



FINAL REPORT

Prepared For

North Jersey Transportation Planning Authority



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**Executive
Summary**



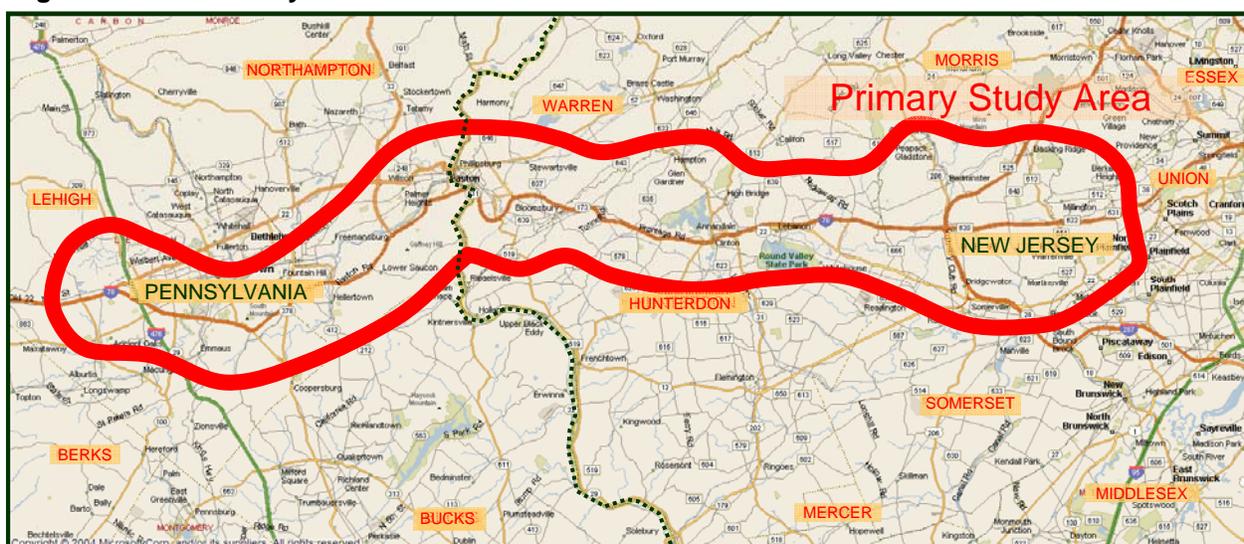
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**SECTION ES
EXECUTIVE SUMMARY**

ES.1 INTRODUCTION

The North Jersey Transportation Planning Authority, Inc. (NJTPA), in conjunction with the New Jersey Department of Transportation (NJDOT), New Jersey Transit (NJT) and the Lehigh Valley Planning Commission (LVPC) initiated the I-78 corridor Transit Study to assess the feasibility of various transit strategies to help address increasing traffic volumes and congestion in the corridor. The segment of the corridor on which the Study focuses is between Lehigh County, Pennsylvania to the west and Somerset County, New Jersey to the east (see Figure ES-1).

Figure ES-1: I-78 Study Corridor



The Study evaluated current transit services and facilities and assessed such potential future strategies as improved bus and rail service, preferential bus treatments on highways and arterials, and new and expanded park-and-ride facilities and transit hubs. The goal was to determine what transit strategies are needed to support sustainable growth in the corridor and region. The Study Team also made an initial assessment of a possible extension of the NJ TRANSIT Raritan Valley Line between High Bridge and Phillipsburg, New Jersey, with the results of these efforts to be used by NJ TRANSIT in its more detailed study (which started in Fall 2007) of the feasibility of possible extensions of rail passenger service into western New Jersey.

The various study activities culminated in a series of recommendations, falling into five areas:

- **Transit Improvements:** New services, and enhancements to existing ones;



- **Transit-Ready Corridor Improvements:** Small-scale transit operations and infrastructure improvements to help provide transit with a competitive edge over other modes of travel;
- **Transit Hubs and Park-and-Ride Improvements:** Facilities that are conveniently and strategically located to allow commuters to access transit and carpool travel modes, and are designed with sufficient capacity to meet future needs;
- **Land Use and Travel Demand Management Strategies:** Public and private sector actions to support more sustainable, transit-oriented land use and site planning decisions and reduce travel demand; and
- **Highway Improvements:** Relatively low-cost options that wherever possible support the need for more efficient transit operations.

Implementation of these improvements will potentially require involvement by many public agencies working in the corridor: New Jersey Department of Transportation (NJDOT); NJ TRANSIT; Delaware River Joint Toll Bridge Commission (DRJTBC); Pennsylvania Department of Transportation (PennDOT); Lehigh and Northampton Transportation Authority (LANTA); the county governments of Somerset, Hunterdon, and Warren Counties in New Jersey, and Lehigh and Northampton County in Pennsylvania; various municipalities; Transportation Management Associations (TMAs); and private bus operators.

ES.2 RECOMMENDED TRANSIT IMPROVEMENTS

The core of the recommended plan is a series of improvements to and expansions of the public transit systems serving the I-78 corridor. These include public and private bus line-haul operations, potential passenger rail services, and shuttle bus services, and are illustrated in Figure ES-1.

Figure ES-2: Recommended Transit Improvements



- | | |
|--|--|
| <p>1 Passenger Rail Service Extension</p> <ul style="list-style-type: none"> - NJ Transit is beginning the next phase of study to investigate the feasibility of extending passenger rail service to Phillipsburg, and possibly into Pennsylvania | <p>3 Express Bus Service in the NJ Route 31 Corridor</p> <ul style="list-style-type: none"> - Originate at future Park-and-Rides in the NJ Route 31 Corridor - Follow NJ Route 31, I-78, and US Route 22 to the eastern Hunterdon and Central Somerset employment centers |
| <p>2 Express Bus in the I-78 & US Route 22 Corridor</p> <ul style="list-style-type: none"> - Originate at the PA Route 33 and PA Route 412 Park-and-Rides in Northampton County - Follow I-78 and US Route 22 to the eastern Hunterdon and Central Somerset employment centers - Stop at major Park-and-Rides in Warren and Hunterdon Counties | <p>4 Shuttle Bus Service at Key Rail Stations and Activity Centers</p> <ul style="list-style-type: none"> - Phillipsburg - Alpha, Pohatcong, and Greenwich - Clinton, Annandale, Union Township - Readington and White House Station - Branchburg and North Branch |



ES.2.1 Passenger Rail Service Extension

A core action that has been discussed for the I-78 corridor is the extension of passenger rail service on NJ TRANSIT's Raritan Valley Line, from its present terminus at High Bridge to Phillipsburg, and possibly beyond into Pennsylvania. It is not the purpose of this study to evaluate the feasibility or effectiveness of extending rail service; instead, NJ TRANSIT is preparing to do so in a Phase 2 study that would examine in greater detail bus and rail options and alternatives in Central New Jersey. This Phase 1 study has been undertaken to identify initial transit enhancement and park-and-ride expansion opportunities in the I-78 corridor, and those findings will feed into the Phase 2 study in which a broader range of rail improvement options will be investigated.

As transit needs and improvement opportunities were reviewed in this I-78 Corridor Transit study, however, it was determined that over the long term bus, rail and park-and-ride improvement actions must be coordinated. One of the most obvious means of extending rail service to Phillipsburg would be to follow the existing right of way on which Raritan Valley Line passenger service was operated until the 1980's. Therefore it was concluded that bus and park-and-ride improvements should be sited at those locations where the rail line is in proximity to, or crosses, major state highways including I-78, NJ Route 31, US Route 22, and NJ Route 173.

ES.2.2 Express Bus in the I-78 and US Route 22 Corridor

Assessment of travel markets clearly indicated the need for high quality bus service originating in Pennsylvania, and serving the areas of Central Hunterdon County and along US Route 22 from Clinton to Branchburg and Bridgewater. The effectiveness of providing such service was further confirmed by travel model runs that showed a significant number of travelers – about 615 riders per day - would use the service.

It is recommended that express bus service be implemented that would originate in Northampton County, PA, or at an Alpha or Bloomsbury park-and-ride, and travel eastward along I-78 to US Route 22 at Clinton Township, then follow US Route 22 to Branchburg and Bridgewater in Somerset County (see Figure ES-2). The service would be designed to intercept travelers as far west as possible, before entering the congested sections of I-78 in Hunterdon and Somerset Counties, and could provide high quality service to the employment centers along US Route 22 and in Bridgewater and Branchburg Townships.

The service plan for the express bus service will need to balance the competing priorities of numerous, conveniently located stops with the need to provide speedy, efficient service. Fortunately employment and activity centers along the US Route 22 corridor are concentrated in a relatively small number of intensely occupied facilities, so service can be defined that accomplishes both objectives. At each location, enhanced bus stop amenities, transit information, and pedestrian facilities (*including sidewalks and crosswalks) should be provided, as discussed below.



ES.2.3 Express Bus Service in the NJ Route 31 Corridor

There is a significant travel market from the north on NJ Route 31 to feed into the Raritan Valley Line and the proposed express bus service on US Route 22. This market originates in the central Warren County region – Washington Borough and Township, Mansfield Township, and the Oxford vicinity – but also emanates from northeastern Pennsylvania, including Monroe County and Stroudsburg. As a result, an additional express bus service was identified that would originate in the vicinity of Washington Borough along NJ Route 31, travel southward with stops at Hampton (if a park-and-ride is developed there), the Clinton vicinity, and then along US Route 22 from Clinton to Bridgewater as discussed above.

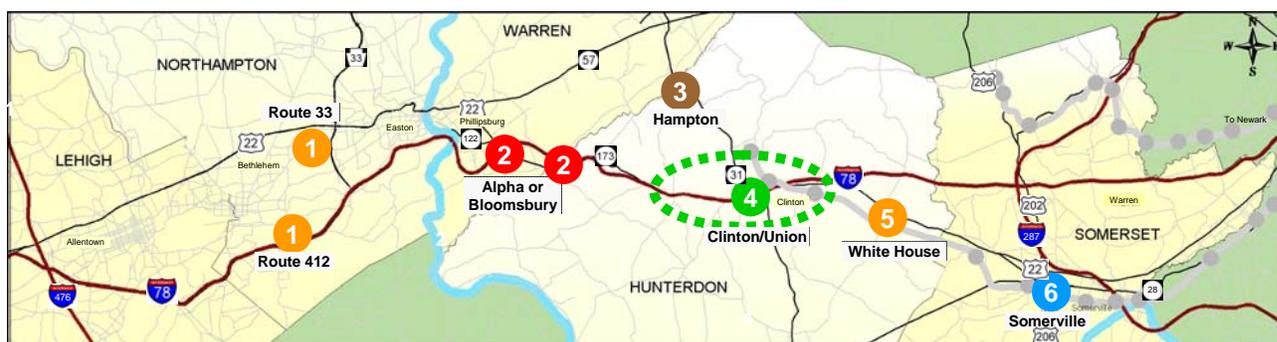
ES.2.4 Shuttle Bus Service at Key Rail Stations and Activity Centers

Connector services can be vital to improve access to and from bus and rail lines. This is particularly important at the destination end of the service to minimize walking distance from the bus / rail stop to the employment or other activity site. A series of connector shuttles are proposed to complement the proposed bus and rail service at Phillipsburg, Alpha, Clinton, Lebanon Borough, Readington Township, Branchburg, and from Raritan to Whitehouse Station.

ES.3 RECOMMENDED PARK-AND-RIDE IMPROVEMENTS

The provision of adequately sized and strategically located park-and-ride facilities will be critical to the success of transit improvements such as express bus and rail service. A series of park-and-ride facilities is recommended that will provide the necessary capacity and amenities (see Figure ES-3). Integral to this is the concept of transit transfer opportunities at these sites, which

Figure ES-3: Recommended Park-and-Ride Improvements



- | | |
|---|---|
| <p>1 Planned Park-and-Ride Expansions at PA Rt. 33 and PA Rt. 412</p> <ul style="list-style-type: none"> - PennDOT is planning to significantly expand the existing Park-and-Rides at PA Route 33 and at PA Route 412, beginning in 2008 <p>2 Transit Hub / Park-and-Ride at Alpha or Bloomsbury</p> <ul style="list-style-type: none"> - Park-and-Ride to intercept travelers as they enter I-78 in New Jersey - Easy access to and from I-78 for parkers and buses - Connections to buses (both New York and US Route 22 Corridor) - Connections to future Raritan Valley Rail Line (if extended) <p>3 Transit Hub / Park-and-Ride at Hampton</p> <ul style="list-style-type: none"> - Park-and-Ride to intercept travelers as they travel south on Route 31 from Warren County and Pennsylvania - Connections to buses on NJ Route 31 - Connections to future Raritan Valley Line (if extended) | <p>4 Possible Central Hunterdon Transit Access Facilities</p> <ul style="list-style-type: none"> - Possible transit access facilities and improvements in Clinton and/or Union Townships - Pending further study and coordination with local municipalities <p>5 Park-and-Ride Expansion & Transit Access Improvements</p> <ul style="list-style-type: none"> - White House Station (consistent with plans by Township of Readington) <p>6</p> <ul style="list-style-type: none"> - At Somerville Station (consistent with plans by Borough of Somerville) |
|---|---|



will not only allow drivers to park and change to buses, but also allow transit riders convenient transfer opportunities.

These transit hubs are proposed to be so located as to allow easy access for autos and buses from the primary highway system (I-78, US Route 22, NJ Route 31, and/or NJ Route 173). Viewed as a system, they will provide a series of intercepts that will capture traffic as it comes eastward from Pennsylvania into the core of New Jersey.

ES.3.1 Planned Park-and-Ride Expansions at PA Route 33 and PA Route 412

PennDOT operates two park-and-ride facilities in Northampton County at PA Route 33 / William Penn Highway, and at I-78 / PA Route 412. They are both heavily utilized by New Jersey-bound commuters. Planned expansions of these facilities will provide more than 1,000 new parking spaces to serve Trans-Bridge buses, Bieber buses, and car poolers. Both bus lines are structured to serve the New York City market exclusively, whereas car poolers are destined in part to suburban employment centers in New Jersey. The expanded lots will serve as a solid anchor and initial intercept for the proposed I-78 / US Route 22 express bus service.

ES.3.2 Transit Hub / Park-and-Ride at Alpha or Bloomsbury

It is recommended that a new multi-modal transit hub be developed along the I-78 corridor in New Jersey. This hub and park-and-ride would complement the intercept lots described above in Pennsylvania by providing additional access both to New Jersey-bound and New York City-bound express bus lines, and also to the Raritan Valley Line if it is extended past High Bridge along the former Central Railroad of New Jersey right of way.

There are several sites located adjacent to I-78 within the Borough of Alpha that could potentially be adapted for use as a transit hub, with direct access via a new interchange with I-78. Bus and auto movements into the lots would be quick and efficient, and impacts by park-and-ride related traffic on local streets would be negligible. Parking demand could approach 1,500 spaces if both bus and rail lines are served by the site. The site design should be arranged such that a specific section of the parking area could be accessed from local streets, but be physically separated from the main part of the site that would be accessed directly from I-78.

Alternative sites are located in Bloomsbury at approximately Milepost 7 of I-78. These sites would not have direct access to I-78 via a direct interchange, but access could be via the existing Interchange 7, potentially saving the cost of new interchange construction.

ES.3.3 Transit Hub / Park-and-Ride at Hampton

Depending on the outcome of the Phase 2 feasibility studies a train station could be located in the vicinity of Hampton, where NJ Route 31 crosses the Central Railroad of New Jersey / Raritan Valley Line right of way in the Borough of Hampton. There will be significant demand both for bus service along NJ Route 31, and for rail access in the vicinity of Hampton.



Therefore a transit hub and/or park-and-ride is proposed in the vicinity of the rail / highway crossing.

ES.3.4 Possible Central Hunterdon Transit Access Facilities

The Central Hunterdon County area in the vicinity of Clinton Borough, Clinton Township, and Union Township is a focal point for the region’s transportation system, which includes I-78, US Route 22, NJ Route 31, and NJ Route 173 as well as the existing Raritan Valley Line and major bus park-and-ride facilities. There is an emerging need to serve the park-and-ride and mobility needs of the residents of Central Hunterdon County. Further study and coordination with the respective municipal representatives will be needed to develop a plan that is responsive to transportation needs, while being sensitive to the area’s development and planning priorities. Therefore it is recommended that further efforts be directed toward continuing the collaborative planning begun in this study to work toward identifying potential transportation solutions within Central Hunterdon County.

ES.3.5 Park-and-Ride Expansion and Transit Access Improvements

Expansion of the rail station park-and-ride in Readington, and transit-oriented development at the Somerville train station are planned. Improvements to pedestrian access and site amenities are proposed at the Clinton Point park-and-ride in Clinton Township.

ES.4 RECOMMENDED “TRANSIT-READY” CORRIDOR AND ACCESS TREATMENTS

Transit improvement recommendations were conceived to provide high quality frequent service in the I-78 and US Route 22 corridor. Recommended companion actions include a system of park-and-ride facilities to facilitate access to the transit system, and “transit-ready” corridor treatments that would ease the movement of buses through congested locations and provide bus stop and pedestrian access improvements (see Figure ES-4).

Figure ES-4: Recommended Transit-Ready Corridor and Transit Access Improvements



ES.4.1 “Transit-Ready” Corridor Treatments

Transit-ready corridor treatments consist of a series of highway improvements specifically targeted at moving buses more expeditiously and efficiently through the corridor. By minimizing the interference of traffic and signals with bus movement, overall bus speeds are increased and, just as important, passengers’ perceptions of travel efficiency are enhanced. It is recommended that this category of improvements be installed on US Route 22, from Interchange 18 on I-78 in Clinton to the interchange with US Route 202/206 in Bridgewater. This highway segment will carry the I-78 / US Route 22 and NJ Route 31 express bus services described above. Implementation along US Route 22 in Phillipsburg, Pohatcong, and Greenwich is also recommended.

ES.4.2 Transit Pedestrian Access Improvements

Improvements at bus stops are recommended to accommodate bus passengers walking to and from the US Route 22 express bus lines. This work could consist of such components as new high-quality bus stops, and enhancements to existing stops, to provide shelters, information, signing, lighting, seating and other amenities; pedestrian access improvements, including sidewalks, crosswalks, lighting, etc.; assistance to municipalities to implement zoning and site plan ordinance revisions to require appropriate design elements in conjunction with site development; and assistance to property owners to provide pedestrian and bus stop amenities appropriate to their site.

ES.5 RECOMMENDED HIGHWAY IMPROVEMENTS

The objective of this study was to identify and develop a set of improvements to the transit system that would improve mobility and decrease congestion in the I-78 corridor. Major highway improvements such as general widenings or managed use lanes (HOV, HOT, TOT) were outside the scope of the project. Certain highway improvements were identified that were smaller in scale and that could, if implemented, either relieve critical bottlenecks or improve corridor flow to facilitate transit service. In addition, specific high-quality access facilities are proposed for major transit facilities (see Figure ES-5).

ES.5.1 Provide Direct Access to Transit Hubs

Transit hubs / park-and-rides have been recommended at three locations: in Alpha adjacent to I-78; in Bloomsbury on NJ Route 173 as an alternative to the Alpha site; and in Hampton on NJ Route 31. Direct access to / from the state highway system is proposed for each, via an interchange with I-78 in Alpha, and via new intersections and signals at Bloomsbury and Hampton.

ES.5.2 Leverage Proposed Improvements to Complement Transit

Several highway improvements have been proposed in the I-78 corridor that complement the proposed transit services if implemented. These include High Speed E-Z Pass at I-78 / Delaware River Bridge, by Delaware River Joint Toll Bridge Commission (DRJTBC); and a Welcome Center on I-78 eastbound between the Delaware River and US Route 22 (by DRJTBC).



Figure ES-5: Recommended Highway Improvements



► **Highway Improvement Objectives:**

- Improve corridor flow to facilitate transit service
- Provide high-quality access to major transit facilities

1

Provide Direct Access to Transit Hubs:

- From I-78 to Alpha or Bloomsbury Transit Hub
- From NJ Route 31 to Hampton Transit Hub

2

Leverage Proposed Improvements to Complement Transit:

- High-Speed E-Z PASS at I-78 / Delaware River Bridge
- Proposed New Jersey Welcome Center at Alpha/Bloomsbury Transit Hub

3

Additional Improvements to Resolve Bottlenecks:

- Truck Climbing Lane (Eastbound at Milepost 19)
- Traffic Signal Coordination on US Route 22
- US Route 22 and US Route 202/206 Corridor Improvements

ES.5.3 Additional Improvements to Resolve Bottlenecks

Highway improvement projects are planned to improve flow on US Route 22 and on US Route 202/206 in the Bridgewater / Somerville area. In addition it is suggested that a truck climbing lane be constructed on I-78 eastbound at approximately milepost 19 (east of US Route 22 in Clinton).

ES.6 RECOMMENDED LAND USE AND TRAVEL DEMAND MANAGEMENT ACTIONS

In addition to the provision of direct transportation services, it is also recommended that support and guidance for smart growth be provided, to affect the pattern of land use development in the corridor; and that increased support be given to travel demand management activities that could reduce the amount of single-occupant commutation. TMA's will be instrumental in supporting commuters' access to and from the proposed express bus services on I-78 and US Route 22, by providing shuttle buses and other transit services to link employers and residential areas to bus stops. It is recommended that the ongoing activities of these TMA's be continued and expanded to promote additional flex-time, rideshare matching, and employer-based travel demand management activities.

ES.7 CONCLUSIONS

There are significant mobility needs in the I-78 corridor that can be addressed through a comprehensive set of actions ranging from new transportation services and improvements to programs and activities that could affect the nature of travel in the corridor. Specific observations concerning the I-78 corridor's travel conditions and responses include:



1. Congestion on I-78 and US Route 22 is extensive and frequent, and affects a lengthy stretch of the corridor, typically from milepost 13 in Union Township, Hunterdon County, to milepost 30 in Bedminster, Somerset County.
2. Congestion is expected to worsen over the coming years without intervention, resulting in more severe over-capacity conditions as well as longer peak periods. The primary highway system (I-78 and US Route 22) will be most affected, but local streets will be affected as well, as traffic diverts from the congested primary system. The quality of life in the Corridor will be adversely affected in general.
3. New York-bound travel is served by both private express bus service and the existing passenger rail lines (Raritan Valley Line and Gladstone Branch). As a result the on-highway share of traffic attributable to a New York destination is relatively small. Nonetheless the amount of traffic from the Study Area to New York will increase, in response to both regional growth and the effects of the Access to the Region's Core (ARC) project. Improvements to the suburban rail system will be important to keep pace with growth.
4. Travel to the urban core of New Jersey (Newark, Hudson County, etc.) relies more heavily on the I-78 highway as well as passenger rail. This component comprises a relatively small and dispersed share of the I-78 market, however, and new transit services in the I-78 Study Area are unlikely to effectively serve it. Instead, improvements to the passenger rail system are the best way to accommodate this market.
5. Expansion of the passenger rail system could be very effective in attracting new, long-distance ridership. However by its very fixed-route nature, passenger rail can only serve certain high-intensity markets. NJ TRANSIT is now beginning a complementary Phase 2 effort: The Central New Jersey / Raritan Valley Transit Study. That study will examine a wide range of passenger rail and other transit alternatives for Central New Jersey.
6. Of the remaining trips with suburban New Jersey destinations, there is a distinct and large travel market that generally follows I-78 and US Route 22 from Pennsylvania and Warren and Hunterdon Counties, with destinations in Central Hunterdon and along US Route 22 in Readington, Branchburg and Bridgewater. This market is essentially unserved by existing transit service – bus or rail – but is large enough that new transit service is warranted.
7. A new system of express bus lines has been formulated and recommended that would link suburban-to-suburban residential origins and employment destinations with high quality, frequent service. Testing with travel models indicates that this service would attract sufficient riders to support frequent, convenient service.
8. Provision of access to and from the proposed express bus and passenger rail systems is of paramount importance to the success of the service. This must take the form of park-and-rides at the origin end, and strategically located stops and shuttles at the destination end.
9. A set of large, high quality, conveniently located, multi-modal transit hub / park-and-ride facilities is proposed that will intercept travelers as they enter New Jersey from the west, allowing them to easily transfer to bus, rail, or car-pool. These facilities are envisioned to have direct access to the primary highway system so that bus and auto access is simplified and efficient.



10. Supporting services such as shuttles, van pools and car pools, accessible, amenity-equipped bus stops, and transit-ready corridor improvements are designed to ease the flow of buses on the highway and speed the transit trip, and to facilitate distribution of trips to employment sites and other key attractors.
11. Long term goals such as land use initiatives (transit villages and transit-oriented development) are endorsed.
12. TMAs have a vital role to continue to promote shared rides, employer-supported flex time, and other programs. TMAs will also be instrumental in designing and maintaining employer-based bus stop locations along US Route 22 that will permit easy access to and from bus stops to employers' front doors.



**Section 1
Study Overview**



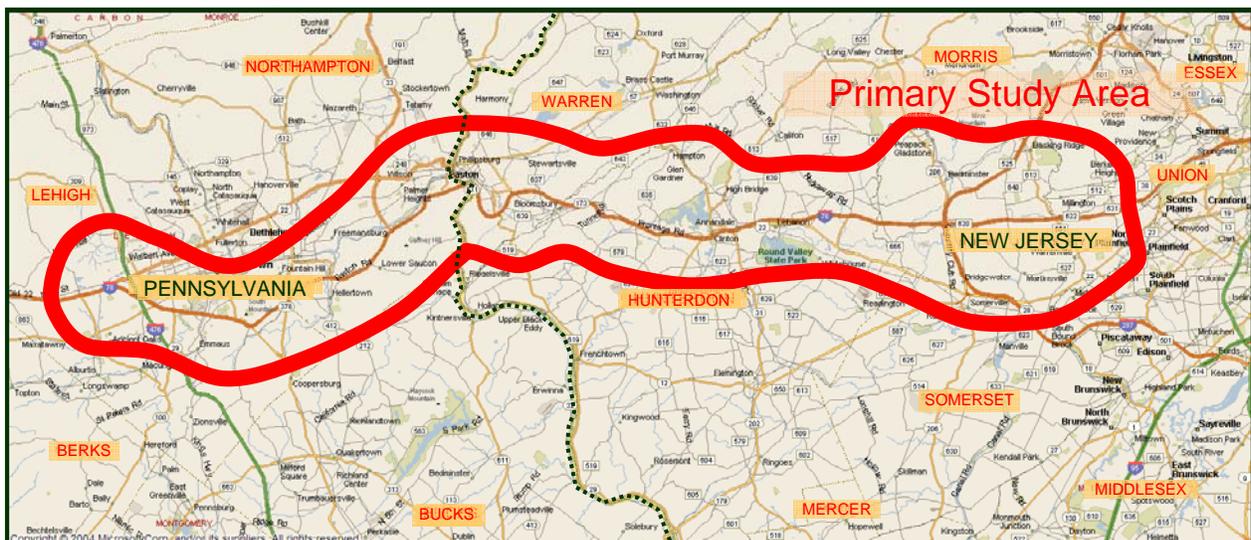
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SECTION I STUDY OVERVIEW

1.1 INTRODUCTION

The North Jersey Transportation Planning Authority, Inc. (NJTPA), in conjunction with the New Jersey Department of Transportation (NJDOT), New Jersey Transit (NJT) and the Lehigh Valley Planning Commission (LVPC) initiated the I-78 Corridor Transit Study (“the Study”) to assess the feasibility of various transit strategies to help address increasing traffic volumes and congestion in the corridor. The segment of the corridor on which the Study focuses is between Lehigh County, Pennsylvania to the west and Somerset County, New Jersey to the east (see Figure 1-1). Dewberry-Goodkind, Inc. and Urbitrans Associates, Inc. were retained as the consultants for this project.

Figure 1-1: I-78 Study Corridor



The boundary of the Primary Study Area as shown in Figure 1-1 forms roughly a five-mile wide band around I-78, expanded occasionally to capture key routes, intersections, and rail lines and rail stations. This boundary was an attempt by the Study Team to capture the areas likely to be involved in various aspects of the Study – e.g., existing or new bus service stops or park-and-ride facilities, where possible highway or transit/park-and-ride improvements might be proposed, etc. Occasional reference is also made in this report to a Secondary Study Area. This area was never formally defined, and instead refers broadly to areas beyond the Primary Study Area but within the same towns or counties, through which various bus routes may pass or where major employment or population centers may be located. In effect, the Study Team’s efforts extended into those areas as needed and where warranted by the nature of the evaluations being performed and alternatives being considered.



1.2 STUDY ACTIVITIES AND FORMAT OF FINAL REPORT

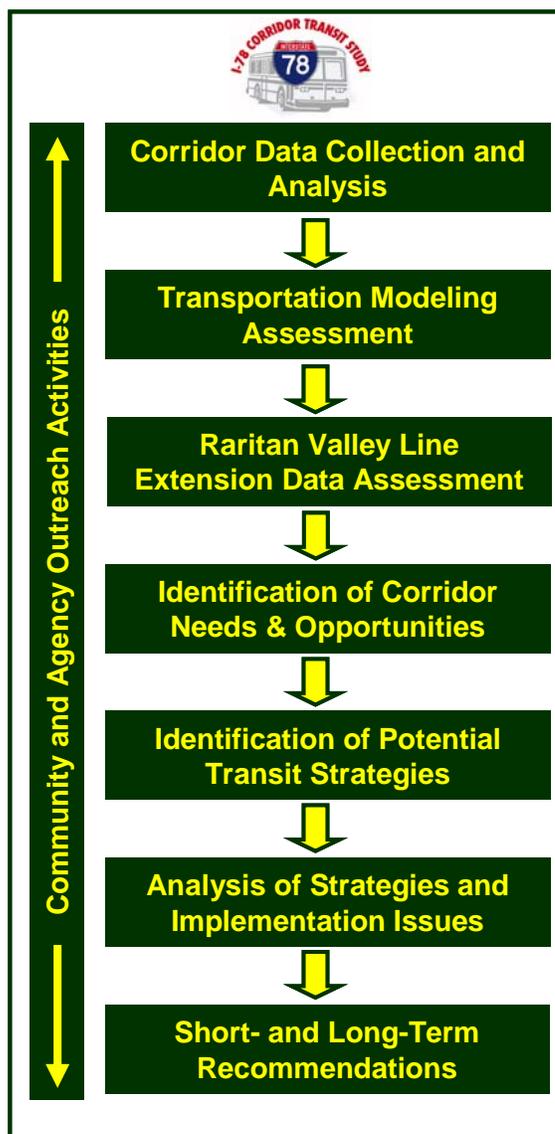
The Study evaluated current transit services and facilities and assessed such potential future strategies as improved bus and rail service, preferential bus treatments on highways and arterials, and new and expanded park-and-ride facilities and transit hubs. The goal was to determine what transit strategies are needed to support sustainable growth in the corridor and region. The Study Team also made an initial assessment of a possible extension of the NJ Transit Raritan Valley Line between High Bridge and Phillipsburg, New Jersey, with the results of these efforts to be used by NJ Transit in its more detailed study (which started in Fall 2007) of the feasibility of possible extensions of rail passenger service into western New Jersey.

Figure 1-2 shows the various elements and activities completed as part of the Study. A key to the overall Study was its approach to public outreach, both with the general public and with elected officials and other interested and involved agencies, authorities and public and private interest groups. NJTPA worked closely with a Project Steering Committee (Freeholders, representatives of local counties, NJDOT, NJ Transit, and other transportation agencies and stakeholders) to guide this study effort. A series of meetings with local elected officials and representatives, along with a round of public workshops, allowed the public to express their views on transit service within the I-78 corridor. A very successful web-based survey provided extensive information about the public's issues and concerns about the corridor, while the project's web site kept the public up to date on the Study's progress and available reports. More information on these outreach activities will be provided in Section 6 of this report.

Based on those initial data collection and assessment efforts and the results of initial transportation modeling assessments, the goals of the Study and the exact nature of the needs to be addressed were brought into sharper focus. A more detailed Purpose and Need statement was prepared to help coalesce these preliminary findings and to direct the remaining phases of the Study. The results of this process are presented in Section 2 of this report.

The overall study effort was data-driven, with the extensive information provided by numerous

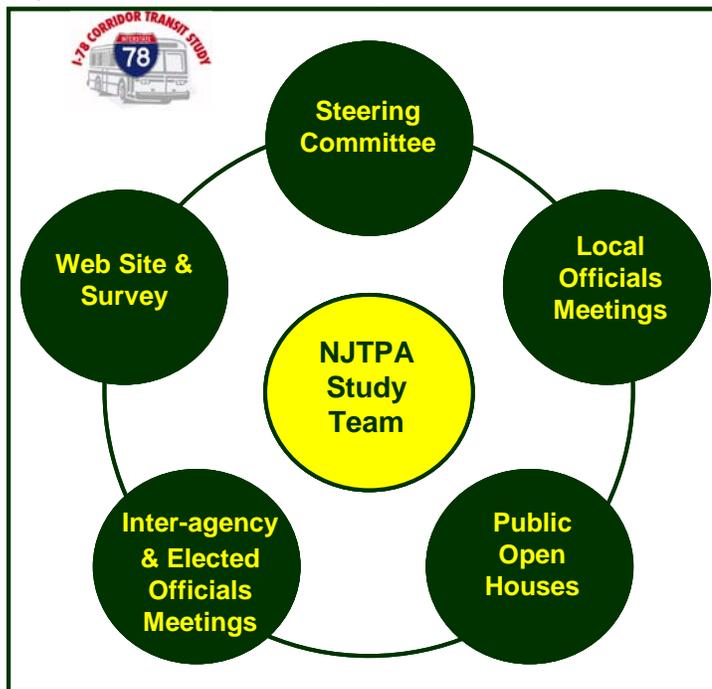
Figure 1-2: Study Activities



agencies, obtained in the field by the Study Team, and provided through public outreach efforts helping to define corridor deficiencies and direct the Study toward the likely most effective strategies to address them. The results of these data and information gathering and assessment activities are summarized in Sections 3 and 4 of this report.

A regional transportation model was used to assess likely future travel conditions in the corridor in the absence of major transit enhancements, providing a so-called “No Build” baseline that further defined corridor needs and helped to shape the nature and extent of needed improvements. These future projections depend on extensive sets of demographic and economic projections, over a 20-year horizon for the counties in the corridor (including both New Jersey and Pennsylvania) and for the rest of the nearby region. New Jersey is a national leader in the development of a comprehensive planning process to arrive at those projections and to work cooperatively with local agencies and elected officials to understand and support the bases for those projections. These employment and population forecasts are used by the Study’s transportation models, as those are the factors that determine the overall level of trips and their patterns. Due to the high level of sensitivity in portions of the Study Area regarding these projections, the study team developed a series of growth scenarios and tested them to ascertain the sensitivity of the modeling results to changes in these assumptions. The overall modeling process and the role that this sensitivity analysis played in that process are presented in Section 5 of this report.

Figure 1-3: Public Outreach Components



With forecasts of likely No Build transportation conditions showing traffic levels on I-78 and the projected shortage of park-and-ride facilities and spaces, the Study then developed an initial set of transit improvement packages (“Build Alternatives”), which were then tested by the Study’s model, screened on various other criteria and discussed with the Steering Committee and local officials and agencies. Based on that process, many of the possible improvements were dropped from further consideration while others were developed further. The results of this overall assessment process are presented in Section 5 of this report.

As noted earlier, the participants in the Study’s public outreach activities (see Figure 1-3) played a major role in shaping the study process, the Study’s results and its eventual success as an effective planning effort. The various outreach forums and other mechanisms used by the Study

Team, a list of participating stakeholders, and the results of those efforts are discussed in Section 6 of this report.

The various study activities summarized above culminated in a series of recommendations, falling into five areas:

- **Transit Improvements** (new services and enhancements to existing ones);
- **Transit-Ready Corridor Improvements** (small-scale transit operations and infrastructure improvements to help provide transit with a competitive edge over other modes of travel);
- **Transit Hubs and Park-and-Ride Improvements** (facilities that are conveniently and strategically located to allow commuters to access transit and carpool travel modes, and are designed with sufficient capacity to meet future needs);
- **Land Use and Travel Demand Management Strategies** (public and private sector actions to support more sustainable, transit-oriented land use and site planning decisions and reduce travel demand); and
- **Highway Improvements** (relatively low-cost options that wherever possible support the need for more efficient transit operations).

Section 7 of this report provides further details regarding these improvements, including their interdependence (e.g., expanded bus transit services cannot succeed without expanded park-and-ride spaces and facilities), short- and long-term phasing and range of costs, while Section 8 focuses on the next steps necessary to move these recommendations forward.



**Section 2
Purpose and Need**



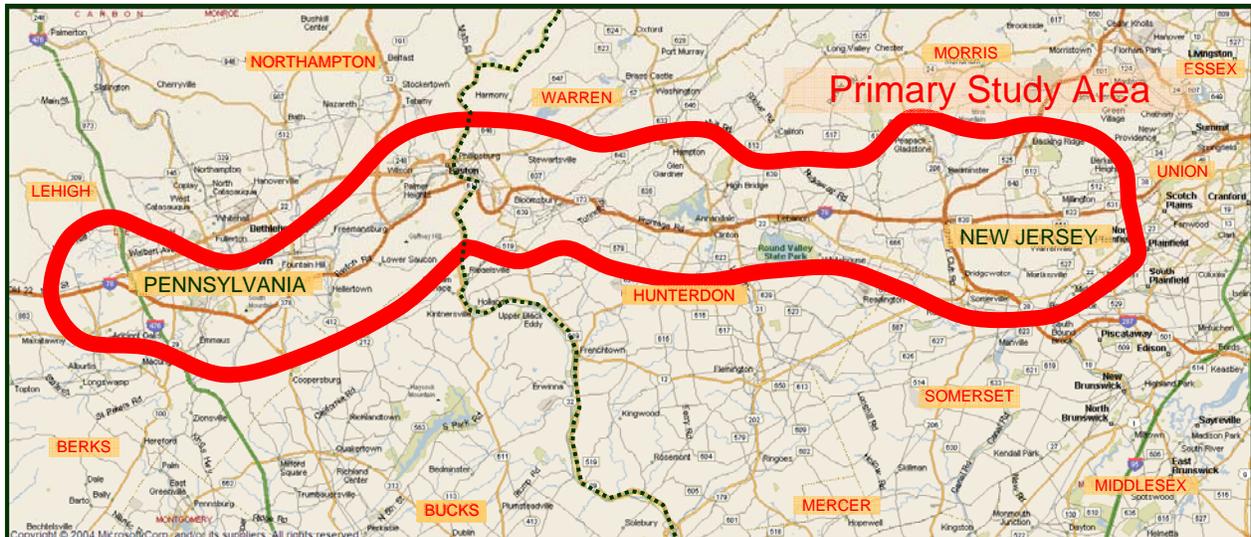
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SECTION 2 PURPOSE AND NEED

2.1 INTRODUCTION

The North Jersey Transportation Planning Authority, Inc. (NJTPA), in conjunction with the New Jersey Department of Transportation (NJDOT), NJ TRANSIT (NJT), and the Lehigh Valley Planning Commission (LVPC) initiated the I-78 Corridor Transit Study (“the Study”) to assess the feasibility of various transit strategies to help address increasing traffic volumes and congestion in the corridor. The segment of the corridor on which the Study focuses is between Lehigh County, Pennsylvania to the west and Somerset County, New Jersey to the east (see Figure 2-1).

Figure 2-1: I-78 Study Corridor



Sections 3 and 4 of this report present the results of the initial baseline data collection, analysis and assessment of existing conditions and deficiencies in the I-78 corridor. Based on the results of those studies, this section defines the Purpose and Need for the Study by providing information in the following three areas:

- The “**Purpose**” states the transportation problems to be solved;
- The “**Need**” provides information to support the problems stated in the Study’s Purpose; and
- The “**Goals and Objectives**” describe other issues that need to be resolved as part of a successful solution to the problem.

Collectively, the Purpose and Need Statement seeks to clarify what the Study is trying to accomplish and why it is necessary. It also functions as a guide in developing alternatives to



address the defined problems, and as a basis for developing the criteria that will eventually be used to rank those alternatives and to select and recommend various actions.

2.2 PURPOSE OF THE STUDY

The purpose of this study is to identify and assess actions that could increase the use of more efficient transportation modes, primarily public transit, along the I-78 corridor in portions of central and western New Jersey and eastern Pennsylvania. Greater use of such modes would help this key corridor to address present and future congestion problems and to better handle its overall mobility needs, which have grown considerably in recent years and are projected to increase further in the future.

2.3 NEED FOR THE STUDY

The following is a brief summary of highway volumes and congestion conditions along the Study corridor (which are presented in greater detail in Section 3 of this report), along with preliminary projections of how travel demand will likely increase in the future. Existing transit operations and the park-and-ride facilities that are keys to the success of those operations (and which are discussed in greater detail in Section 3 of this report) are also reviewed.

2.3.1 Highway Conditions

Traffic volumes along I-78 in the Study corridor have been growing consistently over the past decades, reflecting the steady growth in population and employment in the surrounding communities within Pennsylvania and New Jersey. Data from NJDOT indicate that between 1991 (when the final segment of I-78 in Pennsylvania opened) and 2000, average daily traffic volumes on I-78 in central Hunterdon County increased by over 50 percent, with an annual growth rate of about 4.9 percent over that period. This type of aggressive growth in volumes has continued, with volumes in eastern Somerset County, for example, growing at an average of 5.7 percent per year since 2000. This growth has led to considerable congestion during peak travel periods along certain portions of the corridor, particularly from approximately milepost 14 to 19 (eastbound) in Union and Clinton Townships in the weekday AM peak, and from milepost 32 to 27 (westbound) in Bedminster Township in the weekday PM peak.



I-78/I-287 Interchange

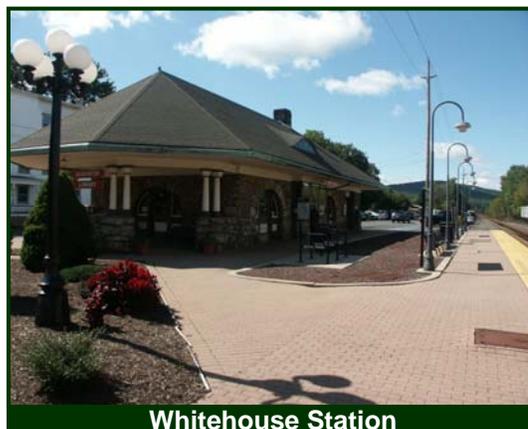
In addition, based on projected population and employment growth along the corridor and elsewhere in the region, volumes along I-78 are projected to continue to increase, although at a reduced rate from which has already been experienced. Between 2005 and 2030, traffic volumes will increase by between 22 percent (at the eastern end of the study area) to 46 percent (in Hunterdon County), with associated annual growth rates ranging from 0.8 and 1.5 percent, respectively. These future volumes will significantly exceed the capacity of I-78 at



critical locations and times, resulting in congestion over additional highway segments and for longer periods of the day.

2.3.2 Transit Operations

Transit service within the I-78 corridor Study Area consists of local bus, commuter bus and commuter rail operations. Local bus operations within the study area connect area residents to key trip destinations (e.g., major employers, shopping centers and other commercial concentrations), and to train stations, park-and-ride lots or other bus transit nodes. Overall, much of this service is too limited in terms of frequency and areas accessed to carry a substantial number of travelers in the key commuter periods.



Whitehouse Station

Commuter bus services operate primarily between pick-up points in the study area and destinations in Lower and Midtown Manhattan in New York City. There are no commuter bus connections to the major employment centers along the corridor, particularly in Hunterdon and Somerset Counties, where much of the corridor's employment is located. Commuter rail operations connect the Study Area to major employment centers such as Newark, Hoboken, and New York City. While all these modes collectively form an interconnected transit network, the connections are considerably more frequent and convenient in the eastern portions of the Study corridor and when connecting to major employment hubs outside of the corridor.

2.3.3 Park-and-Ride Operations

The corridor has approximately 4,500 park-and-ride spaces for bus and rail passengers as well as carpool and vanpool travelers. Surveys by NJDOT and the Study Team confirm that while approximately 16% were presently vacant, many of these facilities were overcrowded, with potential bus users or carpool/vanpool members often forced to find other locations. Without any major new or expanded transit services, the Study Team estimates that an additional 2,000 parking spaces will be needed to accommodate existing demand in the corridor by 2030.



Clinton Point Park-and-Ride

2.4 GOALS AND OBJECTIVES

A set of project goals and objectives have been developed based on:

- the project's Purpose and Need described above;



- findings from initial data gathering and analysis performed by the Study Team, including a web-based survey that was completed by over 5,000 corridor residents;
- input received from the Study's Project Steering Committee (Freeholders, representatives of local counties, NJDOT, NJ TRANSIT, and other transportation agencies and stakeholders); and
- feedback from meetings with local elected officials and representatives.

As such, the goals and objectives cover a broad range of local and regional interests, reflecting transportation, social, economic and environmental concerns. The Study and subsequent planning efforts will seek to identify and select those alternatives that can address as many of these goals and objectives as possible.

The identified project goals and objectives for the Study are as follows:

- Reduce traffic volumes in the corridor by reducing the share of corridor travel handled by automobiles, especially by single-occupant vehicles.
- Reduce congestion along I-78 and other key roadways (e.g., US Route 22, NJ Route 31).
- Propose transit service improvements that serve those travel markets with sufficient numbers of potential transit passengers to make conventional transit service feasible.
- Provide additional park-and-ride spaces in locations and with sufficient number of spaces to provide the density of passengers needed to support conventional bus and/or rail transit operations.
- Locate additional park-and-ride facilities and initiate new or expanded transit operations "upstream" of congested highway locations, avoiding the need to draw those travelers through already congested areas.
- Ensure that new transit services and the park-and-ride facilities where passengers will access them do not create undue traffic congestion or related environmental problems on local streets and arterials surrounding those facilities.
- Consider the use of relatively low cost, effective bus improvement treatments such as the use of roadway shoulders for buses to bypass congestion or bus signal pre-emption.
- Consider proposals that are consistent with local, county and Statewide land use plans, and look for ways to support the goals and intent of those plans. Develop transit improvement concepts that can be incorporated into subsequent plans as appropriate.



- Develop proposals that are consistent with key environmental regulations in the corridor, including the NJ Highlands Preservation Act regulations and the NJ Development and Redevelopment Plan.
- Involve key corridor stakeholders and the public throughout the planning process, as well as local agencies and elected officials.
- Produce a comprehensive, consensus-based set of transit enhancement and highway solutions that will increase the transit share of trips in the corridor now and in the future.

These goals and objectives, developed at a midpoint in the Study's progress, represented a mix of guiding principals and desired outcomes. The quantitative and qualitative analyses carried out by the Study Team provided the performance measures used to assess how well each transportation improvement component and overall improvement packages addressed these study goals and objectives.



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**Section 3
Baseline Travel and
Land Use Patterns**



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**SECTION 3
BASELINE TRAVEL AND LAND USE PATTERNS**

3.1 INTRODUCTION

Interstate 78 links New York City with central Pennsylvania where it connects to I-81, I-83, and the Pennsylvania Turnpike (I-76) to reach points further to the west and south. I-78 was originally planned to extend across Manhattan, Queens and Brooklyn in New York City, with a terminus in the Bronx at Interstate 95 at the current junction of I-95 and I-295. The New York City portion was never built, and I-78 ends at the eastern portal of the Holland Tunnel. The Pennsylvania portion of I-78 in the Study Area opened in 1991 when the 32-mile US-Route 22 “bypass” in Lehigh and Northampton Counties was completed. The sections in the New Jersey portion of the Study Area, which also included either upgrading or bypassing portions of US Route 22, were completed in segments from approximately 1959 to 1971.

As shown in Figure 1-1 in Section 1, the segment of the I-78 corridor that was the focus of the I-78 Corridor Transit Study includes portions of Lehigh and Northampton Counties in eastern Pennsylvania, and of Warren, Hunterdon and Somerset Counties in New Jersey. The main topographical features that define the corridor are:

- The Delaware River Crossing (see Figure 3-1), including the Delaware River Joint Toll Bridge Commission (DRJTBC) bridges on I-78, US 22, and Northampton Street;
- Jugtown Mountain (approximately milepost 8.5 to 11), in the Bethlehem Township area of Hunterdon County, with steep highway grades that would benefit from truck climbing lanes;
- East of I-287 (MP 32-33.5) in Somerset County, another major upgrade which includes existing truck climbing lanes; and
- A restricted width section (MP 44 to 47) in the sensitive Watchung reservation area just east of Study Area’s eastern boundary in the Berkeley Heights section of Union County.

Figure 3-1: I-78 Delaware River Crossing



Pavement conditions along the corridor are generally good, as measured by available data from PennDOT and NJDOT. It is interesting to note that the results of study’s web-based survey of corridor travelers, which are discussed later in this report, showed that pavement conditions are



I-78 CORRIDOR TRANSIT STUDY

Section 3: Baseline Travel and Land Use Patterns

among the more important issues for regular travelers. Although present highway conditions are relatively good, travelers clearly expect the two states to keep the highway in a state of good repair.

This section summarizes various information compiled during the Study's initial data collection phase. This includes:

- 3.2. Highway geometry and median conditions;
- 3.3. Review of land use and development patterns along the corridor;
- 3.4. Collection of available traffic data in the corridor from State and County agencies;
- 3.5. Limited primary traffic data collection process to verify and enhance those data for I-78 and other key corridor roadways;
- 3.6. Detailed inventory and review of existing park-and-ride facilities within the Study Area; and
- 3.7. Surveys to better understand who is traveling in the corridor and their opinions on various transportation issues and proposals.

3.2 HIGHWAY GEOMETRY AND MEDIAN CONDITONS

I-78 throughout the Study Area in Pennsylvania and New Jersey generally exhibits the design characteristics of a suburban-rural interstate. Table 3-1 presents representative highway geometry conditions along the corridor in terms of lanes, cartway width and shoulder and median conditions. As shown, the highway in the Study Area is normally three lanes in each direction, with the only differences occurring near congested and complex interchanges and in steep segments where climbing lanes are needed to maintain traffic and safety.

Table 3-1: Existing Roadway Travel Lane, Shoulder and Median Conditions on I-78 at Selected Locations

Location (MP = Mile Post)		MP 7.0	MP 30.0	MP 40.0
		Greenwich Township east of Rt. 22	Bedminster west of I-287	Warren Township west of Int.40
Total Lanes	EB	3	3	3
	WB	3	3	3
Shoulder	EB	12'	12'	12'
	WB	12'	12'	12'
Median [2]		Unprotected, variable width (50' typical)	Unprotected, 50'	Unprotected, 40'
Cartway [1]		146' (typ.)	146' (typ.)	136' (typ.)
Control		Limited Access	Limited Access	Limited Access
[1] Cartway = Total width from outer edge of shoulders. [2] "Positive" median = natural features (ravines, rock outcrops, etc.) preclude median crossing Source: NJDOT 2005 Straight Line Data.				



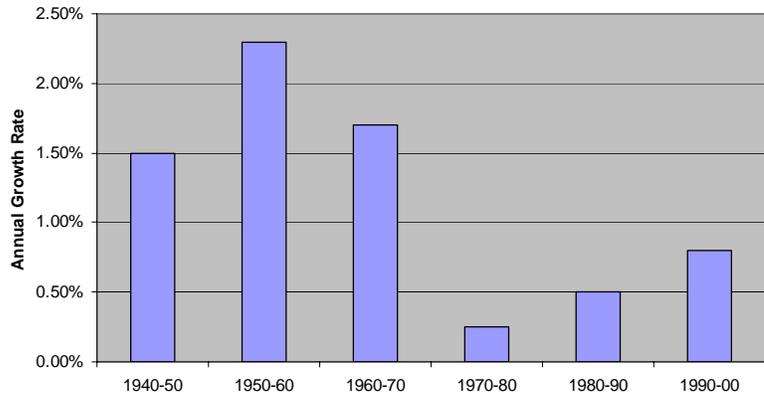
3.3 LAND USE AND DEVELOPMENT

3.3.1 Land Use and Population Patterns in I-78 Corridor

Statewide Patterns in New Jersey

Statewide development patterns in New Jersey reflect the gradual increase in development density, particularly the expansion of suburban residential, commercial and industrial activities into areas that were historically more rural in character. The changes were most dramatic from the early 1980s to the mid-1990s, when developed land statewide increased by 17% from approximately 1.2 million acres in 1984 to approximately 1.43 million acres in 1995 – an average annual development rate of 20,200 acres per year.

Figure 3-2: Average Annual Population Growth – New Jersey (1950s – 1990s)



This rapid growth over the past roughly 20 years parallels the resurgence of population growth over this period (see Figure 3-2). After the slowdown from the post-war boom in the 1970s, annual population growth rates continued to rise throughout the 1980s and 1990s. These trends, along with increased employment, add to development pressures. To accommodate this, housing developments, office parks and shopping malls encroach on lands that were formerly farm fields and forests. The overall trends revealed in the 2000 Land Use Update conducted by Rutgers University Center for Remote Sensing and Spatial Analysis (see Table 4-2) show that New Jersey’s urban development continues at a pace comparable with the 1986 to 1995 time period.

Table 3-2: New Jersey Landscape Change 1984 - 2001 in Acres

Land area	1984	1995	2001
Developed	1,204,920	1,427,315	1,483,158
Cultivated Grassland	1,006,980	883,590	849,999
Upland Forest	1,465,680	1,421,060	1,388,941
Bare Land	38,450	45,530	58,982
Unconsolidated Shore	47,160	45,880	46,809
Coastal Wetland	208,280	201,570	200,166
Inland Wetland	788,870	737,010	734,028
Water	516,570	514,960	514,843
Totals [1]	5,276,910	5,276,915	5,276,926

[1] Minor differences in totals reflect rounding errors and minor variations in sub-totals reported in each year. **Source:** Rutgers University Center for Remote Sensing and Spatial Analysis, 2006.



Patterns in the I-78 Corridor

Segments of the corridor in both Pennsylvania and New Jersey experienced significant growth in recent years, with areas like Bridgewater, Hillsborough and Montgomery in Somerset County among the leaders in newly developed land area since the mid-1980s. Growth in portions of the Lehigh Valley area of Pennsylvania has been similarly high. Figures 3-3, 3-4 and 3-5 provide graphic illustrations of existing land use patterns and population and employment densities along the entire corridor in New Jersey and Pennsylvania as of 2006. The still-prominent role of agriculture within and near the I-78 corridor throughout much of Warren and Hunterdon Counties is clear, along with the longer tradition and greater density of urban activities within the Lehigh Valley, similar in many ways to the patterns in Union, Essex and Middlesex Counties to the east in New Jersey. The associated population and employment densities likewise reflect these patterns.

A wide variety of planning efforts are being carried out or implemented to better understand and shape the often rapid growth along the corridor. New Jersey, through its Highlands regulations, has made one of the most significant moves to shape and control this growth by limiting where and what types of growth can occur within the Highlands area. As shown in Figure 3-6, the Highlands is an approximately 1,000 square mile area in the northwestern part of the State noted for its rugged hills, lush forest and scenic lakes, covering portions of 7 counties (including Hunterdon, Somerset and Warren Counties within the Study Area) and 87 municipalities. Along the I-78 corridor, the Highland's most stringent Preservation Area regulations focus on the corridor's western half, within portions of Hunterdon and Warren Counties.

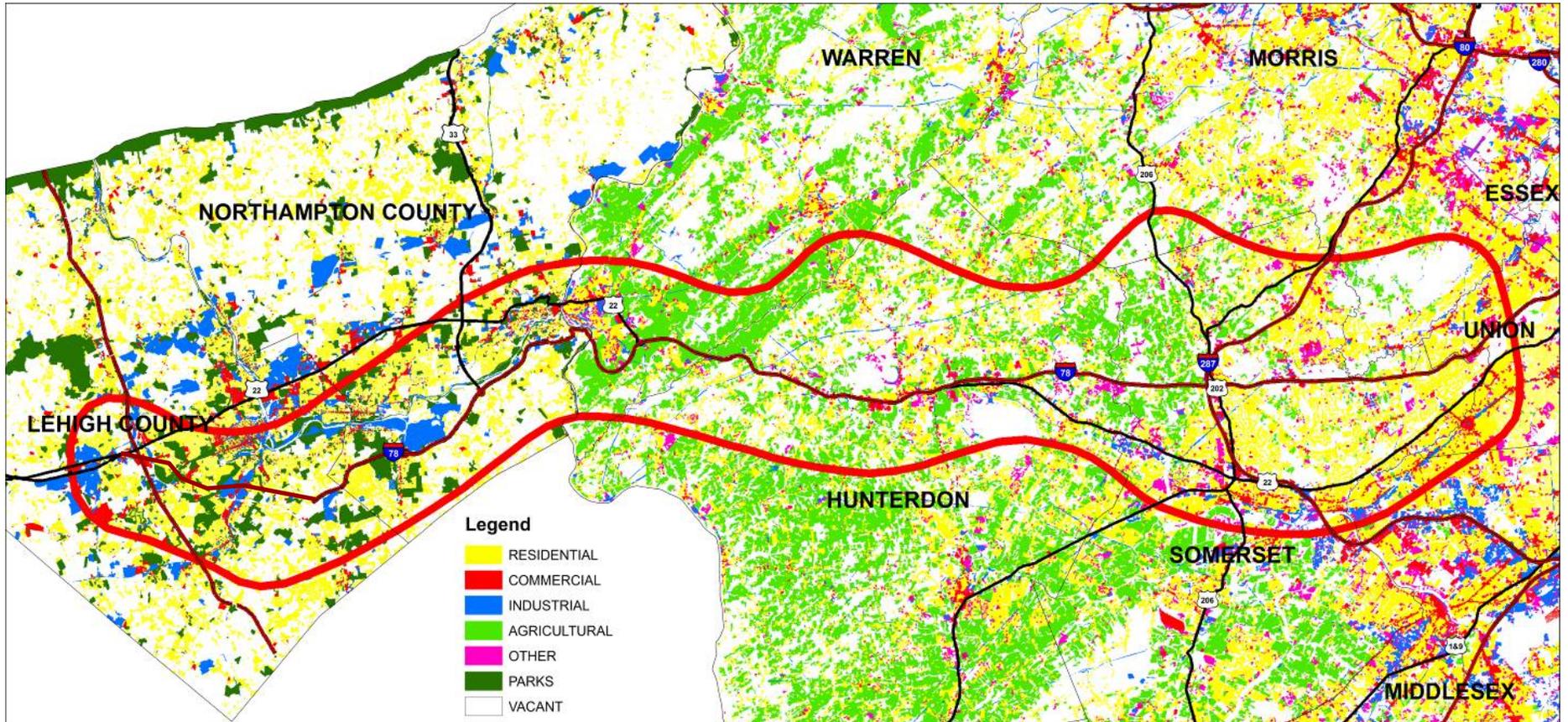
In November 2006 the NJ Highlands Council released its Highlands Draft Regional Master Plan, including a future land use plan map that establishes three land use zones that overlay municipal zoning, each with its own set of criteria and standards:

- **The Protection Zone** – considered the most environmentally critical lands, with standards that prohibit disturbance of natural resources or adding new infrastructure, with an emphasis on public or private purchase for long-term preservation.
- **The Conservation Zone** -- areas with significant agricultural lands and valuable environmental features to be preserved when possible and development limited in size and intensity (emphasis on low impact, clustered development to minimize environmental impact and need for new infrastructure).
- **The Planned Community Zone** – areas already well developed that with proper planning could support development consistent with local planning goals. Looks to efficiently use already developed lands (e.g., adaptive reuse, in fill).

The mapping of these zones along the I-78 corridor in Warren, Hunterdon and Somerset Counties is shown in Figure 3-7. The success of the plan depends on local governments working with the Council to adjust land use plans to support the goals of the Plan. The Highlands Act requires communities within the **Preservation Area** to conform to the Plan and those in the **Planning Area** to voluntarily conform to the Plan. The Council is scheduled to finalize its plan in Fall 2007, using extensive feedback from a broad public outreach process and results from studies such as the I-78 Corridor Transit Study to help shape the plan and the



Figure 3-3: Land Use Patterns in Study Area (2006)



NOTE: To allow mapping consistent across the two-state area, Pennsylvania's more extensive GIS land use categories were aggregated into the five NJ land use categories. A fifth category (Parks) was also created. The table shows how the PA categories were consolidated.

Map Symbol	PA Land Use Categories
Vacant (NJ)	Agricultural, Vacant,
Industrial (NJ)	Manufacturing, Industrial, Warehousing & Distribution
Commercial (NJ)	Office, Business, Retail, Commercial
Residential (NJ)	Residential
Parks	Parks & Other Outdoor Recreation, Public & Quasi-Public
Other (NJ)	Transportation, Communication & Utilities

Figure 3-4: Population Density 2006

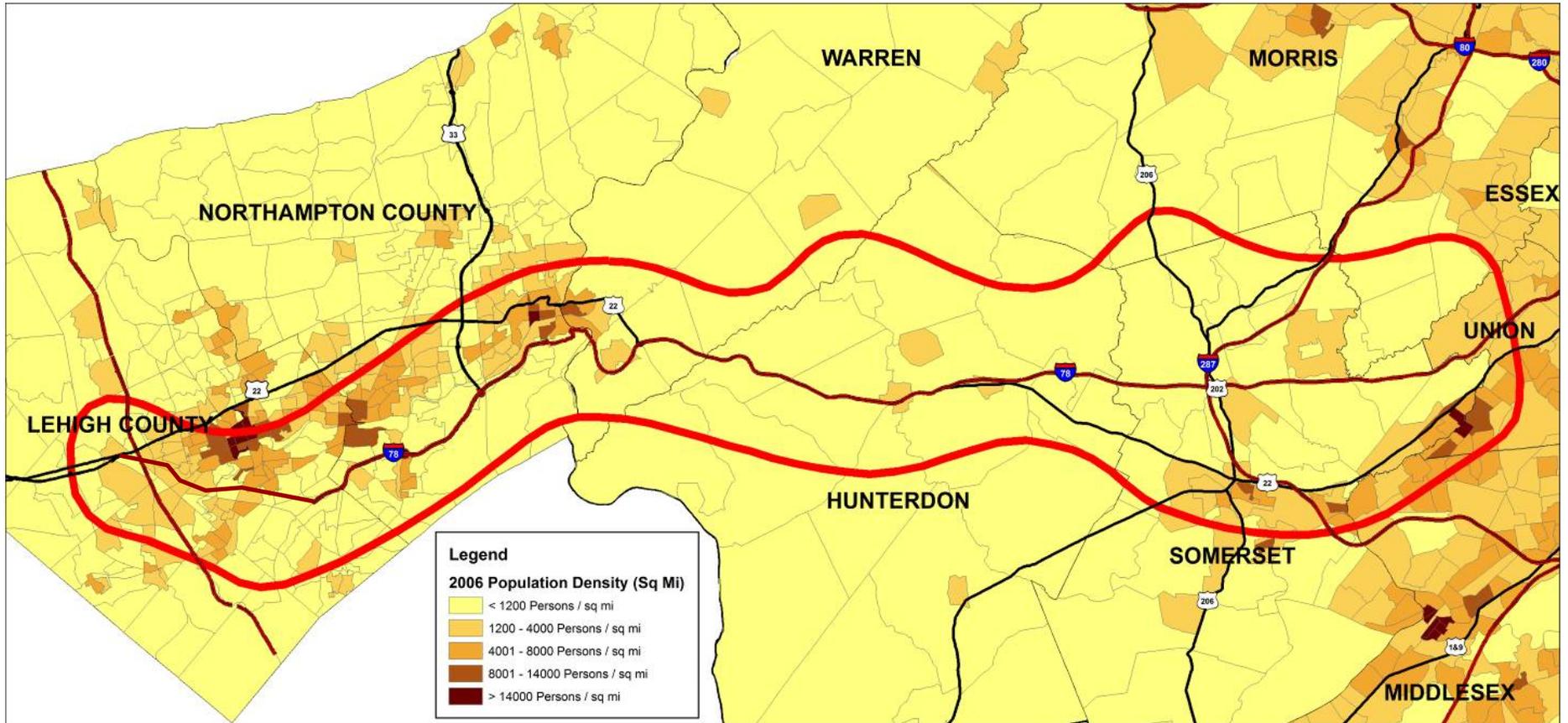
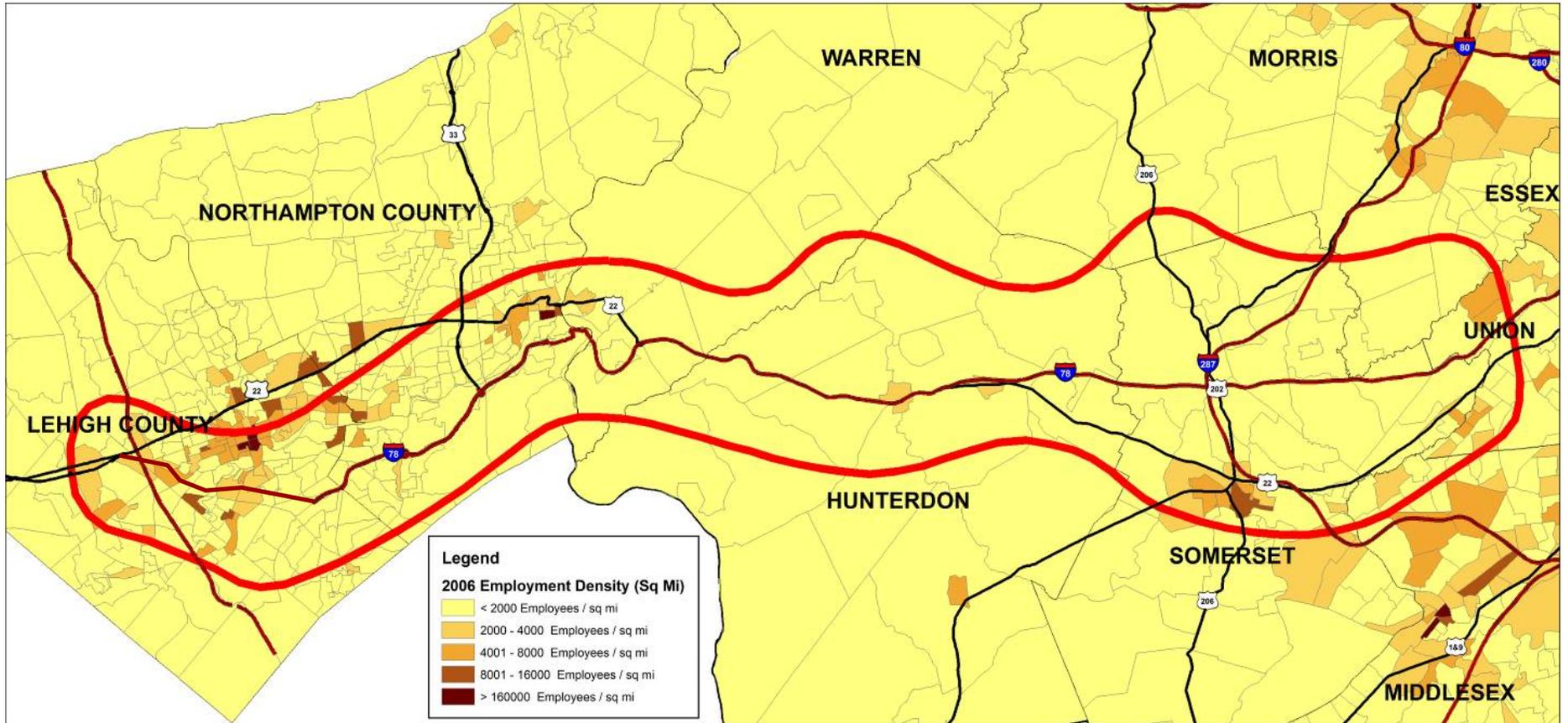


Figure 3-5: Employment Density 2006



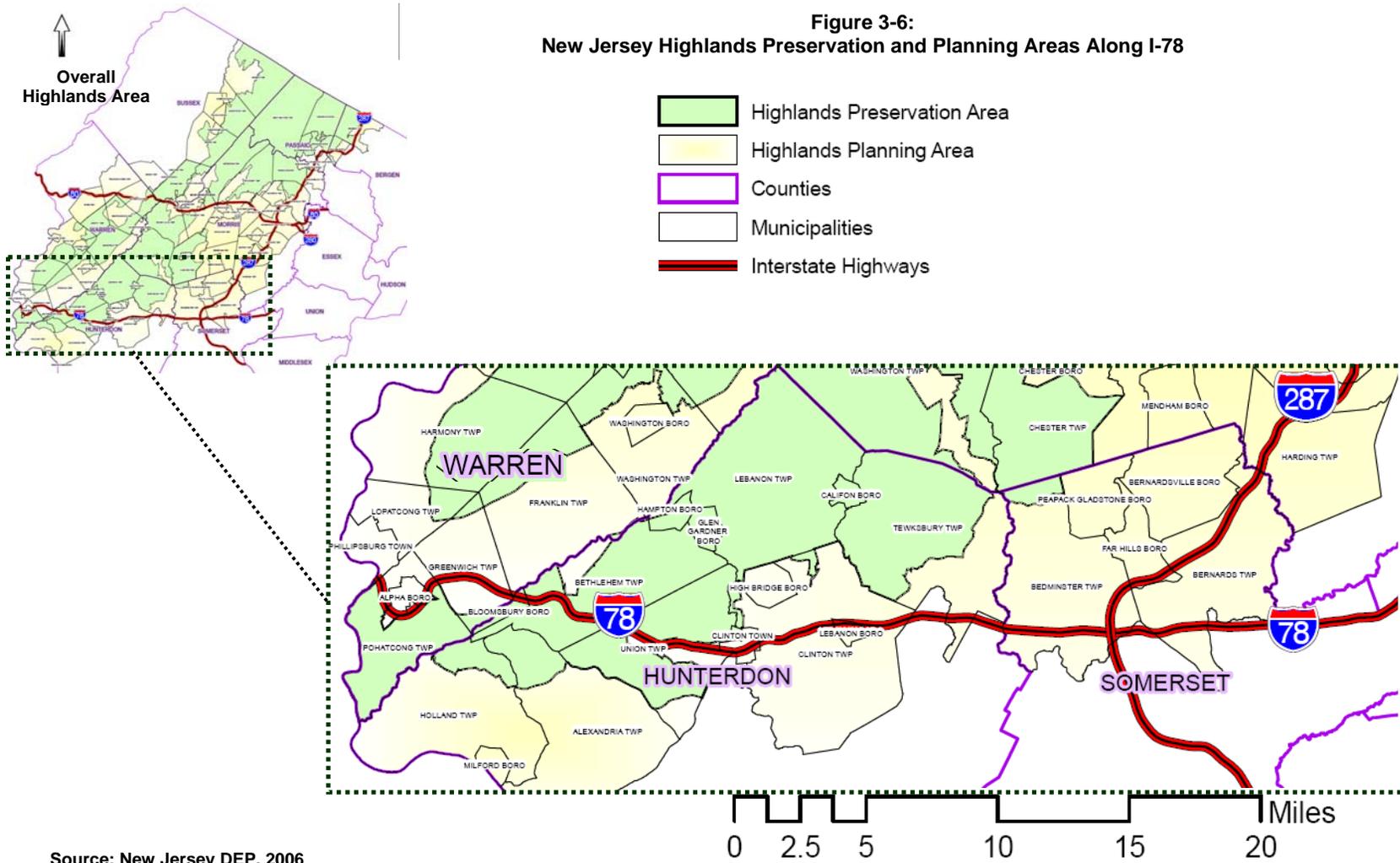
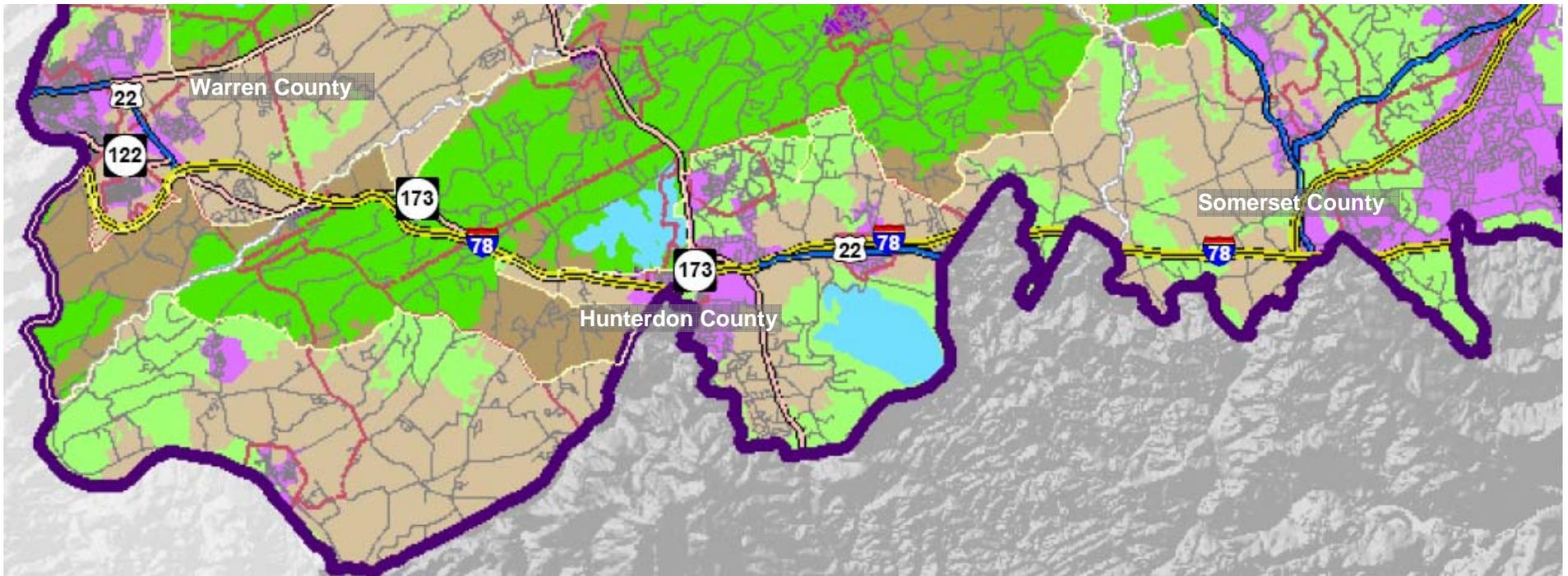


Figure 3-7:
New Jersey Highlands Preservation and Planning Areas along I-78 Corridor



Preservation Area	Planning Area
 Conservation Zone	 Conservation Zone
 Protection Zone	 Protection Zone
 Planned Community Zone/ Specially Planned Areas	 Planned Community Zone/ Specially Planned Areas

Source: Land Use Capability Map – Draft Regional Master Plan. NJ Highlands Council (2006).



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procedures to be used by municipalities and county governments to conform to the plan's requirements.

During the second half of the 1990s, Somerset, Hunterdon and Warren Counties, which collectively account for less than 15% of the state's land area, included close to 21% of the state's new urban and transitional land growth. The management of this type of growth in the midst of critically important natural area is the main focus of the Highland Commission's efforts. The following are brief discussions of growth patterns in each of the three New Jersey counties within the I-78 Corridor Study Area.

- **Warren County, NJ.** Warren County, located in northwestern New Jersey, is transected by both I-80 and I-78, which provide good highway connections to the metropolitan areas to the east. Interstate 78 began to influence growth most significantly in the early and mid 1980s when it was partially built, and the pattern accelerated when this segment was completed in 1991. This resulted in significant residential growth along Routes 22, 57 and 519 corridors in Lopatcong, Pohatcong and Greenwich Townships.

As shown in Table 3-3, Warren County's developed land increased by 36% from 1984 to 2001, with the expected parallel reductions in grassland, forested areas and wetlands. The county's population of 102,437 in 2000 represented a 12% growth since 1990. At the municipal level, however, population growth over that period ranged from a 14% increase to a 5% decrease. Growth in Warren County, like Somerset and Hunterdon to the east and nearby Lehigh Valley counties, reflects a western migration of population within New Jersey along the I-78 and I-80 corridors into those counties.¹

Table 3-3: Warren County Landscape Change 1984 - 2001 in Acres

Land area	1984	1995	2001
Developed	27,202	34,700	36,929
Cultivated Grassland	78,509	73,837	71,964
Upland Forest	104,072	102,555	101,961
Bare Land	566	957	1,138
Unconsolidated Shore	376	195	194
Coastal Wetland	0	0	0
Inland Wetland	18,583	16,005	15,954
Water	2,896	3,956	3,940
Totals [1]	232,204	232,205	232,080

[1] Minor differences in totals reflect rounding errors and minor changes in reporting procedures. **Source:** Rutgers University Center for Remote Sensing and Spatial Analysis, 2006.

Projected population in Warren County, reflecting these trends, building levels and patterns as well as the build-out analysis in the context of the Highlands regulations, is expected to reach 136,666 persons by the year 2030 (33% increase over 2000 levels). The growth expected across the county is mixed, ranging from 8% and 55% over this period.

¹ New Jersey Futures, *Moving Out: New Jersey's Population Growth and Migration Patterns*. (2006).



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- Hunterdon County, NJ.** The rural atmosphere, combined with its transportation connectivity, is a major attraction for new residents. Two major transportation corridors: I-78 and US Route 202 running east and west and NJ State Route 31 running north and south, bisect the county. Land development along these corridors continues to have a substantial effect on Hunterdon County and its population. One factor that somewhat controls this trend is that roughly two-thirds of the county's 275,400 acres are in farmland assessment, a tax assessment treatment that helps protect farmland and counteract development pressures. Farming is still Hunterdon's biggest industry, one that employs thousands in producing, processing, and selling crops and their products.

Table 3-4: Hunterdon County Landscape Change 1984 - 2001 in Acres

Land area	1984	1995	2001
Developed	48,548	60,961	66,161
Cultivated Grassland	120,506	111,190	106,876
Upland Forest	94,486	92,088	90,755
Bare Land	629	762	1,193
Unconsolidated Shore	250	405	246
Coastal Wetland	0	0	0
Inland Wetland	10,686	9,814	9,779
Water	4,837	4,722	4,871
Totals [1]	279,942	279,942	279,881

[1] Minor differences in totals reflect rounding errors and minor changes in reporting procedures. **Source:** Rutgers University Center for Remote Sensing and Spatial Analysis, 2006.

The changes in land use over the past two decades in Hunterdon County are similar to those discussed previously for Warren County, with developed land increasing by 36% over the 1984-2001 period and related reductions in cultivated/grassland, forested areas and wetlands. While its population is low when compared to most of the State's counties, Hunterdon's explosive population growth since 1970 (69,718 in 1970 to 121,989 by 2000 -- 75.2% rise) has been among the State's highest.

- Somerset County, NJ.** The county's historical development is closely related to improvements in its transportation network, starting with passenger and freight railroad services throughout the 19th and early 20th centuries. By the 1950s and 1960s, the role of railroads had been gradually displaced by roads and highways, and particularly by Interstate highways such as I-287 and I-78.

Table 3-5: Somerset County Landscape Change 1984 - 2001 in Acres

Land area	1984	1995	2001
Developed	63,488	77,916	83,331
Cultivated Grassland	58,314	52,019	48,577
Upland Forest	58,843	50,320	47,614
Bare Land	1,646	1,534	2,502
Unconsolidated Shore	520	267	232
Coastal Wetland	0	0	0
Inland Wetland	14,590	12,225	12,044
Water	614	735	718
Totals [1]	198,015	195,016	195,018

[1] Minor differences in totals reflect rounding errors and minor changes in reporting procedures. **Source:** Rutgers University Center for Remote Sensing and Spatial Analysis, 2006.

Somerset County has experienced a large growth in residential housing units, mostly single family detached, located on large lots in rural townships. This



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predominant suburban development pattern, along with significant expansions of office parks and retail and other commercial development, has led to the decreases in open space and farmland that is a common pattern in rural New Jersey over the past 20 years.

Somerset County's 31% increase in developed land area over the 1984 – 2001 period, as shown in Table 3-5, is similar to the 35% - 36% increases that occurred in Warren and Hunterdon Counties along the corridor. Five townships -- Bernards, Bridgewater, Franklin, Hillsborough and Montgomery Townships -- accounted for 41,260 (72.8%) of Somerset County's 57,211 person population growth (24%) from 1990-2000.

- Lehigh and Northampton Counties, PA.** The Lehigh Valley region (Lehigh and Northampton Counties) is located in the central-eastern portion of Pennsylvania, within 300 miles of all the major metropolitan areas of the northeastern United States (New York - New Jersey; Philadelphia; Baltimore - Washington, D.C.; Boston). During the 1970s, industrial building expanded in the suburban areas. As population growth was stabilizing statewide in the 1960s and 1970s and declining in some of the older industrialized parts of the state and region (the cities and boroughs), the overall Lehigh Valley saw a period of expansion – population grew by roughly 6% and 8% in the 1970s and 1980s while statewide growth was under 5% in both decades. As much of this growth occurred within or near the present location of I-78, completion of I-78 through the region in 1991 further eased commutation to the large employment centers in New Jersey and further promoted expansion and economic development.

Table 3-6: Lehigh Valley Land Use Change 1985 - 2002 in Acres

Land area	1985	1995	2002
Residential	86,514	102,273	115,379
Commercial	6,023	7,133	8,109
Industrial	10,821	11,316	11,782
Wholesale & Warehousing	5,040	5,575	7,169
Transp., Comm. & Utilities	34,651	35,766	36,391
Public & Quasi-Public	7,439	8,022	8,837
Parks & Recreation	25,005	33,666	36,026
Agricultural & Vacant	290,864	262,607	242,665
Totals	466,357	466,358	466,358

Source: Delaware Valley RVC, 2006.

Land use changes since the mid-1980s, as shown in Table 3-6, are similar in many ways to those shown along I-78 in New Jersey, with substantial drops in vacant land and increases in development activity. While there was some growth in various commercial and industrial areas, the Lehigh Valley region saw explosive growth in the amount of residential land – a 33% rise from approximately 86,500 acres in 1985 to approximately 115,400 acres in 2002, paralleling the substantial population growth noted above.

3.3.2 Projected Land Use, Population and Employment Patterns in the Corridor

The previous section discussed how the continued suburbanization of formerly rural areas of western New Jersey and eastern Pennsylvania over the past three decades has resulted in higher-than-average growth rates and associated changes in land use development patterns in both the New Jersey and Pennsylvania portions of the Study corridor. Forecasting patterns for the next 25 years indicate that population and employment growth along the corridor will continue in similar growth patterns. Figures 3-8 and 3-9 illustrate the projected 2030 employment and population densities (jobs and persons per acre) in the I-78 Study Corridor.



Figure 3-8: Employment Density 2030

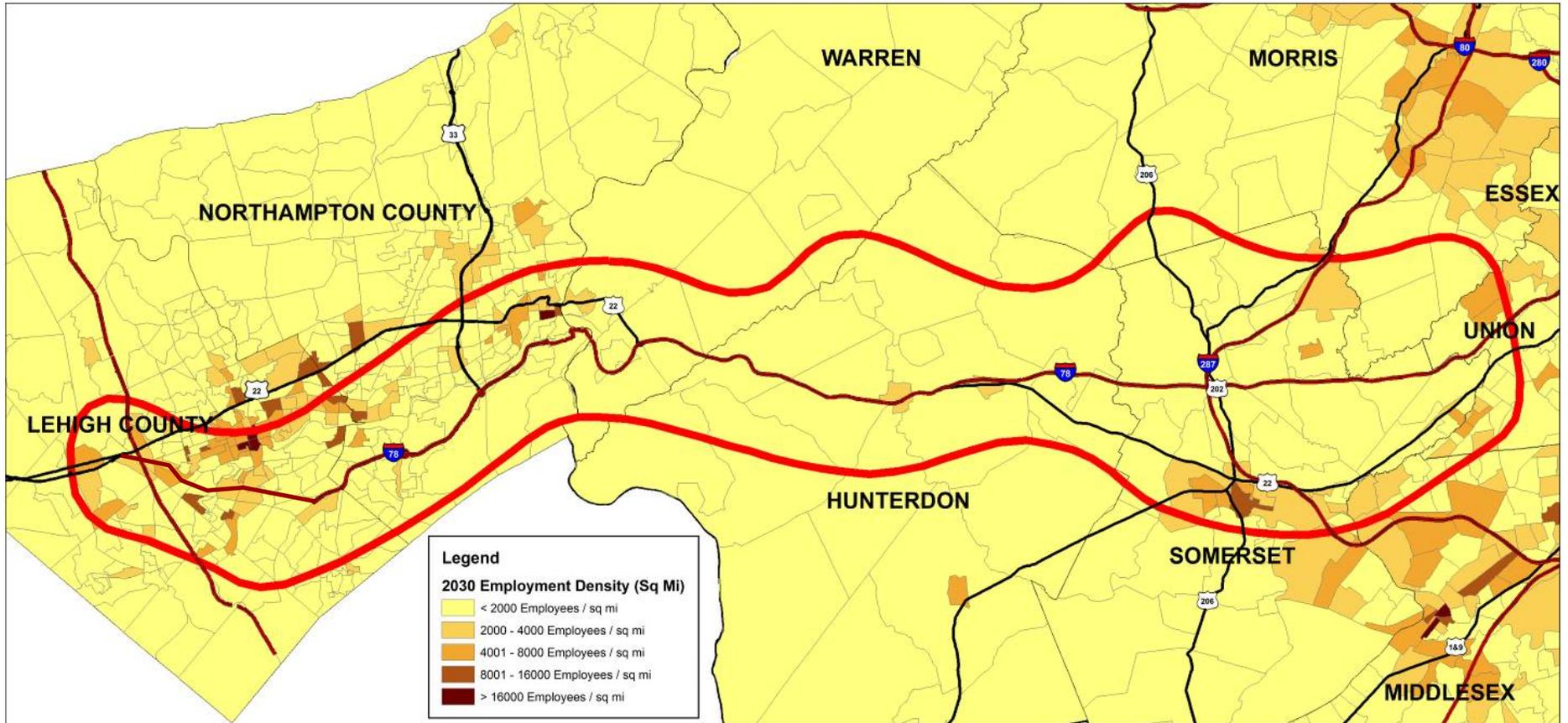
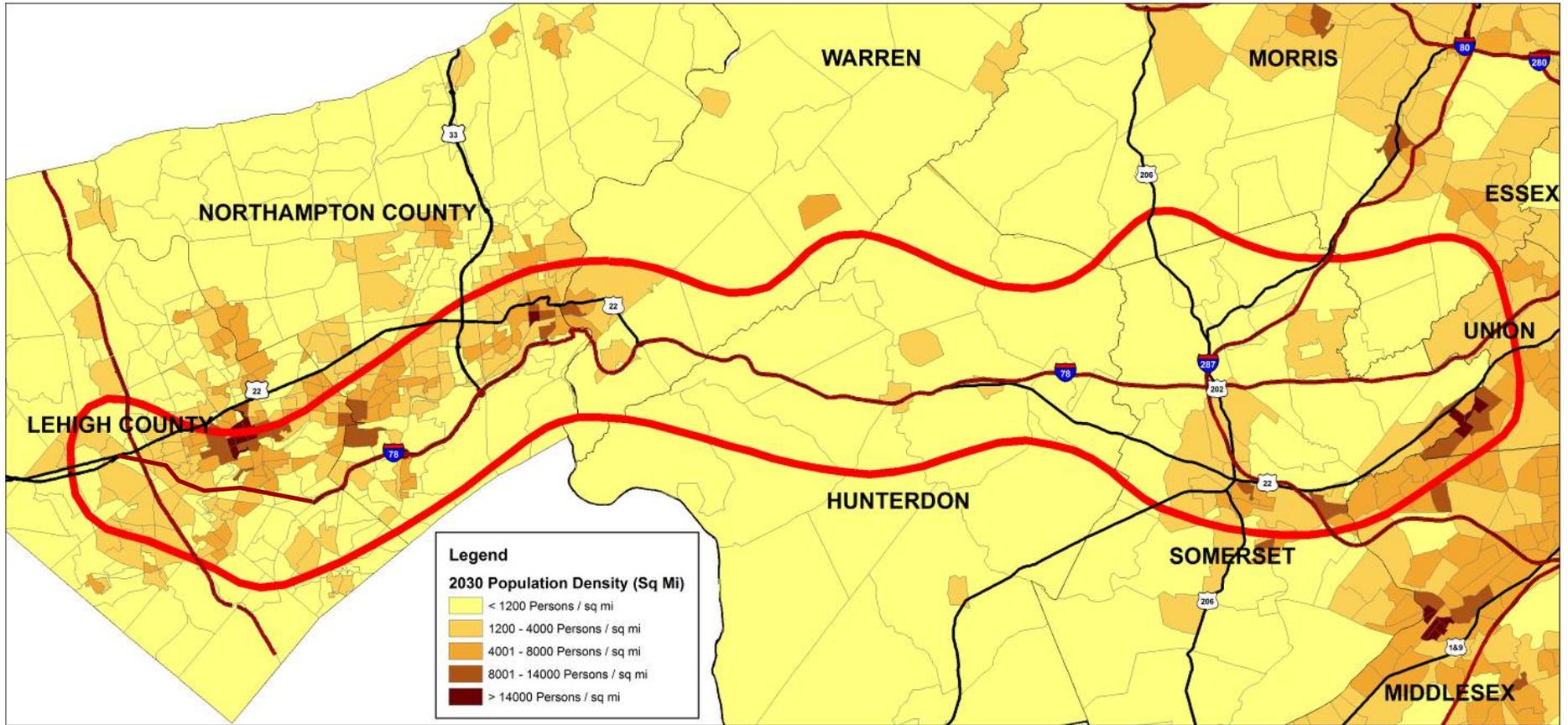


Figure 3-9: Population Density 2030



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Density patterns remain roughly the same along the corridor, with the most pronounced changes in the Lehigh Valley area in terms of continued population growth, particularly in Northampton County in the areas north of US Route 22 and west of PA Route 33 in the vicinity of Nazareth.

3.3.3 Major Employment Sites

While many travelers within the I-78 corridor commute to jobs outside of the Study Area, there are several notable centers of high employment concentration within the Study Area. Additionally, there are numerous institutions, scattered throughout the study area, which employ a sizable number of people (i.e., at least 200).

The following regions within the Study Area display a high density of employment. The listings are not meant to be a comprehensive presentation of all major employers, and the employment levels at each site are often rough approximations, with employers often having more employees in the overall area when all of its sites are considered. Rather they are intended to provide a general sense of the types and sizes of employers in each of these key areas.

- **Allentown, PA** – Once a center of manufacturing activity, Allentown is now dominated by service sector employment activity. Some of the major employers in this region include: Air Products and Chemicals (approximately 4,000 employees), Lucent Technologies (3,800 employees), and the Lehigh Valley Hospital (3,600 employees). Table 3-7 shows those employers in Allentown with over 1,000 employees:

Table 3-7: Major Employers in Allentown, PA (employees > 1,000)

Employer	Number of Employees
Air Products and Chemicals	3,800
Lucent Technologies	3,800
Lehigh Valley Hospital	3,600
Dorney Park & Wildwater Kingdom	2,600
Allentown School District	1,600
PPL Corporation	1,500
Mack Trucks Inc.	1,000
Sacred Heart Hospital	1,000
B Braun Medical MFG Division	1,000
Source: Lehigh Valley Planning Commission, 2006	

- **Bethlehem, PA** – The majority of jobs in Bethlehem tend to be in the service sector. Major employers in Bethlehem include: St. Luke's Hospital (~2,900), First International Life Insurance (~1,500 employees), and Lehigh University (~1,300 employees). Table 3-8 shows those employers in Bethlehem with greater than 1,000 employees.



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Table 3-8: Major Employers in Bethlehem, PA (employees > 1,000)

Employer	Number of Employees
St. Luke's Hospital	2,900
First International Life Insurance	1,500
Guardian Life Insurance Co.	1,400
Lehigh University	1,300
Dun & Bradstreet Info SVC	1,200
Source: Lehigh Valley Planning Commission, 2006	

- **Easton, PA** – Like its Lehigh Valley counterparts, Easton has experienced a decrease in manufacturing jobs and an increase in service sector jobs. The major employers in Easton include: Northampton County (~1,900 employees), Victaulic Co. of America (~1450 employees), and Easton Hospital (~1,400 employees). Table 3-9 shows those employers in Easton with over 1,000 employees:

Table 3-9: Major Employers in Easton, PA (employees > 1,000)

Employer	Number of Employees
Northampton County	1,900
Victaulic Co. of America	1,450
Easton Hospital	1,400
Binney & Smith, Inc.	1,000
Source: Lehigh Valley Planning Commission, 2006.	

- **Phillipsburg (Warren County), NJ** – Spurred on by its designation as an Urban Enterprise Zone, Phillipsburg has been experiencing an increase of businesses, particularly in the center of the city. While Phillipsburg is, in fact, a center of employment activity, employment density in Phillipsburg does not match that of the major centers in the nearby Lehigh Valley. Major employers in the Phillipsburg area include: Warren Hospital (approximately 1,400 employees), Lopatcong Care Center (400 employees), and Mallinckrodt/Baker, Inc. (400 employees). Table 3-10 shows those employers in Phillipsburg with more than 200 employees:

Table 3-10: Major Employers in Phillipsburg, NJ (employees > 200)

Employer	Number of Employees
Warren Hospital	1,400
Lopatcong Care Center	400
Mallinckrodt/Baker, Inc.	400
Wal-Mart	250
Atlantic States Cast Iron Pipe Co.	275
Sears Roebuck	250
Home Depot	200
Source: North Jersey Transportation Planning Association, 2006.	

- **Clinton, NJ** – Major employers in Clinton include: Exxon Mobil Research and Engineering (~500 employees), Shop-Rite of Hunterdon (~450 employees), and New York Life (~400 employees). Table 3-11 shows those employers in Clinton with greater than 200 employees:



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Table 3-11: Major Employers in Clinton, NJ (employees > 200)

Employer	Number of Employees
Exxon Mobil Research and Engineering	500
Shop-Rite of Hunterdon	450
New York Life	400
Kullman Industries	350
Source: North Jersey Transportation Planning Association, 2006.	

- **Readington, NJ** – While Readington does not have a large number of employers, it is home to a few major employers including: Merck & Co (~1,800 employees) and Chubb Insurance Co (~1,500 employees). These employers are displayed in Table 3-12:

Table 3-12: Major Employers in Readington, NJ (employees > 1500)

Employer	Number of Employees
Merck & Co.	1,800
Chubb Insurance Co.	1,500
Source: North Jersey Transportation Planning Association, 2006.	

- **Bedminster, NJ** – Bedminster Township is a center for communications-related companies. These major employers found in Bedminster include Advanced Realty Advisors, Inc. and Verizon. (No data on the number of employees were available).

- **Bridgewater, NJ** – Bridgewater Township is a center for pharmaceutical and health-related companies, as well as being the retail center of Somerset County with the Bridgewater Commons and nearby retail outlets. The following are among the major employers found in Bridgewater (no data on the number of employees at each location were available):

- Courier News
- Bridgewater Commons and related retail stores
- Ethicon
- Johnson & Johnson
- MetLife
- National Starch and Chemical
- Ortho Clinical Diagnostic Inc.
- Schering Plough Corporation
- Wyant Corporation

- **Somerville, NJ** – The Borough of Somerville is the seat of Somerset County government. Some of the larger employees in Somerville include Imclone System, Inc., Somerset County government, and the Somerset Medical Center. (Data on the number of employees at these locations were not available.)

- **Warren Township, NJ** – Warren Township is also a center for communications-related, pharmaceutical, and other general business companies. Some of the larger employees found in Warren Township include the Chubb Group of Insurance, Cordis Corporation, Lucent Technologies and the SBI Group. (Data on the number of employees at these locations were not available.)



3.3.4 Major Transportation Projects

Given the size of the Study Area, it is not surprising that several major transportation projects have been proposed by the various agencies in the area. The following is a list of projects that would have some impact on transportation within the Study Area. None have yet been committed to and all are in various stages of analysis and approval.

- **Completion of Interchange 20 on I-78** – This project in Lebanon Township would add ramp access from Cokesbury Road to I-78 westbound and from I-78 eastbound to Cokesbury Road, thereby completing the interchange (Interchange Completion Study Feasibility Assessment: Interstate 78 at Exit 20 – Cokesbury Road Hunterdon County, NJ, February, 2004).
- **Route 22 Sustainable Corridor** – This project proposes to create a sustainable corridor with such measures as transit enhancements (with the possible end goal of creating a transit village), TDM strategies, dense mixed-use development, a continuous sidewalk system, green space, and highway enhancements. The corridor runs along US Route 22 in Somerset County from the Raritan River to the Bridgewater Township Corporate Boundary (Somerset County Regional Center Route 22 Sustainable Corridor Plan, July, 2001).
- **West Trenton Line** – NJ Transit has recently submitted the Environmental Assessment (EA) to restore 27 miles of commuter rail service on the West Trenton Line from the existing West Trenton Station in Ewing, Mercer County to Bridgewater Station in Bridgewater, Somerset County. This line connects with the Raritan Valley Line and provides service into Newark Penn Station (NJ Transit Dept of Capital Planning and Programs, April, 2005).

3.4 TRAFFIC DATA COLLECTION ACTIVITIES

3.4.1 Overview

As noted above, the goal of the Study was to assess the potential for various transit improvements (focusing on bus transit service and related park-and-ride facilities) that could help the corridor better handle existing and projected higher travel demand. These assessments used a detailed travel demand model to test the effectiveness of such actions on travelers' choice of mode, and the related impact on highway use and congestion. This modeling effort used available information on traffic volumes, transit routes, service and ridership and related transportation data.

The goal of the traffic data collection process was (1) to gather information to verify and, where possible, update data within the model and assist with the model's validation and calibration; and (2) to provide data and observations on traffic operations to corroborate the Study Team's understanding of how the highway is presently operating, where problems exist and the cause of those problems. Similar information collected for existing transit services in the Study Area is presented in Section 4 of this report.



3.4.2 Existing Traffic Data Collection

Traffic data collection began with queries to the New Jersey Department of Transportation (NJDOT), Lehigh Valley Planning Commission (LVPC), Pennsylvania Department of Transportation (Penn DOT), New Jersey Transit (NJ Transit), Delaware River Joint Toll Bridge Commission (DRJTBC), Hunterdon, Somerset, and Warren Counties, and other agency staff and websites for any available and relevant traffic data along the I-78 corridor. All available ATR data, manual counts, AADT, etc. were obtained for all key routes within the Study Area.

Table 3-13 provides a listing of the traffic volume data that were received. The locations of these data points are presented in Figure 3-10.

3.4.3 Supplemental Data Collection

Additional traffic data were collected to supplement the data compiled from available sources. Figure 3-11 presents the locations where additional data were collected. This effort included the following:

- **Automatic Traffic Recorder (ATR) Counts.** Automatic Traffic Recorders (ATRs) were placed during the week of December 3 through December 9, 2005 to record traffic volumes on a 24-Hour, 7-Day basis at the locations listed below:

- Location 1 – I-78, MP 41.5 (Berkeley Heights)
- Location 2 – I-78, MP 29.67 (I-287)
- Location 3 – I-78, MP 15.25 (between on- and off-ramps for Route 513)
- Location 4 – I-78, MP 4.5 (Greenwich)
- Location 5 – US-22 @ Raritan River (MP 30.9)

A comparison of the daily variations in hourly traffic volumes at each of these locations for the full survey period is included in *Technical Memorandum #1: Baseline Travel and Land Use Patterns* (July 2006), Appendix A.

Peak hour traffic volumes along the corridor as collected during these surveys are illustrated in Figures 3-12 and 3-13. The traffic data collected confirmed that weekday traffic flow on I-78 has the expected directional peaking characteristics – eastbound in the AM peak and westbound in the PM peak. The peak hour varies along the Study corridor. On average, the AM peak hour ranges from 6:00 – 7:00 am to 9:00 – 10:00 am while the PM peak hour ranges from 3:00 – 4:00 pm to 6:00 – 7:00 pm. The highest peak hour volume for the eastbound direction, approximately 6,010 vehicles, was recorded on the segment to the west of I-287 (MP 29.7) from 8:00 – 9:00 am. For the westbound direction, the highest peak hour volume, approximately 6,050 vehicles, was recorded immediately west of Interchange 26 (MP 25.7) from 5:00 – 6:00 pm.

- **Manual Classification Counts.** Manual classification counts were taken on the afternoon of Wednesday, December 7, 2005 between 4:00 pm and 7:00 pm, and on the



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Table 3-13: Existing Traffic Count Locations and Categories

#	Locations	MP	Direction	Cross Streets	Average Weekday (Hourly)	Manual Counts	Manual Counts (Peak Hours)	Monthly ADT	Classification	7-Day Averages	Daily Averages	Peak Periods	Peak Hours	Date From	Date To	Township	County
1	I-78	18.00	EB/WB	SR 31 & US 22	√							6-8, 4-6	7-8, 5-6	2/15/2000	2/17/2000	Clinton	Hunterdon
2	I-78	18.00	EB	SR 31 & US 22	√							6-8, 4-6	7-8, 5-6	10/14/2002	10/16/2002	Clinton	Hunterdon
3	I-78	22.00	EB/WB	Pottstown & Blossom	√							6-8, 4-6	6-7, 4-5	10/5/1999	10/8/1999	Clinton	Hunterdon
4	I-78	22.20	EB/WB	Pottstown & Blossom	√							6-8, 4-6	6-7, 4-5	10/21/2002	10/23/2002	Clinton	Hunterdon
5	I-78	25.70	EB/WB	Guli / Cedar Overpass				√	√					Sept. 2003	Dec. 2003	Tewkbury	Hunterdon
6	I-78	25.70	EB/WB	Guli / Cedar Overpass	√							6-9, 4-6	6-7, 5-6	9/22/2003	9/28/2003	Readington	Hunterdon
7	I-78	25.70	EB	Guli / Cedar Overpass						√				9/8/2003	10/27/2003	Readington	Hunterdon
8	I-78	40.40	EB	Valley View Overpass							√			Jan. 1999	Dec. 1999	Warren	Hunterdon
9	I-78	40.40	EB	Valley View Overpass						√				Jan. 2000	Dec. 2000	Warren	Hunterdon
10	I-78	40.40	EB	Valley View Overpass	√							6-9, 5-7	8-9, 6-7	1/3/2000	1/9/2000	Warren	Hunterdon
11	I-78	40.40	EB	Valley View Overpass							√			Jan. 2000	Dec. 2000	Warren	Hunterdon
12	I-78	41.20	EB	Hillcrest and Dale							√			Jan. 1999	Dec. 1999	Watchung	Somerset
13	CR-531	12.50	NB/SB	Emerson & Mountain	√							6-9, 4-6	8-9, 4-5	5/5/1999	5/7/1999	Warren	Hunterdon
14	US-22	30.03	EB/WB-NB/SB	Readington Road		√						7-10, 3-5	9-10, 4-5	11/29/2001	6am-6pm	Bridgewater	Somerset
15	US-22	32.30	EB/WB	Country Club				√	√					Jan. 2003	Dec. 2003	Bridgewater	Somerset
16	US-22	38.10	EB/WB-NB/SB	Vosseller Avenue		√						7-10, 4-6	8-9, 4-5	10/30/2003	6am-6pm	Branchburg	Hunterdon



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Table 3-13: Existing Traffic Count Locations and Categories (Continued)

#	Locations	MP	Direction	Cross Streets	Average Weekday (Hourly)	Manual Counts	Manual Counts (Peak Hours)	Monthly ADT	Classification	7-Day Averages	Daily Averages	Peak Periods	Peak Hours	Date From	Date To	Township	County
17	Somerville		NB/SB	I-78 & CR-512	√							7-10, 4-6	8-9, 4-5	8/29/2000	9/1/2000	Bernards	Somerset
18	I-78	25.03	EB/WB-NB/SB	CR 523 / Oldwick		√						7-10, 4-7	8-9, 5-6	3/14/2005	7-10, 4-7	Tewksbury	Hunderton
19	CR-523		EB/WB-NB/SB	West Bromley Road	√	√						7-10, 4-7	8-9, 5-6	3/14/2005	7-10, 4-7	Tewksbury	Hunderton
20	US-22	20.30		Petticoat / Bray's Hill			√						7-8, 5-6	6/9/1003		Clinton	Hunterdon
21	US-22	20.02		Sand Hill Road			√						7-8, 5-6	6/9/1003		Clinton	Hunterdon
22	I-78		I-78	DRJTBC Bridge	√				√					10/17/2005	10/23/2005	Phillipsburg	Lehigh
23	EP		Easton-Phillisburg	DRJTBC Bridge	√				√					10/17/2005	10/23/2005	Easton Phillipsburg	Lehigh Warren
24	NHS		Northampton St.	DRJTBC Bridge	√				√					10/17/2005	10/23/2005	Easton Phillipsburg	Lehigh Warren
25	RB		Riverton-Belvidere Toll	DRJTBC Bridge	√				√					10/17/2005	10/23/2005	Easton Phillipsburg	Lehigh Warren
26	RGVL		Riegelsville Toll	DRJTBC Bridge	√				√					10/17/2005	10/23/2005	Easton Phillipsburg	Lehigh Warren
27	UBEM		Upper Black Eddy - Milford Toll	DRJTBC Bridge	√				√					10/17/2005	10/23/2005	Easton Phillipsburg	Lehigh Warren
28	UF		Uhlerstown - Frenchtown Toll	DRJTBC Bridge	√				√					10/17/2005	10/23/2005	Easton Phillipsburg	Lehigh Warren
29	I-78		EB/WB	Route 100/US-22 Exit	√									4/7/2004	4/7/2004	U Macungie	Lehigh
30	I-78		EB/WB	US 22 / 222 Exit	√									4/7/2004	4/7/2004	U Macungie	Lehigh
31	I-78		EB/WB	Lehigh Street/Rock Rd. Exit	√									4/7/2004	4/7/2004	Allentown	Lehigh
32	US-22		EB/WB	I-476 /	√									4/21/2004	4/21/2004	U Macungie	Lehigh
33	US-22			I-78 & Tilghman St. Exit	√									8/14/2004	8/14/2004	U Macungie	Lehigh



Figure 3-10:
Location of Existing Traffic Counts in Corridor

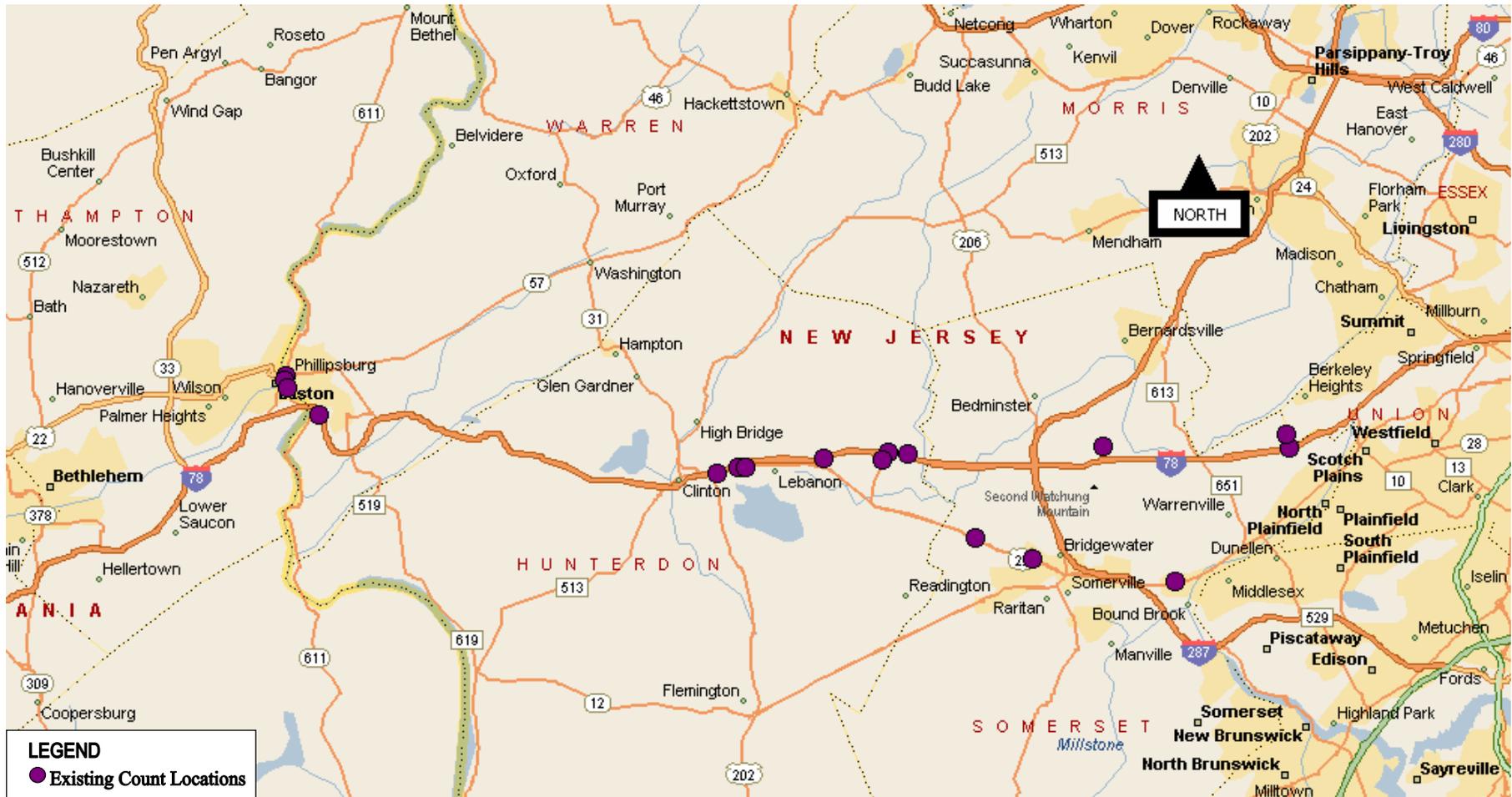


Figure 3-11:
Location of Additional I-78 Study Traffic Counts in I-78 Corridor

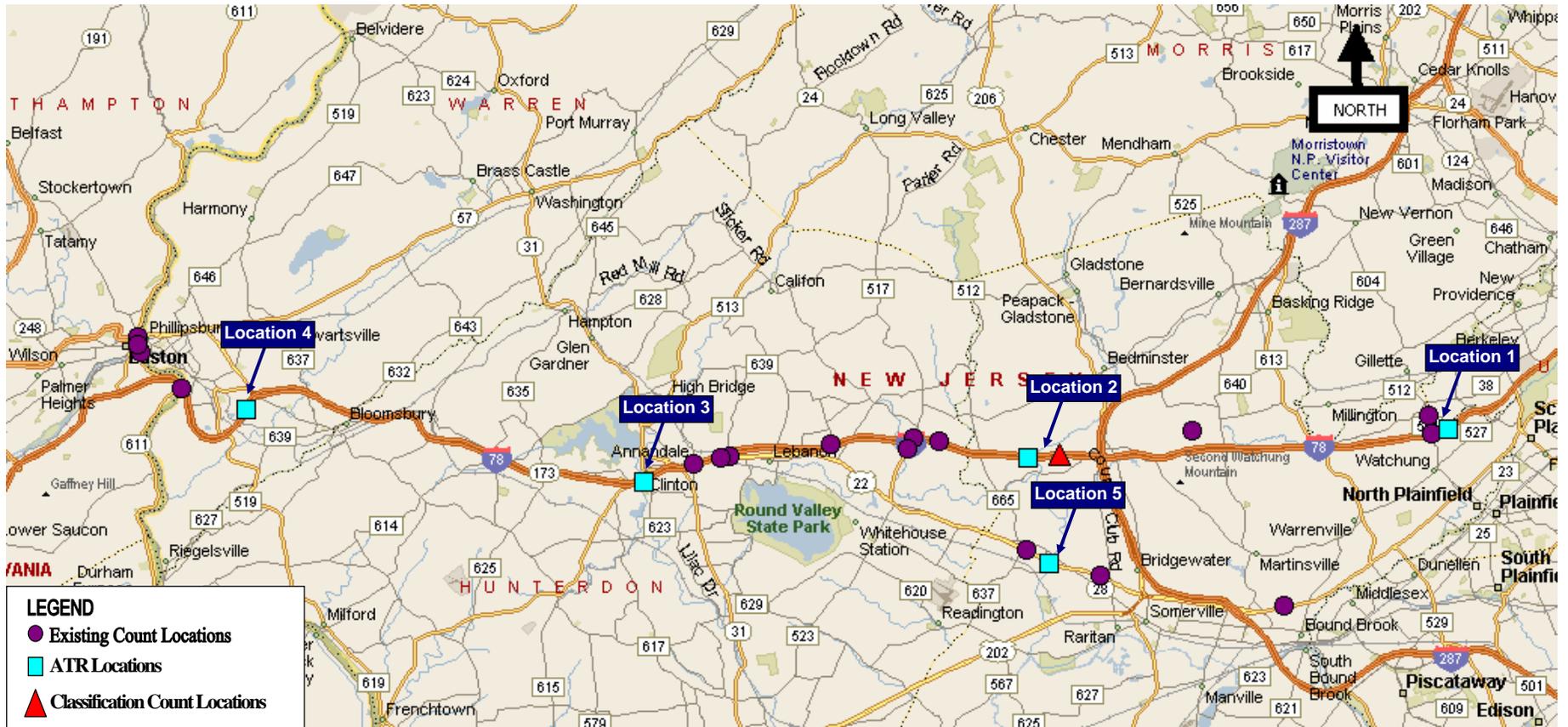


Figure 3-12: Existing AM Peak (6AM-9AM) Directional Volumes in the I-78 Study Corridor

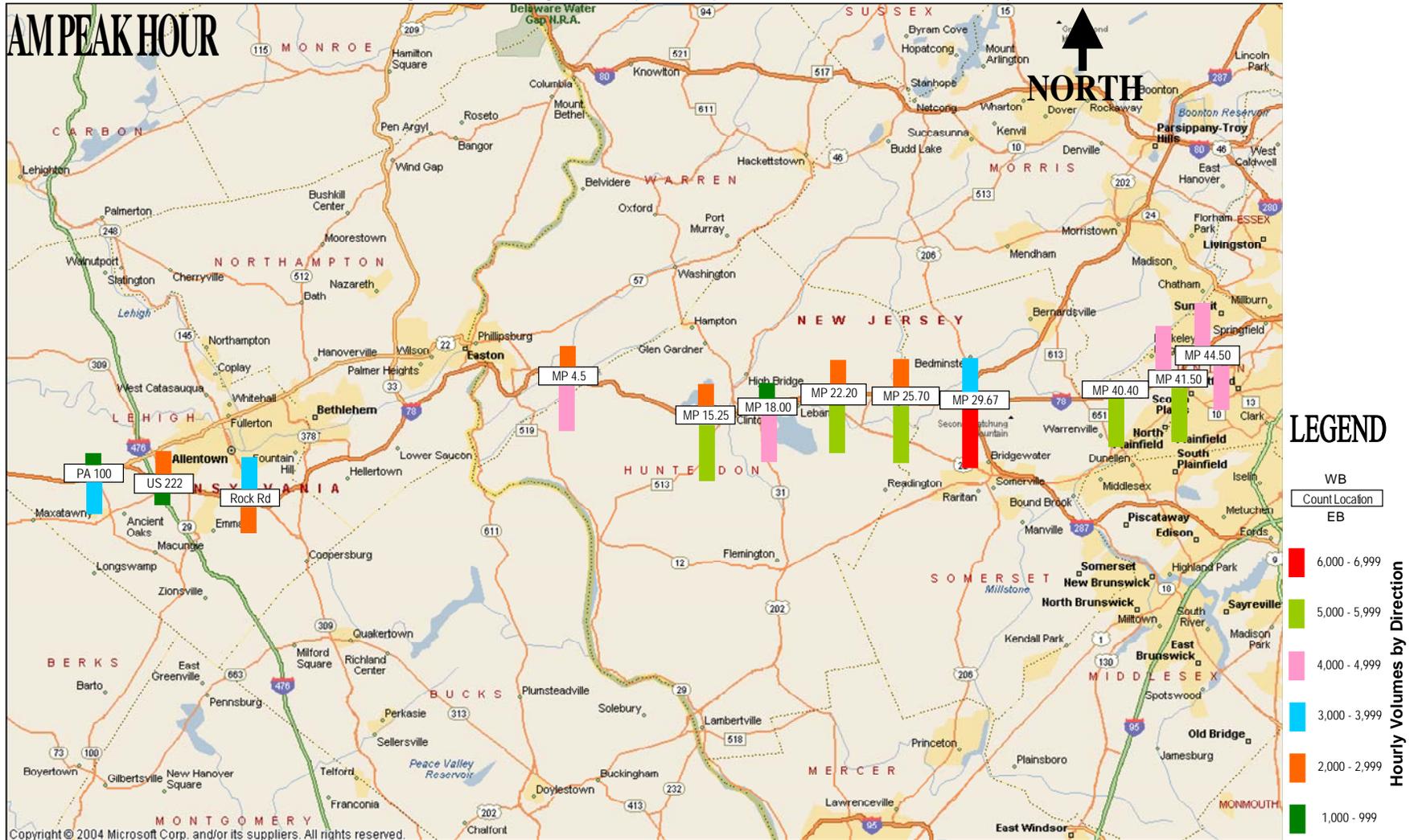
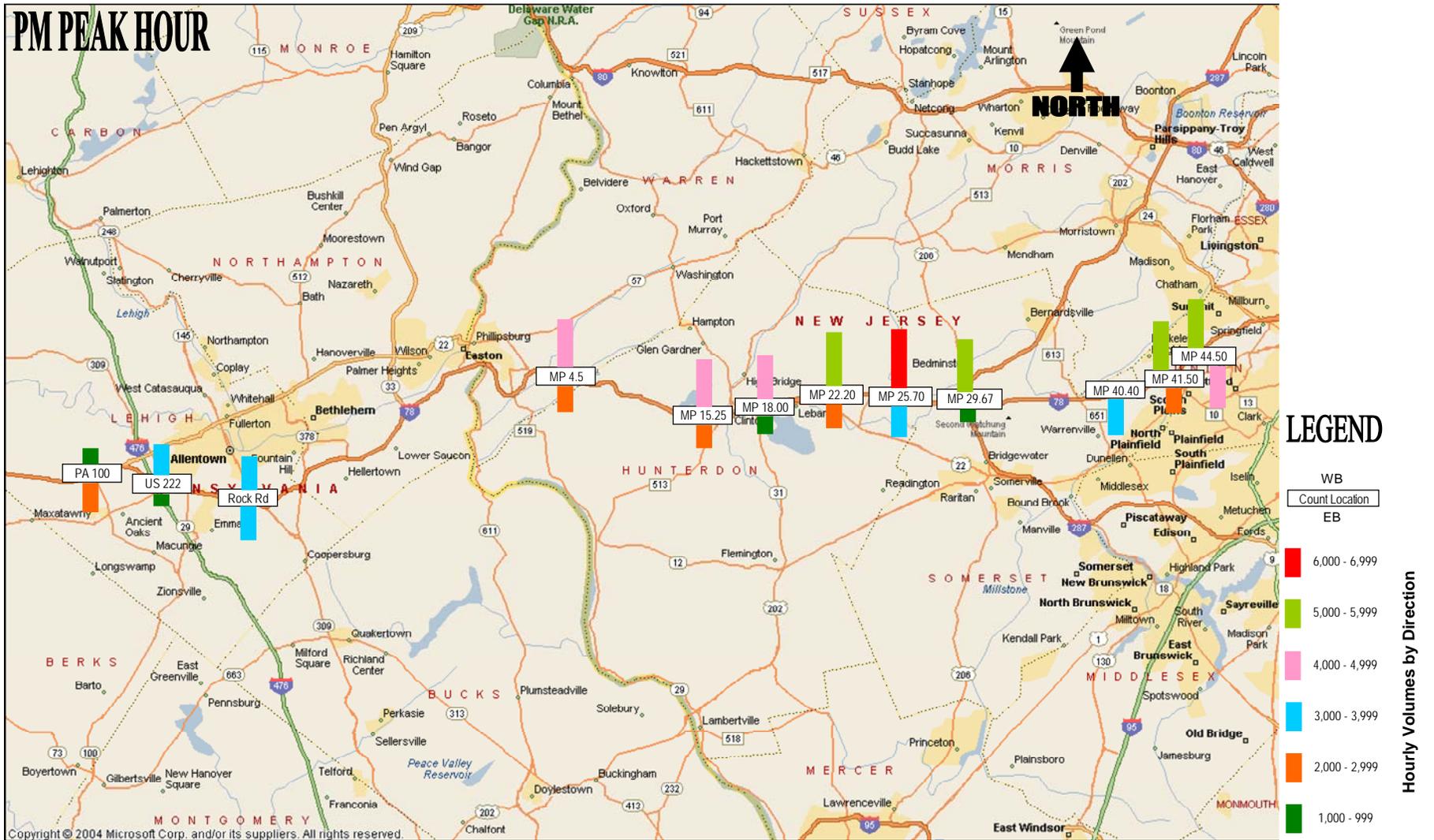


Figure 3-13: Existing PM Peak(4PM-7PM) Directional Volumes in the I-78 Study Corridor



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morning of Thursday, December 8, 2005 between 6:00 am and 9:00 am. These counts were conducted on I-78 in both directions at Location 2 (MP 29) at the I-287 interchange. The classification data compiled from these counts are summarized in Tables 3-14 and 3-15, while Figure 3-14 presents the AM and PM peak truck/bus percentages observed during the classification survey. As shown, truck and bus percentages are very high throughout both periods, particularly in the off-peak directions during each peak – westbound in the AM peak and eastbound in the PM peak. This confirmed data from other sources (primarily NJDOT) regarding truck traffic along this highway, and was consistent with feedback from various groups in initial outreach meetings, as well as discussions with Study Advisory Group members regarding high truck volumes.

- **Travel Time and Delay Study.** Travel time and delay analyses were conducted to identify those sections of I-78 where congestion or less-than-free-flow conditions occur along with the cause(s) for these conditions. Data were collected for the AM and PM peak traffic periods in both directions using the standard “floating car technique” survey methods where surveyors try to match the average traffic flow. The AM period analysis was conducted between 5:30 am and 8:30 am and the PM analysis, between 4:00 pm and 7:30 pm. Four runs were conducted for each study period.

Figures 3-15 and 3-16 illustrate the travel time routes that were covered for the AM and PM peak periods. The study results are presented in Table 3-16. The speeds (MPH) shown represent the average travel speeds for the study section, reflecting the effects of prevailing traffic conditions during those times. The delay values represent the difference in travel time between free-flow conditions (i.e., the speed limit) and more congested conditions. There are other sources of delay beyond volume-driven congestion – e.g., accidents, bad weather, “rubber-necking,” etc. These sources of “non-recurring delay” were not quantified during these travel-time studies. The following is a summary of observed conditions in the two weekday peak periods:

- **AM Peak Hour.** The travel time survey data indicate that the highest AM peak level of congestion along the I-78 corridor occurred in the eastbound direction in Hunterdon County between Interchange 15 (Pittstown Road/CR513) and Interchange 20 (Cokesbury Road/CR 639). Vehicles in that area experienced stop-and-go traffic with average travel speeds averaging below 25 miles per hour. Within that area, the highest recorded delay due to prevailing congestion -- almost 9 minutes -- occurred in the vicinity of Interchange 17 (NJ 31) heading towards Interchange 20 (Cokesbury Road/CR 614). Lesser delays were also recorded immediately east and west of Interchange 17, near Interchanges 11, 24, 26, and 43. As expected, westbound delays in the AM peak were minimal. The only westbound AM peak delay recorded along the corridor was at Interchange 48 (NJ 24), which is actually outside the Primary Study Area.
- **PM Peak Hour.** In the PM peak, the eastbound (off-peak) direction experienced minimal delays, except at Interchange 54 (Essex CR 604/Winans Avenue) in Hillside, New Jersey (again outside the Primary Study Area) and at Interchange 67 (PA Route 412 / Hellertown Rd) in Hellertown, Pennsylvania. Westbound congestion occurred



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Table 3-14: Eastbound Classification Counts

Start Time	CARS	BUSES	MEDIUM TRUCKS	LARGE TRUCKS	15-MIN TOTAL	HOURLY TOTAL		Start Time	CARS	BUSES	MEDIUM TRUCKS	LARGE TRUCKS	15-MIN TOTAL	HOURLY TOTAL
06:00 AM	1149	6	43	161	1358			04:00 PM	595	25	26	62	707	
06:15 AM	1241	6	46	97	1389			04:15 PM	593	18	30	58	698	
06:30 AM	1271	7	37	79	1393			04:30 PM	617	21	24	74	735	
06:45 AM	1124	7	25	88	1243	5383		04:45 PM	702	18	15	70	804	2944
07:00 AM	1106	8	22	79	1214	5239		05:00 PM	585	15	17	55	671	2908
07:15 AM	1167	7	33	83	1288	5138		05:15 PM	710	18	19	60	807	3016
07:30 AM	1238	5	25	81	1348	5093		05:30 PM	613	17	16	56	702	2983
07:45 AM	1071	11	32	83	1197	5046		05:45 PM	616	15	11	62	704	2883
08:00 AM	1173	10	35	85	1302	5134		06:00 PM	532	10	10	58	609	2821
08:15 AM	1137	11	35	94	1275	5121		06:15 PM	529	14	11	62	615	2630
08:30 AM	998	12	37	74	1120	4893		06:30 PM	434	13	9	67	522	2450
08:45 AM	1115	7	29	118	1268	4965		06:45 PM	360	15	17	54	445	2191
Total	13787	92.5	395	1118.5	15393	5383		Total	6884	195.5	202.5	735	8017	3016
Percentages	89.57%	0.60%	2.57%	7.27%				Percentages	85.87%	2.44%	2.53%	9.17%		
Peak Hour	4785	25	150	424	5383			Peak Hour	2613	71	74	258	3016	
Percentages	88.89%	0.46%	2.79%	7.87%				Percentages	86.64%	2.35%	2.45%	8.55%		
Peak 15-min	1271	7	37	79	1393	1393		Peak 15-min	710	18	19	60	807	807
Percentages	91.24%	0.50%	2.62%	5.64%				Percentages	88.03%	2.23%	2.36%	7.38%		
Peak Hour						(6:00-7:00)		Peak Hour						(4:30-5:30)



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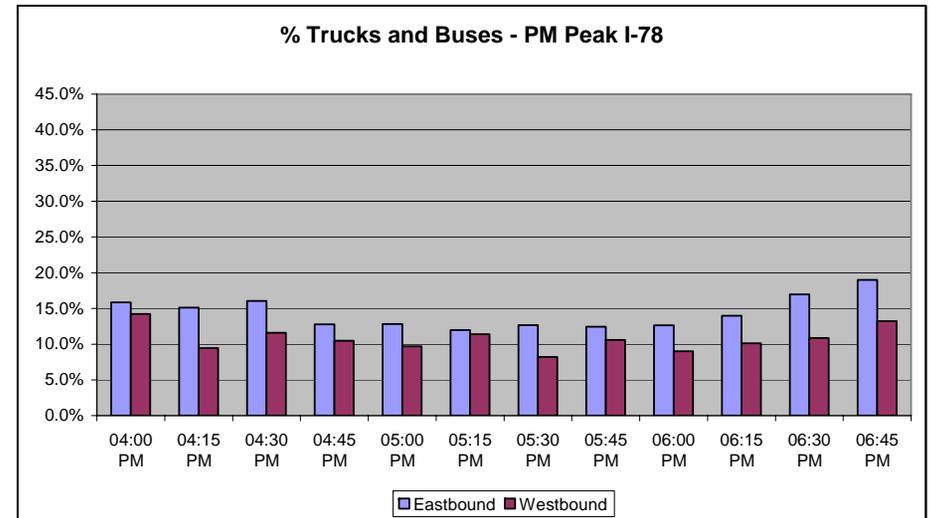
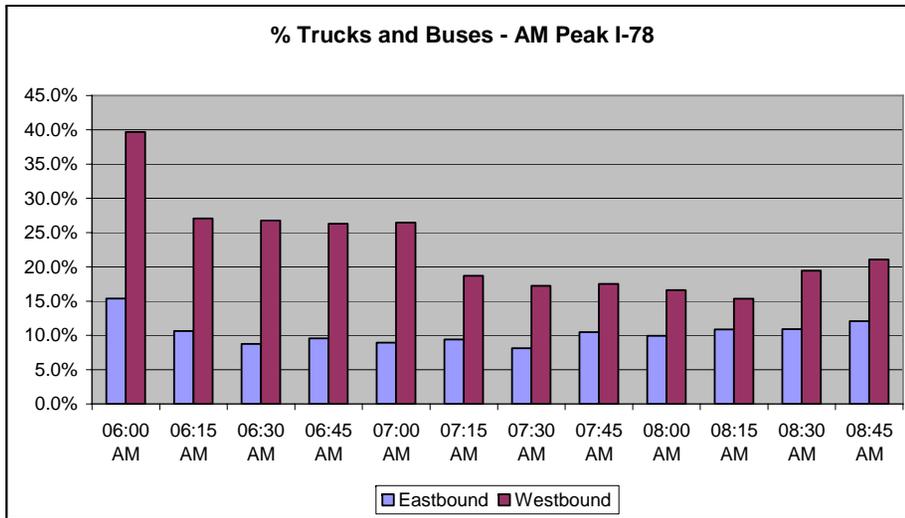
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Table 3-15: Westbound Classification Counts

Start Time	CARS	BUSES	MEDIUM TRUCKS	LARGE TRUCKS	15-MIN TOTAL	HOURLY TOTAL		Start Time	CARS	BUSES	MEDIUM TRUCKS	LARGE TRUCKS	15-MIN TOTAL	HOURLY TOTAL
06:00 AM	196	0	20	109	324			04:00 PM	1144	13	35	142	1333	
06:15 AM	283	1	26	79	388			04:15 PM	1006	10	17	79	1111	
06:30 AM	336	11	21	92	458			04:30 PM	969	5	24	99	1096	
06:45 AM	360	1	30	98	489	1659		04:45 PM	932	13	18	79	1041	4580
07:00 AM	419	5	38	108	569	1904		05:00 PM	1092	2	22	95	1210	4457
07:15 AM	533	5	25	93	655	2171		05:15 PM	1148	21	19	108	1295	4641
07:30 AM	511	7	27	73	618	2330		05:30 PM	1147	3	12	89	1250	4795
07:45 AM	570	7	18	96	691	2533		05:45 PM	1161	25	11	103	1298	5052
08:00 AM	553	2	19	90	663	2626		06:00 PM	1136	6	14	93	1248	5091
08:15 AM	640	8	29	80	756	2727		06:15 PM	1072	5	23	93	1193	4988
08:30 AM	587	2	46	94	728	2837		06:30 PM	1019	12	17	96	1143	4881
08:45 AM	533	3	32	108	675	2821		06:45 PM	936	30	12	101	1078	4661
Total	5517	49.5	328.5	1116.5	7011.5	2837		Total	12758	142.5	220	1172.5	14293	5091
Percentages	78.69%	0.71%	4.69%	15.92%				Percentages	89.26%	1.00%	1.54%	8.20%		
Peak Hour	2349	19	112	359	2837			Peak Hour	4591	54	55	391	5091	
Percentages	82.78%	0.65%	3.93%	12.64%				Percentages	90.18%	1.06%	1.08%	7.68%		
Peak 15-min	640	8	29	80	756	756		Peak 15-min	1161	25	11	103	1298	1298
Percentages	84.65%	0.99%	3.84%	10.52%				Percentages	89.41%	1.89%	0.81%	7.90%		
Peak Hour						(7:45-8:45)		Peak Hour						(5:15-6:15)



Figure 3-14:
Existing Truck and Bus Percentages in I-78 Corridor (MP 29.7 West of I-287 Interchange)



Source: Classification counts taken in December 2005



Figure 3-15: Traffic Speed/Delay Study Locations: AM Peak Period

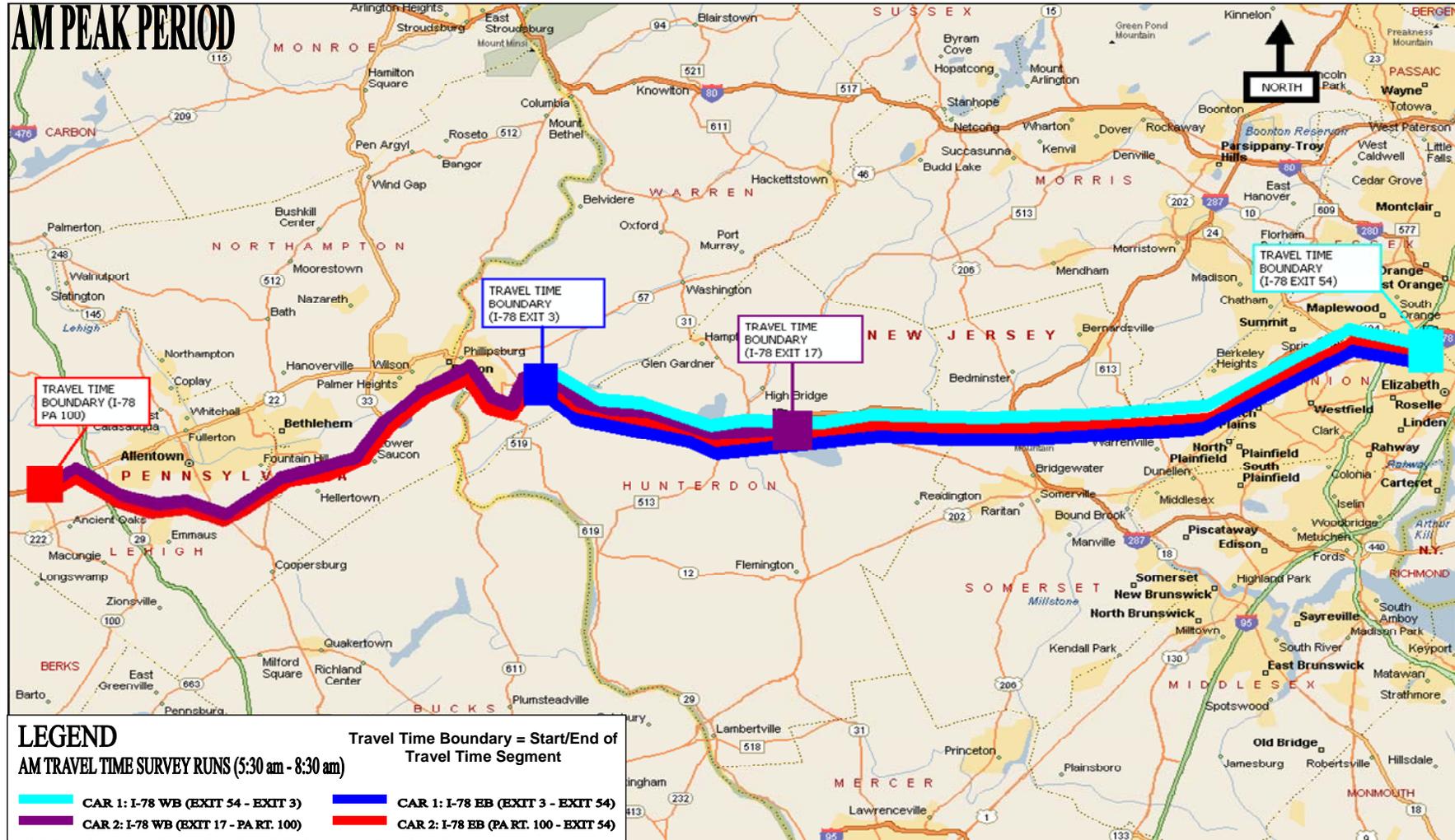
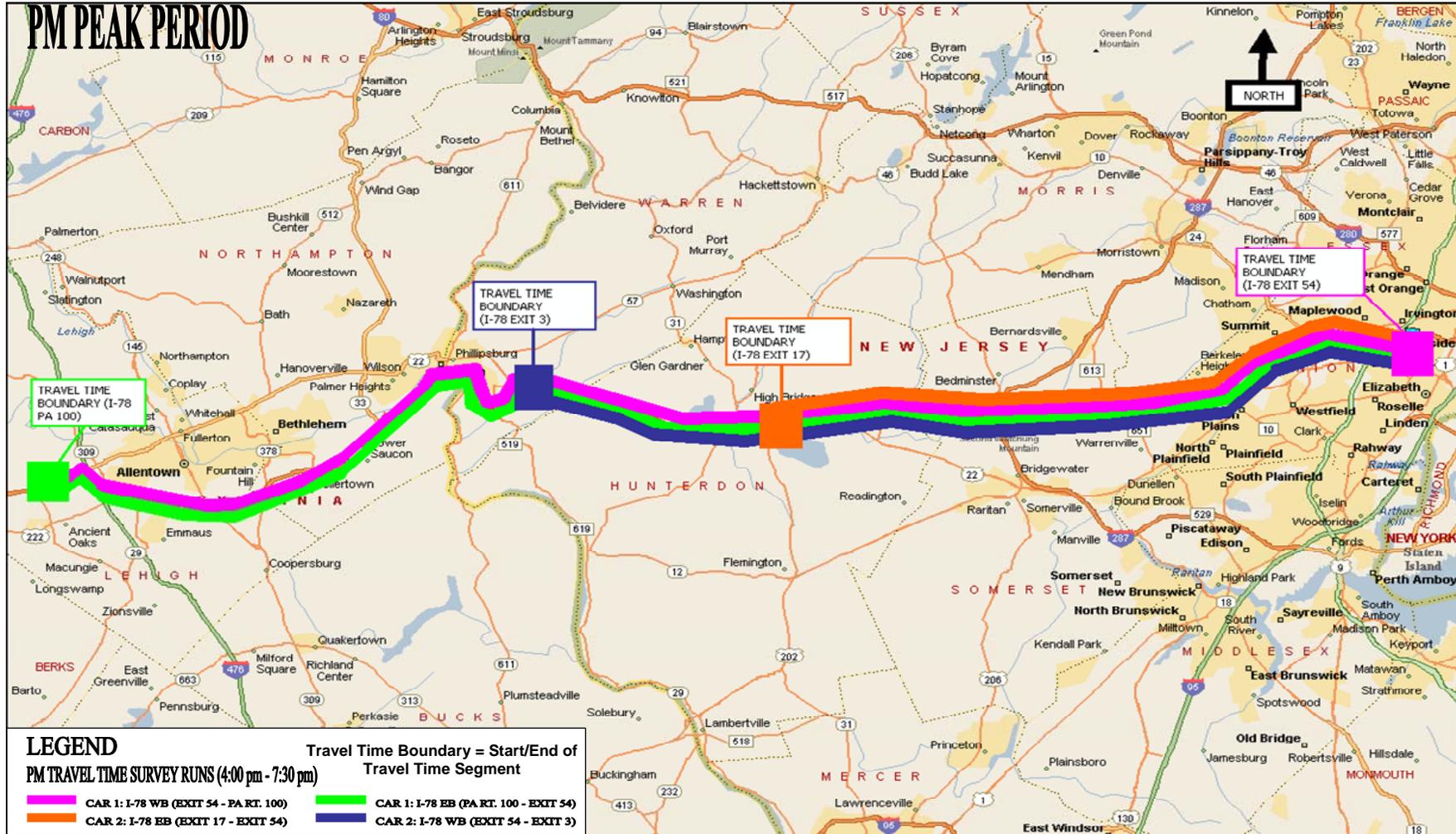


Figure 3-16: Traffic Speed/Delay Study Locations: PM Peak Period



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Table 3-16: Travel Time Survey Summary

AM PEAK PERIOD (5:30 AM - 8:30 AM)					
	CAR 1			CAR 2	
	I-78 WB (EXIT 54 - EXIT 3)			I-78 WB (EXIT 17 - PA RT. 100)	
	I-78 EB (EXIT 3 - EXIT 54)			I-78 EB (PA RT. 100 - EXIT 54)	
	CAR 1		CAR 2		
	WB	EB		WB	EB
Travel Time (Sec.)	2,610	5,826		2,900	3,846
Travel Distance (Miles)	46	82		50	50
Travel Speed (Mph)	63	51		63	47
Running Time (Sec.)	2,610	4,453		2,623	2,832
Stopped/Slowed Time (Sec.)	46	1,373		277	1,014
Running Speed (MPH)	63	67		69	64
Maximum Delays(Sec.)	0	539		277	371

PM PEAK PERIOD (4:00 PM - 7:00 PM)					
	CAR 1			CAR 2	
	I-78 WB (EXIT 54 - PA RT. 100)			I-78 WB (EXIT 54 - EXIT 3)	
	I-78 EB (PA RT. 100 - EXIT 54)			I-78 EB (EXIT 17 - EXIT 54)	
	CAR 1		CAR 2		
	WB	EB		WB	EB
Travel Time (Sec.)	3,896	2,130		5,003	4,608
Travel Distance (Miles)	50	36		82	82
Travel Speed (Mph)	47	62		59	64
Running Time (Sec.)	2,800	1,996		3,540	4,335
Stopped/Slowed Time (Sec.)	1,096	134		1,463	273
Running Speed (MPH)	65	66		84	68
Maximum Delays(Sec.)	579	134		338	273

WESTBOUND CONTROL POINTS	EASTBOUND CONTROL POINTS
1 Winans Avenue (Int. 54)	1 PA Route 100
2 Garden State Parkway Overpass (Int. 52)	2 S. Cedar Crest Boulevard (Exit 55)
3 Vauxhall Road CR 30/CR 630 (Int. 50)	3 Abbott Street SR 309 (Exit 60B)
4 NJ 24 (Int. 48)	4 Hellertown Road SR 412 (Exit 67)
5 Diamond Hill Road CR 655 (Int. 43)	5 SR 33 (Exit 71)
6 Hillcrest Road CR 531 (Int. 40)	6 Morgan Hill Road (Exit 75)
7 King George Road CR 527S (Int. 36)	7 US 22/SR 173
8 Liberty Corner Road CR 525 (Int. 33)	8 Clinton Street SR 173 (Int. 7)
9 I-287 (Int. 30/29)	9 Pattenburg Road CR 614 (Int. 11)
10 Rattlesnake Bridge Road CR 523/CR 665 (Int. 26)	10 Pittstown Road CR 513/SR 173 (Int. 15)
11 Oldwick Road CR 523 (Int. 24)	11 SR 31 (Int. 17)
12 Cokesbury Road CR 639 (Int. 20)	12 Cokesbury Road CR 639 (Int. 20)
13 SR 31 (Int. 17)	13 Oldwick Road CR 523 (Int. 24)
14 Pittstown Road CR 513/SR 173 (Int. 15)	14 Rattlesnake Bridge Road CR 523/CR 665 (Int. 26)
15 Pattenburg Road CR 614 (Int. 11)	15 I-287 (Int. 30/29)
16 Clinton Street SR 173 (Int. 7)	16 Liberty Corner Road CR 525 (Int. 33)
17 US 22/SR 173	17 King George Road CR 527S (Int. 36)
18 Morgan Hill Road (Exit 75)	18 Hillcrest Road CR 531 (Int. 40)
19 SR 33 (Exit 71)	19 Diamond Hill Road CR 655 (Int. 43)
20 Hellertown Road SR 412 (Exit 67)	20 NJ 24 (Int. 48)
21 Abbott Street SR 309 (Exit 60B)	21 Vauxhall Road CR 30/CR 630 (Int. 50)
22 S. Cedar Crest Boulevard (Exit 55)	22 Garden State Parkway Overpass (Int. 52)
23 PA Route 100	23 Winans Avenue (Int. 54)



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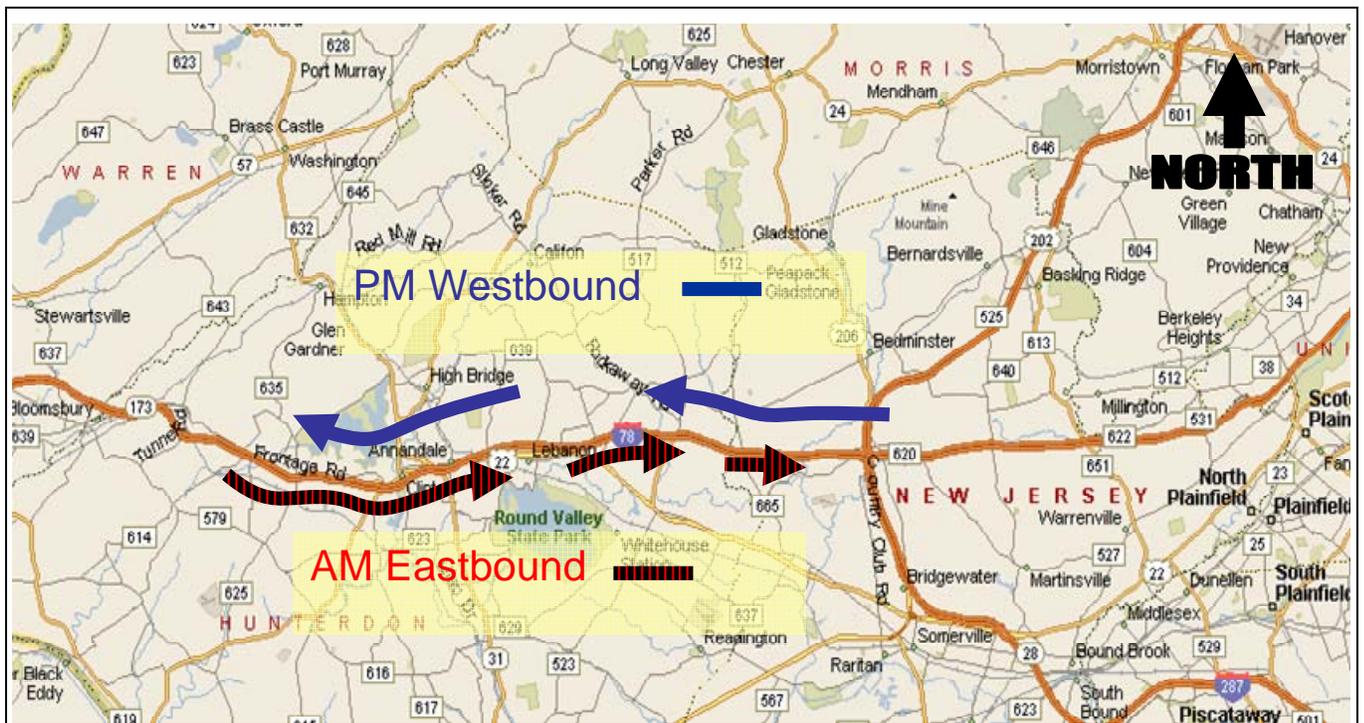
between Interchange 48 (NJ Route 24) and Interchange 17 (NJ Route 31), with frequent stop-and-go conditions, average travel speeds below 25 miles per hour. The highest recorded delay of 9.5 minutes was in Somerset County in the vicinity of Interchange 33 (Liberty Corner Road / CR 525) heading toward Interchange 30/29 (I-287).

Overall, as with traffic volumes, delays along the I-78 corridor are closely associated with commuter travel patterns – i.e., at their worst eastbound in the AM peak and westbound in the PM peak travel period. The pockets of congestion along the corridor appear to concentrate in the vicinity of major crossroads which, for the most part, are experiencing some levels of congestion themselves and which are major nodes of office development and employment. The causes confirmed in the travel time studies and in aerial surveys (see below) involve the typical combination of large highway volumes and truck percentages and limiting highway geometry (e.g., lane drops, weave-merge conditions, steep grades, etc.) that are behind most recurring highway congestion and delay.

- **Queue Analysis using Aerial Photography.** Traffic observation flights and associated photography were taken by SKYCOMP for the morning (7:00 am – 9:00 am) and evening (4:00 am – 6:00 pm) peak periods on October 26, 2005 and November 9, 2005, respectively.

The resultant photos provide a useful documentation of traffic congestion and queues in the I-78 corridor and help to highlight its underlying causes. The general locations of these queues are illustrated in Figure 3-17 for the AM peak hour eastbound and for the PM peak hour westbound.

Figure 3-17: Observed Queue Locations



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As shown, the congested areas identified through aerial surveys during the AM peak hour were all in the eastbound direction in the vicinity of following locations on I-78:

- Exit 16, Route 513 and 172, Pittstown Road,
- Exit 17, NJ 31,
- Exit 18, US Route 22,
- West of CR 665, Rattlesnake Bridge Road near Exit 25, and
- West of Exit 30 (I-287).

The congested areas identified during the PM peak, all in the westbound direction, were in the vicinity of the following locations:

- Exit 30 (I-287),
- West of I-287 to Exit 20,
- Exit 26, (CR 665, Rattlesnake Bridge Road),
- Exit 19 (East of US 22, Annandale), and
- Exit 17 (NJ 31).

Figures 3-18 to 3-27 provide illustrations of some of the most congested areas and/or longest queues recorded during the aerial traffic monitoring.

These congested areas along the corridor are caused by the heavier traffic volumes that occur during these periods, as well as local geometric or operational issues that limit effective capacity and/or make it more difficult for highway to handle these volumes.

Specific problem areas in the **AM Peak eastbound direction** include:

- **The segment between Interchanges 17 (NJ Route 31) and 18 (US Route 22) in Clinton Township.** While this section is wider than typical (four lanes in each direction instead of the typical three), large volumes of traffic enter the eastbound roadway from NJ Route 31(see Figure 3-18), then large volumes also exit at US Route 22. In effect this segment is like the throat of an hour glass with concentrated volumes that exceed the section's capacity.
- **The steep grades east of Interchange 18 on the I-78 eastbound mainline.** With no climbing lane, traffic flow (including a large percentage of trucks) on all lanes is affected and congestion results. At certain times this grade-induced congestion backs into and through the segment between Interchanges 17 and 18 as well, further aggravating the congestion there.
- **High traffic volumes between Interchanges 20 (Cokesbury Road) and 29 (I-287).** These volumes are frequently equal to the highway's capacity in this period, while the upgrade east of Interchange 18 essentially meters flow to the east so the traffic volume is in general equilibrium with capacity. However at each interchange eastbound entering volumes are slightly higher than exiting volumes, so the additional traffic causes a localized backup. The result is that the 11-mile segment from Interchange 18 to 29 (US 22 to I-287) operates in a sometimes stop-and-go, constrained manner, with speeds varying from 25 mph or less to 50 mph and higher.



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The attendant shock waves and stop-and-go conditions are a safety problem, as well as being time consuming for motorists and buses.



 **Figure 3-18: I-78 EB at Milepost 16**
(Exit 16, CR-513 and NJ Route 172, Pittstown Road) Nov 9, 2005, 7:59am



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**Figure 3-19: I-78 EB at Milepost 17
(Exit 17, NJ Route 31) Nov 9, 2005, 8:01am**



**Figure 3-20: I-78 EB at Milepost 18
(Exit 18, US Route 22) Nov 9, 2005, 8:01am**

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Figure 3-21: I-78 EB at Milepost 25
(West of CR 665, Rattlesnake Bridge Road) Nov 9, 2005, 8:05am



Figure 3-22: I-78 EB at Milepost 28
(West of I-287) Nov. 9, 2005, 8:06am



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Figure 3-23: I-78 WB at Milepost 30
(at I-287) Oct 26, 2005, 5:35pm



Figure 3-24: I-78 WB at Milepost 29
(just west of I-287) Oct 26, 2005, 5:35pm



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**Figure 3-25: I-78 WB at Milepost 26
(CR 665, Rattlesnake Bridge Road) Oct 26, 2005, 5:37pm**



**Figure 3-26: I-78 WB at Milepost 19
(East of US-Route 22, Annandale) Oct 26, 2005, 5:39pm**





Figure 3-27: I-78 WB at Milepost 17
(Exit 17, NJ Route 31) Oct 26, 2005, 5:42pm

- **Better traffic conditions from just east of Interchange 29 (I-287) to the end of the Study Area at the Somerset / Union County line (MP 42).** A large percentage of the eastbound traffic exits at I-287, and the volume of entering traffic from I-287 at that interchange is considerably lower. As the three interchanges immediately to the east of I-287 -- Martinsville Road (CR 525), King George Road (CR 651), and Hillcrest Road (CR 531) -- are active development-employment nodes, the volume of eastbound exiting traffic offsets much of the traffic entering at those locations. Nevertheless, congestion sometimes occurs in the eastbound direction in this section. Given that overall traffic demands are approaching capacity immediately east of I-287, actions taken to increase capacity west of I-287 would likely shift to the east the more severe congestion that presently occurs in the segments west of I-287.

In terms of the potential for increased public transit use in the corridor, the AM peak congestion in these segments slows down all traffic, including commuter buses (presently all New York City-bound). This makes it difficult to convince those presently driving to use existing bus routes, and limits the ability to use this congested highway segment as part of any new bus routes. The same holds true for PM peak congestion. A key goal of the I-78 Corridor Transit Study was to find ways to give transit a travel time edge over other traffic during congested periods, which would make it a more attractive alternative for travelers.

Specific problems in the **PM Peak westbound** direction include the following:



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- **High volumes and unstable traffic flow east of I-287.** As observed in the eastbound conditions in the morning, traffic conditions to the east of I-287 up to the Primary Study Area boundary (the Somerset / Union County line) are highly variable. Westbound traffic volumes are close to, and sometimes exceed, the capacity of the highway in the PM peak hours. Under such conditions, slight variations in volume result in wide swings in congestion and speed, ranging from stop-and-go to free-flow.
- **Impact of southbound I-287 traffic merging into westbound I-78.** At Interchange 29 (I-287) the ramp from I-287 southbound to I-78 westbound carries a very high volume of traffic that must merge into the westbound I-78 roadway. At the same location the ramp from I-287 northbound merges as well, although it carries a lower volume of traffic. As is shown in Figure 3-23, the resulting traffic demands are considerably greater than the capacity of the three-lane section of I-78 west of I-287, so extensive backups occur on both the I-78 mainline, and on I-287 southbound and the ramp to I-78 westbound. The backup on the I-78 mainline often extends eastward nearly to Exit 33 (Martinsville Road / CR 525).
- **Close-to-capacity volumes west of I-287 to Interchange 18 (US Route 22).** As with the morning eastbound condition, westbound traffic volumes to the west of I-287 in the PM peak period are essentially equal to capacity. Slight variations in traffic demand, plus the friction of interchange entry ramps, cause stop-and-go conditions and congestion throughout the 11 miles from I-287 (Interchange 29) to US 22 (Interchange 18). In particular, there is a westbound upgrade between Interchange 20 (Cokesbury Road) and Interchange 18 (US 22) that impedes westbound flow in the peak period. The result is illustrated in Figure 3-24.
- **Interchange weave/merge conditions west of Interchange 17 (NJ Route 31).** The section of I-78 westbound from Interchange 17 (NJ Route 31) to Interchange 15 (CR 513 / Pittstown Road) is also heavily congested as a result of the traffic entering, exiting, and weaving among ramps at Interchanges 17, 16, and 15.

3.5 I-78 CORRIDOR ORIGIN/DESTINATION STUDY

In 1992, a roadside highway traffic survey was conducted for NJDOT along I-78 from the Delaware River to Interchange 44 (Glenside Avenue). Because much of the data produced by this survey is relevant to the current NJTPA I-78 Corridor Transit Study, the results, adjusted to reflect 2005 conditions (described in Section 3.4.1 below), have been used to identify core travel characteristics in the I-78 corridor, and to support the process of validating / calibrating the NJ TRANSIT model to local corridor conditions.

The original survey was conducted from July 8, 1992 to August 10, 1992. Eastbound trips were captured between 6:00 a.m. and 10:00 a.m. This period exactly matches the AM peak period used in the current I-78 Transit Corridor study. 39,526 survey postcards were distributed to vehicles on all eastbound on-ramps along I-78, from the Delaware River to Interchange 44. 14,400 cards were returned and of those, 14,256 cards were deemed valid. The study produced an origin/destination trip matrix of AM peak eastbound I-78 users, from zip code to zip code and by entry and exit number.



3.5.1 Methodology for Updating Origin-Destination Data

Origin/destination data from 1992, in its pure form, is somewhat unreflective of today's conditions. Thus, in order to glean substance from the 1992 I-78 Corridor Origin/Destination Study, it was necessary to adjust the results to reflect base year (2005) traffic patterns. As such, growth factors were applied based on 1992 to 2005 population and employment changes in the region. A growth factor was developed for each of the 14,400 trip records, considering the trip's purpose, and the population and/or employment growth at the trip's origin and destination. Weighted trip records were then accumulated for key sections of the I-78 roadway where traffic counts were available, and the weighting factors for trip records crossing those points were adjusted so that the weighted trips matched the four-hour (6 am to 10 am) auto traffic volume. Once the survey trips were increased to account for growth from 1992 to 2005, the adjustments needed to fit with 2005 counted traffic volumes were modest. It was therefore concluded that the adjusted survey did in fact provide an accurate depiction of the travel characteristics of vehicles using I-78. In addition, checks were made against other data sources, including 2000 Census county-to-county Journey-to-Work data, and data from the 2004 Route 139 -- Holland Tunnel survey conducted by NJDOT. These comparisons supported the conclusion that it was reasonable to use the updated origin/destination survey data for the present study.

3.5.2 Results

Because the 1992 I-78 Corridor Origin/Destination Study covered only the 6 am to 10 am period, the following survey update discussion only addresses this time period. Additionally, since eastbound is the peak direction during this period, all results listed below apply to eastbound traffic only. Figure 3-28 depicts the origins and destinations of eastbound vehicles passing certain points along I-78.

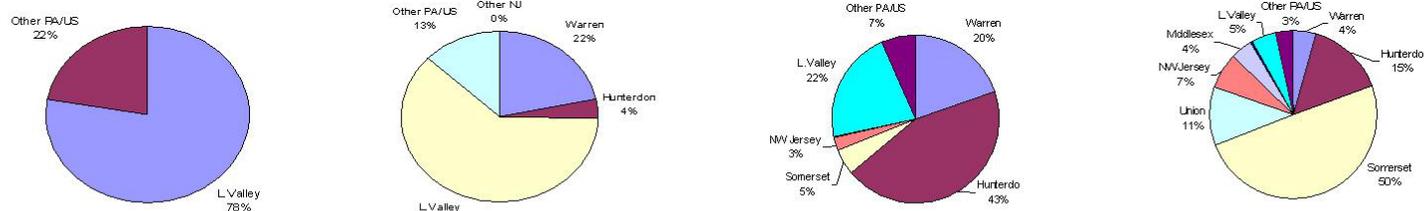
- The majority of vehicles passing Milepost 0 (in Warren County, just east of the Delaware River) and Milepost 10 (in Hunterdon County, just west of CR 614) on I-78 originated from the Lehigh Valley in Pennsylvania (78% and 61% respectively). The most common destinations of these vehicles were Hunterdon County (25% and 29% respectively) and Somerset County (24% and 29% respectively).
- Nearly half of all vehicles passing Milepost 28 (in western Somerset County, just west of I-287) originated in Hunterdon County with other large portions coming from Warren County (20%) and the Lehigh Valley in Pennsylvania (22%). Common destinations for vehicles passing Milepost 28 were Somerset County (27%), Union County (17%), northeastern New Jersey (15%), and northwestern New Jersey (14%).
- The majority of vehicles passing Milepost 44 (in Somerset County, just west of the Union County boundary) were split between origins of Somerset County (50%) and Hunterdon County (15%). The major destinations of this group included Union County (21%), northeastern New Jersey (53%), and Hudson County (11%).



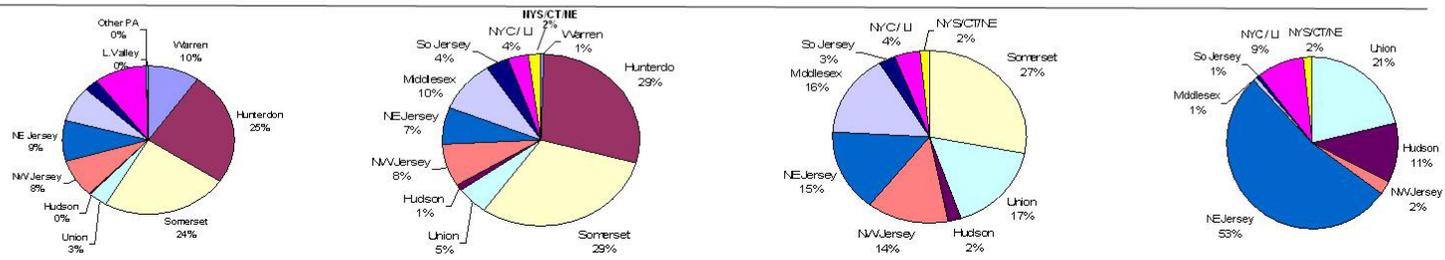
Figure 3-28:
Results of Updated Origin-Destination Survey Along I-78 Corridor



ORIGINS



DESTINATIONS



NW Jersey = Morris, Sussex
NE Jersey = Bergen, Passaic, Essex
So Jersey = Monmouth, Mercer and south



3.6 PARK AND RIDE LOCATIONS

3.6.1 Initial Data Collection

Travelers to park-and-ride lots are either dropped off, walk or ride a bike to, or drive (alone or with others) and park their cars at the facility. They then either go by carpool/ vanpool or public transit to their eventual destination. These facilities provide travelers (mostly commuters) with a staging area to form carpools, convenient access to transit routes with only limited stops in their region, and in the process substantially reduce travel costs and lower traffic demands on major highways. By understanding travelers' needs and the overall level of demand for such facilities, park-and-ride facilities can be located and sized to maximize their usefulness to the traveling public and to better integrate them with the surrounding community. The initial data gathering efforts by the Study Team were essential in insuring that the Study had an accurate measure of existing supply and demand conditions at these facilities, as well as any available information on the characteristics of park-and-ride users. The Study included field verification of park-and-ride data provided by other parties (e.g., NJDOT, transit operators, etc.) as well as limited surveys of park-and-ride lot users in New Jersey and Pennsylvania.

Table 3-17 identifies the name, location, county, capacity, and usage of the approximately 26 park-and-ride lots in the corridor. Their locations are illustrated in Figure 3-29. The data shown in Table 3-17 is based on the information from the following sources:

- **New Jersey Department of Transportation (NJDOT)**
 - New Jersey Park-and-Ride program – Facility Inventory and County Level Graphics.
 - Ridesharing Park-and-Ride Locator and Transportation Management Associations Website
- **NJ Transit Park-and-Rides Website**
- **HART** – Transportation Management Association (TMA), Hunterdon County
- **Ridewise** – the traffic and transportation division of the Somerset County Business Partnership and the TMA for Somerset County
- **TransOptions** – TMA for northwest New Jersey, including Warren County

The information provided from these various public and private sources did not always agree in terms of the capacity, utilization or available capacity at individual facilities. To confirm conditions, in-field surveys and follow-up discussions with lot operators and related agencies were performed.

3.6.2 Park-and-Ride Lot In-Field Inventory

An inventory of identified park-and-ride lots was conducted by the Study Team during the week of March 6, 2006 to verify their capacity and current usage and any other relevant information. The following data were gathered for the park-and-ride lots and their immediate vicinities:

- Park-and-ride address/location,
- Transportation services at the lot,
- Other services or amenities offered at the lot,



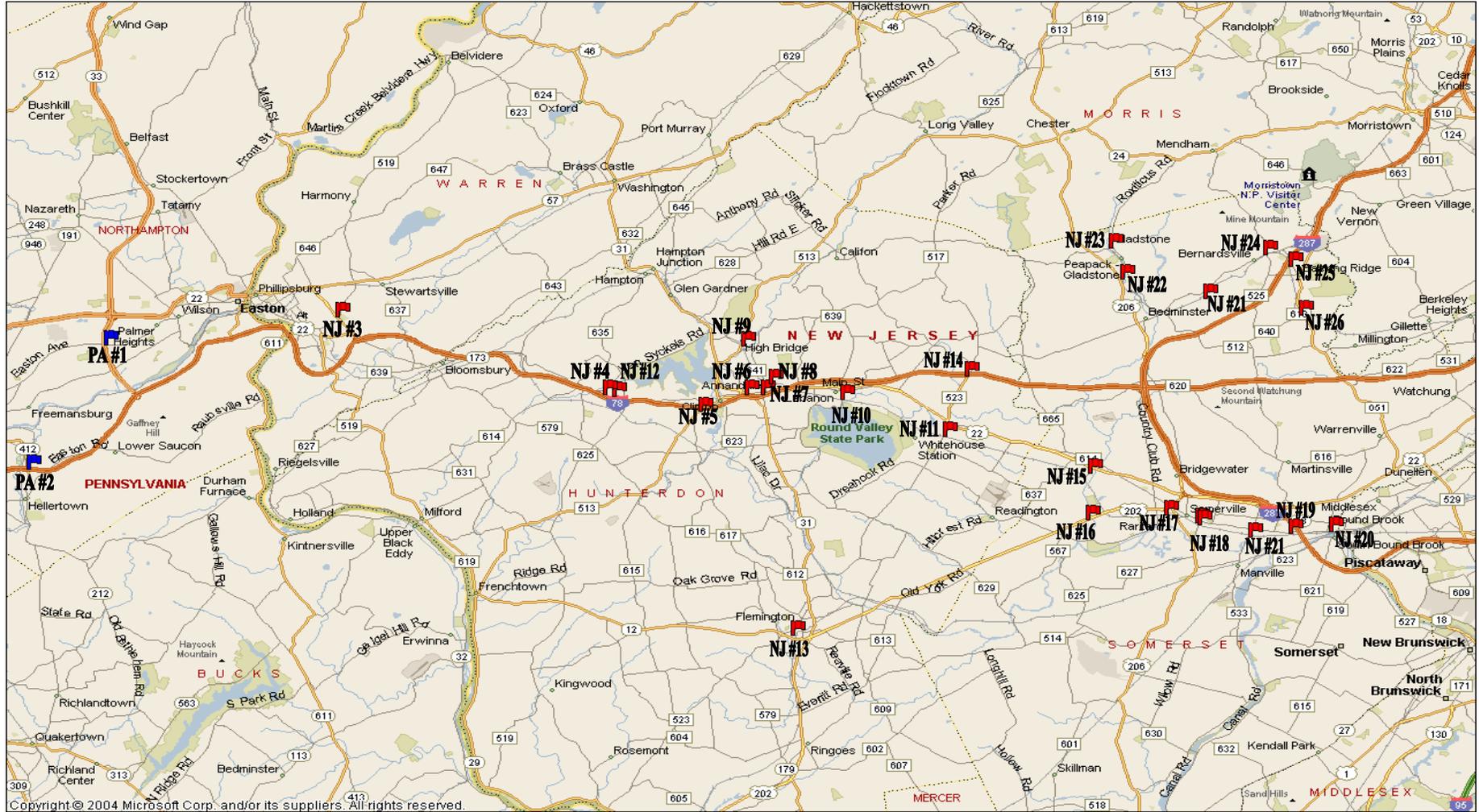
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Table 3-17: Park-and-Ride Location Summary

P&R Name	Township	County	Location	Source: NJTRANSIT			Source: RIDEWISE			Source: NJDOT			Source: Other			Source: HART		
				Capacity	Parked Vehicles	Usage	Capacity	Parked Vehicles	Usage	Capacity	Parked Vehicles	Usage	Capacity	Parked Vehicles	Usage	NJ	PA	NY
1	Route 33/William Penn Highway	Bethlehem	Northampton	Route 33/William Penn Highway									200		>100%			
2	I-78 & Route 412	Bethlehem	Northampton	I-78 & Route 412									100		>100%			
3	Phillipsburg Mall	Phillipsburg	Warren	US-22 & Route 57									120		11%			
4	Hunterdon Hills Playhouse (Trans-Bridge)	Hampton (Union)	Hunterdon	Near Exit 12 of I-78 NJDOT Park-and-Ride near Hunterdon Hills Playhouse 90 RT-173 Hampton, NJ 08827						40	20	50%	50	35	70%	52%	18%	0%
5	Hunterdon Developmental Center	Clinton	Hunterdon	Near Exit 15 of I-78 along Route 513						75	5	7%	157	17	11%	97%	3%	0%
6	Clinton Twp (Clinton Point)	Clinton	Hunterdon	Near Exit 16 of I-78 along Center Street NJDOT Park & Ride at I-78/ NJ 31 and Center Street (Exit 17), Clinton, NJ						305	297	97%	297	338	114%	90%	9%	0%
7	Annandale Square	Annandale	Hunterdon	Near Exit 18 of I-78 along Beaver Ave NJDOT Park-and-Ride at Annandale Office Complex, Beaver Avenue & Allerton Road, Clinton, NJ						90	84	93%	96	89	93%	93%	3%	3%
8	Annandale RR Station	Clinton	Hunterdon	Annandale RR Station	77	69	90%			77	50	65%						
9	Highbridge RR Station	High Bridge	Hunterdon	Highbridge RR Station	43	32	74%			43	20	47%						
10	Lebanon RR Station	Lebanon	Hunterdon	Lebanon RR Station	15	7	47%			15	7	47%						
11	White House RR Station	Readington	Hunterdon	White House RR Station	75	51	68%			75	36	48%						
12	Oldwick	Tewksbury	Hunterdon	Near Exit 24 of I-78 along Route 523 S NJDOT Park-and-Ride at I-78 and Oldwick Road, Tewksbury, NJ						60	37	62%	50	40	80%	99%	1%	0%
13	Liberty Village	Flemington	Hunterdon	Flemington near the Routes 202 and 12 NJDOT Park-and-Ride at Route 12 W., Flemington, NJ						100	92	92%	130	105	81%	79%	21%	0%
14	Kingwood	Kingwood	Hunterdon	Near Exit 24 of I-78 along Route 523 S NJDOT Park-and-Ride at Bank Parking Lot, Intersection of SR 12 & CR 519, Kingwood, NJ						60	37	62%	50	40	80%	99%	1%	0%
15	North Branch RR Station	Branchburg	Somerset	Rte 202 North (River Rd & Station Rd)	40	34	85%	40		40	31	78%	50					
16	Branchburg	Branchburg	Somerset	Rte 202 North				110		119	107	90%	110					
17	Raritan Borough RR Station	Raritan	Somerset	Thompson & Anderson Street	288	259	90%	288		284	244	86%	243					
18	Somerville RR Station	Somerville	Somerset	S. Bridge Street off Vet. Mem Hwy	466	281	60%	466		1900	1060	32%	398					
19	Bridgewater Rail Station	Bridgewater	Somerset	Main Street (CR 533) and Cole Drive E. Main Street at American Cyanamid Lot & Commerce Bank Ballpark Complex	467	280	60%	467		467	228	49%	455					
20	Bound Brook RR Station Lot	Bound Brook	Somerset	E. Main Street (Rte 533 and S. Main St.) Main St. at foot of Hamilton St. (1/2 mile from Rt. 18)	275	215	78%	275		293	184	63%	340					
21	Far Hills RR Station	Bridgewater (Far Hills)	Somerset	Rte 202 (Rte 202 & Far Hills Road) Rt. 202, near intersection of Far Hills Rd. 1/2 mile East of Rt. 206	170	83	49%	170		170	84	49%	100					
22	Peapack RR Station	Peapack	Somerset	Holland Rd. (NJ 661) between Rt. 206 & Main St.	54	50	93%	54		54	46	85%	50					
23	Gladstone RR Station	Peapack/Gladstone (Gladstone)	Somerset	Pottersville Road (CR 512) (Route 202 & Pottersville Road) - Main St. near intersection of Pottersville Rd.	186	145	78%	186		186	151	81%	85					
24	Bernardsville RR Station	Bernardsville	Somerset	Rte 202 and Claremont Road (CR659) (Mine Brook Road (Route 202) near Mt. Airy Road	143	109	76%	143		143	96	67%	192					
25	Basking Ridge RR Station	Basking Ridge	Somerset	Ridge Street & Depot Place near Washington Street				80		143	96	67%	192					
26	Lyons RR Station	Basking Ridge	Somerset	Lyons Road & South Finley Avenue				331		143	96	67%	192					



Figure 3-29:
Existing Park-and-Ride Facilities in I-78 Corridor



- Operator of the lot,
- Number of spaces in the lot,
- Number of occupied spaces in the lot, and
- Description of the area surrounding the park-and-ride lot.

The results of these efforts are summarized in Table 3-18, while Figure 3-30 graphically shows the patterns of utilization throughout the corridor. These field inventory efforts clarified the discrepancies among various sources about these lots, and confirmed that 16% of the Study corridor's approximately 4,500 park-and-ride spaces were presently vacant. Some overall observations:

- The average size of a facility was approximately 174 spaces, ranging from 805 spaces at the Somerville rail station to 16 spaces at the Lebanon rail station. The largest non-rail park-and-ride lot was the 303-space Clinton Point lot at Exit 16.
- Of the 26 facilities, 15 were located at rail stations along the Raritan Valley Line or the Gladstone Branch.
- The majority of the facilities were operated by NJ Transit or NJDOT, with some lots operated by other transit systems (e.g., Trans-Bridge, LANTA) on their own or jointly with NJDOT.
- Most facilities were free, while others required a permit with annual charges (posted) from \$150 to \$360.
- Some spaces were limited to specific customers (e.g., paved areas at Annandale Square were posted as limited to Trans-Bridge bus passengers to Wall Street in Lower Manhattan).
- Some facilities were clearly marked out, with areas assigned to specific users, including lots shared with customers of retail outlets within the rail station or adjacent to the lot, while others were unmarked or even unpaved.

3.6.3 Surveys of Park-and-Ride Users

Some information on park-and-ride users was available from NJ Transit from its surveys of rail and bus commuters into Manhattan. In addition, HART had completed a survey of park-and-ride users at the two major facilities in Hunterdon: the 303-space lot at Exit 16 in Clinton Point, and the 111-space lot at Annandale Square. The 2000 survey by HART had a rather good response (177 users) and showed a fairly consistent story. As shown in Table 3-19, virtually everyone drove alone to both facilities, took a bus into New York City, and came from relatively nearby communities to the south, north and west of these two facilities.



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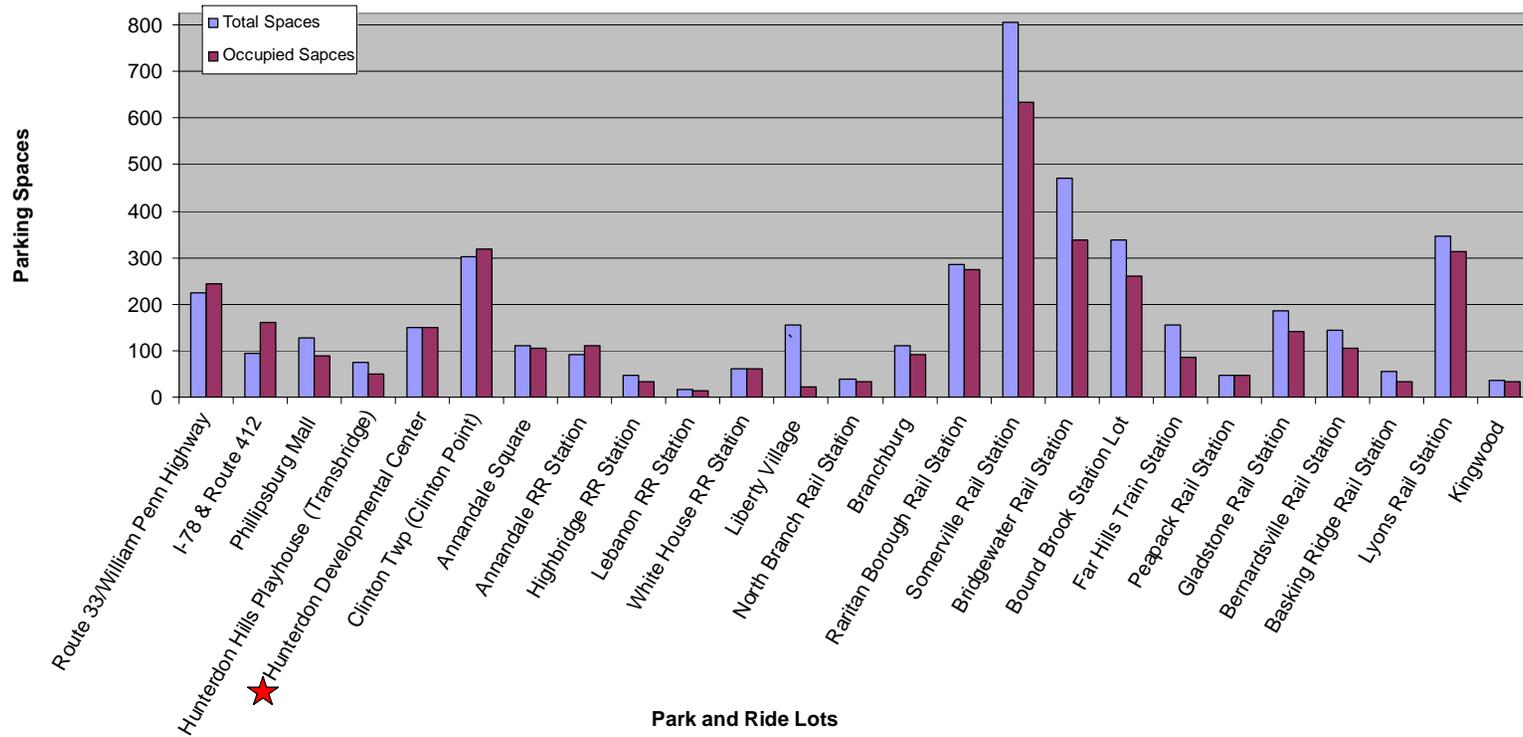
Table 3-18: Results of Park-and-Ride Lot Field Survey in I-78 Corridor

	P&R Name	Township	County	Location	Transportation Services	Transportation Companies	Additional Services	Operator	Fees	Lot Description	Surrounding Area	Number of Spaces	Number of Occupied	Occupancy	Surplus/Shortfall
1	Route 33/William Penn Highway	Bethlehem	Northampton	Route 33/William Penn Highway	Bus, Carpool / Vanpool	LANTA / Trans-Bridge	None	LANTA Metro	No Visible fees	Overflow of parking in the lot	None	223	244	109%	-21
2	I-78 & Route 412	Bethlehem	Northampton	I-78 & Route 412	Bus	Bieber / LANTA	None	LANTA Metro	No Visible fees	Overflow of parking in the lot	Concrete company, Gas station & Wendy's	94	160	170%	-66
3	Phillipsburg Mall	Phillipsburg	Warren	US-22 & Route 57	Bus	Trans-Bridge	None	Trans-Bridge	No Visible fees	Signed parking lot	Phillipsburg mall	127	88	69%	39
4	Hunterdon Hills Playhouse (Transbridge)	Hampton (Union)	Hunterdon	Near Exit 12 of I-78 NJDOT Park-and-Ride near Hunterdon Hills Playhouse 90 RT-173 Hampton, NJ 08827	Bus	Trans-Bridge	None	NJDOT / Trans-Bridge	No Visible fees, some cars appear to have permits	Shared lot with playhouse	RURAL	74	50	68%	24
★ 5	Hunterdon Developmental Center	Clinton	Hunterdon	Near Exit 15 of I-78 along Route 513	Carpool/Vanpool	None	None	NJDOT	No Visible fees	None	None	150	150	100%	0
6	Clinton Twp (Clinton Point)	Clinton	Hunterdon	Near Exit 16 of I-78 along Center Street NJDOT Park-and-Ride at I-78/ NJ 31 and Center Street (Exit 17), Clinton, NJ	Bus, Shuttle, Carpool/Vanpool	Trans-Bridge, NJ TRANSIT	Shuttle Bus	NJDOT / Trans-Bridge	No Visible fees	Overflow of parking in the lot	Residential	303	318	105%	-15
7	Annandale Square	Annandale	Hunterdon	Near Exit 18 of I-78 along Beaver Ave NJDOT Park-and-Ride at Annandale Office Complex, Beaver Avenue & Allerton Road, Clinton, NJ	Bus, Carpool/Vanpool	Trans-Bridge	None	NJDOT	No Visible fees	Asphalt Surface	RURAL	111	105	95%	6
8	Annandale RR Station	Clinton	Hunterdon	Annandale RR Station	Train	NJ TRANSIT	None	NJ TRANSIT	No Visible fees	Asphalt Surface	None	90	110	122%	-20
9	Highbridge RR Station	High Bridge	Hunterdon	Highbridge RR Station, West Main & Bridge Street	Train	NJ TRANSIT	None	NJTRANSIT	No Visible fees	None	Residential	46	32	70%	14
10	Lebanon RR Station	Lebanon	Hunterdon	Lebanon RR Station, Railroad Avenue near reservoir	Train	NJ TRANSIT	None	NJ TRANSIT	FREE	No marking of spaces	New construction and old abandon buildings	16	13	81%	3
11	White House RR Station	Readington	Hunterdon	White House RR Station, Off of Main Street in Readington, next to Readington Library	Train	NJ TRANSIT	None	NJ TRANSIT	FREE		On main street, in a small town	62	62	100%	0
12	Oldwick	Tewksbury	Hunterdon	Near Exit 24 of I-78 along Route 523 S NJDOT Park-and-Ride at I-78 and Oldwick Road, Tewksbury, NJ (Dead end Street)	Carpool/Vanpool	None	None	NJDOT	No Visible fees	No Parking lot, cars parked on one lane road, Dead end Street	Cell Tower / Highway	55	39	71%	16
13	Liberty Village	Flemington	Hunterdon	Flemington near the Routes 202 and 12 NJDOT Park-and-Ride at Route 12 W., Flemington, NJ	Bus	Trans-Bridge	None	NJDOT	No Visible fees	None	Renaissance Plaza Mall	154	23	15%	131
14	Kingwood	Kingwood	Hunterdon	Near Exit 24 of I-78 along Route 523 S NJDOT Park-and-Ride Lot, Adjacent to I-78 EB Exit Ramp, on private road to Cell Tower	Bus, Carpool/Vanpool	Trans-Bridge	None	NJDOT	No Visible fees	None	Off of I-78	36	33	92%	3
15	North Branch RR Station	Branchburg	Somerset	Rte 202 North (River Rd & Station Rd)	Train	NJ TRANSIT	None	NJ TRANSIT	FREE	None	RURAL	38	33	87%	5
16	Branchburg	Branchburg	Somerset	Rte 202 North, just north of River Road	Bus	NJ TRANSIT	None	NJDOT	FREE	None	Near highway	111	91	82%	20
17	Raritan Borough RR Station	Raritan	Somerset	Thompson & Anderson Street	Train	NJ TRANSIT	None	NJ TRANSIT	\$2.00 Daily, \$30.00 Monthly permit	60 Daily spaces, 225 Monthly spaces, 2-hr free on street parking. Lot divided on both sides of tracks	URBAN	285	275	96%	10
18	Somerville RR Station	Somerville	Somerset	S. Bridge Street off Vet. Mem Hwy, Post Office Plaza, across from train Station	Train	NJ TRANSIT	None	Petruci Development (Private Lot)	\$2.00 Daily, \$75.00 per Quarter	Double story parking lot	Business area of train	805	633	79%	172
19	Bridgewater RR Station	Bridgewater	Somerset	Main Street (CR 533) and Cole Drive E. Main Street at American Cyanamid Lot & Commerce Bank Ballpark Complex	Train	NJ TRANSIT	None	NJTRANSIT	No Visible fees	None	Business area of baseball field & ball field parking lot	471	337	72%	134
20	Bound Brook RR Station Lot	Bound Brook	Somerset	E. Main Street (Rte 533 and S. Main St.) Main St. at foot of Hamilton St. (1/2 mile from Rt. 18)	Train	NJ TRANSIT	Kurtz's mine market & tottery	NJ TRANSIT	Permit parking & Meter parking	None	Business area & a train station	339	259	76%	80
21	Far Hills RR Station	Bridgewater (Far Hills)	Somerset	Rte 202 (Rte 202 & Far Hills Road) Rt. 202, near intersection of Far Hills Rd. 1/2 mile East of Rt. 206	Train	NJ TRANSIT	Food	NJ TRANSIT	\$2.00 daily, free parking after 9:00 am	32 parking spaces are numbered, Restaurant is located inside of Transit Building and has 23 designated parking spaces.	Residential	154	85	55%	69
22	Peapack RR Station	Peapack	Somerset	Holland Rd. (NJ 661) between Rt. 206 & Main St.	Train	NJ TRANSIT	None	NJ TRANSIT	FREE	Grassy area with trees	Near NJ Transit Repair Station and Private residence	48	48	100%	0
23	Gladstone RR Station	Peapack/Gladstone (Gladstone)	Somerset	Pottersville Road (CR 512) (Route 202 & Pottersville Road) - Main St. near intersection of Pottersville Rd.	Train	NJ TRANSIT	None	NJ TRANSIT	FREE	There are 4 parking lots, which include an employee only lot	Gladstone company & Torsileri nearby	186	140	75%	46
24	Bernardsville RR Station	Bernardsville	Somerset	Rte 202 and Claremont Road (CR659) (Mime Brook Road (Route 202) near Mt. Airy Road, 50 Main Brook Road, Bernardsville	Train	NJ TRANSIT	Financial Services and Food	NJ TRANSIT	Yearly Permit \$150.00	Bank and Deli are located inside of Transit Building. There are designated permit parking	Middle of Town, built area	143	105	73%	38
25	Basking Ridge RR Station	Basking Ridge	Somerset	Ridge Street & Depot Place near Washington Street	Train	NJ TRANSIT	None	NJ TRANSIT	FREE	None	Residential	54	33	61%	21
26	Lyons Rail RR Station	Basking Ridge	Somerset	Lyons Road & South Finley Avenue, South Finley Ave (CR 613) & Cross Rd	Train	NJ TRANSIT & Bernards Township	None	NJTRANSIT	\$1.00 Daily & Parking permit	None	Residential	346	313	90%	33
SUMMARY												4,521	3,779	84%	742

★ Hunterdon Development Center lot was closed after the site inventory was taken.



Figure 3-30:
Park and Ride Lots -
Capacity vs. Occupancy



★ Hunterdon Development Center lot was closed after the site inventory was taken.



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**Table 3-19: Arrival and Departure Mode and Destination
Park-and-Ride Lot Users at Clinton Point and Annandale Square**

	Clinton Point	Annandale	Total
Drive Alone	95%	94%	95%
Drop Off/Carpool	5%	6%	5%
Leave Lot on Bus	81%	91%	83%
Leave in Carpool/Vanpool	19%	9%	17%
Destination in NY City	97%	100%	98%
Commuter Trip	93%	97%	94%

Source: HART, 2000 park-and-ride survey results.

These results were consistent with information received from transit operators and anecdotal feedback received from the Project Steering Committee and others. However, limited surveys were also performed by the Study Team at selected park-and-ride lots in the corridor. These surveys could address the fact that very little information is available for users of park-and-ride facilities in Pennsylvania, and the 2006 data could be used to check for any changes in usage patterns since 2000 (by surveying the same locations covered in the 2000 HART survey). One-day surveys were therefore performed at the locations listed in Table 3-20 during the week of April 24, 2006; the number of spaces at each location is also noted:

Table 3-20: Surveyed Park-and-Ride Facilities

Facility	# Spaces
Route 33/William Penn Highway	223
I-78 & Route 412 – PA	94
Phillipsburg Mall – NJ	127
Clinton Twp (Clinton Point) – NJ	303
Annandale Square	111

Questions asked included the user's trip origin, mode of arrival at the lot, trip destination and mode used to get to the destination. The results of this survey are summarized in Table 3-21. As indicated, over 300 persons were surveyed using simple, 4-question in-person questionnaires asking respondents about the origin and destination of their trips and the mode used to arrive at the park-and-ride and to reach their destination. The following observations can be made based on the recorded results of the survey and comments made by surveyors in the field:

- **Lots Primarily Used by Bus Passengers.** Virtually all lot users were leaving on a bus, with only 3% of all respondents traveling by carpool or vanpool. While some lots (Clinton and Annandale Square) are dedicated to bus passengers, others (especially those in Pennsylvania) were projected to have more carpool users. While bus passengers could be easily captured at the bus pick-up point, it was more difficult to identify and survey carpools. Therefore it is likely that carpools were under-represented at those locations.
- **New York City as Primary Destination.** As expected, virtually all bus routes departing from these locations are heading for the Port Authority Bus Terminal in Manhattan.



Table 3-21: Results of Surveys at Selected Park-and-Ride Lots in Pennsylvania and New Jersey (April 2006)

Lot Occupany and Surveys Completed by Location	I-78/Rt. 112 PA	Rt. 33/Wm. Penn Hwy. PA	Phillipsburg Mall - NJ	Clinton Township (Clinton Point) NJ	Annandale Square - NJ
Total Spaces	94	223	127	303	111
Spaces Occupied	160	244	88	318	105
Occupancy %	170%	109%	69%	105%	95%
Surveys Completed	48	46	53	99	57
Surveys as % of Spaces	30%	19%	60%	31%	54%

Where Did Your Trip Start From Today?	I-78/Rt. 112 PA	Rt. 33/Wm. Penn Hwy. PA	Phillipsburg Mall - NJ	Clinton Township (Clinton Point) NJ	Annandale Square - NJ
New Jersey	0.0%	0.0%	60.4%	87.9%	89.5%
Pennsylvania	100.0%	100.0%	39.6%	12.1%	10.5%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

Where are you traveling to today?	I-78/Rt. 112 PA	Rt. 33/Wm. Penn Hwy. PA	Phillipsburg Mall - NJ	Clinton Township (Clinton Point) - NJ	Annandale Square - NJ
New York	95.8%	97.8%	96.2%	100.0%	100.0%
New Jersey	0.0%	2.2%	3.8%	0.0%	0.0%
Pennsylvania	4.2%	0.0%	0.0%	0.0%	0.0%
Total	100%	100%	100%	100%	100%

How Did You Get Here?	I-78/Rt. 112 PA	Rt. 33/Wm. Penn Hwy. PA	Phillipsburg Mall - NJ	Clinton Township (Clinton Point) NJ	Annandale Square - NJ
Walked/Bike	4.2%	0.0%	0.0%	1.0%	0.0%
Bus	0.0%	0.0%	0.0%	0.0%	0.0%
Drove Alone	70.8%	84.8%	98.1%	79.8%	100.0%
Carpool	8.3%	15.2%	1.9%	13.1%	0.0%
Other (Dropped-off)	16.7%	0.0%	0.0%	6.1%	0.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

How Are You Getting to Your Destination?	I-78/Rt. 112 PA	Rt. 33/Wm. Penn Hwy. PA	Phillipsburg Mall - NJ	Clinton Township (Clinton Point) - NJ	Annandale Square - NJ
Bus	100.0%	100.0%	94.3%	100.0%	100.0%
Carpool	0.0%	0.0%	3.8%	0.0%	0.0%
Vanpool	0.0%	0.0%	1.9%	0.0%	0.0%
Total	100%	100%	100%	100%	100%



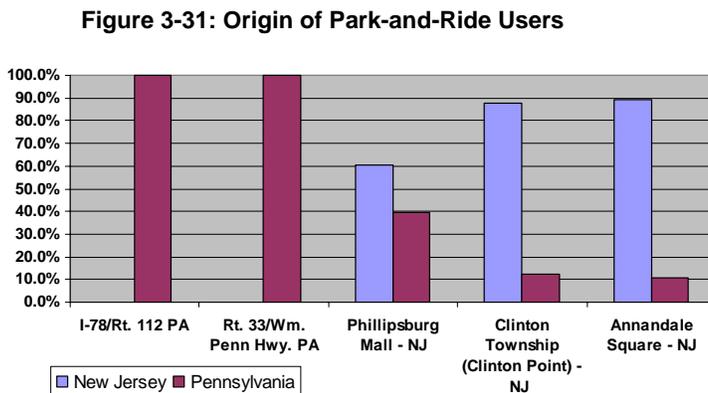
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- **Arrival Mode – Car.** While some persons were dropped off at the facility and a few walked, the dominant arrival mode was drive alone (71% to 100%) and carpool (2% to 15%).

- **Many Lots at or over Capacity.** Consistent with earlier surveys and field observations, the two Pennsylvania facilities and the two in Hunterdon County were at or above capacity, usually by 7:00 am to 7:30 am, while the Phillipsburg Mall site was well under capacity.

- **Few Pennsylvania Residents Use New Jersey Facilities.** As expected, based on previous surveys and field observations of license plates, while 40% of those surveyed at the Phillipsburg Mall site were from Pennsylvania (reflecting its close proximity to the border), only 10% of those at the Clinton Point and Annandale Square lots were from Pennsylvania (see Figure 3-31). In fact, very few of the Clinton Point/Annandale Square users were from locations outside of Hunterdon County. This finding was consistent with results from the 2000 survey mentioned above, and from observations made at other park-and-ride locations – i.e., the vast majority of users at facilities in these types of fairly rural locations live a relatively short distance from the facility.

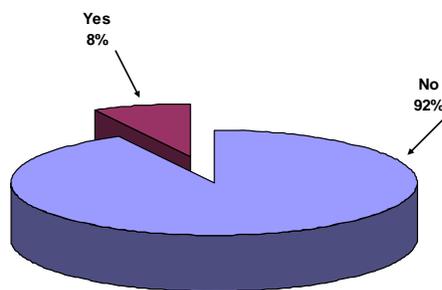


3.7 WEB-BASED SURVEY

3.7.1 Overview

A key element of the overall Study was a web-based survey to solicit concerns about travel issues along the I-78 corridor, as well as ideas regarding measures to improve those conditions. Many of the survey questions were targeted to better understand people’s attitudes about transit service along I-78 between New Jersey and eastern Pennsylvania. The survey also explored various potential improvements to transit services which could make transit more attractive to I-78 users. The intent and focus of the survey was developed in consultation with the Project Steering Committee. (A copy of the survey form is included in Appendix C of *Technical Memorandum #1: Baseline Travel and Land Use Patterns*. July 2006).

Figure 3-32: Response to Question: Are You a Regular User?



3.7.2 Survey Results

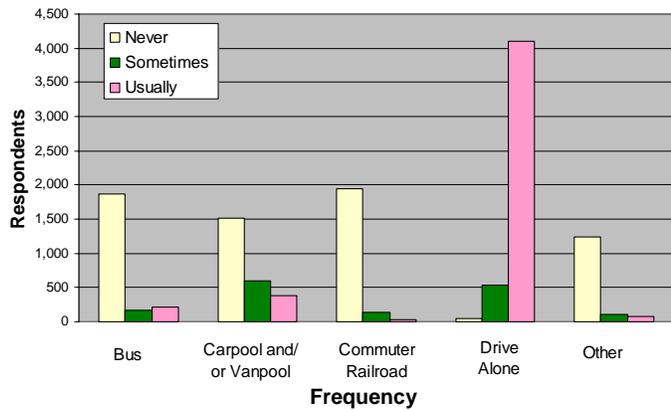


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The promotion of the web-based survey was spearheaded by NJTPA. NJTPA, all TMAs, AAA and others posted links to the survey on their respective websites. Copies of the advertisement postcard created by NJTPA were distributed at park-and-rides and at toll plazas. Variable Message Signs (VMSs) provided by the Delaware River Joint Toll Bridge Commission at its bridges and by NJDOT along I-78 were also used to advise the motoring public about the web-based survey. Approximately 5,000 users completed the survey which ran from January to April, 2006.

Figure 3-33: Frequency of Use by Mode



Detailed results of the survey are included in Appendix D of *Technical Memorandum #1: Baseline Travel and Land Use Patterns*. (July 2006). The notable observations from the survey results are as follows:

- **Overall Responses**

- 72% of those surveyed travel on I-78 approximately 5-6 days per week;
- 89% of the total trips made by the respondents happen during the typical weekday commuter periods;
- 91% of the total trips are work related;
- 81% usually drive alone;
- 92% do not use transit regularly;
- 29% start trips in Lehigh or Northampton Counties (PA); most others start in Hunterdon, Warren or Somerset;
- Biggest trip destination – Somerset County (38%).

- **Responses by Regular Transit Users**

- 60% (the highest percentage) use the Trans-Bridge bus service;
- Most drive to park-and-ride lots (46%) or stations (36%) to get buses or trains;

Figure 3-34: Origin Counties

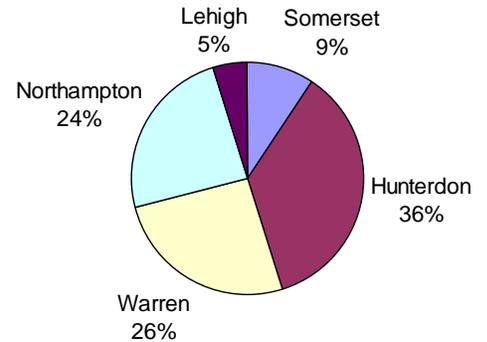
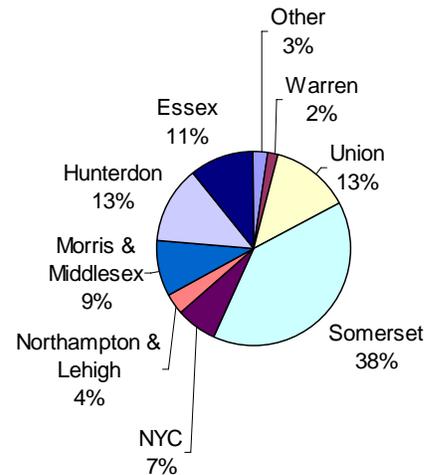


Figure 3-35: Destination Counties



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- 63% felt that faster service and more frequent transit service would increase transit ridership;
- Biggest travel concern in the I-78 corridor (% of regular transit users that mentioned the following concerns):
 - “too much congestion” 80%
 - “too many trucks” 56%
 - “aggressive drivers” 46%
- When faced with the spike in gas prices in late 2005 (since then repeated in 2006), 38% of the transit users said their travel habits were not affected at all, with only a small percentage actually changing their travel habits.

• Responses by Non-Transit Users

- 85% indicated that not having service to points where they need to go was the main impediment to using transit;
- Approximately 44% indicated that they found the required walking distance at one or both trip ends was too great to make transit use viable;

These two factors, collectively representing travelers’ need for a convenient trip from their origins to their destinations, define the principal challenge when planning public transit services in suburban and rural areas to compete with the automobile.

- Given this, 80% indicated that the most important improvement in terms of them reconsidering the use of transit would be the provision of service close to where they would need to go.

Figure 3-36: Importance of Transit Improvements to Non-Users

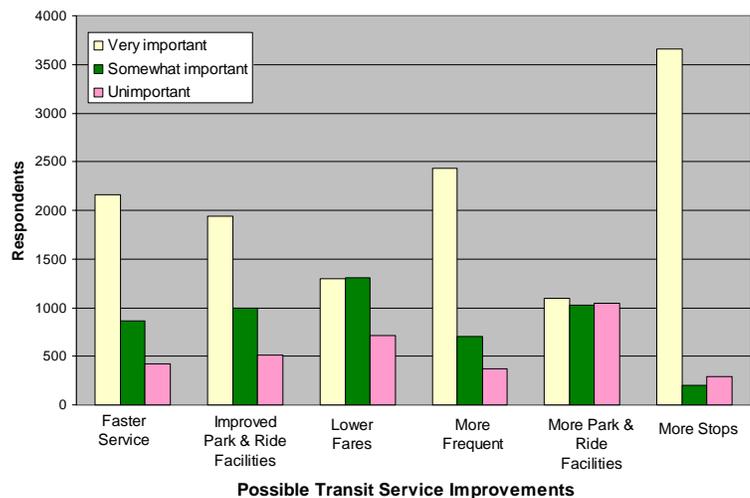
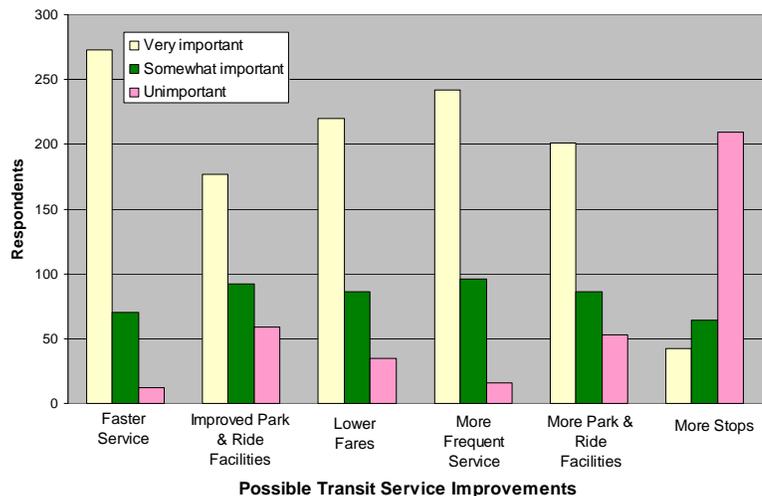


Figure 3-37: Importance of Transit Improvements to Users



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- Biggest travel concern in the I-78 corridor (% of those rarely using transit that mentioned the following concerns):
 - “too much congestion” 89%
 - “too many trucks” 68%
 - “aggressive drivers” 54%
 - “poor road conditions” 50%
- 50% were not affected by the Fall 2005 increase in gas prices, although 21% considered making a change in travel patterns or mode choice.

• **Response to Open-Ended Questions**

In addition to the survey’s guided questions, the survey included a number of open-ended questions that allowed people to freely comment on an aspect of their travel in the corridor. To elicit such answers, the following questions were asked:

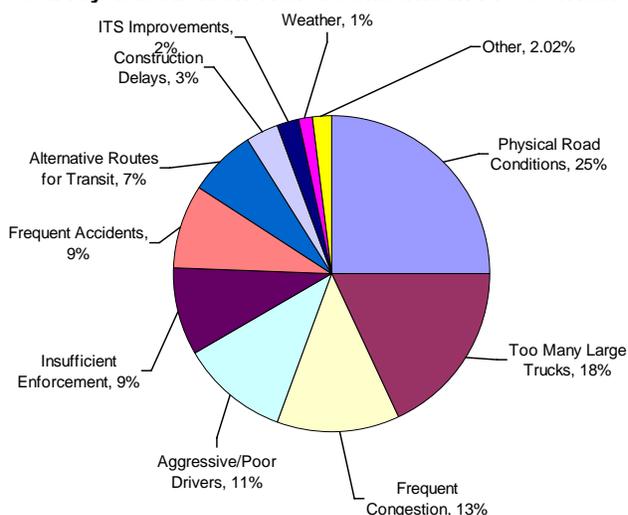
- “Do you have any additional concerns about traveling on I-78 that you’d like to discuss?”
- “What improvements to I-78 do you feel would best address your concerns?”
- “If there is congestion on I-78, do you use an alternative route?” “Please describe route.”

In responding to these questions, individuals often wrote paragraph-long answers. In effect, it was the equivalent of holding a public meeting to which 5,000 people show up and provide comments.

It was often difficult to reduce these thousands of thoughts to a reportable number of items. However, as shown in Figure 3-38, a few common themes did emerge. Some were similar to the guided responses while others showed a consistent concern in areas that were relatively unexpected:

- The most frequently listed comments (25% of those responding to these questions) about corridor conditions related to the physical condition of I-78, essentially stating that corridor travelers expected the highway would be kept in a good state of repair.
- Approximately 7% (over 200 respondents) indicated that the corridor needed alternative routes for buses so they wouldn’t have to travel in the same congested traffic as other vehicles.

Figure 3-38: Distribution of Responses to “Open Ended” Survey Question on Travel Concerns in I-78 Corridor



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- The problem of aggressive drivers (11%) was matched with the call for greater traffic enforcement (9%) to correct that problem.
- The complaints about too many large trucks (18%) and frequent congestion (13%) were once again similar to answers given to earlier guided questions, but these open-ended questions allowed a considerable number of respondents to note that frequent accidents (9%) and construction delays (3%) were perceived and the causes of this problem.



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SECTION 4 BASELINE TRANSIT AND FREIGHT ACTIVITIES

4.1 TRANSIT SERVICES IN CORRIDOR

Transit service within the I-78 corridor Study Area consists of local bus, commuter bus and commuter rail operations. Local bus operations within the study area connect area residents to key trip destinations (e.g., major employers, shopping centers and other commercial concentrations, etc.), and to train stations, park-and-ride lots or other bus transit nodes. Commuter bus services operate primarily between pick-up points in the study area and destinations in Lower and Midtown Manhattan in New York City. Commuter rail operations connect the study area to major employment centers such as Newark, Hoboken, and New York City. All modes collectively form an interconnected transit network, with the connections more frequent and convenient in the eastern portions of the Study Area.

4.1.1 Bus Transit Operations

The level of local transit options varies considerably throughout the Study Area. In the eastern part of the Study Area, NJ Transit provides a few local transit routes. The Lehigh and Northampton Transportation Authority (LANTA) serving the Allentown-Bethlehem-Easton area is the local transit provider in the western (Pennsylvania) part of the Study Area. In between there are various smaller local agencies and service providers, including routes operated through NJ Transit's WHEELS program (primarily shuttle-type routes operated by private contractors to provide transit service in suburban and rural areas where traditional bus service is not feasible). Most local bus service is fixed route service. Many of the smaller providers are county systems that have routes connecting towns, providing service within a particular town, or connecting population areas or transit lines to major employment areas.



Most of the corridor has good commuter bus access to New York City, specifically to the Port Authority Bus Terminal. A number of operators provide such service, including Carl Bieber Tourways, Trans-Bridge Lines, Lakeland Bus, and NJ Transit. Trans-Bridge Lines also provides service to the Wall Street area. Additional service is available from Allentown and Bethlehem to Philadelphia on a route operated by Carl Bieber Tourways. Commuter express bus service in the corridor is not provided to any areas other than to New York City and Philadelphia (with some stops at Newark Liberty International Airport). Figures 4-1 through 4-6 present the various transit routes and their associated operators. The following is an overview of the corridor's bus transit operations along these routes.

- **NJ Transit.** NJ Transit is the main bus transit provider throughout the state of New Jersey. Within the Study Area, NJ Transit provides local bus service as well as limited commuter express service into New York City. Local bus services circulate through portions of the Study Area and provide connections to other parts of New Jersey such as Newark and

Figure 4-1:
Existing Transit Service in the I-78 Study Corridor- BIEBER

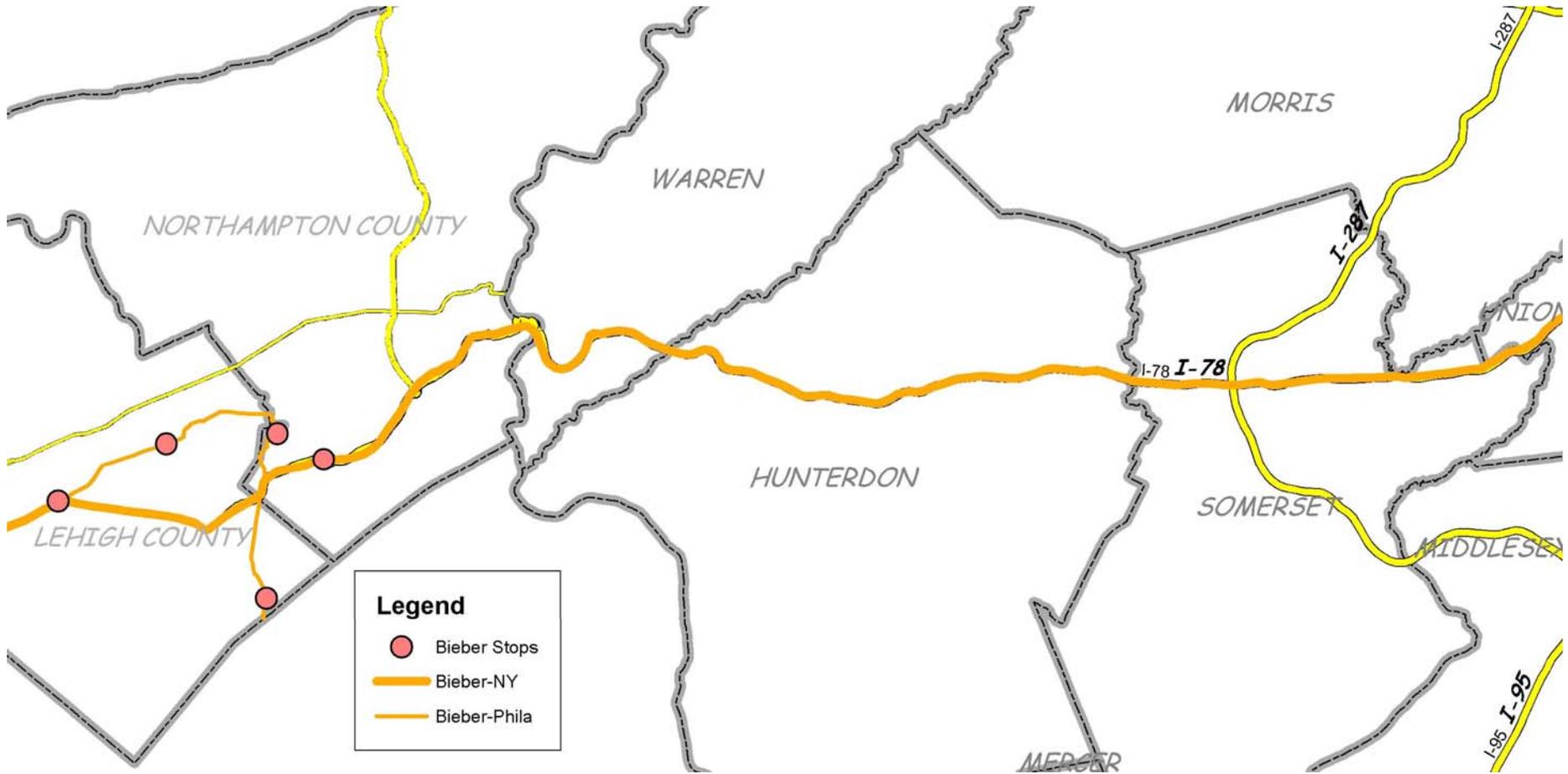


Figure 4-2:
Existing Transit Service in the I-78 Study Corridor: TRANS-BRIDGE

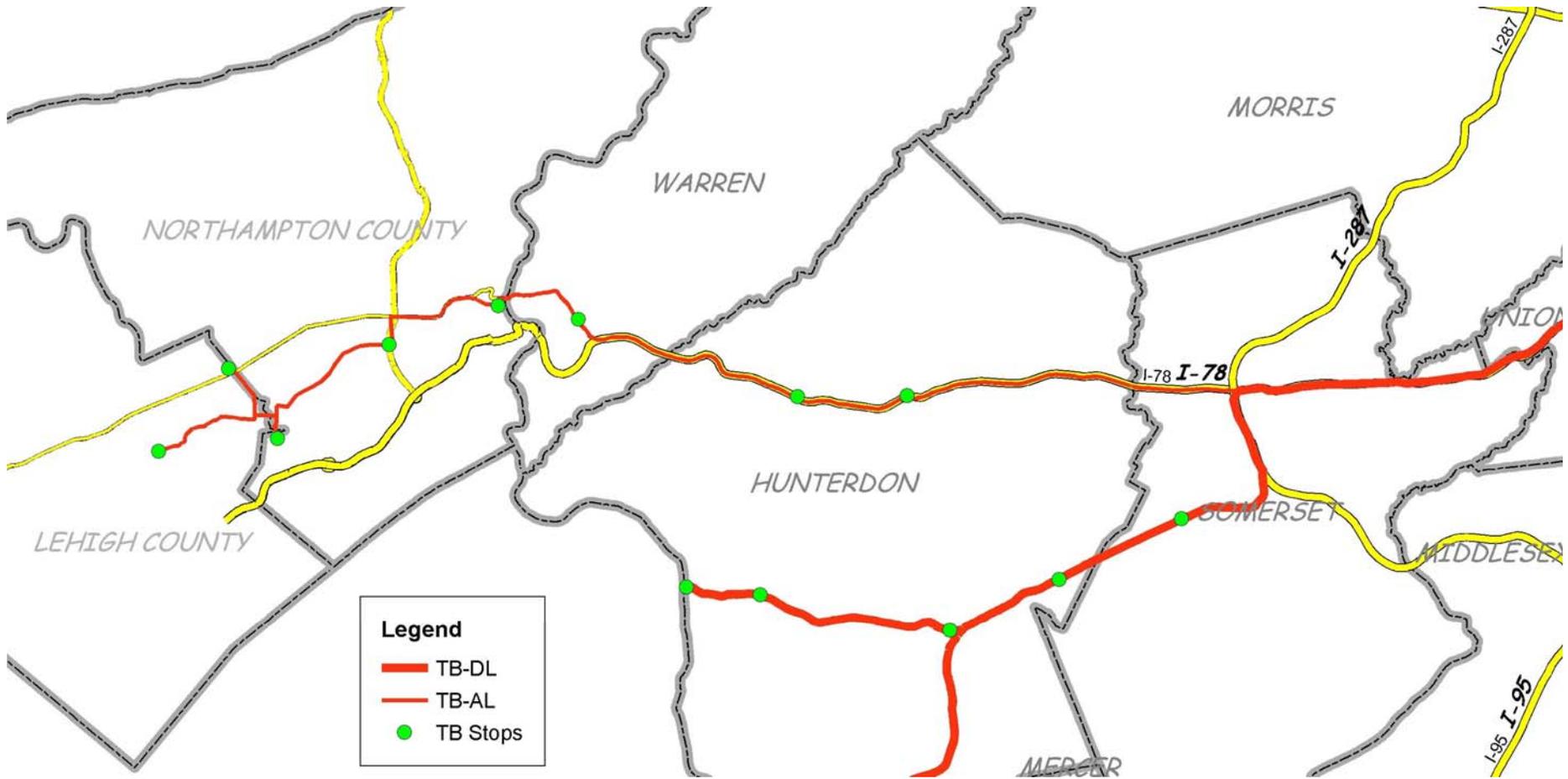


Figure 4-3:
Existing Transit Service in the I-78 Study Corridor- HART,LANTA, LAKELAND

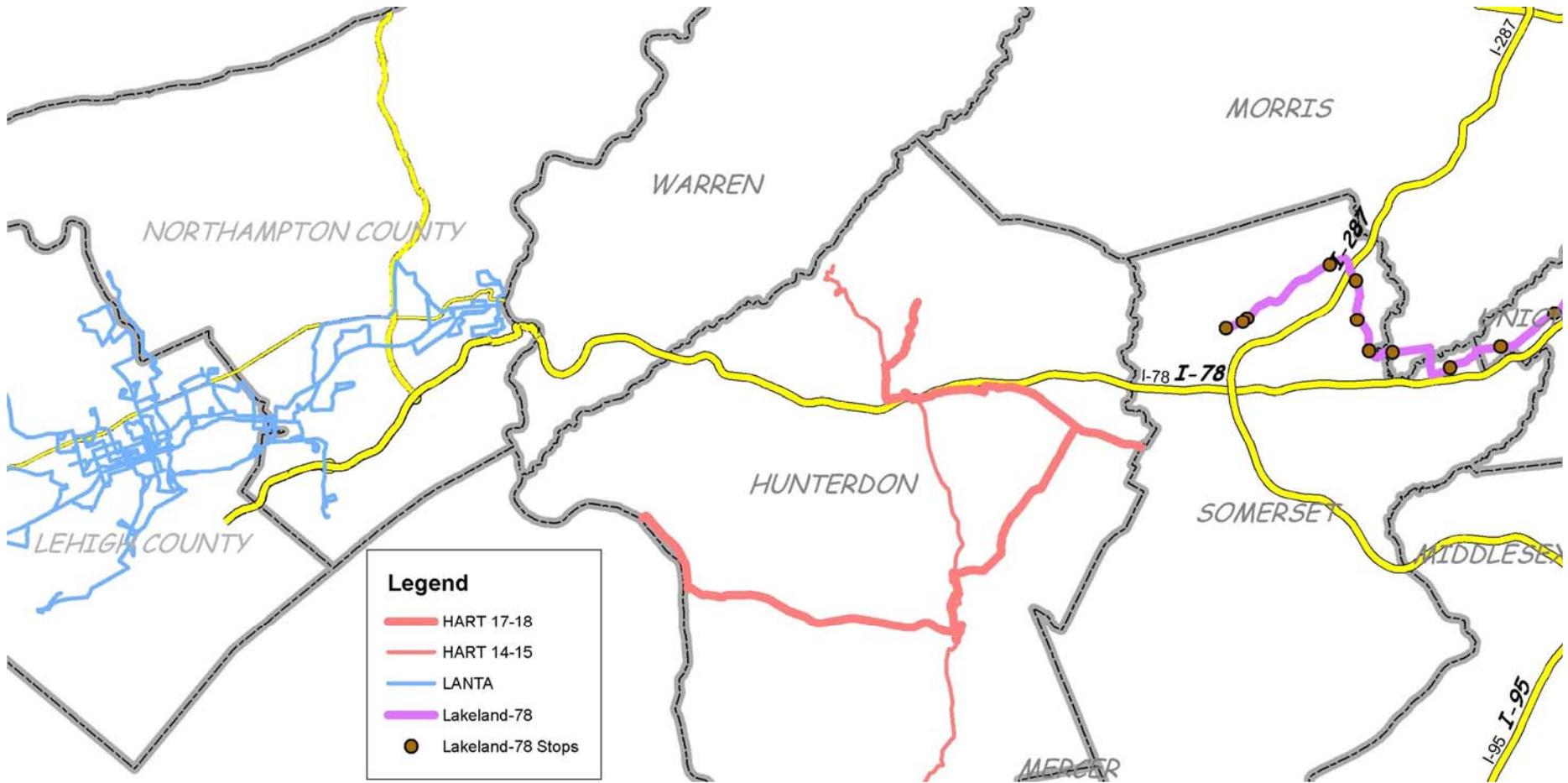
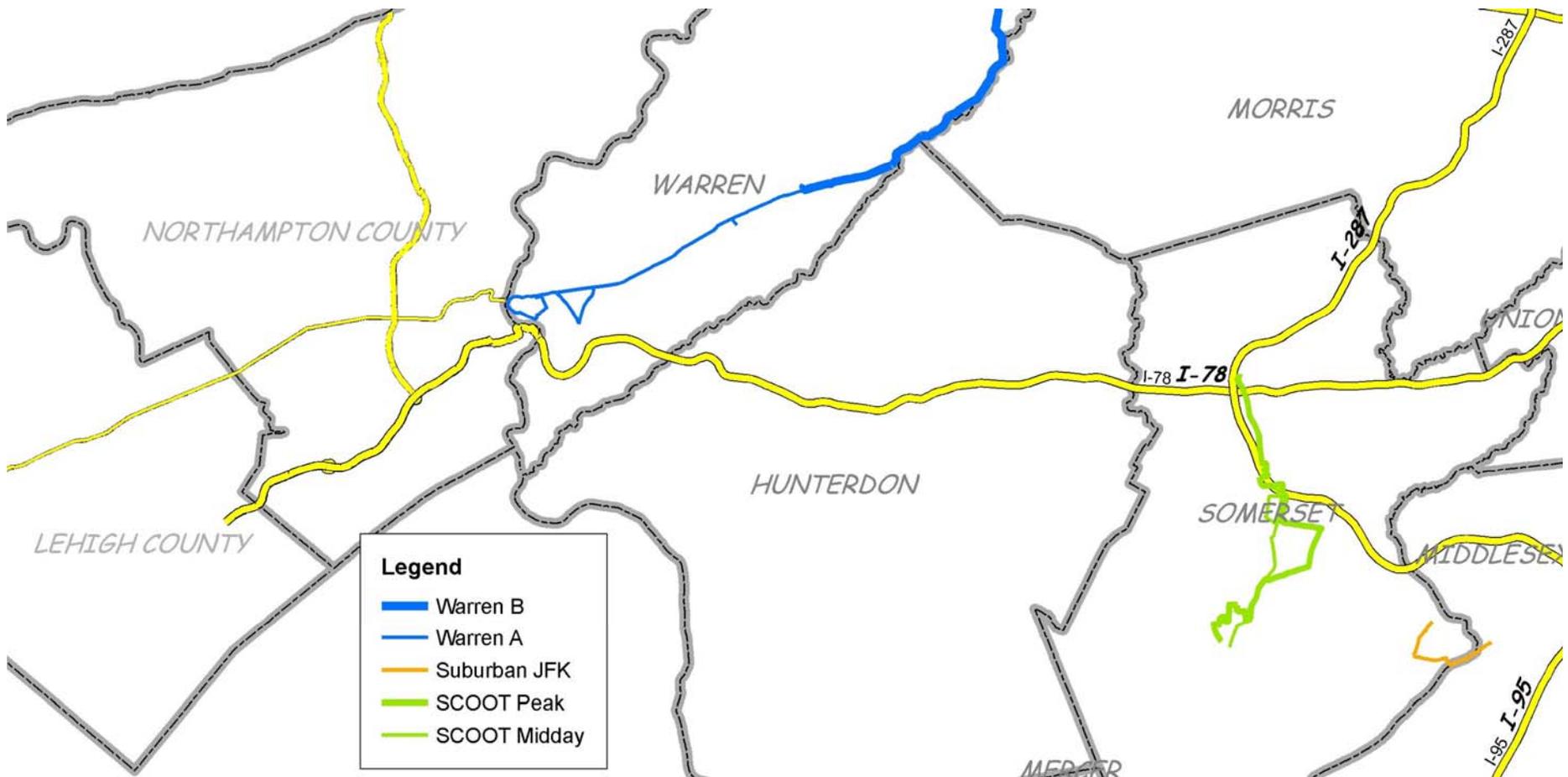


Figure 4-4:
Existing Transit Service in the I-78 Study Corridor- WARREN, SUBURBAN, SCOOT



Legend

- Warren B
- Warren A
- Suburban JFK
- SCOOT Peak
- SCOOT Midday

Figure 4-5:
Existing Transit Service in the I-78 Study Corridor- NJ TRANSIT BUS

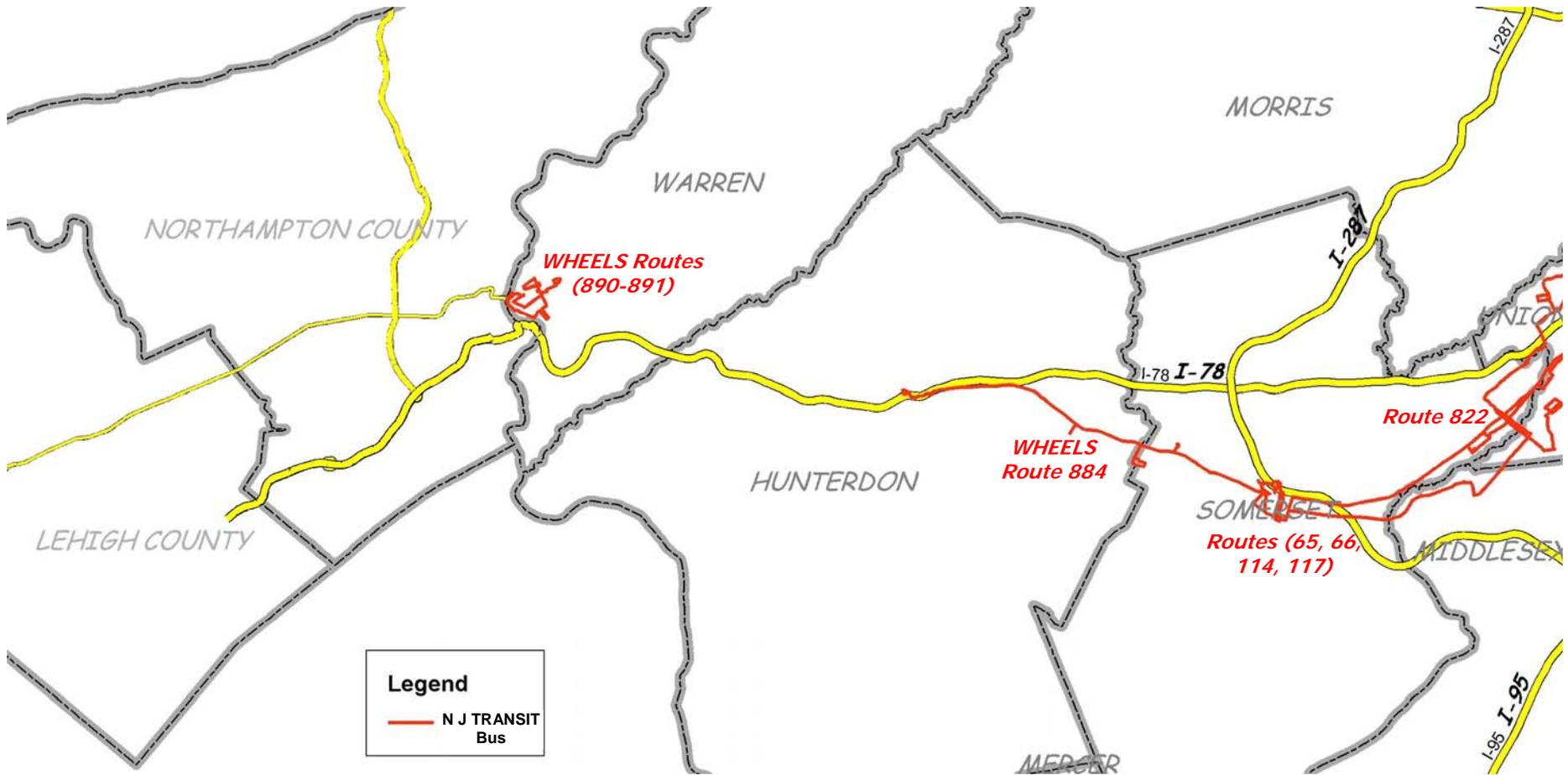
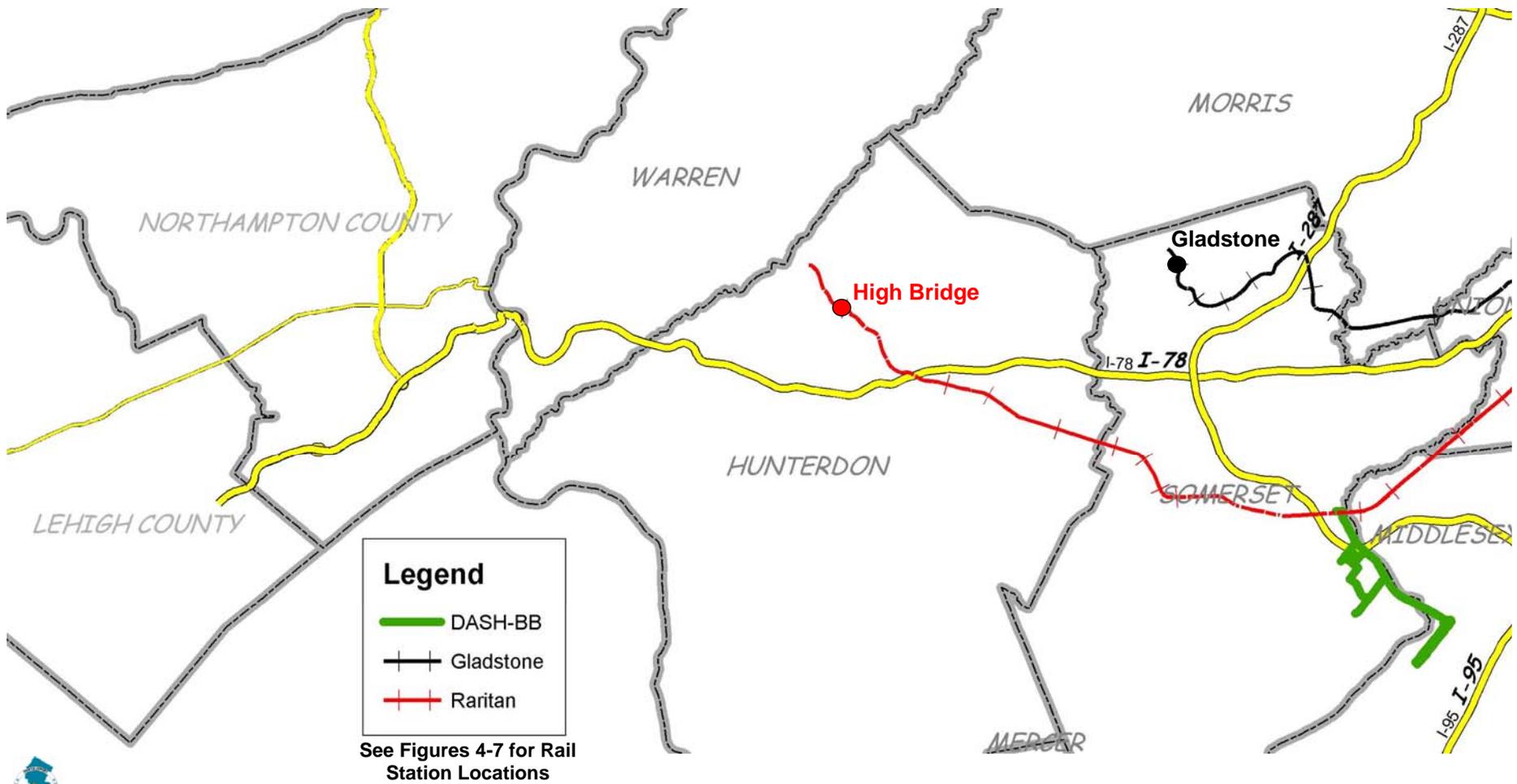


Figure 4-6:
Existing Transit Service in the I-78 Study Corridor- NJ TRANSIT Gladstone Branch and Raritan Valley Line Rail Services; DASH



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Trenton. There are ten NJ Transit bus routes in the three Study Area counties in New Jersey. A description of each route in the three counties is presented below (see Figure 4-5 for route locations):

- **Routes 65 and 66** – Operate local service primarily between Newark and Cranford which is not located in the study area. A small number of trips extend to Bound Brook.
- **Routes 114 and 117** – These two routes provide commuter express bus service from Bridgewater, Somerville, and Bound Brook to New York Port Authority Bus Terminal. Route 114 also makes local roadside stops in Somerset and Union Counties.
- **Route 822** – This route provides local bus service between Plainfield, North Plainfield, and Greenbrook. Greenbrook is located in the Primary Study Area.
- **Route 884** – This route provides local bus service along NJ Route 31 and US Route 22 from Clinton to Somerville. This entire route, located within the Primary Study Area, is a WHEELS service contracted out to Suburban Transit Management.
- **Routes 890 and 891** – These routes provide local bus service in western Warren County, connecting into Easton, PA. The service is provided in Phillipsburg and Lopatcong Township in New Jersey and Easton, PA, all within the Primary Study Area. This WHEELS service is contracted out to Delaware River Coach Lines.
- **Route 986** – This bus route provides local bus service between Summit and Plainfield operating north/south through the Secondary Study Area. This WHEELS service is operated by Suburban Transit Management. This route is east of and essentially outside the actual Study Area for the I-78 Corridor Transit Study.

NJ Transit bus ridership is presented below in Table 4-1. This table shows that the highest ridership routes are the commuter routes into New York, as well as a longer distance local route that connects the Study Area to Newark. The table also shows the number of bus trips that operate within the Study Area for each route, and that the higher ridership routes, as expected, offer more frequent service. The other NJ Transit routes in the study area function more as area circulators and rural transit routes, which by their nature do not carry as many passengers. Some of these routes offer relatively infrequent service. No information on ridership trends on these routes is available at this time.

Table 4-1: NJ Transit Bus Ridership in Primary Study Area

Route	Number of Bus Trips per Period						Average Daily Ridership [1]
	AM Peak		Midday		PM Peak		
	EB	WB	EB	WB	EB	WB	
Route 65/66	5	5	1	2	4	4	3,181
Route 114/117	7	4	9	10	6	10	5,675
Route 822	3	3	5	5	4	3	300
Route 884	5	5	5	6	4	4	115
Route 890/891	5	5	8	8	3	5	202
Route 986	5	5	0	0	6	7	154

[1] No trend data available for these routes at this time.
Source: NJ Transit, 2006.



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- Lehigh and Northampton Transportation Authority (LANTA).** LANTA operates the fixed route Metro bus system in Northampton and Lehigh counties in Pennsylvania, with 26 routes serving Allentown, Bethlehem, and Easton, PA. LANTA also operates the Metro Plus complementary demand responsive transportation service within most locations in Northampton and Lehigh counties, thus satisfying the requirements of the Americans with Disabilities Act.
- Trans-Bridge Lines.** Trans-Bridge Lines provides commuter express service between areas in the western half of the study area and New York City. Service is provided both into the Port Authority Bus Terminal (PABT) in Midtown Manhattan and to the Wall Street area in Lower Manhattan. Table 4-2 presents the weekday service levels on the routes operated by Trans-Bridge and Bieber. The following are brief descriptions of the Trans-Bridge routes:

Table 4-2: Weekday Service Levels - Trans-Bridge & Bieber

Allentown/Bethlehem, PA - Clinton, NJ >> PABT			
Weekday Service Levels			
Direction	AM	Midday	PM
Eastbound	23	6	3
Westbound	2	6	20
Doylestown, PA - Hunterdon, NJ -- PABT			
Direction	AM	Midday	PM
Eastbound	7	2	3
Westbound	2	1	8
Bethlehem, PA - Clinton, NJ - Lower Manhattan			
Direction	AM	Midday	PM
Eastbound	7	-	-
Westbound	-	-	-
Reading/Hellertown, PA >> PABT			
Weekday Service Levels			
Direction	AM	Midday	PM
Eastbound	6	6	3
Westbound	1	4	8
Reading/Allentown/Bethlehem, PA >> Philadelphia			
Direction	AM	Midday	PM
Eastbound	2	2	1
Westbound	1	1	3

- Commuter express route serving Allentown/Bethlehem and other locations as far east as Clinton, NJ to the PABT. Some buses continue in service to JFK International Airport. Major stops include the park-and-ride lots at PA Route 33 / William Penn Highway in Bethlehem Township, PA, and at I-78 and NJ Route 31 in Clinton, NJ. Not all buses make all stops along this route. No ridership levels or trend information are available for these routes at this time.



- Commuter express route from Doylestown, PA operating along US Route 202 in Hunterdon County, NJ to the PABT, with some buses continuing to JFK International Airport. This route operates primarily through the Secondary Study Area, although some portions of the route pass through the Primary Study Area. Not all buses make all stops along this route. No ridership levels or trend information are available for these routes at this time.
- Commuter express route from Bethlehem and other locations as far east as Clinton, NJ to Wall Street in Lower Manhattan. No ridership levels or trend information were available for these routes at this time.

- **Carl Bieber Tourways.** Carl Bieber Tourways provides commuter express service to New York City, Philadelphia and Atlantic City from Reading, PA. These locations are served from areas within Lehigh and Northampton Counties, in the western (PA) part of the Study Area. Service levels are shown in Table 4-2, and a description of each route operated by Bieber Tourways is presented below. No ridership levels or trend information are available for these routes at this time.



- Commuter express service between Reading and the PABT via I-78 stops at the I-78/Route 412 park-and-ride in Hellertown, outside of Bethlehem, PA.
- Commuter express route from Reading to Philadelphia which stops in Allentown and Bethlehem en-route.

- **Lakeland Bus Lines.** Lakeland provides commuter express bus service along I-78 between Bedminster (near interchange of I-78 and I-287) and the PABT. In the eastbound direction there are 8 AM peak period trips and 1 midday trip. In the westbound direction there are 9 PM peak period trips. No ridership levels or trend information are available for these routes at this time.

- **Somerset County Office of Transportation.** Somerset County operates two local services to residents and commuters in Somerset County: the DASH shuttle and the SCOOT service. The DASH shuttle operates during peak periods only, while the SCOOT service operates all day. Route descriptions for each service are presented below:

- **DASH (Davidson Avenue Shuttle)** – The Davidson Avenue Shuttle provides local bus connections to employment sites along Route 527 (Easton Avenue) between the Bound Brook and New Brunswick train stations. This shuttle consists of two routes (with some common elements): one that operates between New Brunswick and the Bound Brook train station via the Davidson Avenue office parks, and another between areas of Bound Brook and the



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Davidson Avenue office parks. This is a flag stop service (i.e., buses stop when flagged down by waiting passengers) that carries on average about 160 passengers per day¹. The Bound Brook route has 3 AM peak trips departing the Bound Brook area for the Davidson Avenue office parks and 4 PM peak period returns. The New Brunswick route has 4 AM peak trips departing from New Brunswick and 5 PM peak return trips.

- **Somerset County – SCOOT** – This route, also operated through the Somerset County Office of Transportation, operates as a local bus route, connecting through Bedminster and Hillsborough, with some route variations between midday peak periods. This service averages about 150 passengers per day². The SCOOT peak service runs four AM and four PM roundtrips, while the midday service has five trips.



- **Hunterdon County LINK.** The LINK, Hunterdon County's consolidated Transportation System, provides County residents with transportation within Hunterdon County. Special fares are available to senior citizens, disabled and low income residents. Fixed route and dial-a-ride services are provided. Based on conversations with Hunterdon Area Rural



Transit's Transportation Management Association (HART TMA) personnel, this public transit operation is actually a county paratransit system that does allow general public use on a space-available basis, although general public ridership on these buses is presently negligible. Each route has 1 AM peak, 1 midday, and 1 PM peak trip in each direction. Below is a description of the routes operated by Hunterdon County (ridership information is presently unavailable):

- **Route 14** – This route provides local bus service between Lambertville and High Bridge. This north/south route operates in both the Primary and Secondary Study Areas.
- **Route 15** - This route provides local bus service between Lambertville and Hampton. This north/south route operates in both the Primary and Secondary Study Areas.
- **Route 16** – This route, which provides local bus service through Flemington, is located within the Secondary Study Area.
- **Route 17** - This route provides local bus service between Milford and High Bridge. This route operates in both the Primary and Secondary Study Areas.
- **Route 18** - This route provides local bus service between Milford and High Bridge. This route operates in Primary and Secondary Study Areas.

¹ Source: Ridewise (Somerset County Business Partnership)

² Source: Ridewise (Somerset County Business Partnership)



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- **Route 19** – This route provides local bus service through Flemington within the Secondary Study Area.
- **County of Warren.** Warren County operates two local fixed shuttle routes that connect various towns within Warren County along NJ Route 57. Ridership for the two routes averages about 100 passengers a day. Below is a description of each of the routes.
- **Shuttle Route A** - operates between Washington and Philipsburg along NJ Route 57. This area is mostly within the Primary Study Area, with 60-minute service provided on weekdays from 6:00 am to 9:45 pm.
- **Shuttle Route B** operates between Hackettstown and Washington serving the Secondary Study Area, with 60-minute service provided on weekdays from 8:00 am to 5:00 pm.

4.1.2 Passenger Rail Service

Train service is provided on two lines through the Primary Study Area and another line in the Secondary Study Area. The Raritan Valley Line, which closely parallels I-78, provides service into Newark Penn Station, while Midtown Direct service (i.e., direct service to New York Penn Station) is available on the Morris & Essex Line's Gladstone Branch, which is located directly north of I-78 within Somerset County. As shown previously in Figure 4-6, passenger rail service along these lines does not extend west of High Bridge – the end of the Raritan Valley Line. Below is a description of each passenger rail line in the study area:

- **Raritan Valley Line.** The Raritan Valley Line is a passenger rail line that is oriented to commuter service and which operates between High Bridge in Hunterdon County and Newark Penn Station, where passengers can connect to two other rail lines for service to New York City or to points south as well as to Amtrak and PATH services. This rail line closely parallels I-78 and US 22 throughout the Study Area, operating just south of I-78.

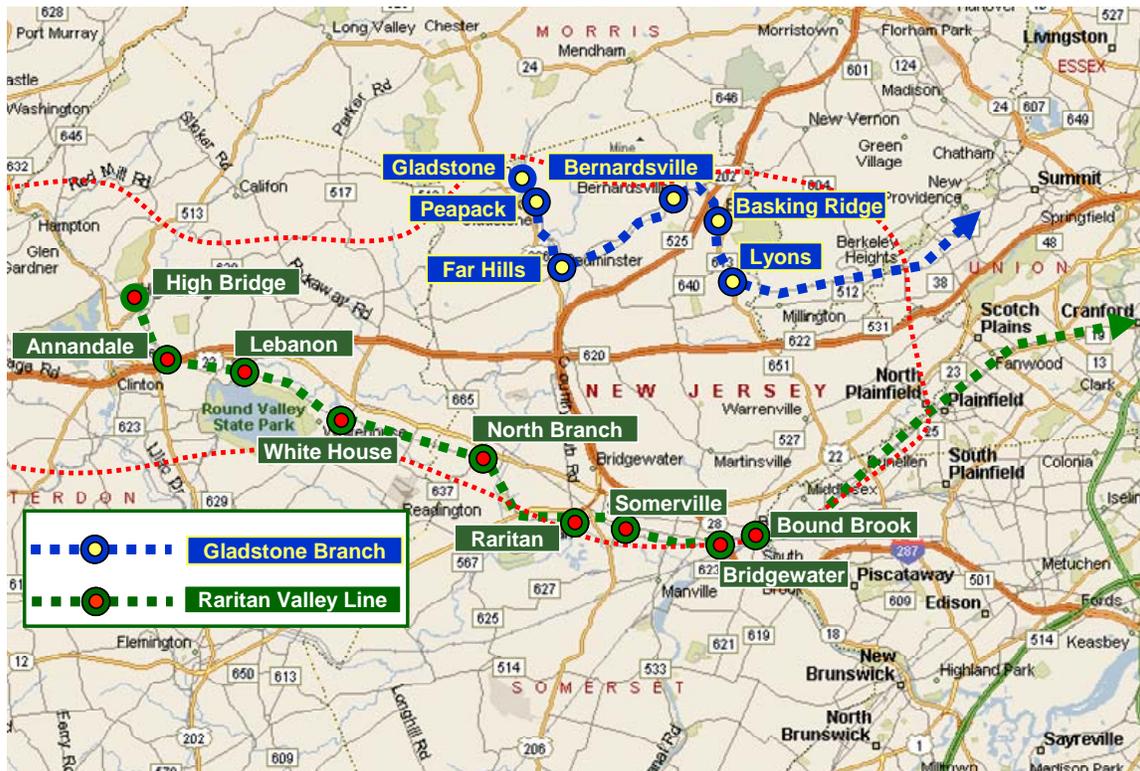
Figure 4-7 indicates the location of the nine Raritan Valley Line train stations and six Gladstone Branch stations within the Study Area, all of them within a few miles of the highway, and images of three of these stations.

The number of trains per period on weekdays is shown in Table 3-2, along with ridership growth since 1999. Within the Study Area there are about 2,759 boardings per day. As indicated, all but one station has seen increased ridership in recent years, with many stations showing a dramatic increase over the 1999 – 2005 period. The station with the most dramatic increase was Bridgewater, which grew by almost 700%. This increase reflects the construction of a large park-and-ride lot at that location in conjunction with a minor league baseball stadium. Overall the Raritan Valley Line ridership grew by an average of 25% at the stations in the Study Area.



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Figure 4-7: Raritan Valley Line and Gladstone Branch Stations in Study Area



Somerville Train Station



Bridgewater Train Station



Gladstone Train Station

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Table 4-3: Average Daily Ridership of Raritan Valley Line Stations in Study Area

Station	Number of Trains per Period						Average Daily Ridership		
	AM Peak		Midday		PM Peak		FY '05	FY '99	Percent Change
	EB	WB	EB	WB	EB	WB			
High Bridge	3	1	1	1	1	4	60	48	25.0%
Annandale	3	1	1	1	1	4	85	48	77.1%
Lebanon	3	1	1	1	1	4	17	12	41.7%
White House	3	1	1	1	1	4	103	77	33.8%
North Branch	3	1	1	1	1	4	71	67	6.0%
Raritan	9	4	9	8	5	8	660	442	49.3%
Somerville	9	4	9	8	5	8	663	817	-18.9%
Bridgewater	5	4	9	8	5	8	412	53	677.4%
Bound Brook	7	4	9	8	5	8	660	624	5.8%
Total	9	4	9	8	5	8	2,731	2,150	25.2%

Source: NJ Transit, 2006.

As discussed in Section 1, the I-78 Corridor Transit Study compiled an extensive amount of transportation, planning, operation and economic data and other materials to provide the planning background necessary to launch the Raritan Valley Line Extension Assessment and Environmental Reconnaissance study by NJ Transit. That study, scheduled to begin in Fall 2007, will carry out a comprehensive feasibility assessment of extending rail passenger service into western New Jersey, including the possible extension of the Raritan Valley Rail Line between its present High Bridge Station terminus in Hunterdon County to Phillipsburg in Warren County on the NJ/PA border. The study may also look at extending such services into the Lehigh Valley portion of Pennsylvania.

- Morris & Essex Line/Gladstone Branch.** This branch of the Morris & Essex Line provides passenger rail service oriented to commuters between Gladstone in Somerset County and either New York Penn Station or Hoboken via Newark's Broad Street Station. As shown in Figure 4-7 above, within the Study Area this branch runs north of and roughly parallel to I-78. The branch's six stations in Somerset County recorded on average a total of 1,180 passenger boardings per day. As shown on Table 4-4, weekday train service is clearly concentrated during the peak commuting periods -- eastbound in the AM peak and westbound during the PM peak. Ridership on this segment of the line has been essentially constant since 1999, reflecting in part the at-capacity conditions of its station-area parking lots.

Table 4-4: Average Daily Ridership of Gladstone Branch Stations within the Study Area

Station	Number of Trains per Period						Average Daily Ridership		
	AM Peak		Midday		PM Peak		FY '05	FY '99	Percent Change
	EB	WB	EB	WB	EB	WB			
Gladstone	8	1	6	8	2	8	183	199	-8.0%
Peapack	9	1	6	8	2	8	40	41	-2.4%
Far Hills	9	1	6	8	2	8	174	196	-11.2%
Bernardsville	9	2	7	8	2	8	219	224	-2.2%
Basking Ridge	9	2	7	8	2	8	102	101	1.0%
Lyons	9	2	7	8	2	8	462	429	7.7%
Total	9	2	7	8	2	8	1,180	1,190	-0.8%

Source: NJ Transit, 2006.



- **Montclair-Boonton Line and Morris & Essex Line's Morristown Branch.** These two passenger rail lines operate between Hackettstown in Warren County and Hoboken, with connections available to other rail lines. The line operates over differing routes from Hackettstown to reach Newark's Broad Street Station. Within the Study Area's three NJ counties, this line has one station (Hackettstown), located in northern Warren County, and its operations relate more to conditions in the I-80 corridor than to I-78. There are a total of six eastbound departures and six westbound arrivals at the Hackettstown station each weekday: 4 westbound trains on the Montclair-Boonton Line and 2 on the Morris and Essex Line, and 4 eastbound Morris and Essex Line trains and 2 eastbound Montclair-Boonton Line trains.



NJT Train Departs Denville Station

4.2 COMPARISON OF TRANSPORTATION CONDITIONS IN THE I-78 & I-80 CORRIDORS

The I-80 corridor in New Jersey was chosen to briefly provide some comparisons, perspectives, and insights on conditions in and potential future improvements to transit services in the I-78 corridor (see Figure 4-8):

- The I-80 corridor in Essex, Morris, Sussex, and Warren Counties in New Jersey, extending into Monroe County in Pennsylvania.
- The portion of the US 1 corridor that passes through Mercer and Middlesex Counties in New Jersey.

The following sections briefly discuss aspects of the I-80 corridor that make it relevant to conditions and challenges found in the Study's I-78 corridor segment.

4.2.1 I-80 Corridor

As shown in Figure 4-8, the I-80 corridor runs roughly parallel to and approximately 15 to 20 miles north of the I-78 corridor. Like I-78, I-80 is a critical east-west Interstate link between Pennsylvania and the Greater New York City area. Extending from more densely developed suburban and urban areas in the east to more rural areas in the west, this segment of I-80 has faced congestion issues similar to those in the Study's I-78 corridor. However, its congestion problems are somewhat greater and have occurred over a longer period of time than for I-78. While the eastern portions of this segment of I-80 carry a fair number of commuters to and from New York City, the highway primarily carries traffic among the major commercial and residential centers in Northern New Jersey.

- **Passenger Rail Service.** Passenger rail service along this corridor is provided by two lines; the Montclair-Boonton Line, and the Morris & Essex Line's Morristown Branch (see Figure 3-3). Both rail lines start service in Hackettstown on their western termini and operate either to New York Penn Station or to Hoboken. The rail lines share the same right of way

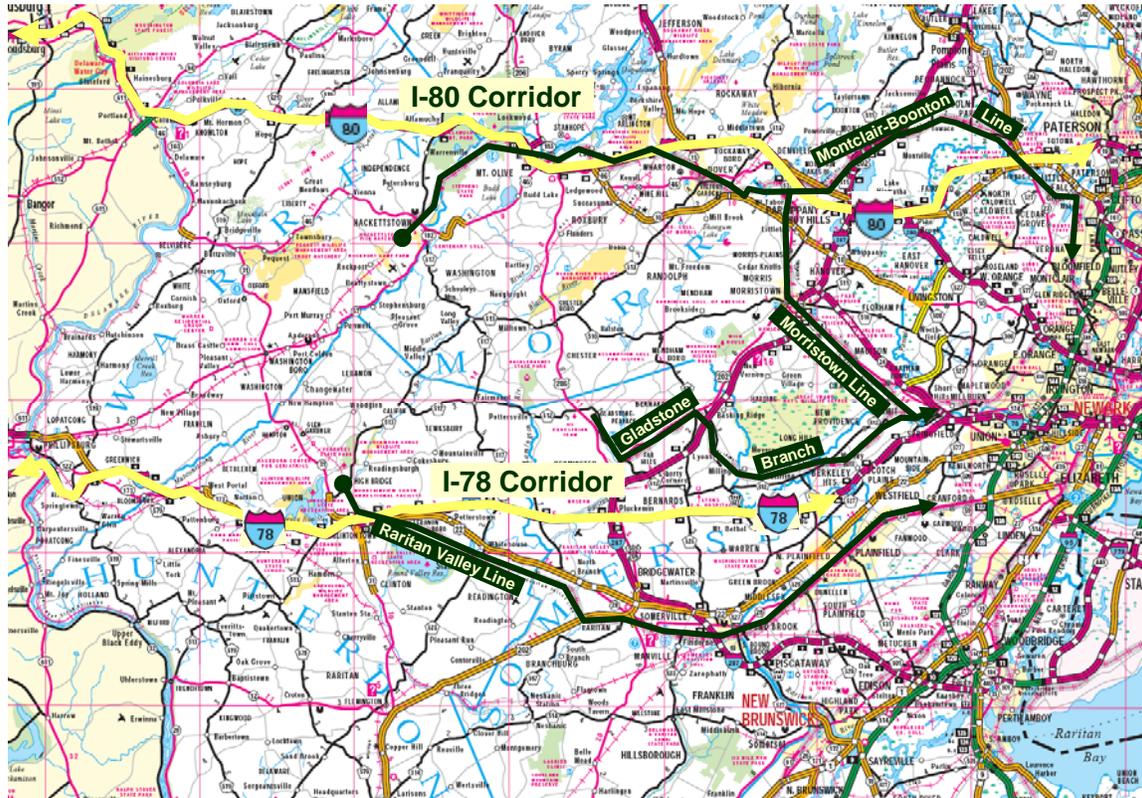


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between the Hackettstown and Denville stations, where the Morristown Branch splits off from the Montclair-Boonton line to serve Morristown. Both lines merge back together near Newark's Broad Street Station.

Figure 4-8: Comparison Transportation Corridors



In this section of the I-80 corridor, there are six stations serving both the Morris and Essex and Montclair-Boonton Lines, and four other stations serving only Montclair-Boonton trains. There are a total of six westbound and eastbound trains operating along this line -- four westbound trains on the Montclair-Boonton Line and two on the Morris and Essex Line, and four eastbound Morris and Essex Line trains and two eastbound Montclair-Boonton Line trains.

There is generally less commuter rail service in this corridor than in the I-78 corridor in terms of the number of stations and frequency of service. However, service west of Raritan on the Raritan Valley Line is considerably less frequent than at stations further east.

- **Commuter and Local Bus Service.** There is a considerable amount of commuter bus service into New York City from areas along this section of the I-80 corridor, operated by both NJ Transit and various private carriers. Most of the commuter buses along this corridor are operated by private carriers such as Community Coach, Lakeland Bus Lines, DeCamp Bus Lines, and Martz Trailways. There are a number of small commuter bus operators who have



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recently begun service from the Poconos region into New York City, serving the western portion of the corridor in response to rapid growth in this region. There are more commuter bus routes to New York City, with more frequent service and greater geographic coverage, than the equivalent routes in the I-78 corridor. This greater dependence on NYC-bound bus service in the western part of the corridor is largely due to a relative lack of commuter rail service.

Local bus service in this region is very similar to local bus service in the I-78 area. Service is provided by a combination of State and local transit agencies such as NJ Transit in New Jersey and the Monroe County Transportation Authority (MCTA) in Pennsylvania. Some NJ Transit routes connect the corridor to major employment areas outside of the immediate corridor area. The local TMAs have set up shuttle services to access employment sites. County transit offices operate a few small transit routes or shuttles. For both the I-80 and I-78 corridors, the area just east of the corridor segments has the most intense transit usage and service patterns. Service and ridership levels are both a bit heavier along the I-80 corridor, with a major hub of local and commuter buses (the Willowbrook Mall) located just east of the study area near the I-80-US 46-NJ 23 interchange. The local buses, primarily the Morris County Metro (MCM) routes, are less frequent than the local buses in the I-78 corridor, however the local buses in this corridor that serve Newark tend to be more frequent than the buses in the I-78 corridor.

- **Typical Highway Cross Sections: I-78 vs. I-80.** Based on available data from NJDOT, Table 4-5 shows the typical cross section at selected locations along the I-78 Study corridor, and comparable data for similar locations along the I-80 corridor. These data clearly show the additional lanes in the eastern (Morris County) segment of the I-80 corridor, including sections that were part of the I-80/I-287 HOV Lane project (see below), and reflect the higher

Table 4-5: Cross Section at Selected Points in I-78 and I-80 Corridors

		I-78			I-80		
Location [3]		1	2	3	1	2	3
Total Lanes	EB	3	3	3	3	4	4
	WB	3	3	3	3	4	3
Shoulder	EB	12'	12'	12'	12'	12'	12'
	WB	12'	12'	12'	12'	12'	12'
Median [2]		Unprotected, variable width (50' typical)	Unprotected, 50'	Unprotected, 40'	Positive, 100' typical	Barrier Curb 15'	Barrier Curb - 22'
Cartway [1]		146' (typ.)	146' (typ.)	136' (typ.)	196' (typ.)	135' (typ.)	130' (typ.)
Control		Limited Access	Limited Access	Limited Access	Limited Access	Limited Access	Limited Access
[1] Cartway = Total width from outer edge of shoulders. [2] "Positive" median = natural features (ravines, rock outcrops, etc.) preclude median crossing							
[3] Highway Segment Locations:							
Highway	MP	Location					
I-78							
	1	7.0 Greenwich Township East of US Route 22					
	2	29.7 Bedminster west of I-287					
	3	40.4 Warren Township west of Interchange 40					
I-80							
	1	11.0 Hope Township					
	2	38.5 Denville Township					
	3	53.0 Fairfield Borough at Passaic River					
Source: NJDOT 2005 Straight Line Data.							



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traffic volumes in the I-80 corridor in that area. Median conditions along I-78, especially in the eastern portion, are more rural in nature (unprotected grass median) than comparable segments along I-80.

- **Highway Volumes Relative to I-78.** Highway volumes and patterns along this segment of I-80 are similar in many ways to those along I-78 – both have considerably higher volumes and congestion levels in the east than in the west, both include a tolled crossing of the Delaware River between PA and NJ, and both have significant truck volumes. Average daily traffic (ADT) weekday volumes along I-78 are roughly 65,000 – 75,000 in the western portion of the corridor and 100,000 – 105,000 in eastern Somerset County. In comparison, I-80 ADT volumes rise from 45,000 – 55,000 in western Warren County to 140,000 – 150,000 in sections of Morris and Essex Counties.³

Looking to reduce congestion along I-80 by increasing ridesharing and transit use, NJDOT implemented HOV lanes between Exit 34 (NJ 15) in Rockaway Township and Exit 43 (I-287) in Parsippany in March 1994, and similar HOV operations on I-287 between I-80 and I-78 in 1998 (see Figure 4-9). Both HOV operations (buses and 2+ cars) were limited to the morning and afternoon peak commuter periods. Based on their relatively light usage, especially along I-287, various groups called for the lanes' closure on both highways.

NJDOT assessed whether the HOV lanes (1) encouraged ridesharing; (2) handled the same or more persons per hour than the average general purpose lane; and (3) reduced congestion and air pollution. Based on those studies, NJDOT converted the HOV lanes to general purpose use after approximately four years of HOV operation on I-80 and 11 months on I-287. The lack of supporting facilities (e.g., park-and-ride lots), new transit or ridesharing services and media and public support during the lanes' implementation period were major factors in the lanes' ineffectiveness.⁴ FHWA issued *Program Guidance for HOV Operations* the year after the lanes' closure to help agencies avoid similar problems in planning and operating such facilities.

Figure 4-9: HOV Lanes in I-80 and I-287 Corridors



³ All highway ADT data are from NJDOT, *Coverage Count 5 Year AADT Comparison Report* (June 2005).

⁴ US DOT, FHWA, *Executive Edition: New Jersey I-80 and I-287 HOV Lane Case Study*. (Washington, DC, 2000).



- **Conclusions.** Travelers on these segments of I-78 and I-80 are generally not heading to and from New York City but rather to and from major employment and commercial centers in their respective sections of New Jersey. The I-78 corridor, while more rural in nature, has more rail and less bus service than the comparable communities along I-80. When considering ways to increase public transit use, both corridors have the traditional “many-to-many” trip pattern problems that smaller urban, suburban and rural areas must face when trying to support a shift from auto to transit use.

4.3 FREIGHT ACTIVITY

4.3.1 Overview

I-78 presently handles a high volume of trucks, and high growth rates in truck volumes are predicted for the future due to I-78's connections with Port Newark and Port Elizabeth in New Jersey and major container and rail terminals in Bethlehem, PA. In 2000, based on AM peak volumes, the I-78 corridor was classified as one of the highest volume truck segments in New Jersey, with more than 180 trucks per hour in the peak direction.⁵ High truck volumes add to congestion and delays as well as air pollution and a higher risk of traffic accidents. Addressing this problem with roadway capacity improvements is expensive and poses a wide range of environmental and land use consequences, while diversion of freight from truck to rail holds more promise. Switching freight to rail must contend with limited rail system capacity and market acceptance by freight shippers. Furthermore, dual freight/passenger use of rail lines in the region could offer a solution. The following is a quick review of freight conditions on I-78 and the freight activity levels on the major freight rail lines in the area, generally parallel to the I-78 corridor. Such freight movement issues are important to plans to increase transit use in the corridor, as (1) buses and cars must compete with the high volume of trucks in the corridor, and (2) growing rail freight demands can limit the ability to use existing rail freight corridors for joint freight/passenger operations.

4.3.2 Freight Transportation Modes in I-78 Corridor

Table 4-6 below shows the modal split between truck and rail freight movement in New Jersey in 2003, both by weight and by value of the commodity being transported. Table 4-7 shows the truck and rail freight movements that took place in New Jersey counties along the full length of the I-78 corridor in New Jersey – i.e., through Warren, Hunterdon, Somerset, Union, Essex, and Hudson Counties. About three-fourths of the freight tonnage in the I-78 corridor is carried by truck.

As shown in Table 4-6, freight in New Jersey, like in most of the US, moves primarily on highways -- 87% measured by weight and 91% measured by estimated value, with rail freight accounting for 13% by weight and 9% by estimated value. While truck volumes along I-78 are considerable, Table 4-7 indicates that overall freight movement in the I-78 corridor is somewhat more rail oriented, with only 79% by weight/87% by value going by truck and 21% by weight/13% by value going by rail – almost double the state average. This reflects the high level of activity on Norfolk Southern's Lehigh Line, which closely parallels I-78 to the Lehigh Valley, Harrisburg, Pittsburgh and beyond.

⁵ Cambridge Systematics, *NJTPA Freight System Performance Assessment* (April 2005)



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Table 4-6: Truck/Rail Freight Modal Split in New Jersey, 2003

Mode	Parameter	Inbound	Outbound	Inbound	Outbound	Avg. of Inbound and Outbound
		(Destinations)	(Origins)	(Destinations) %	(Origins) %	
Truck	By Weight (Short Tons)	103,873,482	117,584,251	82%	91%	87%
	By Value (\$ Billion)	262	232	88%	93%	91%
Rail	By Weight (Short Tons)	22,518,946	10,974,368	18%	9%	13%
	By Value (\$ Billion)	36.2	16.7	12%	7%	9%
Total	By Weight (Short Tons)	126,392,428	128,558,619	-	-	-
	By Value (\$ Billion)	298.2	248.7	-	-	-

Source: NJTPA, *Freight System Performance Assessment* (2005)

Table 4-7: Truck/Rail Freight Modal Split in I-78 Corridor, 2003

Mode	Parameter	Inbound	Outbound	Inbound	Outbound	Avg. of Inbound and Outbound
		(Destinations)	(Origins)	(Destinations) %	(Origins) %	
Truck	By Weight (Short Tons)	32,632,168	52,104,459	72%	87%	79%
	By Value (\$ Billion)	76	88	83%	90%	87%
Rail	By Weight (Short Tons)	12,519,364	8,044,384	28%	13%	21%
	By Value (\$ Billion)	15.5	9.5	17%	10%	13%
Total	By Weight (Short Tons)	45,151,532	60,148,843	-	-	-
	By Value (\$ Billion)	91.7	97.1	-	-	-

Source: NJTPA, *Freight System Performance Assessment* (2005)

- Existing Truck Freight Conditions.** I-78 serves as the primary route between New York City and the rapidly growing warehouse/distribution centers in eastern Pennsylvania. It is also a key connection from New York City to the I-81 corridor (near Harrisburg) that serves as a parallel “inland route” which is heavily used by trucks to bypass the congested urban centers along the I-95 corridor. Table 4-8 provides some data on truck volumes in the I-78 corridor.

These data, from NJDOT’s *TransCAD Freight Analysis Framework Network* (1998), compare truck and total traffic volumes on I-78 and other highways in the State.

Table 4-8: Existing Daily Truck and Traffic Volumes on I-78 and Other Interstates in NJ

	Traffic per Lane	Truck Per Lane	Truck %	% of State Truck Total	% of State Traffic Total
I-195	9,169	1,207	13.2%	5.5%	6.8%
I-276	11,357	961	8.5%	6.8%	5.4%
I-278	12,799	1,256	9.8%	7.7%	7.1%
I-280	14,131	1,661	11.8%	8.5%	9.4%
I-287	14,266	1,549	10.9%	8.6%	8.7%
I-295	11,151	1,536	13.8%	6.7%	8.7%
I-495	23,696	1,228	5.2%	14.3%	6.9%
I-676	10,932	1,431	13.1%	6.6%	8.1%
I-76	13,501	1,808	13.4%	8.1%	10.2%
I-78	14,584	1,419	9.7%	8.8%	8.0%
I-80	14,986	1,361	9.1%	9.0%	7.7%
I-95	15,277	2,319	15.2%	9.2%	13.1%
Statewide	165,847	17,735	11%	100%	100%

Source: Derived from NJDOT *Freight Analysis Framework Network* (1998)



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As shown in Table 4-8, I-78 over its entire length carries almost the same amounts of traffic (in terms of traffic per lane) as I-80, and slightly more truck traffic. That study further indicated that truck percentages vary from 8% to 16% of total traffic along I-78 – figures are highest in the western part of the corridor and decline in the east as the roadway becomes more heavily influenced by commuter-oriented traffic.

Figure 4-10 shows the existing daily traffic volumes along the I-78 corridor obtained from the NJ Congestion Management System, while Figure 4-11 shows the existing daily truck volumes along the corridor and the associated truck percentages. A summary of existing truck percentages on I-78 is also presented in Table 4-9. As shown in Table 4-9, the truck percentages along I-78 are dramatically higher in the western portion of the Study Area, including as high as 30% in the eastbound AM peak and 16% in the westbound PM peak in the Hunterdon County segment of the corridor.

Table 4-9: Existing Truck Percentages on I-78 Corridor [1]

MP	Daily 2-Way Truck %	AM Eastbound Truck %	PM Westbound Truck %
0-7.03	10.69	28.77	2.88
7.03-26.7	16.60	30.00	16.20
26.7-54.32	9.15	7.34	7.14
54.32-67.83	2.15	1.65	2.80

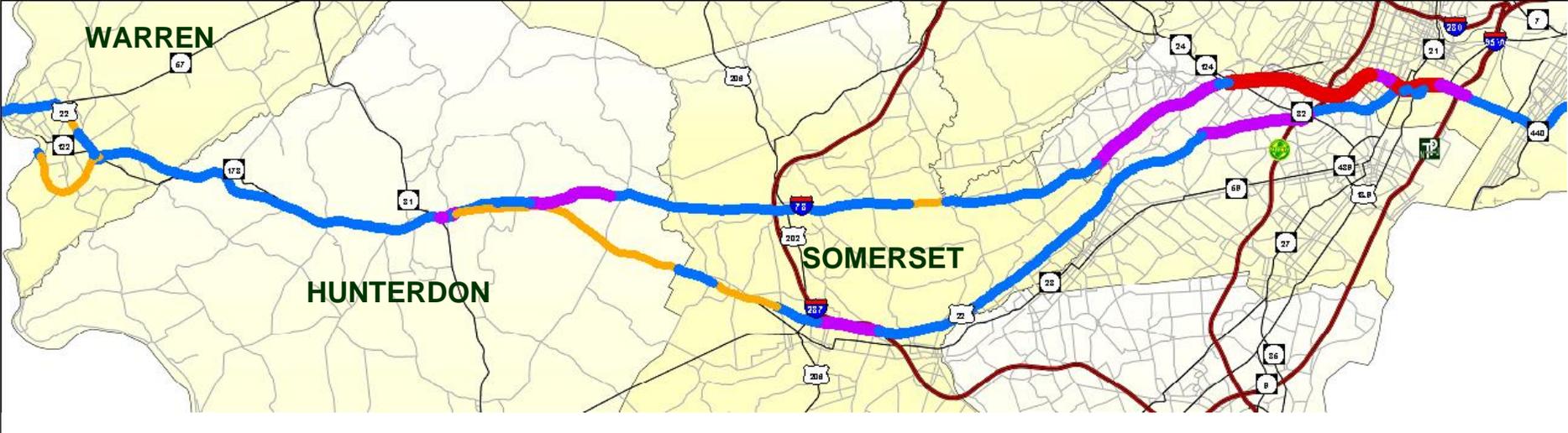
[1] MP = Milepost: 0-7 = primarily Warren County), 7 – 26 = Hunterdon County, 26 – 41 = Somerset County, 41 – 57 = Union/Essex Counties.

Source: NJDOT CMS Network (2006).

These high volumes play an important role in the rate of crashes in the corridor involving trucks. Truck involvement rates in crashes along I-78 in 2003 are plotted in Figure 4-12. As shown, higher truck involvement rates occur along the western portions of I-78, particularly between mileposts 0 and 42 – the range of the Study Area. This is consistent with the previously mentioned high truck percentages of total traffic volume in those sections. On 87% of the half-mile crash segments along I-78, a crash involving at least one truck occurred in 2003. The average rate of truck involvements in crashes on I-78 was 19% (i.e., out of 100 vehicle involvements, on average, 19 were trucks). Given that, about 49% of the half-mile crash segments had a truck involvement rate above the average (i.e., 19%). These statistics highlight the need to look beyond pure volume data and volume/capacity ratios when evaluating truck issues. These issues require careful consideration. High truck volumes in a corridor can influence accident rates, but a corridor's above-average truck involvement rate can reflect in part the corridor's high truck volumes, with trucks involved in accidents even when they are not at fault.



Figure 4-10:
Existing Traffic Volumes in the Corridor (Average Daily Totals)



Source: NJDOT, Congestion Management System database (2006).

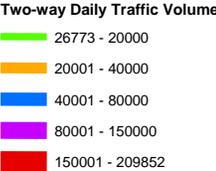
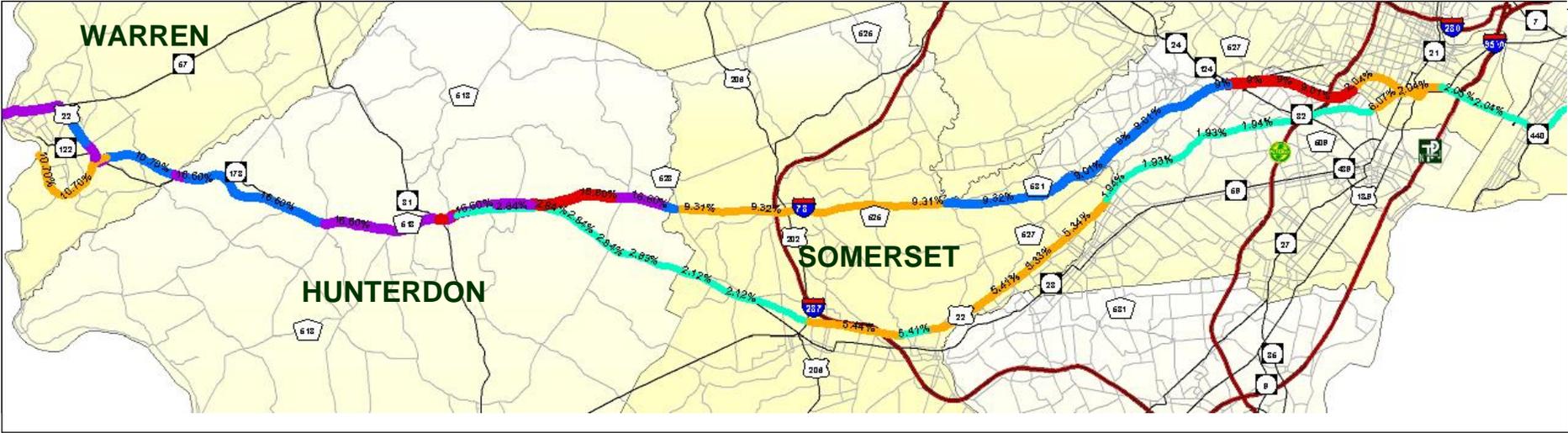
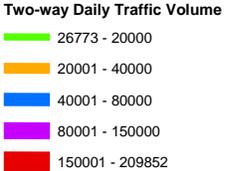


Figure 4-11:
 Existing Truck Volume (Average Daily Totals) and Percentages in the I-78 Corridor



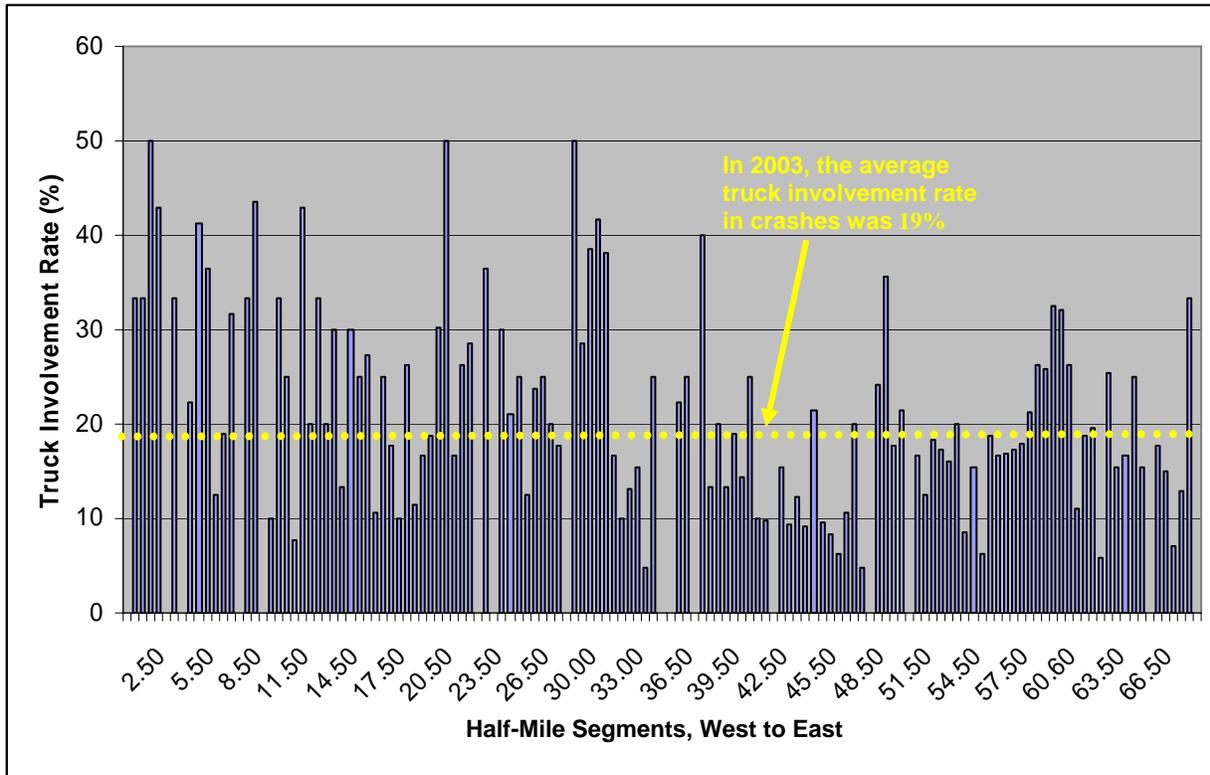
Source: NJDOT, Congestion Management System database (2006).



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Figure 4-12: Truck Involvement Rate in Crashes in I-78 Corridor in 2003



Source: NJTPA, *Development of Regional Safety Priorities* (2005)

- Existing Rail Freight Conditions.** Figure 4-13 shows the three major rail freight lines in the I-78 corridor. The Norfolk Southern (NS) Lehigh Line from Harrisburg, PA provides direct access to the Oak Island Yard and to Port Elizabeth Yard, Port Newark Yard and E Rail Terminal via the Elizabeth Industrial Track. This alignment, which is primarily used as a freight corridor, is single-track but with sufficient passing sidings to support bi-directional operation. The northern-most 13 miles of the Lehigh Line consist of a double-track alignment, which is shared with NJ Transit’s Raritan Valley Line passenger trains within the I-78 Corridor Transit Study Area. Train movement is controlled by the NS dispatcher as far as Aldene, where control then shifts to the NJ Transit dispatcher. Freight trains move at 40-50 mph along the length of the Lehigh Line. Tracks north of Cranford Junction are shared with 60 weekday NJ TRANSIT passenger trains.

CSX Corporation utilizes the Trenton Line for service from Philadelphia and points south and southwest. The Trenton Line joins with the Lehigh Line at Port Reading Junction, where trains operate either directly to Oak Island Yard or diverge at CP Bound Brook to the Port Reading Secondary (see Figure 4-14 for the location of these yards and connecting tracks). The Trenton Line includes 35 miles of single track and 22 miles of double-track alignments, handling speeds of 40-50 mph. The final leg of the journey to Oak Island Yard is either via the Lehigh Line or the Port Reading Secondary/Chemical Coast Secondary. The CSX Main Line dispatcher controls



Figure 4-13:
Existing Rail Freight Lines in I-78 Corridor

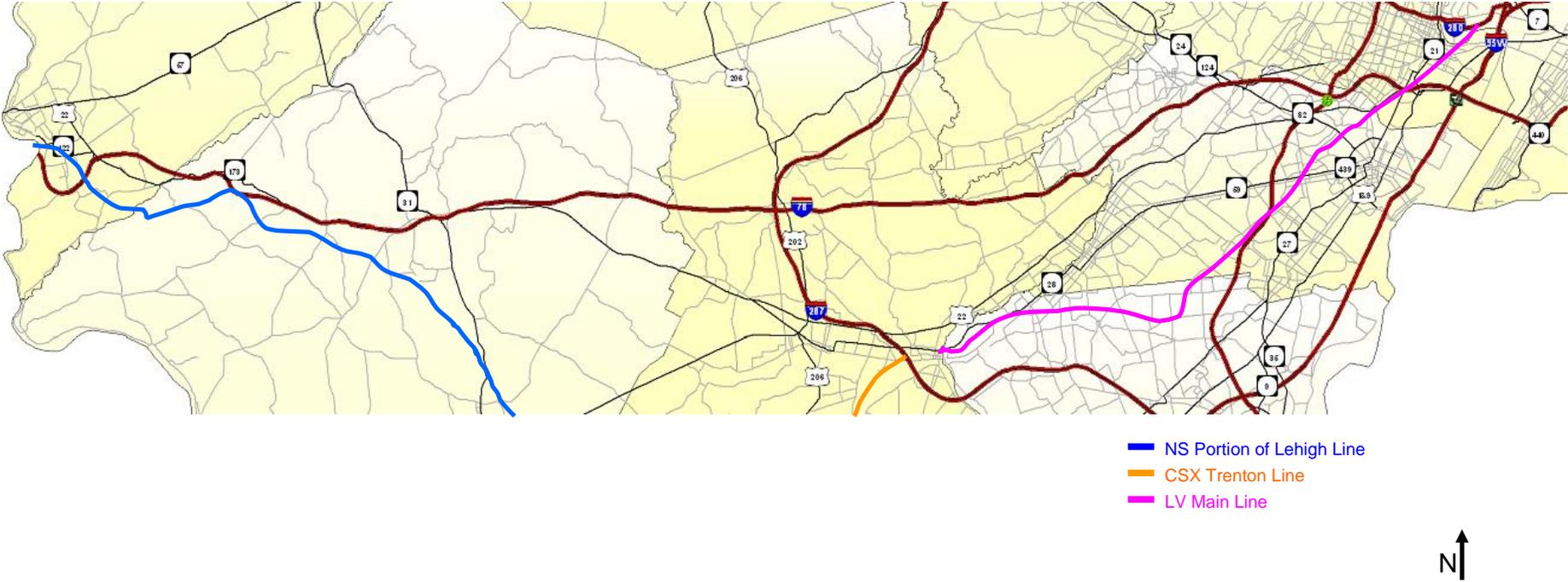
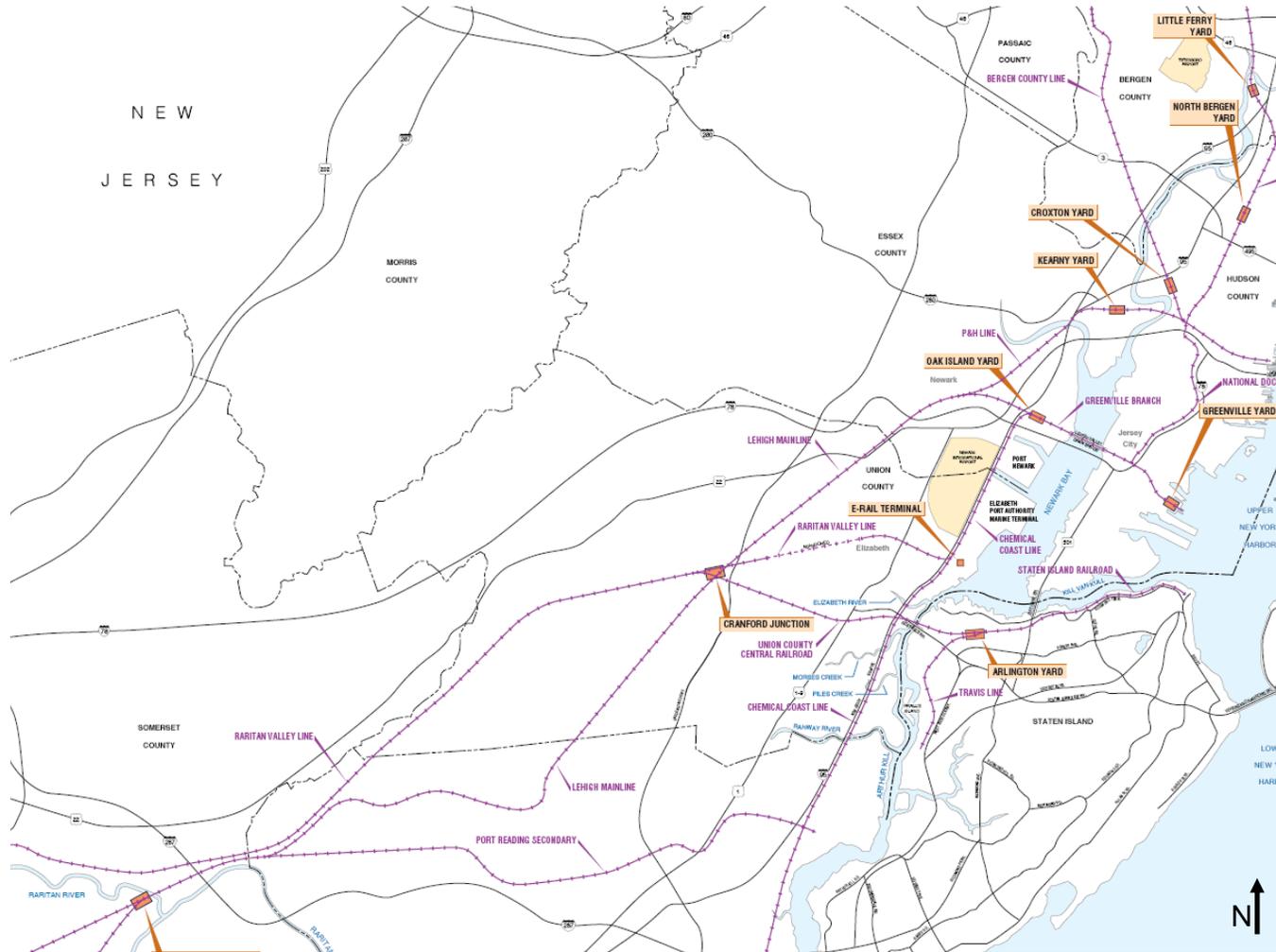


Figure 4-14:
Location of Rail Yards in Eastern New Jersey



Source: NYCEDC, Cross-Harbor Freight Study (2004)



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movements over the Trenton Line, while the NS dispatcher and the NJ Transit dispatcher control movements into Oak Island Yard.

In addition to the major corridors described above, the four-track Amtrak Northeast Corridor (NEC) is used for a small percentage of freight train movements. The NEC, however, carries 322 passenger trains (Amtrak and NJ Transit on weekdays, resulting in few opportunities for relatively slow freight train movements).

There are in excess of 10 train movements per week serving E-Rail Terminal. Service to Croxton Yard, which is owned by NS, is more frequent, with approximately 40 train movements per week.

There are frequent calls for more of the freight in the corridor to be handled by rail freight. However, the rail network needs to have the capacity to handle such a shift, above and beyond the otherwise-expected rise in rail demand. Table 4-10 shows the existing demand and capacity of major rail lines in the study area (as of 2003). As can be seen, by year 2025 rail demand is expected to increase. Without increases in capacity, the rail freight network will not be able to handle a significant shifting of freight from trucks.

Table 4-10: Existing and Future Rail Capacity and Demand within the Study Area (Through-Trains Only)

Year	Capacity and Demand	NS Lehigh Line*	CSX Trenton Line*	LV Main Line
2003	Existing Capacity (Trains/Day)	30-40	30	41 (single-track) 80-100 (double-track)
2003	Avg. Daily Demand (Freight Trains)	18	13	32
	Avg. Daily Demand (All Trains)	18	13	94
	Peak Demand	23	16	100
2025	Avg. Daily Demand (Freight Trains)	36	23	60
	Avg. Daily Demand (All Trains)	36	23	120
	Peak Demand	45	29	135
2003-2025 Growth	Avg. Daily Demand (Freight Trains)	100%	77%	88%
	Avg. Daily Demand (All Trains)	100%	77%	28%
	Peak Demand	96%	81%	35%

* Includes through-trains only.

Source: NJTPA Freight System Performance Assessment (2005)

Further, just as Smart Growth type planning and actions are needed to make transit more accessible and efficient, similar Smart Growth planning is needed in the long run to make rail freight more competitive. This includes improving the efficiency of "close-in" railyards (i.e., those nearest to major freight trip generators and attractors) as well as planning for rail yards that allow appropriate heavy-freight users (e.g., warehousing) convenient rail access and increase the potential for truck-rail and water-rail intermodal connections.



- **Conclusions.** Other studies have looked, and are continuing to look in much greater detail at the freight system challenges both statewide and along the I-78 corridor. The present I-78 study's focus is on opportunities to increase public transit usage to more efficiently handle trips in this corridor. Given that, a review of the available data, discussions with public and private sector stateholders in various outreach meetings, and comments received from respondents to the study's web-based survey all confirm the importance of truck freight as a traffic and safety issue in the I-78 corridor.

The present freight patterns and rail and highway system conditions reflect the results of decades of land use, economic development and transportation system decisions made by private and public sector interests at the local, state, nation and even international level. In the next phases of this project, when actions are being recommended to increase public transit use, some attention will be focuses on the parallel efforts to move freight more efficiently. Some of the same "Smart Growth" concepts that can make transit more accessible to travelers and focus future growth around transit nodes have similar actions that can increase rail and intermodal possibilities for shippers.



**Section 5
Public Outreach**



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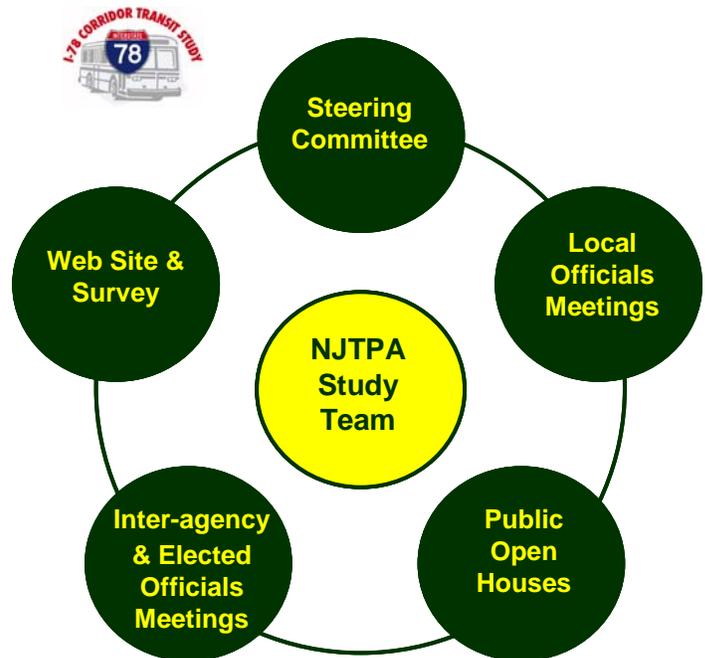
**SECTION 5
PUBLIC OUTREACH**

5.1 OVERVIEW OF OUTREACH

The I-78 Corridor Transit Study included a very comprehensive and innovative public outreach program. As shown in Figure 5-1, the plan called for the following:

- A **Steering Committee** comprised of representatives from NJTPA, NJ Transit, NJDOT, the Lehigh Valley Planning Commission (LVPC), the Delaware River Joint Bridge Toll Commission (DRJBTC) and other transportation agencies and stakeholders, including Freeholders from the three New Jersey counties and representatives of local county agencies. The role of the Committee was to guide the overall study effort, provide data and other support, and critique the Study’s work products and findings.
- A **Web-Based Survey** to obtain extensive information from users of the corridor on their perceptions of the problems the corridors faced, improvements needed and their feelings about existing transit service in the corridor.
- A **Project Website** to distribute current information to the public, other agencies and interested parties and keep them apprised of the Study’s progress and early findings.
- **Local Officials Meetings** – three rounds of meetings were held in Warren, Somerset and Hunterdon Counties, with county and municipal officials and agencies, to allow the team to spend more time with the on-the-ground planning issues and concerns.
- **Public Open Houses**, three separate meetings – one in each of the three New Jersey counties – were held. The open house format allowed attendees to walk around to “stations” covering different topics, discuss issues informally with team members, and then provide comments and ask questions during brief presentations by the study team. Attendance was moderate but very involved, with extensive participation by local elected officials.
- **Other Meetings**, involving small, focused interagency meetings and discussions with elected officials were also conducted.

Figure 5.1: Public Outreach Components



This outreach approach allowed for extensive public involvement in all phases of the Study but enabled local officials and agency representatives to go into greater depth with the Study Team on issues affecting their



communities. The following sections provide more details on the results of these efforts.

5.2 WEB-BASED SURVEY

Section 3,7 of this report included an extensive presentation of the format, intent and results of the web-based survey. Not intended as a scientific survey instrument, the main goal was to provide an easy way for regular users of the corridor (in cars, buses or trains) to:

- comment on the corridor’s problems;
- provide a profile of their corridor travel patterns (frequency, time of day, trip purpose, mode of travel, origin and destinations);
- provide their opinions as to what transit improvements were needed and (for admitted non-users of corridor transit services) what improvements might get them to consider transit as an alternative; and
- provide some feedback on their reactions to higher fuel prices (which has initially spiked up in Fall 2005, right before the survey occurred in early 2006).

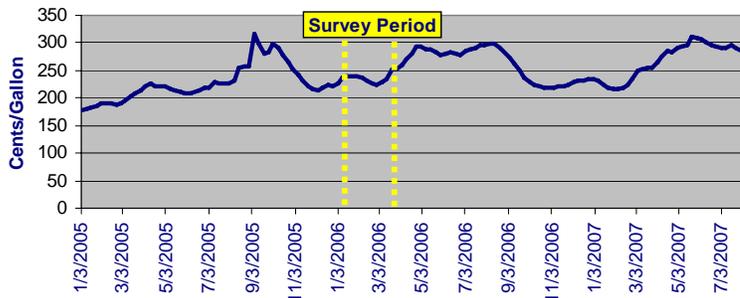
The findings of the survey, as presented in Section 3.7 of this report, provided a wealth of information – the equivalent of holding a public meeting and having 5,000 people attend and fill out detailed questionnaires. Some of the comments supported what the study team already understood and the Steering Committee had pointed out as key issues, such as:

- There is extensive congestion during peak hours -- mentioned by almost 90% of the respondents that regularly drive in the corridor;
- The high volume of trucks pose a safety problem -- over two-thirds mentioned this; and
- Aggressive drivers pose a problem for other drivers -- over half mentioned this concern.

At the same time, some issues were not expected to rank as highly as they did – e.g., slightly over half of the regular corridor drivers cited poor pavement conditions on I-78. In the months before the survey was activated in January 2006, gasoline prices had risen to the \$3 range (see Figure 5-2). When asked in the survey about their reaction to this, very few people mentioned any change in travel patterns due to the recent spike in gasoline prices.

Some of the most critically important responses and overall feedback from the survey were also in many ways the most obvious, particularly in the area of transit services and the potential to attract riders from those who readily admitted they rarely used any transit services in the corridor. The responses confirmed that reasonably

Figure 5-2:
Retail Gasoline Prices (East Coast USA) Jan. 2005 – July 2007.



Source: US Department of Energy, 2007



scheduled service that took people conveniently close to their destinations was necessary to make any serious inroads into the auto-driving population. This reinforced the Study Team’s focus on identifying and testing options that could meet this difficult but reasonable goal.

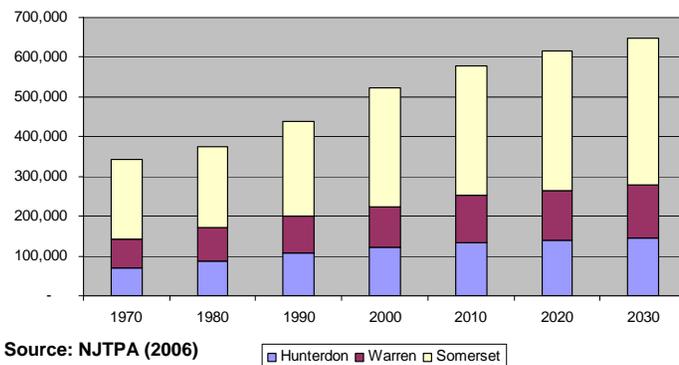
5.3 LOCAL OFFICIAL MEETINGS

As noted above, county and elected officials were represented on the Study’s Steering Committee, which met at key timelines throughout the Study (e.g., after existing conditions studies were completed, before all public meetings, etc.). The goal was for committee members to bring local and county-wide concerns and comments to these meetings, and report back to their constituents regarding the Study’s progress, upcoming events, available reports and other information and news. However, as the Study began to identify specific corridors and locations for everything from new bus service to possible park-and-ride lots or transit hubs, it became clear that another round of meetings focused more on local concerns was needed. After an initial set of more informal local meetings were held in March 2006, a formal round of meetings with local officials in Warren, Hunterdon and Somerset Counties was held in September 2006 and May 2007. Each meeting would start with an overview of the overall Study and concepts under consideration along the entire corridor, but discussion would then focus on proposals involving local communities within that county.

These meetings, more than any other aspect of the Study’s public outreach efforts, brought about some significant changes in how certain analyses were being completed, and what would likely be recommended at the Study’s end. The following are two important results:

- Impact of Projected Growth on Study Recommendations.** New Jersey has an innovative method of establishing both growth projections and the planning behind them. After the State’s Office of Smart Growth establishes draft projections, a State Plan “cross-acceptance” process is carried out to obtain the comments and agreement of local and county officials. The process essentially compares local and county land use and infrastructure plans with a statewide policy plan called the “State Development and Redevelopment Plan.” At the time when the study team was beginning to define preliminary improvement concepts (July 2006), this cross-acceptance process was on-going for the latest State Plan. The I-78 Corridor Transit Study, following standard guidelines for these types of studies, was using NJTPA’s 30-year projections (see Figure 5-3) as the basis for its modeling efforts. Those projections called for continued growth along much of the corridor’s three New Jersey counties, and particularly in the same areas in which the State Plan was also projecting growth.

Figure 5-3: Population Growth: 1970-2030



In the Local Officials meetings, local and county officials in Hunterdon County indicated their opposition in the State Plan to (1) the designation of major portions of the county (especially along the I-78 corridor) as “Suburban” areas in which future growth was projected to be concentrated, and (2) the overall level of growth in population and employment. Given this, they were concerned that the I-78 Corridor Transit Study’s recommendations, based on NJTPA’s growth projections which were similar to those in the State Plan, would call for transportation facilities (including a possible transit hub in Clinton) that would be larger than necessary and would induce more growth.

In response to these comments, NJTPA agreed that the Study Team would (1) work with the counties in question to define what they considered to be more reasonable 20-30 year projections than those projected by NJTPA, and (2) do the Study’s modeling runs with both the original projections and the agreed to “lower-growth” projections. This process did not circumvent the ongoing cross-acceptance process but instead allowed these officials to see how sensitive the projected transportation conditions and associated recommendations were to changes in these projections.

- **Mid-Hunterdon and Warren County Transportation Hubs.** As discussed in Section 7, the study is recommending new park-and-ride facilities in both Warren and Hunterdon Counties. The Local Officials meeting process enabled the team to work closely with county and local officials in Warren County, and specifically those in the Borough of Alpha, to discuss the concept in greater detail, identify possible locations and discuss related concepts like transit-oriented development and the overall relation to the surrounding street network and neighborhoods. In Hunterdon, the extensive and valuable interactions with local stakeholders and officials made possible by the Local Officials Meeting format clarified that while such a facility was most likely needed in the long term, local concerns, consistency with local land use and growth policies precluded the Study Team’s ability to make specific recommendations on such a facility at this time. Instead, the team recommended that local coordination continue and that further study is needed.

5.4 PUBLIC MEETINGS

As noted above, the original outreach plan that called for two rounds of public meetings was revised based on the success of the web-based survey and the decision to depend more on the Steering Committee and Local Officials meetings, as well as discussions with other stakeholders to inform and receive initial comments from the public, was made. The revised approach called for a single round of open house-style public meetings, which were held in May 2007 in Somerset, Warren and Hunterdon Counties. Each of the meetings were held in large open areas (cafeteria, gymnasium) in which people could walk around to various “stations” that had boards covering various topics (e.g., Web-Based Survey Results, Existing Traffic Conditions) and Study Team members were present to discuss those and other topics. Notes were taken of general topics and issues raised, and attendees were also asked to fill in comment sheets and either leave them or send them in later (see Section 5.5 below for a summary of these comments). There was also a brief informal presentation by the Study Team, followed by a questions-and-answers (Q&A) period. At each meeting, County Freeholders representing the county the meeting was being held in led off the Study Team’s presentation



and participated in the Q&A discussion. While attendance levels were moderate, attendees were well-informed about the issues, understood the concepts being discussed and had valuable thoughts and insights into how to best implement these and other improvements.

In addition to these public meetings, the study team developed and placed on its website a slideshow of the study's preliminary recommendations, similar to the information discussed at these meetings (see Figure 5-4). Reviewers on the web were also asked to email any comments or suggestions they might have on these recommendations, continuing the valuable use of the web as an outreach tool.

This same presentation tool was offered to members of the Steering Committee to use in making follow-up presentation to their various constituents or other groups (e.g., presentations to major employers to get them to participate more in ride-sharing, trip-reduction and transit use programs).

Figure 5-4:
Web Site Presentation of Study Recommendations



5.5 SUMMARY OF PUBLIC COMMENTS RECEIVED

At the three public meetings, much of the feedback from the public came during informal discussions with team members standing at each of the topic stations. Often the staff would walk with a small group of persons from station to station, briefly discussing each topic and staying longer at those of more interest to the attendees. Most of the discussions were about the proposed recommendations (as presented in Sections 6 and 7), how they would be implemented and when, and whether they would be effective (e.g., would they use a proposed transit service). The following is a general breakdown of the types of comments made and topics raised by attendees and by people emailing in comments to the website:

Proposed Express Bus Service in I-78 / US Route 22 Corridors

- People won't use those services (taking people to major employment centers in Somerset County along US Route 22) because:
 - Service won't be sufficiently frequent;
 - There won't be options for those that stay late (the concept of "guaranteed ride home" that is often used by major employers was discussed);
 - Working hours are becoming more scattered with more outsourcing, people working at home, etc.;
 - It will be hard to connect people from the bus stops along US Route 22 to the buildings in which they work, as distances are too great and can't slow buses down by providing drop-off service at each building; and

- Need to provide sufficient convenient stops at/near employment centers in Somerset for this type of service to make a dent in auto use.

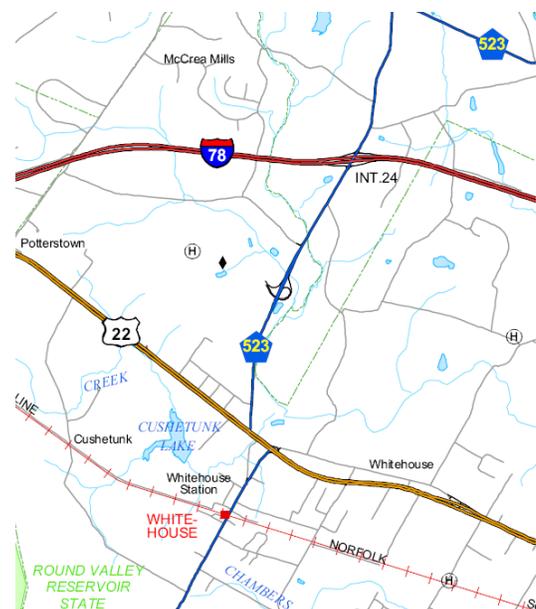
HOV Lanes

- Should consider using contra-flow lane on I-78 to speed up buses through congested areas in Hunterdon and Somerset Counties.
- HOV lanes are often not successful due to enforcement problems.
- Should consider using the service roads from Bloomsbury to Clinton Station as exclusive bus lanes, with local traffic using other roadways.

Congestion and Safety Levels on I-78 and Other Roads

- I-78 is congested in peak as always but congestion is now extending more into the off-peak periods and is definitely increasing every year.
- County Route 523, especially in I-78 / US Route 22 area (see Figure 5-5) is often the most congested roadway in Hunterdon.
- Safety is a major issue, and State should emphasize this when it pushes for new bus and rail transit plans.

**Figure 5-5:
Route 523 between I-78 and Route 22**



Other Questions & Suggestions on New or Improved Transit Services

- Flemington Cut Glass would support 30-40 passenger per day.
- Remember to include smaller employers in discussions of new service.
- Who would operate the new bus services?
- Should consider rail passenger service from Hackettstown to Phillipsburg via the Washington Secondary line.
- State should improve Tran-Bridge Service at Clinton Point as service is often late.
- Should consider high-speed rail service from Scranton to Penn Station Newark.
- Rail service concepts being considered (extension to Phillipsburg) won't address major source of congestion – traffic coming from Lehigh Valley.
- How about a monorail from PA to New York City – State already owns the land and it would be attractive to commuters and could be built in stages.
- There is an unmet demand out of High Bridge Station for better, limited-stop express service into Newark/New York City.
- Existing and new express bus service to NYC should include stop at Penn Station Newark with connections to PATH, Newark Light Rail, etc.



Carpools and Vanpools

- New park-and-ride facilities for vanpools and carpools are needed, as they'll often attract more travelers out of cars than transit service.
- Greater dependence on carpooling will have more of an impact on traffic than new bus service.

Park-and-Ride Facilities

- Should consider using the new weight station for park-and-ride users as well.
- Improve former pedestrian connection to Clinton Point park-and-ride.
- Consideration of possible major park-and-ride/Transit Hub in Bloomsbury is premature and requires considerably more public input and study before further decisions are made.
- Should not allow drivers from the west (PA) to use facility at Clinton Point.
- Consider charging for parking at Clinton Point (due to crowding).

Truck Freight Issues

- Need major effort to reduce the use of I-78 by trucks, mainly through shift to rail freight.
- Slow-moving trucks (especially in congested stop-and-go traffic) are major source of delay. (This is an argument for truck climbing lanes.)
- Should consider charging trucks higher tolls on all tolled crossings and roadways to help reduce traffic and force shift to rail.
- Should make sure that trucks don't get off I-78 just upstream from new weight station to avoid station. Traffic is much better when station is in operation (as it removes trucks).
- State should consider banning trucks from I-78 during morning and afternoon peak periods on weekdays.

Bus-on-Shoulder Concept

- State should seriously review safety issues associated with bus-on-shoulder operations. (In response, it was noted that on present US Route 9 operation by NJ Transit and NJDOT, buses are limited to 35 MPH, and for proposed US Route 22 application would only have it for short distances in congested areas.)



Highway and Interchange Improvements

- Should consider completing the interchange at Exit 20 (Cokesbury Road). Presently takes 10 minutes to get from Lebanon to I-78.
- Should consider widening I-78 out to PA Turnpike Extension (I-476) with peak period Bus/HOV lane.
- Widening I-78 won't work, as land is hard to get and concept will be broadly opposed.
- Should improve connection from I-78 to NJ Route 31 and exiting I-78 onto US Route 22 in Annandale, as both are major sources of local congestion.
- Improve US Route 22 from Annandale to Somerville as viable option to I-78, and improve connection at Interchange 18 from I-78 to US Route 22.
- Adding a climbing lane on I-78 EB east of Interchange 18 is a good idea, but should do it on both sides to deal with high volume of slow-moving trucks.

Land Use/Planning Issues

- Need to coordinate these issues with local land use planning and policies, as scattered development with no town centers exacerbates the problems and makes it harder to support transit.
- We value the beauty of Hunterdon County and rapid growth is ruining it. Public transit and land use planning would allow more of the beauty to be preserved.



**Section 6
Evaluation Methods**



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SECTION 6 EVALUATION METHODS

6.1 INTRODUCTION

Transportation improvement needs in the I-78 corridor, and strategies to address these needs, were identified through a mix of technical analysis and public input as described in the previous sections of this report. These needs and strategies are in direct response to the key goals of the Study, which are to:

- Reduce traffic volumes in the corridor by reducing the share of corridor travel handled by automobiles, especially by single-occupant vehicles.
- Reduce congestion along I-78 and other key roadways (e.g., US Route 22, NJ Route 31).
- Propose transit service improvements that serve those travel markets with sufficient numbers of potential transit passengers to make conventional transit service feasible, and to support shared ride (car pools, van pools, and other VMT-reducing efforts of the TMAs).
- Provide additional park-and-ride spaces in locations and with sufficient number of spaces to provide the density of passengers needed to support conventional bus and/or rail transit operations, and to provide additional parking for car pool and van pool commuters.
- Locate additional park-and-ride facilities and initiate new or expanded transit operations “upstream” of congested highway locations, avoiding the need to draw those travelers through already congested areas.
- Ensure that new transit services and the park-and-ride facilities where passengers will access them do not create undue traffic congestion or related environmental problems on local streets and arterials surrounding those facilities.
- Consider the use of relatively low cost, effective bus improvement treatments such as the use of roadway shoulders for buses to bypass congestion or bus signal pre-emption.
- Consider proposals that are consistent with local, county and Statewide land use plans, and look for ways to support the goals and intent of those plans. Develop transit improvement concepts that can be incorporated into subsequent plans as appropriate.
- Develop proposals that are consistent with key environmental regulations in the corridor, including the NJ Highlands Preservation Act regulations and the NJ Development and Redevelopment Plan.
- Involve key corridor stakeholders and the public throughout the planning process, as well as local agencies and elected officials. The result of this coordination and collaborative planning will be proposals with the greatest chance for further development and implementation.



- Produce a comprehensive, consensus-based set of transit enhancement and highway solutions that will increase the transit share of trips in the corridor now and in the future.

In this Section the development of improvement alternatives is discussed, and the process and findings of alternatives evaluation are presented.

6.2 TRAVEL FORECASTING METHODOLOGY

Underlying the development and assessment of improvement alternatives is a process for forecasting travel demands in the corridor, and for estimating travelers' responses to anticipated or proposed changes. This process relied on the North Jersey Transit Demand Forecasting Model (NJTDFM), which has been developed and maintained by NJ TRANSIT for the specific purpose of forecasting and analyzing the multi-modal transportation system of northern New Jersey.

The standard NJTDFM has been used extensively by NJ TRANSIT in other portions of the NJ TRANSIT service area to analyze major corridor projects such as the Middlesex-Ocean-Monmouth Rail Study and the Lackawanna Cutoff Passenger Service Restoration Project. The model that was used for those studies was obtained and applied to this study. The NJTDFM had been modified and extended to include eight counties in northeastern Pennsylvania. It contained estimates of population, households and employment for the years 2002 and 2025 for those eight counties plus the 14 counties of northern New Jersey (the NJTPA region plus Mercer County) and several New York counties.

Ridership forecasting assumptions embedded in this baseline model include:

- Pennsylvania county forecasts were developed by Pennsylvania Department of Environmental Protection (PADEP);
- New York forecasts used New York Metropolitan Transportation Council (NYMTC) 2004 forecasts for New York counties;
- North Jersey Transportation Planning Authority (NJTPA) 2004 forecasts for NJ counties. Incorporation of the NJTPA forecasts into the NJ TRANSIT travel model predated slightly the adoption of official demographic forecasts by NJTPA, and therefore the model trip tables were updated as discussed below to reflect currently adopted totals;
- 2000 Census Journey to Work data was used to estimate trips to Manhattan and other points from the Pennsylvania portion of the Study Area as a base; these were supplemented with 2002 bus survey data for riders to Manhattan. Further adjustments were made for this study as described below;
- Future growth was factored in to develop estimates for 2025 No-Build work trips;
- Non-work trips were factored in, based on 1990 relationships between work and non-work trips from the Study Area, and factored to 2000 using Census and other data;
- NJ TRANSIT rail fares were extended to Scranton to encompass the proposed Lackawanna Cutoff passenger rail project;



- Parking costs were assumed to be \$1 per day or less at stations, with no parking capacity constraint;
- 2002 bus schedules for Martz and Lakeland were added and updated;
- Travel times do not consider any capacity constraints on railroad;
- The highway network was extended to Pennsylvania origins and updated; and
- The ARC Build Alternative rail service plan was assumed in the baseline model.

For the I-78 Corridor Transit Study a number of additional enhancements were made to the above baseline NJTDFM. These included:

- Highway networks in the I-78 corridor were updated and recoded to provide interchange detail, and to update other significant geometric features such as number of lanes, capacities, and free-flow speeds;
- Transit networks were updated to reflect additional service and current schedules in the I-78 corridor (Trans-Bridge, Bieber, NJ TRANSIT, various shuttles);
- Transit fares in the I-78 corridor were updated to 2005 levels;
- Population, households and employment were updated to NJTPA adopted base year (2004) totals. An additional demographic set, the Suggested Condition, was prepared during the study in response to public and interagency comment;
- Trip tables were interpolated and extrapolated to 2005 (base) and 2030, accounting for the above demographic sets;
- Various adjustments were made to the demand and mode choice modules to better reflect the long-distance aspect of trips originating in Pennsylvania;
- Further adjustments were made to the trip tables, using origin / destination survey data developed for the I-78 study (described below). These adjustments were applied to both the work and non-work purposes;
- Delaware River bridge tolls were updated at all crossings under the jurisdiction of the Delaware River Joint Toll Bridge Commission (DRJTBC); and
- Highway network loadings were recalibrated to reflect current ground counts in the I-78 corridor.

The result of this work was an improved NJTDFM that includes greater detail in the suburban areas of the I-78 corridor, enabling it to more accurately address the suburban mobility initiatives that were the focus of this study.

6.3 DEMOGRAPHICS

Demographic forecasts provide the basis for estimating future travel demands. The I-78 Corridor Transit Study is using NJ Transit's North Jersey Transit Demand Forecasting Model (NJTDFM) to estimate travel demand along the corridor by mode, and to test alternative improvement scenarios. Population and households at the place of residence, and employment at the place of work are the specific measures used to reflect growth within communities and for computing growth in travel demand. Tables 6-1, 6-2, and 6-3 present the adopted population, household and employment projections used in the Study's initial modeling efforts.



I-78 CORRIDOR TRANSIT STUDY

Section 6: Evaluation Methods

Table 6-1: Base Year and Future Population Estimates

NUTPA REGION		NUTPA ADOPTED POPULATION FORECASTS					SUGGESTED REVISED POPULATION FORECAST		
County Name	MCD Name	2000 Population	2005 Population	2005 Rev. Population	2030 Population	Change 2005 to 2030	2030 Population	Change 2005 to 2030	
Hunterdon County	Alexandria township	4,700	5,110	5,110	6,190	1,080	6,190	1,080	
	Bethlehem township	3,820	3,850	3,850	4,230	380	4,230	380	
	Bloomsbury borough	890	890	890	890	0	890	0	
	Calton borough	1,060	1,060	1,060	1,090	30	1,090	30	
	Clinton town	2,630	2,650	2,650	2,780	130	2,780	130	
	Clinton township	12,960	14,630	14,630	17,940	3,310	13,630	-781	
	Glen Gardner borough	1,900	1,910	1,910	1,910	0	1,910	0	
	Hampton borough	1,550	1,600	1,600	1,600	0	1,600	0	
	High Bridge borough	3,780	3,770	3,770	3,800	30	3,800	30	
	Holland township	5,120	5,310	5,310	5,880	560	5,880	560	
	Lebanon borough	1,070	1,210	1,210	1,430	220	1,430	220	
	Lebanon township	5,820	6,100	6,100	6,300	200	6,300	200	
	Readington township	15,800	16,330	16,330	18,490	2,160	18,490	2,160	
	Tewksbury township	5,540	6,030	6,030	6,990	960	6,990	960	
	Union township	6,160	6,530	6,530	7,290	760	7,290	760	
	Subtotal - I-78 Study Area		72,800	76,980	76,980	86,790	9,810	82,669	5,719
	Remainder		49,200	53,720	53,720	59,710	5,990	59,710	5,990
Hunterdon County Totals		122,000	130,700	130,700	146,500	15,800	142,409	11,709	
Somerset County	Bedminster township	8,300	8,310	8,310	8,850	540	8,850	540	
	Bernards township	24,580	27,380	27,380	28,970	1,590	28,970	1,590	
	Bernardsville borough	7,350	7,700	7,700	9,020	1,320	9,020	1,320	
	Bound Brook borough	10,160	10,150	10,150	12,330	2,180	12,330	2,180	
	Branchburg township	14,570	14,850	14,850	16,740	1,890	16,740	1,890	
	Bridgewater township	42,940	44,750	44,750	48,040	3,290	48,040	3,290	
	Far Hills borough	860	880	880	1,030	140	1,030	140	
	Prospect and Gladstone borough	2,430	2,470	2,470	3,540	1,070	3,540	1,070	
	Raritan borough	6,340	6,370	6,370	7,550	1,180	7,550	1,180	
	Somerville borough	12,420	12,690	12,690	14,760	2,070	14,760	2,070	
	Warren township	14,260	16,070	16,070	18,470	2,400	18,470	2,400	
	Watchung borough	5,610	5,820	5,820	6,350	530	6,350	530	
	Subtotal - I-78 Study Area		149,620	157,450	157,450	175,650	18,200	175,650	18,200
	Remainder		147,680	158,450	158,450	191,450	33,000	191,450	33,000
	Somerset County Totals		297,500	315,900	315,900	367,100	51,200	367,100	51,200
	Warren County	Alpha borough	2,480	2,530	2,530	3,110	580	3,110	580
		Greenwich township	4,370	5,360	5,360	6,410	1,050	6,410	1,050
Lopatcong township		5,770	8,020	8,020	8,790	770	8,790	770	
Phillipsburg town		15,170	15,350	15,350	16,860	1,510	16,860	1,510	
Philmont township		3,420	3,480	3,480	5,690	2,210	5,690	2,210	
Washington borough		6,710	7,000	7,000	8,340	1,340	8,340	1,340	
Washington township		6,250	6,790	6,790	8,100	1,310	8,100	1,310	
Subtotal - I-78 Study Area			44,170	48,530	48,530	57,300	8,770	57,300	8,770
Remainder			58,230	62,870	62,870	76,100	13,230	76,100	13,230
Warren County Totals			102,400	111,400	111,400	133,400	22,000	133,400	22,000
I-78 Study Area Totals		266,790	282,960	282,960	319,740	36,780	315,649	32,689	
Hunterdon / Somerset / Warren Totals		521,900	558,000	558,000	647,000	89,000	642,909	84,909	
NUTPA Regional Totals		6,311,000	6,554,200	6,554,200	7,619,600	1,065,400	7,615,509	1,061,309	
LVPC REGION		NUTPA ADOPTED POPULATION FORECASTS					SUGGESTED REVISED		
County Name	MCD Name	2000 Population	2005 Population	2005 Rev. Population	2030 Population	Change 2005 to 2030	2030 Population	Change 2005 to 2030	
Lehigh County	Allentown	106,612	106,632	106,632	106,673	41	107,963	1,331	
	Bethlehem	19,029	19,029	19,029	19,029	0	20,188	1,159	
	Emmus	11,313	11,313	11,313	11,313	0	11,448	133	
	Fountain Hill	4,614	4,614	4,614	4,614	0	4,548	-67	
	Lower Macungie	19,220	21,297	21,297	32,938	11,669	49,481	28,184	
	Salisbury	13,498	13,543	13,543	13,987	444	14,975	1,332	
	South Whitehall	18,028	18,865	18,865	23,005	4,140	23,281	4,415	
	Upper Macungie	13,895	15,716	15,716	24,002	8,287	27,468	11,783	
	Upper Saucon	11,938	12,669	12,669	16,313	3,645	20,747	8,079	
	Subtotal - I-78 Study Area		218,148	223,677	223,677	251,902	28,225	280,025	56,348
Remainder		93,942	97,144	97,144	110,558	13,414	122,073	24,929	
Lehigh County Totals		312,090	320,821	320,821	362,460	41,639	402,098	81,277	
Northampton County	Bethlehem	52,300	52,319	52,319	52,357	38	56,642	4,323	
	Bethlehem Twp	21,171	22,635	22,635	30,572	7,937	33,508	10,873	
	Easton	26,263	26,268	26,268	26,293	26	26,200	-22	
	Forks	8,419	9,481	9,481	17,556	8,075	27,976	18,495	
	Freemansburg	1,897	2,008	2,008	2,659	652	2,488	481	
	Glendon	367	368	368	368	1	357	-11	
	Hillertown	5,606	5,606	5,606	5,606	0	5,638	32	
	Lower Nazareth	5,258	6,148	6,148	10,142	3,994	8,838	2,691	
	Lower Saucon	9,884	10,409	10,409	12,573	2,165	15,023	4,614	
	Palmer	16,809	17,597	17,597	23,240	5,644	25,584	7,988	
	West Easton	1,152	1,152	1,152	1,152	0	1,216	63	
	Williams	4,470	4,915	4,915	7,131	2,217	9,915	5,000	
	Wilson	7,682	7,682	7,682	7,682	0	7,931	249	
Subtotal - I-78 Study Area		161,279	166,585	166,585	197,331	30,746	221,204	54,619	
Remainder		105,787	112,408	112,408	144,187	31,780	149,579	37,171	
Northampton County Totals		267,066	278,993	278,993	341,518	62,526	370,783	91,790	
I-78 Study Area Total		379,427	390,262	390,262	449,233	58,971	501,229	110,967	
LVPC Region Total		579,156	599,814	599,814	703,978	104,165	772,880	772,880	
NJ & PA Region									
	I-78 Study Area	646,217	673,222	673,222	768,973	95,751	816,878	143,656	
	5-County Region	1,101,056	1,157,814	1,157,814	1,350,978	193,165	1,415,789	257,976	

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Table 6-2: Base Year and Future Household Estimates

NUTPA REGION		NUTPA ADOPTED HOUSEHOLD FORECASTS					SUGGESTED REVISED HOUSEHOLD FORECAST		
County Name	MCD Name	2000 Households	2005 Households	2005 Rev. Households	2030 Households	Change 2005 to 2030	2030 Households	Change 2005 to 2030	
Hunterdon County	Alexandria township	1,540	1,620	1,620	2,040	420	2,040	420	
	Bethlehem township	1,270	1,280	1,280	1,400	120	1,400	120	
	Bloomsbury borough	320	320	320	320	0	320	0	
	Califon borough	400	410	410	420	10	420	10	
	Clinton town	1,070	1,080	1,080	1,130	50	1,130	50	
	Clinton township	4,130	4,430	4,430	5,810	1,380	4,430	0	
	Glen Gardner borough	810	800	800	810	10	810	10	
	Hampton borough	560	560	560	580	20	580	20	
	High Bridge borough	1,430	1,430	1,430	1,440	10	1,440	10	
	Holland township	1,880	1,950	1,950	2,150	200	2,150	200	
	Lebanon borough	460	510	510	620	110	620	110	
	Lebanon township	1,980	2,020	2,020	2,140	120	2,140	120	
	Readington township	5,680	5,880	5,880	6,680	800	6,680	800	
	Tewksbury township	1,980	2,140	2,140	2,510	370	2,510	370	
	Union township	1,670	1,750	1,750	2,100	350	2,100	350	
	Subtotal - I-78 Study Area		25,170	26,180	26,180	30,150	3,970	28,770	2,590
	Remainder		18,530	19,620	19,620	22,550	2,930	22,550	2,930
Hunterdon County Totals		43,700	45,800	45,800	52,700	6,900	51,320	5,520	
Somerset County	Bedminster township	4,240	4,260	4,260	4,530	270	4,530	270	
	Bernards township	9,240	10,220	10,220	10,790	570	10,790	570	
	Bernardsville borough	2,720	2,750	2,750	3,110	360	3,110	360	
	Bound Brook borough	3,620	3,610	3,610	4,370	760	4,370	760	
	Branchburg township	5,270	5,380	5,380	6,090	710	6,090	710	
	Bridgewater township	15,560	15,850	15,850	18,020	2,170	18,020	2,170	
	Far Hills borough	370	390	390	460	70	460	70	
	Peapack and Gladstone borough	840	880	880	1,340	460	1,340	460	
	Raritan borough	2,580	2,580	2,580	3,330	750	3,330	750	
	Somerville borough	4,740	4,750	4,750	5,770	1,020	5,770	1,020	
	Warren township	4,630	5,220	5,220	5,800	580	5,800	580	
	Watchung borough	2,100	2,140	2,140	2,440	300	2,440	300	
	Subtotal - I-78 Study Area		55,850	58,030	58,030	66,050	8,020	66,050	8,020
	Remainder		53,110	55,770	55,770	70,650	13,880	70,650	13,880
	Somerset County Totals		108,960	114,800	114,800	136,700	21,900	136,700	21,900
	Warren County	Alpha borough	990	1,010	1,010	1,240	230	1,240	230
		Greenwich township	1,420	1,750	1,750	2,090	340	2,090	340
Lopatcong township		2,140	3,030	3,030	3,330	300	3,330	300	
Phillipsburg town		6,040	6,130	6,130	6,730	600	6,730	600	
Pohatcong township		1,340	1,370	1,370	2,240	870	2,240	870	
Washington borough		2,720	2,850	2,850	3,390	540	3,390	540	
Washington township		2,100	2,280	2,280	2,730	450	2,730	450	
Subtotal - I-78 Study Area			16,750	18,420	18,420	21,750	3,330	21,750	3,330
Remainder			21,950	23,480	23,480	28,650	5,170	28,650	5,170
Warren County Totals		38,700	41,900	41,900	50,400	8,500	50,400	8,500	
I-78 Study Area Totals		97,810	102,630	102,630	117,950	15,320	116,570	13,940	
Hunterdon / Somerset / Warren Totals		191,400	202,500	202,500	239,800	37,300	238,420	35,920	
NUTPA Regional Totals		2,297,400	2,388,000	2,388,000	2,900,500	512,500	2,889,120	511,120	
LVPC REGION		NUTPA ADOPTED HOUSEHOLD FORECASTS					SUGGESTED REVISED HOUSEHOLD FORECAST		
County Name	MCD Name	2000 Households	2005 Households	2005 Rev. Households	2030 Households	Change 2005 to 2030	2030 Households	Change 2005 to 2030	
Lehigh County	Allentown	42,032	42,385	42,385	43,511	1,126	44,037	1,652	
	Bethlehem	8,188	8,327	8,327	8,472	145	8,988	661	
	Emmaus	4,985	5,027	5,027	5,158	132	5,219	192	
	Fountain Hill	1,911	1,927	1,927	1,977	50	1,945	22	
	Lower Macungie	7,158	8,016	8,016	12,778	4,763	19,175	11,164	
	Salisbury	5,138	5,196	5,196	5,501	305	5,850	654	
	South Whitehall	6,943	7,332	7,332	9,202	1,870	9,312	1,980	
	Upper Macungie	5,128	5,847	5,847	9,127	3,280	10,457	4,610	
	Upper Saucon	3,970	4,282	4,282	5,801	1,520	7,378	3,096	
	Subtotal - I-78 Study Area		85,453	88,338	88,338	101,527	13,190	112,368	24,030
Remainder		36,453	37,875	37,875	43,984	6,110	49,473	11,599	
Lehigh County Totals		121,906	126,212	126,212	145,511	19,299	161,841	35,629	
Northampton County	Bethlehem	19,928	20,178	20,178	20,920	743	22,632	2,454	
	Bethlehem Twp	7,619	8,255	8,255	11,556	3,301	12,666	4,411	
	Easton	9,548	9,696	9,696	10,023	327	10,022	326	
	Forks	3,035	3,438	3,438	6,416	2,979	10,234	6,796	
	Freemansburg	697	737	737	1,010	274	945	209	
	Glendon	135	137	137	141	5	137	0	
	Hillertown	2,448	2,478	2,478	2,568	90	2,582	104	
	Lower Nazareth	1,788	2,122	2,122	3,647	1,526	3,106	985	
	Lower Saucon	3,735	3,982	3,982	4,969	988	5,937	1,956	
	Palmer	6,716	7,103	7,103	9,572	2,469	10,538	3,435	
	West Easton	452	458	458	474	17	500	42	
	Williams	1,657	1,850	1,850	2,794	945	3,885	2,035	
Wilson	3,164	3,203	3,203	3,320	117	3,427	224		
Subtotal - I-78 Study Area		60,912	63,603	63,603	77,410	13,807	86,601	22,988	
Remainder		40,629	43,556	43,556	56,988	13,433	59,119	15,564	
Northampton County Total		101,541	107,159	107,159	134,398	27,240	145,720	38,551	
I-78 Study Area Total		146,365	151,941	151,941	178,937	26,997	198,969	47,028	
LVPC Region Total		223,447	233,371	233,371	279,909	46,539	307,561	74,191	
NJ & PA Region									
	I-78 Study Area	244,175	254,571	254,571	296,887	42,317	315,539	60,968	
	5-County Region	414,847	436,871	436,871	519,709	83,839	545,981	110,111	



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Table 6-3: Base Year and Future Employment Estimates

County Name	MCD Name	NUTPA ADOPTED EMPLOYMENT FORECASTS					SUGGESTED REVISED EMPLOYMENT FORECAST				
		2000 Employees	2005 Employees	2005 Rev. Employees	2030 Employees	Change 2005 to 2030	2030 Employees	Change 2005 to 2030			
Hunterdon County	Alexandria township	1,600	1,610	1,610	2,990	1,320	82%	2,138	528	33%	
	Bethlehem township	1,420	1,440	1,440	2,400	960	67%	1,824	384	27%	
	Bloomsbury borough	180	190	190	370	180	95%	262	72	38%	
	Calton borough	170	180	180	280	100	56%	220	40	22%	
	Clinton town	6,580	6,650	6,650	7,470	820	12%	6,978	328	5%	
	Clinton township	5,730	6,050	6,050	7,900	1,850	31%	6,790	740	12%	
	Glen Gardner borough	140	150	150	270	120	80%	198	48	32%	
	Hampton borough	460	470	470	620	150	32%	530	60	13%	
	High Bridge borough	890	890	890	1,150	260	29%	994	104	12%	
	Holland township	670	700	700	1,750	1,050	150%	1,120	420	60%	
	Lebanon borough	1,250	1,380	1,380	1,600	220	16%	1,468	88	6%	
	Lebanon township	2,290	2,310	2,310	3,840	1,530	66%	2,922	612	26%	
	Readington township	8,390	8,490	8,490	11,040	2,550	30%	9,510	1,020	12%	
	Teakensbury township	1,420	1,440	1,440	3,000	1,560	108%	2,054	634	43%	
Union township	1,200	1,860	1,860	3,490	1,630	88%	2,512	652	35%		
Subtotal - I-78 Study Area		32,430	33,810	33,810	48,110	14,300	42%	39,530	5,720	17%	
Remainder		24,370	26,490	26,490	38,790	12,300	46%	31,410	4,920	19%	
Hunterdon County Total		56,800	60,300	60,300	86,900	26,600	44%	70,940	10,640	18%	
Somerset County	Bedminster township	7,350	5,780	5,110	8,120	2,340	40%	6,767	1,657	32%	
	Bernards township	14,440	16,420	14,510	20,480	4,060	25%	18,162	3,652	25%	
	Bernardsville borough	3,020	3,950	3,490	4,870	920	23%	4,256	766	22%	
	Bound Brook borough	4,880	3,130	2,770	3,300	170	5%	3,352	582	21%	
	Branchburg township	8,900	16,440	14,530	17,600	1,160	7%	16,801	2,271	16%	
	Bridgewater township	35,790	34,020	30,070	42,990	8,970	26%	40,626	10,756	36%	
	Far Hills borough	970	310	270	700	390	126%	330	60	22%	
	Peapack and Gladstone borough	1,310	2,830	2,500	3,430	600	21%	2,969	469	19%	
	Raritan borough	8,960	8,680	7,670	10,120	1,440	17%	9,821	2,151	28%	
	Somerville borough	17,300	18,950	16,750	18,800	-150	-1%	18,907	2,157	13%	
	Warren township	15,870	13,370	11,820	19,050	5,690	42%	13,566	1,746	15%	
	Watchung borough	8,400	8,670	7,660	11,090	2,420	28%	10,949	3,289	43%	
	Subtotal - I-78 Study Area		127,190	132,550	117,150	160,550	28,000	21%	146,706	29,556	25%
	Remainder		75,910	80,350	71,010	118,250	37,900	47%	111,955	40,995	58%
Somerset County Total		203,100	212,900	188,160	278,800	65,900	31%	258,701	70,541	37%	
Warren County	Alpha borough	890	890	890	990	90	10%	990	90	10%	
	Greenwich township	720	940	940	1,210	270	25%	1,210	270	25%	
	Lopatcong township	3,310	4,370	4,370	5,140	770	18%	5,140	770	18%	
	Phillipsburg town	4,600	4,670	4,670	4,990	320	7%	4,990	320	7%	
	Pohatcong township	2,490	2,520	2,520	2,820	300	12%	2,820	300	12%	
	Washington borough	3,080	3,220	3,220	3,360	140	4%	3,360	140	4%	
	Washington township	1,010	1,080	1,080	1,430	350	32%	1,430	350	32%	
	Subtotal - I-78 Study Area		16,100	17,690	17,690	19,930	2,240	13%	19,930	2,240	13%
	Remainder		19,600	20,210	20,210	25,470	5,260	26%	25,470	5,260	26%
Warren County Total		35,700	37,900	37,900	45,400	7,500	20%	45,400	7,500	20%	
I-78 Study Area Total		175,720	184,050	184,050	228,590	44,540	24%	206,166	22,116	12%	
Hunterdon / Somerset / Warren Total		295,600	311,100	311,100	411,100	100,000	32%	375,041	63,941	21%	
NUTPA Region Total		3,006,700	3,094,300	3,094,300	3,778,900	684,600	22%	3,756,476	662,176	21%	



Tables 6-1, 6-2 and 6-3 contain estimates of 2000, 2005 and 2030 population, households, and employment for the I-78 Corridor study area. Data are shown for the five counties in New Jersey and Pennsylvania that contain the I-78 study area, and for the entire North Jersey Transportation Planning Authority (NJTPA) and Lehigh Valley Planning Commission (LVPC) regions. Two distinct scenarios are presented in these tables and are explained below:

6.3.1 Adopted Demographics Forecast

Both NJTPA and LVPC have adopted municipal-level population and household projections, and NJTPA has adopted municipal-level employment. LVPC has not published employment data at the municipal level. Because the I-78 Corridor Transit Study must ultimately be integrated into the MPOs' ongoing planning processes, the Study's initial travel demand travel forecasting efforts were based on these MPO- adopted totals.

According to these forecasts, population within the New Jersey portion of the I-78 Study Area will increase by about 36,800 persons from 2005 to 2030, or about 13 percent (See Table 6-4). Employment within the New Jersey portion of the I-78 Study Area is also estimated to increase by about 44,500 jobs, or about 24 percent. In the Pennsylvania portion of the I-78 Study Area, population is expected to increase by about 59,000 persons from 2005 to 2030, or about 15 percent.

Table 6-4: Adopted Demographic Totals, I-78 Corridor*

	2005	2030	Change	
POPULATION:				
Hunterdon County	76,980	86,790	9,810	13%
Somerset County	157,450	175,850	18,200	12%
Warren County	48,530	57,300	8,770	18%
NJ Subtotal	282,960	319,740	36,780	13%
Lehigh County	223,670	251,900	28,220	13%
Northampton County	166,590	197,330	30,750	18%
PA Subtotal	390,260	449,230	58,970	15%
I-78 Corridor Total	673,220	768,970	95,750	14%
HOUSEHOLDS:				
Hunterdon County	26,180	30,150	3,970	15%
Somerset County	58,030	66,050	8,020	14%
Warren County	18,420	21,750	3,330	18%
NJ Subtotal	102,630	117,950	15,320	15%
Lehigh County	88,340	101,530	13,190	15%
Northampton County	63,600	77,410	13,810	22%
PA Subtotal	151,940	178,940	27,000	18%
I-78 Corridor Total	254,570	296,890	42,320	17%
EMPLOYMENT:				
Hunterdon County	33,810	48,110	14,300	42%
Somerset County	132,550	160,550	28,000	21%
Warren County	17,690	19,930	2,240	13%
NJ Subtotal	184,050	228,590	44,540	24%

* All county numbers are for the I-78 Study Area portion of the county only



6.3.2 Suggested Revised Demographics Forecast

Consultation with corridor municipalities and the Steering Committee revealed that some stakeholders felt that the MPO-adopted demographics misstate growth in both New Jersey and the Lehigh Valley. In New Jersey, some stated that the adopted totals do not reflect the current county and municipal planning initiatives to control or limit growth, particularly in Hunterdon County. In Pennsylvania, the opposite concern arose: adopted population growth totals appear to be understated.

It was concluded that (1) a second set of demographics would be prepared, and (2) the travel demand model's evaluation of alternatives would be re-run using this alternative growth estimate. Therefore a "Suggested Revised" set of population, household, and employment data was prepared as indicated in Tables 6-1, 6-2, and 6-3. The purpose of these suggested revisions is not to replace the adopted totals, but to demonstrate the travel conditions that would occur if this pattern of growth were to be realized.

Specific estimates that were made are summarized in Table 6-5. Several specific changes were included:

Table 6-5: Suggested Revised Demographic Totals, I-78 Corridor*

	2005	2030	Change	
POPULATION:				
Hunterdon County	76,980	82,700	5,720	7%
Somerset County	157,450	175,650	18,200	12%
Warren County	48,530	57,300	8,770	18%
NJ Subtotal	282,960	315,650	32,690	12%
Lehigh County	223,670	208,030	56,350	25%
Northampton County	166,590	221,200	54,620	33%
PA Subtotal	390,260	501,230	110,970	28%
I-78 Corridor Total	673,220	816,880	143,660	21%
HOUSEHOLDS:				
Hunterdon County	26,180	28,770	2,590	10%
Somerset County	58,030	66,050	8,020	14%
Warren County	18,420	21,750	3,330	18%
NJ Subtotal	102,630	116,570	13,940	14%
Lehigh County	88,340	112,370	24,030	27%
Northampton County	63,600	86,600	23,000	36%
PA Subtotal	151,940	198,970	47,030	31%
I-78 Corridor Total	254,570	315,540	60,970	24%
EMPLOYMENT:				
Hunterdon County	33,810	39,530	5,720	17%
Somerset County	132,550	146,710	29,560	25%
Warren County	17,690	19,930	2,240	13%
NJ Subtotal	184,50	206,170	22,120	12%

* All county numbers are for the I-78 Study Area portion of the county only



1. **Clinton Township Population / Employment** – In the adopted demographics Clinton Township was projected to experience a growth of 1,680 households (41 percent) and 4,980 persons (38 percent) between 2000 and 2030. The municipality anticipates that its efforts to control development (in concert with Hunterdon County and the NJ Office of Smart Growth) will result in considerably less growth. One Clinton Township development that was included in these projections – Windy Acres – was originally expected to have 1,150 dwelling units but could end up with as few as 50 dwelling units. For the Suggested Revised forecast, the Clinton Township growth of 1,680 households was reduced by 1,100 households to account for this change, leaving a growth of about 580 households. It was then assumed that other controls on growth would cut this remaining growth in half, resulting in a net growth in Clinton Township households of about 300 households in the 30 years from 2000 to 2030. That equates to a population growth of about 890 persons (7 percent) over the same period.
2. **Somerset County Employment** – Somerset County provided revised employment projections for each of its municipalities.
3. **Other NJ Population / Employment** – Other municipalities' growth estimates in Hunterdon and Warren Counties were reviewed in consultation with the respective County planning staffs, and it was concluded that no changes to the adopted NJTPA population and household figures were warranted. Employment for the year 2030 in Hunterdon County was reduced, however. It is noted that there is a general loss of employment occurring in New Jersey which calls into question all of the employment forecasts for the I-78 corridor and the remainder of the state. The Steering Committee concluded that this issue would not be addressed at this time for this study, since it is very involved and will require NJTPA's attention at a later date.
4. **Lehigh Valley Population / Employment** – The US Census estimates for 2005 population in Lehigh and Northampton Counties were higher than anticipated. Essentially, the 2005 Census estimate was approximately equal to the LVPC adopted 2010 estimates – or about twice the growth rate that was expected from 2000 to 2005.

It was concluded that the Suggested Revised forecast should account for this change. Two methods were used to provide upper and lower bounds on 2005 – 2030 growth:

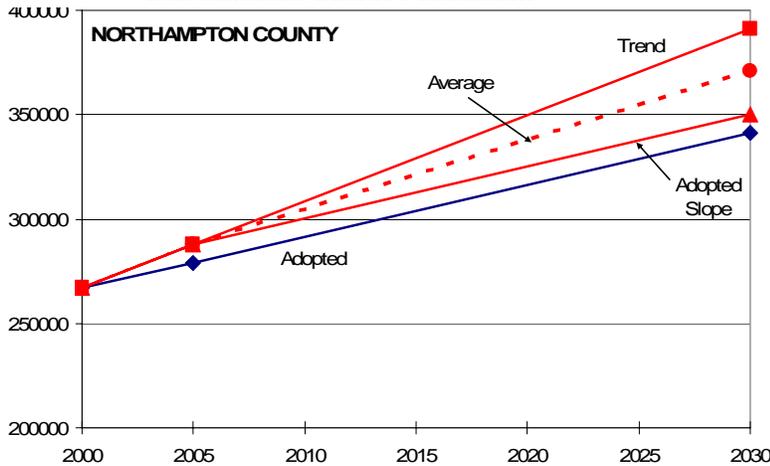
- **Upper Level** -- Assume that the 2000 to 2005 growth “trend” reported by the Census would continue out to 2030, resulting in a very high growth estimate for 2030.
- **Lower Level** -- Use the 2005-2030 rate of growth (as represented by the “Adopted Slope” in the diagram) that was included in LVPC's original adopted 2005 to 2030 forecast, producing a 2030 forecast only slightly higher than the originally adopted 2030 projection.

Given this range, it was concluded that the Suggested Revised forecast should be the average of the Upper and Lower estimates, as is illustrated in Figure 6-1 for Northampton County.



Using this approach, the 2000 to 2030 population growth within the I-78 Study Area in Pennsylvania would change from about 69,800 persons in the adopted forecast, to 121,800 persons in the Suggested Revised forecast, an increase of 53,000 persons in the growth estimate.

**Figure 6-1: Demographics Estimation Method
(Northampton County Population)**



The number of households would increase proportionally: household growth from 2000 to 2030 would increase from about 32,600 (adopted) to 52,600 (suggested).

- 5. New Jersey Employment** – It was observed by some stakeholders that the adopted employment growth was high considering the limited amount of available developable land. However, in light of current statewide economic conditions, it also appeared that employment growth estimates are possibly high throughout the region. This study focuses to a considerable extent on work-trips starting or entering into the I-78 corridor and destined to employment sites within or beyond the corridor. Therefore, reducing employment growth estimates in the I-78 Study Area alone would likely distort and misrepresent overall employment opportunities both within and beyond this corridor. It was therefore concluded at this time to make no changes to the NJTPA adopted employment estimates.

6.4 ORIGIN / DESTINATION DATA

An understanding of the pattern of origins and destinations of travelers in the I-78 corridor is crucial to developing definitions of travel markets, identifying needs, and formulating solutions.

6.4.1 Data Sources

The NJTRANSIT NJTDFM was used as the primary evaluation tool for this study, since it is well maintained and contains the data and relationships needed to evaluate multi-modal traveler response to growth in population, employment and households, and anticipated transportation system changes. As part of this study the NJTDFM was updated, however, to account for



additional information such as origin-destination data and additional traffic count information. This was done in close collaboration with NJ TRANSIT's forecasting division.

Several sources of origin-destination data were relied on for this study, including:

- NJ TRANSIT's North Jersey Transit Demand Forecasting Model (NJTDFM), which contains trip matrices that indicate base year (2005) and future year (2030) person and vehicle trips at a traffic analysis zone (TAZ) level of detail. These trip matrices have been derived from Census Journey to Work tabulations, from transit and other traveler surveys, and other sources. The NJTDFM encompasses the entire NJ TRANSIT service area as well as New York City and eastern Pennsylvania.
- NJTPA's North Jersey Travel Demand Model (NJTDM) contains similar trip matrices to those in the NJTDFM (NJTDFM is in fact based on NJTDM trip tables) but does not include Pennsylvania.
- Lehigh Valley Planning Commission's Lehigh Valley Travel Forecast Model (LVTFM) contains trip matrices for the MPO's coverage area, which is Lehigh and Northampton Counties.
- 2000 Census Journey to Work (JTW) tabulations indicate worker residence and work-site relationships. While Census JTW totals are not purely trips from home to work, with adjustments the data is used to represent trips. The above models are derived from and calibrated to Census JTW values.
- NJ TRANSIT has conducted bus and rail ridership surveys on its system. This data indicates the place of residence and work place of transit riders using specific bus stops and stations. Both NJ TRANSIT and private operators are covered by this data.
- NJDOT conducted roadside surveys of travelers who use I-78 for part of their trip in 1992. The surveys were conducted at all eastbound on ramps during the morning peak period (6am to 10am), were of the postcard mailback type, and achieved a high sample rate. The process of adjusting this dataset is described below.

6.4.2 The I-78 Roadside Origin-Destination Survey

In 1992 the NJDOT conducted an extensive origin-destination survey of travelers who used I-78 west of Interchange 44 in New Providence, Union County. The survey was of the postcard mailback type, and obtained data as to trip origin and destination, trip purpose, I-78 entry and exit interchange, routes used, and vehicle occupancy. The survey was conducted during the morning peak period (6am to 10am) on all eastbound entry ramps from the Delaware River to Interchange 44; at the Delaware River Joint Toll Bridge Commission toll barrier the survey was conducted in the westbound direction during the evening peak period and transposed to represent morning peak conditions. A high sample rate was obtained – approximately 25 percent – so it was concluded that the survey was representative of actual travel conditions.

Recognizing the robustness of this survey, it was concluded that if possible the data should be captured and used for this I-78 study. The survey data were updated to reflect changes that have occurred in the time since the survey was conducted. Population and employment growth at the origin and destination of each survey trip were used to make an initial adjustment to



reflect growth. Then traffic volume totals were tabulated from the survey at key locations on I-78 and compared to traffic counts. Additional adjustments were made to improve the fit between survey-estimated volumes and counts. Overall, the magnitude of the adjustments was reasonable, and the fit with current observed data was good. Therefore it was concluded that the survey data are useful to this study, when used in conjunction with the above travel models.

Figure 6-2 illustrates the basic travel pattern information that was obtained from the origin-destination survey. The Figure shows, for the morning peak period in 2005, the percentage of eastbound vehicle trips using I-78 that originate at and are destined to counties in the I-78 Study Area. For example, at Milepost 10 (east of the Warren / Hunterdon County border), 61 percent of the eastbound traffic originates in the Lehigh Valley (Lehigh and Northampton Counties), and 13 percent originates in the remainder of Pennsylvania and US. About 22 percent originates in Warren County. More than half of this traffic goes to Hunterdon and Somerset Counties (29 percent each). Only 4 percent of the traffic is destined to New York City, Long Island, and Westchester County.

Further to the east at Milepost 28 (just west of I-287), the traffic has a considerably lower orientation to Pennsylvania. Only 22 percent of the traffic at that point originates in the Lehigh Valley, and an additional 7 percent originates in the remainder of Pennsylvania and the US. Nearly half – 43 percent – come from Hunterdon County. The major travel destination at this location is Somerset County (27 percent) followed by Union County (17 percent) and Middlesex County (16 percent). Only 4 percent of the traffic at this location is destined to New York City, Long Island, and Westchester County.

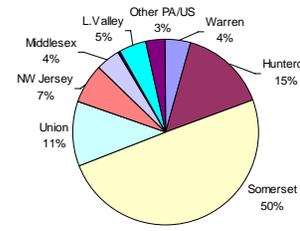
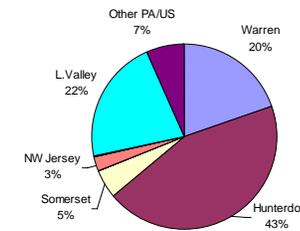
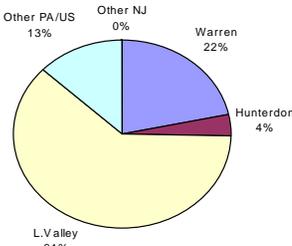
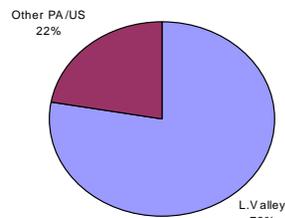
Focusing on the eastbound traffic crossing the Delaware River from Pennsylvania during the morning peak period (see Figure 6-2), over one third (36 percent) originate in Northampton County, and 23 percent originate in the central / eastern portion of Lehigh County. Nearly half of the river-crossing traffic is destined to Hunterdon and Somerset Counties. These two counties comprise a major destination that is presently unserved by transit; the Pennsylvania / Warren / Hunterdon to Hunterdon / Somerset corridor movement is identified as the major travel market needing improved transit service in this corridor.



Figure 6-2: Origins and Destinations of Morning Eastbound Traffic on I-78



ORIGINS



DESTINATIONS

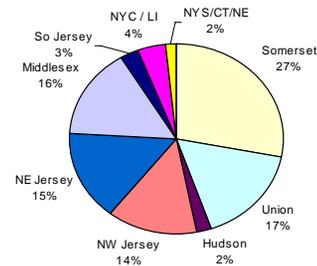
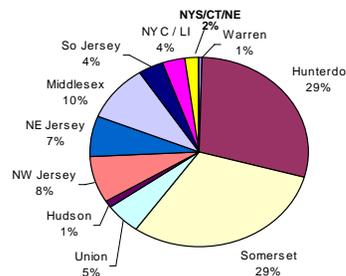
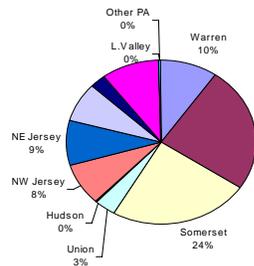
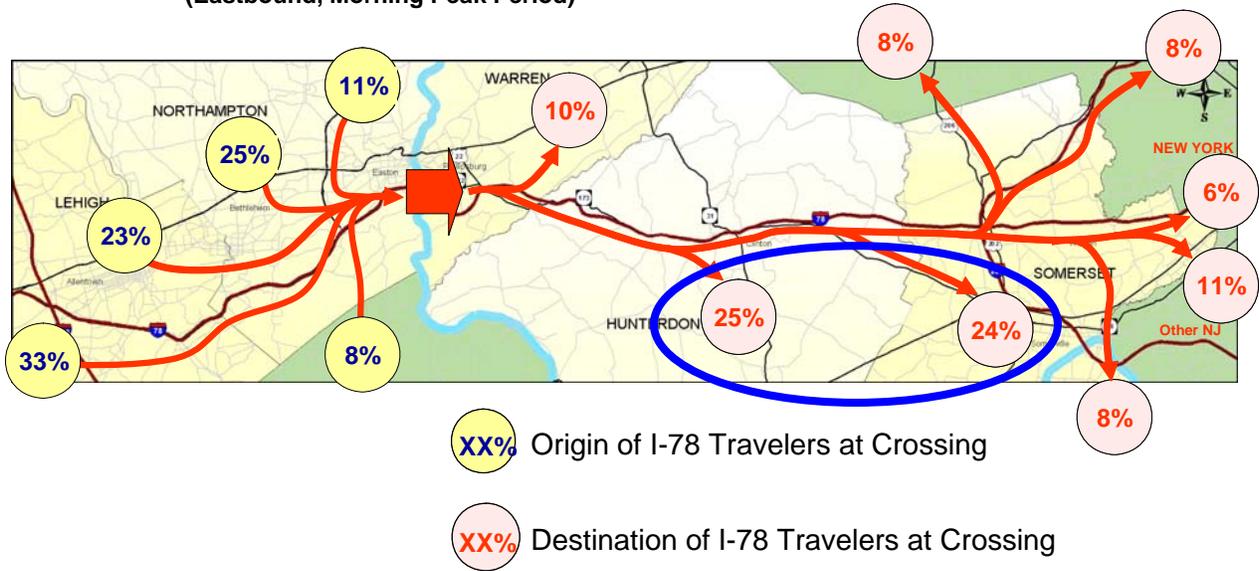


Figure 6-3: Origins and Destinations of Traffic Crossing the Delaware River (Eastbound, Morning Peak Period)



Other destinations in the region such as Morris County, northeast New Jersey, Union County, and Middlesex County are more dispersed and have less intense trip destination activity. Each is in the range of 10 percent of the total river-crossing traffic.

6.4.3 Travel Markets

The origin-destination data was used to identify key travel movements within the overall travel patterns described above. Table 6-6 arrays the 30 highest eastbound, morning peak period volume movements in descending order of their magnitude. The largest single movement in the corridor is from Northampton County to Central Hunterdon County in the vicinity of Clinton (Town of Clinton and Clinton Township, Lebanon Borough, and Readington Township). Altogether 2,188 persons made this trip in 1,673 vehicles in 2005, and the volume will grow to 2,572 persons in 1,966 vehicles by the year 2030. The second largest movement in the corridor is from Northampton County to Branchburg and Bedminster Townships in Somerset County: 1,629 persons made this trip in 1,087 vehicles in 2005, and the volume will increase to 1,915 persons in 1,278 vehicles in 2030.



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**Table 6-6: Key Travel Movements in the I-78 Corridor
(2005 Eastbound, Morning Peak Period)**

ORIGIN	DESTINATION	2005		2030	
		Vehicle Trips	Person Trips	Vehicle Trips	Person Trips
Northampton Cty	Clinton	1,673	2188	1966	2572
Northampton Cty	Branchburg / Bridgewater	1,087	1629	1278	1915
Phillipsburg / Greenwich	Clinton	855	1072	1015	1273
Branchburg / Bridgewater	Newark	630	914	782	1134
North Plainfield / Warren	Newark	559	762	867	1183
Clinton	Branchburg / Bridgewater	544	601	648	717
Phillipsburg / Greenwich	Branchburg / Bridgewater	525	733	624	871
Branchburg / Bridgewater	Berkeley Heights	497	534	617	662
Bloomsbury	Branchburg / Bridgewater	443	511	661	763
Berkeley Heights	Newark	420	501	501	597
Bloomsbury	Clinton	413	534	617	797
Basking Ridge	Newark	410	518	504	638
Branchburg / Bridgewater	North Plainfield / Warren	409	432	508	536
Alexandria	Clinton	378	421	557	620
Northampton Cty	Bedminster / Peapack	377	598	444	703
Clinton	Clinton	374	461	446	550
Clinton	North Plainfield / Warren	334	369	398	440
Washington	Branchburg / Bridgewater	333	372	476	532
Clinton	Basking Ridge	331	381	394	455
Northampton Cty	Basking Ridge	294	499	346	586
Branchburg / Bridgewater	Springfield	293	335	364	416
Clinton	Newark	277	402	330	479
Northampton Cty	Flemington / Pittstown	264	367	310	431
North Plainfield / Warren	Springfield	258	319	401	495
Glen Gardner / Califon	Branchburg / Bridgewater	258	379	372	546
Clinton	Bedminster / Peapack	258	305	307	363
Clinton	Berkeley Heights	257	285	307	340
Northampton Cty	North Plainfield / Warren	246	413	289	486
Clinton	Morristown / Morris Twp	242	281	289	335
Alexandria	Branchburg / Bridgewater	229	271	337	399
Total		13,469	17,389	16,955	21,835

Figure 6-4 accumulates the travel movements (including other minor flows) into corridor flows destined into major areas along I-78 that might be served by transit, if service were to be provided:

- Altogether 9,100 persons travel eastward from Pennsylvania to key markets in New Jersey in 2005, and that will increase to 11,000 persons in 2030.
- About 4,200 of those people were destined to locations in Central Hunterdon County (in the vicinity of Clinton) in 2005, and that volume will grow to 5,100 persons in 2030.
- About 3,900 persons residing in Central Hunterdon in 2005 were destined to major destinations in Somerset and Union Counties. That will grow to about 5,100 persons in 2030.
- About 4,500 persons were destined to Central Somerset County areas in Bridgewater, Branchburg and Somerville in 2005, with growth expected to about 5,800 persons in



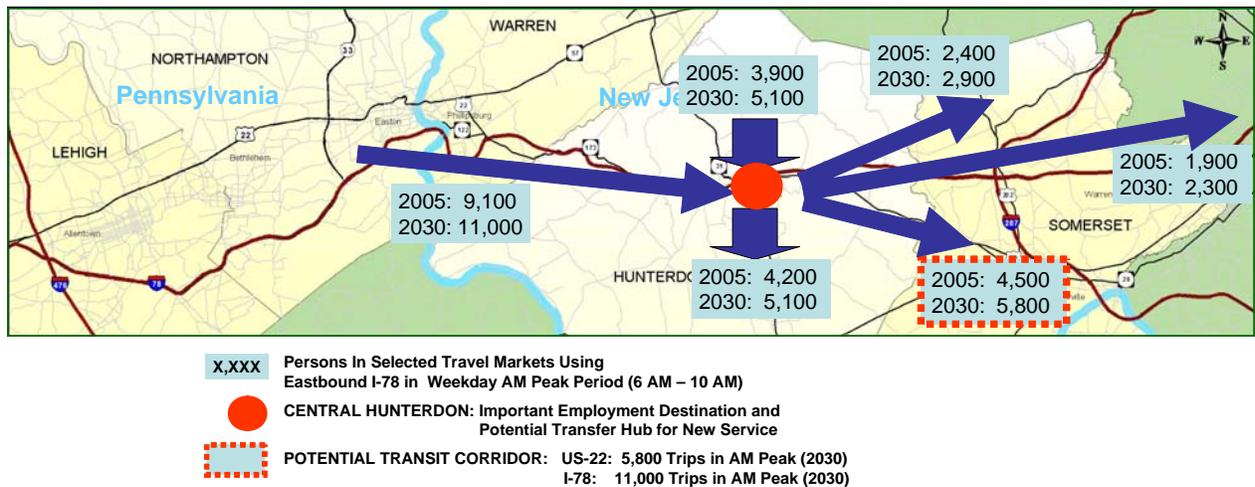
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2030. This is a major set of destinations that are essentially unserved by transit from the west today, and which could benefit significantly if improved service were to be implemented.

- Other corridor movements that were identified were to the Bedminster / Peapack-Gladstone / Bernardsville / Basking Ridge area (2,400 persons in 2005, 2,900 persons in 2030); and to Warren / Berkeley Heights / New Providence along I-78 to the east (1,900 persons in 2005, 2,300 persons in 2030)

Figure 6-4: Potential Transit Markets in the I-78 Corridor (Eastbound, Morning Peak Period)



The result of this analysis is that several potential corridor markets were identified that could significantly benefit from expansion or addition of new transit services:

- From the Lehigh Valley, PA along I-78, through Central Hunterdon, and continuing to other major destinations further to the east as follows;
- From Central Hunterdon along US Route 22 to employment centers in Branchburg, Bridgewater, and Somerville;
- From Central Hunterdon along I-78 to Warren, Berkeley Heights, and New Providence; and
- From Central Hunterdon to the northeast along I-78 and US Routes 202 and 206, to employment centers in Bedminster, Peapack-Gladstone, Bernardsville, and Basking Ridge.

In response to these identified corridor needs, a set of transit improvements was developed, tested and refined that would provide appropriate levels of service. The results of this development and testing are described in the following sections of this report.



6.5 NO-BUILD ALTERNATIVE FORECASTS

The No-Build Alternative is developed to form a baseline against which the various transportation improvement alternatives can be compared. The No-Build Alternative typically consists of all existing transportation facilities, as well as services and facilities that are likely to exist in the future regardless of the outcomes of this study. The No-Build includes “committed” improvements, which typically includes projects in the Transportation Improvement Program (TIP) or other local capital programs, plus other minor transit service expansions or adjustments.

6.5.1 Components of the No-Build Alternative

The No-Build Alternative for the I-78 Corridor Transit Study was developed for the year 2030. It consists of the existing highway network, the existing transit services in the corridor (bus and rail), and major planned transportation improvements. With regard to transit, this includes:

- The current rail and bus system operated by NJ TRANSIT and related private operators;
- The new Mount Arlington station and park-and-ride on the Morris & Essex Line, currently under construction;
- The Access to the Region’s Core (ARC) project, which will build new Trans-Hudson rail tunnels and a new passenger station under 34th Street in Manhattan. The Build-Alternative rail service plan in the ARC DEIS is assumed to be the No-Build rail service plan for the I-78 Corridor Transit Study;
- Rail operating plan changes to the Raritan Valley Line in conjunction with the ARC project that include extensions of the existing service to provide direct (one seat ride) service to New York Penn Station and to Hoboken Terminal.

Major rail improvement projects currently under study, including the Lackawanna Cut-Off Passenger Rail Service Restoration Project and the Middlesex – Ocean – Monmouth Rail Study, are not included in the No-Build or subsequent Build Alternatives.

6.5.2 No-Build Travel Forecast

The NJ TRANSIT North Jersey Transit Demand Forecast Model (NJTDFM) was run for the existing (2005) and future (2030) No-Build conditions to establish baseline highway traffic volume and transit ridership levels. The forecasts described in the following are based on the “Suggested Revised” demographic forecast previously described.

Person trip matrices are provided in Tables 6-7 and 6-8, which show for the 2005 Base and 2030 No-Build the total regional trips and those made by bus and rail. All trips are for the 4-hour morning peak period, and are tabulated in “production / attraction” format. This means that trip “productions” occur at home, regardless of the direction of the trip, and “attractions” occur at a work or other site. A typical pair of trips from home to work and back to home, then, is actually shown as two trips from the home site to the work site.



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Table 6-7: Existing (2005) Origin-to-Destination Trip Matrices

1. Total A.M. Peak Person Trips by District, P/A Format

PRODUCTION DISTRICT	ATTRACTION DISTRICT																	TOTAL
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
	H-I-78	S-I-78	W-I-78	LV	H Rem	S Rem	NE Jersey	W Rem/NW Jersey	Hudson	Union	So Jersey	NE PA	SE PA	Manhattan	Other NYC, LI	Upstate NY	New Eng	
1 Hunterdon I-78	25,303	4,822	2,074	0	3,367	1,156	2,109	3,698	548	1,079	2,615	0	0	497	133	0	0	47,402
2 Somerset I-78	1,990	65,211	170	0	754	8,381	5,921	7,709	1,327	6,216	11,327	0	0	3,698	444	0	0	113,149
3 Warren I-78	2,244	1,196	18,564	0	275	263	508	1,303	124	200	544	0	0	131	2	0	0	25,355
4 Lehigh Valley	3,459	4,009	4,093	0	596	800	1,130	3,970	173	557	1,188	0	5,401	1,079	542	96	10	27,101
5 Hunterdon Rem	1,912	1,449	196	0	23,492	970	865	746	183	312	3,322	0	0	240	68	0	0	33,776
6 Somerset Rem	826	16,786	95	0	1,520	37,319	3,732	1,969	1,057	4,723	25,966	0	0	3,476	976	3	0	99,468
7 NE Jersey	603	4,722	93	0	293	1,466	900,307	50,491	74,228	42,194	15,488	0	11	101,079	24,364	84	0	1,215,425
8 Warren Rem/NW Jersey	3,936	9,536	1,754	0	834	1,927	67,692	309,422	6,911	11,172	6,962	0	16	11,949	1,489	2	0	433,620
9 Hudson	114	807	15	0	60	325	58,641	3,351	168,379	7,131	4,577	0	0	68,208	10,172	79	10	321,870
10 Union	356	9,317	68	0	184	5,238	39,730	10,020	10,079	151,405	32,050	0	0	17,105	4,004	4	0	279,559
11 So Jersey	1,165	14,189	160	0	1,481	20,091	33,422	6,301	11,798	32,752	1,098,955	0	196	50,698	14,848	62	3	1,286,041
12 NE PA	261	414	375	0	74	128	4,185	8,655	770	415	758	253	420	7,097	4,024	2,293	46	30,168
13 SE PA	679	1,267	130	0	995	878	760	635	146	343	20,461	0	3,310	1,672	84	4	0	31,483
14 Manhattan	0	550	0	69	25	54	12,300	722	6,788	981	1,048	40	67	329	162	817	39	24,001
15 Other NYC, LI	19	714	0	10	0	391	17,661	1,401	15,253	3,094	4,971	4	66	20,391	40	1,217	95	64,750
16 Upstate NY	0	137	4	0	15	51	19,002	1,670	1,763	369	556	0	7	17,804	8,475	1,959	0	52,032
17 New England	0	0	0	0	0	0	0	0	54	0	0	0	0	58	12	3	0	126
TOTAL	42,866	135,145	27,792	79	33,946	79,434	1,167,406	412,162	299,601	262,955	1,230,829	298	9,437	305,711	69,839	6,623	203	4,084,325

2. Total A.M. Peak Bus Person Trips by District, P/A Format

PRODUCTION DISTRICT	ATTRACTION DISTRICT																	TOTAL
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
	H-I-78	S-I-78	W-I-78	LV	H Rem	S Rem	NE Jersey	W Rem/NW Jersey	Hudson	Union	So Jersey	NE PA	SE PA	Manhattan	Other NYC, LI	Upstate NY	New Eng	
1 Hunterdon I-78	1	9	0	0	1	0	0	0	3	0	0	0	0	144	15	0	0	172
2 Somerset I-78	1	149	0	0	0	3	1	0	0	13	20	0	0	21	4	0	0	212
3 Warren I-78	0	7	2	0	0	0	0	0	1	0	0	0	0	85	1	0	0	95
4 Lehigh Valley	0	1	0	0	0	0	0	0	2	0	0	0	0	394	33	0	0	430
5 Hunterdon Rem	0	2	0	0	2	0	1	0	1	0	0	0	0	94	11	0	0	110
6 Somerset Rem	0	12	0	0	0	8	3	0	1	29	110	0	0	120	15	0	0	300
7 NE Jersey	0	2	0	0	0	2	30,483	117	3,005	2,130	7	0	0	27,846	1,859	0	0	65,461
8 Warren Rem/NW Jersey	0	1	0	0	0	0	178	518	7	10	0	0	0	736	24	0	0	1,474
9 Hudson	0	0	0	0	0	0	2,603	2	17,337	90	10	0	0	11,935	638	0	0	32,615
10 Union	0	39	0	0	0	29	1,087	17	125	3,531	58	0	0	2,183	232	0	0	7,311
11 So Jersey	0	26	0	0	0	27	63	0	467	115	4,685	0	0	13,638	1,487	0	0	20,508
12 NE PA	0	0	0	0	0	0	1	0	9	0	0	0	0	1,947	378	0	0	2,335
13 SE PA	0	0	0	0	4	0	1	0	1	0	0	0	0	45	1	0	0	51
14 Manhattan	0	0	0	0	0	1	3,671	37	1,711	205	112	0	0	41	1	8	0	5,787
15 Other NYC, LI	0	0	0	0	0	0	725	2	523	25	20	0	0	730	0	2	0	2,026
16 Upstate NY	0	0	0	0	0	0	60	0	5	0	0	0	0	2,693	200	3	0	2,961
17 New England	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	3	249	2	0	7	70	38,885	694	23,198	6,147	5,022	0	0	62,660	4,897	13	0	141,846

3. Total A.M. Peak Rail Person Trips by District, P/A Format

PRODUCTION DISTRICT	ATTRACTION DISTRICT																	TOTAL
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
	H-I-78	S-I-78	W-I-78	LV	H Rem	S Rem	NE Jersey	W Rem/NW Jersey	Hudson	Union	So Jersey	NE PA	SE PA	Manhattan	Other NYC, LI	Upstate NY	New Eng	
1 Hunterdon I-78	0	10	0	0	0	0	33	0	23	5	2	0	0	184	0	0	0	258
2 Somerset I-78	0	22	0	0	0	2	160	8	123	42	6	0	0	2,241	28	0	0	2,632
3 Warren I-78	0	3	0	0	0	0	3	0	4	0	0	0	0	11	0	0	0	22
4 Lehigh Valley	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 Hunterdon Rem	0	0	0	0	0	0	10	0	3	0	3	0	0	39	0	0	0	55
6 Somerset Rem	0	18	0	0	0	1	181	0	135	20	33	0	0	2,095	58	0	0	2,541
7 NE Jersey	0	5	0	0	0	1	1,239	40	4,976	91	87	0	0	30,941	1,020	0	0	39,400
8 Warren Rem/NW Jersey	0	5	0	0	0	0	365	187	390	78	4	0	0	6,195	76	0	0	7,299
9 Hudson	0	1	0	0	0	0	2,193	4	4,337	162	27	0	0	43,481	1,744	0	0	51,949
10 Union	0	23	0	0	0	3	1,392	24	1,338	137	186	0	0	10,343	419	0	0	13,865
11 So Jersey	0	10	0	0	0	2	2,784	2	1,691	252	1,341	0	0	26,671	1,065	0	0	33,799
12 NE PA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 SE PA	0	0	0	0	0	0	117	0	41	6	129	0	0	1,419	20	0	0	1,732
14 Manhattan	0	2	0	0	0	0	960	9	3,132	40	20	0	0	75	31	0	0	4,270
15 Other NYC, LI	0	0	0	0	0	0	366	1	4,171	25	17	0	0	16,671	5	0	0	21,255
16 Upstate NY	0	0	0	0	0	0	178	0	175	1	1	0	0	4,565	102	0	0	5,022
17 New England	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	99	0	0	0	10	9,960	276	20,537	859	1,857	0	0	144,932	4,568	0	0	183,098

Trips to or from the I-78 Study Area



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Table 6-8: Future (2030) No-Build Alternative Origin-to-Destination Trip Matrices

1. Total A.M. Peak Person Trips by District, P/A Format

PRODUCTION DISTRICT	ATTRACTION DISTRICT																	TOTAL
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
	H-I-78	SI-78	WI-78	LV	H Rem	S Rem	NE Jersey	W Rem/NW Jersey	Hudson	Union	So Jersey	NE PA	SE PA	Manhattan	Other NYC, LI	Upstate NY	New Eng	
1 Hunterdon I-78	28,985	5,184	1,890	0	4,178	1,469	2,050	3,732	588	1,078	2,887	0	0	553	182	0	0	52,657
2 Somerset I-78	2,775	79,393	194	0	1,293	10,919	6,860	9,441	1,668	7,247	14,386	0	0	3,730	496	0	0	139,403
3 Warren I-78	3,251	1,494	23,170	0	469	376	637	1,751	173	257	756	0	0	162	2	0	0	32,498
4 Lehigh Valley	4,268	4,511	4,186	0	687	1,203	1,061	4,039	184	578	1,397	0	9,289	1,062	524	95	7	33,393
5 Hunterdon Rem	2,016	1,500	182	0	28,775	1,091	809	721	189	298	3,431	0	0	229	84	0	0	39,303
6 Somerset Rem	1,030	20,989	102	0	2,282	47,999	4,017	2,245	1,180	4,760	26,086	0	0	3,040	1,092	2	0	114,705
7 NE Jersey	819	6,529	109	0	501	2,067	1,013,012	60,333	94,080	49,448	20,117	0	12	117,858	28,993	63	0	1,392,956
8 Warren Rem/NW Jersey	5,639	12,201	2,345	0	1,309	2,819	75,994	378,049	8,722	12,149	9,050	0	8	13,167	1,750	1	0	523,403
9 Hudson	172	1,148	18	0	111	504	70,568	4,197	215,383	9,665	8,200	0	0	90,860	13,886	88	15	411,615
10 Union	450	14,896	74	0	280	5,435	44,068	11,385	12,454	168,746	39,320	0	0	19,077	5,054	3	0	321,242
11 So Jersey	1,627	17,942	187	0	2,277	32,367	38,958	7,693	15,474	36,457	1,382,350	0	254	55,452	18,229	58	2	1,609,226
12 NE PA	425	602	577	0	127	236	4,975	12,981	1,172	487	1,201	411	795	9,582	5,368	2,754	53	41,749
13 SE PA	1,076	1,870	213	0	1,648	1,588	980	771	244	478	26,190	0	3,147	2,358	128	4	0	40,694
14 Manhattan	0	544	0	74	29	93	13,607	803	8,372	1,055	1,276	64	80	354	231	810	37	27,428
15 Other NYC, LI	21	683	0	18	0	724	18,617	1,645	20,949	3,573	6,484	6	68	26,216	43	1,300	104	80,451
16 Upstate NY	0	152	5	0	15	103	22,760	2,478	2,422	455	756	0	7	21,856	9,808	15	2	63,037
17 New England	0	0	0	0	0	0	0	0	88	0	0	0	0	61	15	2	0	146
TOTAL	62,652	169,718	33,250	92	43,981	108,994	1,318,972	502,263	383,283	294,731	1,541,886	482	13,660	365,415	85,888	7,421	219	4,922,906

2. Total A.M. Peak Bus Person Trips by District, P/A Format

PRODUCTION DISTRICT	ATTRACTION DISTRICT																	TOTAL
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
	H-I-78	SI-78	WI-78	LV	H Rem	S Rem	NE Jersey	W Rem/NW Jersey	Hudson	Union	So Jersey	NE PA	SE PA	Manhattan	Other NYC, LI	Upstate NY	New Eng	
1 Hunterdon I-78	1	9	0	0	0	0	0	0	1	0	0	0	0	84	20	0	0	115
2 Somerset I-78	1	203	0	0	0	3	1	0	0	13	21	0	0	8	4	0	0	254
3 Warren I-78	1	8	2	0	0	0	0	0	0	0	0	0	0	73	1	0	0	85
4 Lehigh Valley	0	1	0	0	0	0	0	0	1	0	0	0	0	424	43	0	0	470
5 Hunterdon Rem	0	2	0	0	2	0	1	0	1	0	0	0	0	102	16	0	0	124
6 Somerset Rem	0	17	0	0	0	7	2	0	1	24	91	0	0	54	16	0	0	213
7 NE Jersey	0	5	0	0	0	1	32,879	125	3,598	2,432	23	0	0	26,775	2,312	0	0	68,147
8 Warren Rem/NW Jersey	0	1	0	0	0	0	170	510	7	15	0	0	0	631	35	0	0	1,389
9 Hudson	0	1	0	0	0	0	2,947	2	20,259	102	13	0	0	14,960	820	0	0	39,004
10 Union	0	66	0	0	0	21	1,062	22	139	3,909	59	0	0	1,242	270	0	0	6,788
11 So Jersey	0	33	0	0	0	42	71	0	822	117	5,304	0	0	11,422	1,788	0	0	19,600
12 NE PA	0	0	0	0	0	0	1	0	17	0	0	0	0	3,044	708	0	0	3,771
13 SE PA	0	0	0	0	5	0	0	0	2	0	0	0	0	88	1	0	0	97
14 Manhattan	0	0	0	0	0	1	3,843	41	1,934	214	134	0	0	44	1	8	0	6,218
15 Other NYC, LI	0	0	0	0	0	0	736	2	639	28	26	0	0	388	0	2	0	1,820
16 Upstate NY	0	0	0	0	0	0	57	0	7	0	0	0	0	2,313	195	3	0	2,575
17 New England	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	3	347	2	0	8	75	41,671	703	27,428	6,853	5,670	0	0	61,851	6,229	12	0	150,650

3. Total A.M. Peak Rail Person Trips by District, P/A Format

PRODUCTION DISTRICT	ATTRACTION DISTRICT																	TOTAL
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
	H-I-78	SI-78	WI-78	LV	H Rem	S Rem	NE Jersey	W Rem/NW Jersey	Hudson	Union	So Jersey	NE PA	SE PA	Manhattan	Other NYC, LI	Upstate NY	New Eng	
1 Hunterdon I-78	0	21	0	0	0	1	48	0	52	10	4	0	0	353	1	0	0	490
2 Somerset I-78	0	41	0	0	0	2	190	9	188	55	11	0	0	2,663	52	0	0	3,211
3 Warren I-78	0	11	0	0	0	0	7	0	12	2	1	0	0	56	0	0	0	86
4 Lehigh Valley	0	0	0	0	0	0	1	3	4	1	0	0	0	52	2	0	0	63
5 Hunterdon Rem	0	0	0	0	0	0	9	0	3	0	3	0	0	43	0	0	0	57
6 Somerset Rem	0	40	0	0	0	1	169	1	188	24	32	0	0	2,058	73	0	0	2,587
7 NE Jersey	0	20	0	0	0	2	2,713	85	7,344	187	244	0	0	50,453	2,041	0	0	63,090
8 Warren Rem/NW Jersey	0	7	0	0	0	0	565	255	605	88	13	0	0	8,075	119	0	0	9,727
9 Hudson	0	3	0	0	0	0	2,589	7	9,887	189	56	0	0	62,821	2,782	0	0	78,335
10 Union	0	57	0	0	0	4	1,717	36	2,066	210	301	0	0	14,316	760	0	0	19,467
11 So Jersey	0	29	0	0	0	3	2,864	8	2,351	266	1,932	0	0	34,723	1,722	0	0	43,899
12 NE PA	0	0	0	0	0	0	12	11	6	1	0	0	0	305	13	0	0	347
13 SE PA	0	1	0	0	0	0	136	0	66	7	170	0	0	1,711	26	0	0	2,116
14 Manhattan	0	6	0	0	0	0	1,320	12	4,412	65	53	0	0	61	45	0	0	5,973
15 Other NYC, LI	0	1	0	0	0	0	531	8	6,619	109	77	0	0	23,510	8	0	0	30,862
16 Upstate NY	0	0	0	0	0	0	344	1	335	9	15	0	0	9,540	494	0	0	10,738
17 New England	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	1	237	0	0	0	14	13,214	438	34,138	1,220	2,912	0	0	210,740	8,137	1	0	271,051

Trips to or from the I-78 Study Area



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Table 6-9 summarizes trip activity in the I-78 corridor portion of Hunterdon, Somerset, Warren, Lehigh, and Northampton Counties. Altogether during the morning peak period the NJTDFM estimates that in 2005 there were 213,010 trips produced at home sites, by all travel modes including auto, in the I-78 corridor area during the morning peak period, and 205,900 trips were attracted to work and other sites during the same period. Of those trips, 3,820 (1.8 percent) of the morning peak period trip productions traveled via bus or rail, and 350 (0.2 percent) of the attractions traveled via bus or rail. These low percentages illustrate the effect of the limited transit service availability in the corridor, particularly serving trip destinations that are predominantly employment-based

Table 6-9: AM Peak Period Person Trips Produced or Attracted in the I-78 Corridor Only

	2005 Base	2030 No-Build	Change
AM Peak Productions:			
Total	213,010	256,950	+43,940
Bus	910	920	+10
Rail	2,910	3,850	+940
AM Peak Attractions:			
Total	205,880	255,710	+49,830
Bus	250	350	+60
Rail	100	240	+140
New Transit Trip Ends			+1,150

The NJTDFM further estimates that under the 2030 No-Build condition the total number of morning peak period trip productions in the corridor will increase from 213,010 in 2005 to 256,950 in 2030, an increase of 43,940 trip ends (20.6 percent). Morning peak period trip attractions will increase from 205,880 to 255,710 (24.2 percent). A total of 4,770 trip productions (1.8 percent) will be via bus or rail, and 590 trip attractions (0.2 percent) will be via bus or rail. Again, this low transit percentage indicates that limited transit service under the No-Build will continue to constrain the potential amount of transit use in the corridor without intervention.

Figure 6-5 illustrates the anticipated effect of growth on traffic volumes on I-78. Just west of I-287, about 17,500 vehicles presently travel eastbound during the morning peak period, 7 to 9 am, and 6,000 of those travel during the 8 to 9 am peak hour (Figure 6-5a). By the year 2030 that volume will grow to about 22,200 peak period (i.e. 7 to 9 am) vehicles, a 27 percent increase from 2005 to 2003 (Figure 6-5b). About 7,600 of those vehicles would travel in the peak hour if they could, but the three-lane capacity of I-78 will limit the maximum hourly volume to about 6,000 vehicles per hour. Therefore the traffic volume growth will spread to earlier and later hours as shown in Figure 6-5c. Traffic volumes during the peak hour will be even more intense than today (6,500 vs. 6,000 vehicles per hour, but nearly 3,400 vehicles will need to adjust their travel times to before 6 am or after 9 am. This condition illustrates the stress that traffic growth will place on I-78 travelers, and the opportunity that transit improvements and other actions present to improve mobility in the corridor.



Figure 6-5: Vehicular Traffic Volume Growth on I-78 (2005 to 2030)

Indicated traffic volumes are hourly total traffic, eastbound on I-78 at Milepost 29.7 (west of I-287)

Figure 6-5a: Existing (2005) Eastbound Traffic Volumes

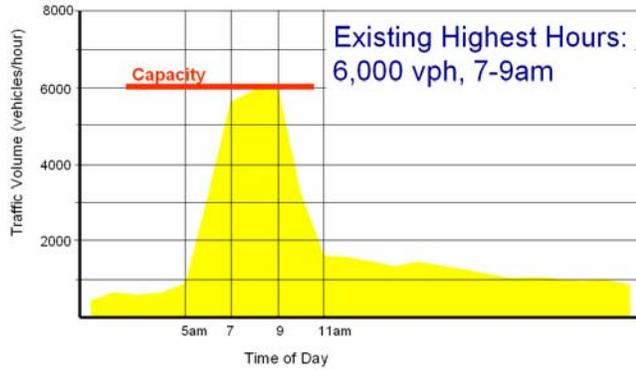


Figure 6-5b: Future No-Build (2030) Eastbound Traffic Demands

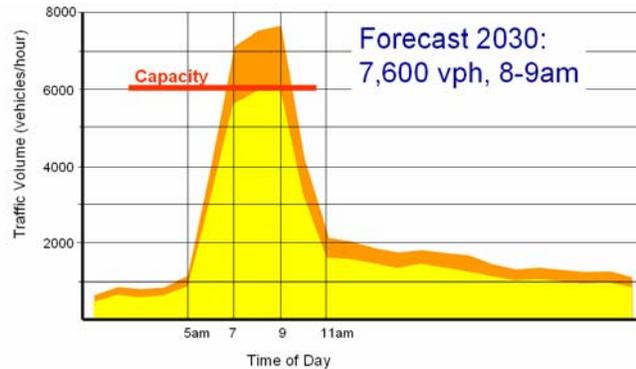
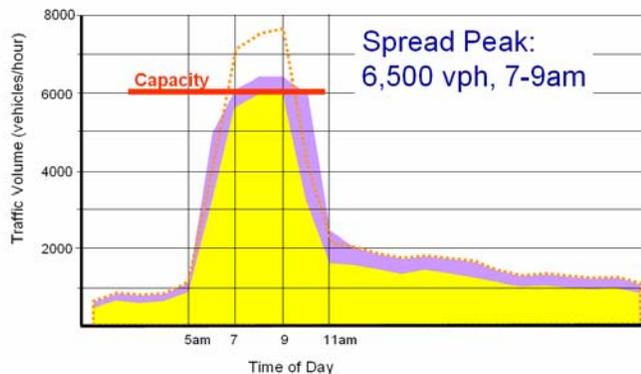


Figure 6-5c: Future No-Build (2030) Eastbound Traffic Volumes
(Adjusted to Spread to Other Hours Due to Capacity Constraints)



6.5.3 No-Build Alternative Performance

Table 6-10 summarizes the performance of the corridor under the 2005 Base and 2030 No-Build conditions in terms of screen line volumes and transit boardings, all during the morning peak period.

Four screen lines are summarized:

- **The Delaware River Screen Line** contains all highway crossings from Upper Black Eddy / Milford on the south, to I-80 (Delaware Water Gap) on the north. In 2005 the screen line carried 25,470 eastbound autos and 2,770 persons by rail and bus during the morning peak period. This is forecast to increase under the 2030 No-Build to 32,530 eastbound autos (a 27.7 percent increase), and 4,240 transit persons (a 53 percent increase). These growth levels are indicative of the high growth rates expected in the Lehigh Valley and Monroe County.
- **The Warren / Hunterdon Border Screen Line** includes I-78 and closely parallel roads including NJ Route 173. During the morning peak period 14,160 eastbound autos crossed this screen line in 2005, and that will increase to 18,240 vehicles (28.8 percent increase) in the 2030 No-Build. During the same period 400 eastbound bus passengers crossed the screen line in 2005, and that will increase to 460 bus passengers (16.2 percent increase) in the 2030 No-Build.
- **The West of I-287 Screen Line** is located just west of the I-78 junction with I-287, and includes I-78, US Route 22, and other nearby local roads including Lamington Road, Pottersville Road, and Old York Road. The eastbound morning peak period volume of autos will increase from 29,240 in 2005 to 36,270 in the 2030 No-Build (24.0 percent increase). The 290 bus passengers crossing the screen line in 2005 will increase to 708 in the 2030 No-Build (a 144 percent increase), and the 870 rail passengers crossing the screen line in 2005 will increase to 920 passengers (a 5.9 percent increase).
- **The Somerset / Union County Border Screen Line** is located at the eastern extreme of the I-78 corridor study area, and includes I-78, US Route 22, NJ Route 28, and other local streets. The NJTDFM estimated that in 2005 25,080 autos crossed this screen line eastbound during the morning peak period. That volume will increase to 28,435 in the 2030 No-Build (a 13.4 percent increase). Rail passengers cross this screen line on both the Raritan Valley Line and the Gladstone Branch of the Morris & Essex Line; a total of 3,930 passengers crossed the screen line eastbound in the morning peak period in 2005, and that is forecast to increase to 5,850 in the 2030 No-Build (a 49 percent increase). Bus passengers will decrease slightly from 1,180 in 2005 to 1,120 in the 2030 No-Build, primarily as a result of the attractiveness of the improved rail connection to New York resulting from the ARC project.



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Table 6-10: 2005 Base and 2030 No-Build Performance Summary

	2005	2030 No-Build (With Raritan Valley Line Extension)
SCREENLINE VOLUMES:		
AM Peak Period, Eastbound		
Delaware River (MP 0.0)		
Rail Persons	-	-
Bus Persons (Includes I-80)	2,765	4,240
Martz (I-80)	2,375	3,783
Trans-Bridge & Bieber	391	457
Other	-	-
Total Rail + Bus	2,765	4,240
Auto Vehicles	25,469	32,532
Warren / Hunterdon Border (MP 6.4)		
Rail Persons	-	-
Bus Persons	396	460
Total Rail + Bus	396	460
Auto Vehicles	14,164	18,240
West of I-287 (MP 29.7)		
Rail Persons	287	708
Bus Persons	869	918
Total Rail + Bus	1,156	1,626
Auto Vehicles	29,243	36,266
Somerset / Union Border (MP 40.4)		
Rail Persons (RVL only)	3,926	5,851
Bus Persons	1,180	1,119
Total Rail + Bus	5,106	6,970
Auto Vehicles	25,080	28,435
TOTAL DAILY BOARDINGS (EASTBOUND):		
Raritan Valley Line, Lebanon and West		
High Bridge	46	127
Annandale	53	197
Clinton	-	-
Lebanon	25	57
Total	124	380
Trans-Bridge	898	954
Bieber	2	22
US-22 Service	-	-
Total	900	976
Rail + Bus Total	1,024	1,356



Also indicated in Table 6-10 are the total rail and bus boardings in the western portion of the I-78 corridor (Lebanon and west). The 120 rail passenger boardings in 2005 will increase to 380 rail passenger boardings in the 2030 No-Build. Bus passenger boardings on the Trans-Bridge and Bieber lines will increase from 900 in 2005 to 980 in the 2030 No-Build.

6.5.4 No-Build Alternative Summary

The above 2005 Base and 2030 No-Build forecasts indicate several conditions that are of note:

- Eastbound morning peak period traffic volumes will increase significantly from 2005 to 2030 – in the range of 25 to 30 percent – despite the fact that no additional highway capacity is proposed and the primary routes (I-78, US Route 22) are heavily congested already.
- Congestion will continue to increase throughout the period from 2005 to 2030. On the primary routes the duration of the congested peak period will lengthen. Local streets and roads are likely to be impacted, since congestion limits the ability of the primary routes to handle additional traffic.
- Without expansion (the No-Build condition), the transit system will not keep pace with highway demands. The ARC project and associated operating changes on the Raritan Valley Line will attract additional rail passengers destined to New York, but the bus service to and from suburban origins and destinations is so limited that almost no new bus ridership can be expected.
- The 2030 No-Build clearly indicates the need for congestion mitigation, and that transit potentially could afford measurable relief.

6.6 BUILD ALTERNATIVE 1: MAXIMUM BUILD

Extensive outreach efforts to the public, partnering agencies, and other stakeholders in the I-78 corridor were summarized in Section 5 of this report. In addition to identifying problems and needs, this participation also identified many possible actions that could potentially increase modal options, provide congestion relief and increase multi-modal accessibility and mobility in the I-78 Corridor.

Those suggestions, coupled with actions identified by the NJTPA staff and Consultant Team, were assembled into a comprehensive alternative that was evaluated to determine its effectiveness to attract transit ridership and mitigate traffic congestion. This initial alternative contained a large number of actions, assembled into a package called the “Maximum Build”. Essentially the package contained virtually every transit improvement that was suggested and reasonable, assembled into a coordinated and integrated package. The NJTDFM was then used to test that package, and to identify components that were or were not particularly effective in attracting ridership and contributing to congestion mitigation. Other qualitative factors were also identified and assessed. A subsequent alternative described below, the “Reduced Build”,



then consisted of the practical and effective components from the Maximum Build, and the Reduced Build Alternative was further tested with the NJTDFM and refined.

6.6.1 Components of the Maximum Build Alternative

Proposed actions under the Maximum Build Alternative can be grouped into seven categories of transportation system improvements, expansions, and programs. These categories are summarized in Figures 6-5 through 6-10 and in the following discussion:

- **Rail Service Enhancements** – Underlying the development of alternatives for the I-78 corridor is the potential extension and restoration of passenger rail service to Phillipsburg, and possibly beyond to Pennsylvania. This significant rail improvement project is to be studied as Phase 2 of the overall I-78 corridor studies (this I-78 Corridor Transit Study is Phase 1). The purpose of the Phase 2 work will be to establish need, investigate feasible alternatives, and develop detailed recommendations for rail improvements in the corridor. These recommendations may or may not include improvements to the Raritan Valley Line (RVL). However, for purposes of this Phase 1 study the possibility of extending / restoring passenger service from the present RVL terminus at High Bridge westward to Phillipsburg has been included as an element of the Build Alternatives, in order to begin to understand the ridership and transit service implications of an integrated bus / rail / travel demand management concept.

As is shown in Figure 6-6, for purposes of this alternative it is assumed that passenger service would be extended to Phillipsburg, with new and/or restored stations at Phillipsburg, Alpha (at a future transit hub / park-and-ride discussed later in this chapter), Bloomsbury, and Hampton. Each of these locations is near I-78 or NJ Route 31 allowing easy access from the region's highways. The base operating plan utilized for the RVL Extension is to continue the RVL operating plan assumed for the ARC project.

Other components evaluated included additional express runs on the RVL, to reduce the number of stops and to improve travel time to the urban core of eastern New Jersey and New York; and to add a low-cost Diesel Multiple Unit (DMU) (a self-propelled commuter railcar) bounce-back service on the RVL between Somerville and Clinton stations, that would facilitate off-peak direction service (outbound in the morning, inbound in the evening).

- **Bus Service Improvements** – Either to complement or to replace the above rail service enhancements, bus service improvements are proposed. These actions focus on serving the high suburban-to-suburban travel demands along I-78 and US Route 22, which were described in Section 6.4.3. The core of the proposed new service is illustrated as component B2-A in Figure 6-7a. It consists of a set of express bus runs denoted as "Spine Service" that would originate at the PA Route 33 / William Penn Highway and I-78 / PA Route 412 park-and-ride facilities, both located in Northampton County. The service would follow I-78 eastward to Clinton, then follow US Route 22 to Branchburg, Bridgewater, and Somerville. Stops are proposed at the Pennsylvania park-and-rides, at a possible new transit hub in Alpha or Bloomsbury, adjacent to I-78; in the vicinity of Clinton; and at various locations near major employers along US Route



22 and the vicinity of Bridgewater. This service would terminate at the Somerville Station, which is being developed as a mixed-use transit-oriented development.

Additional express bus service is proposed under this Alternative to originate in the Clinton area and follow US Route 22 to Branchburg, Bridgewater, and Somerville (B2-B in Figure 6-7b). This additional service would serve a transfer point in the vicinity of Clinton, and could essentially halve the headways for the major destinations along US Route 22.

Finally, additional services are proposed under this alternative to originate in the vicinity of Clinton to serve secondary employment centers and destinations that were identified as travel markets in Section 6.4.3. These routes, shown in Figure 6-8c, include:

- Service along I-78 to County Route 523 in Tewksbury, then along Lamington Road (County Route 523) to US Route 202/206 in Bedminster, and following US Route 202 to a terminus in Basking Ridge (B2-C);
 - Service originating at Somerville station, or some other location such as Bridgewater Commons where, interchange with the I-78 Spine Service is possible, following I-287 and I-78 to Martinsville Road (County Route 525), Valley Road, King George Road (County Route 651), and beyond to employment centers in New Providence / Murray Hill, and finally terminating at the Summit rail station (B2-D);
 - Service along NJ Route 31, from Flemington to the expanded PennDOT park-and-ride at Delaware Water Gap on I-80 (B2-E). This service would interchange with transfer points at Hampton and Clinton as described below.
- **Corridor Transit Facilities** – To support the above bus service improvements, significant transit facilities are proposed that would improve bus flows and provide access to the system (see Figure 6-8):
 - Park-and-ride facilities / transit hubs are proposed under this alternative at Alpha and/or Bloomsbury, Hampton, and in the vicinity of Clinton (P2). These hubs would be located for easy access for buses and motorists / passengers to and from state highways (I-78 and NJ Route 31), to facilitate bus route access by providing ample parking, and to potentially coordinate with rail service along the Raritan Valley Line, which could include extension of service to Phillipsburg.
 - Transit-ready corridor treatments are proposed along US Route 22 in Phillipsburg and along US Route 22 from Clinton eastward to Bridgewater (H1). These improvements would facilitate and speed bus movement, and would include highway improvements to allow buses to use the highway shoulder to bypass congestion at key congested locations; traffic signal preemption for buses; traffic signal coordination; bus stop improvements; and pedestrian access improvements at bus stops.
 - **Ancillary Bus Service Improvements** – Proposed enhancements to existing bus service are proposed that would better integrate those services with the proposed bus



and/or rail and/or park-and-ride alternatives (see Figure 6-9). The Lehigh and Northampton Transportation Authority (LANTA) operates buses in Easton and the remainder of the Lehigh Valley, and extension of that service to the proposed Phillipsburg rail station is proposed. Due to weight restrictions on the Northampton Street bridge, this service would need to use the US Route 22 bridge to cross the Delaware River. The Bieber and Trans-Bridge bus lines operate out of Pennsylvania to the PABT in Midtown as well as to Lower Manhattan. It is proposed under this alternative to allow passengers on the Trans-Bridge lines to alight in Clinton so they could transfer at that point to the express bus or rail; and to add a stop in Clinton on the Bieber lines, with alighting permitted, to allow similar access.

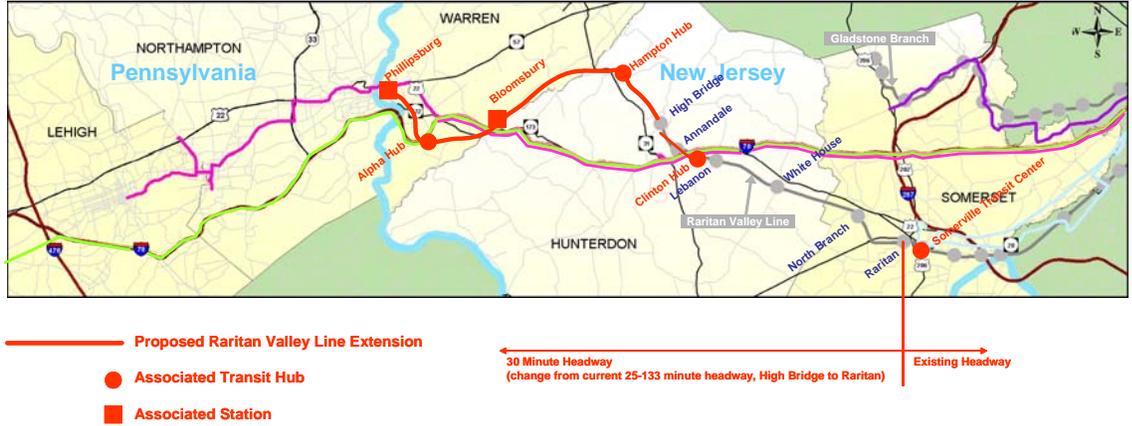
- **Rail Station Access Improvements** – Various new or expanded shuttle services are proposed (see Figure 6-10). Circulator/station connector shuttles are proposed in the vicinity of Phillipsburg, Clinton, Lebanon, and White House Station (B3-A). Driveway shuttles are proposed at key employers to meet the express bus service proposed on US Route 22 (B3-B). A shuttle is proposed on US Route 202 / 206 that would link the various employers and developments along that route to rail stations and to the proposed Lamington Road / US Route 202 service.
- **Park-and-Ride Improvements** – In addition to the transit transfer facilities described above, additional adjustments and expansions to existing park-and-rides are proposed (see Figure 6-12). It is proposed under this Alternative to relocate the Clinton Point and Annandale Square park-and-rides to Union Township so that a larger number of spaces can be provided in one facility, thereby making bus service more efficient and flexible (P1-A). This parking would later be relocated to a new Clinton rail station site. This Alternative also proposes to relocate the Annandale rail station and parking to the proposed Clinton rail station / transit hub, thereby reducing the number of stops on the Raritan Valley Line (P1-B). Finally, the existing park-and-ride lots at I-78 / PA Route 412 and at PA Route 33 / William Penn Highway in Pennsylvania are being expanded by PennDOT, and Readington Township is planning to expand parking in the vicinity of the White House Station rail stop.
- **Travel Demand Management Programs** – In addition to the above actions that could be coded and tested in the travel model, a set of travel demand management program enhancements is also proposed to support this alternative. These include continuing support for implementation of designated transit villages, and ongoing identification of new opportunities for transit villages and other transit-oriented development in the I-78 corridor; continuation and expansion of Transportation Management Association (TMA) activities to promote flex-time, rideshare matching, etc. with major employers; and promotion of employer initiatives for trip reduction programs (i.e. increased use of telecommuting, teleconferencing, work hour programs, etc.), and provision of additional parking spaces for shared ride commuters (van pools and car pools).



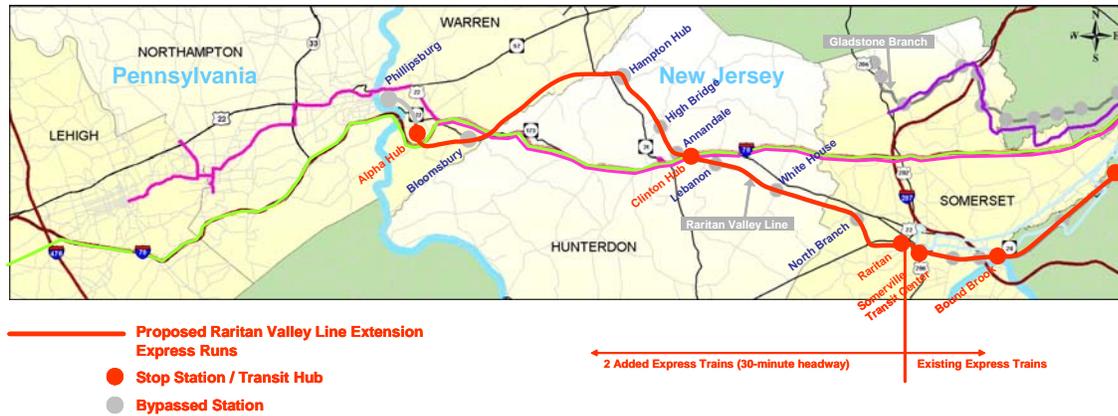
Figure 6-6: Maximum Build Alternative Rail Service Enhancements

NOTE: Operational feasibility of these rail improvements has not been assessed.

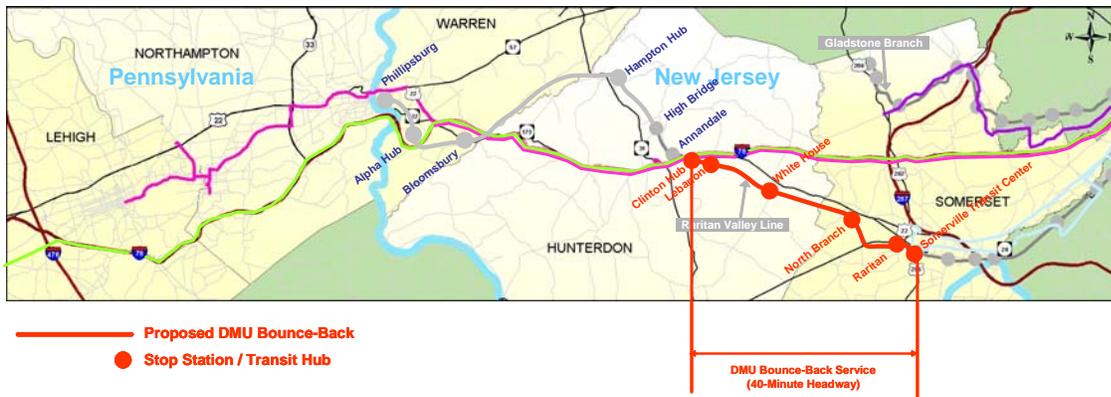
R1-A: Raritan Valley Rail Line Extension



R2-A: Express Runs on the Raritan Valley Line



R2-B: DMU Bounce-Back on the Raritan Valley Line



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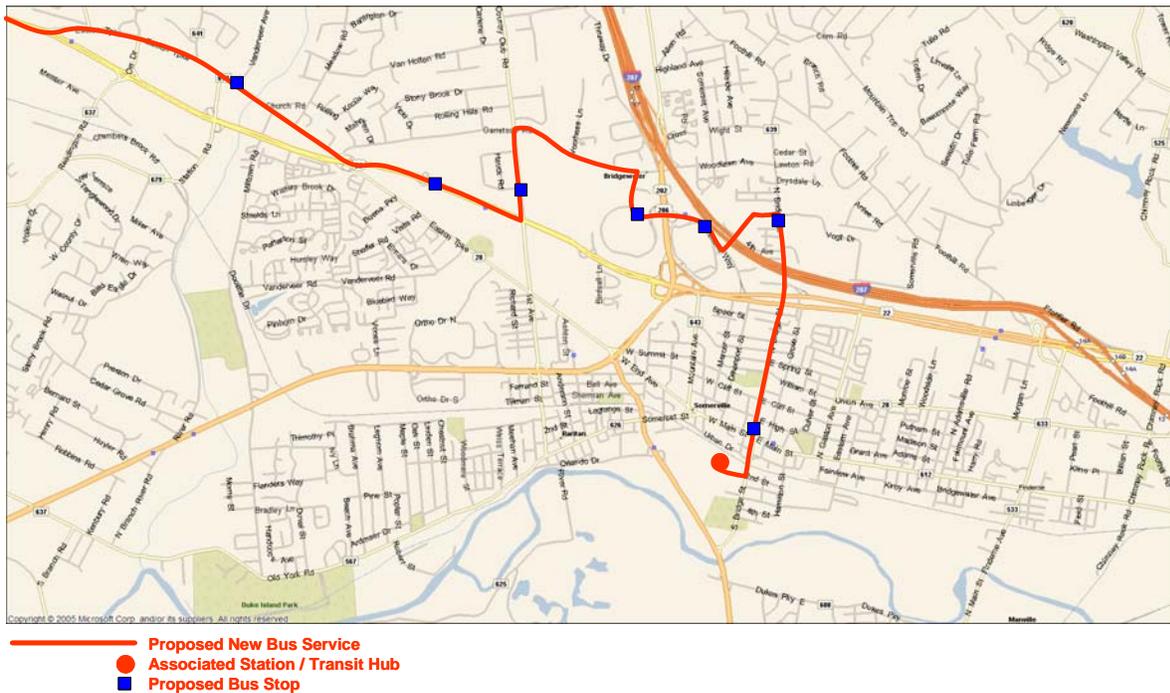
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Figure 6-7a: Maximum Build Alternative Express Bus Service Improvements

B2-A: I-78 / US-22 Spine Bus Service



B2-A: I-78 / US-22 Spine Bus Service
(Bridgewater / Somerville Detail)



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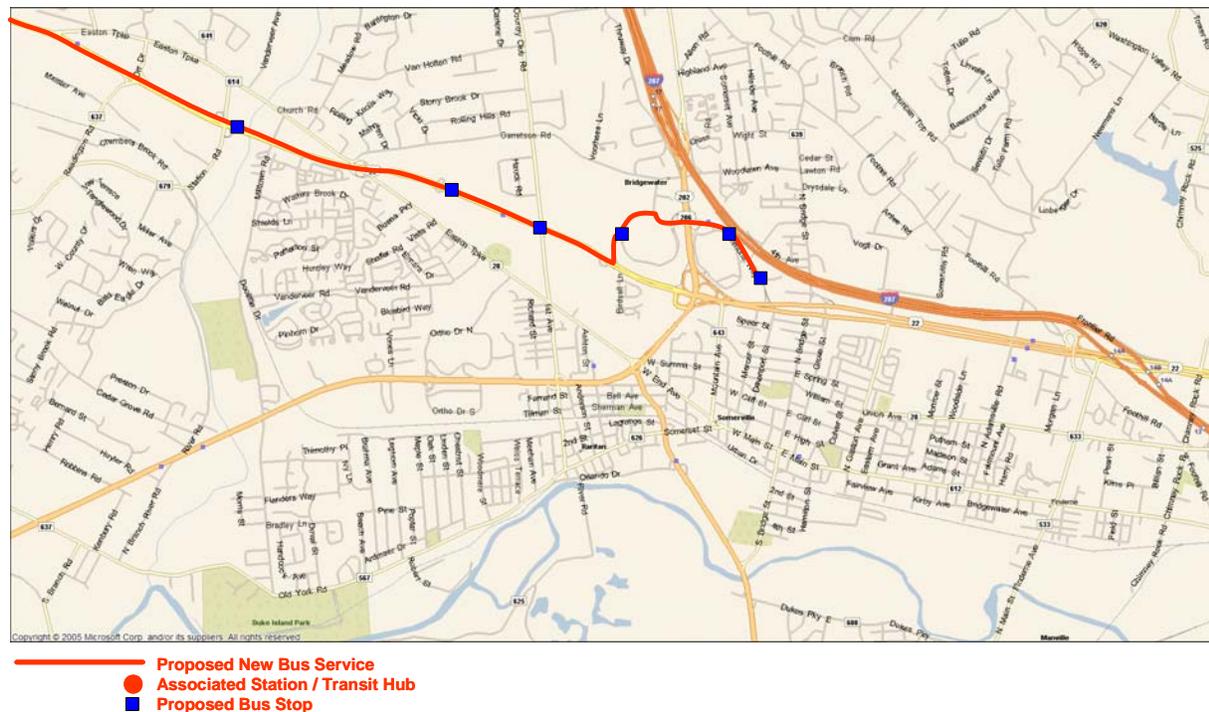
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Figure 6-7b: Maximum Build Alternative Express Bus Service Improvements

B2-B: US-22 Spine Bus Service Overlay



B2-B: US-22 Spine Bus Service Overlay (Bridgewater / Somerville Detail)

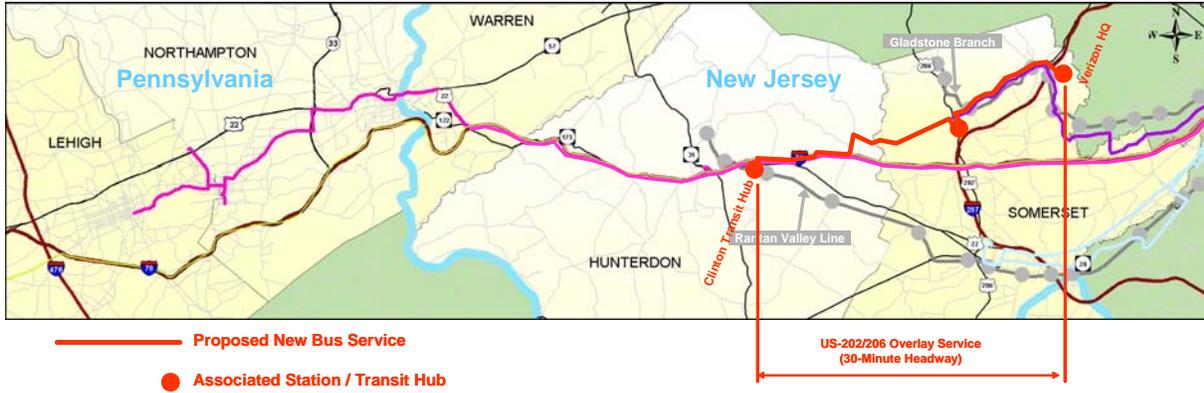


I-78 CORRIDOR TRANSIT STUDY

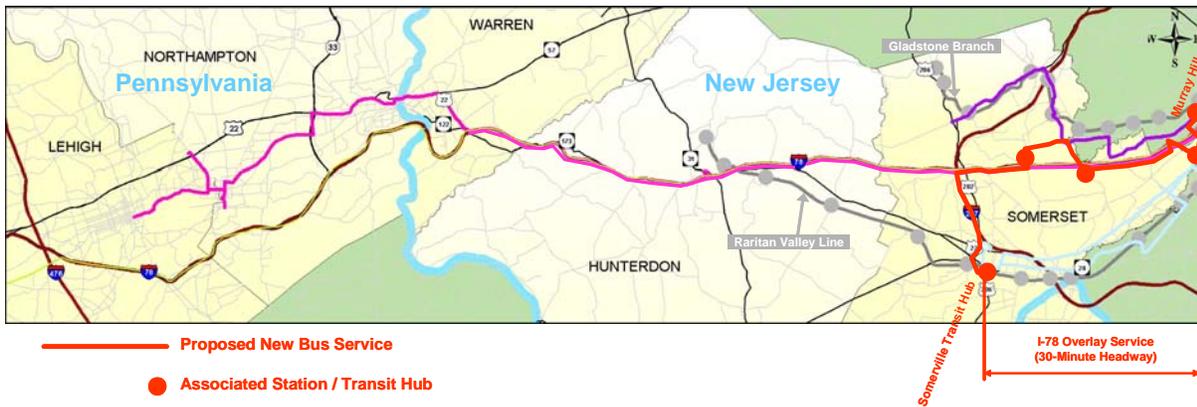
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Figure 6-7c: Maximum Build Alternative Express Bus Service Improvements

B2-C: US-202/206 Bus Service Overlay



B2-D: I-78 East Bus Service Overlay



B2-E: NJ-31 Bus Service Overlay

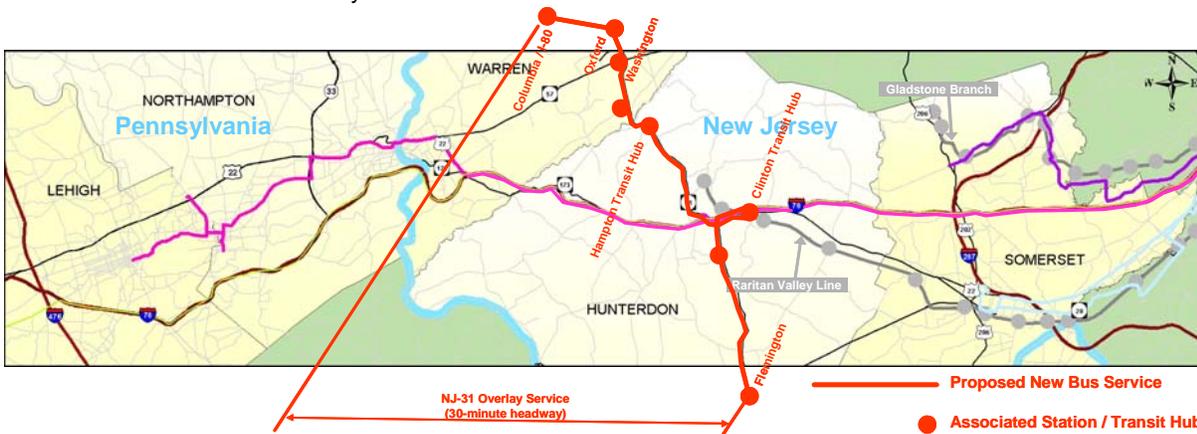


Figure 6-8: Maximum Build Alternative Corridor Transit Facilities

P2: New Park-and-Ride and Transit Hubs



H1: Transit-Ready Corridor Treatments

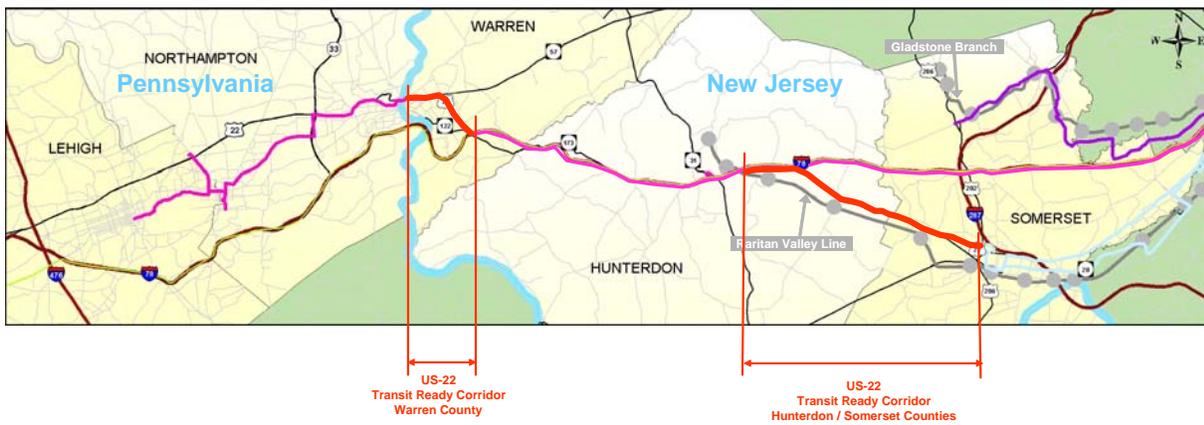
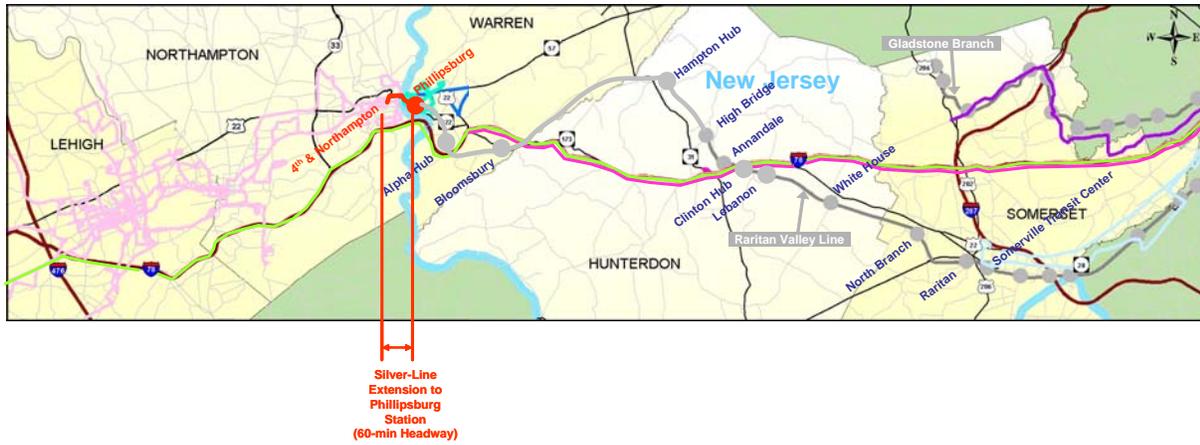


Figure 6-9: Maximum Build Alternative Ancillary Bus Service Improvements

B1-A: LANTA Bus Extension to Phillipsburg Station



B1-B: Trans-Bridge Bus: Allow Alighting at Clinton



B1-C: Bieber Bus: Add Stop (with Alighting) at Clinton



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Figure 6-10: Maximum Build Alternative Rail Station Access Improvements

B3-A: Rail Station Shuttles



B3-B: Corporate Driveway Shuttle



B3-D: Peapack – Bedminster US Route 206 Shuttle

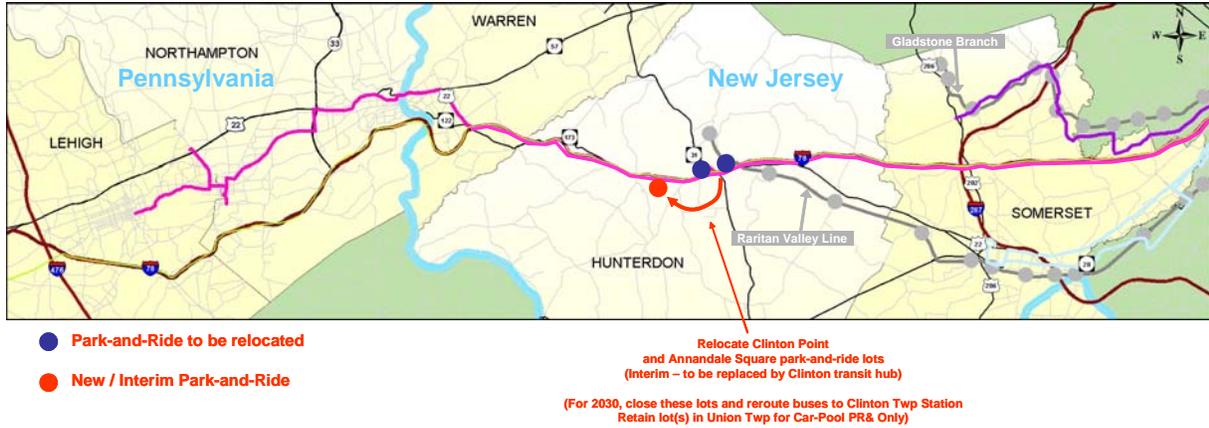


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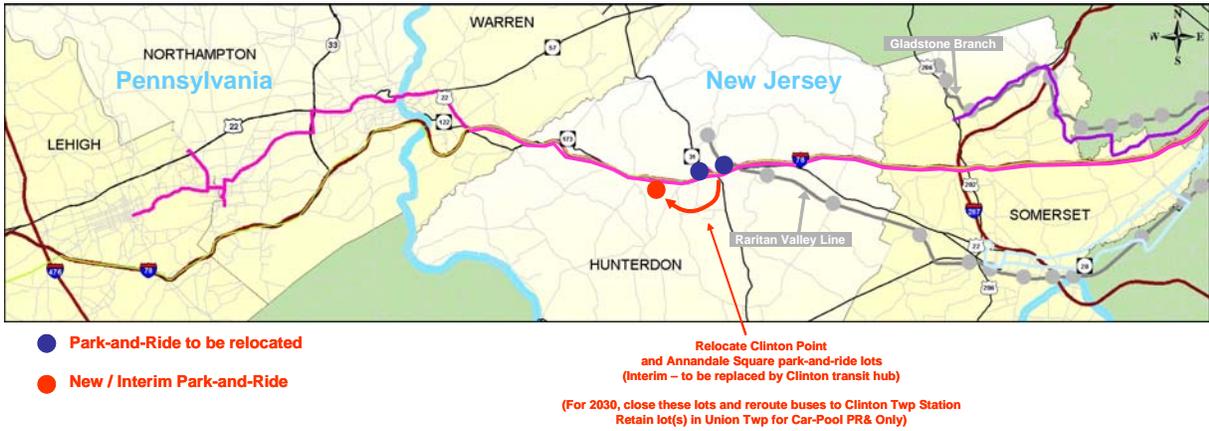
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Figure 6-11: Maximum Build Alternative Park-and-Ride Improvements

P1-A: Relocate Clinton Point & Annandale Square Park-and-Rides



P1-B: Relocate Annandale Rail Station to Clinton Transit Hub Station



P3: Existing Park-and-Ride Expansions



6.6.2 Travel Forecasts for Alternative 1: Maximum Build

The NJ TRANSIT North Jersey Transit Demand Forecast Model (NJTDFM) was run for the 2030 Maximum Build Alternative condition in the same manner as it was for the 2005 Base and 2030 No-Build conditions described in Section 6.5. The forecasts described in the following are based on the “Suggested Revised” demographic forecast.

Person trip matrices are provided in Table 6-11, and show the total regional trips and those made by bus and rail. All trips are for the 4-hour morning peak period.

Table 6-12 summarizes trip activity in the I-78 corridor portion of Hunterdon, Somerset, Warren, Lehigh, and Northampton Counties, in comparison to the 2030 No-Build previously shown.

Table 6-12: Maximum Build Alternative AM Peak Period Person Trips Produced or Attracted in the I-78 Corridor Only

	2030 No-Build	2030 Max-Build	Change
AM Peak Productions:			
Total	256,950	256,950	0
Bus	920	870	-50
Rail	3,850	5,220	+1,370
AM Peak Attractions:			
Total	255,710	255,710	0
Bus	350	820	+470
Rail	240	460	+220
New Transit Trip Ends			+2,010

During the morning peak period the travel model estimates that the number of transit trips produced in the I-78 corridor will increase from the No-Build, from 4,770 to 6,090, a 28 percent increase. The mode share for transit will increase from 1.9 percent in the I-78 corridor to 2.4 percent. Similarly, the number of transit trips attracted to the I-78 corridor will more than double, from 590 under the No-Build to 1,280 in the Build, a 116 percent increase. Altogether it is estimated that 2,010 new transit trips will be made in the study area portion of the I-78 corridor under the Maximum Build Alternative.

These substantial transit ridership increases are due to the extensive system improvements that are proposed under this alternative, including extension of the Raritan Valley Line, express bus services on I-78 and US Route 22, new park-and-rides and transit hubs, and associated facilities.



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Table 6-11: Future (2030) Alternative 1: Maximum Build Trip Matrices

1. Total A.M. Peak Person Trips by District, P/A Format

PRODUCTION DISTRICT	ATTRACTION DISTRICT																	TOTAL
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
	H I-78	SI-78	WI-78	LV	H Rem	S Rem	NE Jersey	W Rem/NW Jersey	Hudson	Union	So Jersey	NE PA	SE PA	Manhattan	Other NYC, LI	Upstate NY	New Eng	
1 Hunterdon I-78	28,885	5,184	1,890	0	4,178	1,469	2,050	3,732	588	1,078	2,887	0	0	553	182	0	0	52,857
2 Somerset I-78	2,775	79,393	194	0	1,293	10,919	6,860	9,441	1,868	7,247	14,386	0	0	3,730	496	0	0	138,403
3 Warren I-78	3,251	1,494	23,170	0	469	376	637	1,751	173	257	756	0	0	162	2	0	0	32,498
4 Lehigh Valley	4,268	4,811	4,186	0	687	1,203	1,061	4,039	184	578	1,397	0	9,289	1,062	524	95	7	33,393
5 Hunterdon Rem	2,016	1,500	182	0	28,775	1,091	809	721	189	298	3,431	0	0	229	84	0	0	39,303
6 Somerset Rem	1,030	20,889	102	0	2,282	47,999	4,017	2,245	1,160	4,760	26,086	0	0	3,040	1,092	2	0	114,705
7 NE Jersey	818	6,528	109	0	501	2,067	1,013,012	60,333	94,080	48,448	20,117	0	12	117,856	28,993	83	0	1,392,956
8 Warren Rem/NW Jersey	5,839	12,201	2,345	0	1,309	2,819	75,994	378,049	8,722	12,149	9,050	0	8	13,167	1,750	1	0	523,403
9 Hudson	172	1,148	18	0	111	504	70,588	4,197	215,383	8,665	6,200	0	0	90,660	13,888	88	15	411,815
10 Union	450	14,896	74	0	280	5,435	44,069	11,385	12,454	168,746	39,320	0	0	19,077	5,054	3	0	321,242
11 So Jersey	1,827	17,942	187	0	2,277	32,367	39,956	7,693	15,474	36,457	1,382,350	0	254	55,452	18,229	58	2	1,609,226
12 NE PA	425	602	577	0	127	238	4,975	12,981	1,172	487	1,201	411	795	9,582	5,368	2,754	53	41,749
13 SE PA	1,076	1,870	213	0	1,648	1,588	980	771	244	478	26,190	0	3,147	2,358	128	4	0	40,694
14 Manhattan	0	544	0	74	29	93	13,607	803	8,372	1,055	1,276	64	80	354	231	810	37	27,428
15 Other NYC, LI	21	683	0	18	0	724	18,617	1,645	20,949	3,573	6,484	6	68	26,216	43	1,300	104	80,451
16 Upstate NY	0	152	5	0	15	103	22,760	2,478	2,422	455	756	0	7	21,856	9,808	2,220	0	63,037
17 New England	0	0	0	0	0	0	0	0	68	0	0	0	0	61	15	2	0	148
TOTAL	62,652	169,718	33,250	92	43,981	108,994	1,318,972	502,263	383,283	294,731	1,541,888	482	13,660	365,415	85,888	7,421	219	4,922,906

2. Total A.M. Peak Bus Person Trips by District, P/A Format

PRODUCTION DISTRICT	ATTRACTION DISTRICT																	TOTAL
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
	H I-78	SI-78	WI-78	LV	H Rem	S Rem	NE Jersey	W Rem/NW Jersey	Hudson	Union	So Jersey	NE PA	SE PA	Manhattan	Other NYC, LI	Upstate NY	New Eng	
1 Hunterdon I-78	19	22	0	0	4	0	0	0	0	0	0	0	0	2	5	0	0	53
2 Somerset I-78	8	304	0	0	0	3	2	1	0	18	21	0	0	12	3	0	0	373
3 Warren I-78	18	46	176	0	1	0	0	0	0	0	0	0	0	15	0	0	0	256
4 Lehigh Valley	19	41	29	0	1	0	0	0	0	0	0	0	0	74	22	0	0	187
5 Hunterdon Rem	2	1	0	0	2	0	1	0	0	0	0	0	0	17	10	0	0	32
6 Somerset Rem	0	18	0	0	0	7	2	0	1	24	91	0	0	52	16	0	0	212
7 NE Jersey	0	8	0	0	0	1	32,879	125	3,596	2,437	23	0	0	26,775	2,312	0	0	68,155
8 Warren Rem/NW Jersey	0	4	0	0	0	0	170	511	6	15	0	0	0	581	35	0	0	1,334
9 Hudson	0	1	0	0	0	0	2,847	2	20,259	102	13	0	0	14,960	820	0	0	39,004
10 Union	0	71	0	0	0	21	1,061	23	140	3,917	59	0	0	1,173	267	0	0	6,731
11 So Jersey	0	35	0	0	0	42	71	0	822	116	5,304	0	0	11,422	1,788	0	0	19,601
12 NE PA	1	0	0	0	0	0	1	0	15	0	0	0	0	2,925	706	0	0	3,648
13 SE PA	0	0	0	0	5	0	0	0	2	0	0	0	0	88	1	0	0	97
14 Manhattan	0	0	0	0	1	1	3,843	41	1,934	215	134	0	0	44	1	8	0	6,220
15 Other NYC, LI	0	0	0	0	0	0	736	2	639	28	26	0	0	388	0	2	0	1,820
16 Upstate NY	0	0	0	0	0	0	57	0	7	0	0	0	0	2,313	195	3	0	2,575
17 New England	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	66	551	205	0	14	75	41,670	708	27,421	6,872	5,870	0	0	60,851	6,183	12	0	150,299

3. Total A.M. Peak Rail Person Trips by District, P/A Format

PRODUCTION DISTRICT	ATTRACTION DISTRICT																	TOTAL
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
	H I-78	SI-78	WI-78	LV	H Rem	S Rem	NE Jersey	W Rem/NW Jersey	Hudson	Union	So Jersey	NE PA	SE PA	Manhattan	Other NYC, LI	Upstate NY	New Eng	
1 Hunterdon I-78	5	44	10	0	0	1	85	1	75	18	7	0	0	482	6	0	0	713
2 Somerset I-78	3	43	2	0	0	2	195	9	189	55	11	0	0	2,689	54	0	0	3,251
3 Warren I-78	3	31	13	0	0	1	28	0	30	10	5	0	0	138	2	0	0	260
4 Lehigh Valley	8	63	9	0	0	1	71	4	32	9	4	0	0	706	93	0	0	1,000
5 Hunterdon Rem	1	6	2	0	0	0	37	0	18	5	4	0	0	165	13	0	0	249
6 Somerset Rem	1	46	1	0	0	1	170	1	188	25	32	0	0	2,073	76	0	0	2,613
7 NE Jersey	1	20	1	0	0	2	2,713	85	7,341	185	244	0	0	50,453	2,041	0	0	63,085
8 Warren Rem/NW Jersey	2	19	7	0	0	0	586	255	821	93	18	0	0	8,130	119	0	0	9,848
9 Hudson	0	3	0	0	0	0	2,589	7	9,987	190	56	0	0	82,821	2,782	0	0	78,336
10 Union	2	60	1	0	0	4	1,730	35	2,069	206	301	0	0	14,451	773	0	0	19,633
11 So Jersey	1	30	1	0	0	3	2,865	9	2,350	286	1,932	0	0	34,728	1,723	0	0	43,908
12 NE PA	0	1	1	0	0	0	19	11	16	1	0	0	0	492	17	0	0	558
13 SE PA	0	1	0	0	0	0	138	0	66	7	170	0	0	1,711	26	0	0	2,116
14 Manhattan	0	10	0	0	0	0	1,320	12	4,412	67	53	0	0	61	45	0	0	5,979
15 Other NYC, LI	0	3	0	0	0	0	531	8	6,619	108	77	0	0	23,510	8	0	0	30,864
16 Upstate NY	0	1	0	0	0	0	344	1	335	9	15	0	0	9,540	494	0	0	10,733
17 New England	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	27	380	48	0	0	18	13,418	438	34,249	1,251	2,927	0	0	212,129	8,271	1	0	273,153

 Trips to or from the I-78 Study Area



6.6.3 Performance of Alternative 1: Maximum Build

Table 6-13 summarizes the performance of the corridor under the 2030 Maximum Build alternative, in terms of screen line volumes and transit boardings, all during the morning peak period.

The following four screen lines are summarized:

- **The Delaware River Screen Line** traffic volume will remain essentially unchanged. In the 2030 No-Build condition it was estimated that 32,530 autos will cross the River eastbound during the morning peak period. The above transit enhancements will decrease that amount slightly – by 304 vehicles – to 32,228 autos. It should be noted that in this alternative a large number of autos are expected to cross from Pennsylvania to the Alpha transit hub; even though they are ultimately transit users, they do not affect this screen line’s auto total as a result. Total transit riders crossing this screen line will decrease: the Martz lines in the I-80 Corridor will lose riders to the extended rail, as will the Trans-Bridge and Bieber lines in the I-78 corridor.
- **The Warren / Hunterdon Border Screen Line** traffic volume will decrease slightly, from 18,240 in the No-Build to 18,030 in the Maximum Build. Total transit ridership crossing the screen line will nearly triple, from 460 to 1,240 persons.
- **The West of I-287 Screen Line** traffic volume will also remain essentially unchanged, decreasing from 36,270 vehicles in the No-Build to 36,340 vehicles in the Maximum Build. This minor change reflects the reality of a congested network: while transit improvements may remove some vehicles from the critical locations, others are using less desirable routes and find that newly available capacity, so the apparent effect is minimal. Transit ridership across this screen line will increase significantly, from 1,630 in the No-Build to 28,840 persons in the Maximum Build (a 75 percent increase).
- **The Somerset / Union County Border Screen Line** traffic volume is actually estimated to increase slightly, from 28,435 to 28,750 autos. Again, this is likely due to motorists diverting to the less congested facility in a highly congested network. Transit ridership across the screen line will increase from 6,970 to 8,230 persons – an increase of 1,260 persons (18 percent).

Also indicated in Table 6-13 are the total rail and bus boardings in the western portion of the I-78 corridor (Lebanon and west). The 380 rail boardings estimated for the 2030 No-Build will increase to 3,400 boardings with the 2030 Maximum Build, again due to the substantial service improvements assumed for this alternative. Bus ridership will decline, from 975 persons boarding in the No-Build to 485 boarding in the Maximum Build. Altogether, total transit boardings (bus and rail) will increase from 1,360 in the 2030 No-Build to 3,880 in the 2030 Maximum Build.



6.6.4 Evaluation of Alternative 1: Maximum Build

The individual components of the Maximum Build Alternative were evaluated with respect to the ridership that they were estimated to attract, as well as physical feasibility and other factors known to apply. The results of this assessment are shown in Table 6-14.

It was concluded that several components should be dropped from the package:

- (R2-B) The DMU Bounceback service did not attract the needed amount of ridership.
- (B1-B) Trans-Bridge bus service to permit alightings in Clinton did not attract sufficient ridership to warrant the change.
- (B1-C) Bieber bus service to permit alightings in Clinton did not attract sufficient ridership to warrant the change.
- (B2-B) US-22 Express Overlay did not attract sufficient ridership.
- (B2-C) US 202/206 Overlay did not attract sufficient ridership.
- (B2-D) I-78 Overlay did not attract sufficient ridership.
- (B2-E) NJ Route 31 Overlay did not attract sufficient ridership.
- (B3-E) Peapack / Bedminster Shuttle did not attract sufficient ridership
- (P2-B) Bloomsbury Park-and-Ride did not attract sufficient activity if the Alpha transit hub is implemented. Because Bloomsbury sites are fully within the Highlands protection zone, it was assumed that for purposes of further evaluation only one of these lots – Alpha or Bloomsbury – should be progressed. Further evaluation of the two sites will be needed during the Phase 2 studies.
- (P2-C) Clinton Transfer and Park-and-Ride was dropped due to inconsistency with local land use and desires. Further investigation of options and opportunities in the vicinity of Clinton may be undertaken in the future, in close coordination with local land use plans, stakeholders and elected officials.



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Table 6-14: Maximum Build Alternative Ridership Evaluation

Component				2030 Travel Model Forecast Person Boardings			SUGGESTED STATUS
				Peak	Off-Peak	Daily	
RAIL							
R1	EXTENSIONS			4555	1579	6134	
	R1-A	Raritan Valley Line Extension (RVLX)	Lebanon Station and West*: Total Raritan Valley Line*: *Note P/A format, boardings + alightings * Note: P/A format, boardings + alightings	30039	10171	38371	Retain
R2	SERVICE ENHANCEMENTS						
	R2-A	Express Passenger Runs on RVLX	Included in Above R1-A				Retain
	R2-B	Local (DMU) bounceback on RVL		74	0	74	Drop - Low ridership
BUS							
B1	SERVICE EXTENSIONS / ENHANCEMENTS TO EXISTING LINES						
	B1-A	LANTA extension to Philipsburg Station on RVLX	Not modeled				Retain
	B1-B	Trans-Bridge service to Clinton		45	9	54	Drop - Ridership not sufficient to warrant added delay
	B1-C	Bieber service to Clinton		0	0	0	Drop - Ridership not sufficient to warrant added delay
B2	NEWBUS SERVICE						
	B2-A	I-78 / US22 Spine service		311	111	422	Retain
	B2-B	US-22 Overlay		41	26	67	Drop - Low ridership
	B2-C	US-202/206 Overlay		12	3	15	Drop - Low ridership
	B2-D	I-78 Bus Service Overlay		304	46	350	Drop - 227 of the 273 boardings stay within Somerville and Summit/Murray Hill (using it as local service).
	B2-E	NJ 31 Overlay		33	0	33	Drop - Low ridership
B3	NEWBUS SHUTTLE SERVICE						
	B3-A	Rail Station Access	All Shuttles	332	239	571	Retain - Ridership could develop despite low forecast
	B3-B	Readington Employers' Driveway Van	Not Modeled				Retain
	B3-C	Bridgewater Circulator	Not Modeled				Retain
	B3-E	Peapack/Bedminster Shuttle		1	0	1	Drop - Low ridership
PARK AND RIDES							
P1	PARK-AND-RIDE FACILITY RELOCATIONS (INTERIM?)						
	P1-A	Clinton Point & Annandale Square to Union Twp / NJ 173	Not Modeled (Interim project)				Retain, Make Union Twp lot permanent
	P1-B	Annandale Station to Clinton Station	Included in Clinton P&R below				Drop - Clinton station dropped
P2	PARK-AND-RIDE / TRANSIT HUBS						
	P2-A	Alpha		1281	383	1664	Retain
	P2-B	Bloomsbury		4	4	8	Drop - Low ridership and potential Highlands Preservation Area conflict
	P2-C	Clinton		803	221	1024	Drop - Inconsistent with local land use plans
	P2-D	Hampton		413	151	564	Retain
P3	EXPANSION OF EXISTING LOTS						
	P3-A	Readington / Whitehouse Station		246	36	282	Retain
	P3-B	PA33 & PA412 Park-and-Ride Expansions	PA-33 P&R	15	9	24	Retain - Existing + programmed
HIGHWAY							
H1	TRANSIT-READY CORRIDOR TREATMENTS						
	H1-A	US-22 / Hunterdon-Somerset					Retain
	H1-B	US-22 / Warren					Retain



6.6.5 Summary of Alternative 1: Maximum Build

The above travel forecasts for the 2030 Maximum Build Alternative indicate several conditions that are of note:

- The proposed express bus service on I-78 and US Route 22 can attract significant ridership – about 500 boardings per day – if implemented. Support actions such as efficient and ample park-and-ride facilities and transit-ready corridor improvements are needed to achieve this level of ridership;
- Significant numbers of travelers would use enhanced rail service if it were provided;
- Transit hubs and park-and-ride facilities would be effective and necessary components of the I-78 corridor plan; and
- Shuttles and connectors to improve access to both bus and rail, and at both the residence trip end and the work site end of the trip, are important components of the plan.

6.7 BUILD ALTERNATIVE 2: REDUCED BUILD

Following review of the above findings with NJTPA and the Steering Committee, a “Reduced Build” alternative was formulated that removed the identified components from the plan, and made adjustments as appropriate to improve the overall plan. The NJTDFM travel model was then used to test the reduced package in terms of ridership and congestion mitigation.

6.7.1 Components of the Reduced Build Alternative

The following components were retained from the Maximum Build Alternative:

- (R1-A) Raritan Valley Line Extension (RVLX)
- (R2-A) Express passenger runs on RVLX
- (B1-A) LANTA extension to Phillipsburg station on RVLX
- (B2-A) I-78 / US 22 Spine Express Bus Service
- (B3-A) Rail station access bus shuttles
- (B3-B) Readington employers’ driveway Van
- (B3-C) Bridgewater circulator bus
- (B3-E) Peapack / Bedminster shuttle
- (P2-A) Alpha Transit Hub
- (P2-B) Bloomsbury Transit Hub (alternative to Alpha Transit Hub)
- (P2-D) Hampton Transit Hub
- (P3-A) Readington / Whitehouse Station parking lot expansion
- (P3-B) PA33 & PA412 Park-and-Ride expansions (Pennsylvania)
- (H1-A) US 22 / Hunterdon – Somerset transit-ready corridor treatments
- (H1-B) US 22 / Warren County transit-ready corridor treatments



In addition to the above, minor route and schedule changes were made to better integrate and coordinate the remaining services. The most significant change was to reroute some of the US-22 corridor buses from an origination in Pennsylvania to an origination at the Hampton park-and-ride / transit hub.

6.7.2 Travel Forecasts for Alternative 2: Reduced Build

The North Jersey Transit Demand Forecast Model (NJTDFM) was rerun for the 2030 Reduced Build Alternative condition in the same manner as it was for the 2030 No-Build and 2030 Maximum Build conditions described above.

Person trip matrices are provided in Table 6-15, and show the total regional trips and those made by bus and rail. Table 6-16 summarizes trip activity in the I-78 corridor portion of Hunterdon, Somerset, Warren, Lehigh, and Northampton Counties, in comparison to the 2030 No-Build.

Table 6-16: Reduced Build Alternative AM Peak Period Person Trips Produced or Attracted in the I-78 Corridor Only (With Raritan Valley Line Extension)

	2030 No-Build	2030 Reduced-Build	Change
AM Peak Productions:			
Total	256,950	256,950	0
Bus	920	895	-25
Rail	3,850	4,580	+730
AM Peak Attractions:			
Total	255,710	255,710	0
Bus	350	810	+460
Rail	240	420	+180
New Transit Trip Ends			+1,345

During the morning peak period the travel model estimates that the number of transit trips produced in the I-78 corridor will increase from the No-Build, from 4,770 to 5,475. The number of transit trips produced for the Reduced Build alternative (5,475 trips) is less than for the Maximum Build (6,067 trips), mainly due to the elimination of the Clinton transit hub / park-and-ride from the alternative. Transit trip attractions respond similarly: total transit trip attractions in the I-78 corridor for the Reduced Build will be 1,230 trips, as compared to a No-Build total of 590 trips attracted, and a Maximum Build Alternative total of 1,280 trips. The resulting transit mode share for trip productions will be 2.1 percent, and for trip attractions it will be 0.5 percent. Altogether it is estimated that 1,345 new transit trips will be made in the study area portion of the I-78 corridor under the Reduced Build Alternative.

While not as large as under the Maximum Build Alternative, the estimated transit usage under the Reduced Build is still substantial and indicates the effectiveness of the proposed service.



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Table 6-15: Future (2030) Alternative 2: Reduced Build Trip Matrices

1. Total A.M. Peak Person Trips by District, P/A Format

PRODUCTION DISTRICT	ATTRACTION DISTRICT																	TOTAL
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
	H I-78	SI-78	WI-78	LV	H Rem	S Rem	NE Jersey	W Rem/NW Jersey	Hudson	Union	So Jersey	NE PA	SE PA	Manhattan	Other NYC, LI	Upstate NY	New Eng	
1 Hunterdon I-78	28,885	5,184	1,890	0	4,178	1,469	2,050	3,732	588	1,078	2,887	0	0	553	182	0	0	52,857
2 Somerset I-78	2,775	79,393	194	0	1,293	10,919	6,860	9,441	1,868	7,247	14,386	0	0	3,730	496	0	0	138,403
3 Warren I-78	3,251	1,494	23,170	0	469	376	637	1,751	173	257	756	0	0	162	2	0	0	32,498
4 Lehigh Valley	4,268	4,811	4,186	0	687	1,203	1,061	4,039	184	578	1,397	0	9,289	1,062	524	95	7	33,393
5 Hunterdon Rem	2,016	1,500	182	0	28,775	1,091	809	721	189	298	3,431	0	0	229	84	0	0	39,303
6 Somerset Rem	1,030	20,889	102	0	2,282	47,999	4,017	2,245	1,160	4,760	26,086	0	0	3,040	1,092	2	0	114,705
7 NE Jersey	818	6,528	109	0	501	2,067	1,013,012	60,333	94,080	48,448	20,117	0	12	117,856	28,993	83	0	1,392,956
8 Warren Rem/NW Jersey	5,839	12,201	2,345	0	1,309	2,819	75,994	378,049	8,722	12,149	9,050	0	8	13,167	1,750	1	0	523,403
9 Hudson	172	1,148	18	0	111	504	70,588	4,197	215,383	8,665	6,200	0	0	90,660	13,886	88	15	411,815
10 Union	450	14,896	74	0	280	5,435	44,069	11,385	12,454	168,746	39,320	0	0	19,077	5,054	3	0	321,242
11 So Jersey	1,827	17,942	187	0	2,277	32,367	39,956	7,693	15,474	36,457	1,382,350	0	254	55,452	18,229	58	2	1,609,226
12 NE PA	425	602	577	0	127	238	4,975	12,981	1,172	487	1,201	411	795	9,582	5,368	2,754	53	41,749
13 SE PA	1,076	1,870	213	0	1,648	1,588	980	771	244	478	26,190	0	3,147	2,358	128	4	0	40,694
14 Manhattan	0	544	0	74	29	93	13,607	803	8,372	1,055	1,276	64	80	354	231	810	37	27,428
15 Other NYC, LI	21	683	0	18	0	724	18,617	1,645	20,949	3,573	6,484	6	68	26,216	43	1,300	104	80,451
16 Upstate NY	0	152	5	0	15	103	22,760	2,478	2,422	455	756	0	7	21,856	9,808	2,220	0	63,037
17 New England	0	0	0	0	0	0	0	0	68	0	0	0	0	61	15	2	0	148
TOTAL	62,652	169,718	33,250	92	43,981	108,994	1,318,972	502,263	383,283	294,731	1,541,888	482	13,660	365,415	85,888	7,421	219	4,922,906

2. Total A.M. Peak Bus Person Trips by District, P/A Format

PRODUCTION DISTRICT	ATTRACTION DISTRICT																	TOTAL
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
	H I-78	SI-78	WI-78	LV	H Rem	S Rem	NE Jersey	W Rem/NW Jersey	Hudson	Union	So Jersey	NE PA	SE PA	Manhattan	Other NYC, LI	Upstate NY	New Eng	
1 Hunterdon I-78	19	22	0	0	4	0	0	0	0	0	0	0	0	2	5	0	0	53
2 Somerset I-78	8	304	0	0	0	3	2	1	0	18	21	0	0	12	3	0	0	373
3 Warren I-78	18	46	176	0	1	0	0	0	0	0	0	0	0	15	0	0	0	256
4 Lehigh Valley	19	41	29	0	1	0	0	0	0	0	0	0	0	74	22	0	0	187
5 Hunterdon Rem	2	1	0	0	2	0	1	0	0	0	0	0	0	17	10	0	0	32
6 Somerset Rem	0	18	0	0	0	7	2	0	1	24	91	0	0	52	16	0	0	212
7 NE Jersey	0	8	0	0	0	1	32,879	125	3,596	2,437	23	0	0	26,775	2,312	0	0	68,155
8 Warren Rem/NW Jersey	0	4	0	0	0	0	170	511	6	15	0	0	0	581	35	0	0	1,334
9 Hudson	0	1	0	0	0	0	2,847	2	20,259	102	13	0	0	14,960	820	0	0	39,004
10 Union	0	71	0	0	0	21	1,061	23	140	3,917	59	0	0	1,173	267	0	0	6,731
11 So Jersey	0	35	0	0	0	42	71	0	822	116	5,304	0	0	11,422	1,788	0	0	19,601
12 NE PA	1	0	0	0	0	0	1	0	15	0	0	0	0	2,925	706	0	0	3,648
13 SE PA	0	0	0	0	5	0	0	0	2	0	0	0	0	88	1	0	0	97
14 Manhattan	0	0	0	0	1	1	3,843	41	1,934	215	134	0	0	44	1	8	0	6,220
15 Other NYC, LI	0	0	0	0	0	0	736	2	639	28	26	0	0	388	0	2	0	1,820
16 Upstate NY	0	0	0	0	0	0	57	0	7	0	0	0	0	2,313	195	3	0	2,575
17 New England	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	66	551	205	0	14	75	41,670	708	27,421	6,872	5,870	0	0	60,851	6,183	12	0	150,299

3. Total A.M. Peak Rail Person Trips by District, P/A Format

PRODUCTION DISTRICT	ATTRACTION DISTRICT																	TOTAL
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
	H I-78	SI-78	WI-78	LV	H Rem	S Rem	NE Jersey	W Rem/NW Jersey	Hudson	Union	So Jersey	NE PA	SE PA	Manhattan	Other NYC, LI	Upstate NY	New Eng	
1 Hunterdon I-78	5	44	10	0	0	1	85	1	75	18	7	0	0	482	6	0	0	713
2 Somerset I-78	3	43	2	0	0	2	195	9	189	55	11	0	0	2,689	54	0	0	3,251
3 Warren I-78	3	31	13	0	0	1	28	0	30	10	5	0	0	138	2	0	0	260
4 Lehigh Valley	8	63	9	0	0	1	71	4	32	9	4	0	0	706	93	0	0	1,000
5 Hunterdon Rem	1	6	2	0	0	0	37	0	18	5	4	0	0	165	13	0	0	249
6 Somerset Rem	1	46	1	0	0	1	170	1	188	25	32	0	0	2,073	76	0	0	2,613
7 NE Jersey	1	20	1	0	0	2	2,713	85	7,341	185	244	0	0	50,453	2,041	0	0	63,085
8 Warren Rem/NW Jersey	2	19	7	0	0	0	586	255	821	93	18	0	0	9,130	119	0	0	9,848
9 Hudson	0	3	0	0	0	0	2,589	7	9,987	190	56	0	0	82,821	2,782	0	0	78,336
10 Union	2	60	1	0	0	4	1,730	35	2,069	206	301	0	0	14,451	773	0	0	19,633
11 So Jersey	1	30	1	0	0	3	2,865	9	2,350	266	1,932	0	0	34,728	1,723	0	0	43,908
12 NE PA	0	1	1	0	0	0	19	11	16	1	0	0	0	492	17	0	0	558
13 SE PA	0	1	0	0	0	0	138	0	66	7	170	0	0	1,711	26	0	0	2,116
14 Manhattan	0	10	0	0	0	0	1,320	12	4,412	67	53	0	0	61	45	0	0	5,979
15 Other NYC, LI	0	3	0	0	0	0	531	8	6,619	108	77	0	0	23,510	8	0	0	30,864
16 Upstate NY	0	1	0	0	0	0	344	1	335	9	15	0	0	9,540	494	0	0	10,733
17 New England	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	27	380	48	0	0	18	13,418	438	34,249	1,251	2,927	0	0	212,129	8,271	1	0	273,153

Trips to or from the I-78 Study Area



The extension and restoration of passenger service on the Raritan Valley Line will be studied in detail in an upcoming Phase 2 study. The travel model was run to estimate travel conditions if the Raritan Valley Line Extension project were not to be implemented, but all other transit options discussed for this Reduced Build Alternative were to occur.

As is shown in Tables 6-17 and 6-18, the number of rail trips produced in the corridor will decrease, as would be expected, from 4,580 with the RVL Extension (RVLX) project, to 3,675 without it. The number of bus trip productions would rise – from 895 to 1,600. The trip attractions in the corridor would react similarly: Rail trip productions would decrease from 420 to 270 without the RVL Extension, whereas bus trip attractions would increase from 810 to 860.

**Table 6-17: AM Peak Period Person Trips Produced or Attracted in the I-78 Corridor Only
(Without Raritan Valley Line Extension)**

	2030 No-Build	2030 Reduced-Build (without RVLX)	Change
AM Peak Productions:			
Total	256,950	256,950	0
Bus	920	1,600	+680
Rail	3,850	3,675	-175
AM Peak Attractions			
Total	255,710	255,710	0
Bus	350	860	+510
Rail	240	270	+30
New Transit Trip Ends			+1,020

These estimates indicate that either with or without the Raritan Valley Line Extension project, the bus service improvements proposed in this alternative will be effective and will attract significant ridership levels.



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**Table 6-18: Future (2030) Alternative 2: Reduced Build Trip Matrices
(Without Raritan Valley Line Extension)**

1. Total A.M. Peak Person Trips by District, P/A Format

PRODUCTION DISTRICT	ATTRACTION DISTRICT																	TOTAL
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
	H I-78	SI-78	WI-78	LV	H Rem	S Rem	NE Jersey	W Rem/NW Jersey	Hudson	Union	So Jersey	NE PA	SE PA	Manhattan	Other NYC, LI	Upstate NY	New Eng	
1 Hunterdon I-78	28,885	5,184	1,890	0	4,178	1,469	2,050	3,732	588	1,078	2,887	0	0	553	182	0	0	52,657
2 Somerset I-78	2,775	79,393	194	0	1,293	10,819	6,860	9,441	1,868	7,247	14,386	0	0	3,730	496	0	0	138,403
3 Warren I-78	3,251	1,494	23,170	0	469	376	637	1,751	173	257	756	0	0	162	2	0	0	32,498
4 Lehigh Valley	4,268	4,811	4,198	0	687	1,203	1,061	4,039	184	578	1,397	0	9,289	1,062	524	95	7	33,393
5 Hunterdon Rem	2,016	1,500	182	0	28,775	1,091	809	721	169	298	3,431	0	0	229	84	0	0	39,303
6 Somerset Rem	1,030	20,899	102	0	2,262	47,999	4,017	2,245	1,160	4,760	26,086	0	0	3,040	1,092	2	0	114,705
7 NE Jersey	818	6,528	109	0	501	2,067	1,013,012	60,333	94,080	48,448	20,117	0	12	117,856	28,993	83	0	1,392,956
8 Warren Rem/NW Jersey	5,839	12,201	2,345	0	1,309	2,819	75,994	378,049	8,722	12,149	9,050	0	8	13,167	1,750	1	0	523,403
9 Hudson	172	1,148	18	0	111	504	70,588	4,197	215,383	8,685	6,200	0	0	90,660	13,888	88	15	411,615
10 Union	450	14,896	74	0	280	5,435	44,089	11,385	12,454	168,746	39,320	0	0	19,077	5,054	3	0	321,242
11 So Jersey	1,627	17,942	187	0	2,277	32,367	38,956	7,693	15,474	36,457	1,382,350	0	254	55,452	18,229	58	2	1,609,226
12 NE PA	425	602	577	0	127	238	4,875	12,981	1,172	487	1,201	411	795	9,582	5,368	2,754	53	41,749
13 SE PA	1,076	1,870	213	0	1,648	1,568	980	771	244	478	26,180	0	3,147	2,358	128	4	0	40,694
14 Manhattan	0	544	0	74	29	93	13,607	803	8,372	1,055	1,276	64	80	354	231	810	37	27,428
15 Other NYC, LI	21	883	0	18	0	724	18,617	1,845	20,949	3,573	6,484	6	68	26,216	43	1,300	104	80,451
16 Upstate NY	0	152	5	0	15	103	22,760	2,478	2,422	455	756	0	7	21,856	9,608	2,220	0	63,037
17 New England	0	0	0	0	0	0	0	0	88	0	0	0	0	61	15	2	0	146
TOTAL	52,652	169,719	33,250	92	43,961	108,994	1,318,972	502,263	383,283	294,731	1,541,886	482	13,660	365,415	85,888	7,421	219	4,922,906

2. Total A.M. Peak Bus Person Trips by District, P/A Format

PRODUCTION DISTRICT	ATTRACTION DISTRICT																	TOTAL
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
	H I-78	SI-78	WI-78	LV	H Rem	S Rem	NE Jersey	W Rem/NW Jersey	Hudson	Union	So Jersey	NE PA	SE PA	Manhattan	Other NYC, LI	Upstate NY	New Eng	
1 Hunterdon I-78	52	47	0	0	0	0	0	0	2	0	0	0	0	121	17	0	0	240
2 Somerset I-78	8	275	0	0	0	3	2	0	0	14	22	0	0	12	4	0	0	338
3 Warren I-78	18	44	177	0	0	0	0	0	1	0	0	0	0	101	1	0	0	342
4 Lehigh Valley	16	49	29	0	0	0	0	0	2	0	0	0	0	522	59	0	0	678
5 Hunterdon Rem	6	5	0	0	2	0	1	0	1	0	0	0	0	105	16	0	0	135
6 Somerset Rem	0	18	0	0	0	7	2	0	1	25	91	0	0	55	17	0	0	216
7 NE Jersey	0	5	0	0	0	1	32,879	125	3,586	2,435	23	0	0	26,775	2,312	0	0	68,149
8 Warren Rem/NW Jersey	5	5	0	0	0	0	170	510	7	15	0	0	0	638	35	0	0	1,385
9 Hudson	0	1	0	0	0	0	2,847	2	20,259	101	13	0	0	14,960	820	0	0	39,003
10 Union	0	67	0	0	0	21	1,065	22	142	3,916	59	0	0	1,236	270	0	0	6,797
11 So Jersey	0	35	0	0	0	42	71	0	822	117	5,304	0	0	11,422	1,789	0	0	19,602
12 NE PA	0	0	0	0	0	0	1	0	17	0	0	0	0	3,031	702	0	0	3,753
13 SE PA	0	0	0	0	5	0	0	0	2	0	0	0	0	88	1	0	0	97
14 Manhattan	0	0	0	0	0	1	3,843	41	1,934	214	134	0	0	44	1	8	0	6,219
15 Other NYC, LI	0	0	0	0	0	0	736	2	639	28	26	0	0	388	0	2	0	1,820
16 Upstate NY	0	0	0	0	0	0	57	0	7	0	0	0	0	2,313	195	3	0	2,575
17 New England	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	106	550	207	0	8	75	41,675	703	27,431	6,863	5,671	0	0	61,810	6,239	12	0	151,350

3. Total A.M. Peak Rail Person Trips by District, P/A Format

PRODUCTION DISTRICT	ATTRACTION DISTRICT																	TOTAL
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
	H I-78	SI-78	WI-78	LV	H Rem	S Rem	NE Jersey	W Rem/NW Jersey	Hudson	Union	So Jersey	NE PA	SE PA	Manhattan	Other NYC, LI	Upstate NY	New Eng	
1 Hunterdon I-78	1	18	5	0	0	0	33	0	35	7	2	0	0	284	1	0	0	395
2 Somerset I-78	2	39	1	0	0	2	178	9	177	52	10	0	0	2,648	50	0	0	3,188
3 Warren I-78	0	5	10	0	0	0	4	0	7	1	1	0	0	24	0	0	0	52
4 Lehigh Valley	0	0	8	0	0	0	1	3	4	1	0	0	0	52	2	0	0	71
5 Hunterdon Rem	0	0	0	0	0	0	9	0	3	0	3	0	0	41	0	0	0	56
6 Somerset Rem	1	42	1	0	0	1	159	0	177	23	31	0	0	2,057	72	0	0	2,584
7 NE Jersey	1	19	1	0	0	2	2,713	85	7,345	180	244	0	0	50,453	2,041	0	0	63,081
8 Warren Rem/NW Jersey	0	6	6	0	0	0	563	255	801	87	13	0	0	8,067	119	0	0	9,718
9 Hudson	0	3	0	0	0	0	2,588	7	9,887	192	56	0	0	62,821	2,782	0	0	78,338
10 Union	2	56	1	0	0	4	1,884	36	2,045	202	298	0	0	14,319	759	0	0	19,404
11 So Jersey	1	27	1	0	0	3	2,859	9	2,343	261	1,931	0	0	34,723	1,722	0	0	43,881
12 NE PA	0	0	1	0	0	0	12	11	6	1	0	0	0	305	13	0	0	348
13 SE PA	0	0	0	0	0	0	136	0	86	6	170	0	0	1,711	26	0	0	2,116
14 Manhattan	0	8	0	0	0	0	1,320	12	4,412	64	53	0	0	61	45	0	0	5,975
15 Other NYC, LI	0	2	0	0	0	0	530	8	6,819	106	77	0	0	23,510	8	0	0	30,661
16 Upstate NY	0	1	0	0	0	0	344	1	335	9	15	0	0	9,540	494	0	0	10,739
17 New England	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	7	224	35	0	0	13	13,133	437	34,062	1,192	2,904	0	0	210,615	8,132	1	0	270,756

Trips to or from the I-78 Study Area



6.7.3 Performance of Alternative 2: Reduced Build

Table 6-19 summarizes the performance of the corridor under the 2030 Reduced Build alternative, and for conditions both with and without the extension of the Raritan Valley Line to Phillipsburg. The table presents screen line volumes and transit boardings, all during the morning peak period.

The following four screen lines are summarized:

- **The Delaware River Screen Line** traffic volume will remain essentially unchanged from the 2030 No-Build to the Reduced Build alternative. In the No-Build it was estimated that 32,530 autos will cross the River eastbound during the morning peak period. The Reduced Build Alternative transit enhancements will decrease that number slightly – by 300 vehicles with the RVL Extension. By contrast, without the RVL Extension project the river crossing volume will increase the river crossing volume by 260 vehicles. The bus passenger volume will decrease from the No-Build by about 580 persons with the RVL Extension, and will decrease from by No-Build by about 470 persons without it.
- **The Warren / Hunterdon Border Screen Line** traffic volume will increase from the No-Build by about 200 vehicles with the RVL Extension, and by about 320 vehicles without the Extension project. About 1,225 rail passengers will cross the screen line with the Extension, and none without it. Bus persons will be 225 less than the No-Build with the Extension, and 230 more than the No-Build without the Extension – an overall difference of 550 more bus passengers without the RVL Extension project.
- **The West of I-287 Screen Line** will show similar characteristics to the above. With the RVL Extension, there will be 425 fewer autos crossing the screen line than the No-Build, whereas without the Extension project there will be 540 more vehicles crossing it. With the Extension 2,145 rail passengers will cross the screen line, and that number falls to 450 passengers without the Extension. The number of bus passengers will increase from 510 with the Extension, to 1,250 without it.
- **The Somerset / Union County Border Screen Line** traffic volume will increase from the No-Build by about 700 vehicles with the RVL Extension, and by about 230 vehicles without the Extension. With the Extension about 7,440 rail passengers will cross the screen line on the Gladstone Branch and the Raritan Valley Line, but that number falls to 5,510 passengers without the RVL Extension.

Also indicated in Table 6-19 are the total rail and bus boardings in the western portion of the I-78 corridor (Lebanon and west). The 380 rail boardings estimated for the 2030 No-Build will increase to 2,840 boardings with the Reduced Build and the Raritan Valley Line Extension in place, and to 212 boardings without the Extension. Bus ridership will decline with the Extension in place and the Reduced Build alternative, from 975 with the No-Build to 685 with the Reduced Build and RVL Extension. The bus boardings will increase to 1,570 with the Reduced Build and without the RVL Extension.



6.7.4 Evaluation of Alternative 2: Reduced Build

The individual components of the Maximum Build Alternative were evaluated with respect to the ridership that they were estimated to attract. The results of this assessment are shown in Table 6-20 for the 2030 Reduced Build Alternative, with the Raritan Valley Line Extension assumed to be in place.

As indicated in the table, the Raritan Valley Line will attract 5,200 daily boardings and alightings from Lebanon station to the west. The proposed bus service on I-78 and US Route 22 will attract 615 daily boardings, and the various station and connector shuttles will attract about 565 daily boardings.

There will be significant demand for parking at the proposed transit hubs in the corridor, and the Alpha hub could attract as many as 1,800 parkers, accessing both rail and bus. The Hampton hub could attract 730 parkers.

6.7.5 Summary of Alternative 2: Reduced Build

The above travel forecasts for the 2030 Reduced Build Alternative indicate several conditions that are of note:

- The proposed express bus service on I-78 and US Route 22 can attract significant ridership – about 615 boardings per day – if implemented. The I-78/US-22 Overlay service (B2-B) proposed as part of the Maximum Build alternative resulted in unnecessary redundancy and was dropped, but the remaining basic I-78/US-22 Spine Service is shown to attract significant ridership. Support actions such as efficient and ample park-and-ride facilities and transit-ready corridor improvements are needed to achieve this level of ridership.
- Significant numbers of travelers would use enhanced rail service if it were provided. Bus transit demands in the US-22 corridor remain essentially unchanged whether the rail enhancements are provided or not.
- Transit hubs and park-and-ride facilities would be effective and necessary components of the I-78 corridor plan. Large demands – on the order of 1,800 spaces – could occur at a facility in Alpha if easy, quick access is provided to I-78, although some of this demand could be accommodated by the park-and-rides in Pennsylvania at PA Routes 33 and 412. The Hampton transit hub could attract a demand for as many as 700 spaces if fully served by rail and bus.
- Shuttles and connectors to improve access to both bus and rail, and at both the residence and work site, are important components of the plan.



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Table 6-19: 2030 Reduced Build Alternative Performance Summary

	2005	2030 No-Build (With RVLX)	2030 Maximum Build	2030 Reduced Build	2030 Reduced Build (No RVLX)
SCREENLINE VOLUMES:					
AM Peak Period, Eastbound					
Delaware River (MP 0.0)					
Rail Persons	-	-	-	-	-
Bus Persons (Includes I-80)	2,765	4,240	3,683	3,656	3,769
Martz (I-80)	2,375	3,783	3,658	3,636	3,741
Trans-Bridge & Bieber	391	457	19	16	24
Other	-	-	5	4	5
Total Rail + Bus	2,765	4,240	3,683	3,656	3,769
Auto Vehicles	25,469	32,532	32,228	32,329	32,789
Warren / Hunterdon Border (MP 6.4)					
Rail Persons	-	-	1,013	1,225	-
Bus Persons	396	460	226	134	687
Total Rail + Bus	396	460	1,239	1,358	687
Auto Vehicles	14,164	18,240	18,032	18,437	18,557
West of I-287 (MP 29.7)					
Rail Persons	287	708	2,485	2,145	447
Bus Persons	869	918	355	511	1,253
Total Rail + Bus	1,156	1,626	2,840	2,655	1,700
Auto Vehicles	29,243	36,266	36,341	35,843	36,806
Somerset / Union Border (MP 40.4)					
Rail Persons (RVL only)	3,926	5,851	7,764	7,440	5,510
Bus Persons	1,180	1,119	466	664	1,345
Total Rail + Bus	5,106	6,970	8,229	8,104	6,855
Auto Vehicles	25,080	28,435	28,752	29,129	28,669
TOTAL DAILY BOARDINGS (EASTBOUND):					
Raritan Valley Line, Lebanon and West					
Phillipsburg	-	-	128	121	-
Alpha	-	-	1,687	1,829	-
Bloomsbury	-	-	8	-	-
Hampton	-	-	562	725	-
High Bridge	46	127	19	48	79
Annandale	53	197	-	73	100
Clinton	-	-	995	-	-
Lebanon	25	57	1	48	34
Total	124	380	3,398	2,843	212
Trans-Bridge	898	954	233	475	1,306
Bieber	2	22	7	-	1
US-22 Service	-	-	245	210	259
Total	900	976	485	685	1,566
Rail + Bus Total	1,024	1,356	3,883	3,528	1,778



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**Table 6-20: Reduced Build Alternative Ridership Evaluation
(With Raritan Valley Line Extension Project)**

Component				2030 Travel Model Forecast Person Boardings		
				Peak	Off-Peak	Daily
RAIL						
R1 EXTENSIONS						
	R1-A	Raritan Valley Line Extension (RVLX)	Lebanon Station and West:* Total Raritan Valley Line:* *Note: P/A format, boardings + alightings	3856 29322	1342 10027	5198 39349
R2 SERVICE ENHANCEMENTS						
	R2-A	Express Passenger Runs on RVLX	Included in Above R1-A			
BUS						
B1 SERVICE EXTENSIONS / ENHANCEMENTS TO EXISTING LINES						
	B1-A	LANTA extension to Philipsburg Station on RVLX	Not modeled			
B2 NEW BUS SERVICE						
	B2-A	I-78 / US-22 Spine service		331	88	419
	B2-F	US-22 Overlay, to Hampton Hub		154	40	194
B3 NEW BUS SHUTTLE SERVICE						
	B3-A	Rail Station Access	All Shuttles	330	236	566
	B3-B	Readington Employers Driveway Van	Not modeled			
	B3-C	Bridgewater Circulator	Not modeled			
PARK AND RIDES						
P2 PARK-AND-RIDE / TRANSIT HUBS						
	P2-A	Alpha		1401	408	1809
	P2-D	Hampton		491	238	728
	P2-E	Union Twp / NJ-173		52	18	69
P3 EXPANSION OF EXISTING LOTS						
	P3-A	Readington / Whitehouse Station		298	42	339
	P3-B	PA33 & PA412 Park-and-Ride Expansions		14	9	23



**Section 7
Recommendations**



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SECTION 7 RECOMMENDATIONS

7.1 INTRODUCTION

The I-78 Corridor Transit Study identified transportation and mobility needs in the five-county study area. In the previous section of this report assembly of potential transportation improvements into packages, and evaluation of their effectiveness, was discussed. Resulting from that process is a series of recommendations for actions that will increase transit options and service, and overall mobility, in the corridor.

Recommended improvements and actions can be grouped into the following categories:

- **Transit Improvements:** Expansion and enhancement of bus transit and rail passenger rail service (Section 7.2);
- **Park-and-Ride Improvements** – Improvements and expansion of existing park-and-ride facilities, and development of new sites (Section 7.3);
- **Transit-Ready Corridor and Access Treatments** – Actions to support efficient movement of buses along the US Route 22 corridor, easing flow through congested areas and facilitating access to and from bus and rail lines (Section 7.4);
- **Highway Improvements** – Improvements to address key congestion and access issues that affect transit service. Highway improvements are selected to resolve specific hot spots in the corridor (Section 7.5); and
- **Land Use and Travel Demand Management** – Actions and policies to encourage development patterns and support services that would reduce dependence on single-occupant auto travel (Section 7.6).

Implementation of these improvements will potentially require involvement by many public agencies working in the corridor: New Jersey Department of Transportation (NJDOT); NJ TRANSIT; Delaware River Joint Toll Bridge Commission (DRJTBC); Pennsylvania Department of Transportation (PennDOT); Lehigh and Northampton Transit Authority (LANTA); the county governments of Somerset, Hunterdon, and Warren Counties in New Jersey, and Lehigh and Northampton County in Pennsylvania; various municipalities; Transportation Management Associations (TMAs); and private bus operators.

In the following summary each of the components of the recommended plan is described. Responsible agencies (implementers and operators of the recommended improvements) are identified, as are general ranges of cost and schedule for implementation.

- **Costs** are expressed in terms of ranges:
 - Low (less than \$1 million to initiate and operate for 5 years);
 - Medium (\$1 million to \$10 million to initiate and operate); or
 - High (more than \$10 million).



I-78 CORRIDOR TRANSIT STUDY

Section 7: Recommendations

- **Schedule** is expressed in ranges also:
 - Immediate (less than 2 years to initiate);
 - Short Term (2 to 5 years to initiate);
 - Medium Term (5 to 10 years to initiate); or
 - Long Term (longer than 10 years to initiate).

7.2 RECOMMENDED TRANSIT IMPROVEMENTS

The core of the recommended plan is a series of improvements to and expansions of the public transit systems serving the I-78 corridor. These include public and private bus line-haul operations, potential passenger rail services, and shuttle bus services, and are illustrated in Figure 7-1.

Figure 7-1: Recommended Transit Improvements



- 1 Passenger Rail Service Extension**
 - NJ Transit is beginning the next phase of study to investigate the feasibility of extending passenger rail service to Phillipsburg, and possibly into Pennsylvania
- 2 Express Bus in the I-78 & US Route 22 Corridor**
 - Originate at the PA Route 33 and PA Route 412 Park-and-Rides in Northampton County
 - Follow I-78 and US Route 22 to the eastern Hunterdon and Central Somerset employment centers
 - Stop at major Park-and-Rides in Warren and Hunterdon Counties
- 3 Express Bus Service in the NJ Route 31 Corridor**
 - Originate at future Park-and-Rides in the NJ Route 31 Corridor
 - Follow NJ Route 31, I-78, and US Route 22 to the eastern Hunterdon and Central Somerset employment centers
- 4 Shuttle Bus Service at Key Rail Stations and Activity Centers**
 - Phillipsburg
 - Alpha, Pohatcong, and Greenwich
 - Clinton, Annandale, Union Township
 - Readington and White House Station
 - Branchburg and North Branch



7.2.1 Passenger Rail Service Extension

A core action that has been discussed for the I-78 corridor is the extension of passenger rail service on NJ TRANSIT's Raritan Valley Line, from its present terminus at High Bridge to Phillipsburg, and possibly beyond into Pennsylvania. It is not the purpose of this study to evaluate the feasibility or effectiveness of extending rail service; instead, NJ TRANSIT is preparing to do so in a Phase 2 study that would examine in greater detail bus and rail options and alternatives in Central New Jersey. This Phase 1 study has been undertaken to identify initial transit enhancement and park-and-ride expansion opportunities in the I-78 Corridor, and those findings will feed into the Phase 2 study in which a broader range of rail improvement options will be investigated.

As transit needs and improvement opportunities were reviewed in this I-78 Corridor Transit Study, however, it was determined that over the long term bus, rail and park-and-ride improvement actions must be coordinated. One of the most obvious means of extending rail service to Phillipsburg would be to follow the existing right of way on which Raritan Valley Line passenger service was operated until the 1980s. Therefore it was concluded that bus and park-and-ride improvements should account for the possible reactivation of the Line for passenger service.

This would focus attention for siting park-and-ride and transfer facilities on those locations where the rail line is in proximity to, or crosses, major state highways including I-78, NJ Route 31, US Route 22, and NJ Route 173. For purposes of defining bus and park-and-ride facilities, then, certain assumptions were made as to the possible layout of the Raritan Valley Line Extension:

- That the passenger rail service extension would follow the original Central Railroad of New Jersey right of way, which was operated as part of the Raritan Valley Line service until the 1980s, from High Bridge westward to Phillipsburg (other options will be evaluated in the Phase 2 study);
- That the service would reach and terminate at a location in downtown Phillipsburg (extension into Pennsylvania is not assumed for this study, but will be evaluated in the Phase 2 study);
- A new station in Alpha, adjacent to I-78, is recommended as a transit hub and park-and-ride. This facility could serve express buses on I-78 as discussed below, as well as providing access to the restored passenger rail service and also serving car pool parkers.
- That new stations along the line could include the major previously served locations: Hampton, Bloomsbury, and Phillipsburg. Minor stations that were previously served, such as Glen Gardner and the downtown of Alpha, are not assumed to be served. Note that the Bloomsbury location is assumed to be only a station, possibly with a small amount of parking. Bloomsbury could serve as an alternative to the transit hub and park-and-ride proposed at Alpha, but such a project is not assumed for purposes of the analysis.



Initial ridership estimates indicate that the expanded rail service would attract a large number of riders destined to the urban core of New Jersey and New York, and consequently could be a successful initiative. It should also be noted that provision of ample parking is an important ingredient to success.

Implementation

- **Responsible Agency:** NJ TRANSIT is responsible for progressing the feasibility and other required studies for the restoration of rail service. As the commuter rail operator of New Jersey, NJ TRANSIT would be responsible for initiating and operating the service.
- **Cost** Cost of the rail extension will be HIGH, substantially higher than the \$10 million threshold defined herein for high-cost improvements. Even an approximation of costs cannot be made at this time because it is not know where or how the new rail line would be constructed, or whether it could use existing trackage such as the Lehigh freight line operated by Norfolk Southern.
- **Schedule** It is anticipated that the necessary feasibility and environmental studies, followed by obtaining necessary approvals and funding, will require more than 10 years, so the rail restoration would be a LONG TERM project.



7.2.2 Express Bus in the I-78 and US Route 22 Corridor

The assessment of travel markets presented in Section 6 of this report clearly indicated the need for high quality bus service originating in Pennsylvania, and serving the areas of Central Hunterdon County and along US Route 22 from Clinton to Branchburg and Bridgewater. The effectiveness of providing such service was further confirmed by travel model runs that showed a significant number of travelers – about 615 riders per day - would use the service.

It is recommended that express bus service be implemented that would originate in Northampton County, PA, or at an Alpha or Bloomsbury park-and-ride, and travel eastward along I-78 to US Route 22 at Clinton Township, then follow US Route 22 to Branchburg and Bridgewater in Somerset County (see Figure 7-1). The service would be designed to intercept travelers as far west as possible, before entering the congested sections of I-78 in Hunterdon and Somerset Counties, and could provide high quality service to the employment centers along US Route 22 and in Bridgewater and Branchburg Townships. The proposed service includes the following key features:

- Service will originate at the PA Route 33 / William Penn Highway park-and-ride lot in Northampton County, PA. PennDOT has announced expansion plans for that lot which could enlarge it to in excess of 1,000 spaces, so it would function as a logical terminus for the service;
- The express service would also stop at the proposed Alpha transit hub / park-and-ride described below. This would provide a major intercept point for travelers following I-78 from Pennsylvania, and for commuters from Warren County using US Route 22;
- The buses would run express to in the vicinity of Central Hunterdon County, and would then follow US Route 22 from Clinton to Branchburg and Bridgewater. Stops would be made at key employers and other major destinations such as shopping malls.
- In Bridgewater, the service would branch to major employment sites along US Routes 202 and 206 in addition to the core destinations along US Route 22.
- Headways would be short – on the order of 20 minutes – to provide high quality, convenient service.
- Transit-Ready Corridor improvements should be implemented along US Route 22 to support the enhanced bus service by improving travel times and pedestrian access. These improvements are described in Section 7.4.
- Off-peak service, including frequent outbound service in the morning, should be provided as part of this initiative. The objective will be both to meet the reverse-commute needs of the corridor that already exist and will increase with time; and to provide backup service to system users who would need to travel during off-peak periods, either regularly or on an emergency basis.

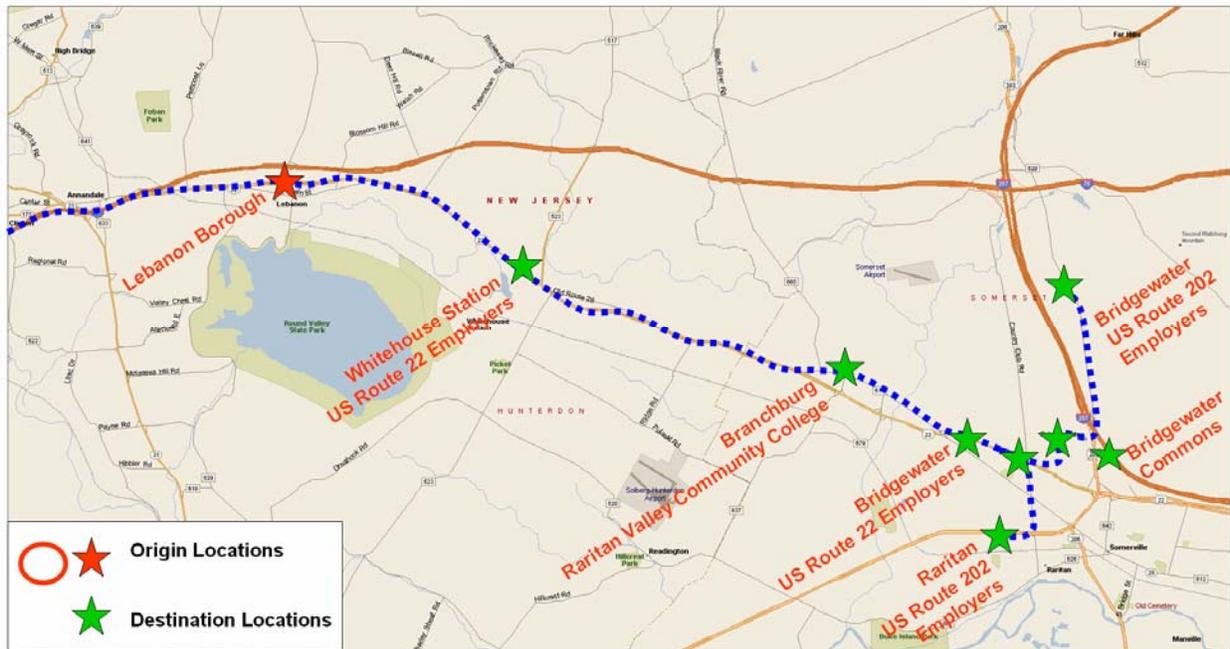
The service plan for the express bus service will need to balance the competing priorities of numerous, conveniently located stops with the need to provide speedy, efficient service. Fortunately employment and activity centers along the US Route 22 corridor are concentrated in a relatively small number of intensely occupied facilities, so service can be defined that



accomplishes both objectives. Figure 7-2 illustrates the key activity centers located along the US Route 22 corridor, plus those in Bridgewater Township that could be ultimate destinations. There are at least eight such locations, as shown in the figure.

At each location, enhanced bus stop amenities, transit information, and pedestrian facilities including sidewalks and crosswalks should be provided, as discussed below.

Figure 7-2: Key Express Bus Stops on US Route 22



Implementation

- **Responsible Agency:** NJ TRANSIT should be responsible for progressing the feasibility and other required studies for the proposed bus service. Operation of the service could be either by NJ TRANSIT or by a private carrier.
- **Cost** Cost of the express bus service will be MEDIUM (in the range of \$1 million to \$10 million to initiate and operate for 5 years).
- **Schedule** It is anticipated that the necessary feasibility and environmental studies, followed by obtaining necessary approvals and funding, will require more than 2 years, making the I-78 / US Route 22 express bus service a SHORT TERM project.



7.2.3 Express Bus Service in the NJ Route 31 Corridor

The travel market analysis and travel forecasting revealed that there is a significant travel market from the north on NJ Route 31 to feed into the Raritan Valley Line and the proposed express bus service on US Route 22. This market originates in the central Warren County region – Washington Borough and Township, Mansfield Township, and the Oxford vicinity – but also emanates from northeastern Pennsylvania, including Monroe County and Stroudsburg. As a result, an additional express bus service was identified that would originate in the vicinity of Washington Borough along NJ Route 31, travel southward with stops at Hampton (if a park-and-ride is developed there), the Clinton vicinity, and then along US Route 22 from Clinton to Bridgewater as discussed above.

It is anticipated that, while this service would not be of the same frequency as the express service originating in Pennsylvania, it would complement that I-78 / US Route 22 express service, and would benefit from the transit-ready corridor infrastructure that is proposed to support that service.

Implementation

- **Responsible Agency:** NJ TRANSIT is responsible for progressing the feasibility and other required studies for proposed bus service. Operation of the service could be either by NJ TRANSIT or by a private carrier.
- **Cost** Cost of the express bus service will be LOW (in the range of less than \$1 million to initiate and operate for 5 years).
- **Schedule** It is anticipated that the necessary feasibility and environmental studies, followed by obtaining necessary approvals and funding, will require more than 2 years, so the NJ Route 31 express bus service would be a SHORT TERM project.



7.2.4 Shuttle Bus Service at Key Rail Stations and Activity Centers

Connector services can be vital to improve access to and from bus and rail lines. This is particularly important at the destination end of the service to minimize walking distance from the bus / rail stop to the employment or other activity site.

A series of connector shuttles are proposed to complement the proposed bus and rail service at the following locations (See Figure 7-3):

- **Phillipsburg** Linking the proposed downtown rail station and residential areas in the vicinity. Also serving the commercial development at the Ingersoll Rand redevelopment tract. This service would be primarily rail-oriented, so timing would be dependent on provision of the assumed rail service.
- **Alpha** Linking the proposed transit hub on I-78 with nearby residential areas in Alpha and nearby Greenwich Township. This service could link to the proposed I-78 / US Route 22 bus service at the transit hub, as well as to Trans-Bridge New York-bound service.
- **Clinton** Linking bus stops to residential areas and to major employers.,
- **Lebanon Borough** Linking the express bus on US Route 22 and the existing Lebanon rail station to residential areas in the vicinity.
- **Readington Township / Whitehouse Station** Linking the existing Whitehouse Station rail station to major employers along US Route 22, and to nearby residential areas. Additional service could include provision of a van to meet the I-78 / US Route 22 express bus and transport employees into employment sites along US Route 22.
- **Branchburg** Linking the North Branch rail station, the I-78 / US Route 22 express bus, Raritan Valley Community College, and other employment sites.
- **Raritan to Whitehouse Station** Pending provision of improved off-peak rail service west of Raritan (i.e. outbound in the morning), frequent shuttle service is needed from Raritan station to employers in the vicinity of Whitehouse Station. This service could be replaced over time by improved rail service, or by outbound service implemented as part of the I-78 / US Route 22 express service.

Implementation

- **Responsible Agency:** The TMAs working with NJ TRANSIT and NJDOT should be responsible for progressing the feasibility and other required studies needed to fund the proposed shuttle services. Operation of the service would likely be either by NJ TRANSIT or by the TMAs. TMAs could also seek out employer support for site-specific shuttles.



- Cost Cost of the shuttle service will be LOW (in the range of less than \$1 million) to initiate and operate for 5 years.
- Schedule It is anticipated that the necessary feasibility and environmental studies, followed by obtaining necessary approvals and funding, will require more than 2 years, so the shuttle services would be a SHORT TERM project.



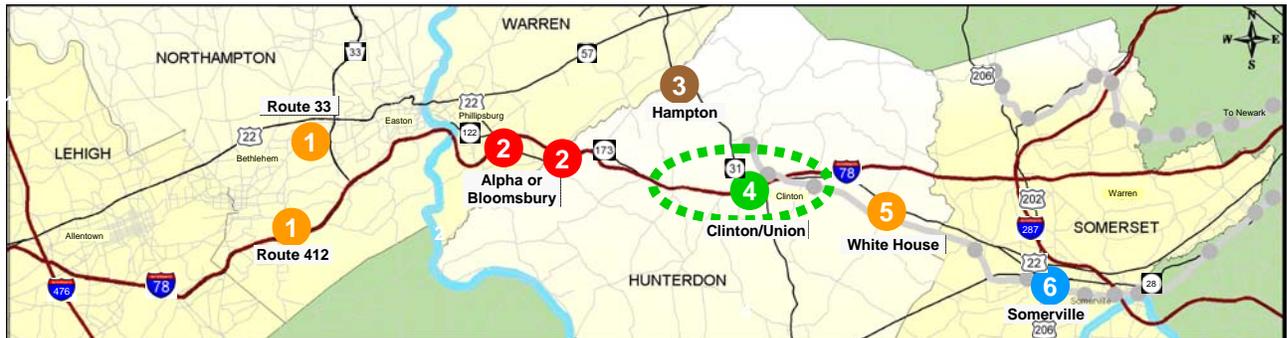
7.3 RECOMMENDED PARK-AND-RIDE IMPROVEMENTS

The provision of adequately sized and strategically located park-and-ride facilities will be critical to the success of transit improvements such as express bus and rail service. A series of park-and-ride facilities is recommended that will provide the necessary capacity and amenities. Integral to this is the concept of transit transfer opportunities at these sites, which will not only allow drivers to park and change to buses, but also allow transit riders convenient transfer opportunities to:

- Express buses destined to New York;
- Buses comprising the proposed I-78 / US Route 22 and NJ Route 31 express bus services;
- Local connector shuttles;
- Future rail service as it either already exists and is planned, or as may occur in the future as the result of the extension of passenger service on the Raritan Valley Line; and
- Car pools and van pools traveling in the corridor.

These transit hubs are proposed to be so located as to allow easy access for autos and buses from the primary highway system (I-78, US Route 22, NJ Route 31, and/or NJ Route 173). Viewed as a system, they will provide a series of intercepts that will capture traffic as it comes eastward from Pennsylvania into the core of New Jersey (see Figure 7-3).

Figure 7-3: Recommended Park-and-Ride Improvements



- | | |
|---|--|
| <p>1 Planned Park-and-Ride Expansions at PA Rt. 33 and PA Rt. 412</p> <ul style="list-style-type: none"> - PennDOT is planning to significantly expand the existing Park-and-Rides at PA Route 33 and at PA Route 412, beginning in 2008 <p>2 Transit Hub / Park-and-Ride at Alpha or Bloomsbury</p> <ul style="list-style-type: none"> - Park-and-Ride to intercept travelers as they enter I-78 in New Jersey - Easy access to and from I-78 for parkers and buses - Connections to buses (both New York and US Route 22 Corridor) - Connections to future Raritan Valley Rail Line (if extended) <p>3 Transit Hub / Park-and-Ride at Hampton</p> <ul style="list-style-type: none"> - Park-and-Ride to intercept travelers as they travel south on Route 31 from Warren County and Pennsylvania - Connections to buses on NJ Route 31 - Connections to future Raritan Valley Line (if extended) | <p>4 Possible Central Hunterdon Transit Access Facilities</p> <ul style="list-style-type: none"> - Possible transit access facilities and improvements in Clinton and/or Union Townships - Pending further study and coordination with local municipalities <p>5 Park-and-Ride Expansion & Transit Access Improvements</p> <ul style="list-style-type: none"> - White House Station (consistent with plans by Township of Readington) <p>6 -- At Somerville Station (consistent with plans by Borough of Somerville)</p> |
|---|--|



7.3.1 Planned Park-and-Ride Expansions at PA Route 33 and PA Route 412

PennDOT operates two park-and-ride facilities in Northampton County that are heavily utilized by New Jersey-bound commuters:

- The lot at PA Route 33 and William Penn Highway in Bethlehem Township, Northampton County contains about 230 delineated parking spaces, and is fully utilized, with a significant number of additional users parking illegally outside these delineated spaces. PennDOT has announced plans to expand this facility to more than 1,000 parking spaces. Construction to begin in 2008.
- The lot at I-78 and PA Route 412 in Hellertown, Northampton County contains about 100 parking spaces. A major addition of about 150 additional spaces is planned by PennDOT. Construction is scheduled to start in 2008.

These substantial expansions will provide more than 1,000 new parking spaces to serve Trans-Bridge buses, Bieber buses, and car poolers. Both bus lines are structured to serve the New York City market exclusively, whereas car poolers are destined in part to suburban employment centers in New Jersey. The expanded lots will serve as a solid anchor and initial intercept for the proposed I-78 / US Route 22 express bus service described more fully in Section 7.2.2.

Implementation

- **Responsible Agency:** PennDOT current operates both park-and-rides, and is designing and will construct the expansions.
- **Cost** Cost of the park-and-ride expansions will be MEDIUM (in the range of \$1 million to \$10 million).
- **Schedule** Construction of the I-78 / PA Route 412 park-and-ride expansion began in 2007. Construction of the PA Route 33 / William Penn Highway park-and-ride is scheduled to commence in 2008. The timeframe is therefore IMMEDIATE.

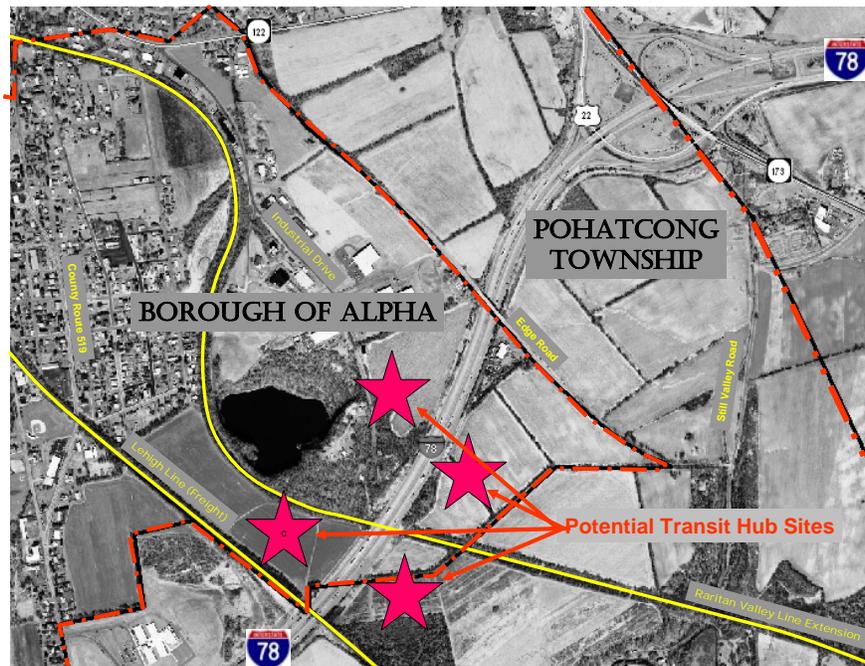


7.3.2 Transit Hub / Park-and-Ride at Alpha or Bloomsbury

It is recommended that a new multi-modal transit hub be developed along the I-78 corridor in New Jersey. This hub and park-and-ride would complement the intercept lots described above in Pennsylvania by providing additional access both to New Jersey-bound and New York City-bound express bus lines, and also to the Raritan Valley Line if it is extended past High Bridge along the former Central Railroad of New Jersey right of way.

There are several sites located adjacent to I-78 within the Borough of Alpha that could potentially be adapted for use as a transit hub (see Figure 7-4). They have direct frontage on I-78 at approximately Milepost 2, and direct access could be provided to the lots via a new interchange with I-78. By doing so, bus and auto movements into the lots would be quick and efficient, and impacts by park-and-ride related traffic on local streets would be negligible. Implementation of a new direct-access interchange on I-78 is discussed as a separate project in Section 7.5.1 of this report, since such a project would be costly and complex and might involve multiple project sponsors and participants (i.e. NJDOT, DRJTBC, and/or NJ TRANSIT at a minimum)

Figure 7-4: Potential Alpha Transit Hub Sites



Parking demand could approach 1,500 spaces if both bus and rail lines are served by the site. The site design should be arranged such that a specific section of the parking area could be accessed from local streets, but be physically separated from the main part of the site that would be accessed directly from I-78.

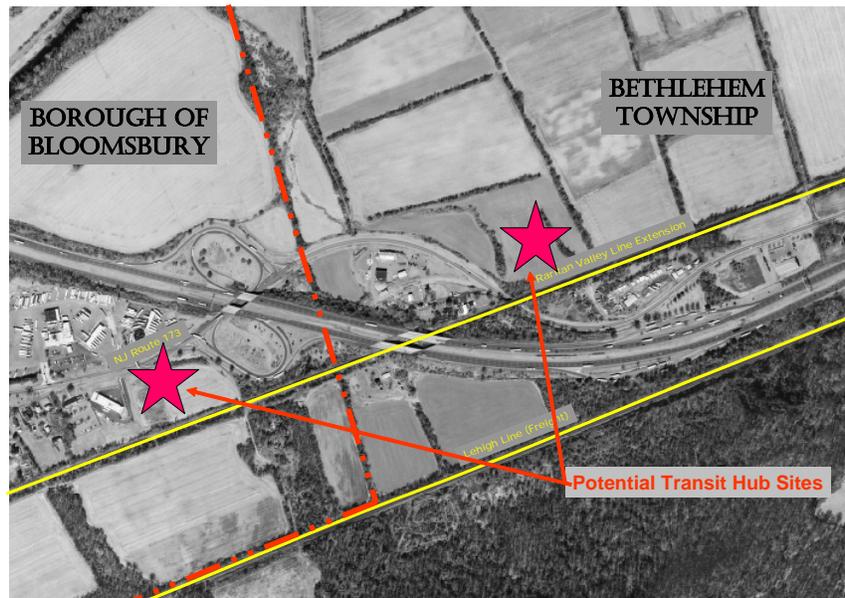


The sites also have varying degrees of access to the existing freight-only Lehigh Line operated by Norfolk Southern, and to the dormant right-of-way for the Central Railroad of New Jersey which was operated as the Raritan Valley passenger line until service was discontinued in the 1980s. NJ TRANSIT's Central New Jersey / Raritan Valley Transit Study will investigate the feasibility of these and other rail service alternatives.

It should be noted that sections of Figure 7-4 in Pohatcong Township lie entirely in the Conservation Zone of the Preservation Area as designated by the Highlands Commission. Development of these sites in Pohatcong Township for a park-and-ride may encounter significant constraints. By contrast, the lands within Alpha Borough have been designated as the Conservation Zone of the Planning Area, and development of those properties for a park-and-ride may encounter less stringent restrictions.

The Delaware River Joint Toll Bridge Commission (DRJTBC) will need to be involved in planning for this facility, since the Commission owns and maintains the section of I-78 from the Delaware River to US Route 22 (including the section discussed here). Federal Highway Administration (FHWA) approval of any proposed highway access may be required. It is anticipated that this approval would be aided if the park-and-ride is a special use interchange with no access to local streets or private development. A New Jersey Welcome Center for roadside tourist information and services has been proposed to be constructed on this section of I-78 also; consolidating the Welcome Center onto the park-and-ride site would minimize access points on I-78 and would create a single, multi-purpose transportation-related site.

Figure 7-5: Potential Bloomsbury Transit Hub Sites



Alternative sites are located in Bloomsbury at approximately Milepost 7 of I-78 (see Figure 7-5). These sites would not have direct access to I-78 via a direct interchange, but access could be via the existing Interchange 7, potentially saving the cost of new interchange construction. The two sites indicated would have access from NJ Route 173, and front on the former Central Railroad of New Jersey / Raritan Valley Line right of way. Access to the Lehigh Line, if needed, would be less convenient.

As stated previously, it should be noted that the entire Borough of Bloomsbury and Bethlehem Township shown in Figure 7-5 is within the Protection Area of the Highlands district, so development of a park-and-ride facility may encounter significant environmental constraints.

Implementation

- **Responsible Agency:** Planning and design of the transit hub / park-and-ride could be by either NJDOT or NJ TRANSIT.
- **Cost** Cost of the park-and-ride expansions will be MEDIUM (in the range of \$1 million to \$10 million) In addition, access to the proposed Alpha park-and-ride site directly from I-78 will entail a new interchange whose costs will be HIGH (\$25 million to \$30-million).
- **Schedule** Planning, design, environmental permitting, and funding of the transit hub / park-and-ride, and the accompanying interchange on I-78, is likely to take at least 5 years. The timeframe for the project is therefore MEDIUM TERM. This project is not dependent on the completion of rail service, and could be initiated when ready in order to serve bus riders and car poolers.

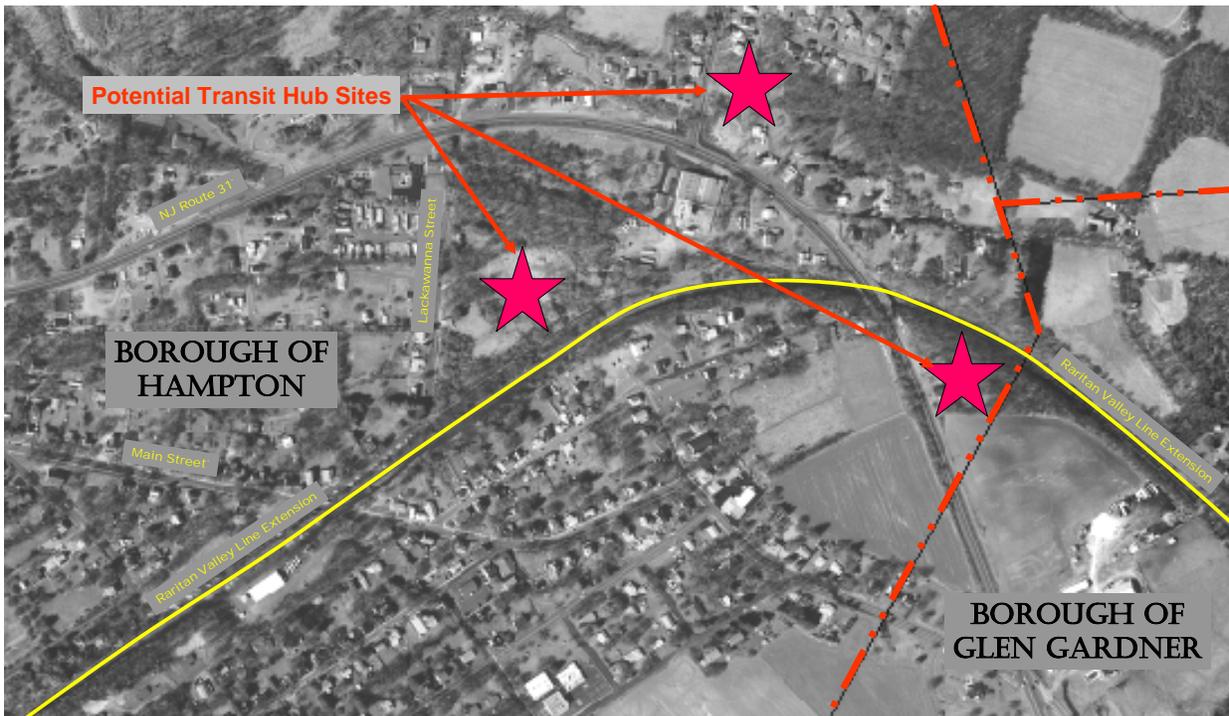


7.3.3 Transit Hub / Park-and-Ride at Hampton

Depending on the outcome of the Phase 2 feasibility studies a train station could be located in the vicinity of Hampton, where NJ Route 31 crosses the Central Railroad of New Jersey / Raritan Valley Line right of way in the Borough of Hampton. The travel market and travel forecasting studies described in Section 6 of this report indicated that there will be significant demand both for bus service along NJ Route 31, and for rail access in the vicinity of Hampton. Therefore a transit hub and/or park-and-ride is proposed in the vicinity of the rail / highway crossing (see Figure 7-6).

The travel forecasts and travel market analyses indicate a demand for about 400 parking spaces if both rail and bus are served. If only bus is served then approximately 150 spaces would be needed.

Figure 7-6: Potential Hampton Transit Hub Sites



Two sites have been identified that are immediately adjacent to both the rail line and NJ Route 31. An additional site on Mackenzie Road north of NJ Route 31 has been suggested by the Borough of Hampton, which would be able to serve buses.

In all cases access to NJ Route 31 will require careful design of an improved intersection, including signalization.



It should also be noted that the entire vicinity of Hampton shown in Figure 7-6 has been designated as a Protection Area by the Highlands Commission. However the westerly site shown in Figure 7-6 (off Lackawanna Street) is a former rail yard and coaling site for the Central Railroad mainline and the abandoned Changewater Secondary line that ran through the site.

Implementation

- **Responsible Agency:** Planning and design of the transit hub / park-and-ride could be by either NJDOT or NJ TRANSIT.
- **Cost** Cost of the park-and-ride expansions will be MEDIUM (in the range of \$1 million to \$10 million).
- **Schedule** Planning, design, environmental permitting, and funding of the transit hub / park-and-ride, is likely to take at least 5 years. The timeframe for the project is therefore MEDIUM TERM. This project is not dependent on the completion of rail service, and could be initiated when ready in order to serve bus riders and car poolers.



7.3.4 Possible Central Hunterdon Transit Access Facilities

The Central Hunterdon area in the vicinity of Clinton Borough, Clinton Township, and Union Township is a focal point for the region’s transportation system, which includes I-78, US Route 22, NJ Route 31, and NJ Route 173 as well as the existing Raritan Valley Line and major bus park-and-ride facilities. As such, the area’s highways and streets are heavily traveled, and congestion occurs daily on the mainline of I-78. There are several existing park-and-ride lots in the area, including the Clinton Point bus facility, the Annandale Square facility, the Annandale train station, and several smaller facilities in Union Township along NJ Route 173.

Travel market studies, including NJ TRANSIT’s survey of rail and bus passengers, park-and-ride surveys conducted for this study and by Hunterdon Area Resources for Transportation (HART), and other observations and analyses indicate that park-and-ride users are predominantly from the Central Hunterdon area and the immediate towns around it.

A transit hub / park-and-ride was at one time suggested to consolidate the various park-and-ride facilities into one multi-modal transit hub adjacent to I-78, US Route 22, and the Raritan Valley Line. However both the Town of Clinton and Clinton Township expressed concerns that such a facility would aggravate what they perceive to be unacceptable traffic conditions in the vicinity, and would be incompatible with the growth management policies of the municipalities. Therefore the concept of a transit hub in Clinton was not pursued by this study.

However, it is still recognized that there is an emerging need to serve the park-and-ride and mobility needs of the residents of Central Hunterdon County. Further study and coordination with the respective municipal representatives will be needed to develop a plan that is responsive to transportation needs, while being sensitive to the area’s development and planning priorities.

Therefore it is recommended that further efforts be directed toward continuing the collaborative planning begun in this study to work toward identifying potential transportation solutions within Central Hunterdon County.

Implementation

- Responsible Agency: Planning and coordination by NJ TRANSIT in conjunction with the Phase 2 rail feasibility study.
- Cost UNKNOWN
- Schedule Planning and coordination could begin as part of the Phase 2 study in Fall, 2007. Further timing UNKNOWN.



7.3.5 Park-and-Ride Expansion and Transit Access Improvements

Certain park-and-ride expansions and transit access improvements are already being planned in the corridor, or have been identified through the public outreach of this study.

- Readington Township is planning to expand the Whitehouse Station parking area with about 35 additional spaces. That plan is endorsed by this study. If possible, additional spaces should be constructed since traveler demands warrant this.
- Transit-oriented development is being implemented at the Somerville train station by the Borough of Somerville. This ongoing plan is endorsed by this study.
- The Clinton Point bus park-and-ride in Clinton is heavily used, and attracts local riders. It has been observed by the public that there are no sidewalks serving the site. It is recommended that sidewalks be funded and constructed to facilitate access by pedestrians, bicycles, and those with disabilities. Appropriate signal modifications such as pedestrian count-down heads, signal phasing and timing, and crosswalk delineation may be needed at the intersection of Center Street with Old Route 22. Improved paving, lighting, signage, shelters, and bicycle lockers should be provided at the Clinton Point lot (see Figure 7-7).

Figure 7-7: Clinton Point Pedestrian Access



Implementation

- **Responsible Agency:** Planning, design, and construction by the respective municipalities (Readington, Somerville, Clinton), with assistance from NJDOT and NJ TRANSIT
- **Cost** Cost of the Whitehouse Station parking expansion and the Clinton Point pedestrian access will be LOW (less than \$1 million). Cost of the Somerville transit oriented development UNKNOWN.
- **Schedule** Planning and implementation of the Whitehouse Station parking expansion and the Clinton Point pedestrian access will be IMMEDIATE (less than 2 years to initiate).



7.4 RECOMMENDED “TRANSIT-READY” CORRIDOR AND ACCESS TREATMENTS

The transit improvement recommendations were conceived to provide high quality frequent service in the I-78 and US Route 22 corridor. Recommended companion actions include a system of park-and-ride facilities to facilitate access to the transit system, and “transit-ready” corridor treatments that would ease the movement of buses through congested locations and provide bus stop and pedestrian access improvements (see Figure 7-8).

Figure 7-8: Recommended Transit-Ready Corridor and Transit Access Improvements



7.4.1 “Transit-Ready” Corridor Treatments

Transit-ready corridor treatments consist of a series of highway improvements specifically targeted at moving buses more expeditiously and efficiently through the corridor. By minimizing the interference of traffic and signals with bus movement, overall bus speeds are increased (shortening scheduled run times) and, just as important, passengers’ perceptions of travel efficiency are enhanced, thereby increasing their attractiveness to potential and existing riders.

It is recommended that this category of improvements be installed on US Route 22, from Interchange 18 on I-78 in Clinton, to the interchange with US Route 202/206 in Bridgewater, a segment of approximately 14 miles. This highway segment will carry the I-78 / US Route 22 and NJ Route 31 express bus services described previously. Implementation along US Route 22 in Phillipsburg, Pohatcong, and Greenwich is also recommended.

Transit-ready corridor improvements include several components which will work together to improve bus flow:

- Traffic signal priority for buses, to reduce bus waiting time at intersections (select buses can trigger a slightly early or extended green signal at some intersections).
- Signal coordination along bus routes. Working with traffic signal priority schemes, this will result in the most efficient movement of buses possible.
- Bus-Shoulder-Bypass treatments. At anticipated congested intersections the shoulder will be upgraded to support bus movement. Buses will then use the shoulder to bypass mixed-traffic queues under congested conditions, and will reach the intersection more quickly as a result (see Figure 7-9). Then the above signal prioritization will work together to process the bus through the intersection more efficiently. A distinct transit signal display for buses could also be employed at locations when these schemes are used together.

Figure 7-9: Typical Bus-Shoulder-Bypass Operation

- Shoulder improvements to support bus-shoulder-bypass operations will include widening of shoulders, reconstruction with full-depth pavement, extension / relocation of drainage structures as needed, and other retrofitting of highway design elements. Intersection elements such as signal hardware (mast arms, etc.) and channelization may require relocation. Special handling of ramps, driveways, and acceleration / deceleration lanes may also be required.



In New Jersey buses currently operate on highway shoulders in two locations: On US Route 22 in Mountainside (Union County), and along US Route 9 in Oldbridge Township (Middlesex County). NJ TRANSIT and NJDOT have found both operations to be safe and successful, and bus travel times have been reduced as a result through these congested locations. Based on these experiences, this treatment holds promise for improving bus operating speeds in the US Route 22 corridor and for attracting ridership to the proposed bus services.

Between I-78 in Clinton and US Route 202/206 in Bridgewater there are 14 signalized intersections. Of them, 11 are suggested to need the proposed bus bypass treatments. In certain cases the level of existing and anticipated congestion is not high, but proximity to other intersections with congestion issues indicates the desirability of providing the shoulder treatment in the interest of segment consistency.

Table 7-1: Signalized Intersections and Proposed Bus Bypass Treatments

Intersecting Street	Extent of Congestion (Existing)	Bus Bypass Proposed
Exxon Research Driveway	Medium	Yes
Petticoat Lane	High	Yes
Round Valley Access Road	Low	No
Cokesbury Road (CR 639)	Medium	No
Merck Pharmaceutical Driveway	Medium	Yes
Oldwick Road (CR 523)	High	Yes
Main Street (CR 523)	High	Yes
County Line Road	Medium	No
Easton Turnpike (CR 614)	High	Yes
Readington Road	High	Yes
Milltown Road	High	Yes
Met Life Driveway	Medium	Yes
County Club Road (CR 567)	High	Yes
Somerset Hills Corporate Center	High	Yes

Implementation

- **Responsible Agency:** Planning, design, and construction by NJDOT in cooperation with NJ TRANSIT.
- **Cost** Cost of the shoulder reconstruction will be MEDIUM (between \$1 million and \$10 million).
- **Schedule** Planning and implementation of the transit-ready corridor treatments will require 2 to 5 years to complete, so this can be a SHORT TERM project.

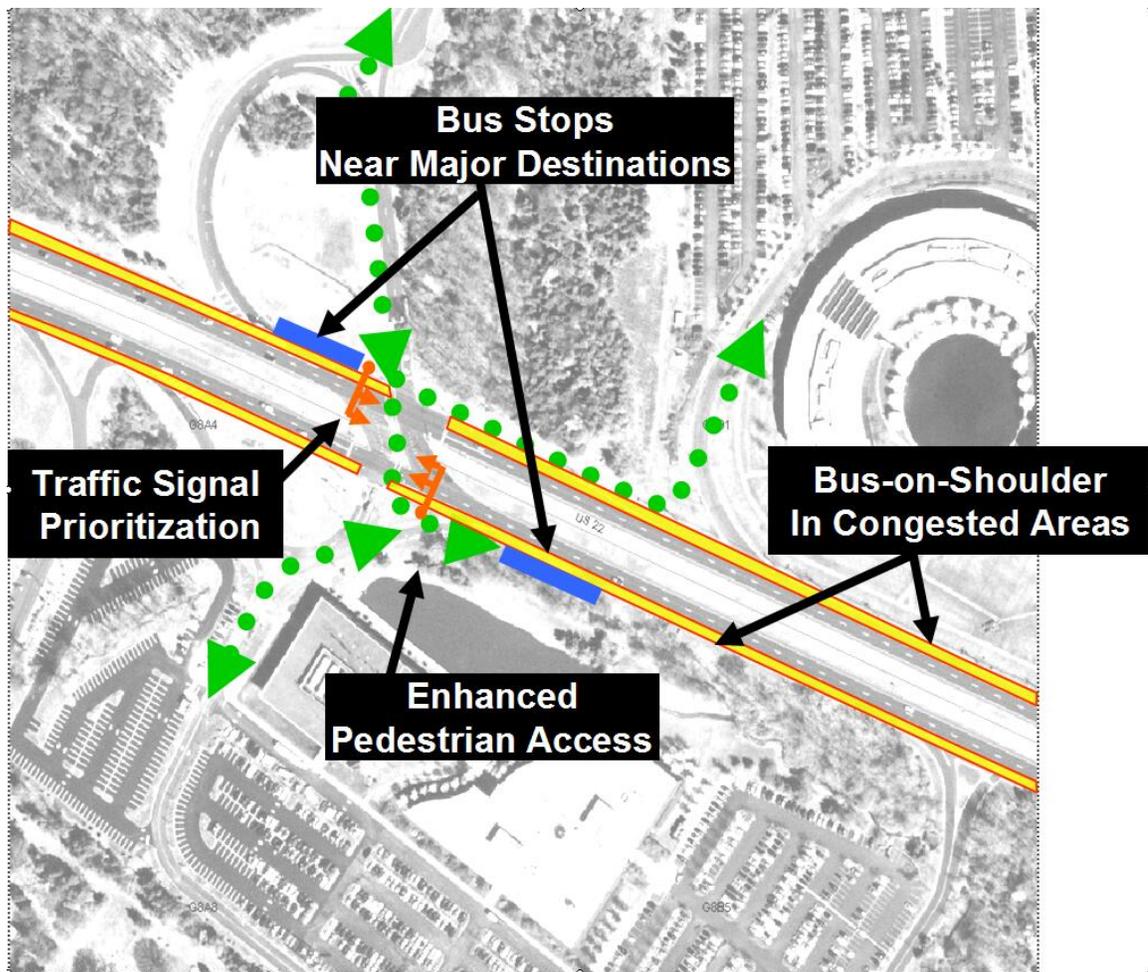


7.4.2 Transit Pedestrian Access Improvements

Improvements at bus stops are recommended to accommodate bus passengers walking to and from the US Route 22 express bus lines. This work will consist of several components, as illustrated in Figure 7-10:

- New high-quality bus stops, and enhancements to existing stops, to provide shelters, information, signing, lighting, seating and other amenities. Bus stops will need to be strategically located to minimize walking distances, to integrate effectively with curb-side traffic elements such as acceleration / deceleration and turning lanes, and to provide safe crosswalk conditions.
- Pedestrian access improvements, including sidewalks, crosswalks, lighting, etc.

Figure 7-10: Typical Transit Access Improvements for Pedestrians



- Assistance to municipalities to implement zoning and site plan ordinance revisions to require appropriate design elements in conjunction with site development.

- Assistance to property owners to provide pedestrian and bus stop amenities appropriate to their site; and to insure that building access conditions and sidewalk maintenance (including snow removal) are provided. This may also include commercial maintenance contracts to finance maintenance of bus stop shelters and other amenities.

Implementation

- **Responsible Agency:** Planning, design, and construction by NJ TRANSIT in cooperation with NJDOT. Assistance to municipalities and property owners by NJDOT, NJ TRANSIT, counties, and TMAs.
- **Cost** Cost of the bus stop amenities will be LOW (less than \$1 million).
- **Schedule** Planning and implementation of the transit-ready corridor treatments will require less than 2 years to complete, so this can be an IMMEDIATE project. Ongoing assistance to municipalities and property owners will extend over at least 10 years, making that a LONG TERM commitment.



7.5 RECOMMENDED HIGHWAY IMPROVEMENTS

The objective of this Study was to identify and develop a set of improvements to the transit system that would improve mobility and decrease congestion in the I-78 corridor. Major highway improvements such as general widenings or managed use lanes (HOV, HOT, TOT) were outside the scope of the project.

However, certain highway improvements were identified that were smaller in scale and that could, if implemented, either relieve critical bottlenecks or improve corridor flow to facilitate transit service. In addition, specific high-quality access facilities are proposed for major transit facilities (see Figure 7-11).

Figure 7-11: Recommended Highway Improvements



➤ Highway Improvement Objectives:

- Improve corridor flow to facilitate transit service
- Provide high-quality access to major transit facilities

1

Provide Direct Access to Transit Hubs:

- From I-78 to Alpha or Bloomsbury Transit Hub
- From NJ Route 31 to Hampton Transit Hub

2

Leverage Proposed Improvements to Complement Transit:

- High-Speed E-Z PASS at I-78 / Delaware River Bridge
- Proposed New Jersey Welcome Center at Alpha/Bloomsbury Transit Hub

3

Additional Improvements to Resolve Bottlenecks:

- Truck Climbing Lane (Eastbound at Milepost 19)
- Traffic Signal Coordination on US Route 22
- US Route 22 and US Route 202/206 Corridor Improvements



7.5.1 Provide Direct Access to Transit Hubs

Transit hubs / park-and-rides have been recommended at up to three locations: In Alpha adjacent to I-78; in Bloomsbury on NJ Route 173 as an alternative to the Alpha site; and in Hampton on NJ Route 31 (see Figure 7-11):

Alpha Transit Hub / Park-and-Ride

Direct access from I-78 to a transit hub / park-and-ride site in Alpha Borough will be an important element of the facility’s success. Lacking direct access to and from the Interstate, access would be very circuitous via local roads; alternative locations that would still include access to one or both rail lines would be even further from the Interstate.

Direct access to one of the properties identified in Section 7.3.2 will require a new interchange on I-78, located between the Delaware River and Interchange 3 (US Route 22 / NJ Route 173). It would be a special-purpose interchange serving only the transit hub / park-and-ride and, potentially the proposed New Jersey Welcome Center, and would not offer access to local streets. Coordination will be needed with Delaware River Joint Toll Bridge Commission (DRJTBC), NJDOT and FHWA to implement the improvement. DRJTBC owns, operates and maintains this section of I-78 and will have jurisdiction over the interchange.

Site assessment and selection has not been done, so there are several candidate sites at this time. Some appear to have ample acreage and frontage on I-78 to allow an appropriate interchange layout, whereas others are more constrained and engineering challenges may result.

Implementation

- **Responsible Agency:** Planning, design, and construction by NJDOT and / or DRJTBC, in cooperation with NJ TRANSIT.
- **Cost** Cost of the I-78 interchange will be HIGH (more than \$10 million).
- **Schedule** Planning and implementation of the I-78 interchange will require 2-3 years minimum, and construction at least 2 more years. Therefore this is a MEDIUM TERM (5 to 10 years) project.

Bloomsbury Transit Hub / Park-and-Ride

Construction of a park-and-ride in Bloomsbury is an alternative to the Alpha site. In the case of Bloomsbury, direct access from I-78 to the park-and-ride is not possible. Instead, park-and-ride traffic will need to use the existing Interchange 7 (I-78 with NJ Route 173).



The interchange is a partial cloverleaf with unsignalized at-grade intersections for each of the exit ramps. Depending on the size of the park-and-ride lot to be constructed, it may be necessary to signalize one or both of the exit ramps. In addition access improvements will be needed at the entrance to the proposed park-and-ride. Route 173 is a two-lane highway, so a center left turn lane(s) and signalization may be required at the site driveway.

Implementation

- **Responsible Agency:** Planning, design, and construction by NJDOT in cooperation with NJ TRANSIT.
- **Cost** Signalization and access improvements at the I-78 ramps and site driveway will be MEDIUM cost (\$1 million to \$10 million).
- **Schedule** Planning and implementation of the park-and-ride and access improvements will require 2-3 years, and construction at least one more year. Therefore this could be a SHORT TERM (2 to 5 years) project.

Hampton Transit Hub / Park-and-Ride

The proposed Hampton transit hub / park-and-ride will need access from NJ Route 31. Depending on the site chosen, access could be via an existing street (Lackawanna Street or Mackenzie Road) or at another location.

NJ Route 31 in this area is on a long upgrade and horizontal curve. As a result there may be serious sight distance issues that could be a factor in site selection. A center left turn lane and acceleration / deceleration lanes will be needed on NJ Route 31.

Implementation of an improved intersection and traffic signal may be needed to serve the proposed transit hub / park-and-ride site. The location and design of this intersection and signal should be coordinated with the Borough of Hampton and NJDOT.

Implementation

- **Responsible Agency:** Planning, design, and construction by NJDOT in cooperation with NJ TRANSIT.
- **Cost** Access improvements and signalization at the site driveway will likely cost between \$1 million and \$2 million, and will be MEDIUM cost (\$1 million to \$10 million).
- **Schedule** Planning and implementation of the park-and-ride and access improvements will require 2-3 years, and construction at least one more year. Therefore this could be a SHORT TERM (2 to 5 years) project.



7.5.2 Leverage Proposed Improvements to Complement Transit

Several highway improvements have been proposed in the I-78 Corridor that complement the proposed transit services if implemented.

High Speed E-Z Pass at I-78 / Delaware River Bridge

DRJTBC is now designing a westbound high-speed E-Z Pass lane at its toll bridge facility, which will relieve existing toll barrier congestion and speed westbound traffic flow, especially during weekday evening peak periods. This congestion relief will benefit transit service destined to the Lehigh Valley, including the proposed I-78 / US Route 22 express service.

Implementation

- Responsible Agency: Planning, design, and construction by DRJTBC.
- Cost Roadway construction and toll barrier modifications will be a HIGH cost project (in excess of \$10 million).
- Schedule Construction is planned to begin in 2009, so this is a SHORT TERM project.

Proposed New Jersey Welcome Center

It has been proposed to construct a new New Jersey Welcome Center on a property to the west of the Lehigh Freight Line and east of Carpentersville Road, with access to/from the eastbound roadway of I-78. It is suggested that instead of that location (which also is constrained by being located within a Highlands Protection Area), the Welcome Center be constructed as part of the Alpha transit hub / park-and-ride a short distance away.

Consolidating the two projects will result in shared costs for ramps to and from I-78, and will produce one integrated project that provides a variety of motorist services.

Implementation

- Responsible Agency: Planning, design, and construction by DRJTBC and/or NJDOT.
- Cost Roadway construction and the Welcome Center building will be a HIGH cost project (in excess of \$10 million).
- Schedule Construction timing is UNKNOWN.



7.5.3 Additional Improvements to Resolve Bottlenecks

Highway improvement projects are planned to improve flow on US Route 22 and on US Route 202/206 in the Bridgewater / Somerville area. In addition it is suggested that a truck climbing lane be constructed on I-78 eastbound at approximately milepost 19 (east of the US Route 22 in Clinton).

Truck Climbing Lane

The section of I-78 eastbound in the vicinity of Interchanges 16 (NJ Route 31 North), 17 (NJ Route 31 South) and 18 (US Route 22) is one of the most congested sections of the Interstate. One contributing cause of this congestion is that the upgrade east of the US Route 22 interchange is steep and long, and trucks are unable to maintain speed on the upgrade. It is proposed to construct a truck climbing lane east of the US Route 22 interchange that would allow trucks to keep right and not interfere with traffic flow.

Implementation

- Responsible Agency: Planning, design, and construction by NJDOT.
- Cost Roadway construction will include possible modifications to the Petticoat Lane overpass bridge, drainage, utilities, and permits, and will be a HIGH cost project (approximately \$15 million to \$20 million).
- Schedule Planning and design could take 2-3 years and construction could be completed in two years. Therefore this could be a MEDIUM TERM project. It is not known if right-of-way acquisition will be required.

Traffic Signal Coordination on US Route 22

Coordination of traffic signals on US Route 22 is planned for the section from US 202/206 eastward. In addition to that work, it is proposed that the traffic signals on US Route 22 west of US 202/206 also be coordinated. This work should be coordinated with the design and implementation of transit-ready corridor improvements described above.

Implementation

- Responsible Agency: Planning, design, and implementation by NJDOT.
- Cost Technical studies typically cost \$4,000 to \$5,000 per intersection, plus the costs of signal hardware upgrades. There are 14 signalized intersections between I-78 in Clinton and US 202/206 in Bridgewater, so costs will be in the MEDIUM range (\$1 million to \$10 million).



- **Schedule** Technical studies and implementation could take about one year. Therefore this could be an IMMEDIATE project.

US Route 22 and US Route 202/206 Corridor Improvements

Corridor improvements planned by NJDOT and Somerset County for US Route 22 and US Route 202/206 are endorsed. The Route 22 Sustainable Corridor project will provide extensive roadway and access improvements along US Route 22 in Bridgewater and Somerville that will change the character of the highway to a more development and pedestrian friendly environment, by introducing urban boulevard, traffic calming, and streetscape amenities. The US Route 202/206 project is a related project that is now in the planning stage, and is similarly intended to change the highway character to better fit into the land use framework of the area. NJDOT is sponsoring these improvements in cooperation with Somerset County. Consideration should be given to insuring that transit-ready corridor improvements, bus stops and other amenities are provided as appropriate to be consistent with the recommendations of this study.

Implementation

- **Responsible Agency:** Planning, design, and construction by NJDOT.
- **Cost** Roadway and streetscape improvements will cost in excess of \$10 million, making these HIGH cost projects.
- **Schedule** Design and construction will take between 2 and 5 years, making these SHORT TERM projects.



7.6 RECOMMENDED LAND USE AND TRAVEL DEMAND MANAGEMENT ACTIONS

In addition to the provision of direct transportation services discussed in the previous sections, it is also recommended that support and guidance for smart growth be provided, to affect the pattern of land use development in the corridor; and that increased support be given to travel demand management activities that could reduce the amount of single-occupant commutation.

7.6.1 Transit Villages and Transit-Oriented Development

Transit villages and other forms of transit-oriented development have been shown to be an effective means of reducing dependence on single-occupant autos for commuting and for other trips such as shopping. While there are no designated transit villages in the I-78 Corridor Study Area specifically, nonetheless the benefits of transit villages extend beyond their immediate geographic area. Therefore it is a recommendation of this study that New Jersey – NJTPA, NJ TRANSIT, NJ Office of Smart Growth and others – continue to designate and implement transit villages. Similarly, it is recommended that the above agencies, in cooperation with the counties and municipalities in the study area, continue to work to identify new opportunities for transit-oriented development.

Implementation

- Responsible Agency: Planning, design, and implementation by NJTPA, NJ TRANSIT, NJ Office of Smart Growth, counties, municipalities.
- Cost UNKNOWN
- Schedule Land use initiatives are a LONG TERM, ongoing process.



7.6.2 Transportation Management Association (TMA) Activities

Three Transportation Management Associations (TMAs) operate within the I-78 corridor: Ridewise of Somerset County, HART Commuter Information Services, and TransOptions. These TMAs actively provide commuter information and other services and assistance to encourage car pooling, van pooling, employer-based trip reduction programs, traffic alert services, shuttle services, and other travel reduction programs.

TMAs will also be instrumental in supporting commuters' access to and from the proposed express bus services on I-78 and US Route 22, by providing shuttle buses and other transit services to link employers and residential areas to bus stops.

It is recommended that the ongoing activities of these TMAs be continued and expanded to promote additional flex-time, rideshare matching, and employer-based travel demand management activities.

Implementation

- Responsible Agency: TMAs with funding from NJDOT.
- Cost LOW investment in services produces high rates of return.
- Schedule Advocacy and planning of travel demand management initiatives is a LONG TERM, ongoing process.



7.7 CONCLUSIONS

The foregoing analyses indicate that there are significant mobility needs in the I-78 corridor that can be addressed through a comprehensive set of actions ranging from new transportation services and improvements to programs and activities that could affect the nature of travel in the corridor.

Specific observations concerning the I-78 corridor's travel conditions and responses include:

1. Congestion on I-78 and US Route 22 is extensive and frequent, and affects a lengthy stretch of the corridor, typically from milepost 13 in Union Township, Hunterdon County, to milepost 30 in Bedminster, Somerset County.
2. Congestion is expected to worsen over the coming years without intervention, resulting in more severe over-capacity conditions as well as longer peak periods. The primary highway system (I-78 and US Route 22) will be most affected, but local streets will be affected as well, as traffic diverts from the congested primary system. The quality of life in the corridor will be adversely affected in general.
3. New York-bound travel is served by both private express bus service and the existing passenger rail lines (Raritan Valley Line and Gladstone Branch). As a result the on-highway share of traffic attributable to a New York destination is relatively small. Nonetheless the amount of traffic from the Study Area to New York will increase, in response to both regional growth and the effects of the Access to the Region's Core (ARC) project. Improvements to the suburban rail system will be important to keep pace with growth.
4. Travel to the urban core of New Jersey (Newark, Hudson County, etc.) relies more heavily on the I-78 highway as well as passenger rail. This component comprises a relatively small and dispersed share of the I-78 market, however, and new transit services in the I-78 Study Area are unlikely to effectively serve it. Instead, improvements to the passenger rail system are the best way to accommodate this market.
5. Expansion of the passenger rail system could be very effective in attracting new, long-distance ridership. However by its very fixed-route nature, passenger rail can only serve certain high-intensity markets. NJ TRANSIT is now beginning a complementary Phase 2 effort: The Central New Jersey / Raritan Valley Transit Study. That study will examine a wide range of passenger rail and other transit alternatives for Central New Jersey.
6. Of the remaining trips with suburban New Jersey destinations, there is a distinct and large travel market that generally follows I-78 and US Route 22 from Pennsylvania and Warren and Hunterdon Counties, with destinations in Central Hunterdon and along US Route 22 in Readington, Branchburg and Bridgewater. This market is essentially unserved by existing transit service – bus or rail – but is large enough that new transit service is warranted.
7. A new system of express bus lines has been formulated and recommended that would link suburban-to-suburban residential origins and employment destinations with high quality, frequent service. Testing with travel models indicates that this service would attract sufficient riders to support frequent, convenient service.



8. Provision of access to and from the proposed express bus and passenger rail systems is of paramount importance to the success of the service. This must take the form of park-and-rides at the origin end, and strategically located stops and shuttles at the destination end.
9. A set of large, high quality, conveniently located, multi-modal transit hub / park-and-ride facilities is proposed that will intercept travelers as they enter New Jersey from the west, allowing them to easily transfer to bus, rail, or car-pool. These facilities are envisioned to have direct access to the primary highway system so that bus and auto access is simplified and efficient.
10. Supporting services such as shuttles, van pools and car pools, accessible, amenity-equipped bus stops, and transit-ready corridor improvements are designed to ease the flow of buses on the highway and speed the transit trip, and to facilitate distribution of trips to employment sites and other key attractors.
11. Long term goals such as land use initiatives (transit villages and transit-oriented development) are endorsed.
12. TMAs have a vital role to continue to promote shared rides, employer-supported flex time, and other programs. TMAs will also be instrumental in designing and maintaining employer-based bus stop locations along US Route 22 that will permit easy access to and from bus stops to employers' front doors.

