the MCM 1 route also providing service on Saturdays. The MCM 4 and MCM 5 have limited operations. The MCM 4 operates weekdays only with three trips in each direction. The MCM 5 operates Mondays and Wednesdays only with one trip in each direction, once in the morning and one in the afternoon.

Morristown Station bus stop

The Morristown Station bus stop is located directly in front of the station building adjacent to the building entrance. The stop is served by MCM 2 to County College, MCM 4 to Chester and MCM 5 to Rockaway Mall. There is a canopy at the rail station building entrance that provides limited shelter for waiting bus passengers. The railroad station has a schedule for commuter rail service, but the bus stop does not have any route or schedule information.

Eastbound bus stop

The eastbound bus stop is located at the southwest corner of the intersection of Morris and Elm streets. The stop is served by MCM 1 to Willowbrook Mall. The eastbound stop has a bus shelter and a bench; however, it does not feature any passenger information such as bus schedules. Access to the rail station may be made by foot. A crosswalk is provided at the signalized intersection of Morris and Elm streets. A sidewalk is present leading up the station driveway to the station building.

Westbound bus stop

The westbound bus stop is located on the northwest corner of the intersection of Morris and Elm streets. The stop is served by the served by the MCM 1 to Morristown; because the stop is the third to last on the route, it generally serves alightings only, not boardings. Since the stop is used primarily for alightings, there are is bus shelter or passenger amenities at this stop. Access to the rail station may be made by foot. A sidewalk is present leading up the station driveway to the station building.

Proposed bus service improvements that affect this area include a new Morristown Railroad Station shuttle, a rerouted MCM 3 that would stop on Morris Street and Elm Street near the station, a new Morristown-Willowbrook Shuttle that would stop in the same location, and increased service

frequency and span on the MCM 1 and 3. However these proposals are subject to stakeholder review, final evaluation of alternatives, and funding availability.

G.13.3. Problems Identified with Current Bus Stop Facilities:

The primary problem with the current bus stop facilities at Morristown Rail Station is the lack of passenger information that may be an impediment to potential users and an inconvenience to existing users.

Based on guidance by NJTRANSIT, the existing bus stops are to remain. The following needs for the bus stops were identified:

Morristown Station bus stop

- Lack of passenger information. The lack of passenger information at the bus stop makes it difficult for existing riders to use this service and discourages potential riders from using these routes because the hours of operation are not apparent. This is a particular concern as all routes in this area operate hourly or less frequently, and the MCM 4 and MCM 5 have very limited operations (a few trips per day for MCM 4, and only two trips per *week* for MCM 5).
- Lack of seating for waiting passengers. This creates an unpleasant environment for existing bus passengers and may discourage potential users.
- Lack of wayfinding signage. There is no signage indicating how to access the local bus stops from the train station.

Eastbound bus stop on Morris and Elm streets

Eastbound bus stop

- Lack of passenger information. While there is a bus stop shelter at this location, there is no information indicating which bus routes serve it or when bus service is available. This is an inconvenience to existing riders and an impediment to potential riders.

- Anticipated transit usage. There are several service related proposals (described in the next section) to increase the span and frequency of existing bus routes and introduce new services that would result in increased transit usage and greater use of this shelter.
- Lack of wayfinding signage. There is no signage indicating how to access the train station from the bus stops.

Westbound bus stop

- The westbound stop is envisioned as remaining a stop used primarily for dropping off passengers; therefore no improvements are proposed.

G.14 Proposed Plan

G.14.1. Proposed New or Adjusted Routes Served

Bus service improvements at this location include a new Morristown-Willowbrook express route and modification of MCM 3 to serve the station (with increased span and frequency).

G.14.2. Proposed Access and Operations

Based on guidance by NJTRANSIT, MCM buses would continue to serve stops on Morris Street near the station. However, proposed new Morristown Shuttle, using minibuses, might stop directly in front of the station.

The MCM 1 and MCM 4 bus routes will continue to serve the eastbound bus stop on Morris Street. An upgrade of the bus shelter at the eastbound stops is recommended. According to the ridership counts performed as part of this study, here were 89 daily boarding at Morristown. Based on the guidelines, *TCRP Report 19: Guidelines for the Locations and Design of Bus Stops*, in urban locations such as Morristown, boarding levels of 50 to 100 boardings per day justify the installation of bus shelters. Furthermore, if two additional bus routes are introduced and service spans and frequencies on existing routes increase as proposed in this study, then the number of users will likely increase.

G.14.3. Proposed Facility Enhancements

The proposed improvements to this location include improved amenities such as schedule information and seating at the train station and an upgrade of the bus shelter at the eastbound Morris Street at Elm Street bus stop.

Morristown Station bus stop

At the Morristown Station bus stop the following improvements and amenities are recommended:

- Seating. Seats provide comfort to waiting customers and increase the attractiveness of the bus service, especially for those with mobility impairments. Patrons who have difficulty standing will benefit from seating and will more likely use transit services.

- Route and timetable information. Providing information on bus arrival time and route allows riders to use the system more effectively and increases the convenience and attractiveness of transit to potential users. Information displays should be permanent features of the bus shelter and can be incorporated into the panels of the shelter. Temporary methods for displaying information (such as tape mounting) create a cluttered, unsophisticated appearance at the bus stop.
- Signage. Proper signage at bus stops is an important element of good transit service. Signs serve as a source of information to patrons and operators regarding the location of the bus stop and are effective marketing tools to promote transit use. Wayfinding signs to improve connectivity between the railroad station and bus stops on Morris Street are proposed, including signs visible to passengers exiting the train using the stairway leading to the intersection of Morris Street and Elm Street.

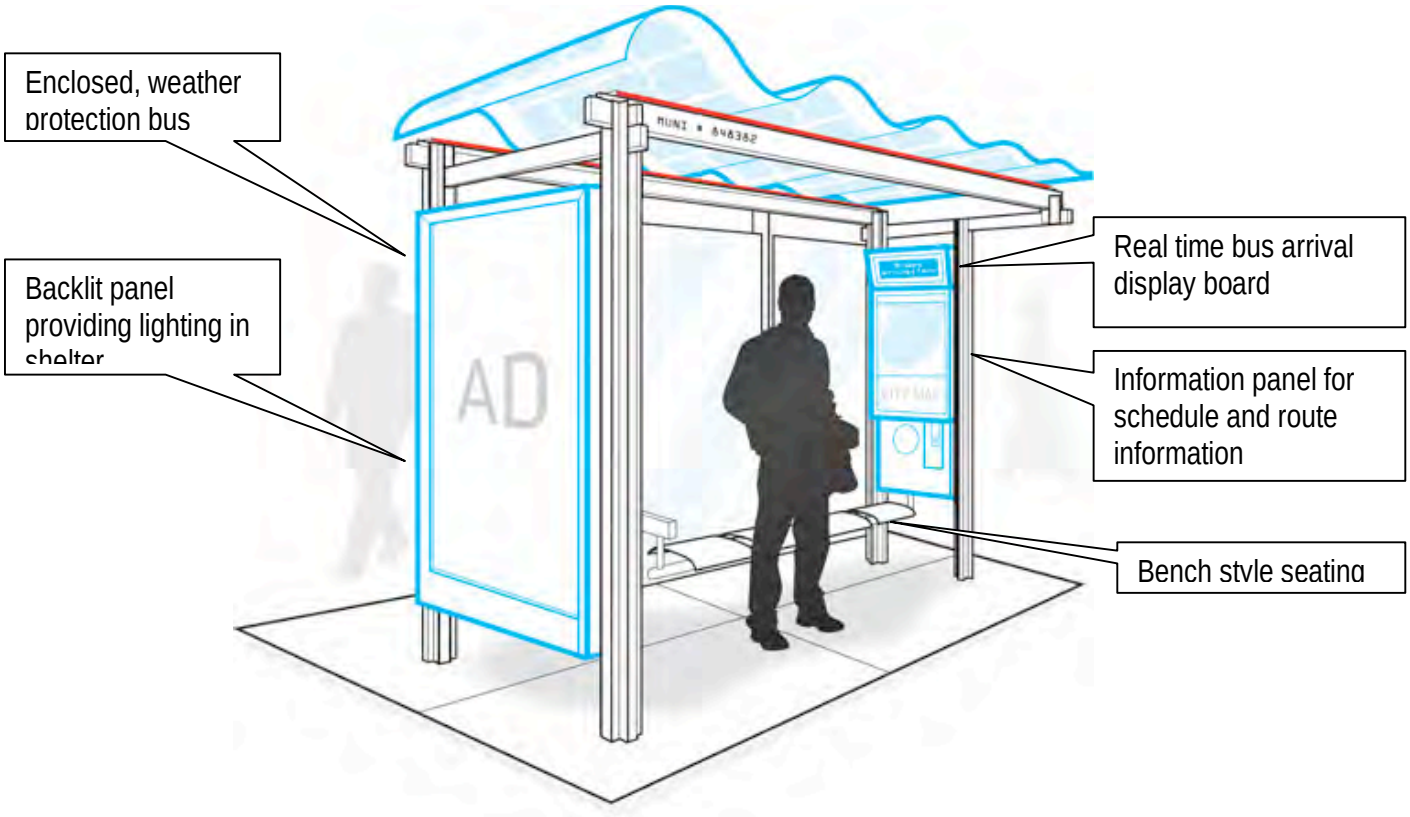
A bus shelter could be provided at the train station to better accommodate passengers using existing buses and shuttles and the proposed new Morristown Shuttle. However, based on current service frequencies and ridership levels the minimum requirements for a shelter are not met.

Eastbound bus stop

At the eastbound bus stop on Morris Street the following improvements and amenities are recommended:

- Upgraded Bus shelter. A bus shelter provides protection from the elements and seating while waiting for a bus. Bus shelters should be designed with transparent sides for visibility and safety. Bus shelters provide an opportunity to provide amenities such as transit route maps, schedules, and seating. Heated shelters at high ridership stops may be considered. In addition, a bus shelter is a highly visible indication that transit service is available along a route and a specific destination.
- Seating. Seats provide comfort to waiting customers and increase the attractiveness of the bus service, especially for those with mobility impairments. Patrons who have difficulty standing will benefit from seating and will more likely use transit services. Seating located in the shelter should leave clear space for patrons with wheelchairs to use the shelter.
- Lighting. Lighting affects bus patrons' perception of safety and security at a bus stop, as well as the use of the site by non-bus patrons. Sufficient lighting can enhance a waiting passenger's sense of comfort and security; insufficient lighting may encourage unintended use of the facility by non-bus patrons, especially after hours. Lighting is particularly important in climates where patrons may arrive and return to the stop in darkness during the winter season. Many new bus shelter designs include panels with backlighting.
- Route and timetable information. Providing information on bus arrival time and route allows riders to use the system more effectively and increases the convenience and attractiveness of transit to potential users. Information displays should be permanent features of the bus shelter and can be incorporated into the panels of the shelter. Temporary methods for displaying information (such as tape mounting) create a cluttered, unsophisticated appearance at the bus stop. As Global Positioning Systems and Automated Vehicle Location systems on buses become more common for transit systems, real time information display boards may be installed at stops to give patrons up to the minute information on bus arrival times and delays.

- Signage. Proper signage at bus stops is an important element of good transit service. Signs serve as a source of information to patrons and operators regarding the location of the bus stop and are effective marketing tools to promote transit use. Wayfinding signs to improve connectivity between the railroad station and bus stops on Morris Street are proposed, including signs visible to passengers exiting the train using the stairway leading to the intersection of Morris Street and Elm Street.
- Vending machines. Vending machines can provide passengers with reading material while they wait for the bus. However, the placement of vending machines should be carefully considered as they may reduce the amount of room for mobility and waiting and create trash and be subject to vandalism.
- Bicycle storage. Bicycle storage facilities, such as bike racks, may be provided at bus stops for the convenience of bicyclists using transit. Designated storage facilities discourage bicycle riders from locking bikes onto the bus facilities or on an adjacent property. Proper storage of bicycles can reduce the amount of visual clutter and ensure a clear pathway. Bicycle storage may be accommodated at the station building.



This rendering illustrates the current direction in bus shelter design. This type of bus shelter incorporates many of the proposed improvements including shelter, seating, lighting, and passenger information.

Figure G-12: Morristown – Proposed Improvements

G.15 Cost Estimate (based on 10% design)

Order-of-magnitude capital cost estimates were developed for the proposed improvements, reflecting the conceptual level of engineering. These estimates include costs for major proposed elements and a 30% contingency to account for items such as maintenance of traffic, construction layout, escalation, and mobilization.

Morristown Station bus stop

Description	Quantity	Unit	Unit Cost	Total Cost
Bench	1	EA	$1,000	$1,000
Signage (1 bus stop information sign and 2 wayfinding signs)	3	TOTAL	$200	$600
Subtotal				$1,600

Contingencies (30%) = $480
Total = $2.080
SAY $2,000

Eastbound bus stop

Description	Quantity	Unit	Unit Cost	Total Cost
Bus Shelter (inc. bench and lighting)	1	EA	$20,000	$20,000
Bus shelter (installation)	1	EA	$5,000	$5,000
Bus shelter (electrical work)	1	EA	$9,000	$9,000
Real-time Message Sign	1	EA	$8,000	$8,000
Trash bin	1	EA	$500	$1,000
Signage (1 bus stop information sign and 2 wayfinding signs)	3	TOTAL	$200	$600
Subtotal				$43,600

Contingencies (30%) = $13,080
Total = $56,680
SAY $57,000

Grand Total = $59,000

The above total does not include any ongoing operations and maintenance costs.

G.16 Key Issues to Resolve

- Determine Town of Morris and Morris County interest in proposed improvements. Obtain agreement on the types and scope of improvements.

- Conduct further design and engineering and perform necessary environmental assessments.

- Consult with the New Jersey State Historic Preservation Office and the Town of Morristown to determine if the proposed improvements will adversely impact the historic station.

G.17 Existing Conditions

G.17.1. Location and Land Use

Looking west on Dickerson Street at NJTRANSIT Dover Rail Station

NJ TRANSIT's Dover rail station is located at 7 E. Dickerson Street in the Town of Dover, Morris County, New Jersey. (See Figure G-13) Dover is a regional transportation hub served by two NJT commuter rail lines, the Morristown Line and the Montclair-Boonton Line and buses. Bus stops most proximate to this station are located one block north on Blackwell Street at South Bergen Street (see Figure G-13). The bus stops are located within a densely developed commercial area characterized by neighborhood retail establishments. The station is served by eight parking lots totaling 837 spaces, primarily for the use of commuter rail passengers. The station, platforms and right-of-way is owned by NJT. There are eight parking lots serving Dover rail station. Each lot is described below:

Lot A (Bergen Street) has 140 spaces, with parking fees. Daily and permit resident: standard $2.50/day, prime $4/day, night $20/month. Non-resident: standard $2.50/day, prime $4/day. The lot is owned by the Town of Dover.

Lot B (S. Morris Street and Monmouth Street) has 385 spaces with parking fees. Daily and permit resident: $2.50/day, night permit $20/month. Non-resident: $2.50/day, night permit $30/month. The lot is owned by the Town of Dover.

Lot C (Orchard Street and Legion Place) has 59 spaces. Short term, daily parking is available for $2.50/day for residents and non-residents. The lot is owned by the Town of Dover.

Lot D (Thompson Avenue and Legion Place) has 161 spaces. Daily and permit resident: $2.50/day, night permit $20/month. Non-resident: $2.50/day, night permit $30/month. The lot is owned by the Town of Dover.

Lot E (E. Dickerson Street and N. Sussex Street) has 40 spaces. Short term, daily parking is available for $2.50/day for residents and non-residents or $0.50/hour, night permit $20/month. The lot is owned by the Town of Dover.

Lot G (E. Dickerson Street and N. Sussex Street) has 49 spaces. Short term, daily parking is available for $2.50/day for residents and non-residents. The lot is owned by the Town of Dover.

Lot H (E. Dickerson Street and N. Warren Street) has 20 spaces. Short term, daily parking is available for residents and non-residents at $0.50/hour with a two-hour limit. The lot is owned by the Town of Dover.

Lot Z (Orchard Street and Legion Place) has 26 spaces. Short term, daily parking is available for residents and non-residents at $0.50/hour. The lot is owned by the Town of Dover.

The area surrounding these sites is a fully developed urban environment. Land uses are primarily mixed-use and residential to the north; a large parking area is located to the west, train storage to the east, and forest (undeveloped land) to the south (see Figure G-14).

G.17.2. Existing Bus Stop Facility Description

Dover Railroad Station is served by the Morristown Line and the Montclair-Boonton Line.

The parking lots are oriented towards serving the rail station. Lot A is adjacent to the rail station. The remaining lots are located adjacent to the north and south sides of the railroad right-of-way west of S. Morris Street. These lots are not situated to serve bus passengers as the bus stops are located to the north on E. Blackwell Street and S. Bergen Street, one block north the rail station.

Two regular routes serve Dover center: MCM 2 (Morristown to County College) and MCM 10 (Morristown to Rockaway Mall). These routes operate hourly on weekdays, with MCM 10 also providing service on Saturdays. The Morris on the Move (MOM) route provides several trips daily between Dover Station and Mount Olive. Two other routes provide very limited service: MCM 5 (Morristown to Hackettstown and Rockaway Mall) and MCM 7 (Dover to Milton); each operates a single round-trip only two days a *week*.

Westbound bus stop

The westbound bus stop serving the MCM 2 to Randolph (County College), the MCM 5 to Rockaway Mall, MCM 7 to Milton and the MCM 10 to Rockaway Mall is located on the sidewalk on the far-side of the intersection of westbound E. Blackwell Street and S. Bergen Avenue. There are no passenger amenities other than signage indicating that there is a bus stop at this location. Connection to the rail station can be made by walking one block south (250 feet) on S. Bergen Avenue. There are sidewalks along E. Blackwell Street and S. Bergen Avenue and marked crosswalks at the intersection.

Eastbound bus stop

The eastbound bus stop serving MCM 2, 5, and 10 to Morristown and MCM 7 to K-Mart Plaza is located on the sidewalk on the far-side of the intersection of eastbound E. Blackwell Street and S. Bergen Avenue. There are no passenger amenities other than signage indicating that there is a bus stop at this location. Connection to the rail station can be made on foot by walking one block south (250 feet) on S. Bergen Avenue. There are sidewalks along of E. Blackwell Street and S. Bergen Avenue and marked crosswalks at the intersection.

Dover Station Bus Stop

The rail station building provides shelter for rail passengers. There was no indication (signage, shelter, or schedules) that the Morris County on the Move (MOM) shuttle stops at the station building.

G.17.3. Problems Identified with Current Bus Stop Facilities:

The current bus stop facilities in Dover feature a lack of passenger amenities that may be an impediment to potential users and an inconvenience to existing users. For both the eastbound and westbound bus stops, the following needs were identified:

- Lack of visibility of the bus stops. The awareness of the availability of transit service begins with the ability to see that bus service is available along a route and that particular destinations are served.
- Lack of signage. This is related to the visibility issue. Signage is important in advertising the location of a bus stop as well as encouraging intermodal connections between the available rail and bus services.
- Lack of passenger information. This is a particular concern in Dover as the bus routes operating in this area run at limited times (i.e., once an hour or once in the morning and once in the afternoon) and for some routes only during certain days of the week.
- Lack of shelter and seating for waiting passengers. This creates an unpleasant environment for existing bus passengers and may discourage potential users.
- Personal safety concerns. The lack of shelter, information, and comfortable waiting areas can combine to create negative perceptions about transit service.

The proposed passenger facility improvements will address identified needs in the level of passenger amenities and comfort, and improve bus operations by providing a bus layover area. The facility improvements will be coordinated and compatible with the Town of Dover's Transit-Oriented Development plan.

G.18 Town of Dover Transit-Oriented Design Plan

In a separate effort the Town of Dover has commissioned a Transit-Oriented Development (TOD) Plan that focuses on the built environment and recommends form-based zoning changes that would concurrently to the Town's Master Plan process. The plan recommended changes that would have a positive impact on social form, and spur private sector investment. One of the key elements of the plan was to improve the streetscape and enhance access to the railroad station.

The TOD plan divided the study into eight sub-areas, with two sub-areas directly affecting the improvements proposed in this study. Sub-area 1 is the Dover Station Area and Sub-area 6 is East Blackwell Street. The TOD recommended the following planning principles to guide redevelopment of these areas:

Sub-area 1: Dover Station Area

- Dover Station to become a focal point of the community while highlighting the Historic nature of the Station and St. Paul's Church.
- Improved streetscape for all streets approaching the Station.
- A "pedestrian first" approach where amenities are clearly defined.
- Traffic calming with brick pavers and "speed tables".
- Defined vehicular circulation with "Kiss N Ride" amenities and taxi stand.
- Partnership with St. John's Church to create and enhance public space while highlighting the historic nature of the Church.
- Relocating surface parking into the parking lots decks proposed in Sub-area 5.
- Consider long term parking solutions such as a parking deck located on Lot A.

Sub-area 6: East Blackwell Street

- Continuation of the streetscape program, especially street trees.
- Connections to the Greenway links identified through acquisition of the abandoned Morristown and Erie rail lines and Rockaway River.
- Bus shelters and other pedestrian amenities identified in the Streetscape section of the plan.
- Improve walkability, thus connecting Senior Citizen's Home and other residents to the Downtown.
- Further study on the appropriateness of certain land uses and a plan for access to the Rockaway River.

Parking Recommendations

According to the TOD Plan, in order to balance the demand for parking and the need to enhance pedestrian friendly activity, Dover must strategically locate parking in a way that encourages automobile users to "park once".

The TOD Plan recommended that in Sub-area 1 the existing surface lot east of the Station (Municipal Lot A) remain but accommodate 121 surface parking spaces of its current 140 capacity. The remainder of surface parking facilities in sub-area 1 would be removed in favor of traffic calming measures, pedestrian amenities, and civic plaza/dining area. In total, the immediate station area would lose approximately 20 spaces from the parking lot but could gain 11 on-street spaces. The plan recommends relocating the lost spaces to development sites in Sub-area 5.

The plan did not make any recommendations concerning parking in Sub-area 6: Blackwell Street.

General Design Principles

The TOD Plan proposed general design guidelines for future redevelopment efforts.

- Create attractive walkways and continuous street-front experiences that maximize the quality of the pedestrian environment and afford opportunities to increase retail traffic.

- Configure sidewalks so people feel safe and comfortable; make sidewalks wide, appealing, and shady.
- Provide a hierarchy of direct and indirect lighting (no sodium vapor lights) that illuminates walkways, ensures safety, highlights buildings and landmark elements, while providing sight lines to retail uses. – (such as a view from a café to bookstores and unique shops.)
- Install well-designed, high quality street furniture to reinforce the strong image and comfort of the place.
- Carefully place strong landscaping elements, including shade trees that enhance the place.
- Vary roofscape and façade designs. (Retailers depend on diverse, appropriately scaled and customized shopfronts.)
- Use compelling, informative, and consistent signage to tell the story of the place (not literally).
- Design attractive corners and gateways to the Downtown.

In addition, specific streetscape standards were recommended including:

- Attractive bus stop shelters should be located at stops in Town.
- Brick pavers on all pedestrian crosswalks (raised at some key crossings in the form of speed tables).
- Uniform trash receptacles with tops that discourage inhibit residential use;
- Bike racks should also be implemented throughout Town to eliminate bicycles being chained to trees.

Specific improvements related to the improvements recommended in this study will be identified in Section 2: Proposed Plan.

Figure G-13: Project Location

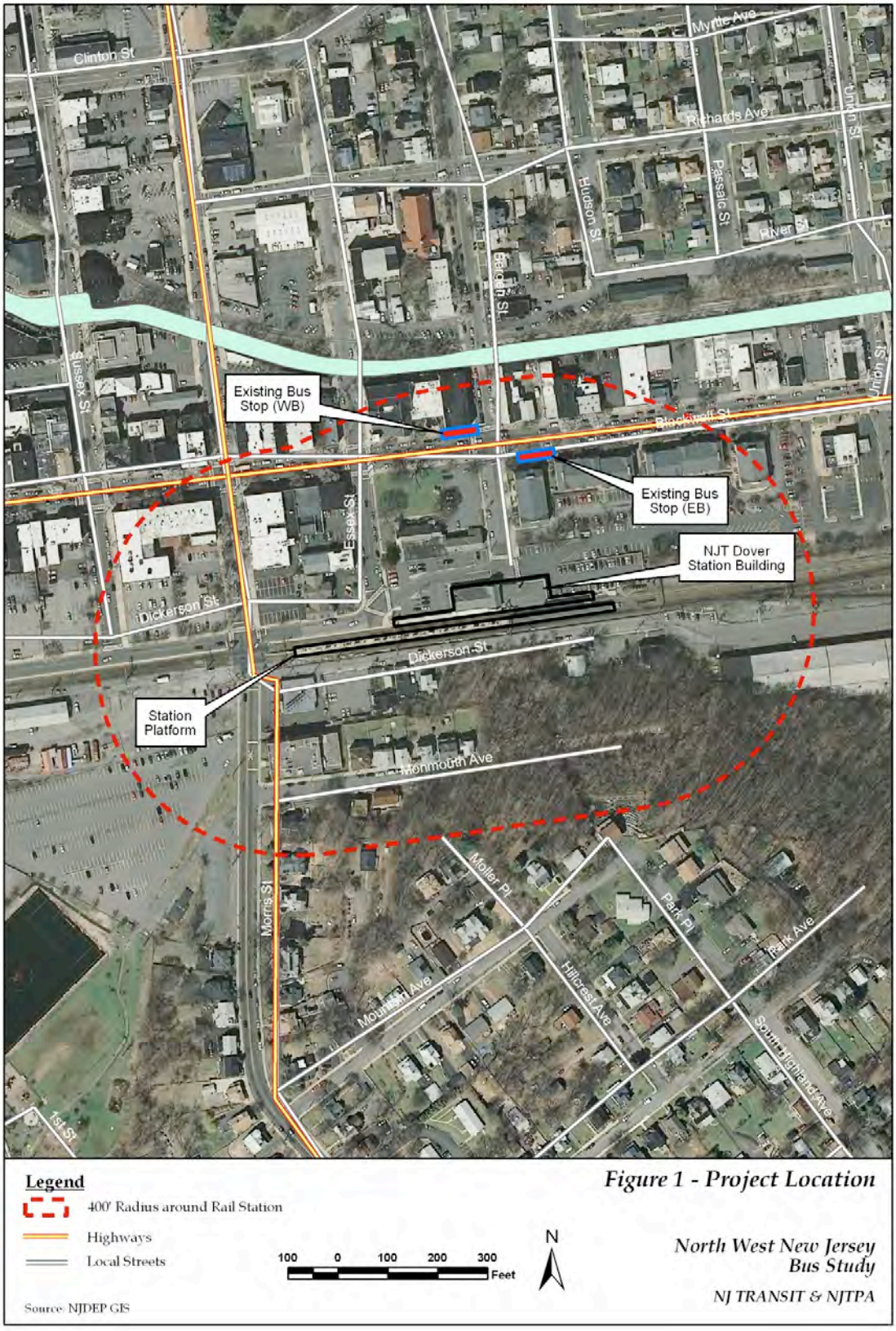


Figure G-14: Existing Conditions

G.19 Proposed Plan

G.19.1. Proposed New or Adjusted Routes Served

Bus service improvements in Dover include a new full-time version of the Morris on the Move which would also serve Rockaway Mall; a new peak hour shuttle from Sussex County which would also provide peak service from Dover to Piccatinny Arsenal; and increased frequency (to half-hourly) and new evening and weekend service on MCM 10.

G.19.2. Proposed Access and Operations:

Based on guidance by NJTRANSIT, MCM buses would continue to serve stops on East Blackwell Street near the station. However, the proposed new shuttle bus route from Sussex County, using minibuses, might stop directly in front of the station.

The four existing bus routes (MCM 2, MCM 5, MCM 7 and MCM 10) will continue to serve this transit hub via E. Blackwell Street. Installation of bus shelters at the eastbound and westbound bus stops is recommended. According to the ridership counts performed as part of this study, here were 68 daily boardings at Dover. Based on the guidelines *TCRP Report 19 Guidelines for the Locations and Design of Bus Stops*, in urban locations such as Dover, boarding levels of 50 to 100 boardings per day justify the installation of bus shelters.

It is anticipated that the existing sidewalks have sufficient space to accommodate 5-foot by 8-foot bus shelters; however, if sidewalk width is an issue, a common approach is to construct a bus bulb. A bus bulb is a bus stop where the sidewalk is extended into the parking lane, which allows the bus to pick up passengers without leaving the travel lane. (Actual sidewalk widths were not measured as this is a conceptual level design.)

An alternative location for the westbound bus shelter could be on the 'near-side' corner to avoid obstructing the existing store front on the 'far-side' corner.

At NJT's request, the study considered the possibility of a bus layover location in the area. A bus layover area could be provided in the existing parking lot along Dickerson Street which would require the removal of approximately 10 existing commuter parking spaces.

In addition, wayfinding signs along E. Blackwell Street and S. Bergen Avenue are proposed to improve connectivity between the railroad station and bus stops on E. Blackwell Street.

Specific recommendations affecting the proposed improvements under this study include:

- Provide textured crosswalks and paving including E. Blackwell Street and S. Bergen Avenue.
- Raised crosswalks in strategic locations to calm traffic including the Dover Station Area.
- Landscaping, including street trees and planters for aesthetics and safety including E. Blackwell Street and S. Bergen Avenue.
- Pedestrian plaza designed at Dover Station

- Consider removing “Right-turn on red” in the Downtown.

G.19.3. Proposed Passenger Facilities and Amenities:

At the Dover bus stops on E. Blackwell Street and at the Dover railroad station, the following improvements and amenities are recommended:

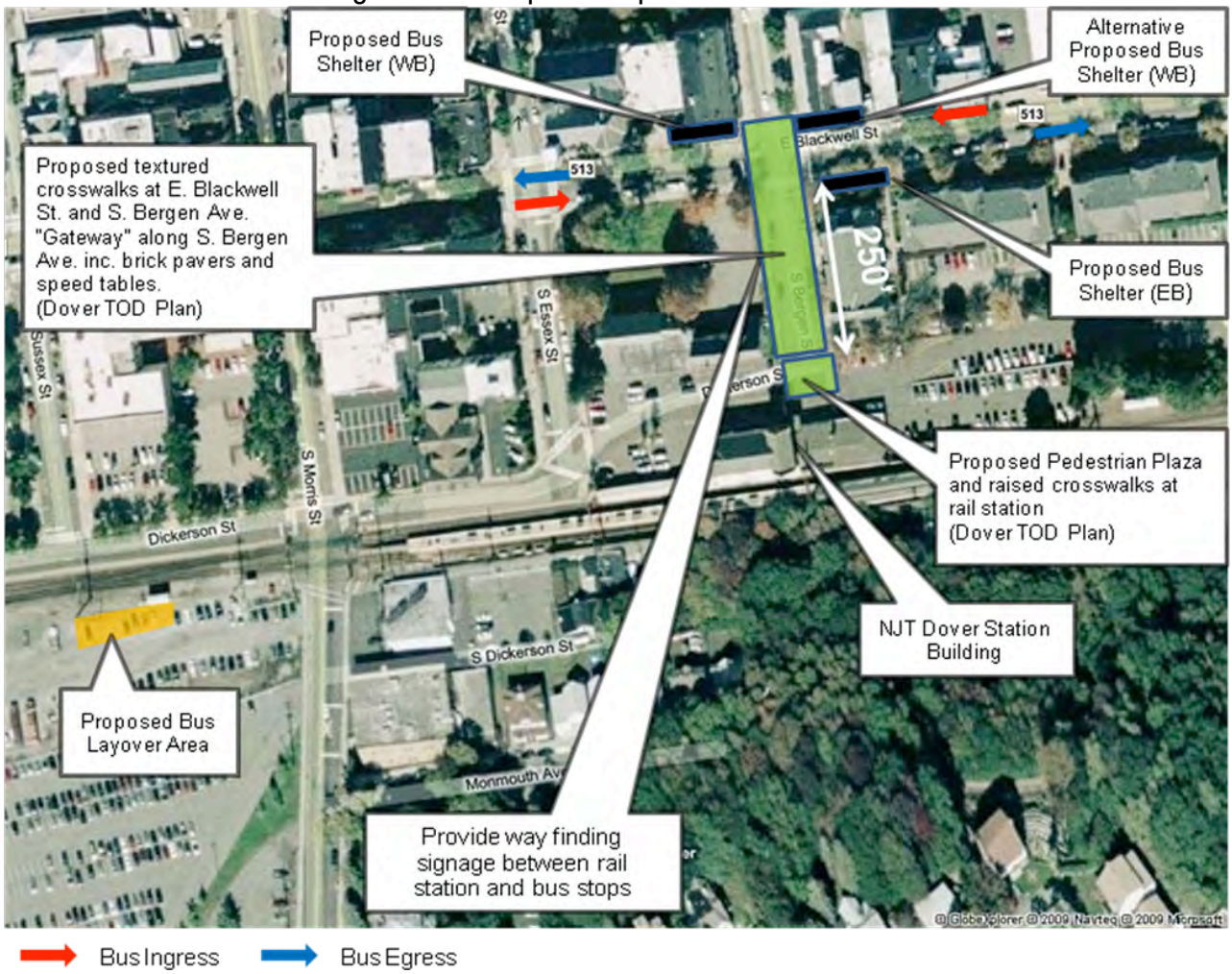
- Bus shelters. A bus shelter provides protection from the elements and seating while waiting for a bus. Bus shelters should be designed with transparent sides for visibility and safety. Bus shelters provide an opportunity to provide amenities such as transit route maps, schedules, and seating. Heated shelters at high ridership stops may be considered. In addition, a bus shelter is a highly visible indication that transit service is available along a route and a specific destination.
- Seating. Seats provide comfort to waiting customers and increase the attractiveness of the bus service, especially for those with mobility impairments. Patrons who have difficulty standing will benefit from seating and will more likely use transit services. Seating located in the shelter should leave clear space for patrons with wheelchairs to use the shelter.
- Lighting. Lighting affects bus patrons’ perception of safety and security at a bus stop, as well as the use of the site by non-bus patrons. Sufficient lighting can enhance a waiting passenger’s sense of comfort and security; insufficient lighting may encourage unintended use of the facility by non-bus patrons, especially after hours. Lighting is particularly important in climates where patrons may arrive and return to the stop in darkness during the winter season. Many new bus shelter designs include panels with backlighting.
- Route and timetable information. Providing information on bus arrival time and route allows riders to use the system more effectively and increases the convenience and attractiveness of transit to potential users. Information displays should be permanent features of the bus shelter and can be incorporated into the panels of the shelter. Temporary methods for displaying information (such as tape mounting) create a cluttered, unsophisticated appearance at the bus stop. As Global Positioning Systems and Automated Vehicle Location systems on buses become more common for transit systems, real time information display boards may be installed at stops to give patrons up to the minute information on bus arrival times and delays.
- Signage. Proper signage at bus stops is an important element of good transit service. Signs serve as a source of information to patrons and operators regarding the location of the bus stop and are effective marketing tools to promote transit use.
- Vending machines. Vending machines can provide passengers with reading material while they wait for the bus. However, the placement of vending machines should be carefully considered as they may reduce the amount of room for mobility and waiting and create trash and be subject to vandalism.
- Bicycle storage. Bicycle storage facilities, such as bike racks, may be provided at bus stops for the convenience of bicyclists using transit. Designated storage facilities discourage bicycle riders from locking bikes onto the bus facilities or on an adjacent property. Proper storage of bicycles can reduce the amount of visual clutter and ensure a clear pathway.
- Trash receptacles. Trash receptacles can improve the appearance of a bus stop by providing a place to dispose of trash.

- **Pedestrian improvements.** Separate from this study, Morris County is planning pedestrian improvements at the intersection of E. Blackwell Street and S. Bergen Avenue including pedestrian countdown signals and crosswalk upgrades.

Figure G-15: Typical Bus Shelter Design

This rendering illustrates the current direction in bus shelter design. This type of bus shelter incorporates many of the proposed improvements including shelter, seating, lighting, and passenger information.

Figure G-16: Proposed Improvements



G.20 Environmental Screening

A sketch environmental screening on this site was performed to identify any areas of environmental concern that would need to be studied and reviewed if this option is to be advanced.

This environmental screening is prepared under the guidance of the Federal Transportation Administration/Federal Highway Administration's Categorical Exclusion and Documented Categorical Exclusion Worksheet and the Code of Federal Regulations (CFR) part 23 CFR 771.

According to 23 CFR 771.117 (a) "Categorical exclusions (CEs) are actions which meet the definition contained in 40 CFR 1508.4, and, based on past experience with similar actions, do not involve significant environmental impacts. They are actions which: do not induce significant impacts to planned growth or land use for the area; do not require the relocation of significant numbers of people; do not have a significant impact on any natural, cultural, recreational, historic or other resource; do not involve significant air, noise, or water quality impacts; do not have significant impacts on travel patterns; or do not otherwise, either individually or cumulatively, have any significant environmental impacts."

Continuing under this description, at 23 CFR 771.117 (d), FHWA guidance directs that "Additional actions which meet the criteria for a CE in the CEQ regulations (40 CFR 1508.4) and paragraph (a) of this section may be designated as CEs only after Administration approval. The applicant shall submit documentation which demonstrates that the specific conditions or criteria for these CEs are satisfied and that significant environmental effects will not result."

Under this section, there are two threshold criteria that indicate that supplemental documentation is appropriate. These subparagraphs (4) and (7) are quoted below:

> "4. Transportation corridor fringe parking facilities."
>
> and
>
> "10. Construction of bus transfer facilities (an open area consisting of passenger shelters, boarding areas, kiosks and related street improvements) when located in a commercial area or other high activity center in which there is adequate street capacity for projected bus traffic."

Location and Land Use

The Dover railroad station and the bus stops on Blackwell Street are located in the Town of Dover, Morris County, New Jersey (see Figure G-13). Dover is a regional transportation hub served by two NJT commuter rail lines, the Morristown Line and the Montclair-Boonton Line and buses. The station is served by eight parking lots totaling 837 spaces, primarily for the use of commuter rail passengers.

In addition to rail service, bus routes serve Dover, stopping at the intersection of Blackwell Street and Bergen Street. The MCM 2 (Morristown to County College) and MCM 10 (Morristown to Rockaway Mall) provide hourly weekday service during peak and off-peak periods, the latter also

providing service on Saturday. . Routes MCM 5 and 7, and the Morris on the Move van provide more limited service.

The area surrounding these sites is a fully developed urban environment. Land uses are primarily mixed-use and residential to the north; a large parking area is located to the west, train storage to the east, and forest to the south. (See Figure G-17)

Coastal Zone

The Town of Dover is not located in the geographic areas defined in the Coastal Area Facility Review Act (CAFRA). No impacts to coastal zones would occur.

Highlands Preservation or Planning Area

The Town of Dover is within the Highlands Region as designated under the Highlands Protection Act (HPA). As such, the regulations governing development, including infrastructure, in these areas are an important consideration in the environmental screening task.

The Dover railroad station and the bus stops on Blackwell Street are located within in a designated Highlands Planning Area. Furthermore, they are located in an Existing Community Zone. .

The lands in the Planning Area of the Highlands Region are not subject to the DEP Highlands Preservation Area Rules and municipalities have the ability to opt into or not opt into the Highlands Regional Master Plan through a process called Plan Conformance.

Highlands Existing Community Zones consist of areas with regionally significant concentrated development signifying existing communities. These areas tend to have limited environmental constraints due to previous development patterns and may have existing infrastructure that can support development and redevelopment provided that such development is compatible with the protection and character of the Highlands environment, at levels that are appropriate to maintain the character of established communities.

Regardless of the designations, it should be assumed that this alternative, if advanced, will need formal review by the Highlands Council in order to obtain a firm determination of Highlands Act applicability.

Environmental Justice

In conformity with federal Executive Order 12898 (EO 12898), an environmental justice screening was performed to ascertain the potential for disproportionate impacts on minority groups or population at or below the poverty level. The analysis considers the proposed project's potential to cause significant adverse environmental impacts in the areas of traffic, air quality, and noise.

Year 2000 Census block group data (the finest level at which Census data are published in this area, given privacy concerns) was gathered and analyzed to identify the presence of populations with more than 50% of minority residents or more than 50% of residences below the poverty level. The Dover railroad station and the bus stops on Blackwell Street are located partially in Census

Tract 448 Block Group 2and partially in Census Tract 450 Block Group 3. These block groups meet the definition of an Environmental Justice community. (See Figure G-18)

The types of improvements proposed are anticipated to be beneficial by improving passenger amenities/passenger comfort and improving bus operations. No adverse impacts to Environmental Justice communities are anticipated.

Use of 4(f) Properties

A Section 4(f) property is defined to include a public park, recreation lands, wildlife and waterfowl refuges, and historic sites. While certain such properties may be used for transportation projects, if there is no reasonable alternative, a Section 4(f) analysis is used to determine whether the use of such lands for transportation purposes has been sufficiently considered and sufficiently minimized.

No Section 4(f) lands are being used for the improvements therefore no impacts to Section 4(f) lands would result. (See Figure G-19)

Historic Resources

According to query of the New Jersey State Historic Preservation Office's database, portions of Blackwell Street and Bergen Street are included with the Blackwell Historic District. (See Figure G-19) The Dover railroad station building is listed on both the National and New Jersey Register of Historic Places.

The findings are presented below:

- Blackwell Street Historic District (ID#2108) - Parts of Blackwell, Dickerson, Sussex, Bergen, Essex, Morris, Warren, Prospect and Dewey streets NR: 5/21/1982 (NR Reference #: 82003287) SR: 3/24/1982

- Delaware, Lackawanna, & Western RR Station at Dover (ID#2109) - North Dickerson Street SR: 2/1/1980 NR: 5/23/1980 (NR Reference #: 80002511) (Also included in Thematic Nomination of Operating Passenger Railroad Stations)

An assessment of the impact of the proposed improvements on these historic resources will be required. The assessment is necessary to determine if there is a change to the historic resource as part of the proposed action and if so, does the proposed action diminish the qualities of the resource. A consultation with the New Jersey State Historic Preservation Office and the Town of Dover will be required to determine if the proposed improvements will adversely impact the historic district.

Floodplains

According to Federal Emergency Management Agency, the bus stops on Blackwell Street are located within the 100 year flood zone. (See FigureG-20) Under the Flood Hazard Area Control Act regulations (N.J.A.C. 7:7-1.1 et seq.), a Stream Encroachment Permit is required for development activities in floodplains and floodways. A Stream Encroachment Permit application will include a

compliance statement addressing the applicable policies at N.J.A.C. 7:7 and the State Stormwater Management Rules at N.J.A.C. 7:8.

Hazardous Sites

According to the NJDEP GIS database, Known Hazardous Sites are sites where contamination of soil or ground water has been identified or where there has been, or there is suspected to have been a discharge of contamination.

Based on the referenced GIS, there appears to be a known contaminated site to the east of Blackwell Street and Bergen Street and in the parking lot of the restaurant at the Dover train station. If the construction activities are limited to the installation of bus shelters, then no adverse impacts are anticipated from this action. However, if more extensive construction or significant ground disturbance occurs then a Phase 2 Environmental Assessment would be required to determine any impacts and their extent. (See Figure G-19)

Air Quality and Conformity with State Implementation Plan

According to the United States Environmental Protection Agency (USEPA), Morris County is in moderate non-attainment for eight hour ozone standards and in non-attainment with PM-2.5. The region and the study area are in attainment with the carbon monoxide, nitrous oxide, sulfur dioxide, and lead standards.

The proposed improvements are not included in the State's plans to avoid or reduce congestion and improve air quality.

The proposed improvements would not result in construction, and would not change traffic volumes. Traffic reassignments would be negligible, and thus, changes in air quality would not be expected.

The proposed improvements are not included in the State's plans to avoid or reduce congestion and improve air quality.

Noise and Vibration

The proposed improvements would not increase traffic volumes or vehicular volumes that could change the noise environment when compared to the existing condition. There would be no substantial construction activity that would require the use of equipment that produces vibration (e.g., pile driving, movement of large bulldozers or trucks) and no impacts to fragile structures (as none exist in the area) would be expected.

Prime and Unique Farmlands

The proposed project is located in a fully developed urban area, and is not located near any prime or unique farmlands, nor is it located in a Highlands Preservation Area. (See Figure G-19)

Rare and Endangered Species; Critical Habitat

According to the NJDEP GIS database, there are no occurrences of Natural Heritage Priority sites. Natural Heritage Priority sites identify critically important areas to conserve New Jersey's biological diversity, with particular emphasis on rare plant species and ecological communities. However, these sites do not cover the entire known habitat for endangered and threatened species in New Jersey. (See Figure G-19)

No adverse impacts to Rare and Endangered Species or Critical Habitat are anticipated, however, it is recommended that the NJDEP's Office of Natural Lands Management be contacted to conduct a search of the Natural Heritage Database.

Water Quality

Surface Water Quality Standards establish the designated uses to be achieved and specify the water quality (criteria) necessary to protect the State's waters. Designated uses include potable water, propagation of fish and wildlife, recreation, agricultural and industrial supplies, and navigation. These are reflected in use classifications assigned to specific waters.

According to the NJDEP GIS database, there are no water bodies located within or near the Dover railroad station and the bus stops on Blackwell Street. No impacts to water quality are expected. (See Figure G-19)

Wetlands

According to the NJDEP GIS database, there are no wetlands located within a 400-foot radius of the Dover railroad station and the bus stops on Blackwell Street. No impacts to wetlands are expected to occur. (See Figure G-19)

It is recommended that the NJDEP's opinion on the impact to wetlands be requested.

Cumulative and Indirect Impacts

The cumulative impacts of the proposed improvements are expected to be positive, and would accrue in the form of increased attractiveness and convenience of transit as an alternative to automobile travel.

Indirect impacts are not anticipated from the implementation of the improvements, as there are no projects or developments that are dependent on the implementation of these improvements.

Property Acquisition

It is anticipated that a small portion of the sidewalk along both sides of the Blackwell Street would be required for bus shelters. There would be no commercial or residential displacements.

Permitting

If it is determined through further investigations and inquiries that there are impacts to wetlands, floodplains, or unique/endangered species habitat, then appropriate permits will be needed.

However, the proposed improvements would not likely affect these resources.

Other Federal Actions

No other federal actions are known to be required to undertake the proposed improvements.

Traffic and Transportation

The proposed improvements affect existing transportation facilities by improving bus stops and, there would not be an increase in traffic volumes or vehicular volumes that could adversely impact traffic or transportation.

Figure G-17: Land Use

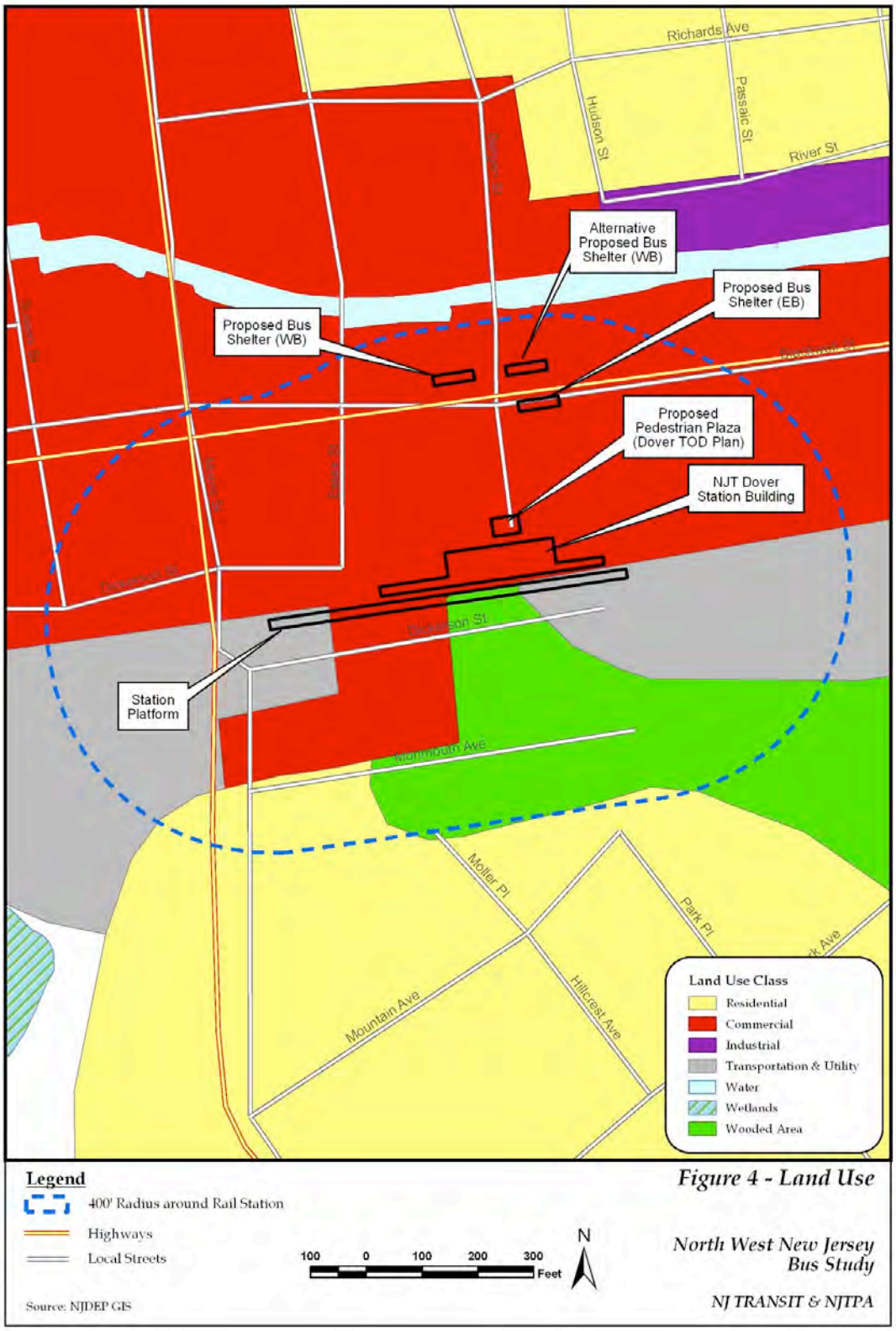


Figure G-18: Environmental Justice Census Block Groups in the Project Area

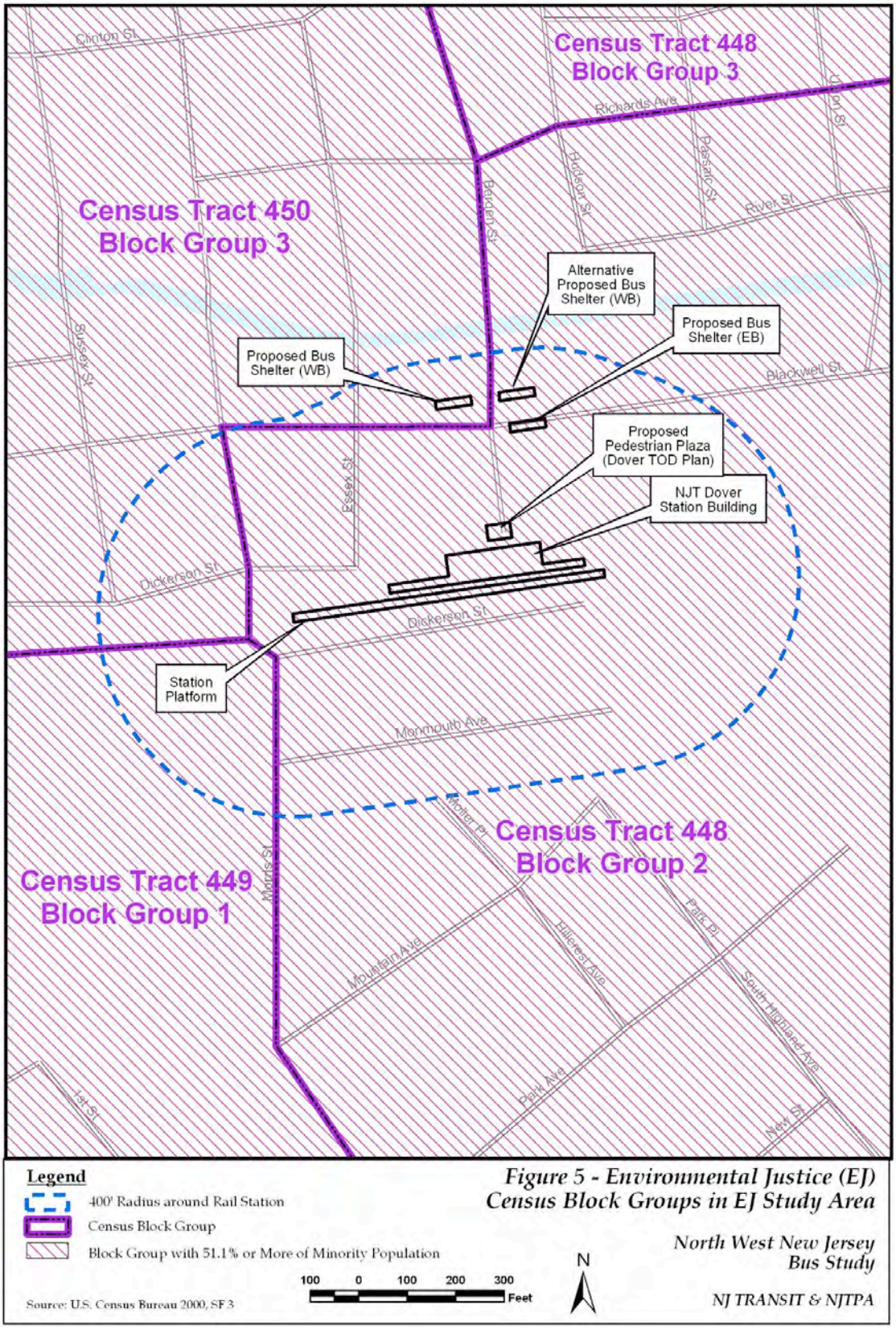


Figure G-19: Areas of Environmental Concern in the Project Area

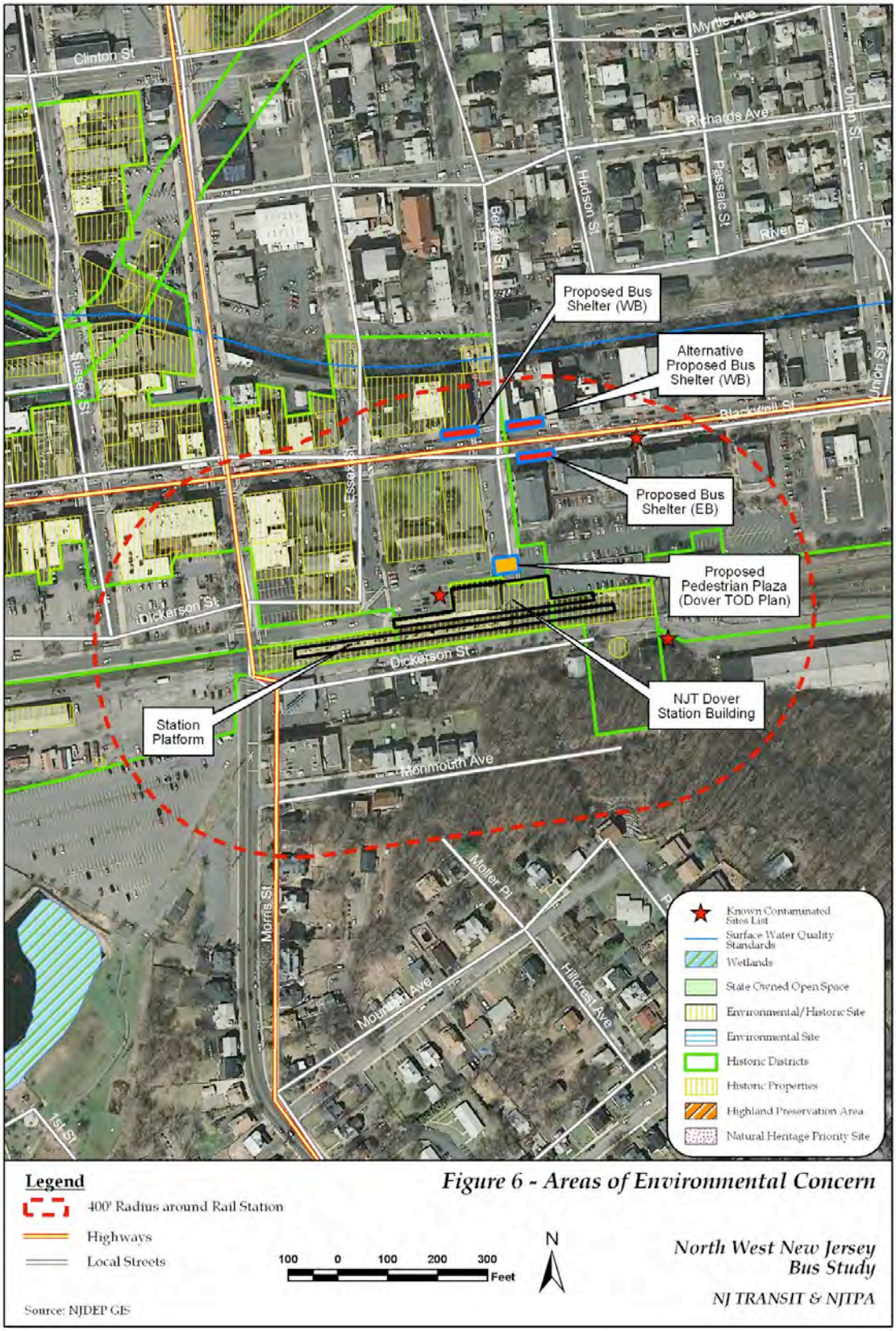
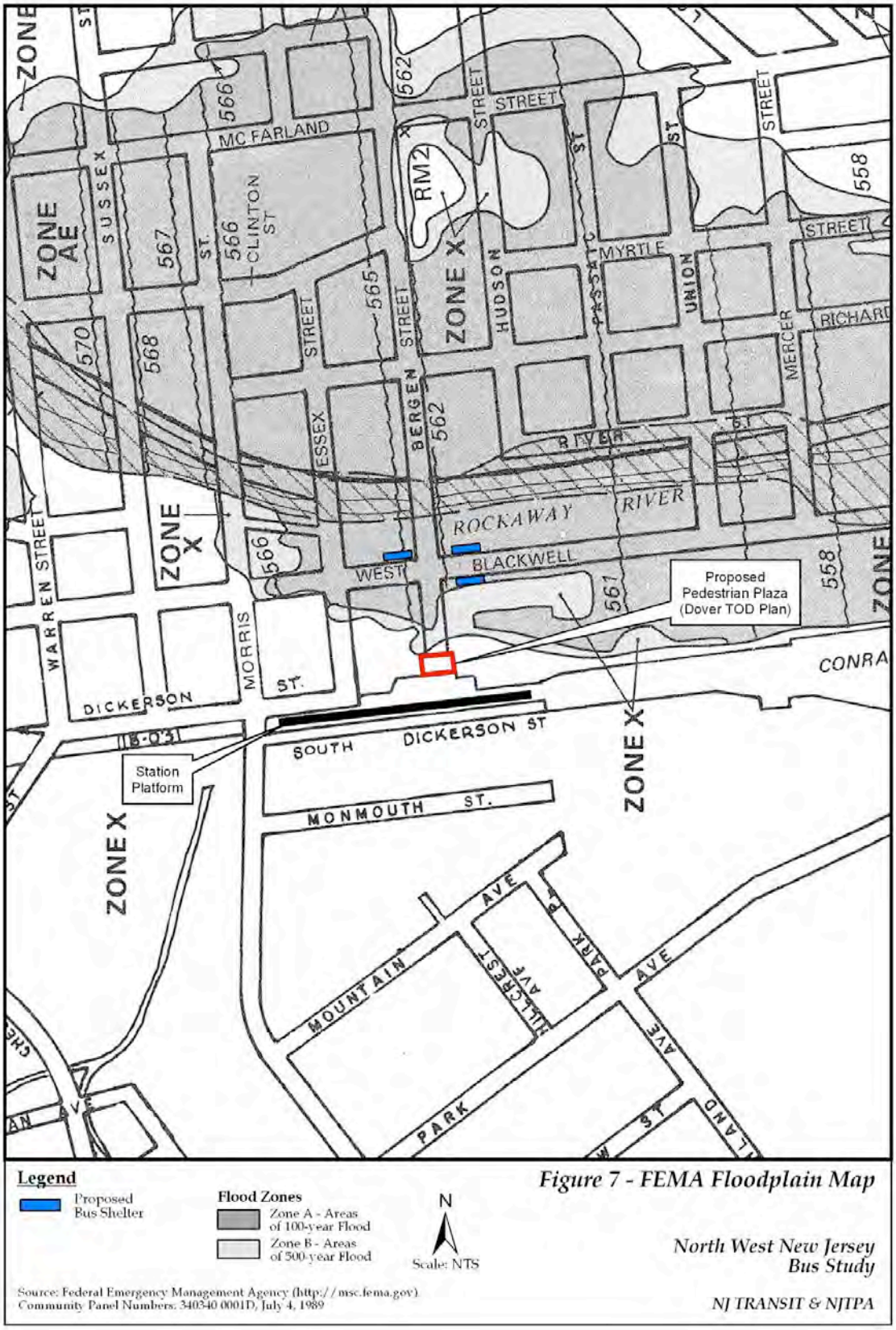


Figure G-20: FEMA Floodplain Map for Project Area



G.21 Cost Estimate (based on 10% design)

Order-of-magnitude capital cost estimates were developed for the proposed improvements, reflecting the conceptual level of engineering. These estimates include costs for major proposed elements and a 30% contingency to account for items such as maintenance of traffic, construction layout, escalation, and mobilization.

Description	Quantity	Unit	Unit Cost	Total Cost
Bus Shelter (inc. bench and lighting)	2	EA	$20,000	$40,000
Bus shelter (installation)	2	EA	$5,000	$10,000
Bus shelter (electrical work)	2	EA	$9,000	$18,000
Real-time Message Sign	2	EA	$8,000	$16,000
Ticket Vending Machine	2	EA	$12,000	$24,000
Trash bin	2	EA	$500	$1,000
Bike rack	2	EA	$1,700	$3,400
Signage (2 bus stop information signs and 2 wayfinding signs)	4	TOTAL	$200	$800
Subtotal				$113,200

Contingencies (30%) = $33,960
Total = $147,160
SAY $147,000

The above total does not include any ongoing operations and maintenance costs.

G.22 Key Issues to Resolve

- Determine Town of Dover interest in proposed improvements. Obtain agreement on the types and scope of improvements.
- Assessment of impact to historic resources, specifically within the Blackwell Street Historic District. Consultation with the New Jersey State Historic Preservation Office and the Town of Dover.
- Contact the Highlands Council for formal review in order to obtain a firm determination of Highlands Act applicability.
- Contact NJDEP's Office of Natural Lands Management to confirm that no Rare and Endangered Species or Critical Habitat is located within the project site.
- Consult with the New Jersey State Historic Preservation Office and the Town of Dover to determine if the proposed improvements will adversely impact the historic district.

G.23 Sources

The following sources were used to identify any areas of environmental concern.

Location and Land Use

NJDEP GIS database and layers - http://www.state.nj.us/dep/gis/lulc02shp.html

Coastal Zone

NJDEP GIS database and layers - http://www.state.nj.us/dep/landuse/caframap.html

Highlands Preservation or Planning Area

http://maps.njhighlands.us/default.asp#

Use of 4(f) Properties

NJDEP GIS database and layers - http://www.state.nj.us/dep/gis/lulc02shp.html
NJDEP GIS database and layers - http://www.state.nj.us/dep/gis/stateshp.html#STOPEN

Historic Resources

http://www.nr.nps.gov/iwisapi/explorer.dll?IWS_SCHEMA=NRIS1&IWS_LOGIN=1&IWS_REPORT=100000040

http://www.state.nj.us/dep/hpo/1identify/nrsr_lists.htm

Hazardous Sites

NJDEP GIS database and layers - http://www.state.nj.us/dep/gis/

Prime and Unique Farmlands

NJDEP GIS database and layers - http://www.state.nj.us/dep/gis/lulc02shp.html

Rare and Endangered Species; Critical Habitat

NJDEP GIS database and layers – http://www.nj.gov/dep/parksandforests/natural/heritage/datareq.html

Water Quality

NJDEP GIS database and layers – http://www.state.nj.us/dep/gis/stateshp.html#SWQS

Wetlands

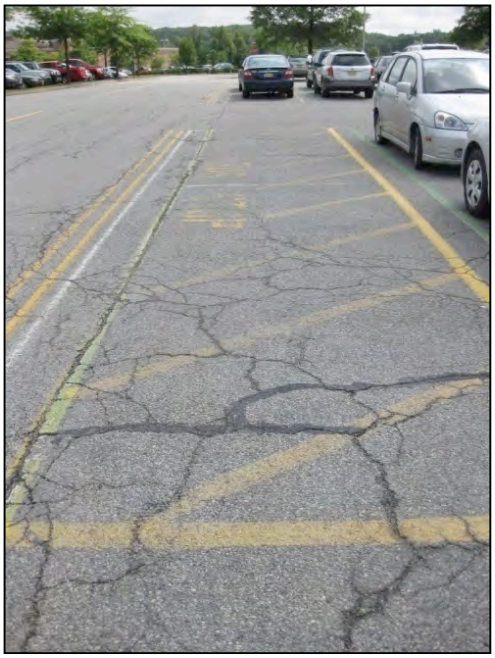
NJDEP GIS database and layers - http://www.state.nj.us/dep/gis/

G.24 Existing Conditions

G.24.1. Location and Land Use

Rockaway Townsquare Mall is located at 301 Mt. Hope Avenue in Rockaway Township, NJ (see Figure G-21). The mall is a major retail activity center as well as a transit hub located at the intersection of Interstate 80 and Mount Hope Avenue. The mall is owned by the Simon Property Group. It is anchored by Macy's, Lord & Taylor, JC Penney, and Sears and has over 180 retail establishments and a gross leasable area of 1,244,000 square feet. There are approximately 8,000 parking spaces in the mall. There are 400 parking spaces (outlined in green pavement striping) reserved for commuters in Lot 36, one of the sections of the mall parking lot, located in the southeastern portion of the property. This represents only 5% of the total parking spaces available on site. Parking utilization at this lot is high and nearing capacity. Commuters are not permitted to use other spaces in the mall. There are no fees for commuters to park at this facility (see Figure G-22).

Land use at Rockaway Townsquare Mall is commercial, with surrounding uses zoned as wooded (i.e., undeveloped) areas (undeveloped), wetlands and extractive mining. (See Figure G-26) While Simon Property Group owns the mall and most of the surrounding retail properties, a few smaller sites toward the northeast portion of the area are owned by others.



The commuter bus stop waiting area

G.24.2. Existing Bus Stop Facility Description

The Rockaway Townsquare Mall is served by four bus routes. The Mall hosts two bus stops, a "shoppers" stop served by local bus service to Morristown and a "park-and-ride commuter" stop served by local and express bus routes to New York City. A portion of the Mall's parking facilities are used during commuting hours as a park-and-ride under an agreement with NJ TRANSIT. A total of 400 parking spaces are set aside for commuter use (designated by green parking stall markings).

Rockaway Townsquare Mall management and NJ TRANSIT have partnered to provide two bus stops at the Rockaway Townsquare Mall.

Commuter Park-and-Ride Stop

The commuter bus stop at this park and ride site is located in the southeastern parking lot adjacent to the commuter parking and offers two waiting areas. This stop is served by two Lakeland bus routes:

- Lakeland 80- Interstate express service between Newton/Sparta/Budd Lake and New York City during peak periods in the peak direction
- Lakeland 46/80 local – Interstate local service between Newton/Sparta/Budd Lake and New York City with stops made between Dover and WIllowbrook Mall for reverse peak, off-peak and weekend trips.

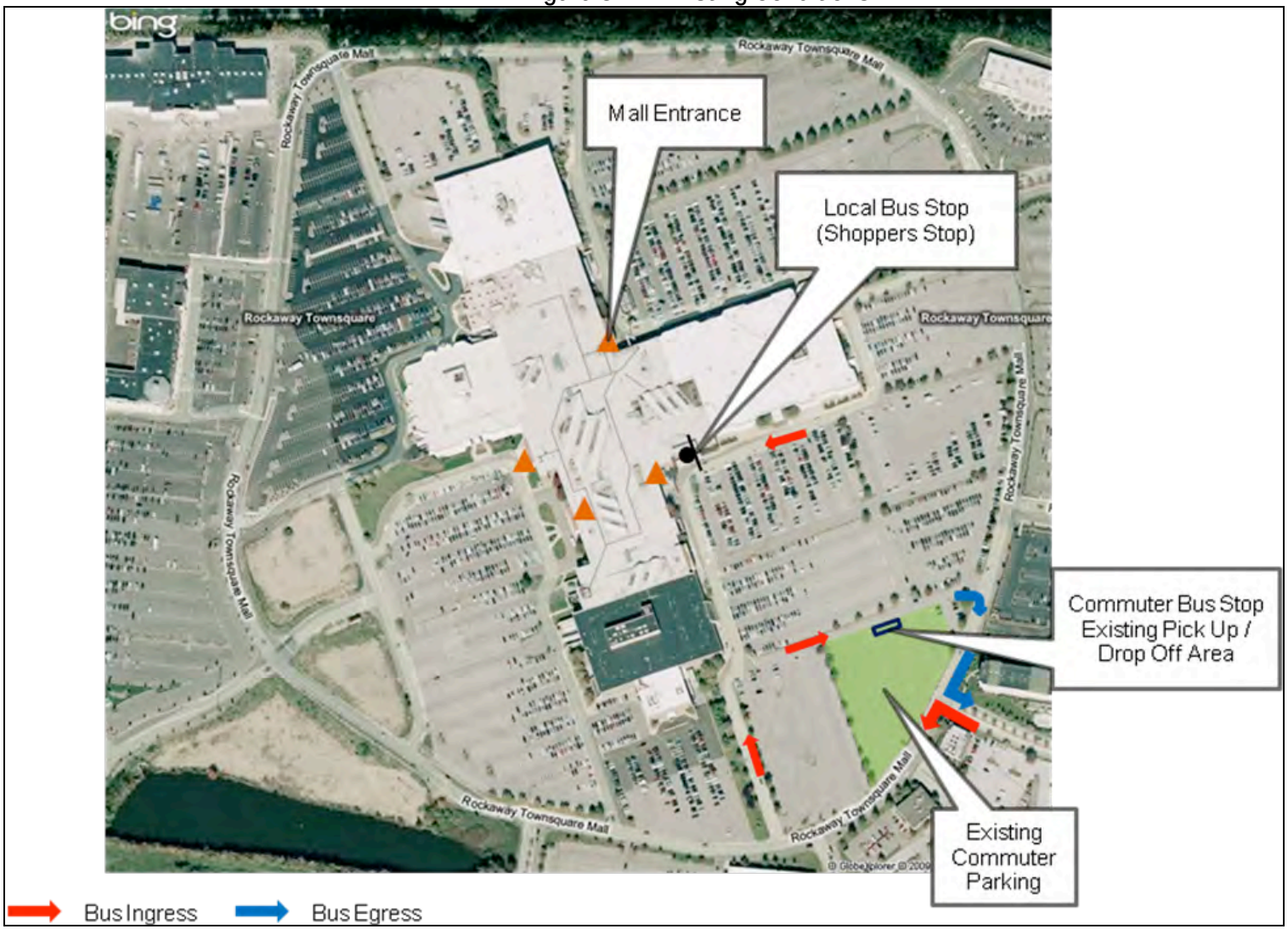
Local "Shoppers'" Stop:

The local "shoppers" bus stop is located at the Mall entrance adjacent to Lakeland Bank and Macy's. This stop is served by two local bus routes: MCM 5 (Morristown to Rockaway Mall via Hackettstown) and MCM 10 (Morristown to Rockaway Mall). This stop is used to pick-up and drop-off passengers. This has a bus stop sign and post with bus route numbers and names. There is a bench and bicycle rack (accommodating 3 bikes) at this stop, but the latter is not necessarily for use by bus passengers. The MCM 10 route operates hourly Monday to Saturday and the MCM 5 operates only two days a week, and with one trip in each direction during off-peak periods.

View of Local "Shoppers" Stop at Rockaway Townsquare Mall entrance

Figure G-21: Proposed Project Area

Figure G-22: Existing Conditions



G.24.3. Problems Identified with Current Facilities

The Rockaway Townsquare Mall is a major transit hub with 544 daily boardings according to the ridership surveys conducted as part of this study. Rockaway Townsquare Mall's commuter park-and-ride stop and shopper's stop both lack the most basic passenger amenities such as bus shelters with seating, posted schedules, lighting, trailblazer (i.e., signage along adjacent roads indicating the presence and direction of park-and-ride facilities), and bus route signage (at the commuter stop).

The commuter bus stop offers two waiting areas identifiable only by pavement markings that say "bus stop". There are currently no shelters, benches, bus stop signs or passenger information displays for customers.

At the local "Shoppers" stop, there is a small canopy over the mall's entrance with a bench and bicycle rack, although they are not necessarily designed for the needs of bus passengers.

For both bus stops, the lack of passenger amenities may be an impediment to potential users and an inconvenience to existing users. For both the local "shoppers" stop and the commuter bus stops, the following needs were identified:

- Lack of visibility of the bus stops. The awareness of the availability of transit service begins with the ability to see that bus service is available along a route and that particular destinations are served.
- Lack of signage. This is related to the visibility issue. Signage is important in advertising the location of a bus stop as well as encouraging connections between the available bus services.
- Lack of passenger information. This is a particular concern in as the bus routes operating in this area run at limited times (i.e., once an hour or once in the morning and once in the afternoon) and for some routes only during certain days of the week.
- Lack of shelter and seating for waiting passengers. This creates an unpleasant environment for existing bus passengers and may discourage potential users.
- Personal safety concerns. The lack of shelter, information, lighting, and comfortable waiting areas can combine to create negative perceptions about transit service.

Under the current configuration, the "shoppers" stop and commuter park-and-ride stop are separated from each other. By combining the two stops into one location, a synergy can be created and facilities and amenities could be shared. Transfers between routes would be made more attractive and convenient. Furthermore, the operational efficiency of these bus stops could be improved by combining bus operations into one location in the northeastern portion of the mall parking lot and upgrading the existing passenger facilities to reflect its importance as a transit hub.

The proposed passenger facility improvements will address needs identified in the study for improving ease of transfers between all bus routes, improving passenger comfort, amenities, and mall access, and future opportunities for park and ride capacity expansion. There are a number of service proposals that, if implemented, would further introduce even more bus routes thus increasing the usage of this facility as well as its importance as a major transit hub.

G.25 Proposed Plan

G.25.1. Proposed New or Adjusted Routes Served

The frequency of MCM 10 is proposed to be increased from hourly to half-hourly. Evening and Sunday service would be added. Additionally, a new daily route would operate hourly to Dover and points west.

Express bus service would be slightly increased with new trips to Hackettstown and possibly the Roxbury and Ledgewood Malls (if demand exceeds the number of parking spaces available here). Off-peak service would be added to serve Newton and Sparta and combined trips, which would increase frequency at the Rockaway Mall to hourly at most times.

G.25.2. Proposed Access and Operations

An integrated Transit Hub and shared use park and ride facility is proposed to be relocated to the northeast portion of the mall (see Figure G-25) to be closer to Mount Hope Avenue and Interstate-80. This will minimize bus running times by reducing travel within the mall parking areas, which can become congested at certain times.

Several options for the location of the integrated Transit Hub and Shared Use Park and Ride within Rockaway Townsquare Mall were considered and discussed with NJ TRANSIT. The northeast section was selected as the best location for an integrated transit hub because of its proximity to Mount Hope Avenue and Interstate-80.

The four existing bus routes will continue to serve this transit hub with the possibility of one additional bus route, for a combined total of five bus routes. The new combined Transit Hub would facilitate transfers between local and commuter buses for both inbound and reverse commute travelers.

The new location would provide approximately 400 parking spaces and identify an additional 200 parking spaces (3% of total parking capacity) that could be leased when demand for the existing spaces exceeds supply. The installation of the new bus shelter and parking for people with disabilities [note the requirements for disabled parking] would require the removal of 50 existing customer parking spaces. This represents 0.6% of total parking capacity.

G.25.3. Proposed Facility Enhancements

At the integrated Transit Hub and Shared Use Park and Ride, the following upgrades improvements and amenities are recommended:

- Bus shelters. A bus shelter provides protection from the elements and seating while waiting for a bus. Bus shelters should be designed with transparent sides for visibility and safety. Bus shelters provide an opportunity to provide amenities such as transit route maps, schedules, and seating. Heated shelters at high ridership stops may be considered. In addition, a bus shelter is a highly visible indication that transit service is available along a route and a specific destination.
- Seating. Seats provide comfort to waiting customers and increase the attractiveness of the bus service, especially for those with mobility impairments. Patrons who have difficulty standing will benefit from seating and will more likely use transit services. Seating located in the shelter should leave clear space for patrons with wheelchairs to use the shelter.
- Lighting. Lighting affects bus patrons' perception of safety and security at a bus stop, as well as the use of the site by non-bus patrons. Sufficient lighting can enhance a waiting passenger's sense of comfort and security; insufficient lighting may encourage unintended use of the facility by non-bus patrons, especially after hours. Lighting is particularly important in climates where patrons may arrive and return to the stop in darkness during the winter season. Many new bus shelter designs include panels with backlighting.
- Route and timetable information. Providing information on bus arrival time and route allows riders to use the system more effectively and increases the convenience and attractiveness of transit to potential users. Information displays should be permanent features of the bus shelter and can be incorporated into the panels of the shelter. Temporary methods for displaying information (such as tape mounting) create a cluttered, unsophisticated appearance at the bus stop. As Global Positioning Systems and Automated Vehicle Location systems on buses become more common for transit systems, real time information display boards may be installed at stops to give patrons up to the minute information on bus arrival times and delays.
- Signage. Proper signage at bus stops is an important element of good transit service. Signs serve as a source of information to patrons and operators regarding the location of the bus stop and are effective marketing tools to promote transit use.
- Vending machines. Vending machines can provide passengers with reading material while they wait for the bus. However, the placement of vending machines should be carefully considered as they may reduce the amount of room for mobility and waiting and create trash and be subject to vandalism.
- Bicycle storage. Bicycle storage facilities, such as bike racks, may be provided at bus stops for the convenience of bicyclists using transit. Designated storage facilities discourage bicycle riders from locking bikes onto the bus facilities or on an adjacent property. Proper storage of bicycles can reduce the amount of visual clutter and ensure a clear pathway.
- Trash receptacles. Trash receptacles can improve the appearance of a bus stop by providing a place to dispose of trash.
- Pedestrian improvements. High visibility crosswalks would be provided to the Mall from the parking area. High visibility crosswalks are typically eight feet wide and are comprised

of 24 inch longitudinal lines separated by 24 inch spaces, and parallel to the approach lanes.

It is recommended that a pedestrian canopy be provided to connect the bus stop with the mall entrance.

- Access to restrooms. If not already included in the leasing agreement, a provision to allow bus passengers to use the mall restroom facilities should be considered. Since these facilities are already available, an access agreement would eliminate the need and cost of constructing this type of facility.

The same number of commuter and overflow parking spaces would be provided at the new location. However, the area identified leaves room for future expansion. The installation of the new bus shelter would require the removal of 10 existing parking spaces. Overall parking capacity will be minimally affected by the removal of ten spaces as the total parking capacity is 8,000 spaces (or 0.13% of total parking capacity).

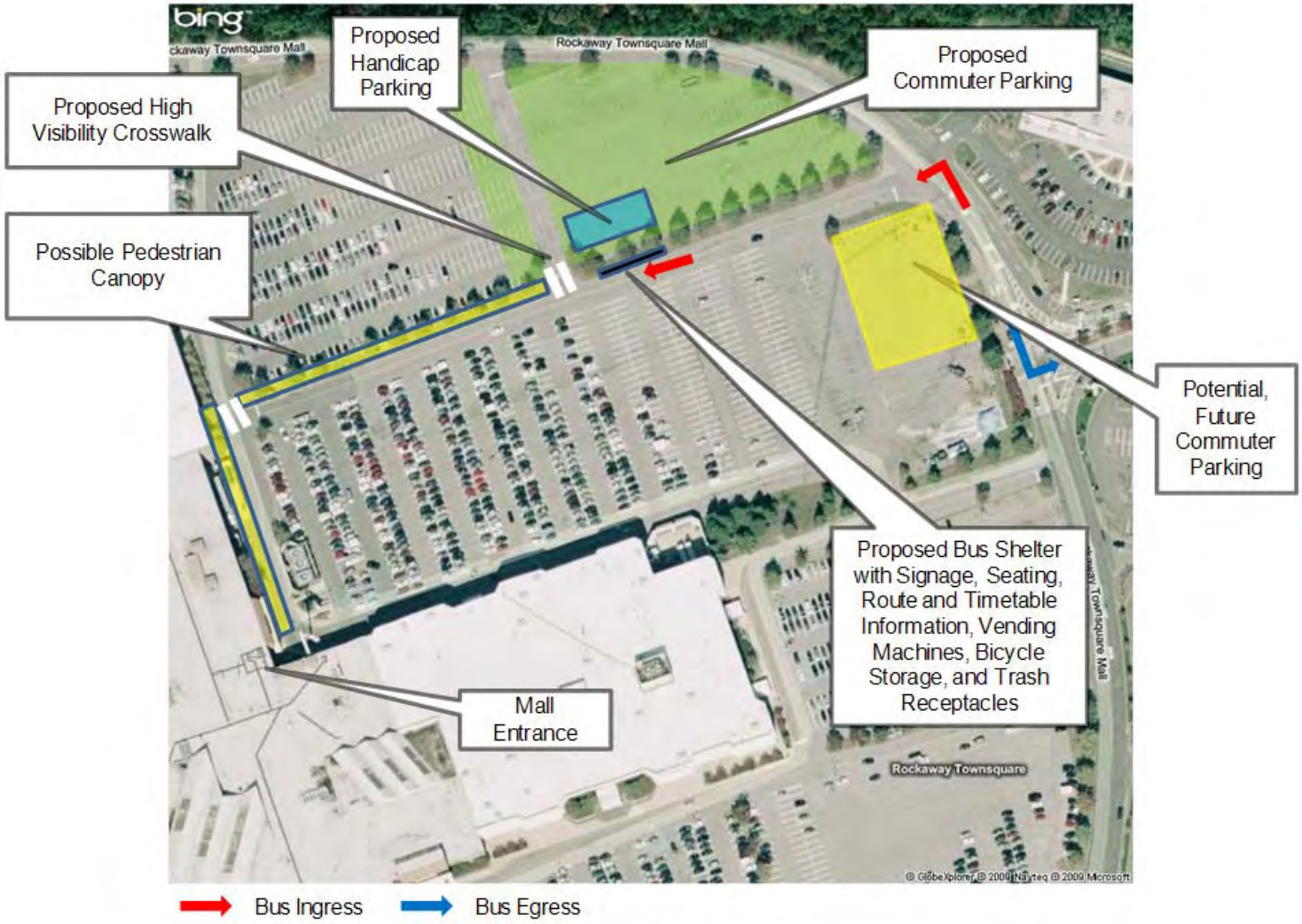
Figure G-23: Visualization of Proposed Transit Center at Rockaway Mall

Figure G-23 shows a photo-illustration of a concept for a Transit Center at the Rockaway Townsquare Mall. The Transit Center features amenities such as printed and electronic schedule information, lighting, heating, security cameras, seating, wind screens, trash bins, and ticket vending machines. Passenger facilities should also contain enclosed shelters to protect passengers in inclement weather.

A covered walkway (see example in Figure G-24) should be installed to provide a clear, safe, weather-protected pathway for bus passengers between the mall building, parking areas, and the transit center.

Figure G-24: Example of Covered Walkway

Figure G-25: Proposed Improvements



G.26 Environmental Screening

A sketch environmental screening on this site was performed to identify any areas of environmental concern that would need to be studied and reviewed if this option is to be advanced.

This environmental screening is prepared under the guidance of the Federal Transportation Administration/Federal Highway Administration's Categorical Exclusion and Documented Categorical Exclusion Worksheet and the Code of Federal Regulations (CFR) part 23 CFR 771.

According to 23 CFR 771.117 (a) "Categorical exclusions (CEs) are actions which meet the definition contained in 40 CFR 1508.4, and, based on past experience with similar actions, do not involve significant environmental impacts. They are actions which: do not induce significant impacts to planned growth or land use for the area; do not require the relocation of significant numbers of people; do not have a significant impact on any natural, cultural, recreational, historic or other resource; do not involve significant air, noise, or water quality impacts; do not have significant impacts on travel patterns; or do not otherwise, either individually or cumulatively, have any significant environmental impacts."

Continuing under this description, at 23 CFR 771.117 (d), FHWA guidance directs that "Additional actions which meet the criteria for a CE in the CEQ regulations (40 CFR 1508.4) and paragraph (a) of this section may be designated as CEs only after Administration approval. The applicant shall submit documentation which demonstrates that the specific conditions or criteria for these CEs are satisfied and that significant environmental effects will not result."

Under this section, there are two threshold criteria that indicate that supplemental documentation is appropriate. These subparagraphs (4) and (7) are quoted following:

> "4. Transportation corridor fringe parking facilities."
>
> and
>
> "10. Construction of bus transfer facilities (an open area consisting of passenger shelters, boarding areas, kiosks and related street improvements) when located in a commercial area or other high activity center in which there is adequate street capacity for projected bus traffic."

Coastal Zone

Rockaway Township is not located in the geographic areas defined in the Coastal Area Facility Review Act (CAFRA). No impacts to coastal zones would occur.

Highlands Preservation or Planning Area

Rockaway Township is within the Highlands Region as designated under the Highlands Protection Act (HPA). As such, the regulations governing development, including infrastructure, in these areas are an important consideration in the environmental screening task.

Rockaway Townsquare Mall is located within a designated Highlands Planning Area. Furthermore, it is located in an Existing Community Zone.

The lands in the Planning Area of the Highlands Region are not subject to the DEP Highlands Preservation Area Rules and municipalities have the ability to opt into or not opt into the Highlands Regional Master Plan through a process called Plan Conformance.

Highlands Existing Community Zones consist of areas with regionally significant concentrated development signifying existing communities. These areas tend to have limited environmental constraints due to previous development patterns and may have existing infrastructure that can support development and redevelopment provided that such development is compatible with the protection and character of the Highlands environment, at levels that are appropriate to maintain the character of established communities.

Regardless of the designations, it should be assumed that this alternative, if advanced, will need formal review by the Highlands Council in order to obtain a firm determination of Highlands Act applicability.

Environmental Justice

In conformity with federal Executive Order 12898 (EO 12898), an environmental justice screening was performed to ascertain the potential for disproportionate impacts on minority groups or population at or below the poverty level. The analysis considers the proposed project's potential to cause significant adverse environmental impacts in the areas of traffic, air quality, and noise.

Year 2000 Census block group data (the finest level at which Census data are published in this area, given privacy concerns) was gathered and analyzed to identify the presence of populations with more than 50% of minority residents or more than 50% of residences below the poverty level. There are no environmental justice communities located in or near the project site. No impacts to Environmental Justice communities are anticipated. (See Figure G-27)

Use of 4(f) Properties

A Section 4(f) property is a public park, recreation lands, wildlife and waterfowl refuges, and historic sites. While certain such properties, may, if there is no reasonable alternative be used for transportation projects, a Section 4(f) analysis is used to determine whether the use of such lands for transportation purposes has been sufficiently considered and sufficiently minimized.

The Rockaway Townsquare Mall does not include any 4(f) properties. The proposed improvements do not affect any lands outside of the property boundaries. No Section 4(f) lands

are being used for the improvements therefore no impacts to Section 4(f) lands would result. (See Figure G-28)

Historic Resources

A query of the New Jersey Department of Environmental Protection's Nautical and Historic Preservation Office's database and National Registers of Historic Places indicates that the Rockaway Townsquare Mall does not appear in the State of National Register of Historic Places as a listed or eligible resource. (See Figure G-28)

Floodplains

A search for the property in the Federal Emergency Management Agency's website indicated that this location is not in any flood zones.

Hazardous Sites

According to the NJDEP GIS database, Known Hazardous Sites are sites where contamination of soil or ground water has been identified or where there has been, or there is suspected to have been a discharge of contamination.

Based on the referenced GIS, there appears to be a known contaminated site at the Rockaway Townsquare Mall building. However, this area is well outside of the 400-foot radius of the proposed project site. (See Figure G-28)

Air Quality and Conformity with State Implementation Plan

According to the United States Environmental Protection Agency (USEPA), Morris County is in moderate non-attainment for eight hour ozone standards and in non-attainment with PM-2.5. The region and the study area are in attainment with the carbon monoxide, nitrous oxide, sulfur dioxide, and lead standards.

The proposed improvements are not included in the State's plans to avoid or reduce congestion and improve air quality.

The proposed improvements would not result in construction, and would not change traffic volumes. Traffic reassignments would be negligible, and thus, changes in air quality would not be expected.

Noise and Vibration

The proposed improvements would not increase traffic volumes or vehicular volumes that that could change the noise environment when compared to the existing condition. There would be no substantial construction activity that would require the use of equipment that produces vibration (e.g., pile driving, movement of large bulldozers or trucks) and no impacts to fragile structures (as none exist in the area) would be expected.

Prime and Unique Farmlands

The proposed project is located in a fully developed area, and is not located near any prime or unique farmlands, nor is it located in a Highlands Preservation Area. (See Figure G-28)

Rare and Endangered Species; Critical Habitat

According to the NJDEP GIS database, there are no occurrences of Natural Heritage Priority sites. Natural Heritage Priority sites identify critically important areas to conserve New Jersey's biological diversity, with particular emphasis on rare plant species and ecological communities. However, these sites do not cover the entire known habitat for endangered and threatened species in New Jersey.

No adverse impacts to Rare and Endangered Species or Critical Habitat are anticipated, however, it is recommended that the NJDEP's Office of Natural Lands Management be contacted to conduct a search of the Natural Heritage Database. (See Figure G-28)

Water Quality

Surface Water Quality Standards establish the designated uses to be achieved and specify the water quality (criteria) necessary to protect the State's waters. Designated uses include potable water, propagation of fish and wildlife, recreation, agricultural and industrial supplies, and navigation. These are reflected in use classifications assigned to specific waters.

According to the NJDEP GIS database, there are no water bodies located within the Rockaway Townsquare property or within a 400-foot radius of the proposed site for improvements. No impacts to water quality are expected. (See Figure G-28)

Wetlands

According to the NJDEP GIS database, there are wetlands located within a 400-foot radius of the proposed site for improvements to the east. (See Figure G-28) The proposed improvements do not affect lands outside of the established property boundaries and would not likely affect this resource. However, if improvements that result in changes to drainage and water flow were to occur this may affect the wetlands and require permits.

It is recommended that the NJDEP's opinion on the impact to wetlands be requested.

Cumulative and Indirect Impacts

The cumulative impacts of the proposed improvements are expected to be positive, and would accrue in the form of increased attractiveness and convenience of transit as an alternative to automobile travel.

Indirect impacts are not anticipated from the implementation of the improvements, as there are no projects or developments that are dependent on the implementation of these improvements.

Property Acquisition

No property acquisition is required for the proposed improvements. There would be no commercial or residential displacements.

Permitting

If it is determined through further investigations and inquiries that there are impacts to wetlands or unique/endangered species habitat, then appropriate permits will be needed. However, the proposed improvements would not likely affect these resources.

Other Federal Actions

No other federal actions are known to be required to undertake the proposed improvements.

Traffic and Transportation

The proposed improvements affect existing transportation facilities by improving bus stops and there would not be an increase in traffic volumes or vehicular volumes that could adversely impact traffic or transportation.

Figure G-26: Land Use

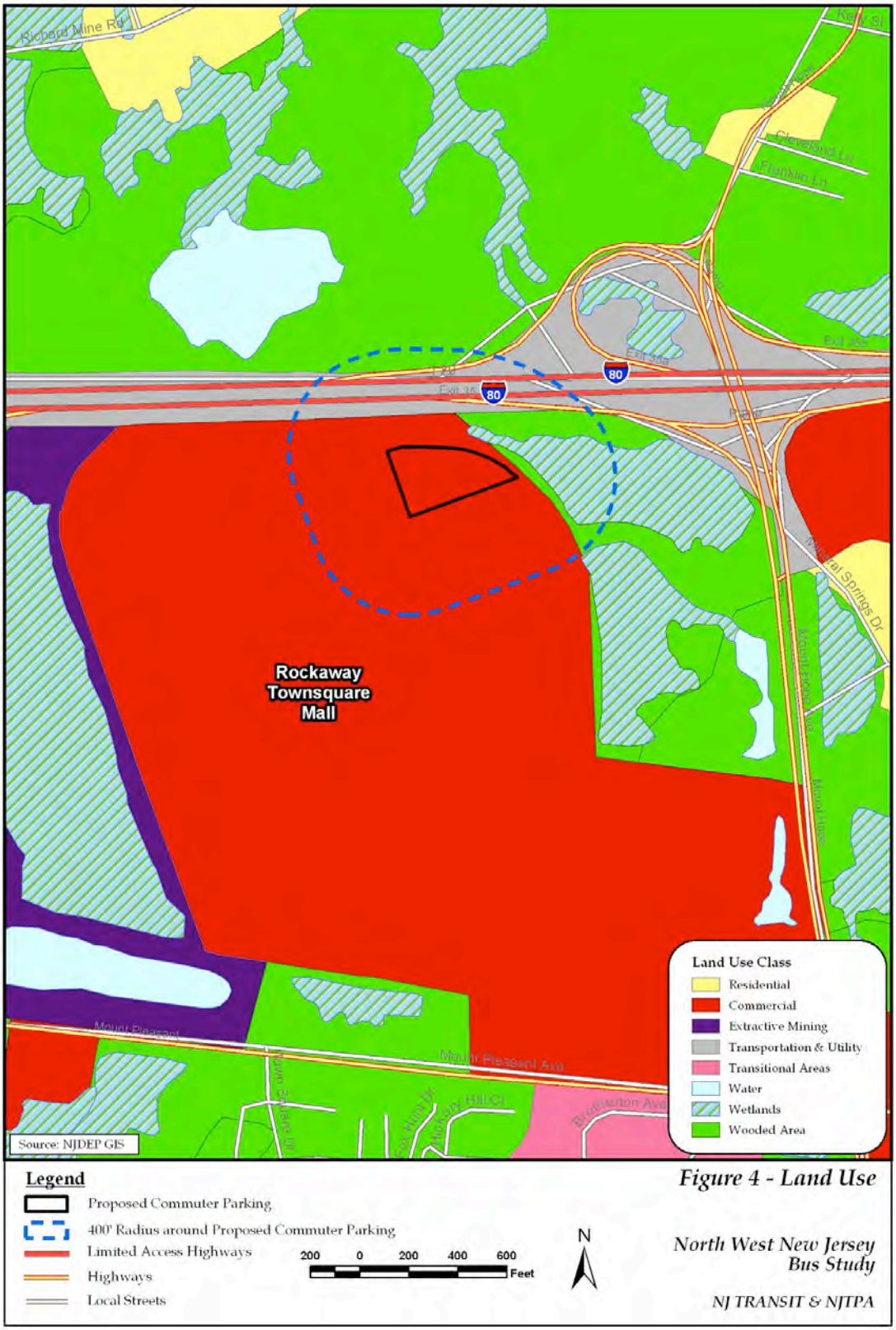


Figure G-27: Environmental Justice Census Block Groups in the Project Area

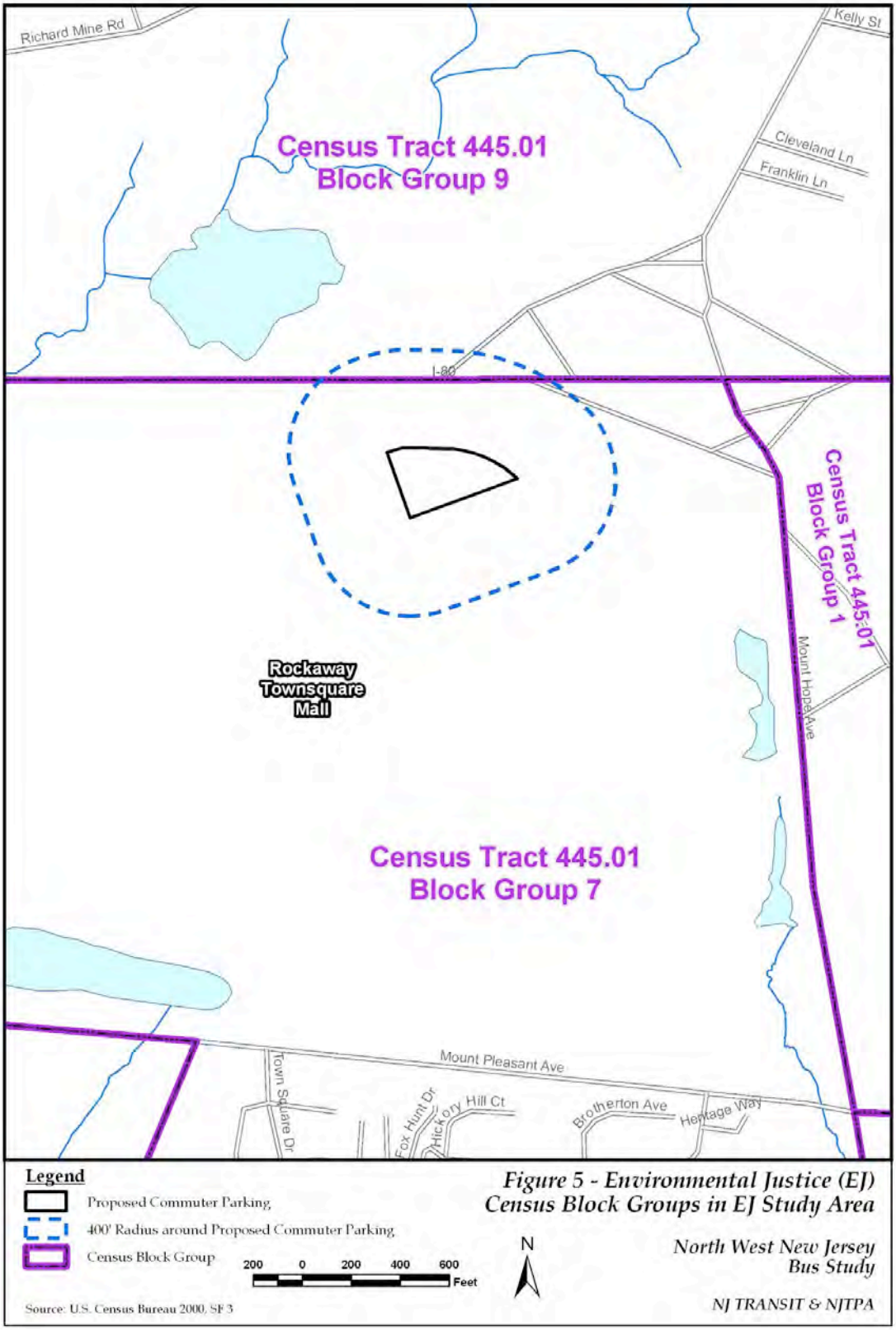
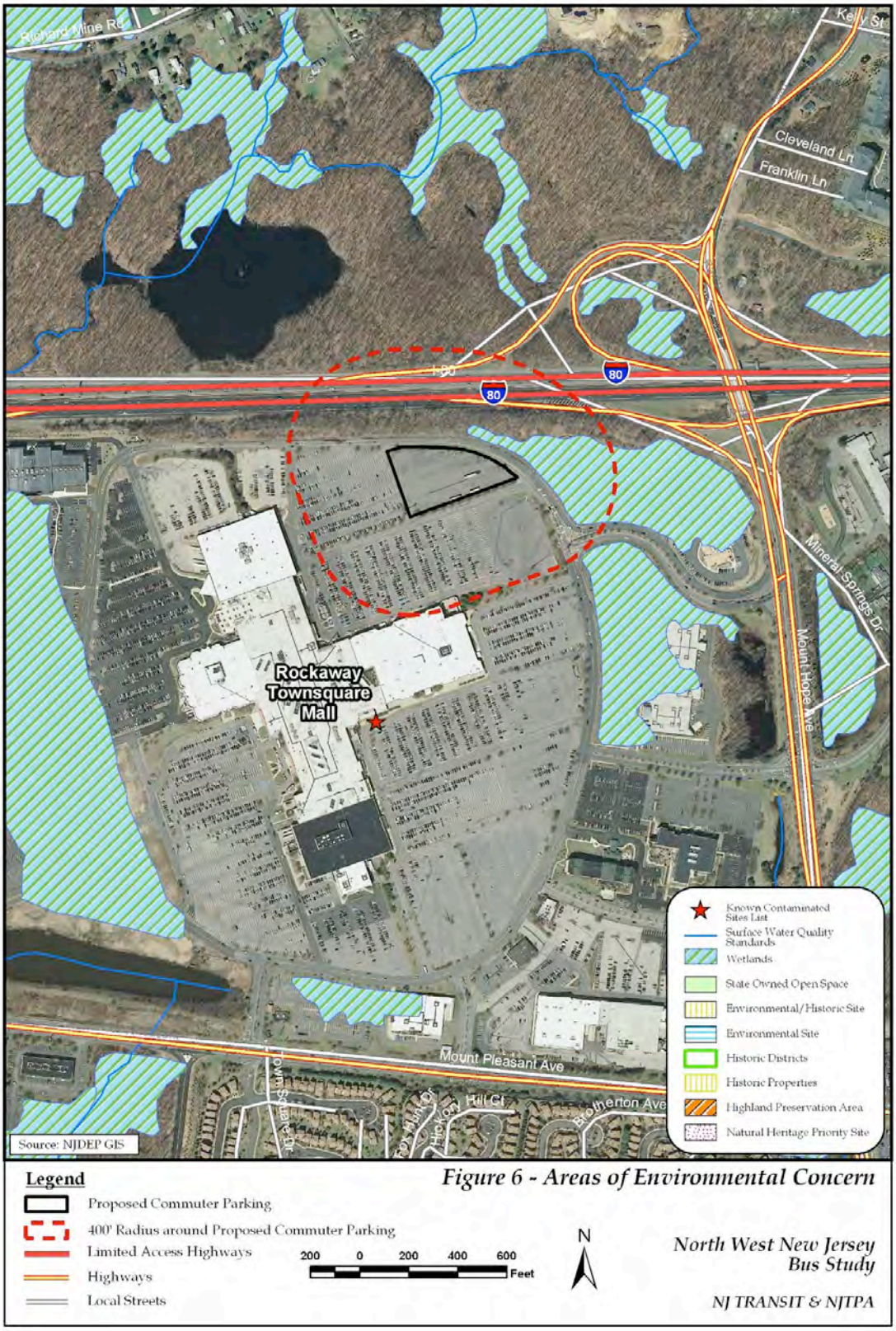


Figure G-28: Areas of Environmental Concern in the Project Area



G.27 Cost Estimate (based on 10% design)

Order-of-magnitude capital cost estimates were developed for the proposed improvement, reflecting the conceptual level of engineering. These estimates include costs for major proposed elements and a 30% contingency to account for items such as landscaping, maintenance of traffic, construction layout, escalation, and mobilization.

Description	Quantity	Unit	Unit Cost	Total Cost
Bus Shelter (inc. bench and lighting)	1	EA	$20,000	$20,000
Bus shelter (installation)	1	EA	$5,000	$5,000
Bus shelter (electrical work)	1	EA	$9,000	$9,000
Real-time Message Sign	1	EA	$8,000	$8,000
Ticket Vending Machine	1	EA	$12,000	$12,000
Trash bin	1	EA	$500	$500
Bike rack	1	EA	$1,700	$1,700
Signage	20	SF	$50	$1,000
Pavement Markings	750	LF	$5	$3,750
Pedestrian Canopy	600	LF	$50	$30,000
				$90,950

Contingencies (30%) = $27,285
Total = $118,235
SAY $118,000

The above total does not include any ongoing operations and maintenance costs. It assumes those costs are accounted for separately by NJTRANSIT.

G.28 Key Issues to Resolve

- Determine property owner interest in proposed improvements. Obtain agreement on the types and scope of improvements. It has been suggested that the Mall facility may utilize a "condominium style" ownership arrangement, which means that a multitude of property owners may need to be consulted, depending on the final site(s) chosen for improvements. This would also need to be clarified in subsequent discussions. This would also need to be clarified in subsequent discussions.
- Contact the Highlands Council for formal review in order to obtain a firm determination of Highlands Act applicability.
- Contact NJDEP's Office of Natural Lands Management to confirm that no Rare and Endangered Species or Critical Habitat is located within the project site.
- Contact NJDEP's Division of Land Use Regulation to confirm that no wetlands are impacted.

G.29 Sources

The following sources were used to identify any areas of environmental concern.

Location and Land Use

NJDEP GIS database and layers - http://www.state.nj.us/dep/gis/lulc02shp.html

Coastal Zone

NJDEP GIS database and layers - http://www.state.nj.us/dep/landuse/caframap.html

Highlands Preservation or Planning Area

http://maps.njhighlands.us/default.asp#

Use of 4(f) Properties

NJDEP GIS database and layers - http://www.state.nj.us/dep/gis/lulc02shp.html
NJDEP GIS database and layers - http://www.state.nj.us/dep/gis/stateshp.html#STOPEN

Historic Resources

http://www.nr.nps.gov/iwisapi/explorer.dll?IWS_SCHEMA=NRIS1&IWS_LOGIN=1&IWS_REPORT=100000040

http://www.state.nj.us/dep/hpo/1identify/nrsr_lists.htm

Hazardous Sites

NJDEP GIS database and layers - http://www.state.nj.us/dep/gis/

Prime and Unique Farmlands

NJDEP GIS database and layers - http://www.state.nj.us/dep/gis/lulc02shp.html

Rare and Endangered Species; Critical Habitat

NJDEP GIS database and layers – http://www.nj.gov/dep/parksandforests/natural/heritage/datareq.html

Water Quality

NJDEP GIS database and layers – http://www.state.nj.us/dep/gis/stateshp.html#SWQS

Wetlands

NJDEP GIS database and layers - http://www.state.nj.us/dep/gis/

G.30 Existing Conditions

G.30.1. Location and Land Use

View of Willowbrook Mall Shopper's Stop

The Willowbrook Mall is located in Wayne Township in Passaic County, New Jersey (See Figure G-29). The Willowbrook Mall is a major retail activity center as well as a transit hub located at the intersection of Interstate 80, US 46 and N.J. Route 23. The Mall is owned by General Growth Properties and has over 200 retail establishments and a gross leasable area of 1,500,000 square feet. Information obtained suggests that a "condominium style" of ownership is used at the Mall facility, involving a multitude of property owners. This would need to be clarified in discussions with the above mentioned property owner. Major anchor stores include Macys, Sears, Bloomingdales and Lord & Taylor. There are 7,997 parking spaces in the Mall; approximately 870 or 11% of the spaces are used for commuter parking

The Mall is separated from the area surrounding it by US 46 to the north, NJ 23 to the east, and Willowbrook Boulevard to the south and west. The land uses surrounding the Willowbrook Mall are primarily low density residential to the west and south, and commercial land uses to the west and north. (See Figure G-33)

G.30.2. Existing Bus Stop Facility Description

The Willowbrook Mall is served by 11 bus routes. The Mall hosts two bus stops, a "shoppers" stop served by local bus service to Morristown, Paterson, Clifton, Hackensack, and New York City; and a "park-and-ride commuter" stop served by local and express bus routes to New York City. A portion of the Mall's parking facilities are used during commuting hours as a park-and-ride under an agreement with NJ TRANSIT. A total of 870 parking spaces are set aside for commuter use (designated by green parking stall markings).

Willowbrook Mall management and NJ TRANSIT have long partnered to provide two bus stops at the Willowbrook Mall.

Commuter Park-and-Ride Stop

The park and ride and commuter bus stop is located in the southern and southeastern portions of the property adjacent to a park and ride containing 870 commuter parking spaces (outlined in green pavement striping) .Daily and permit parking is available 7 days a week, with parking fees set at $2 per day or $25 per month. This stop is primarily served by buses traveling to New York City. Parking utilization at these two lots is high and nearing capacity.

Six NJ TRANSIT bus routes serve the commuter park-and-ride stop: 191 (Willowbrook-Little Falls-New York), 193 (Packanack Lake-New York), 194 (Wayne-New York), 195 (Willowbrook-New York), 197 (Totowa-New York), and 198 (Wayne-New York).

Local "Shoppers'" Stop:

The "shoppers'" bus stop for local bus users, shoppers and mall employees is located to the south of the Lord & Taylor department store along the southernmost parking lots (see Figure G-30). This stop is served primarily by local bus routes (with two routes to New York City also serving this stop). A third parking area to the west of the shoppers' stop is reserved for commuter parking; however, it is primarily used as a bus layover area.

Eleven NJ TRANSIT bus routes serve the local "shoppers" stop: 11 (Newark-Montclair-Willowbrook), 191 (Willowbrook-Little Falls-New York), 193 (Packanack Lake-New York), 195 (Willowbrook-Cedar Grove-New York), 197 (Totowa-New York), 198 (Wayne-New York), 704 (Patterson-Willowbrook Mall), 705 (Passaic-Wayne), 712 (Hackensack-Willowbrook), 748 (Patterson-Willowbrook), and MCM 1 (Morristown-Willowbrook Mall).

Figure G-29: Project Location

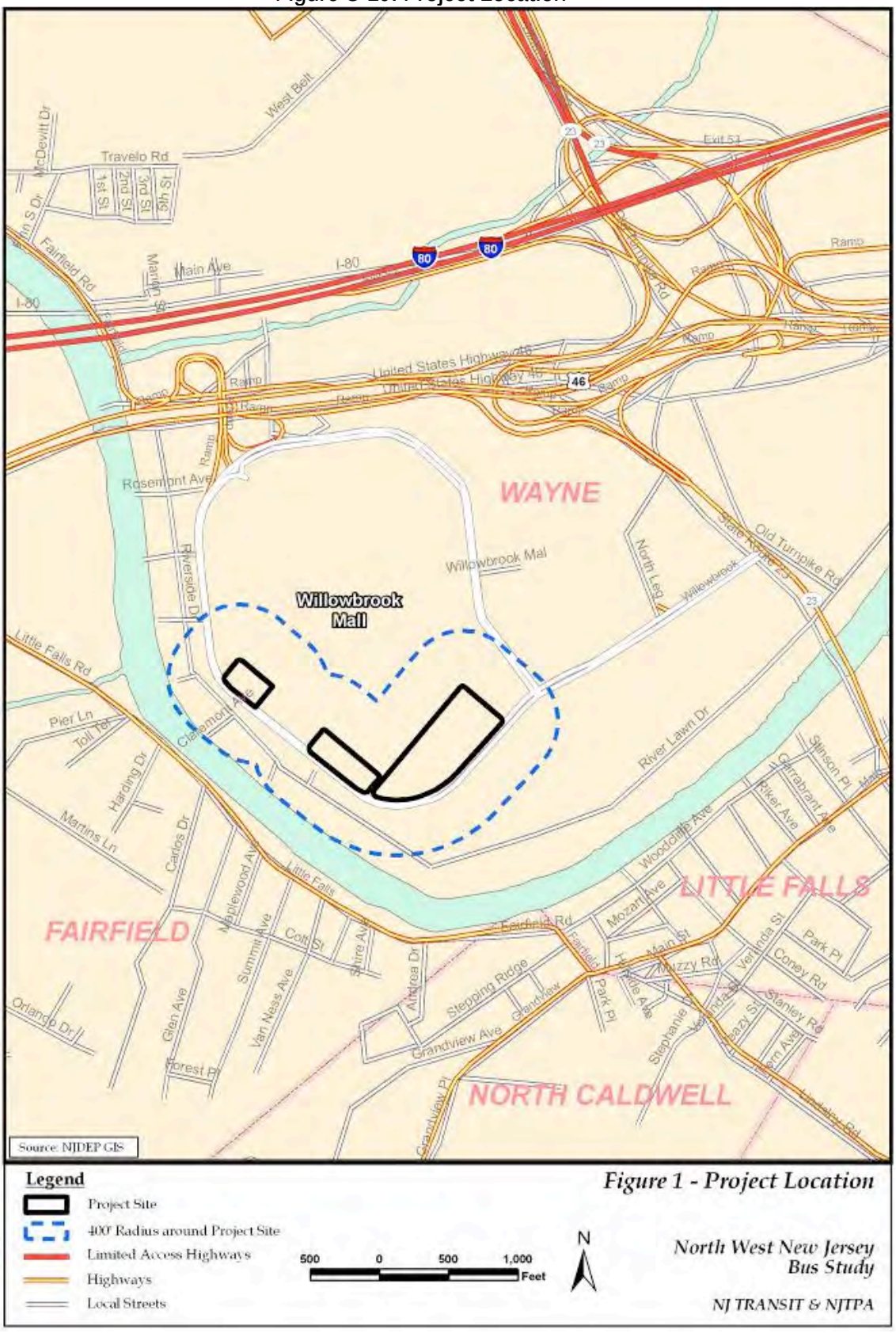


Figure G-30: Existing Conditions

G.30.3. Problems Identified with Current Bus Stop Facilities:

The Willowbrook Mall is a major transit hub with 391 daily boardings according to the ridership surveys conducted as part of this study. The Willowbrook Mall commuter park-and-ride stop and shopper's stop each feature basic passenger amenities such as bus shelters with seating, posted schedules, trailblazer (i.e., signage along adjacent roads indicating the presence and direction of park-and-ride facilities), marked crosswalks for pedestrians, and bus route signage. In addition, at the park-and-ride stop only there are ticket vending machines. Bicycle racks are not provided at either stop.

However, the operational efficiency of these bus stops could be improved by combining bus operations into one location closer to US 46 and upgrading the existing passenger facilities to reflect its importance as a transit hub.

Under the current configuration, the "shoppers" stop and commuter park-and-ride stop are separated from each other. Some bus routes such as NJ TRANSIT 191, 193, 195, 197, and 198 serve both stops, and essentially are making two stops within Willowbrook Mall. These additional stops and the time to load and unload passengers add to travel time which has cascading effects on operations costs. By combining the two stops into one location, a synergy can be created and facilities and amenities could be shared. Transfers between routes would be made more attractive and convenient, and travel time could be reduced on bus routes currently serving both the "shoppers" stop and the park-and-ride stop.

The proposed passenger facility improvements will address needs identified in the study for improving ease of transfers between all bus routes, improving passenger comfort, amenities, and mall access, and future opportunities for park and ride capacity expansion. Furthermore, there are a number of service proposals that, if implemented, would further introduce even more bus routes thus increasing the usage of this facility as well as its importance as a major transit hub.

G.31 Proposed Plan

G.31.1. Proposed New or Adjusted Routes Served

- Bus service improvements proposed to serve Willowbrook Mall include a new Morristown to Willowbrook express bus route, a new Montclair-Boonton Line off-peak shuttle bus route, and frequency and coverage improvements to NJT 194 (though the latter would be interlined with existing trips terminating here). Under the proposed MCM 1 modifications, this route would no longer serve Willowbrook Mall.

G.31.2. Proposed Access and Operations:

A combined shoppers and commuter bus stop and park and ride area is proposed to be relocated to the northwest corner of the mall (see Figure G-32) to be closer to US 46. This location would minimize bus running time by reducing travel time and avoiding conflicts with other vehicles and pedestrians within the mall access roads and parking areas. The new combined Transit Hub would also facilitate transfers between local and commuter buses for both inbound and reverse commute travelers.

Several options for the location of the integrated Transit Hub and Shared Use Park and Ride within Willowbrook Mall were considered and discussed with NJ TRANSIT. The northwest corner was selected as the best location for an integrated transit hub because of its proximity to the off ramps from US 46 and because several of the parking lots closest to the mall building are owned by retail tenants that would likely prefer these parking spaces are available for their customers.

The eleven existing bus routes will continue to serve this transit hub with the possibility of three additional bus routes, for a combined total of 14 bus routes.

G.31.3. Proposed Facility Enhancements

At the integrated Transit Hub and Shared Use Park and Ride, the following upgrades improvements and amenities are recommended:

- Bus shelters. A bus shelter provides protection from the elements and seating while waiting for a bus. Bus shelters should be designed with transparent sides for visibility and safety. Bus shelters provide an opportunity to provide amenities such as transit route maps, schedules, and seating. Heated shelters at high ridership stops may be considered. In addition, a bus shelter is a highly visible indication that transit service is available along a route and a specific destination.
- Seating. Seats provide comfort to waiting customers and increase the attractiveness of the bus service, especially for those with mobility impairments. Patrons who have difficulty standing will benefit from seating and will more likely use transit services. Seating located in the shelter should leave clear space for patrons with wheelchairs to use the shelter.
- Lighting. Lighting affects bus patrons' perception of safety and security at a bus stop, as well as the use of the site by non-bus patrons. Sufficient lighting can enhance a waiting passenger's sense of comfort and security; insufficient lighting may encourage unintended use of the facility by non-bus patrons, especially after hours. Lighting is particularly important in climates where patrons may arrive and return to the stop in darkness during the winter season. Many new bus shelter designs include panels with backlighting.
- Route and timetable information. Providing information on bus arrival time and route allows riders to use the system more effectively and increases the convenience and attractiveness of transit to potential users. Information displays should be permanent features of the bus shelter and can be incorporated into the panels of the shelter. Temporary methods for displaying information (such as tape mounting) create a cluttered, unsophisticated appearance at the bus stop. As Global Positioning Systems and Automated Vehicle Location systems on buses become more common for transit systems, real time information display boards may be installed at stops to give patrons up to the minute information on bus arrival times and delays.
- Signage. Proper signage at bus stops is an important element of good transit service. Signs serve as a source of information to patrons and operators regarding the location of the bus stop and are effective marketing tools to promote transit use.
- Vending machines. Vending machines can provide passengers with reading material while they wait for the bus. However, the placement of vending machines should be carefully considered as they may reduce the amount of room for mobility and waiting and create trash and be subject to vandalism.

- Bicycle storage. Bicycle storage facilities, such as bike racks, may be provided at bus stops for the convenience of bicyclists using transit. Designated storage facilities discourage bicycle riders from locking bikes onto the bus facilities or on an adjacent property. Proper storage of bicycles can reduce the amount of visual clutter and ensure a clear pathway.
- Trash receptacles. Trash receptacles can improve the appearance of a bus stop by providing a place to dispose of trash.
- Pedestrian improvements. High visibility crosswalks would be provided to the Mall from the parking area.
- Access to restrooms. If not already included in the leasing agreement, a provision to allow bus passengers to use the mall restroom facilities should be considered. Since these facilities are already available, an access agreement would eliminate the need and cost of constructing this type of facility.

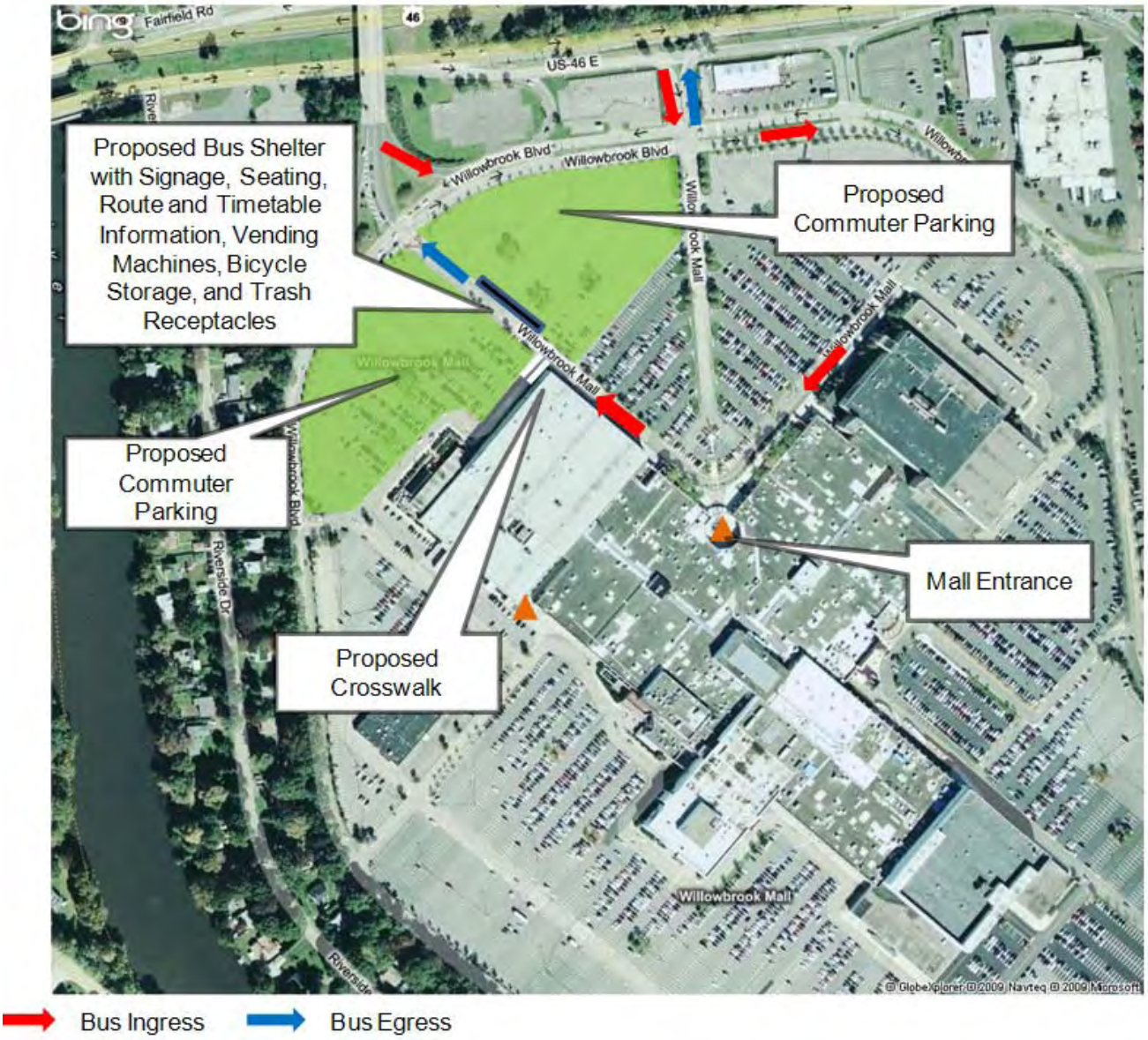
The same number of commuter and overflow parking spaces would be provided at the new location. However, the area identified leaves room for future expansion. The installation of the new bus shelter would require the removal of 10 existing parking spaces. Overall parking capacity will be minimally affected by the removal of ten spaces as the total parking capacity is 7,997 spaces.

Figure G-31: Visualization of a possible Transit Center Bus Stop Design at Willowbrook Mall

Figure G-31 shows a photo-illustration of a concept for a Transit Center at the Willowbrook Mall. The Transit Center features amenities such as printed and electronic schedule information, lighting,

heating, security cameras, seating, wind screens, trash bins, and ticket vending machines. Passenger facilities should also contain enclosed shelters to protect passengers in inclement weather. The Transit Center is located close to the proposed relocated park and ride area and to a building entrance.

Figure G-32: Proposed Improvements



G.32 Environmental Screening

A sketch environmental screening on this site was performed to identify any areas of environmental concern that would need to be studied and reviewed if this option is to be advanced.

This environmental screening is prepared under the guidance of the Federal Transportation Administration/Federal Highway Administration's Categorical Exclusion and Documented Categorical Exclusion Worksheet and the Code of Federal Regulations (CFR) part 23 CFR 771.

According to 23 CFR 771.117 (a) "Categorical exclusions (CEs) are actions which meet the definition contained in 40 CFR 1508.4, and, based on past experience with similar actions, do not involve significant environmental impacts. They are actions which: do not induce significant impacts to planned growth or land use for the area; do not require the relocation of significant numbers of people; do not have a significant impact on any natural, cultural, recreational, historic or other resource; do not involve significant air, noise, or water quality impacts; do not have significant impacts on travel patterns; or do not otherwise, either individually or cumulatively, have any significant environmental impacts. "

Continuing under this description, at 23 CFR 771.117 (d), FHWA guidance directs that "Additional actions which meet the criteria for a CE in the CEQ regulations (40 CFR 1508.4) and paragraph (a) of this section may be designated as CEs only after Administration approval. The applicant shall submit documentation which demonstrates that the specific conditions or criteria for these CEs are satisfied and that significant environmental effects will not result

Under this section, there are two threshold criteria that indicate that supplemental documentation is appropriate. These subparagraphs (4) and (7) are quoted following:

> "4. Transportation corridor fringe parking facilities."
>
> and
>
> "10. Construction of bus transfer facilities (an open area consisting of passenger shelters, boarding areas, kiosks and related street improvements) when located in a commercial area or other high activity center in which there is adequate street capacity for projected bus traffic."

Coastal Zone

The Willowbrook Mall is not located in the geographic areas defined in the Coastal Area Facility Review Act (CAFRA). No impacts to coastal zones would occur.

Highlands Preservation or Planning Area

The Willowbrook Mall is not located in the geographic areas defined in the Highlands Water Protection and Planning Act). No impacts to Highlands preservation or planning areas would occur.

Environmental Justice

In conformity with federal Executive Order 12898 (EO 12898), an environmental justice screening was performed to ascertain the potential for disproportionate impacts on minority groups or population at or below the poverty level. The analysis considers the proposed project's potential to cause significant adverse environmental impacts in the areas of traffic, air quality, and noise.

Year 2000 Census block group data (the finest level at which Census data are published in this area, given privacy concerns) was gathered and analyzed to identify the presence of populations with more than 50% of minority residents or more than 50% of residences below the poverty level. The Willowbrook Mall is located in Census Tract 2463 Block Group 3 and it was determined that this block group does not meet the definition of an Environmental Justice community. Therefore the proposed improvements will not result in an impact to this category.

Use of 4(f) Properties

A Section 4(f) property is defined as a public park, recreation lands, wildlife and waterfowl refuges, and historic sites. While certain such properties may be used for transportation projects if there is no reasonable alternative, a Section 4(f) analysis is used to determine whether the use of such lands for transportation purposes has been sufficiently considered and sufficiently minimized.

The Willowbrook Mall does not include any Section 4(f) properties. The proposed improvements do not affect any lands outside of the established property boundaries. No impacts to Section 4(f) lands would result. (See Figure 4)

Historic Resources

A query of the New Jersey Department of Environmental Protection's Natural and Historic Resources Historic Preservation Office's database for New Jersey and National Registers of Historic Places indicates that the Willowbrook Mall does not appear in the State or National Register of Historic Places as a listed or eligible resource. (See Figure 4)

Floodplains

According to Federal Emergency Management Agency, portions of the southern and westernmost parking lots are located within the 100 year flood zone and the remainder of the site is located within the 500-year flood zone. (See Figure 5)

Hazardous Sites

According to the NJDEP GIS database, Known Hazardous Sites are sites where contamination of soil or ground water has been identified or where there has been, or there is suspected to have been a discharge of contamination. (See Figure 4)

Based on the referenced GIS, there are occurrences of known contaminated sites in the areas surrounding the Willowbrook Mall (including one at the Wayne Center Mall). However, these areas are all located well outside of the 400-foot radius study area of the proposed project site.

Air Quality and Conformity with State Implementation Plan

According to the United States Environmental Protection Agency (USEPA), Passaic County is in moderate non-attainment for eight hour ozone standards and in non-attainment with PM-2.5. The region and the study area are in attainment with the carbon monoxide, nitrous oxide, sulfur dioxide, and lead standards.

The proposed improvements are not included in the State's plans to avoid or reduce congestion and improve air quality.

The proposed improvements would not result in construction, and would not change traffic volumes. Traffic reassignments would be negligible, and thus, changes in air quality would not be expected.

Noise and Vibration

The proposed improvements do not affect any lands outside of the established property boundaries so there would not be an increase in traffic volumes or vehicular volumes that that could change the noise environment when compared to the existing condition. There would be no substantial construction activity that would require the use of equipment that produces vibration (e.g., pile driving, movement of large bulldozers or trucks) and no impacts to fragile structures (as none exist in the area) would be expected.

Prime and Unique Farmlands

The proposed project is located in a fully developed urban area, and is not located near any prime or unique farmlands, nor is it located in a Highlands Preservation Area. (See Figure G-35)

Rare and Endangered Species; Critical Habitat

According to the NJDEP GIS database, there are no occurrences of Natural Heritage Priority sites. Natural heritage priority sites identify critically important areas to conserve New Jersey's biological diversity, with particular emphasis on rare plant species and ecological communities. However, these sites do not cover the entire known habitat for endangered and threatened species in New Jersey. (See Figure G-35)

No adverse impacts to Rare and Endangered Species or Critical Habitat are anticipated, however, it is recommended that the NJDEP's Office of Natural Lands Management be contacted to conduct a search of the Natural Heritage Database.

Water Quality

Surface Water Quality Standards establish the designated uses to be achieved and specify the water quality (criteria) necessary to protect the State's waters. Designated uses include potable water, propagation of fish and wildlife, recreation, agricultural and industrial supplies, and navigation. These are reflected in use classifications assigned to specific waters.

According to the NJDEP GIS database, the Passaic River is located just beyond the 400-foot project radius. The proposed improvements do not affect any lands outside of the established property boundaries and therefore would not likely affect this resource. However, if improvements that result in changes to drainage and water flow were to occur this may affect the river and require permits. (See Figure G-35)

Wetlands

According to the NJDEP GIS database, there are wetlands located within a 400-foot radius to the southeast and southwest of the commuter park-and-ride lots. The proposed improvements do not affect any lands outside of the established property boundaries and therefore would not likely affect this resource. However, if improvements that result in changes to drainage and water flow were to occur this may affect the wetlands and require permits.

It is recommended that the NJDEP's opinion on the impact to wetlands be requested.

Cumulative and Indirect Impacts

The cumulative impacts of the proposed improvements are expected to be positive, and would accrue in the form of increased attractiveness and convenience of transit as an alternative to automobile travel.

Indirect impacts are not anticipated from the implementation of the improvements, as there are no projects or developments that are dependent on the implementation of these improvements.

Property Acquisition

No property acquisition is required for the proposed improvements, which would take place entirely within the Willowbrook Mall boundaries. Consequently, there would be no commercial or residential displacements.

Permitting

If it is determined through further investigations and inquiries that there are impacts to wetlands or unique/endangered species habitat, then appropriate permits will be needed.

However, the proposed improvements do not affect any lands outside of the established property boundaries and would not likely affect these resources.

Other Federal Actions

No other federal actions are known to be required to undertake the proposed improvements.

Traffic and Transportation

The proposed improvements do not affect any lands outside of the established property boundaries and, there would not be an increase in traffic volumes or vehicular volumes that could adversely impact traffic or transportation.

Figure G-33: Land Use

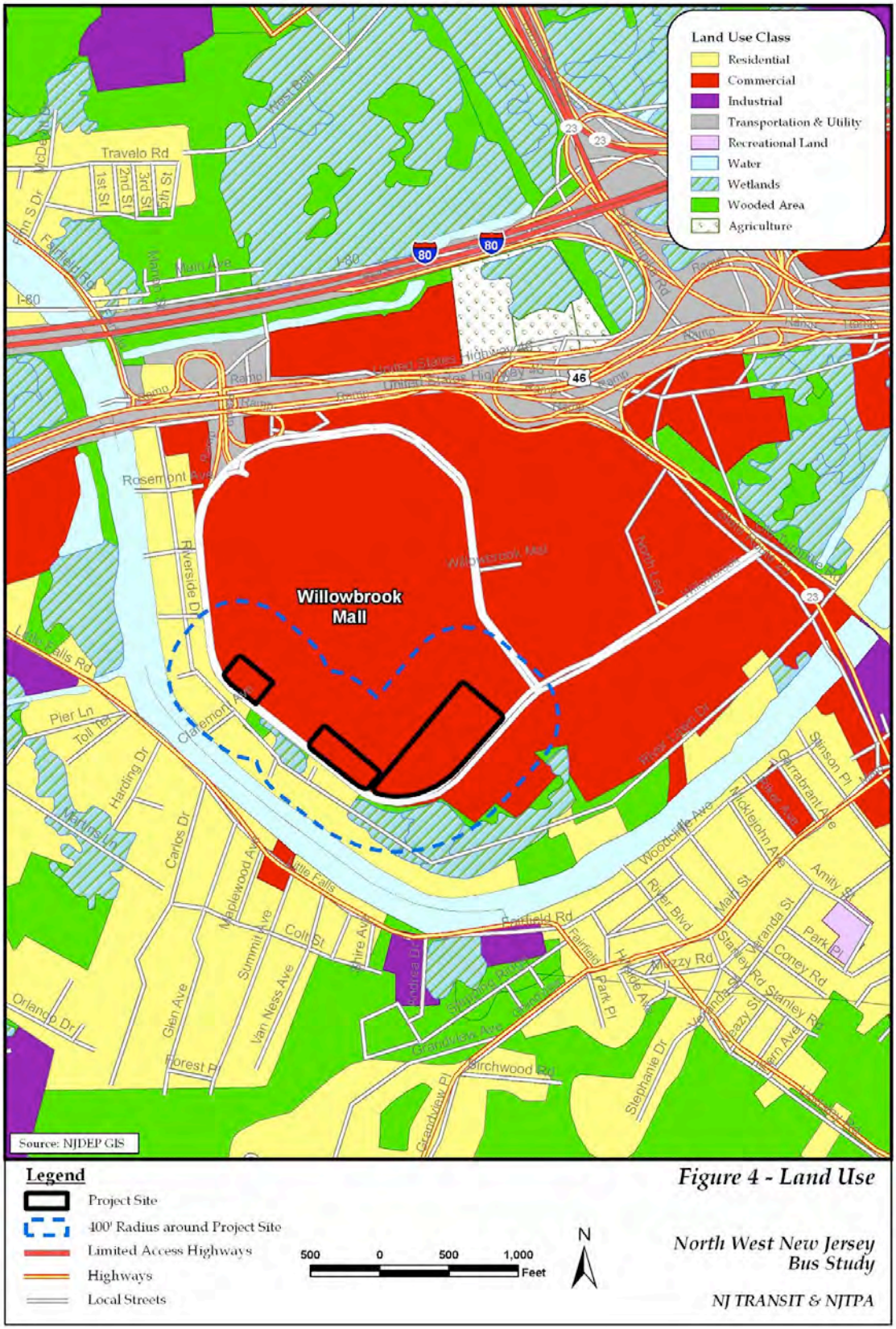


Figure G-34: Environmental Justice Census Block Groups in the Project Area

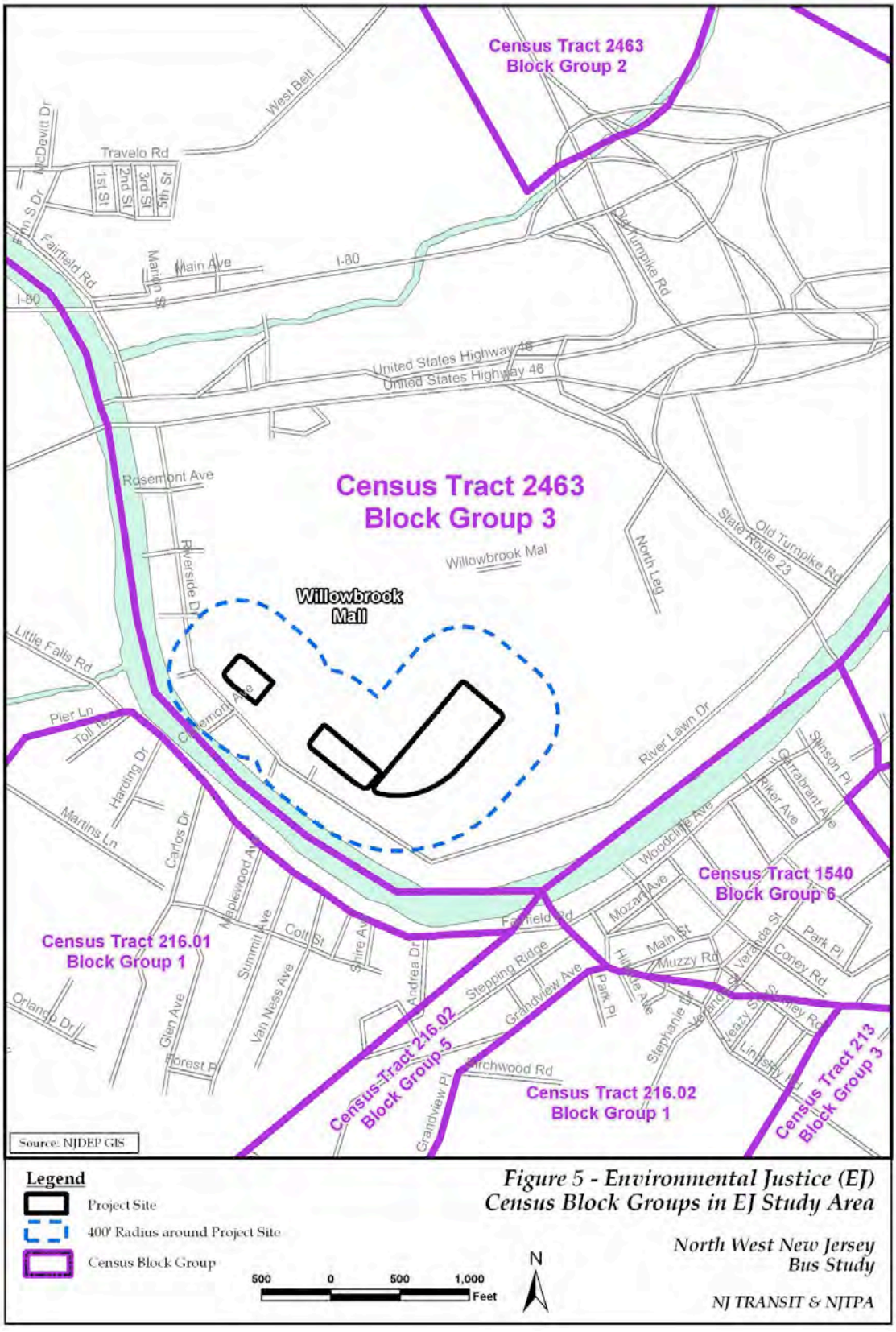


Figure G-35: Areas of Environmental Concern in the Project Area

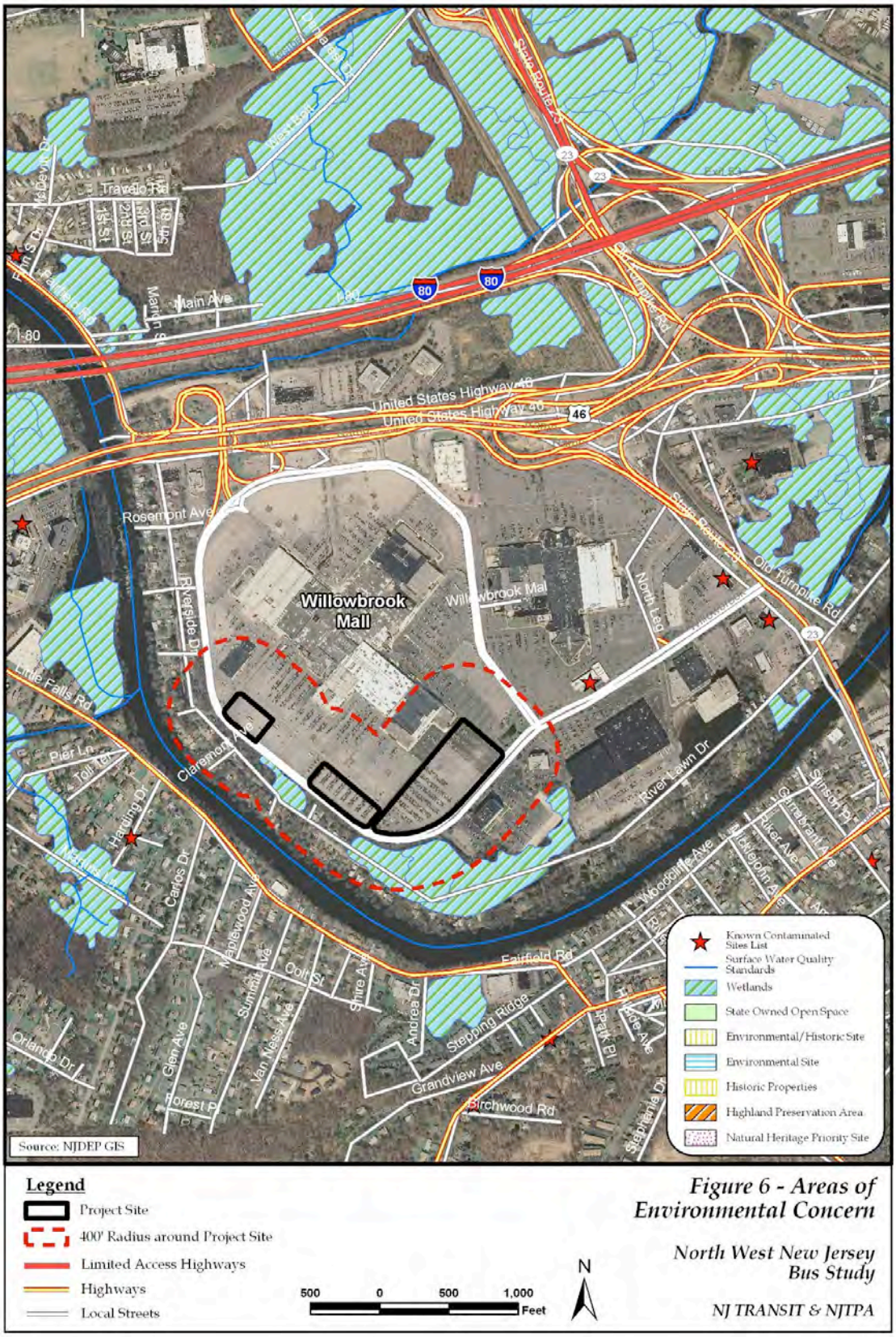
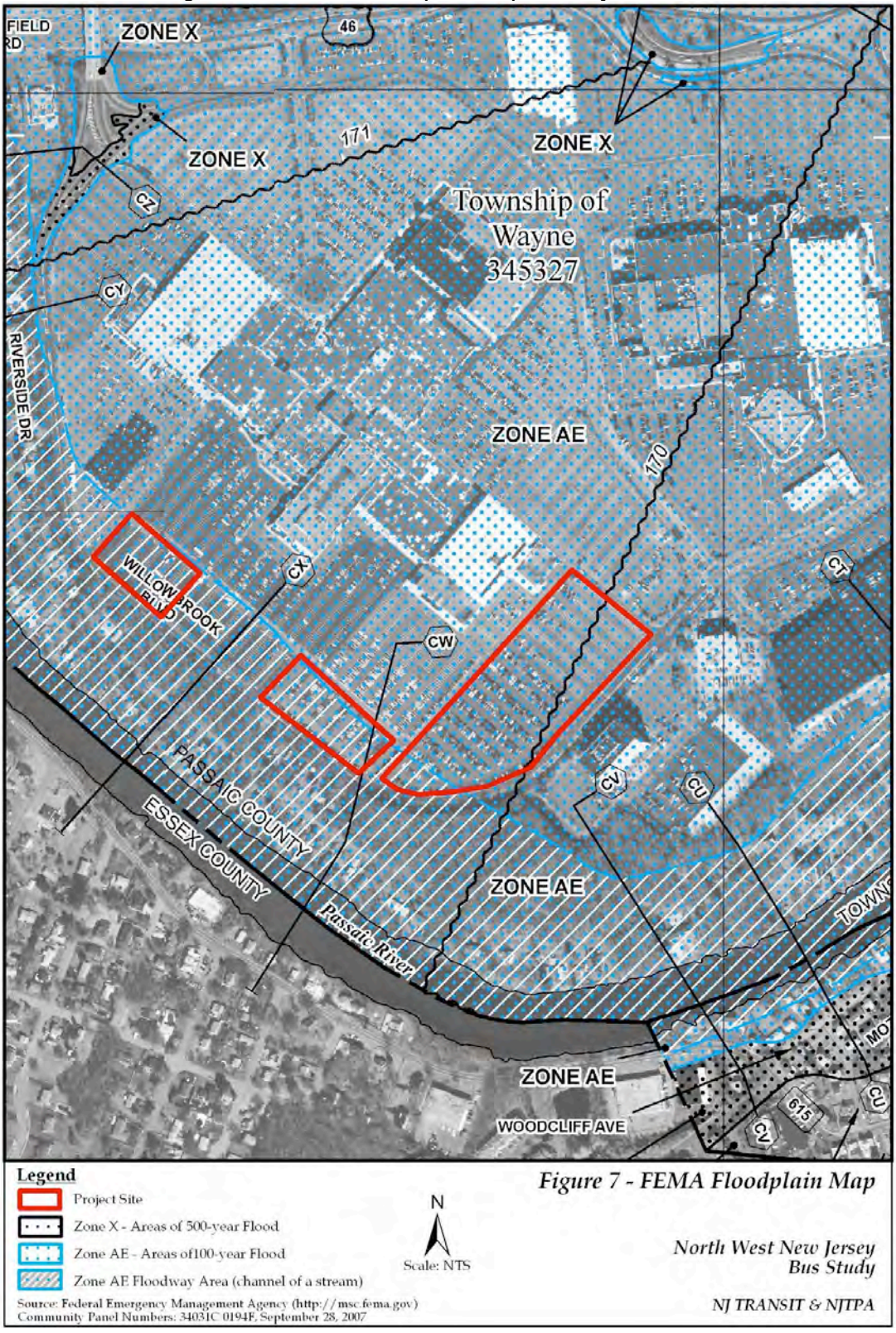


Figure G-36: FEMA Floodplain Map for Project Area



G.33 Cost Estimate (based on 10% design)

Order-of-magnitude capital cost estimates were developed for the proposed improvement, reflecting the conceptual level of engineering. These estimates include costs for major proposed elements and a 30% contingency to account for items such as maintenance of traffic, construction layout, escalation, and mobilization. [Note methods used to determine costs]

Description	Quantity	Unit	Unit Cost	Total Cost
Bus Shelter (inc. bench and lighting)	4	EA	$20,000	$80,000
Bus shelter (installation)	4	EA	$5,000	$20,000
Bus shelter (electrical work)	4	EA	$9,000	$36,000
Real-time Message Sign	4	EA	$8,000	$32,000
Ticket Vending Machine	2	EA	$12,000	$24,000
Trash bin	4	EA	$500	$2,000
Bike rack	2	EA	$1,700	$3,400
Signage (4 bus stop signs)	4	TOTAL	$200	$800
Pavement marking	500	Linear feet	$5	$2,500
Subtotal				$200,700

Contingencies (30%) = $60,210
Total = $260,910
SAY $270,000

The above total does not include any ongoing operations and maintenance costs. It also does not include any costs for new ticket vending machines; it assumes any costs for ticket vending machines are accounted for separately by NJTRANSIT.

G.34 Key Issues to Resolve

The following issues would need to be resolved prior to implementation of the improvements:

- Determine property owner interest in proposed improvements. Obtain agreement on the types and scope of improvements. It was reported that "condominium style" ownership arrangement is utilized at the Mall facility, which means that a multitude of property owners may need to be consulted, depending on the final site(s) chosen for improvements. This would also need to be clarified in subsequent discussions.
- Contact NJDEP's Office of Natural Lands Management to confirm that no Rare and Endangered Species or Critical Habitat is located within the project site.
- Contact NJDEP's Division of Land Use Regulation to confirm that wetlands are not impacted.

G.35 Sources

The following sources were used to identify any areas of environmental concern.

Location and Land Use

NJDEP GIS database and layers - http://www.state.nj.us/dep/gis/lulc02shp.html

Coastal Zone

NJDEP GIS database and layers - http://www.state.nj.us/dep/landuse/caframap.html

Highlands Preservation or Planning Area

http://maps.njhighlands.us/default.asp#

Use of 4(f) Properties

NJDEP GIS database and layers - http://www.state.nj.us/dep/gis/lulc02shp.html
NJDEP GIS database and layers - http://www.state.nj.us/dep/gis/stateshp.html#STOPEN

Historic Resources
http://www.nr.nps.gov/iwisapi/explorer.dll?IWS_SCHEMA=NRIS1&IWS_LOGIN=1&IWS_REPORT=100000040

http://www.state.nj.us/dep/hpo/1identify/nrsr_lists.htm

Hazardous Sites

NJDEP GIS database and layers - http://www.state.nj.us/dep/gis/

Prime and Unique Farmlands

NJDEP GIS database and layers - http://www.state.nj.us/dep/gis/lulc02shp.html

Rare and Endangered Species; Critical Habitat

NJDEP GIS database and layers –
http://www.nj.gov/dep/parksandforests/natural/heritage/datareq.html

Water Quality

NJDEP GIS database and layers – http://www.state.nj.us/dep/gis/stateshp.html#SWQS

Wetlands

NJDEP GIS database and layers - http://www.state.nj.us/dep/gis/

G.36 Existing Conditions

G.36.1. Location and Land Use

Weis Supermarket is located at 140 NJ 23 in Franklin Borough in Sussex County, New Jersey (see Figure G-37). It is a retail activity center located adjacent to N.J. Route 23. The parking capacity at the supermarket is 450 parking spaces. A total of 60 spaces (including handicapped parking) is proposed as adequate for commuter parking needs. Currently the location is not directly served by any transit services or bus stops. However, it was selected in this study as a potential shared park-and-ride location as it fits the criteria for shared use parking. That is, the parking demand at this location primarily occurs during evenings and weekends, therefore during commuting periods, much of the parking lot is unutilized.

The area surrounding the Weis Supermarket are primarily undeveloped land to the south, low density residential to the west and northwest, commercial/retail uses directly to the north, and recreational (Black Bear Country Club) to the east. (See Figure G-38)

View of Weis Supermarket

Underutilized parking along the perimeter of the lot

G.36.2. Existing Parking Facility

Weis Supermarket is a retail activity center that has been identified as a strong candidate for a new, shared use park-and-ride.

Shared park-and-rides are parking lots used for adjacent buildings which are also used by transit customers, typically from the start of the morning peak period to the end of the evening peak period. The likelihood of available space for parking is greatest when the peak parking demand for the primary use (i.e., grocery shopping) is in the evenings and weekends.

The Weis Supermarket parking lot contains 450 spaces. There is no existing bus stop, shelter or commuter parking at this location. This location is unique because it is served by an access road that runs roughly parallel to NJ 23. The parking lot is located such that it could provide an

opportunity for buses to exit NJ 23 and serve the proposed bus stops along the access road without interfering with traffic on NJ 23 or in the Weis parking lot.
No bus stop currently exists, so no amenities for bus passengers are provided.

G.36.3. Current Bus Routes Served

The Sussex County Transit loop bus serves the Weis Supermarket on weekdays only. There are 5 arrivals per day for the Route 101 bus headed toward Sparta and Newton and 5 arrivals for the Route 102 bus headed toward Sussex Borough) between 7:43 am and 5:39 pm. The trips are spaced at irregular intervals ranging one to three hours. There is no formal bus stop facility at the site and no passenger amenities currently exist.

G.36.4. Problems Identified with Current Facilities

There are currently no transit facilities for users of the Sussex County Transit buses at the Weis Supermarket site. Furthermore, the study identified a need for commuter parking and boarding facilities at this location to support the proposed extension of NJT 194 express bus service to New York.

This location is envisioned as an automobile-oriented facility. There are no sidewalks in the immediate area, and no existing residences are close enough to access the proposed park-and-ride by foot.

Figure G-37: Project Location

Figure G-38: Project Location

G.37 Proposed Plan

The proposed improvements to this location include new bus shelters, with seating and schedule information, in both the northbound and southbound direction for buses exiting NJ Route 23.

G.37.1. Proposed New or Adjusted Routes Served

A park and ride would be established at this location to support the proposed extended NJT 194 express bus route to Franklin, which would terminate and layover here.

Local service within Sussex County would be provided primarily by an improved SCT service, which would offer hourly service on weekdays and limited service on Saturdays. The proposed Franklin-Vernon route would terminate here and provide a connection to employment sites in Vernon.

G.37.2. Access and Operations:

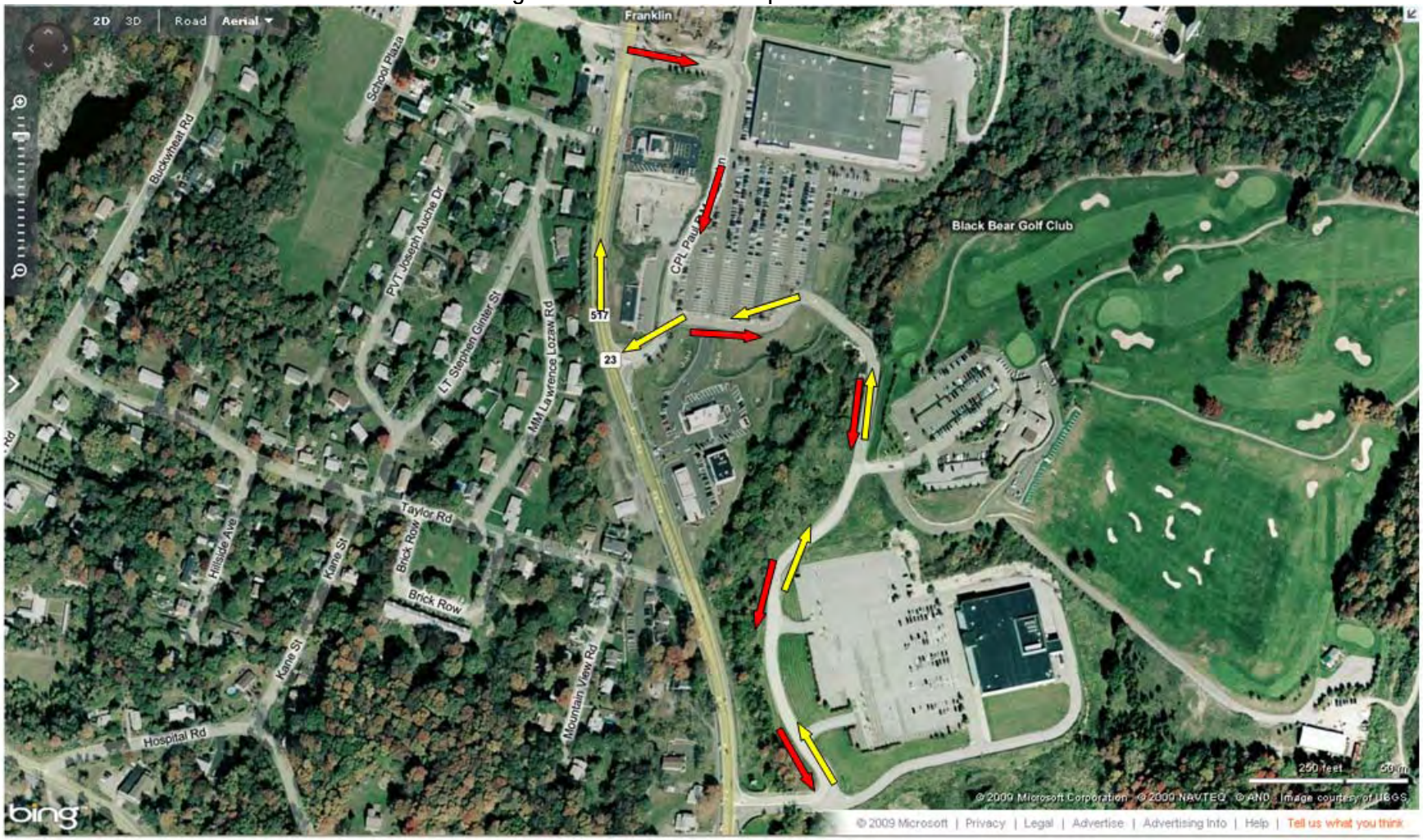
The bus stops at this location are proposed to be located on either side of the access road, rather than in the parking lot, to minimize bus running time and maximize convenience for bus passengers arriving by automobile.

The bus stop and shelters would be adjacent to the existing access road; (locating the bus stops within the parking lot would slow bus operations and would lead to a greater reduction in parking spaces). Approximately 60 commuter parking spaces, including handicap parking, would be provided in the vicinity of the bus shelters and would require the redesignation of 65 existing shopping spaces. However, shoppers would continue to have the use of these spaces when they are not occupied by commuters. Pedestrian access from the parking lot to the new bus shelters would be via a new pedestrian walkway and crosswalk. Traffic patterns within the existing parking lot would remain unchanged.

The southbound bus would access the Weis Supermarket park-and-ride by traveling south on Route 23 to Washington Avenue. The bus would turn right onto Washington Avenue and go straight to Cpl. Paul B. Madden Lane. The bus would turn on right on Cpl. Paul B. Madden Lane and continue south to the service road leading to Black Bear Golf Club and Weis Supermarket. After loading and unloading passengers, the bus would continue south along the access road and turn right into the Weis Supermarket driveway leading southbound Route 23. (See Figure G-39)

The northbound bus would access the Weis Supermarket park-and-ride by traveling north on Route 23 and turning right on the Weis Supermarket driveway. The bus would turn left on the access road and head north to the bus stop. After loading and unloading passengers, the bus would continue north along the access road, past Black bear Golf Club and follow the service road to its end at northbound Route 23.

Figure G-39: Access and Operations



Southbound Bus

Northbound Bus

G.37.3. Passenger Facilities Amenities:

At the Weis Supermarket park-and-ride, the following improvements and amenities are recommended:

- Bus shelters. A bus shelter provides protection from the elements and seating while waiting for a bus. Bus shelters should be designed with transparent sides for visibility and safety. Bus shelters provide an opportunity to provide amenities such as transit route maps, schedules, and seating. Heated shelters at high ridership stops may be considered. In addition, a bus shelter is a highly visible indication that transit service is available along a route and a specific destination.
- Seating. Seats provide comfort to waiting customers and increase the attractiveness of the bus service, especially for those with mobility impairments. Patrons who have difficulty standing will benefit from seating and will more likely use transit services. Seating located in the shelter should leave clear space for patrons with wheelchairs to use the shelter.
- Lighting. Lighting affects bus patrons' perception of safety and security at a bus stop, as well as the use of the site by non-bus patrons. Sufficient lighting can enhance a waiting passenger's sense of comfort and security; insufficient lighting may encourage unintended use of the facility by non-bus patrons, especially after hours. Lighting is particularly important in climates where patrons may arrive and return to the stop in darkness during the winter season. Many new bus shelter designs include panels with backlighting.
- Route and timetable information. Providing information on bus arrival time and route allows riders to use the system more effectively and increases the convenience and attractiveness of transit to potential users. Information displays should be permanent features of the bus shelter and can be incorporated into the panels of the shelter. Temporary methods for displaying information (such as tape mounting) create a cluttered, unsophisticated appearance at the bus stop. As Global Positioning Systems and Automated Vehicle Location systems on buses become more common for transit systems, real time information display boards may be installed at stops to give patrons up to the minute information on bus arrival times and delays.
- Signage. Proper signage at bus stops is an important element of good transit service. Signs serve as a source of information to patrons and operators regarding the location of the bus stop and are effective marketing tools to promote transit use.
- Vending machines. Vending machines can provide passengers with reading material while they wait for the bus. However, the placement of vending machines should be carefully considered as they may reduce the amount of room for mobility and waiting and create trash and be subject to vandalism.
- Bicycle storage. Bicycle storage facilities, such as bike racks, may be provided at bus stops for the convenience of bicyclists using transit. Designated storage facilities discourage bicycle riders from locking bikes onto the bus facilities or on an adjacent property. Proper storage of bicycles can reduce the amount of visual clutter and ensure a clear pathway.
- Trash receptacles. Trash receptacles can improve the appearance of a bus stop by providing a place to dispose of trash.

This rendering illustrates the current direction in bus shelter design. This type of bus shelter incorporates many of the proposed improvements including shelter, seating, lighting, and passenger information.

Figure G-40: Proposed facilities

G.38 Environmental Screening

A sketch environmental screening on this site was performed to identify any areas of environmental concern that would need to be studied and reviewed if this option is to be advanced.

This environmental screening is prepared under the guidance of the Federal Transportation Administration/Federal Highway Administration's Categorical Exclusion and Documented Categorical Exclusion Worksheet and the Code of Federal Regulations (CFR) part 23 CFR 771.

According to 23 CFR 771.117 (a) "Categorical exclusions (CEs) are actions which meet the definition contained in 40 CFR 1508.4, and, based on past experience with similar actions, do not involve significant environmental impacts. They are actions which: do not induce significant impacts to planned growth or land use for the area; do not require the relocation of significant numbers of people; do not have a significant impact on any natural, cultural, recreational, historic or other resource; do not involve significant air, noise, or water quality impacts; do not have significant impacts on travel patterns; or do not otherwise, either individually or cumulatively, have any significant environmental impacts. "

Continuing under this description, at 23 CFR 771.117 (d), FHWA guidance directs that "Additional actions which meet the criteria for a CE in the CEQ regulations (40 CFR 1508.4) and paragraph (a) of this section may be designated as CEs only after Administration approval. The applicant shall submit documentation which demonstrates that the specific conditions or criteria for these CEs are satisfied and that significant environmental effects will not result.

Under this section, there are two threshold criteria that indicate that supplemental documentation is appropriate. These subparagraphs (4) and (7) are quoted following:

> "4. Transportation corridor fringe parking facilities."
>
> and
>
> "10. Construction of bus transfer facilities (an open area consisting of passenger shelters, boarding areas, kiosks and related street improvements) when located in a commercial area or other high activity center in which there is adequate street capacity for projected bus traffic."

Location and Land Use

Weis Supermarket is located at 140 NJ 23 in Franklin Borough in Sussex County, New Jersey (see Figure G-37). It is a retail activity center located adjacent to N.J. Route 23. The parking capacity at the supermarket is 450 parking spaces. A total of 60 spaces (including handicapped parking) is proposed as adequate for commuter parking needs. Currently the location is not directly served by any transit services or bus stops. However, it was selected in this study as a potential shared park-and-ride location as it fits the criteria for shared use parking. That is, the parking demand at this location primarily occurs during evenings and weekends, therefore during commuting periods, much of the parking lot is unutilized.

The area surrounding the Weis Supermarket are primarily vacant land to the south, low density residential to the west and northwest, commercial/retail uses directly to the north, and recreational (Black Bear Country Club) to the east. (See Figure G-38)

Coastal Zone

The Weis Supermarket is not located in the geographic areas defined in the Coastal Area Facility Review Act (CAFRA). No impacts to coastal zones would occur.

Highlands Preservation or Planning Area

Franklin Borough is within the Highlands Region as designated under the Highlands Protection Act (HPA). As such, the regulations governing development, including infrastructure, in these areas are an important consideration in the environmental screening task.

The Weis Supermarket site is located within in a designated Highlands Planning Area. Furthermore, the building and its parking lots are located in an Existing Community Zone; however, the land along the access road where bus shelters are proposed is designated an Existing Community Zone – Environmentally Constrained Sub-Zone. Each of the zones is defined below.

The lands in the Planning Area of the Highlands Region are not subject to the DEP Highlands Preservation Area Rules and municipalities have the ability to opt into or not opt into the Highlands Regional Master Plan through a process called Plan Conformance.

Highlands Existing Community Zones consist of areas with regionally significant concentrated development signifying existing communities. These areas tend to have limited environmental constraints due to previous development patterns and may have existing infrastructure that can support development and redevelopment provided that such development is compatible with the protection and character of the Highlands environment, at levels that are appropriate to maintain the character of established communities.

The Existing Community Zone – Environmentally Constrained Sub-Zone consists of significant areas of contiguous critical habitat, steep slopes and forested lands within the Existing Community Zone that should be protected from further fragmentation.

Regardless of the designations, it should be assumed that this alternative, if advanced, will need formal review by the Highlands Council in order to obtain a firm determination of Highlands Act applicability.

Environmental Justice

In conformity with federal Executive Order 12898 (EO 12898), an environmental justice screening was performed to ascertain the potential for disproportionate impacts on minority groups or population at or below the poverty level. The analysis considers the proposed project's potential to cause significant adverse environmental impacts in the areas of traffic, air quality, and noise.

Year 2000 Census block group data (the finest level at which Census data are published in this area, given privacy concerns) was gathered and analyzed to identify the presence of populations with more than 50% of minority residents or more than 50% of residences below the poverty level. The Willowbrook Mall is located in Census Tract 2463 Block Group 3 and it was determined that this block group does not meet the definition of an Environmental Justice community. Therefore the proposed improvements will not result in an impact to this category.

Use of 4(f) Properties

Section 4(f) properties include public parks, recreation lands, wildlife and waterfowl refuges, and historic sites. While certain such properties may be used for transportation projects, if there is no reasonable alternative, a Section 4(f) analysis is used to determine whether the use of such lands for transportation purposes has been sufficiently considered and sufficiently minimized.

The Weis Supermarket does not include any Section 4(f) properties. The proposed improvements do not affect any lands outside of the established property boundaries. No impacts to Section 4(f) lands would result. (See Figure G-43)

Historic Resources

A query of the New Jersey Department of Environmental Protection's Natural and Historic Resources Historic Preservation Office's database for New Jersey and National Registers of Historic Places indicates that the Weis Supermarket does not appear in the State or National Register of Historic Places as a listed or eligible resource. (See Figure G-43)

Floodplains

The Weis Supermarket is not located within any geographic areas defined as flood zones according to the Federal Emergency Management Agency. No impacts to floodplains would occur. (See Figure G-44)

Hazardous Sites

According to the NJDEP GIS database, Known Hazardous Sites are sites where contamination of soil or ground water has been identified or where there has been, or there is suspected to have been a discharge of contamination. (See Figure G-43)

Based on the referenced GIS, there are no known occurrences of known contaminated sites in the Weis Supermarket site or in the areas surrounding it.

Air Quality and Conformity with State Implementation Plan

According to the United States Environmental Protection Agency (USEPA), Sussex County is in moderate non-attainment for eight hour ozone standards. The region and the study area are in attainment with the carbon monoxide, nitrous oxide, sulfur dioxide, and lead standards.

The proposed improvements are not included in the State's plans to avoid or reduce congestion and improve air quality.

The proposed improvements would not result in construction, and would not change traffic volumes. Traffic reassignments would be negligible, and thus, changes in air quality would not be expected.

The proposed improvements are not included in the State's plans to avoid or reduce congestion and improve air quality.

Noise and Vibration

The proposed improvements do not affect any lands outside of the established property boundaries so there would not be an increase in traffic volumes or vehicular volumes that that could change the noise environment when compared to the existing condition. There would be no substantial construction activity that would require the use of equipment that produces vibration (e.g., pile driving, movement of large bulldozers or trucks) and no impacts to fragile structures (as none exist in the area) would be expected.

Prime and Unique Farmlands

The proposed project is located in a fully developed area, and is not located near any prime or unique farmlands, nor is it located in a Highlands Preservation Area. (See Figure G-43)

Rare and Endangered Species; Critical Habitat

According to the NJDEP GIS database, there are no occurrences of Natural Heritage Priority sites. Natural Heritage Priority sites identify critically important areas to conserve New Jersey's biological diversity, with particular emphasis on rare plant species and ecological communities. However, these sites do not cover the entire known habitat for endangered and threatened species in New Jersey. (See Figure G-43)

It is recommended that the NJDEP's Office of Natural Lands Management be contacted to conduct Natural Heritage Database search.

Water Quality

Surface Water Quality Standards establish the designated uses to be achieved and specify the water quality (criteria) necessary to protect the State's waters. Designated uses include potable water, propagation of fish and wildlife, recreation, agricultural and industrial supplies, and navigation. These are reflected in use classifications assigned to specific waters.

According to the NJDEP GIS database, there are no water bodies located within or near the property. No impacts to water quality are expected. (See Figure G-43)

Wetlands

According to the NJDEP GIS database, there are wetlands located within a 400-foot radius to the west of the property. The proposed improvements do not affect any lands outside of the established property boundaries and would not likely affect this resource. However, if improvements that result in changes to drainage and water flow were to occur this may affect the wetlands and require permits.

It is recommended that the NJDEP's opinion on the impact to wetlands be requested.

Cumulative and Indirect Impacts

The cumulative impacts of the proposed improvements are expected to be positive, and would accrue in the form of increased attractiveness and convenience of transit as an alternative to automobile travel.

Indirect impacts are not anticipated from the implementation of the improvements, as there are no projects or developments that are dependent on the implementation of these improvements.

Property Acquisition

It is anticipated that a small portion of land along both sides of the access road to the west of the supermarket would be required for bus shelters. There would be no commercial or residential displacements.

Permitting

If it is determined through further investigations and inquiries that there are impacts to wetlands or unique/endangered species habitat, then appropriate permits will be needed.

However, the proposed improvements do not affect any lands outside of the established property boundaries and would not likely affect these resources.

Other Federal Actions

No other federal actions are known to be required to undertake the proposed improvements.

Traffic and Transportation

The proposed improvements do not affect any lands outside of the established property boundaries and, there would not be an increase in traffic volumes or vehicular volumes that could adversely impact traffic or transportation.

Figure G-41: Land Use

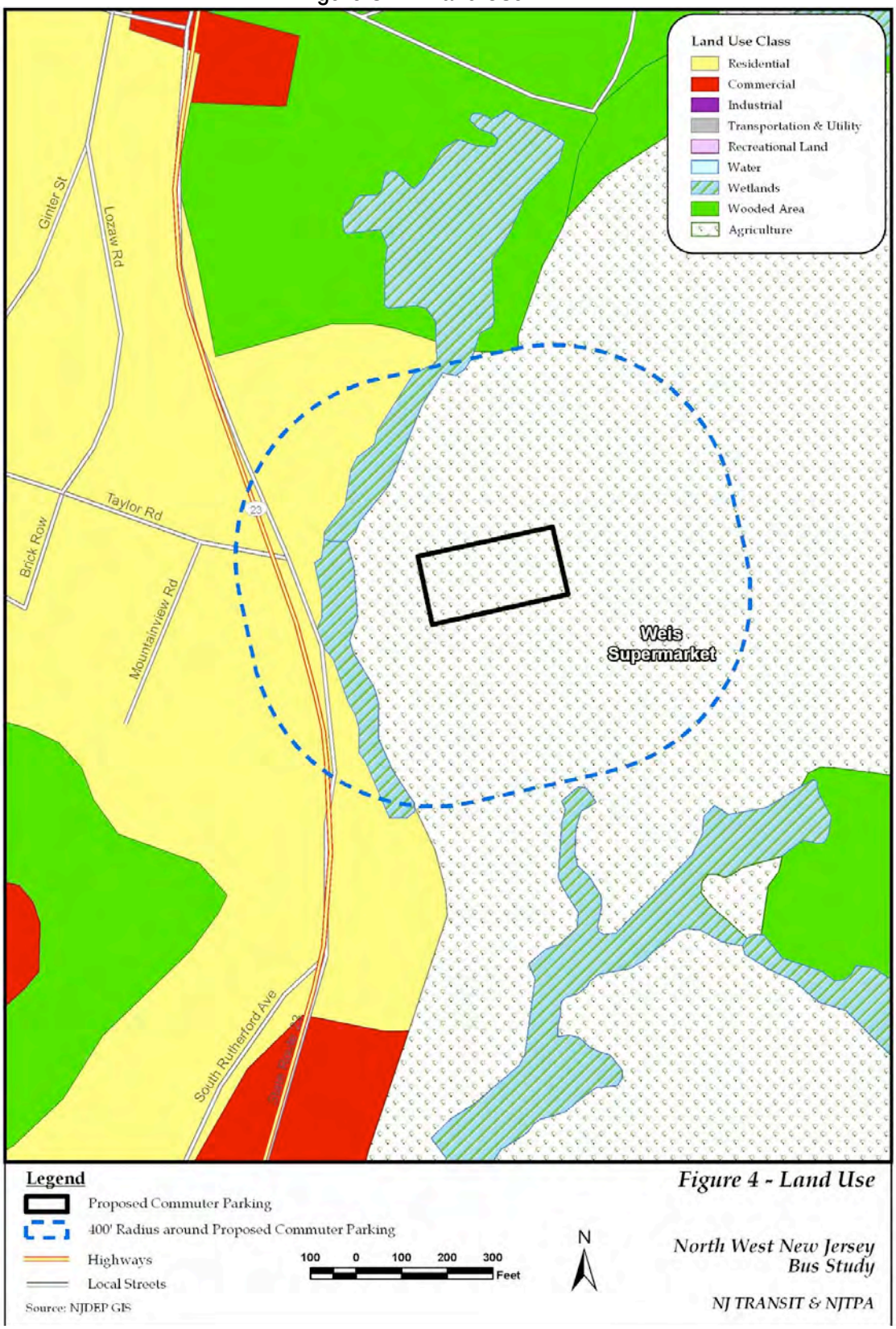


Figure G-42: Environmental Justice Census Block Groups in the Project Area

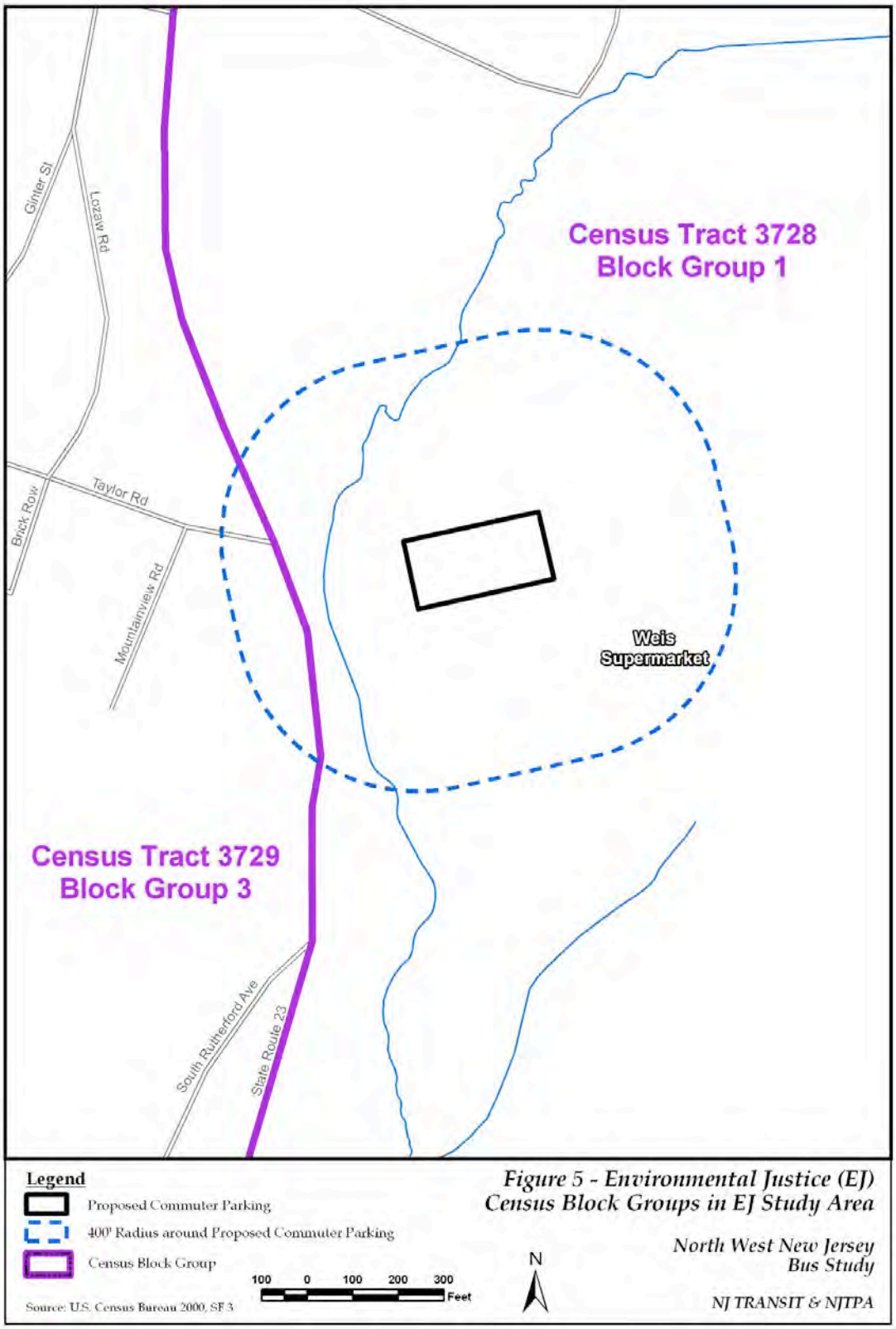
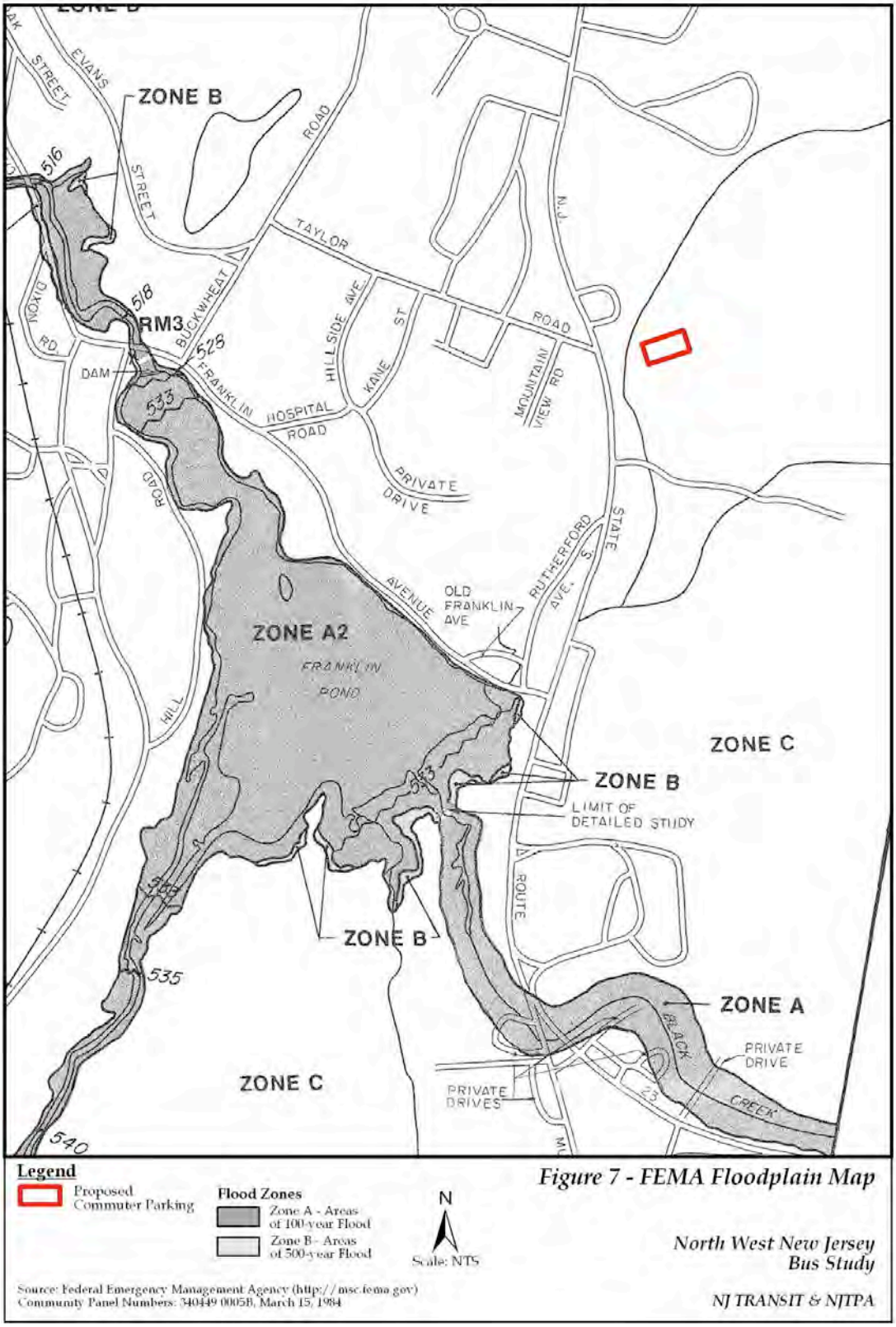


Figure G-43: Areas of Environmental Concern in the Project Area

Figure G-44: FEMA Floodplain Map for Project Area



G.39 Cost Estimate (based on 10% design)

Order-of-magnitude capital cost estimates were developed for the proposed improvements reflecting the conceptual level of engineering. These estimates include costs for major proposed elements and a 30% contingency to account for items such as maintenance of traffic, construction layout, escalation, and mobilization.

Description	Quantity	Unit	Unit Cost	Total Cost
Bus Shelter (inc. bench and lighting)	2	EA	$20,000	$40,000
Bus Shelter Pad	1000	SF	$20	$20,000
Bus shelter (installation)	2	EA	$5,000	$10,000
Bus shelter (electrical work)	2	EA	$9,000	$18,000
Real-time Message Sign	2	EA	$8,000	$16,000
Ticket Vending Machine	2	EA	$12,000	$24,000
Trash bin	2	EA	$500	$1,000
Bike rack	2	EA	$1,700	$3,400
Signage (2 bus stop information signs and 2 wayfinding signs)	4	TOTAL	$200	$800
Pedestrian Walkway	300	SF	$15	$4,500
Pavement Markings	500	LF	$5	$2,500
Subtotal				$100,200

Contingencies (30%) = $30,060
Total = $130,260
SAY $130,000

The above total does not include any ongoing operations and maintenance costs.

G.40 Key Issues to Resolve

The following issues would need to be resolved prior to implementation of the improvements:

- Determine property owner interest in proposed improvements. Obtain agreement on the types and scope of improvements.
- Contact the Highlands Council for formal review in order to obtain a firm determination of Highlands Act applicability.
- Contact NJDEP's Office of Natural Lands Management to confirm that no Rare and Endangered Species or Critical Habitat is located within the project site.
- Contact NJDEP's Division of Land Use Regulation to confirm that wetlands are not impacted.

G.41 Sources

The following sources were used to identify any areas of environmental concern.

Location and Land Use

NJDEP GIS database and layers - http://www.state.nj.us/dep/gis/lulc02shp.html

Coastal Zone

NJDEP GIS database and layers - http://www.state.nj.us/dep/landuse/caframap.html

Highlands Preservation or Planning Area

http://maps.njhighlands.us/default.asp#

Use of 4(f) Properties

NJDEP GIS database and layers - http://www.state.nj.us/dep/gis/lulc02shp.html
NJDEP GIS database and layers - http://www.state.nj.us/dep/gis/stateshp.html#STOPEN

Historic Resources

http://www.nr.nps.gov/iwisapi/explorer.dll?IWS_SCHEMA=NRIS1&IWS_LOGIN=1&IWS_REPORT=100000040

http://www.state.nj.us/dep/hpo/1identify/nrsr_lists.htm

Hazardous Sites

NJDEP GIS database and layers - http://www.state.nj.us/dep/gis/

Prime and Unique Farmlands

NJDEP GIS database and layers - http://www.state.nj.us/dep/gis/lulc02shp.html

Rare and Endangered Species; Critical Habitat

NJDEP GIS database and layers –
http://www.nj.gov/dep/parksandforests/natural/heritage/datareq.html

Water Quality

NJDEP GIS database and layers – http://www.state.nj.us/dep/gis/stateshp.html#SWQS

Wetlands

NJDEP GIS database and layers - http://www.state.nj.us/dep/gis/

H. Appendix H: Existing Park and Ride Lots

Table H-1: Existing Park-and-Ride Lots – Sussex-Passaic Corridor Recommended Improvements

Facility Name	Facility Type	Transit Service	Post hours of operation	Improve pedestrian access	Improve visibility of bus stop	Add signs	Add bus shelter	Post schedule[1]	Improve lighting	Improve parking lot	Add trash bin	Add bicycle parking
Wayne Park-and-Ride (Rte 23)	Dedicated P&R	NJT Montclair-Boonton Line / NJT 75, 194, 198, 324, 748	●									●
Wayne Park-and-Ride (Willowbrook Mall) *	Shared P&R	NJT 75, 191, 193, 194, 195, 197, 198										●
Wayne Park-and-Ride (Mothers Park-and-Ride)	Dedicated P&R	NJT 75, 194, 198, 324, 748										●
Montville Park-and-Ride (NJT Towaco Station)	Rail Station	NJT Montclair-Boonton Line / MCM1, Lakeland	●	●			●	●			●	●
Pequannock Park-and-Ride	Dedicated P&R	NJT 75, 194	●			●		●				●
Ringwood Park-and-Ride	Dedicated P&R	NJT 196, 197	●			●		●				
West Milford Park-and-Ride (Greenwood Lake)	Dedicated P&R	NJT 196, 197		●		●	●	●	●	●		●
Butler Park-and-Ride	Dedicated P&R	NJT 194	●			●	●	●	●		●	●
Butler/Kinnelon Park-and-Ride (Butler Bowl)	Shared P&R	NJT 75, 194	●				●	●	●		●	●
Newfoundland Park-and-Ride	Dedicated P&R	NJT 194		●		●		●	●	●		●
Sussex park-and-Ride (Municipal Parking Lot)	Dedicated P&R	SCT	●		●	●	●	●	●	●	●	●

* - Proposed to be upgraded to a transit center.

Table H-2: Existing Park-and-Ride Lots – Sussex-Morris Corridor Recommended Improvements

Facility Name	Facility Type	Transit Service	Post hours of operation	Improve pedestrian access	Improve visibility of bus stop	Add signs	Add bus shelter	Post schedule[1]	Improve lighting	Improve parking lot	Add trash bin	Add bicycle parking
Sparta Park-and-Ride (Blue Heron)	Dedicated P&R	Lakeland 80	●	●			●	●		●	●	●
Sparta Park-and-Ride (White Deer Plaza)	Shared P&R	Lakeland 80	●		●	●	●	●	●		●	●
Sparta Park-and-Ride*	Shared P&R	Lakeland 80	●		●	●	●	●				●
Newton Park-and-Ride	Dedicated P&R	Lakeland 80	●			●	●	●	●	●	●	●
Frankford Park-and-Ride (Ross' Corner)	Dedicated P&R	Wheels 967	●		●		●	●	●		●	●

* - Proposed to be upgraded to a transit center.

Table H-3: Existing Park-and-Ride Lots – Morris County Corridor Recommended Improvements

Facility Name	Facility Type	Transit Service	Post hours of operation	Improve pedestrian access	Improve visibility of bus stop	Add signs	Add bus shelter	Post schedule[1]	Improve lighting	Improve parking lot	Add trash bin	Add bicycle parking
Montclair State Univ. NJT Station (Essex County)	Rail Station	NJT Montclair-Boonton Line	●			●		●			●	●
Parsippany Park-and-Ride (Arlington Plaza)	Shared P&R	NJT 29, 79, Lakeland	●			●	●	●			●	●
Parsippany Park-and-Ride (Beverwyck)	Dedicated P&R	NJT 29, 79, Lakeland	●			●	●	●				●
Parsippany Park-and-Ride (Smithfield Lot 2)	Shared P&R	NJT 29, 79, Lakeland	●	●		●		●			●	●
Parsippany Park-and-Ride (Smithfield Lot 1)	Shared P&R	NJT 29, 79, Lakeland	●	●		●		●				●
Parsippany Park-and-Ride (Waterview)	Dedicated P&R	NJT 29, 79, Lakeland	●	●		●		●				●
Boonton NJT Station	Rail Station	NJT Montclair-Boonton Line / MCM 1, Lakeland	●					●	●		●	●
Mountain Lakes Park-and-Ride	Dedicated P&R	Lakeland	●			●		●		●		●
Denville Park-and-Ride	Dedicated P&R	MCM 10, Lakeland				●		●			●	●

Facility Name	Facility Type	Transit Service	Post hours of operation	Improve pedestrian access	Improve visibility of bus stop	Add signs	Add bus shelter	Post schedule[1]	Improve lighting	Improve parking lot	Add trash bin	Add bicycle parking
(Savage Rd)												
Rockaway Park-and-Ride	Dedicated P&R	MCM 10, Lakeland			●	●	●	●	●		●	●
Dover Park-and-Ride Lot 2 (Bus Terminal)	Dedicated P&R	MCM 2, 10, Lakeland	●	●		●		●	●		●	●
Dover NJT Station*	Rail Station	NJT Morristown Line and Montclair-Boonton Line / MCM 10, Lakeland	●			●	●	●	●	●	●	
Rockaway Townsquare Mall Park-and-Ride*	Shared P&R	MCM 10, Lakeland 80				●	●	●				
Mount Arlington Park-and-Ride (Howard Blvd)	Rail Station	NJT Montclair-Boonton Line, Morristown Line / Lakeland 80	●									
Mount Arlington Park-and-Ride (Stierli Court)	Shared P&R	No	●			●					●	●
Netcong NJT Station*	Rail Station	NJT Montclair-Boonton Line, Morristown	●		●		●	●		●		
Hopatcong Park-and-Ride	Dedicated P&R	No	●		●		●	●	●	●	●	●
Stanhope Park-and-Ride	Shared P&R	No	●					●			●	●
Byram Park-and-Ride	Dedicated P&R	No	●						●	●		●
Mount Olive Park-and-Ride	Shared P&R	No	●	●	●		●	●			●	●
Hackettstown NJT Station	Rail Station	NJT Morristown Line /NJT 973	●	●	●			●		●		
Hackettstown Park-and-Ride (Municipal Lot #4)	Shared P&R	No			●	●	●	●	●		●	●
Hackettstown Park-and-Ride (Municipal Lot #3)	Shared P&R	No			●		●	●			●	●
Hackettstown Park-and-Ride (Municipal Lot #2)	Shared P&R	No			●	●	●	●	●		●	●

I. Appendix I: Candidate Park and Ride Lots

Legend for the following tables:

- ○ Indicates that most or all elements are missing for a specific category. (For example, in terms of pedestrian amenities, a candidate site may have a pedestrian button located at the nearest signalized intersection, but no curb cuts, pedestrian signals, and visible crosswalk.)

- ⊙ Indicates that some elements are missing for a specific category. (For example, in terms of pedestrian amenities, a candidate site may have curb cuts and visible crosswalks at the nearest signalized intersection, but no pedestrian signal or button. In other cases, parking capacity may be an issue but only during certain times such as holidays or during the winter.)

- ● Indicates that all the elements are present for a specific category. (For example, a site may have all of the recommended pedestrian amenities (curb cuts, crosswalks, pedestrian signal and button) or the site has existing bus stops.)

Table I-1: Potential Shared-Use Park-and-Ride Candidates for Sussex-Passaic Corridor

Park-and-Ride Candidate	Municipality	Nearest Intersection	Findings	Recommendation	Related Service Improvement
Packanack Wayne Shopping Ctr	Wayne	NJ 23 & Packanack Lake Rd	○ Capacity: Insufficient capacity due to high existing parking demand.	Eliminate from further consideration	Not applicable
Brentwood Plaza	Wayne	NJ 23 & Jug handle N/O Plaza	○ Pedestrian amenities: Lacks pedestrian amenities (curb cuts, pedestrian button, and visible crosswalk). Pedestrian signal is present. ○ Pedestrian access: Far from nearest signalized intersection (600 ft). ○ Bus Stops: No existing bus stops present. ● Shoulder Width: Adequate shoulder width for buses to stop on roadway (12' shoulders). ● Bus Access: May be accessed by smaller transit vehicles. ⊙ Capacity: Potential capacity issue (parking may be unavailable during holiday season, snow removal, etc.).	Eliminate from further consideration	NJT 194 concept
Kohl's Lot	Wayne	NJ 23 & Ratzer Rd	○ Pedestrian amenities: Lacks pedestrian amenities (curb cuts, pedestrian signal and button, and visible crosswalk). ● Bus Stops: Existing bus stops present. ● Shoulder Width: Adequate shoulder width for buses to stop on roadway (12' shoulders). ● Bus Access: May be accessed by smaller transit vehicles. ⊙ Capacity: Potential capacity issue (parking may be unavailable during holiday season, snow removal, etc.).	Potential candidate for shared park-and-ride (Site would require pedestrian improvements to be considered a stronger candidate)	NJT 194 concept

Table I-1: Potential Shared-Use Park-and-Ride Candidates for Sussex-Passaic Corridor

Park-and-Ride Candidate	Municipality	Nearest Intersection	Findings	Recommendation	Related Service Improvement
Jackson Ave Shopping Ctr	Pompton Plains	NJ 23 & Jackson Ave	● Pedestrian amenities: Pedestrian amenities (curb cuts, crosswalks, pedestrian signal and button) are present. ○ Bus Stops: No existing bus stops present. ● Shoulder Width: Adequate shoulder width for buses to stop on roadway (12' shoulders). ● Bus Access: May be accessed by buses or smaller transit vehicles. ⊙ Capacity: Potential capacity issue (parking may be unavailable during holiday season, snow removal, etc.).	Potential candidate for shared park-and-ride (Parking lot is set back from roadways requiring walking 400'to access the parking lot)	NJT 194 concept
Wanaque Ave & Lakeside Ave	Pompton Lakes	Wanaque Ave & Lakeside Ave	○ Capacity: This location does not meet 50 space minimum. Existing parking is metered.	Eliminate from further consideration	Not applicable
Riverdale Crossing	Riverdale	NJ 23 & Highland Ave	○ Pedestrian amenities: Lacks pedestrian amenities (curb cuts, pedestrian signal and button, and visible crosswalk). ○ Bus Stops: No existing bus stops present. ○ Shoulder Width: No shoulders. ● Bus Access May be accessed by buses or smaller transit vehicles. Would require internal circulation. ⊙ Capacity: Potential capacity issue (parking may be unavailable during holiday season, snow removal, etc.).	Strong candidate for shared park-and-ride	NJT 194 concept
Home Depot / Staples	Riverdale	NJ 23 & Cotluss Rd	● Pedestrian amenities: Pedestrian amenities (curb cuts, crosswalks, pedestrian signal and button) are present. ○ Bus Stops: No existing bus stops present. ● Shoulder Width: Adequate shoulder width for	Strong candidate for shared park-and-ride	NJT 194 concept

Table I-1: Potential Shared-Use Park-and-Ride Candidates for Sussex-Passaic Corridor

Park-and-Ride Candidate	Municipality	Nearest Intersection	Findings	Recommendation	Related Service Improvement
			buses to stop on roadway (12' shoulders). ● Bus Access: May be accessed by buses or smaller transit vehicles. ⊙ Capacity: Potential capacity issue (parking may be unavailable during holiday season, snow removal, etc.).		
Cedar Crest Senior Housing	Riverdale	NJ 23 & Cotluss Rd	○ Bus Access: A shuttle bus would be needed to transport riders from Cedar Crest housing to Cotluss Rd. There are no sidewalks or crosswalks to Cotluss Rd. May be possible to place a shelter on WB Cotluss Rd. EB bus could use Cotluss Rd to access EB Rte 23 though it must pass through a residential area. For a WB bus to serve this location would be difficult requiring significant deviation from the route to access WB Rte 23.	Eliminate from further consideration	Not applicable
Lowes	Butler	NJ 23 & Morse Ave	● Pedestrian amenities: Pedestrian amenities (curb cuts, crosswalks, pedestrian signal and button) are present. ○ Bus Stops: No existing bus stops present. ● Shoulder Width: Adequate shoulder width for buses to stop on roadway (12' shoulders). ● Bus Access: May be accessed by smaller transit vehicles. ⊙ Capacity: Potential capacity issue (parking may be unavailable during holiday season, snow removal, etc.).	Eliminate from further consideration Home Depot is a better alternative for P&R in terms of bus circulation and connectivity to adjacent retail sites (i.e. Target).	Not applicable
Shopping Center	Butler	NJ 23 & Kiel Ave	○ Capacity: Insufficient capacity due to high existing parking demand.	Eliminate from further consideration	Not applicable
Maple Tree Plaza	Stockholm	NJ 23 & Snufftown Rd	○ Pedestrian amenities: Lacks pedestrian amenities (curb cuts, pedestrian signal and button, and visible crosswalk).	Potential candidate for shared park-and-ride (Site would require	NJT 194 concept

Table I-1: Potential Shared-Use Park-and-Ride Candidates for Sussex-Passaic Corridor

Park-and-Ride Candidate	Municipality	Nearest Intersection	Findings	Recommendation	Related Service Improvement
			○ Bus Stops: No existing bus stops present. ● Shoulder Width: Adequate shoulder width for buses to stop on roadway (12' shoulders). ● Bus Access: May be accessed by buses or smaller transit vehicles. ⊙ Capacity: Potential capacity issue (parking may be unavailable during holiday season, snow removal, etc.).Potential capacity issue (parking may be unavailable during holiday season, snow removal, etc.).	pedestrian improvements to be considered a stronger candidate)	
Skyland's Ice World	Stockholm	NJ 23 & Snufftown Rd	○ NJDOT approached property owner in the past. Could not promise availability of space due to after-school activities (i.e. hockey).	Eliminate from further consideration	Not applicable
Weis Supermarket	Franklin	NJ 23 & South Rutherford Ave	● Bus Access: This site is served by an internal roadway which may be used by a bus or smaller transit vehicle.	Strong candidate for shared park-and-ride	NJT 194 concept
Shop Rite Shopping Center	Franklin	NJ 23 & Ridgewood Rd	● Pedestrian amenities: Pedestrian amenities (curb cuts, crosswalks, pedestrian signal and button) are present. ○ Bus Stops: No existing bus stops present. ● Shoulder Width: Adequate shoulder width for buses to stop on roadway (12' shoulders). ● Bus Access: May be accessed by buses or smaller transit vehicles. ⊙ Capacity: Potential capacity issue (parking may be unavailable during holiday season, snow removal, etc.).Potential capacity issue (parking may be unavailable during holiday season, snow removal, etc.).	Strong candidate for shared park-and-ride	NJT 194 concept
Hamburg Mountain State Park	Vernon	CR 515	○ Bus Access: This road has a weight restriction	Eliminate from further consideration	Not applicable

Table I-1: Potential Shared-Use Park-and-Ride Candidates for Sussex-Passaic Corridor

Park-and-Ride Candidate	Municipality	Nearest Intersection	Findings	Recommendation	Related Service Improvement
			and is in a remote location. ○ Pedestrian amenities: Lacks pedestrian amenities (curb cuts, pedestrian signal and button, and visible crosswalk). ○ Bus Stops: No existing bus stops present. ○ Shoulder Width: No shoulders.	Eliminate from further consideration	Not applicable
DPW Building - 16 Wallkill Ave,	Hamburg	NJ23 & Walkill Ave	○ Location could not be found. ○ Pedestrian amenities: This location lacks pedestrian amenities and sidewalks. Long walk from parking lot to roadway.	Eliminate from further consideration Eliminate from further consideration	Not applicable Not applicable
Hamburg Firemans Pavilion	Hamburg	Urban St & King Kole Rd	○ Bus Access: Access to lot is along a steep, sloped driveway (which could be hazardous during winter). Existing lot is unpaved. ○ Bus Stops: No existing bus stops present. ○ Shoulder Width: No shoulder lanes are present. ○ Capacity: Potential capacity issue during evening baseball games / practice (a baseball field is adjacent to the pavilion).		

Table I-2: Potential Shared-Use Park-and-Ride Candidates for Sussex-Morris Corridor

Park-and-Ride Candidate	Municipality	Nearest Intersection	Findings	Recommendation	Related Service Improvement
VFW - 66 Main St	Sparta	Main St & Old Forge Rd	○ VFW has a sign posted specifically stating no commuter parking is allowed.	Eliminate from further consideration	Not applicable
Pathmark	Lake Hopatcong	NJ 15 & Bowling Green Pkwy	○ Pedestrian amenities: Lacks pedestrian amenities (curb cuts, pedestrian signal and button, visible crosswalk). ○ Bus Stops: No existing bus stops present. (Lakeland stops nearby at the Lakeside Shopping Center. A shared-park-and-ride may help attract more riders.) ● Shoulder Width: Adequate shoulder width for buses to stop on roadway (12' shoulders). ● Bus Access: May be accessed by smaller transit vehicles. ⊙ Capacity: Potential capacity issue (parking may be unavailable during holiday season, snow removal, etc.).	Potential candidate for shared park-and-ride (Site would require pedestrian improvements to be considered a stronger candidate)	Lakeland 80 Newton Sparta concept
Costco	Wharton	NJ 15 & E Dewey Ave	○ Pedestrian amenities: Lacks pedestrian amenities (curb cuts, pedestrian signal, and visible crosswalk). Pedestrian button is present. ○ Bus Stops: No existing bus stops present. ● Shoulder Width: Adequate shoulder width for buses to stop on roadway (8' shoulders). ● Bus Access: May be accessed by smaller transit vehicles. ⊙ Capacity: Potential capacity issue (parking may be unavailable during holiday season, snow removal, etc.). ○ A shared park-and-ride already exists at nearby Rockaway Townsquare Mall. Commuter bus service may not want to have stops spaced so closely together.	Potential candidate for shared park-and-ride (Not a strong candidate due to proximity to Rockaway Townsquare Mall)	Lakeland 80 Newton Sparta concept

Table I-3: Potential Shared-Use Park-and-Ride Candidates for Morris County Corridor

Park-and-Ride Candidate	Municipality	Nearest Intersection	Findings	Recommendation	Related Service Improvement
Ledgewood Plaza	Roxbury	US 46 & Howard Blvd	● Pedestrian amenities: Pedestrian amenities (curb cuts, crosswalks, pedestrian signal and button) are present. ○ Bus Stops: No existing bus stops present. ● Shoulder Width: Adequate shoulder width for buses to stop on roadway (10' shoulders). ● Bus Access: May be accessed by smaller transit vehicles. ⊙ Capacity: Potential capacity issue (parking may be unavailable during holiday season, snow removal, etc.).	Strong candidate for shared park-and-ride	Lakeland 46 local service concept Lakeland 80 (Budd Lake branch) service concept Community Coach 77 service concept Expansion of service on NJT 29 & 79 service concept New MCM route serving Ledgewood Mall
Church	Dover	US 46 & S Main St	○ Capacity: Insufficient capacity due to high existing parking demand.	Eliminate from further consideration	Not applicable
St Claire's Hospital	Dover	US 46 & Elk Ave	○ Capacity: Insufficient capacity due to high existing parking demand.	Eliminate from further consideration	Not applicable
Shop Rite Shopping Ctr	Dover	US 46 & Shop Rite Dwy	○ Capacity: Insufficient capacity due to high existing parking demand.	Eliminate from further consideration	Not applicable
Dover Town Hall	Dover	US 46 & Sussex St	○ Location could not be found.	Eliminate from further consideration	Not applicable
Fitness Factory	Rockaway	US 46 & Boro Plaza Dwy	● Pedestrian amenities: Pedestrian amenities (curb cuts, crosswalks, pedestrian signal and button) are present. ○ Bus Stops: No existing bus stops present. ● Shoulder Width: Adequate shoulder width for buses to stop on roadway (10' shoulders).	Strong candidate for shared park-and-ride	Lakeland 46 local service concept Community Coach 77 service concept Expansion of service on NJT 29 & 79 service concept

Table I-3: Potential Shared-Use Park-and-Ride Candidates for Morris County Corridor

Park-and-Ride Candidate	Municipality	Nearest Intersection	Findings	Recommendation	Related Service Improvement
World Gym	Rockaway	US 46 & Mannino Dr	● Bus Access: May be accessed by smaller transit vehicles. ○ Capacity: Insufficient capacity due to high existing parking demand.	Eliminate from further consideration	Not applicable
Denville Town Hall	Denville	US 46 & Savage Rd	○ Capacity: Insufficient capacity due to high existing parking demand.	Eliminate from further consideration	Not applicable
Zeris Inn Banquet / Chrisandis Restaurant	Denville	US 46 & Fox Hill Rd	⊙ Pedestrian amenities: Pedestrian amenities (crosswalks, pedestrian signal and button) are present. No curb cuts present. ● Bus Stops: Existing bus stops present (served by Lakeland) ● Shoulder Width: Adequate shoulder width for buses to stop on roadway (10' shoulders). ● Bus Access: May be accessed by smaller transit vehicles. ⊙ Capacity: Potential capacity issue during evening catering hours.	Potential candidate for shared park-and-ride (Potential candidate because of potential parking conflicts due to needs of existing business)	Lakeland 46 local service concept Community Coach 77 service concept Expansion of service on NJT 29 & 79 service concept
South City Grill	Mountain Lakes	US 46 & Lackawanna Ave	○ Pedestrian amenities: Lacks pedestrian amenities (curb cuts, pedestrian signal, and visible crosswalk). Pedestrian button present. ● Bus Stops: Existing bus stops present (served by Lakeland) ● Shoulder Width: Adequate shoulder width for buses to stop on roadway (10' shoulders). ● Bus Access: May be accessed by smaller transit vehicles.	Potential candidate for shared park-and-ride (Potential candidate because of potential parking conflicts due to needs of existing business))	Lakeland 46 local service concept Community Coach 77 service concept Expansion of service on NJT 29 & 79 service concept

Table I-3: Potential Shared-Use Park-and-Ride Candidates for Morris County Corridor

Park-and-Ride Candidate	Municipality	Nearest Intersection	Findings	Recommendation	Related Service Improvement
Lutheran Church	Mountain Lakes	US 46 & Lackawanna Ave	⊙ Capacity: Potential capacity issue during evening dinner hours. ○ Pedestrian amenities: Lacks pedestrian amenities (curb cuts, pedestrian signal, and visible crosswalk). Pedestrian button present. ○ Pedestrian access: Far from nearest signalized intersection (750 ft). ● Bus Stops: Existing bus stops present (served by Lakeland) ● Shoulder Width: Adequate shoulder width for buses to stop on roadway (10' shoulders). ● Bus Access: May be accessed by smaller transit vehicles.	Eliminate from further consideration	Not applicable
Morris Hills Plaza	Parsippany	US 46 & US 202	⊙ Pedestrian amenities: Pedestrian amenities (crosswalks, pedestrian signal and button) are present. No curb cuts present. ● Bus Stops: Existing bus stops present (served by NJT 29 and Lakeland – EB NJT 29 and MCM1 - WB) ● Shoulder Width: Adequate shoulder width for buses to stop on roadway (10' shoulders). ● Bus Access: May be accessed by buses and smaller transit vehicles. ⊙ Capacity: Potential capacity issue (parking may be unavailable during holiday season, snow removal, etc.).	Strong candidate for shared park-and-ride	Lakeland 46 local service concept Community Coach 77 service concept Expansion of service on NJT 29 & 79 service concept

Table I-3: Potential Shared-Use Park-and-Ride Candidates for Morris County Corridor

Park-and-Ride Candidate	Municipality	Nearest Intersection	Findings	Recommendation	Related Service Improvement
IMS Office Complex	Parsippany	US 46 & US 202	⊙ Pedestrian amenities: Pedestrian amenities (crosswalks, pedestrian signal and button) are present. No curb cuts present. ○ Pedestrian access: Difficult for pedestrians to access existing bus stops. No sidewalks. ● Bus Stops: Existing bus stops present (served by NJT 29 and Lakeland – EB NJT 29 and MCM1 - WB) ● Shoulder Width: Adequate shoulder width for buses to stop on roadway (10' shoulders). ● Bus Access: May be accessed by smaller transit vehicles.	Eliminate from further consideration (Morris Hills Plaza is a better candidate.)	Not applicable
Cost Cutters Shopping Ctr	Parsippany	US 46 & Baldwin Rd	● Pedestrian amenities: Pedestrian amenities (curb cuts, crosswalks, pedestrian signal and button) are present. ● Bus Stops: Existing bus stops present (served by NJT 29 and 79) ● Shoulder Width: Adequate shoulder width for buses to stop on roadway (10' shoulders). ● Bus Access: May be accessed by smaller transit vehicles. ⊙ Capacity: Potential capacity issue (parking may be unavailable during holiday season, snow removal, etc.).	Strong candidate for shared park-and-ride (Can be used in conjunction with existing Smithfield P&R.)	Lakeland 46 local service concept Community Coach 77 service concept Expansion of service on NJT 29 & 79 service concept
St. Peter the Apostle Church	Parsippany	US 46 & Baldwin Rd	● Pedestrian amenities: Pedestrian amenities (curb cuts, crosswalks, pedestrian signal and button) are present.	Strong candidate for shared park-and-ride	Lakeland 46 local service concept

Table I-3: Potential Shared-Use Park-and-Ride Candidates for Morris County Corridor

Park-and-Ride Candidate	Municipality	Nearest Intersection	Findings	Recommendation	Related Service Improvement
			● Bus Stops: Existing bus stops present (served by NJT 29 and 79) ● Shoulder Width: Adequate shoulder width for buses to stop on roadway (10' shoulders). ● Bus Access: May be accessed by smaller transit vehicles.	(Can be used in conjunction with existing Smithfield P&R)	Community Coach 77 service concept Expansion of service on NJT 29 & 79 service concept
VFW Hall -220 Troy Rd	Parsippany	US 46 & Baldwin Rd	○ Capacity: This location does not meet 50 space minimum.	Eliminate from further consideration	Not applicable
Troy Hills Plaza	Parsippany	US 46 & Berverwyck Rd	● Pedestrian amenities: Pedestrian amenities (curb cuts, crosswalks, pedestrian signal and button) are present. ○ Bus Stops: No existing bus stops present. ● Shoulder Width: Adequate shoulder width for buses to stop on roadway (10' shoulders). ● Bus Access: May be accessed by smaller transit vehicles. ⊙ Capacity: Potential capacity issue (parking may be unavailable during holiday season, snow removal, etc.).	Strong candidate for shared park-and-ride (Can be used in conjunction with existing Berverwyck P&R.)	Lakeland 46 local service concept Community Coach 77 service concept Expansion of service on NJT 29 & 79 service concept
Office Complex	Parsippany	US 46 & Beverwyck Rd	○ Pedestrian amenities: Lacks pedestrian amenities (curb cuts, pedestrian signal and button, and visible crosswalk). ○ Pedestrian access: Far from nearest signalized intersection (1,000 ft). ○ Bus Stops: No existing bus stops present. ● Shoulder Width: Adequate shoulder	Eliminate from further consideration	Not applicable

Table I-3: Potential Shared-Use Park-and-Ride Candidates for Morris County Corridor

Park-and-Ride Candidate	Municipality	Nearest Intersection	Findings	Recommendation	Related Service Improvement
			width for buses to stop on roadway (10' shoulders). ● Bus Access: May be accessed by smaller transit vehicles.		
Office Complex	Pine Brook	US 46 & Chapin Rd	○ Pedestrian amenities: Lacks pedestrian amenities (curb cuts, pedestrian signal and button, and visible crosswalk). ○ Pedestrian access: No access from westbound Route 46 (divided by highway median). ● Bus Stops: Existing bus stops present (served by NJT 29 and 79) ● Shoulder Width: Adequate shoulder width for buses to stop on roadway (10' shoulders).	Eliminate from further consideration	Not applicable
Home Depot	Pine Brook	US 46 & Bloomfield Ave	○ Pedestrian amenities: Lacks pedestrian amenities (curb cuts, pedestrian signal and button, and visible crosswalk). ○ Pedestrian access: No access from westbound Route 46 (divided by highway median). ○ Bus Stops: No existing bus stops present. ● Shoulder Width: Adequate shoulder width for buses to stop on roadway (10' shoulders).	Eliminate from further consideration	Not applicable
Business Complex	Fairfield	US 46 & Clinton Rd	○ Pedestrian amenities: Lacks pedestrian amenities (curb cuts, pedestrian signal and button, and visible crosswalk). ○ Bus Stops: No existing bus stops present.	Eliminate from further consideration	Not applicable

Table I-3: Potential Shared-Use Park-and-Ride Candidates for Morris County Corridor

Park-and-Ride Candidate	Municipality	Nearest Intersection	Findings	Recommendation	Related Service Improvement
VFW Hall (45 Plymouth Street)	Fairfield	US 46 & Clinton Rd	○ Shoulder Width: No shoulders in either direction. ○ Capacity: This location does not meet 50 space minimum.	Eliminate from further consideration	Not applicable
Business Complex	Fairfield	US 46 & Law Dr	○ Pedestrian amenities: Lacks pedestrian amenities (curb cuts, pedestrian signal and button, and visible crosswalk). ○ Bus Stops: No existing bus stops present. ○ Bus Access: These businesses are not located on Rte 46. To serve would require deviation from Rte 46. The route is long and circuitous. Parking lots are not designed for buses.	Eliminate from further consideration	Not applicable
Staples Lot	Livingston	NJ 10 & Walnut St / Daven Ave	○ Pedestrian amenities: Lacks pedestrian amenities (curb cuts, pedestrian signals, visible crosswalk). Pedestrian button present. ○ Pedestrian access: Located far from nearest signalized intersection (750 feet) ○ Bus Access: Buses cannot circulate within lot.	Eliminate from further consideration	Not applicable
VFW Hall - 95 W Mount Pleasant Ave	Livingston	Mitchell Ave & Mt Pleasant Ave	⊙ Pedestrian amenities: Pedestrian amenities (curb cuts, visible crosswalk) are present. No pedestrian signal or button. ● Bus Stops: Existing bus stops present (served by NJT 79). ○ Shoulder Width: No shoulder lanes in either direction. (This is a local road)	Strong candidate for shared park-and-ride	Not applicable
Castle Ridge Plaza/Daffy's	East Hanover	NJ 10 & River Rd	⊙ Pedestrian amenities: Pedestrian	Strong candidate for shared park-and-ride	Community Coach 77 concept

Table I-3: Potential Shared-Use Park-and-Ride Candidates for Morris County Corridor

Park-and-Ride Candidate	Municipality	Nearest Intersection	Findings	Recommendation	Related Service Improvement
Marshalls Lot	East Hanover	NJ 10 & New Murray Rd	amenities (pedestrian signal and button) are present. No crosswalk or curb cuts. ● Bus Stops: Existing bus stops present (served by NJT 73). ● Shoulder Width: Adequate shoulder width for buses to stop on roadway (8' shoulders). ● Bus Access: Both lots may be accessed by smaller transit vehicles. ⊙ Capacity: Potential capacity issue (parking may be unavailable during holiday season, snow removal, etc.). ⊙ Pedestrian amenities: Pedestrian amenities (crosswalks, pedestrian signal and button) are present. No curb cuts. ● Bus Stops: Existing bus stops present (served by NJT 73). ● Shoulder Width: Adequate shoulder width for buses to stop on roadway (8' shoulders). ● Bus Access: May be accessed by smaller transit vehicles. ⊙ Capacity: Has less parking capacity (450 spaces) than Home Depot (600 spaces).	Potential candidate for shared park-and-ride (Home Depot is the preferred site)	Community Coach 77 concept
Home Depot	East Hanover	NJ 10 & New Murray Rd	⊙ Pedestrian amenities: Pedestrian amenities (crosswalks, pedestrian signal and button) are present. No curb cuts ● Bus Stops: Existing bus stops present (served by NJT 73).	Strong candidate for shared park-and-ride	Community Coach 77 concept

Table I-3: Potential Shared-Use Park-and-Ride Candidates for Morris County Corridor

Park-and-Ride Candidate	Municipality	Nearest Intersection	Findings	Recommendation	Related Service Improvement
Costco	East Hanover	NJ 10 & Faranella Dr	● Shoulder Width: Adequate shoulder width for buses to stop on roadway (8' shoulders). ● Bus Access: May be accessed by smaller transit vehicles. ⊙ Capacity: Potential capacity issue (parking may be unavailable during holiday season, snow removal, etc.). ● Pedestrian amenities: Pedestrian amenities (curb cuts, crosswalks, pedestrian signal and button) are present. ● Bus Stops: Existing bus stops present (served by NJT 73).	Strong candidate for shared park-and-ride	Community Coach 77 concept
Target	East Hanover	NJ 10 & Faranella Dr	● Shoulder Width: Adequate shoulder width for buses to stop on roadway (8' shoulders). ● Bus Access: May be accessed by smaller transit vehicles. ⊙ Capacity: Potential capacity issue (parking may be unavailable during holiday season, snow removal, etc.). ● Pedestrian amenities: Pedestrian amenities (curb cuts, crosswalks, pedestrian signal and button) are present. ● Bus Stops: Existing bus stops present (served by NJT 73).	Potential candidate for shared park-and-ride (May be used as an alternative to Costco lot)	Community Coach 77 concept
			● Shoulder Width: Adequate shoulder width for buses to stop on roadway (8' shoulders). ● Bus Access: May be accessed by		

Table I-3: Potential Shared-Use Park-and-Ride Candidates for Morris County Corridor

Park-and-Ride Candidate	Municipality	Nearest Intersection	Findings	Recommendation	Related Service Improvement
			smaller transit vehicles. ⊙ Capacity: Potential capacity issue (parking may be unavailable during holiday season, snow removal, etc.).		
Babies R' Us	East Hanover	NJ 10 & Faranella Dr	● Pedestrian amenities: Pedestrian amenities (curb cuts, crosswalks, pedestrian signal and button) are present. ○ Pedestrian access: Far from nearest signalized intersection (1,250 ft). ● Bus Stops: Existing bus stops present (served by NJT 73). ● Shoulder Width: Adequate shoulder width for buses to stop on roadway (8' shoulders). ● Bus Access: May be accessed by smaller transit vehicles. ⊙ Capacity: Potential capacity issue (parking may be unavailable during holiday season, snow removal, etc.).	Eliminate from further consideration (Costco and Target are better candidates.)	Not applicable
East Hanover Public Works Department	East Hanover	NJ 10 & Ridgedale Ave	○ Capacity: Insufficient capacity due to high existing parking demand.	Eliminate from further consideration	Not applicable
Hanover Municipal Building	Hanover	NJ 10 & Ridgedale Ave	○ Capacity: Insufficient capacity due to high existing parking demand.	Eliminate from further consideration	Not applicable
Signature Fitness	Hanover	NJ 10 & Ridgedale Ave	● Pedestrian amenities: Pedestrian amenities (curb cuts, crosswalks, pedestrian signal and button) are present. ○ Pedestrian access: Far from nearest signalized intersection (700 ft) / difficult to access intersection from site. ○ Bus Stops: No existing bus stops	Eliminate from further consideration	Not applicable

Table I-3: Potential Shared-Use Park-and-Ride Candidates for Morris County Corridor

Park-and-Ride Candidate	Municipality	Nearest Intersection	Findings	Recommendation	Related Service Improvement
			present. ● Shoulder Width: Adequate shoulder width for buses to stop on roadway (12' shoulders). ● Bus Access: May be accessed by smaller transit vehicles. ⊙ Capacity: Potential capacity issue (parking may be unavailable during holiday season, snow removal, etc.).		
PC Richards & Sons/ Hometown Hearth & Grill Lot	Hanover	NJ 10 & Algonquin Pkwy	⊙ Pedestrian amenities: Pedestrian amenities (curb cuts, crosswalks, pedestrian button) are present. No pedestrian signal. ○ Bus Stops: No existing bus stops present. ● Shoulder Width: Adequate shoulder width for buses to stop on roadway (8' shoulders). ● Bus Access: May be accessed by smaller transit vehicles. ⊙ Capacity: Potential capacity issue (parking may be unavailable during holiday season, snow removal, etc.).	Strong candidate for shared park-and-ride	Community Coach 77 concept
Recreational Center - 1000 State Route 10	Hanover	NJ 10 & N Jefferson Rd	○ Pedestrian amenities: Lacks pedestrian amenities (curb cuts, pedestrian signals). Only crosswalk present. ○ Bus Stops: No existing bus stops present. No space for an EB bus stop. ○ Shoulder Width: No eastbound shoulder lane, all 3 lanes are used by traffic.	Eliminate from further consideration	Not applicable
Hanover Twp Public Works - 25	Hanover	NJ 10 & N Jefferson Rd	○ Capacity: This site has a salt dome,	Eliminate from further consideration	Not applicable

Table I-3: Potential Shared-Use Park-and-Ride Candidates for Morris County Corridor

Park-and-Ride Candidate	Municipality	Nearest Intersection	Findings	Recommendation	Related Service Improvement
N Jefferson Rd			truck parking and gas station on it.		
Pine Brook Plaza	Hanover	NJ 10 & Pine Brook Plaza Dwy	⊙ Pedestrian amenities: Pedestrian amenities (curb cuts, crosswalks, pedestrian button) are present. No pedestrian signal. ○ Bus Stops: No existing bus stops present. ● Shoulder Width: Adequate shoulder width for buses to stop on roadway (8' shoulders). ● Bus Access: May be accessed by smaller transit vehicles. ⊙ Capacity: Potential capacity issue (parking may be unavailable during holiday season, snow removal, etc.).	Potential candidate for shared park-and-ride (PC Richards & Sons/ Hometown Hearth & Grill Lot offer more potential parking capacity)	Community Coach 77 concept
Chase Office Complex	Hanover	NJ 10 & US 202	● Pedestrian amenities: Pedestrian amenities (curb cuts, crosswalks, pedestrian signal and button) are present. ○ Pedestrian access: Far from nearest signalized intersection (1,300 ft). ○ Bus Stops: No existing bus stops present. ○ Shoulder Width No shoulder in the westbound direction. ● Bus Access: May be accessed by smaller transit vehicles.	Eliminate from further consideration	Not applicable
Powder Mill Plaza	Morris Plains	NJ 10 & Yacenda Dr	○ Pedestrian amenities: Lacks pedestrian amenities (curb cuts, pedestrian signals, visible crosswalk). Pedestrian button present. ⊙ Bus Stops: Existing bus stops present	Eliminate from further consideration	Not applicable

Table I-3: Potential Shared-Use Park-and-Ride Candidates for Morris County Corridor

Park-and-Ride Candidate	Municipality	Nearest Intersection	Findings	Recommendation	Related Service Improvement
			eastbound only (served by MCM 2). ○ Shoulder Width No shoulder in the westbound direction. ⊙ Capacity: Potential capacity issue (parking may be unavailable during holiday season, snow removal, etc.).		
VFW Hall - 45 Tabor Rd	Morris Plains	NJ 10 & Littleton Rd	○ Location could not be found.	Eliminate from further consideration	Not applicable
Shoppes at Union Hill	Denville	NJ 10 & Union Hill Shops Dwy	○ Pedestrian amenities: Lacks pedestrian amenities (curb cuts, pedestrian signals, visible crosswalk). Pedestrian button present. ○ Bus Stops: No existing bus stops present. ○ Shoulder Width: No shoulder in the either direction. ⊙ Capacity: Potential capacity issue (parking may be unavailable during holiday season, snow removal, etc.).	Eliminate from further consideration	Not applicable
K-Mart Lot	Randolph	NJ 10 & S Salem St	○ Pedestrian amenities: Lacks pedestrian amenities (curb cuts, pedestrian signal and button, visible crosswalk). ○ Pedestrian access: Far from nearest intersection (1,250 ft). ○ Bus Stops: No existing bus stops present. The MCM 2 has scheduled stops at the K-Mart Mall Lot. ○ Shoulder Width: No shoulder in the westbound direction. ● Bus Access: May be accessed by buses or smaller transit vehicles.	Eliminate from further consideration	Not applicable

Table I-3: Potential Shared-Use Park-and-Ride Candidates for Morris County Corridor

Park-and-Ride Candidate	Municipality	Nearest Intersection	Findings	Recommendation	Related Service Improvement
			⊙ Capacity: Potential capacity issue (parking may be unavailable during holiday season, snow removal, etc.).		
Lakeview Cardiology Center	Randolph	NJ 10 & Millbrook Ave	○ Capacity: Insufficient capacity due to high existing parking demand.	Eliminate from further consideration	Not applicable
College Plaza	Randolph	NJ 10 & Center Grove Rd	○ Capacity: Insufficient capacity due to high existing parking demand.	Eliminate from further consideration	Not applicable
Meadow Wood Manor/ A & P Lot	Randolph	NJ 10 & Center Grove Rd	● Pedestrian amenities: Pedestrian amenities (curb cuts, crosswalks, pedestrian signal and button) are present. ○ Pedestrian access: Meadow Wood Manor is far from nearest signalized intersection (1,300 ft). (A&P lot is located at the intersection) ○ Bus Stops: No existing bus stops present. ● Shoulder Width: Adequate shoulder width for buses to stop on roadway (8' shoulders). ● Bus Access: May be accessed by smaller transit vehicles. ⊙ Capacity: Potential capacity issue during evening catering hours for Meadow Wood Manor. Potential capacity issue (parking may be unavailable during holiday season, snow removal, etc.) for A&P lot.	Strong candidate for shared park-and-ride (A&P lot only)	New MCM route serving Roxbury Mall
Bethlehem Church	Randolph	NJ 10 & Dover Chester Rd	⊙ Pedestrian amenities: Pedestrian amenities (crosswalks, pedestrian button) are present. No pedestrian signal or curb cuts. ○ Pedestrian access: Far from nearest	Potential candidate for shared park-and-ride (A&P preferred site)	New MCM route serving Roxbury Mall

Table I-3: Potential Shared-Use Park-and-Ride Candidates for Morris County Corridor

Park-and-Ride Candidate	Municipality	Nearest Intersection	Findings	Recommendation	Related Service Improvement
Baseball Field Lot	Roxbury	NJ 10 & Green Ln	signalized intersection (750 ft). ○ Bus Stops: No existing bus stops present. ● Shoulder Width: Adequate shoulder width for buses to stop on roadway (10' shoulders). ● Bus Access: May be accessed by smaller transit vehicles ○ Pedestrian amenities: Lacks pedestrian amenities (curb cuts, pedestrian signal and button, visible crosswalk).	Eliminate from further consideration	Not applicable
Time Out Adult Care Center	Roxbury	NJ 10 & Hillside Ave	○ Bus Stops: No existing bus stops present. ● Shoulder Width: Adequate shoulder width for buses to stop on roadway (10' shoulders). ● Bus Access: May be accessed by smaller transit vehicles ○ Capacity: Potential capacity issue during evening baseball games / practice. ○ Capacity: Insufficient capacity due to high existing parking demand.	Eliminate from further consideration	Not applicable
Roxbury Mall	Roxbury	NJ 10 & Commerce Blvd	● Pedestrian amenities: Pedestrian amenities (curb cuts, crosswalks, pedestrian signal and button) are present. ○ Bus Stops: No existing bus stops present. ● Shoulder Width: Adequate shoulder width for buses to stop on roadway (10' shoulders).	Strong candidate for shared park-and-ride	Lakeland 80 Budd Lake Branch concept New MCM route serving Roxbury Mall

Table I-3: Potential Shared-Use Park-and-Ride Candidates for Morris County Corridor

Park-and-Ride Candidate	Municipality	Nearest Intersection	Findings	Recommendation	Related Service Improvement
Ledgewood Mall	Roxbury	NJ 10 & Mary Louise Ave	● Bus Access: May be accessed by buses or smaller transit vehicles. ⊙ Capacity: Potential capacity issue (parking may be unavailable during holiday season, snow removal, etc.). ○ Pedestrian amenities: Lacks pedestrian amenities (curb cuts, pedestrian signal and button, visible crosswalk). ○ Bus Stops: No existing bus stops present. ● Shoulder Width: Adequate shoulder width for buses to stop on roadway (10' shoulders). ● Bus Access: May be accessed by buses or smaller transit vehicles. ⊙ Capacity: Potential capacity issue (parking may be unavailable during holiday season, snow removal, etc.).	Eliminate from further consideration (Roxbury Mall is located adjacent to this site and is a better candidate)	Not applicable

J. Appendix J: Summary of Existing Conditions at Sample Bus Stops

This appendix provides a summary of existing conditions at selected bus stops within the Northwest New Jersey Bus Study area. The data collected provide an overall evaluation of the safety and operational characteristics of representative bus stops exhibiting various levels of attributes.

A field reconnaissance was undertaken by STV to identify the needs and deficiencies of these facilities in order to develop recommendations to improve their safety and/or operation. This assessment was then be used as a guide for evaluating other bus stop locations within the study area and establishing a recommended list of standard improvement measures.

The bus stops selected for examination included locations:

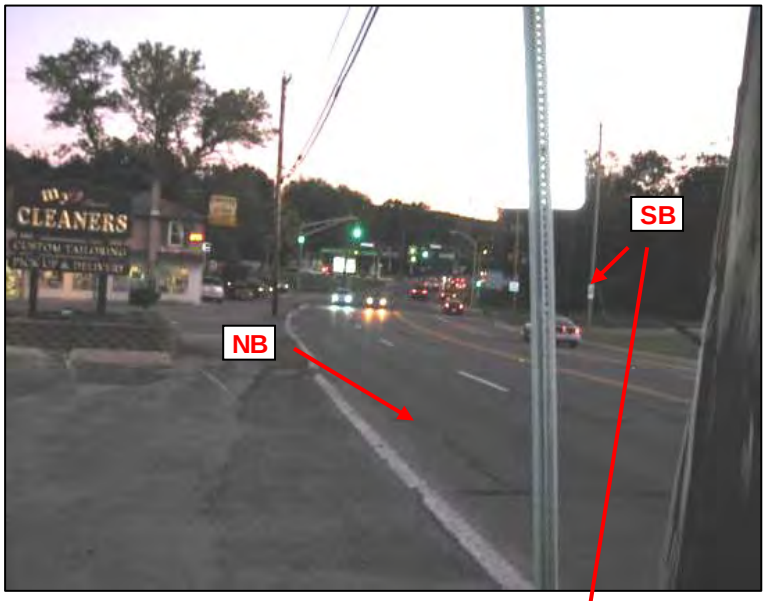
- identified as having a deficiency by drivers, riders, or stakeholders, based on feedback received from surveys conducted for this study; and
- having daily boardings/alightings in excess of 50 persons based on load profiles.

Each existing bus stop was assessed to obtain the following information:

- Bus route served and direction of travel
- Stop area location – within travel lane, pull-off area, parking lane, etc.
- Intersection location – near-side, far-side, or midblock
- Stop Indication – sign post, bus sign on utility pole, bus shelter
- Landing position – sidewalk, off-road/no sidewalk, shoulder
- Landing area material – concrete, grass, dirt
- Pedestrian crossing amenities provided – traffic light, pedestrian crossing signal, crosswalks, corner curb ramps/cuts
- Adjacent land uses – residential, shopping center, restaurant, church, etc.

J.1 Location: Route 46/Mount Olive Road at New Street (NB/SB, Board/Alight)

- Northbound:
  - Midblock stop
  - Bus sign post on sidewalk
  - Sidewalk in poor condition
- Southbound:
  - Near-side stop on grassy area in front of Valley National Bank at corner
  - Bus sign on light post
- Bus stops in travel lane
- Nearby Properties: grocery store, cleaners, Valley National Bank, residences, lake/recreational area west on New Street



J.2 Location: Main Street and Harry Shupe Blvd (NB/SB, Board/Alight)

- Northbound:
  - Midblock stop
  - Bus sign post by sidewalk in front of housing complex.
- Southbound:
  - Midblock stop
  - Bus sign post by sidewalk by Wharton America Legion Post 91
- Bus stops in travel lane
- Nearby properties: post office, residential, small lake and water tower house, Cherokee Glass (auto glass)

J.3 Location: Blackwell Street at Warren Street (EB/WB, Board/Alight)

- Eastbound:
  - Far-side stop
  - Bus sign post on sidewalk
- Westbound:
  - Far-side stop
  - Bus sign post on sidewalk
- Bus stops in parking lane
- Nearby Properties: small town center with retail and restaurants surrounded by residential uses

J.4 Location: Blackwell Street at Morris Street (EB/WB, Board/Alight)

- Eastbound:
  - Far-side stop
  - Bus sign post on sidewalk in front of H&R Block
- Westbound:
  - Far-side stop
  - Bus post sign on sidewalk in front of Dover Business College
- Bus stops in parking lane
- Nearby Properties: small town center with retail and restaurants surrounded by residential uses

J.5 Location: Rockaway Townsquare Mall (Board/Alight)

- Bus sign post by mall entrance (under construction), located at the rear of Macy's department store. East side of mall, no trailblazer signs to the bus stop (large complex; very difficult to locate bus stop).
- Informed by store employees that a park-and-ride lot has been set aside for commuters

J.6 Location: Speedwell Avenue and Sussex Avenue (NB/SB, Board/Alight)

- Northbound:
  - Midblock stop
  - Bus sign on light post
  - No bus shelter / benches provided
  - Concrete passenger waiting area provided
- Southbound:
  - Near-side Stop
  - Bus sign post
  - No bus shelter / benches provided
  - Concrete pavement provided
- Bus stops in parking lane
- Nearby properties: Downtown center (small shops, restaurants, Jewish Community Center, church)

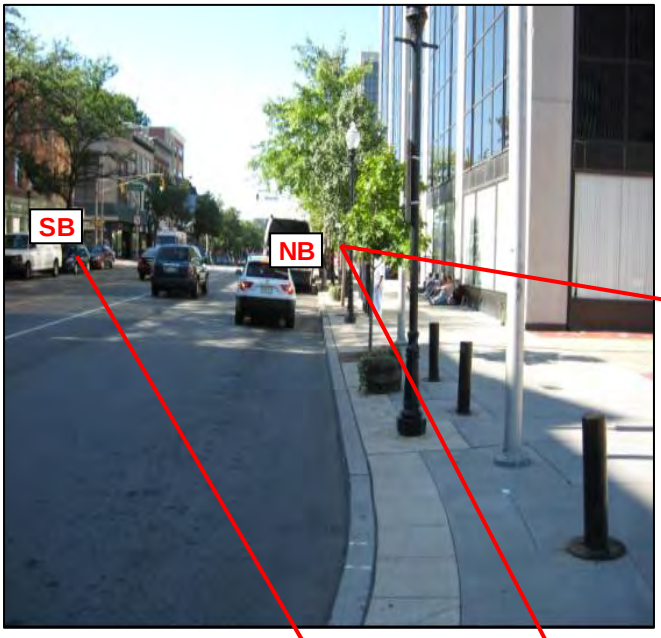

SB

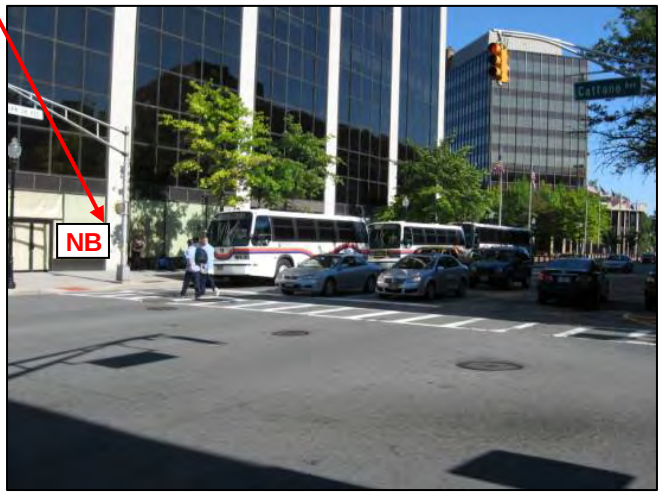

NJ TRANSIT
MO 33 00033
Bus Stop
Board Here For:
MCM3 To Livingston Mall
MCM10 To Morristown


SB

J.7 Location: Speedwell Avenue at Cattano Avenue (NB/SB, Board/Alight)

- Northbound:
  - Near-side stop in front of Headquarter Plaza (T-intersection)
  - Bus sign on post
- Southbound:
  - Near-side stop
  - Bus sign on light post sign
- Bus stops in parking lane
- Nearby properties; downtown area with Hyatt, Century 21, community college, and other shops





J.8 Location: Morris Street at Elm Street (EB/WB, Board/Alight)

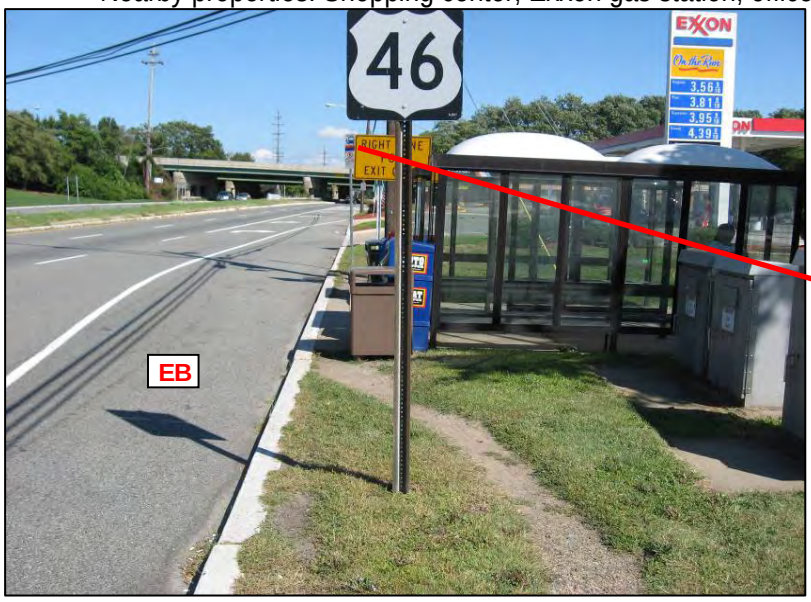
- Eastbound:
  - Near-side stop
  - Stop contains bus shelter with bench; very good condition
  - Bus stops in travel lane
- Westbound:
  - Bus stops in Morristown commuter rail station plaza
  - Bus circulates inside the station plaza then exits
- Nearby properties: small shops (restaurant/retail), NJ TRANSIT Morristown train station

J.9 Location: NJT Convent Station (Park & Ride Facility)

- Facility in good condition
- Passenger drop-off / handicap accessible
- Bus connections include WHEELS 966
- Provides indoor shelter with benches for customers waiting to board / alight buses with connection to NJ TRANSIT Rail

J.10 Location: Route 46 and US 202/Parsippany Boulevard (EB/WB Board/Alight)

- Eastbound:
  - Far-side stop
  - Contains bus shelter with bench
  - Access to shelter via dirt path
  - Bus stops in shoulder lane
- Westbound:
  - Far-side stop
  - No bus shelter / benches provided
  - Grass surface for passenger waiting area provided
  - Bus stops in travel lane (same lane as vehicles accessing jughandle)
- Nearby properties: Shopping center, Exxon gas station, office complex, residential



J.11 Location: Route 46 and Hook Mountain Road (EB/WB Board/Alight)

- Eastbound:
  - Far-side stop
  - Contains bus shelter with bench
  - Concrete sidewalk to shelter provided
- Westbound:
  - Near-side stop
  - No bus shelter / benches provided
  - Four- to six-foot concrete sidewalk provided (fair condition)
  - Primarily grassy area
- Bus stops in shoulder lane
- Nearby properties: Restaurants, residential, small shops


BUS STOP
WB


TRANSIT
Bus Stop
ONE WAY


WB

J.12 Location: Route 23 at Kiel/Kinnelon Avenues (NB/SB, Board/Alight)

- Northbound:
  - Near-side stop
  - Bus sign on light post on northbound side of Route 23
  - No sidewalk provided
- Southbound:
  - Midblock stop
  - Bus post on sidewalk in front of Meadtown Shopping Center parking lot
- Bus stops in travel lane
- Nearby Properties: Church of Nazarene, Meadtown Shopping Center, Burger King, Stop and Shop, residential

J.13 Location: Ringwood Avenue and Wanaque Avenue (EB/WB)

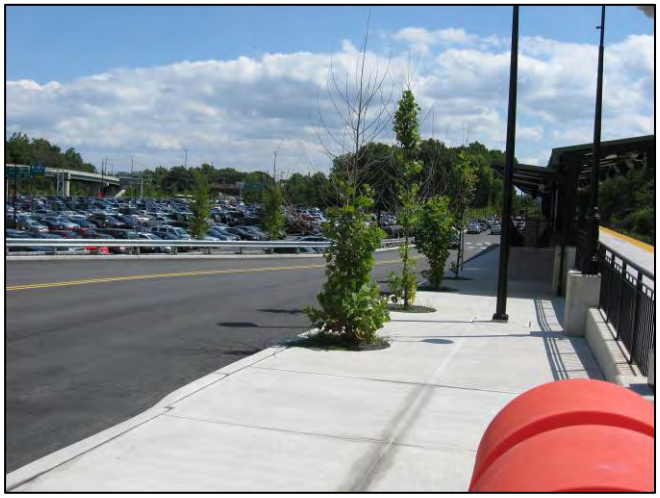
- Eastbound:
  - Midblock (near Laura Street)
  - Bus stop with shelter and bench; good condition
- Westbound:
  - Midblock stop (near Grove Street)
  - Bus stops contain shelter and bench; good condition
- Bus stops in travel lane
- Nearby properties: Pompton Lakes Townsquare, restaurants, banks, fast food, and beauty services

J.14 Location: WillowBrook Mall (Board/Alight)

- Three bus stops with shelters and benches serving multiple routes; good condition
- Commuter parking provided in designated area

J.15 Location: NJT Route 23 Transit Center (Park & Ride Facility)

- Adjacent to Route 23
- New facility in good condition
- Shelter with benches for customers waiting to board / alight buses provided
- Handicap accessible (ADA parking located adjacent to bus shelter)
- Passenger drop-off location
- Connection to NJT commuter rail service



Access roadway within facility

Bus-only lanes and passenger waiting area

ADA parking spaces

Rail platform

J.16 Location: Paterson Hamburg Turnpike at Alps Road (EB/WB, Board/Alight)

- Eastbound:
  - Midblock stop
  - Bus stop contains shelter with bench, adjacent to gas station
  - Sidewalk in poor condition
- Westbound:
  - Near-side stop
  - Bus sign post at edge of sidewalk in front of Goodyear parking lot
- Bus stops in travel lane
- Nearby properties: Shopping Center

J.17 Location: Paterson Hamburg Turnpike at Berdan Avenue (EB/WB, Board/Alight)

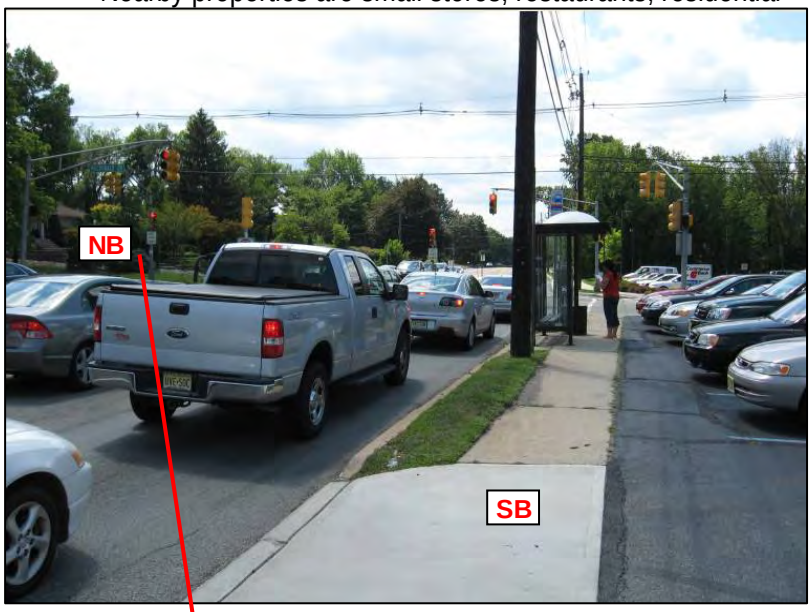
- Eastbound:
  - Midblock stop
  - Bus stop contains shelter with bench; good condition
  - Bus stops in shoulder lane
- Westbound:
  - Midblock stop adjacent to shopping center lot
  - Bus stop contains shelter with bench; fair condition
  - Bus stops in travel lane
- Nearby properties: Wedgewood Plaza, Berdan Shopping Center, Kmart, Kings Arms Garden Apartments townhouses

J.18 Location: Paterson Hamburg Turnpike at Valley Road (EB/WB, Board/Alight)

- Eastbound:
  - Near-side stop
  - Bus stop contains shelter with bench; good condition
- Westbound
  - Midblock stop
- Bus stops in travel lane
- Nearby properties are shopping center, bank, and residences

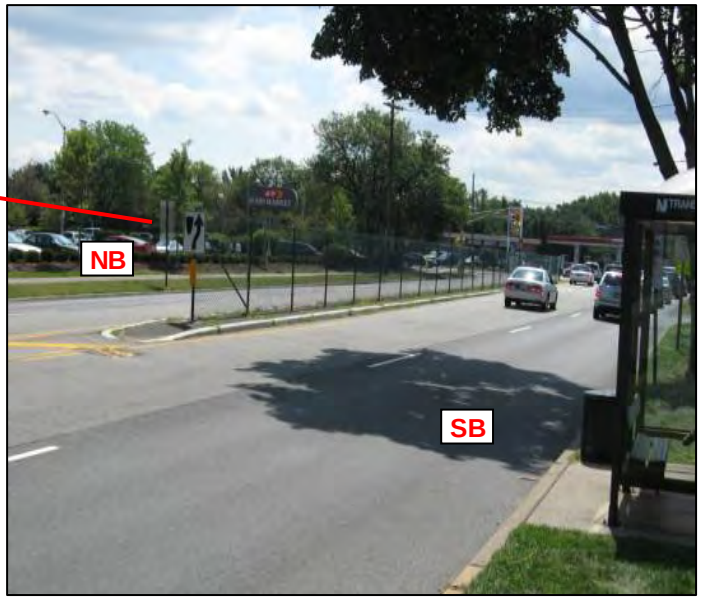
J.19 Location: MacDonald Drive and Valley Road (NB/SB, Board/Alight)

- Northbound:
  - Near-side stop adjacent to private residence
  - Bus sign on light post
  - Lacks safe, dedicated passenger waiting area
- Southbound:
  - Near-side stop in front of shopping area parking lot
  - Bus stop contains shelter and bench; fair condition
  - Concrete sidewalk provided
- Bus stops in travel lane
- Nearby properties are small stores, restaurants, residential



J.20 Location: Valley Road and Preakness Ave (NB/SB, Board/Alight)

- Northbound:
  - Far-side stop
  - Bus sign post on grassy median in front of A & P Market parking lot
- Southbound:
  - Midblock stop
  - Bus stop contains shelter and bench; good condition
- Bus stops in travel lane
- Nearby properties: Retail uses, Wayne Valley High School, residence



Northwest New Jersey Bus Study: Summary of Existing Conditions at Sample Bus Stop Locations

No.	County	Location / Nearest Intersection	Bus Route	Weekday Ridership (On / Off)[1]	Service Frequency (AM / PM)[2]	Bus Stop				Accessibility						Connections (Trip Generators)	Recommendations
						Direction of Travel	Stop Area Location	Position	Stop Indicator	Landing Position	Landing Material	Pedestrian Crossing Amenities					
												Curb Cuts	Ped Button	Ped Signal Head	Visible Crosswalk		
1	Morris	Route 46 / Mount Olive Road at New Street	MCM 5, Lakeland 46	N/A	14 / 4	Northbound	Outermost travel lane	Mid-block	Bus sign post	Sidewalk	Concrete / Dirt	On a few approaches				Valley National Bank, residential, lake/recreational area west on New Street, few small stores	Provide schedule of service, curb cuts, pedestrian buttons, pedestrian signal heads, and visible crosswalks.
				N/A	4 / 11	Southbound	Outermost travel lane	Nearside	Bus sign on light post	Off Road / No Sidewalk	Grass / Dirt	On a few approaches					
2	Morris	Main Street and Harry Shupe Boulevard	MCM 10	0 / 4	2 / 3	Northbound	Outermost travel lane	Mid-block	Bus sign post	Sidewalk	Concrete	√	Unsignalized		No	Post office, residential, small lake, water tower house	Provide schedule of service and visible crosswalks.
				2	2 / 4	Southbound	Outermost travel lane	Mid-block	Bus sign post	Sidewalk	Concrete	√	Unsignalized		No		
3	Morris	Blackwell Street at Warren Street	MCM 5, 10	15 / 48	3 / 3	Eastbound	Parking lane	Farside	Bus sign post	Sidewalk	Stone paving	√	√	√	√	Small town shopping area (restaurant, shops, community college, library etc.)	Provide schedule of service.
			MCM 10	39 / 14	2 / 3	Westbound	Parking lane	Farside	Bus sign post	Sidewalk	Concrete	√	√	√	√		
4	Morris	Blackwell Street at Morris Street	MCM 2, 5, 10	68 / 35	6 / 5	Eastbound	Parking lane	Farside	Bus sign post	Sidewalk	Concrete	√	√	√	√	Small town shopping area (restaurant, shops, community college, library etc.)	Provide schedule of service and bus shelter with seating.
				49 / 27	4 / 6	Westbound	Parking lane	Farside	Bus sign post	Sidewalk	Stone paving	√	√	√	√		
5	Morris	Rockaway Townsquare Mall	MCM 5, 7, 10, Lakeland 46, 80	547 / 473	28 / 21	Multiple routes and directions	Parking lot	N/A	Bus sign post	Sidewalk	Concrete	N/A[3]	N/A	N/A	N/A	Towncenter/Shopping Mall	Provide bus shelter with seating.
6	Morris	Speedwell Avenue and Sussex Avenue	MCM 3, 10	46 / 55	5 / 6	Northbound	Parking lane	Mid-block	Bus sign on light post	Sidewalk	Concrete	√	√	√	√	Downtown center (small shops, restaurants, community center, church etc.)	Provide schedule of service and bus shelter with seating.
				77 / 21	5 / 5	Southbound	Parking lane	Nearside	Bus sign post	Sidewalk	Concrete	√	√	√	√		
7	Morris	Speedwell Avenue at Cattano Avenue	MCM 1, 2, 3, 10, Community Coach	104 / 61	12 / 12	Northbound	Bus Bay	Nearside	Bus sign post	Sidewalk	Concrete	√	√	√	√	Towncenter/Downtown area (shops, restaurants, hotel, park, department stores)	Provide schedule of service and bus shelter with seating.
				66 / 48	15 / 16	Southbound	Parking lane	Nearside	Bus sign on light post	Sidewalk	Concrete	√	√	√	√		
8	Morris	Morris Street at Elm Street	MCM 1, 4, Community Coach	89 / 2	11 / 7	Eastbound	Outermost travel lane	Nearside	Bus sign post, shelter with bench	Sidewalk	Concrete	√	√	√	√	Downtown center (small shops, restaurants, NJ Transit Morristown train station)	Provide schedule of service.
			MCM 1	0 / 50	2 / 3	Westbound	Inside NJT Morristown station plaza	N/A	Bus sign post, NJT Morristown station plaza entrance	Sidewalk	Concrete	√	√	√	√		
9	Morris	NJT Convent Station	WHEELS 966	102 / 78	4 / 5	Park and Ride Facility	Drop off bus area	N/A	Park-and-Ride Facility	Sidewalk	Concrete	N/A	N/A	N/A	N/A	Downtown center (small shops, restaurants, community center, church, NJ Transit Convent train station)	Provide schedule of service.
10	Morris	Route 46 and US 202 / Parsippany Boulevard	NJT 29,[4] Lakeland 46	60 / 2	14 / 7	Eastbound	Shoulder lane	Farside	Bus sign post, shelter with bench	Sidewalk	Concrete	No	√	√	√	Shopping center, Exxon gas station, office complex, residential	Provide schedule of service, curb cuts, and a 5' x 8' clear concrete waiting area adjacent to the curb with a sidewalk connection to the nearest accessible route/street.
			NJT 29, MCM 1	5 / 0	8 / 5	Westbound	Outermost travel lane	Farside	Bus sign post	Off Road / No Sidewalk	Grass / Dirt	No	√	√	√		

Bus Route	Weekday Ridership (On / Off)[1]	Service Frequency (AM / PM)[2]	Bus Stop				Accessibility						Connections (Trip Generators)	Recommendations
			Direction of Travel	Stop Area Location	Position	Stop Indicator	Landing Position	Landing Material	Pedestrian Crossing Amenities					
									Curb Cuts	Ped Button	Ped Signal Head	Visible Crosswalk		
NJT 29, Lakeland 46	105 / 3	13 / 8	Eastbound	Shoulder lane	Farside	Bus shelter with benches	Sidewalk	Concrete	√	√	√	√	Restaurants, residential, small shops	Provide schedule of service and sidewalks leading to bus stop
	5 / 103	9 / 10	Westbound	Shoulder lane	Nearside	Bus sign on light post	Off Road / No Sidewalk	Grass/Dirt	√	√	√	√		
NJT 194	0 / 96	2 / 14	Northbound	Outermost travel lane	Nearside	Bus sign on light post	Off Road / No Sidewalk	Grass/Dirt	√	√	√	√	Residential, small shopping center, supermarket, church	Provide schedule of service, southbound bus shelter with seating, and sidewalks leading to bus stop.
NJT 75, 194	63 / 0	10 / 2	Southbound	Outermost travel lane	Mid-block	Bus sign post	Concrete Pad / No Sidewalk Connection	Concrete	√	√	√	√		
NJT 75, 194, 197	59 / 25	18 / 6	Eastbound	Outermost travel lane	Mid-block	Bus sign post, shelter with bench	Sidewalk	Concrete	√	√	√	√	Townsquare Mall (retail), restaurants, banks, beauty services	Provide schedule of service.
NJT 197, 748	20 / 62	6 / 10	Westbound	Outermost travel lane	Mid-block	Bus sign post, shelter with bench	Sidewalk	Concrete	√	√	√	√		
NJT 11, 28, 75, 191, 192, 193, 194, 195, 197, 198, 704, 712	668 / 1,064	59 / 57	Multiple routes and directions	Parking lot	N/A	Bus shelters with benches	Parking lot designated bus area	Concrete	N/A	N/A	N/A	N/A	Shopping Mall	None.
NJT 75, 194, 198, 324, 748	126 / 478	34 / 45	Park and Ride Facility	Drop off bus area	N/A	Bus Shelter with benches	Bus shelter area	Concrete	N/A	N/A	N/A	N/A	Park and Ride (Buses and Rail)	None.
NJT 197, 748	66 / 19	14 / 5	Eastbound	Outermost travel lane	Farside	Bus sign post, shelter with bench	Sidewalk	Concrete / Grass	√	√	√	√	Shopping center	Provide schedule of service and a 5' x 8' clear concrete waiting area adjacent to the curb with a sidewalk connection to the nearest accessible route/street.
	15 / 45	6 / 9	Westbound	Outermost travel lane	Nearside	Bus sign post	Sidewalk	Concrete	√	√	√	√		
NJT 197, 744, 748	23 / 15	20 / 12	Eastbound	Pull off area	Mid-block	Bus sign post, shelter with bench	Sidewalk	Concrete	√	√	√	√	Shopping Plaza, big department store, residential	Provide schedule of service.
NJT 197, 748	23 / 25	7 / 10	Westbound	Outermost travel lane	Mid-block	Bus sign post, shelter with bench	Sidewalk	Concrete	√	√	√	√		
NJT 197, 744, 748	14 / 9	19 / 11	Eastbound	Outermost travel lane	Nearside	Bus sign post, shelter with bench	Sidewalk	Concrete / Grass	√	√	√	√	Shopping center, bank center, apartment housings	Provide schedule of service and a 5' x 8' clear concrete waiting area adjacent to the curb with a sidewalk connection to the nearest accessible route/street.
	6 / 59	10 / 14	Westbound	Outermost travel lane	Mid-block	Bus sign post	Grass / Dirt	Concrete / Grass	√	√	√	√		
NJT 75, 197, 198	0 / 80	11 / 5	Northbound	Outermost travel lane	Nearside	Sign on light post	Off Road / Residential Driveway	Stone paving	√	√	√	√	Small shops, restaurants, residential	Provide schedule of service and a 5' x 8' clear concrete waiting area adjacent to the curb with a sidewalk connection to the nearest accessible route/street.
	96 / 1	4 / 8	Southbound	Outermost travel lane	Nearside	Bus sign post, shelter with bench	Sidewalk	Concrete	√	√	√	√		
NJT 75, 197, 198	2 / 77	11 / 5	Northbound	Outermost travel lane	Farside	Bus sign post	Sidewalk	Concrete / Grass	√	√	√	√	Bank, shopping, High School, residential	Provide schedule of service.
	76 / 11	4 / 8	Southbound	Outermost travel lane	Mid-block	Bus sign post, shelter with bench	Sidewalk	Concrete	√	√	√	√		