4 Level 2 Screening Results – No Build Scenario

Analysis of a No Build scenario is a requirement for the preparation of environmental documentation under NEPA and SEQRA. As it establishes the future baseline for comparison of project impacts, this chapter commences the overall discussion of the results of the Level 2 screening process by summarizing the key results related to the No Build scenario. The analysis of the No Build scenario was developed by:

- Projecting future travel demand using the Best Practice Model (BPM), which is the regional transportation model developed and approved by NYMTC (Subchapter 4.1).
- Characterizing existing travel patterns in the corridor based on existing data and collection of new data, such as travel surveys (Subchapter 4.2).
- Identifying all other projects and improvements that may be implemented in the future (Subchapter 4.3). These would include all highway and transit improvements that are currently shown in the TIP and population and job growth that NYMTC believes will occur by the time this project is completed. For the Tappan Zee Bridge, the highway improvements would include the replacement of the bridge deck and use of the existing toll plaza with express lanes implemented.

Subchapters 4.4 and 4.5 then present the screening analyses of Scenarios H1 and H2.

4.1 Transportation Demand Modeling

The BPM was used to provide travel demand forecasts for each of the scenarios. The BPM is a complex modeling process that is designed to predict the detailed travel patterns of the region's diverse population for all modes of travel. The BPM includes 28 counties in New York, New Jersey, and Connecticut, in 3,500 transportation analysis zones. All types of road facilities, from minor arterials to major ones, are represented in the highway network used by the model. All forms of public transportation are represented at the individual route level in the transit network database. (A more complete description of the BPM is available in a separate report, *Alternatives Analysis Travel Demand Methodology*_[NYSTA/Metro-North, November, 2005] prepared for this study).

The BPM introduces some important innovative extensions to conventional travel demand models. It was designed to account for contemporary best practice in travel demand modeling and relied on extensive research implemented in the field over the last several years, including a Regional Travel – Household Interview Survey which gathered responses from more than 27,000 people (in more than 11,000 households) in 28 counties. BPM is representative of the "third generation" of regional travel models that is characterized by the following main advanced features:

- Use of "journeys" rather than "trips" that are used in conventional demand models of the previous generation. BPM defines the journey as travel between principal locations, identifying anchor points in an individual's travel pattern, and accounting for intermediate stops made between the two points (e.g., daycare center, gym, or store on the way home from work). The use of journeys helps to form a more realistic analysis that is based on various decisions made by travelers between these locations, such as mode, purpose, destination, frequency, and locations of intermediate stops, as well as time of day periods.

- Comprehensive coverage of all modes and vehicle types in detailed traffic and transit simulations. Where traditional models operate at the zone level, with matrix tables of aggregate flows, BPM uses a micro-simulation method to simulate the travel pattern of each person and each individual journey in the region. This finer level of detail, when combined with the model's use of the journey, increases the accuracy and usefulness of the travel demand forecasts.

- A Household, Auto-Ownership and Journey-Frequency (HAJ) model in BPM, which replaces the traditional trip generation model. It determines the number of journeys based on variables per household that influence trip-making decisions, such as income, size, and number of children, workers, and autos.

- A Mode Destination Stop Choice (MDSC) Model, which replaces the traditional trip distribution and mode choice model. Based on the person and household characteristics, land-use densities around the journey origin, and the travel times and costs associated with each mode to all possible destinations, this model predicts which modes of travel each person chooses, where the person goes, and whether the person stops along the way on the journey. If a person does make a stop on his/her way to work or school or university, this model predicts the location of the stop.

- Trips grouped into four time periods: AM Peak (6:00 AM to 10:00 AM), mid-day (10:00 AM to 3:00 PM), PM Peak (3:00 PM to 7:00 PM), and overnight (7:00 PM to 6:00 AM). "Assignments" are then run to predict which roads or which transit routes travelers will use, and the resulting vehicular and passenger volumes on those routes.

BPM was calibrated to the year 1996 conditions by NYMTC using various data sources, including the US Census, the Regional Travel – Household Interview Survey, and 1996 screenline traffic count data. Travel demand forecasts for the scenarios were developed for year 2025 using NYMTC's 2025 Population and Employment Forecasts (adopted July 17, 2003). In the DEIS, it will be recalibrated to 2005.

Given BPM's large geographic coverage, it was necessary to make certain model refinements to more accurately predict travel in the I-287 Corridor. In order to do this, four different types of travel surveys (discussed in Subchapter 4.2) were conducted in the corridor. The survey results were used to enhance BPM for use in the study area. The following steps were completed:

- A set of district-to-district (or "zone group"-to-"zone group") adjustment factors was developed to adjust the trip tables in BPM. The adjustment factors were applied by type of trips (i.e., work and non-work trips).

- External trips and truck trips in BPM were adjusted based on the results of the origin/destination and truck surveys.

- Certain mode choice model coefficients were used in the regional model to reflect the specific travel characteristics in the study corridor based on a review of the stated preference survey results (as described below).

4.2 Travel Surveys

Before beginning to forecast and predict what traffic and travel patterns might look like in the future (even under the scenario where no changes are made to the current system), it is crucial to understand and

define the existing conditions. To do this, it is necessary to gather existing data that relate to this network and then fill in the gaps with additional data collection. Various agencies within the study area were able to provide existing data, including traffic volumes, speeds, classification, location and timing of traffic signals, etc. In addition, ridership numbers and service plans from all mass transportation providers were collected. This information was then reviewed and processed to determine what, if any, additional data would still be needed. The following material describes the additional studies and data collection efforts that were undertaken to fill in the gaps in available data.

Surveys were done in the west to east direction since that is the peak direction of commuter traffic in this corridor heading toward employment centers, including New York City, White Plains. and Stamford. Additionally, since tolls are collected eastbound, data collection was facilitated.

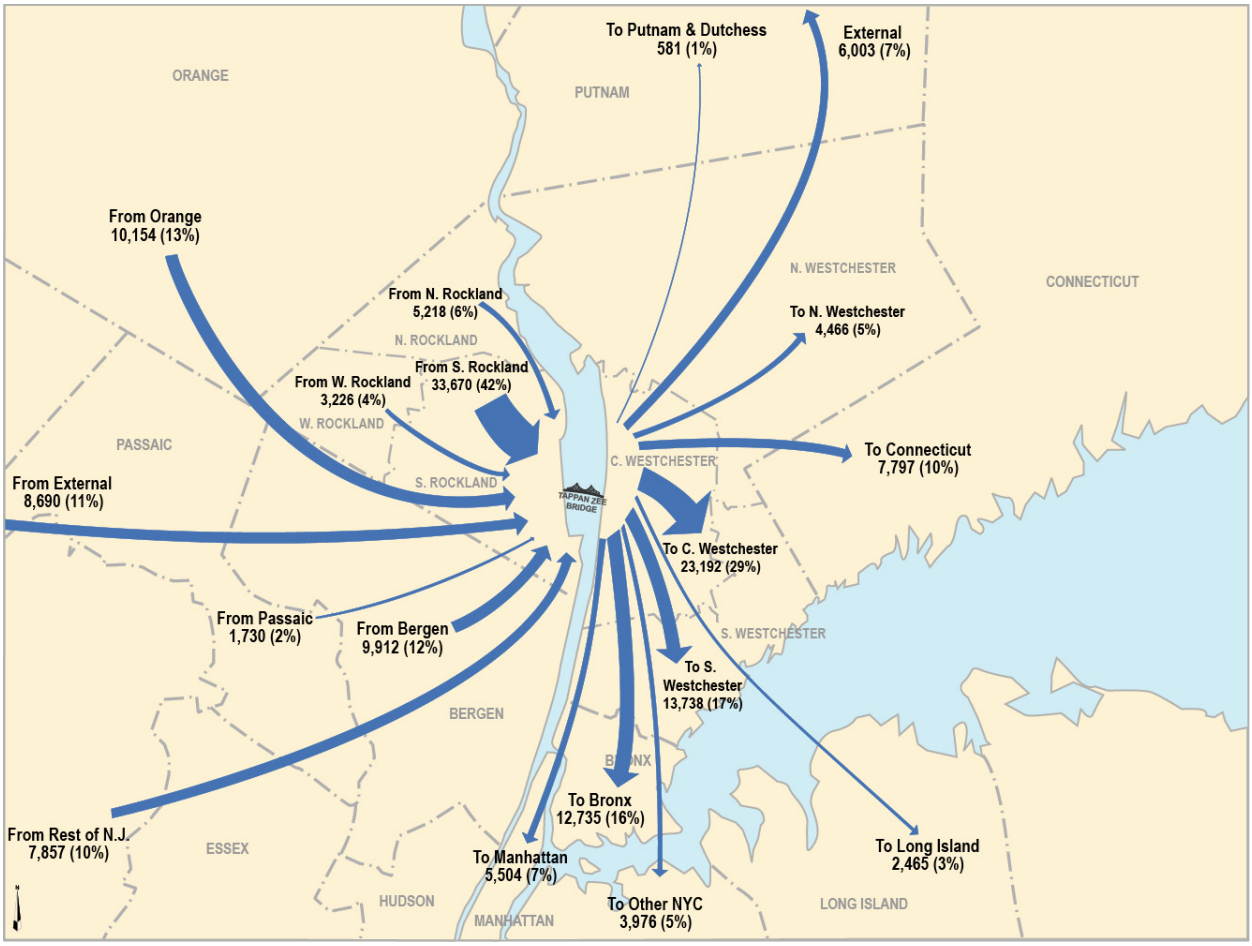
4.2.1 Origin-Destination Survey

Surveys were distributed in April 2003 to eastbound auto and transit travelers across five Hudson River crossings (the Newburgh-Beacon, Bear Mountain, Tappan Zee and George Washington Bridges, and the Lincoln Tunnel) and customers on select public transit systems operating in the I-287 Corridor (Tappan Zee Express bus, CT Transit's I-Bus, Coach USA's Red & Tan and ShortLine buses, Metro-North Railroad's Port Jervis and Pascack Valley Line trains, and New York Waterway's Weehawken and Haverstraw-Ossining ferries). The survey targeted three main categories of travelers: Tappan Zee Bridge cash customers; E-ZPass customers on all five crossings; and public transit customers.

Survey respondents were asked to provide a variety of information about their most recent trip across the Hudson River, including the geographical locations where the trip began and ended and the mode (car, bus, etc.) by which the trip was made.

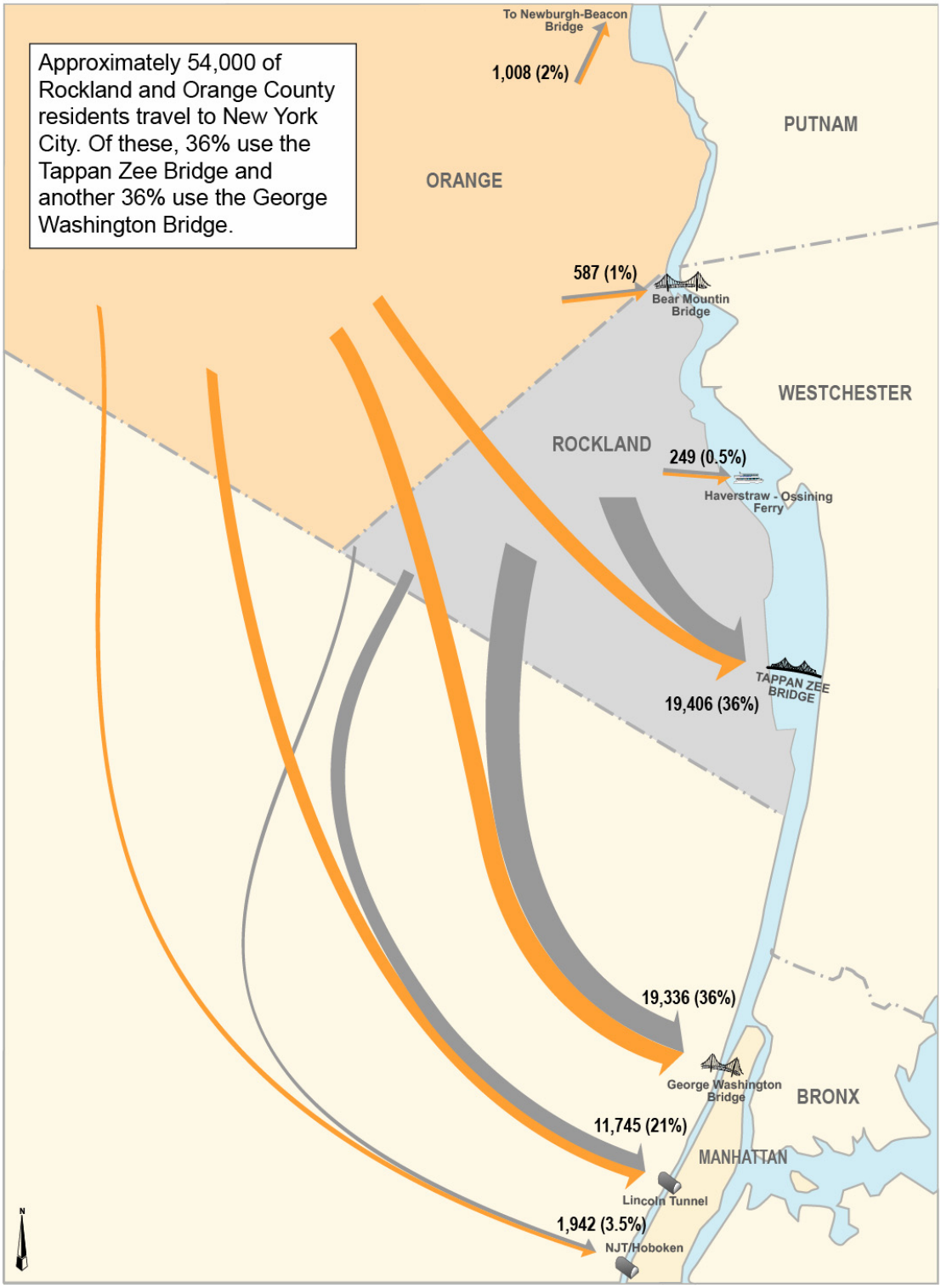
The Port Authority of New York & New Jersey (PANYNJ) provided names and addresses of E-ZPass users for their facilities and the New York State Bridge Authority provided information for their facilities. The survey questionnaire was distributed to about 90,000 travelers and yielded 11,496 completed surveys (almost three times more than the target sample size of 4,000 required for statistical accuracy). The survey responses were converted to replicate the whole traveling population on the five Hudson River crossings and the select transit services using a weighting process to expand the sample to the size of the population.

Figure 4-1 illustrates the origins and destinations of people traveling eastbound across the Tappan Zee Bridge on a typical weekday (over a 24-hour period). Figure 4-2 illustrates how trips are distributed beginning in either Rockland or Orange County and ending in New York City on a typical weekday among the Hudson River crossings. Also, it illustrates commuters traveling to Hoboken via Port Jervis or Pascack Valley rail lines and crossing the Hudson River by ferry or PATH service to Manhattan.



Tappan Zee Bridge Eastbound Average Weekday Person Trips (Vehicular and Transit)

Figure 4-1



Average Weekday Eastbound Person Trips (Vehicular and Transit) from Rockland & Orange Counties to New York City - All Hudson River Crossings

Figure 4-2

4.2.1.1 Tappan Zee Bridge Person Trips – Eastbound

On an average weekday, 80,500 people cross the Tappan Zee Bridge in the eastbound direction. Of these:

- 79,100 (~98 percent) cross in automobiles (415 of whom travel to the Tarrytown Station for rail service to Manhattan).
- 1,350 (~2 percent) cross in Tappan Zee Express buses (663 of whom travel to the Tarrytown Station for service to Manhattan).

The majority of the person-trips (65 percent) originate in Rockland and Orange Counties, with 42 percent coming from southern Rockland County alone. The remaining person trips begin either in New Jersey (24 percent) or at locations external to the study region (11 percent).

In terms of where trips end, slightly more than half (51 percent) of all the eastbound person trips over the Tappan Zee Bridge terminate in Westchester County. Approximately 28 percent of the trips end in New York City (16 percent in the Bronx, 7 percent in Manhattan, and 5 percent in other areas of the city). This figure includes those person-trips on the Hudson Line from the Tarrytown Station. The remaining person-trips terminate in Connecticut (10 percent), Long Island (3 percent), Putnam and Dutchess Counties (1 percent), and at locations external to the New York metropolitan area[1] (7 percent).

4.2.1.2 Cross-Hudson Trips (including Tappan Zee Bridge) – Eastbound

On an average weekday, 378,600 people cross the Hudson River traveling eastbound on the facilities surveyed. Nearly one-third (or 119,622) of the weekday travelers begin the trip in either Rockland or Orange County and, of these, about 45 percent (or 54,273) are traveling to New York City.

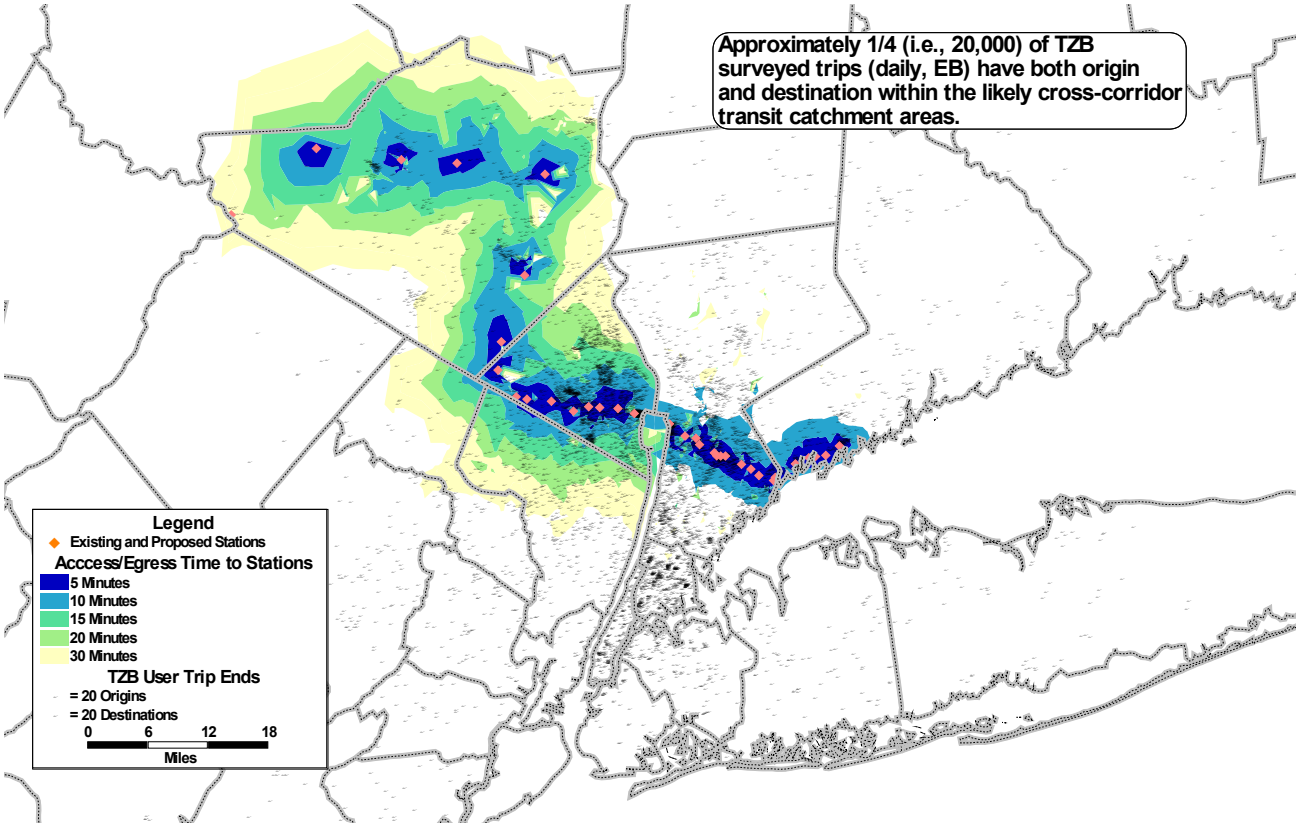
The George Washington and Tappan Zee Bridges are the facilities used most by the Rockland and Orange Counties-to-New York City travel market (each at 36 percent). Less than one-quarter (21 percent) of these weekday travelers use the Lincoln Tunnel. The remaining trips are distributed among the Newburgh-Beacon Bridge (2 percent), the Bear Mountain Bridge (1 percent), the Haverstraw-Ossining Ferry (0.5 percent), and the Hoboken PATH or ferry crossings (3.5 percent).

4.2.1.3 Transit-Accessible Origins and Destinations

The survey results were also analyzed to assess how many current trips across the Tappan Zee Bridge would be directly served by cross-corridor rail service. On the west side of the Hudson, zones within 30 minutes' driving time from rail stations (on the Port Jervis Line and in the corridor) were considered to be in the transit catchment area. This catchment area covers virtually all of Rockland and Orange Counties. On the east side of the Hudson, the catchment area was defined as zones within 15 minutes of cross-corridor rail stations (including the New Haven Line to Stamford). This lower time threshold was used on the east side of the Hudson (destination side) based on Metro-North experience.

The results of this analysis (Figure 4-3) indicate that about 20,000 (or one-quarter) of the Tappan Zee Bridge surveyed trips fall within the total catchment area. While most trip origins fall within this catchment area, only a portion of the destinations do.

[1] New York City, Long Island, Westchester, Rockland, Orange, Putnam, Dutchess, the northern half of New Jersey, and Fairfield and New Haven counties in Connecticut.



Transit-Accessible Origins and Destinations

Figure 4-3

4.2.2 Stated Preference Survey

Through the preference mode choice survey, detailed data were collected on travelers' current mode choices ("revealed preferences"). Those stated preference data were used to estimate effects of corridor demographics on mode choice and to determine the propensity to use new rail service. The primary focus of the survey was on trips in the corridor, especially trips between Rockland or Orange and Westchester Counties.

The survey approach was based on a computer-assisted self-interview (CASI) technique that utilized an adaptive computer-based questionnaire customized for each respondent. The customized questionnaire was adapted to each respondent by presenting questions and modifying wording based on respondents' answers. Several attributes including travel time, costs, station access/egress costs, and service headway were varied for rail, express bus, and ferry travel alternatives that were tested using stated preference experiments.

The survey questionnaire was administered to more than 2,800 individuals at diverse locations including malls, colleges, hospitals, Department of Motor Vehicle offices, unemployment centers, and other government offices within Westchester, Rockland, and Orange Counties in New York and Fairfield County, Connecticut, over a 2-month period in the spring of 2003. Participation was limited to individuals

who had made a recent trip of at least 20 minutes in duration that used or could have used any part of I-287, or that used public transit across the Hudson River.

The stated preference data from the computer-based survey were used to support estimation of the coefficients of a logit-based mode choice model. Survey data for weekday work commute, school commute, and work-related business trips were selected and modeled independently for comparison with the existing work journey mode choice model in BPM.

A primary objective of the stated preference survey was to quantify differences between the mode choice behavior of travelers in the I-287 Corridor and the behavior of travelers in the greater New York metropolitan region (as represented in the BPM mode choice model). With respect to travel time, the survey and BPM model results were comparable. However, the survey showed that work commuters have a slightly higher sensitivity to travel cost than represented in the BPM model. This results in a 17 percent lower dollar value for travel time among the I-287 travelers. This difference in travel time value ($13.62 in survey, $15.81 in BPM) could be a result of differences in the unobserved demographic characteristics and travel patterns of travelers in the corridor and those in the greater New York metropolitan region. The values of time from the stated preference survey could have been reflected by modifying the BPM coefficient values that are applied to the I-287 Corridor trips. However, because the value of time differences are not statistically significant, the BPM model was applied without this adjustment.

The stated preference survey was also designed to determine whether travelers in the corridor have different predispositions toward the use of commuter rail and light rail. The statistical analyses of the stated preference data indicate that I-287 commuters view light rail transit the way they view subways and buses, and have a preference for commuter rail. This preference is similar to the preference found by NYMTC in their 1996 survey, and is reflected in the BPM. As a result, light rail transit was represented as a general transit mode in the BPM, while commuter rail was modeled using the BPM commuter rail-specific coefficients.

Overall, the stated preference survey results indicate that the BPM mode choice model provides a suitable representation of mode choice behavior in the I-287 Corridor.

4.2.3 Commercial Vehicle Survey

A survey for commercial vehicles was conducted in spring and summer 2003 by distributing questionnaires to 700 commercial vehicles using the cash toll facilities at Tappan Zee and Spring Valley and mailing questionnaires to 1,300 fleet managers with vehicles that had used one of the two facilities during the same period. A response rate of about 6 percent was achieved. Because the fleet managers could not be asked about a particular trip, those questionnaires covered fleet behavior and geographic coverage. Key findings included:

- One-third of the trips were wholly within New York State.
- Cash payers were more likely to be long-haul trips than E-ZPass users, but more than half of the cash payers were also local.
- Users were more likely to alter their travel time of day than their route when faced with peak period toll surcharges.
- E-ZPass users were more likely to alter their route due to congestion pricing than were cash payers (70 percent and 40 percent, respectively).

- Only 10 percent of cash payers and 40 percent of E-ZPass users would change their travel time of day to avoid a surcharge.

- The majority of trips, 60 percent, were to destinations outside the metropolitan area, about 25 percent of the trips were to destinations within the metropolitan area, and the rest were to multiple destinations both within and outside the area.

- About 70 percent make trips two or more times a week across the Tappan Zee; 20 percent make trips more than six times a week.

- The only other routes considered by more than a few were across the George Washington Bridge or the Newburgh-Beacon Bridge. Two-thirds did not consider an alternate route.

4.2.4 Bus On-Off Counts

Bus on-off counts were conducted on two services in the corridor, the Tappan Zee Express and the I-Bus, to provide ridership data on those services. The data were used to weight trips made on those services during the analysis of the origin-destination survey. On Saturday, April 5, and Wednesday, April 9, 2003, on-off counts were conducted on both the Tappan Zee Express from Spring Valley to White Plains via Tarrytown (including the TOR Route 91, a spur route for the Tappan Zee Express from Stony Point to the Palisades Center) and CT Transit's I-Bus lines from White Plains to Stamford. These counts tracked the number of passengers that boarded and disembarked at each stop. Counts were carried out on a total of 28 separate bus runs, with a total of 357 passengers counted.

4.3 Other Proposed Projects and Demographic Trends

Before any forecasts of future travel patterns and levels can be made, all programmed highway and transit changes and improvements must be factored into the models. This was done by entering data on all projects in the New York and North Jersey TIPs that are within the bounds of the study area as of 2003 (see Appendix B). The TIP is a list of all federally funded projects that are scheduled to begin during the next three-federal-fiscal-year time frame. The TIP is required to be updated every two years and include a minimum three-year listing of federal-aid projects. Following are some of the projects in the current TIP that were included in the forecasting model:

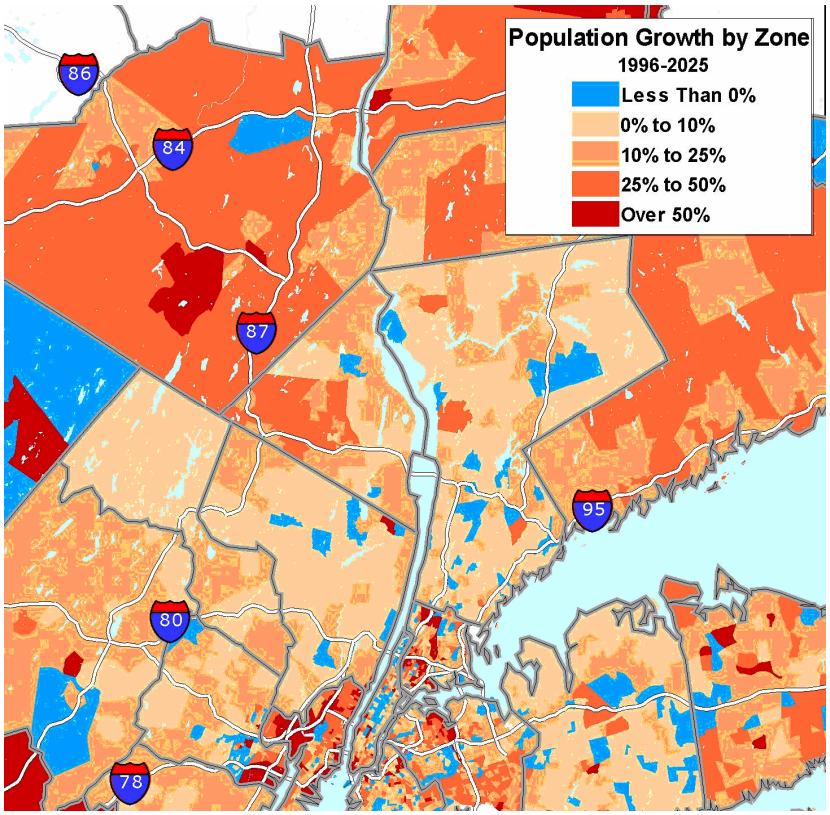
- I-287 (CWE) Rehab Stage 3; Bronx River Parkway to Central Westchester.
- Suffern Railroad Parking.
- I-287 Exit 8 Improvements – Westchester.
- New City Park-and-Ride lot.
- Sprain Brook Parkway southbound ramp to Route 100.
- Tappan Zee Express (upgrade bus service).
- Bee-Line planning activities.

The Access to the Region's Core (ARC) project, now called the Trans Hudson Express (THE) Tunnel, was not incorporated in this report since it was not a committed project at the time of the undertaking of this analysis. Similarly, THE Tunnel project did not incorporate the Tappan Zee/I-287 project into their report. However, because of the ongoing progress of that project and the commitment from NJTransit to include it in the New Jersey TIP, it will therefore be included in the DEIS analyses. Metro-North and NJTransit are working together to develop a common set of assumptions so that each project can address the other in future studies.

THE tunnel will bring the Port Jervis, Bergen/Main, and Pascack Valley Lines into Manhattan, terminating at a station under 34th Street between 6th and 7th Avenues. This will provide a one-seat ride for New Jersey and New York commuters on these lines and save approximately 5 minutes compared to their current trip.

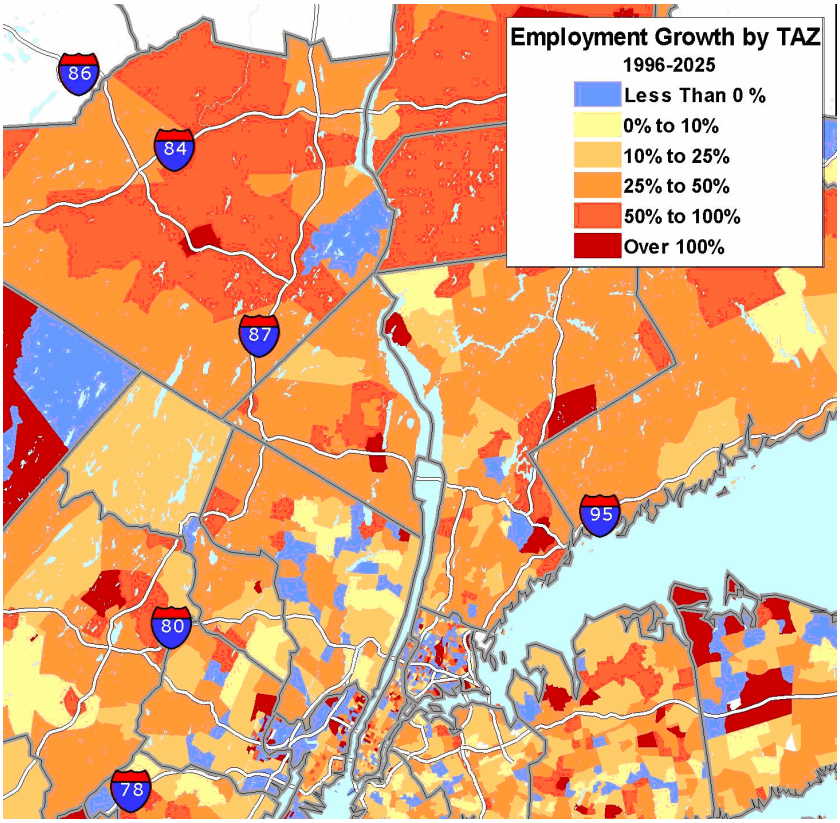
In addition to highway and transit projects, the forecasting model must also take into account land use and demographic trends that will have impacts in the study area. NYMTC, as part of its BPM, has developed forecasts of various socioeconomic variables (mainly population and employment) by zone. NYMTC 2025 socioeconomic forecasts, adopted in July 2003 were used as inputs for all of the 2025 scenarios. Their forecasts include 15 fields, but the key fields are household population, group quarters population (i.e., residents of institutions such as dormitories or nursing homes), employed labor force (where workers live) and total employees (where workers work).

Population and employment growth rates are shown at the zone level in Figures 4-4 and 4-5 In general, growth rates are expected to be highest in the outlying counties of the region, so that Rockland will experience higher growth rates in all categories than Westchester, and Orange County will see even higher growth. Between the 2000 Census and 2025, regional household population is expected to grow by 12 percent, with Rockland expected to grow by 18 percent and Orange County 27 percent. (Westchester population is expected to be more stable – growing by 4 percent). All three counties are expected to exceed the forecasted regional employment growth of 17 percent: Westchester will grow by 19 percent, Rockland by 29 percent, and Orange by 35 percent.



Population Growth by Zone, 1996-2025

Figure 4-4

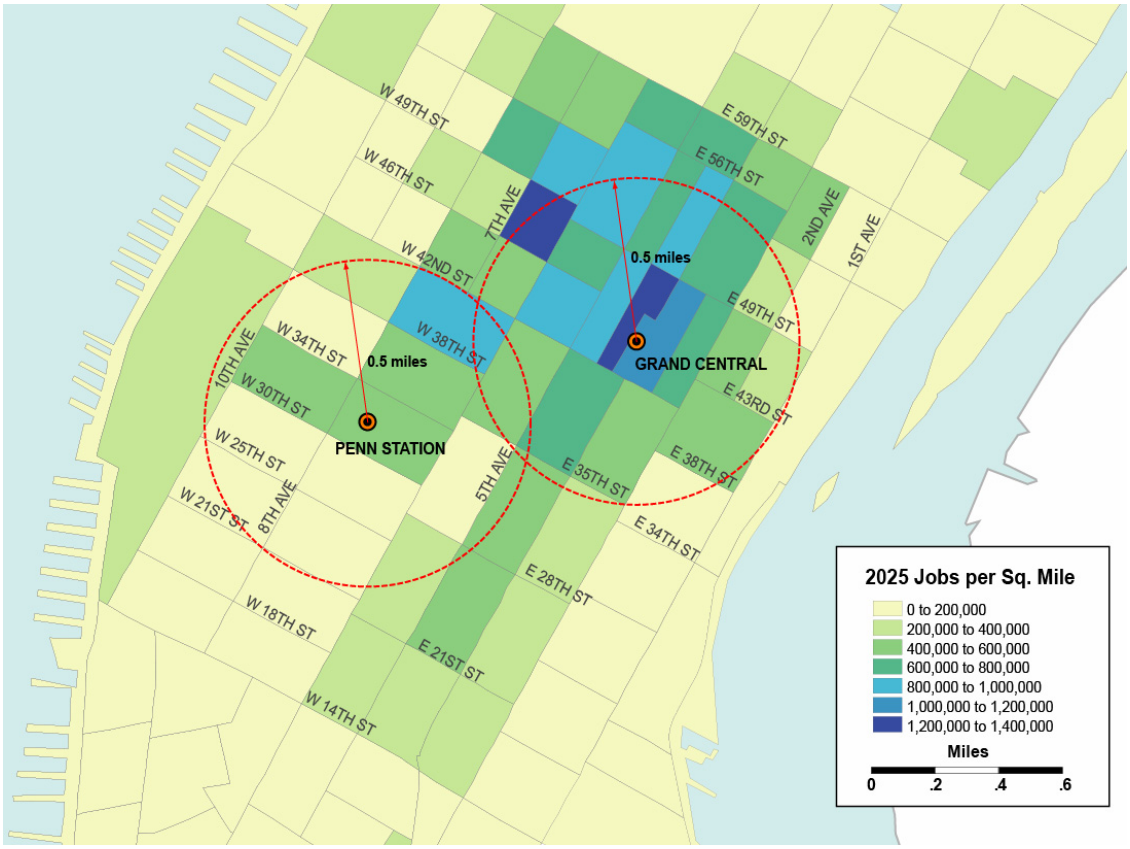


Employment Growth by Zone, 1996-2025

Figure 4-5

Demography outside of the corridor will also have implications for travel for corridor residents and workers. Fairfield County in Connecticut is also expected to experience high population and job growth (18 percent and 20 percent respectively). In New York City, the location of jobs within Manhattan will affect travel patterns in the corridor, particularly their location relative to Grand Central Terminal on the east side of Manhattan, and Pennsylvania Station on the west side of Manhattan. According to NYMTC estimates, currently about 700,000 jobs are concentrated within one-half mile of Grand Central Terminal, compared to about 300,000 jobs within one-half mile of Penn Station. Even with the expected future development on the west side of Manhattan, the forecasts prepared by NYMTC show the east side of Manhattan as a more robust job market in 2025: the Grand Central area job concentration is predicted to be about 770,000 compared to 445,000 predicted for the Pennsylvania Station half-mile radius. (One half-mile is a typical transit planning standard for walk access to and from transit stations. as shown on Figure 4-6).

The purpose of reviewing the TIP and future land use projections is to develop an understanding of what projects will be implemented and therefore which projects will be used, within the forecasting model, to determine the future state of the transportation system in the No Build condition.



Midtown Manhattan Future Job Density

Figure 4-6

4.4 No Build Scenario (H1)

In the No Build condition no highway improvements beyond those currently programmed would be built. Capacity within the project area would basically remain as it is today. The same cross section and number of lanes would be maintained on the highway and bridge. Under the No Build scenario (2025 was the analysis year for the traffic and ridership forecasts), traffic conditions are projected to deteriorate substantially as background traffic grows. With the same number of lanes and more and more vehicles trying to use the highway, congestion will increase, and queues at the toll plaza would likely get longer, as will the length of the peak periods. Spillover of the excess volume will start clogging parallel arterials as drivers change their travel times and patterns in an attempt to reduce their trip times. Daily VMT would increase significantly, especially in the fast-growing counties of Orange (85 percent increase over 1996), Rockland (54 percent increase over 1996), and, to a lesser degree, Westchester (29 percent increase over 1996).

These high percentage increases are a result of the projected population and employment forecasts described above, and the lack of transit options in the corridor. Indeed, the corridor's proximity to New York City makes it inevitable that growth will occur. Current commuting patterns in Rockland County and on the Tappan Zee Bridge – eastbound peak flows in the morning and westbound peak flows in the evening – would continue and grow in the 2025 No Build condition. There would be an even higher growth rate in the reverse peak direction resulting from the ongoing trend to locate back office and commercial space in suburban areas.

4.4.1 Corridor Mobility

One measure of mobility is congestion, which is quantitatively characterized by what is called level-of-service (LOS). Although speed is a major concern of drivers as related to service quality, freedom to maneuver within the traffic stream and proximity to other vehicles are equally noticeable concerns. Traffic conditions expressed as a LOS are calculated for the AM and PM peak hours, when traffic volumes are greatest, using the methodology from *The Highway Capacity Manual* (Transportation Research Board Special Report 209, 2000 Edition). LOS definitions ranging from LOS A to F are as follows:

- **LOS A** – describes free-flow operations. Free flow speeds (FFS) prevail. Vehicles are almost completely unimpeded in their ability to maneuver within the traffic stream. The effects of incidents or point breakdowns are easily absorbed at this level.

- **LOS B** – represents reasonably free flow, and FFS is maintained. The ability to maneuver within the traffic stream is only slightly restricted, and the general level of physical and psychological comfort provided to drivers is still high. The effects of minor incidents and point breakdowns are still easily absorbed.

- **LOS C** – provides for flow with speeds at or near the FFS of the highway. However, freedom to maneuver within the traffic stream is noticeably restricted, and lane changes require more care and vigilance on the part of the driver. Minor incidents may still be absorbed, but the local deterioration in service will be substantial. Queues may be expected to form behind any significant blockage.

- **LOS D** – is the level at which speeds begin to decline slightly, with increasing flows and density beginning to increase somewhat more quickly. Freedom to maneuver within the traffic stream is more noticeably limited, and the driver experiences reduced physical and psychological comfort levels. Even minor incidents can be expected to create queuing, because the traffic stream has little space to absorb disruptions.

- **LOS E** – at its highest density value, describes operation at capacity. Operations at this level are volatile, because there are virtually no usable gaps in the traffic stream. Vehicles are closely spaced, leaving little room to maneuver within the traffic stream at speeds that still exceed 49 mi/h. At capacity, the traffic stream has no ability to dissipate even the most minor disruption, and any incident can be expected to produce a serious breakdown with extensive queuing. Maneuverability within the traffic stream is extremely limited, and the level of physical and psychological comfort afforded the driver is poor.

- **LOS F** – describes breakdowns in vehicular flow, commonly characterized as “stop and go” traffic.

Table 4-1 shows the criteria for each LOS at the different FFSs.

4.4.1.1 Eastbound AM Peak Period

The AM peak period currently extends from 6 AM to 10 AM, which today includes a 7 AM-to-8 AM peak hour. As indicated by average peak period speeds (Figure 4-7), I-87/I-287 eastbound in Rockland operates at LOS A to LOS E during the morning peak hour, depending on the location. Morning operations currently show acceptable conditions in Rockland County with LOS A/B west of the interchange with the Garden State Parkway and LOS C/D to the east. Average travel speeds decline

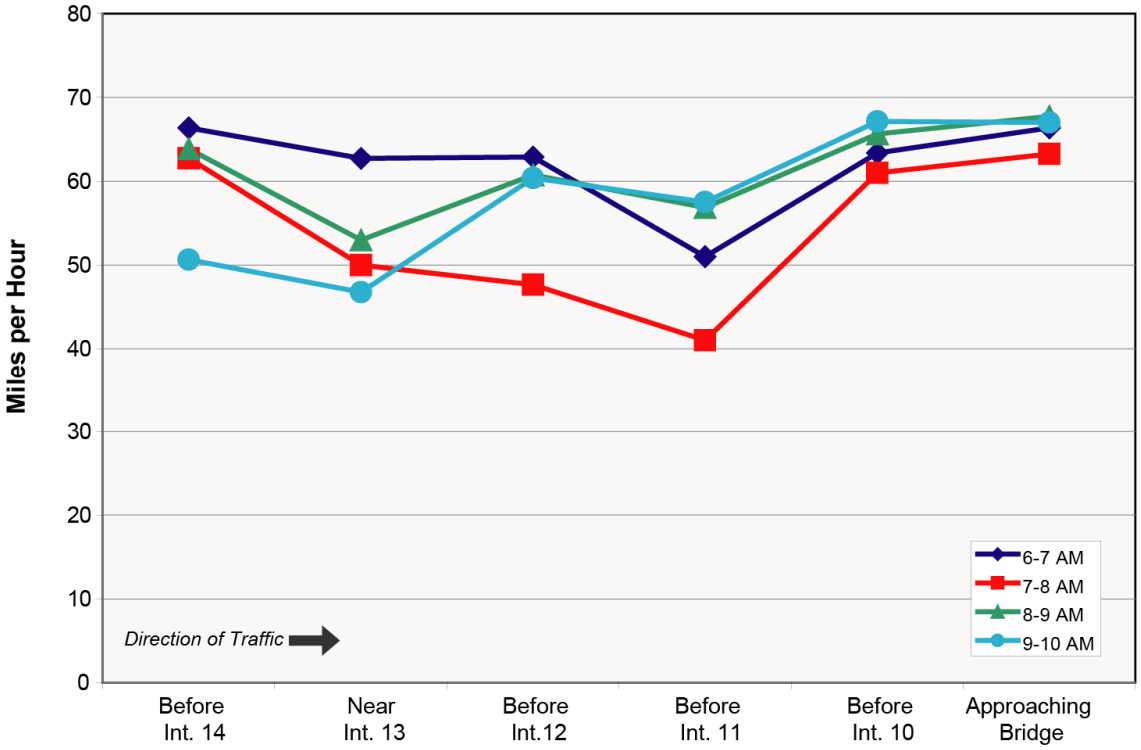
Table 4-1

Level of Service Criteria
Basic Freeway Segments

Criteria	LOS				
	A	B	C	D	E
FFS = 75 mi/h					
Maximum density (pc/mi/ln)	11	18	26	35	45
Minimum speed (mi/h)	75.0	74.8	70.6	62.2	53.3
Maximum v/c	0.34	0.56	0.76	0.90	1.00
Maximum service flow rate (pc/h/ln)	820	1350	1830	2170	2400
FFS = 70 mi/h					
Maximum density (pc/mi/ln)	11	18	26	35	45
Minimum speed (mi/h)	70.0	70.0	68.2	61.5	53.3
Maximum v/c	0.32	0.53	0.74	0.90	1.00
Maximum service flow rate (pc/h/ln)	770	1260	1770	2150	2400
FFS = 65 mi/h					
Maximum density (pc/mi/ln)	11	18	26	35	45
Minimum speed (mi/h)	65.0	65.0	64.6	59.7	52.2
Maximum v/c	0.30	0.50	0.71	0.89	1.00
Maximum service flow rate (pc/h/ln)	710	1170	1680	2090	2350
FFS = 60 mi/h					
Maximum density (pc/mi/ln)	11	18	26	35	45
Minimum speed (mi/h)	60.0	60.0	60.0	57.6	51.1
Maximum v/c	0.29	0.47	0.68	0.88	1.00
Maximum service flow rate (pc/h/ln)	660	1080	1560	2020	2300
FFS = 55 mi/h					
Maximum density (pc/mi/ln)	11	18	26	35	45
Minimum speed (mi/h)	55.0	55.0	55.0	54.7	50.0
Maximum v/c	0.27	0.44	0.64	0.85	1.00
Maximum service flow rate (pc/h/ln)	600	990	1430	1910	2250

Source: *2000 Highway Capacity Manual*.

Notes:
pc = passenger cars
ln = lane
mi = miles
v = volume
h = hours
c = capacity
FFS = free flow speed



Average Existing Thruway Speeds – Eastbound Weekday AM Peak

Figure 4-7

significantly as vehicles approach the hill between Interchanges 12 (Route 303) and 11 (Nyack, Route 9W). Slow-moving vehicles, trucks, and buses entering the highway from Parking Lot J at the Palisades Center Mall impede the traffic flow because of the 3 percent grade in this location.

Grades, more commonly known as hills, are slopes in the roadway surface. The steeper the grade the slower the traffic will go. This is especially true for trucks. Passenger vehicles, with their greater horsepower to weight ratio can more easily maintain highway speeds, even on steep grades, if they are paying attention. In reality, drivers do not pay as close attention to their speeds as they should and will in many cases slow down as they enter the grade. This results in a small loss in capacity, with a much larger loss caused by trucks.

In Westchester County, more significant congestion is present with LOS ratings of C/D for the majority of the corridor and LOS E in the area extending from Exit 5 east to Exit 9 in the AM. The toll plaza on the Tappan Zee Bridge results in significant eastbound congestion and LOS F in the morning peak.

Peak period traffic in the corridor is projected to increase at an overall rate of 30 percent between 1996 (the baseline year for this stage of the study) and 2025 for the No Build condition. In the AM peak period on a typical weekday in 2025, traffic operations would worsen throughout Rockland to LOS C/D. The Tappan Zee Bridge would become a capacity constraint primarily due to the existing geometric configuration of the bridge and the projected high traffic volumes. The combination of vehicles entering at Interchange 10 (South Nyack), the approaching curve of the bridge causeway, and the narrow lanes and lack of shoulders on the bridge all would contribute to the poor levels of service on the bridge approach. Traffic approaching the toll plaza, particularly with the speed-reducing 3 percent upgrade between Interchange 12 and 11, would be at LOS F for the full length of the bridge and could extend back as far as Interchange 14 (Route 59) in Rockland County, a distance of about 7 miles. In Westchester County, LOS

ratings of D/E are evident from the Tappan Zee Bridge to Exit 10 on the Cross Westchester Expressway, a distance of approximately 10 miles.

Because of the capacity constraint on the bridge segment, vehicle queues would spill back and cause the existing lane capacity to be exceeded in many locations along the Rockland corridor. The number of lane miles in the corridor operating at LOS E or F would significantly increase (Table 4-2).

The capacity of the roadway segments was determined in accordance with *The Highway Capacity Manual* (2000 Edition). The manual recommends the segmentation of the roadway by characteristics including, but not limited to, number of lanes, presence of shoulders, location of on and off ramps, and grades. Ideal capacities are reduced by adjustment factors to account for lane widths, shoulder clearance, percentage of heavy vehicles, grades, etc. Adjustments were also possible for the familiarity of the driver population (applicable to weekend estimates). The lane configurations and roadway characteristics for the different segments vary widely, as does the capacity, shown below in Table 4-2.

Figures 4-8 and 4-9 show the decline in AM speeds expected in the No Build as compared to 1996 conditions. As similarly illustrated in the LOS tables, the decline in speeds within the corridor will be much more severe in Rockland County than in Westchester. With deterioration of traffic conditions on the Thruway, commuters would divert to alternate routes or delay entry to the Thruway and opt for adjacent arterials (eventually reentering the Thruway to cross the river). Speeds and levels of service on adjacent arterials would then deteriorate as well though generally not to the same extent as on I-287. The analysis of traffic flows and projects indicate that if no improvements are made, peak period spreading would occur as drivers alter the time of their trip, earlier or later, to avoid congestion. With peak spreading in both the AM and PM periods, there would be very little time remaining between the peaks for non-congested operation. Extremely poor operating conditions would extend throughout the entire peak periods.

Since growth in VMT rates in Rockland County are forecasted to be significantly higher than in Westchester County (Rockland has space, Westchester does not), and I-287 in Westchester would have benefited from the programmed improvements already completed or under construction (e.g., reconfigure and reconstruct Interchange 8, add an eastbound collector – distributor road to Route 119/Saw Mill River Parkway, add eastbound and westbound auxiliary lanes at several locations, etc.), the projected traffic volume increases would have a greater negative impact on I-87/I-287 in Rockland County.

4.4.1.2 Westbound PM Peak Period

Today's congestion in the PM peak period is worse than in the AM peak period in many parts of Rockland County. Poor levels of service are found throughout the entire corridor (Table 4-3). However, Westchester's evening traffic conditions are a little better than the morning's. The westbound peak period extends from 3 PM to 7 PM, with the peak hour occurring between 5 PM and 6 PM. As indicated by average peak period speeds (Figure 4-10), LOS F conditions exist between the bridge and Interchange 13.

Although there are currently four lanes from the bridge into Rockland County, the 3 percent upgrade through Nyack reduces lane capacity (because of the slower speeds required for climbing the grade), and the lane drop just west of Interchange 11 creates a bottleneck causing congestion in the peak hour. Continuing west, the 3 percent grade between Interchange 12 (Palisades Center Mall) and Interchange 13 (Palisades Interstate Parkway), a distance of approximately 2 miles, causes another speed reduction, exacerbated by the inadequate three-lane capacity in this segment of the corridor. In Westchester, congestion at LOS E extends between Exit 2 and Exit 9 on the Cross Westchester Expressway during the evening peak hour. None of these conditions would be improved in the No Build condition.

Table 4-2

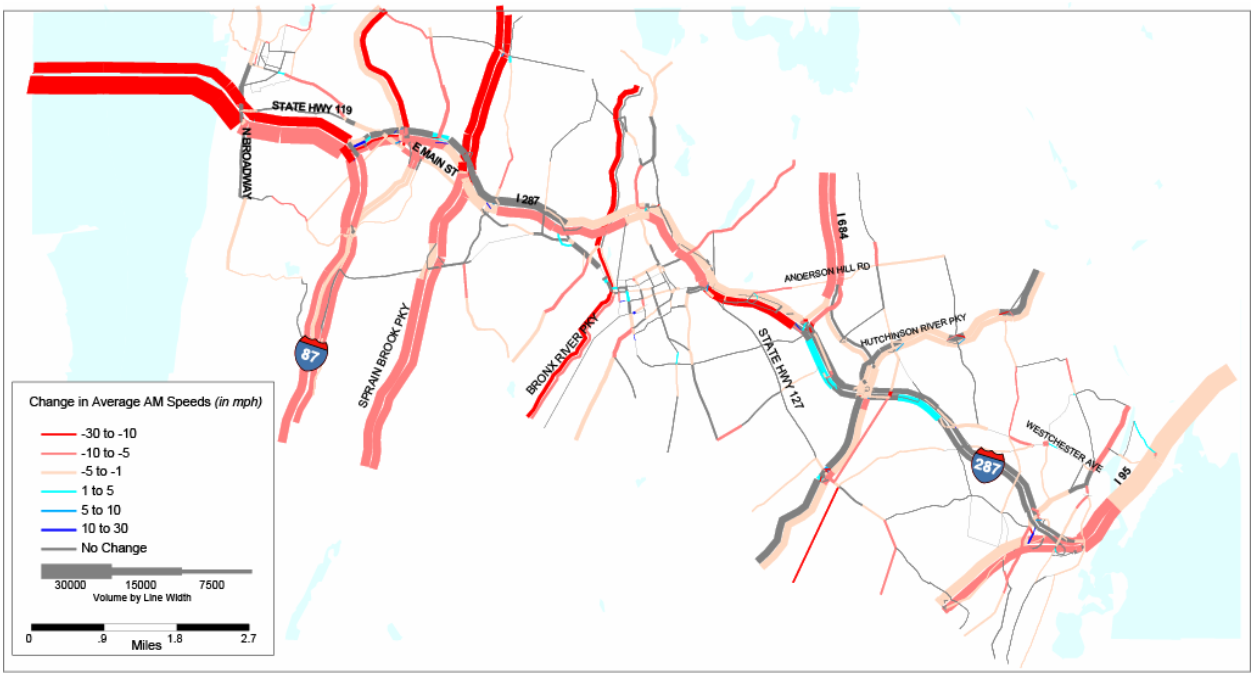
Estimated Main-Line Impacts – Eastbound AM Peak Hour
Vehicle Volumes/LOS

Expressway Segment	Number of Lanes	Effective Capacity	Existing Conditions[2]	2025 No Build (H1)[3]
Rockland County				
Int 15 (Rte 17) – Int 14A (GSP)	3	6400	3900 C	4800 D
Int 14A (GSP) – Int 14 (Rte 59)	3	6400	3900 C	5000 D
Int 14 (Rte 59) – Int 13 (PIP)	3	6400	3600 C	4400 F[1]
Int 13 (PIP) – Int 12 (Rte. 303)	3	6400	3900 C	5000 F[1]
Int 12 (Rte 303) – Int 11 (Rte 9W, Nyack)	3	6400	4200 C	5400 F[1]
Int 11(Rte 9W, Nyack) – Int 10 (Rte 9W, S. Nyack)	4	8600	5500 C	7200 F[1]
Int 10 (Rte 9W, S. Nyack) – Tappan Zee Bridge	4	8200	6700 E	8800 F
Westchester County				
Tappan Zee Bridge – Int 8 (CWE)	4	8200	6300 D	7800 E
Exit 2 (Rte 9A) – Exit 3 (Sprain Brook)	3	5800	5000 E	5200 E
Exit 4 (Rte 100A) – Exit 5 (Rte 100)	4	8100	6600 D	6800 D
Exit 7 (CWP) – Exit 8W (Rte 127)	3	5800	6400 F	6800 F
Exit 9 (HRP) – Exit 10 (Rte 120)	3	6100	4100 D	4500 D

1. LOS F is caused by queues from bridge, not volume on segment itself.
2. Existing conditions based on year 1996 counts, the year to which BPM is calibrated.
3. 2025 No Build was estimated based on 1996 counts. Recent 2004 counts indicate that in the AM peak congestion may be underestimated in the western portion of the Rockland corridor.

Change in Average Speeds, Rockland County: 2025 No Build vs. 1996, Weekday AM Peak Period

Figure 4-8



Change in Average Speeds, Westchester County: 2025 No Build vs. 1996, Weekday AM Peak Period

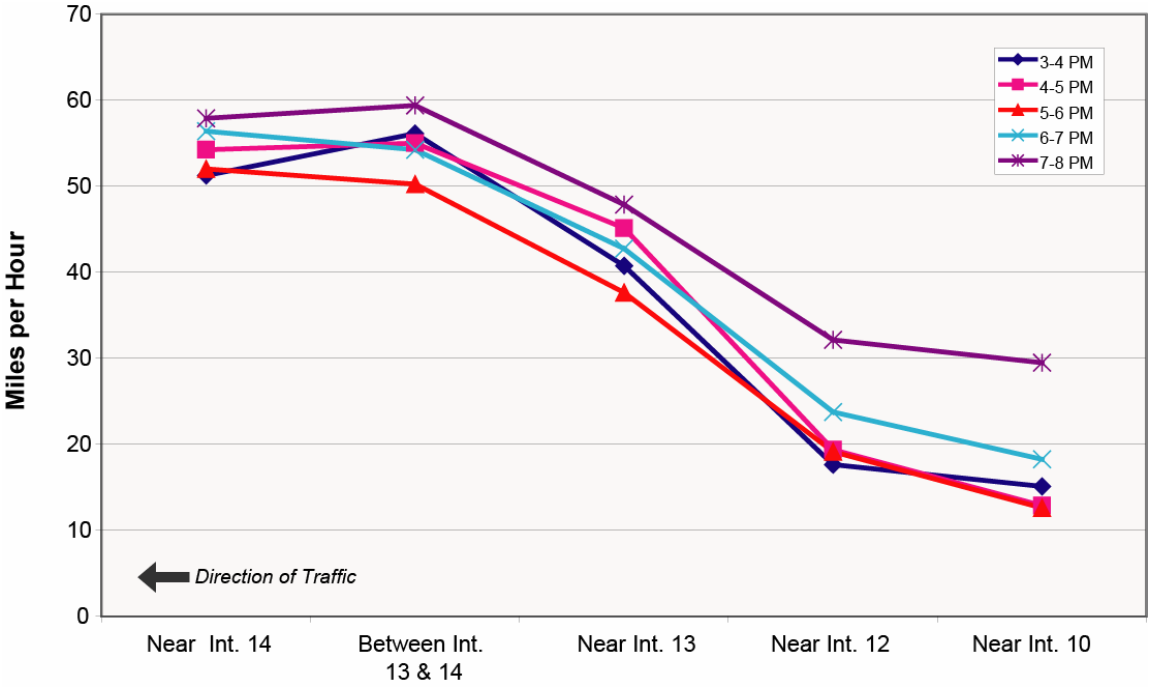
Figure 4-9

Table 4-3

Estimated Main-Line Impacts – Westbound PM Peak Hour
Vehicle Volumes/LOS

Expressway Segment	Number of Lanes	Effective Capacity	Existing Conditions[2]	2025 No Build (H1)[3]
Rockland County				
Int 14A (GSP) – Int 15 (Rte 17)	3	6400	6000 E	7200 F
Int 14 (Rte 59) – Int 14A (GSP)	3	6400	5600 E	6700 F
Int 13 (PIP) – Int 14 (Rte 59)	3	6400	5800 E	6300 E
Int 12 (Rte 303) – Int 13 (PIP)	3	6100	6200 F	7300 F
Int 11 (Rte 9W, Nyack) – Int 12 (Rte 303)	3	6400	5600 E	7100 F
Int 10 (Rte 9W, S. Nyack) – Int 11 (Rte 9W, Nyack)	4	8400	5300 C	7100 D
Tappan Zee Bridge – Int 10 (Rte 9W, S. Nyack)	4	8200	6100 D	8100 F
Westchester County				
Int 8 (CWE) – Tappan Zee Bridge	4	8200	4900 C	6300 F[1]
Exit 3 (Sprain Brook) – Exit 2 (Rte 9A)	3	5800	5100 E	5800 F
Exit 5 (Rte 100) – Exit 4 (Rte 100A)	3	6100	6000 E	6300 F
Exit 8W (Rte 127) – Exit 7 (CWP)	3	5800	5100 E	6000 F
Exit 10 (Rte 120) – Exit 9 (HRP)	3	6100	3700 C	4200 D

1. LOS F is caused by queues from bridge, not volume on segment itself.
2. Existing conditions based on year 1996 counts, the year to which BPM is calibrated.
3. 2025 No Build was estimated based on 1996 counts. Recent 2004 counts indicate that in the PM peak congestion may be overestimated in the western portion of the Rockland corridor.



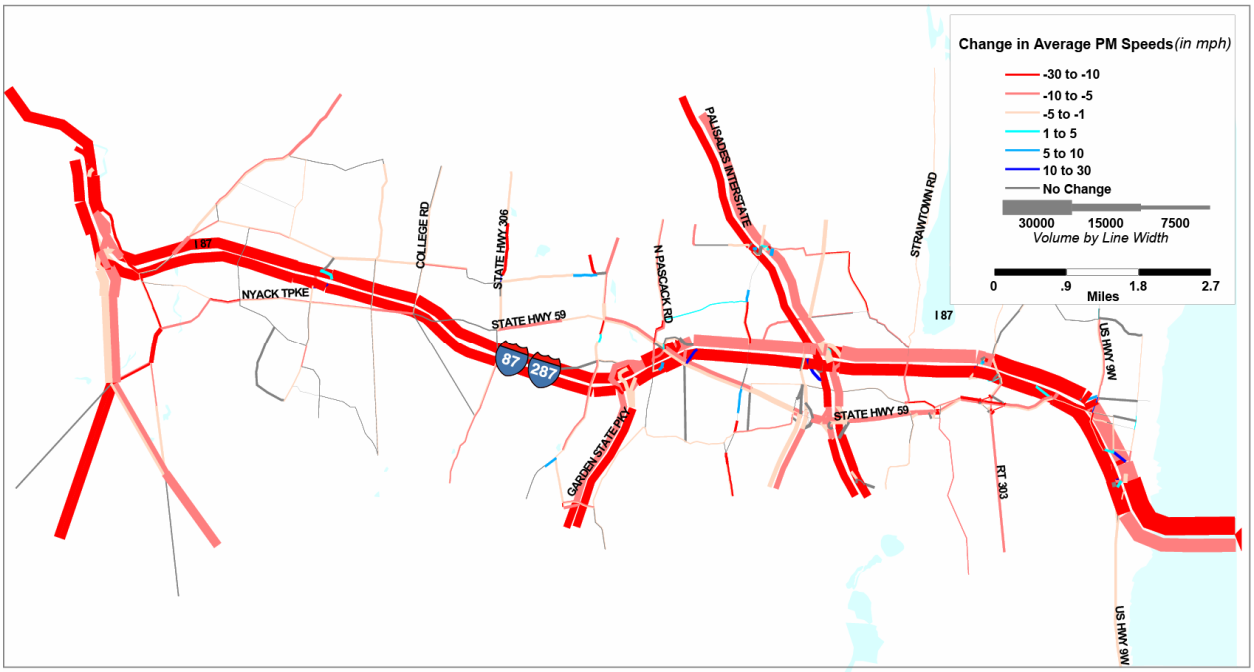
Average Existing Thruway Speeds – Westbound Weekday PM Peak (Existing)

Figure 4-10

Peak period traffic in the westbound direction is expected to be 30 percent higher in 2025 than 1996. Under the No Build scenario, the performance of the highway in Rockland and Westchester Counties show failure conditions (LOS F) extending through most of the corridor. With the severe deterioration of traffic conditions on the highway and peak period spreading, as described above, evening commuters would also be expected to divert to alternate routes or delay entry to the Thruway and remain on local arterials longer. As a result, significant speed reductions and deterioration in levels of service, indicated in Figures 4-11 and 4-12, are also expected in the westbound direction in 2025. Similar to the AM condition, the decline in speeds within the corridor will be more severe in Rockland County than in Westchester.

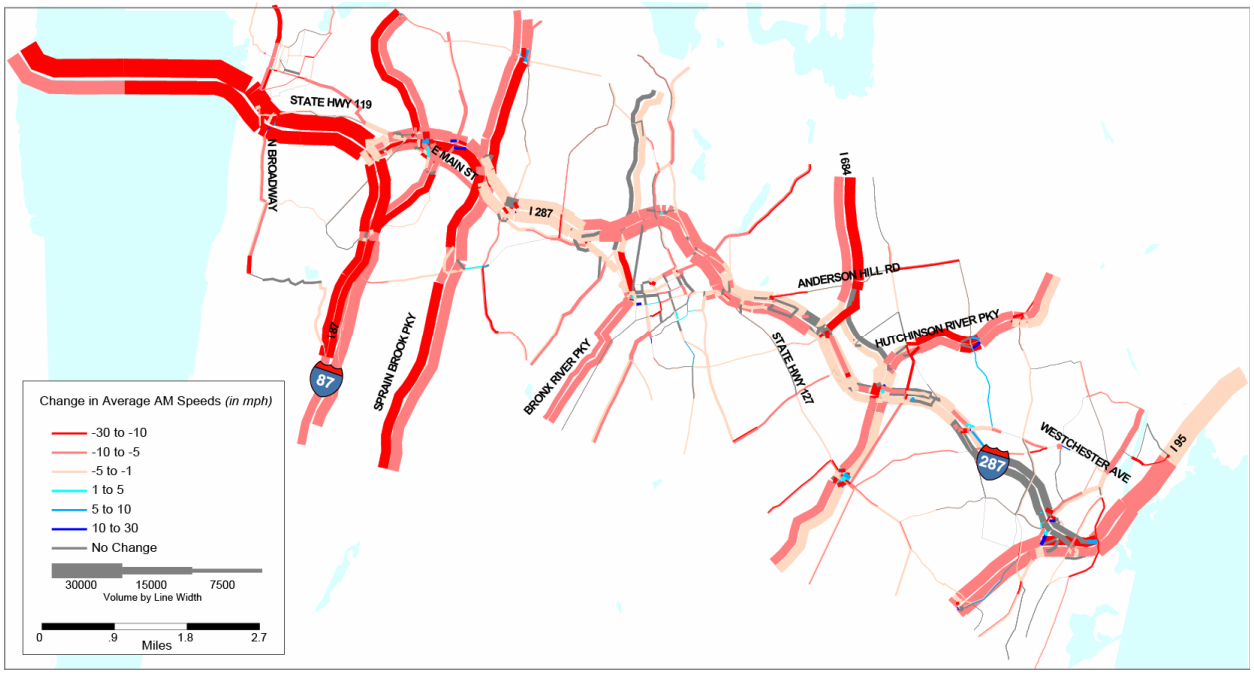
4.4.1.3 Weekend Conditions

Comparable to weekday traffic growth, volume is projected to grow 30 percent by 2025 for holidays and summer weekends in Rockland County. The large number of non-work, recreational travelers during the Friday PM peak period that exists today would continue to create more westbound congestion than the typical weekday. Similarly, Sunday afternoon and evening eastbound congestion is worse than the weekday AM peak period (Figure 4-13). Further, studies have noted that non-commuter driver populations do not display the same characteristics as regular commuters. For recreational traffic, capacities have been observed to be as much as 10 to 15 percent lower than commuter traffic traveling on the same segment, primarily because drivers are less familiar with the road and its operating characteristics.



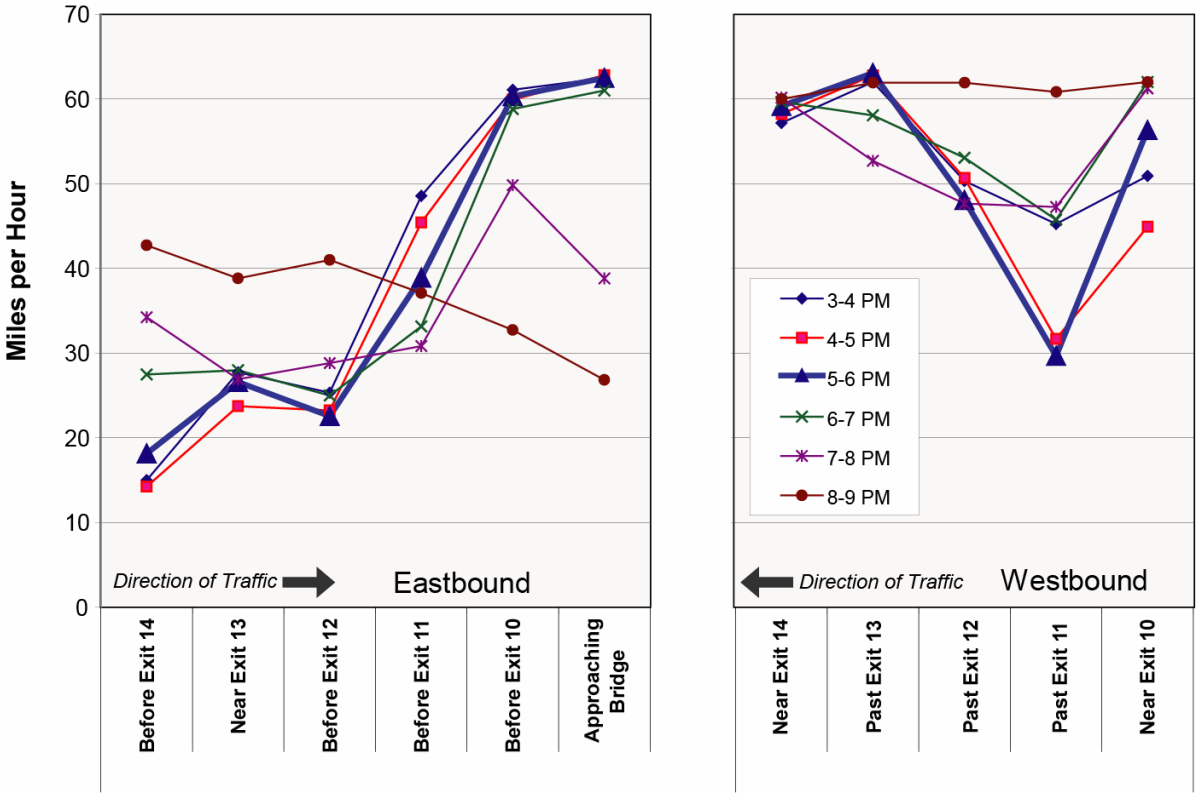
Change in Average Speeds, Rockland County: 2025 No Build vs. 1996, Weekday PM Peak Period

Figure 4-11



Change in Average Speeds, Westchester County: 2025 No Build vs. 1996, Weekday PM Peak Period

Figure 4-12



Average Thruway Speeds Sunday Evenings (June 2004)

Figure 4-13

Under the No Build condition, these additional volumes would serve to make the roadway more congested and travel times longer. At the Tappan Zee Bridge toll plaza, E-ZPass use is considerably less on weekends than the typical weekday commute and queues can now extend up to 10 miles from the bridge. It is expected that these queues could be even longer in the future. The new high speed E–ZPass lanes would help to reduce the queues but when demand on the bridge exceeds the capacity, vehicles will not be able to take advantage of this new technology. Currently the E–ZPass market share is 85 percent of collections during weekday peak periods and 65 percent on weekends.

4.4.1.4 Truck Traffic

Commercial traffic in the corridor would continue to lower practical vehicle capacity on critical links due to a number of inherent characteristics associated with heavy vehicles (trucks, buses and large recreational vehicles) in the traffic stream, including:

- Longer and more frequent gaps of excessive length both in front of and behind heavy vehicles.
- The effect of the generally slower moving large vehicles on the speed and spacing of vehicles in adjacent lanes.
- The greater physical space in terms of length taken up by the large vehicles, typically two or three times greater than that of a typical passenger car.

In the Cross Harbor freight movement DEIS (a study for a new tunnel under the Hudson River between New Jersey and New York City to carry freight trains), freight volume (tonnage) in the region is forecast

to increase by 70 percent between 2000 and 2025 (New York City Economic Development Corporation, 2004), and 79 percent of this increase would be carried by trucks. This would translate to thousands of additional trucks on roadways in and around New York City, including I-87 and I-287. Heavy truck volume currently approaches 7 percent of the daily traffic in the eastbound direction and 9 percent in the westbound direction.

This heavy truck volume is expected to increase significantly under all the alternatives. Trucks would continue to contribute to the congestion in both directions between the Tappan Zee Bridge and Exit 14B (Airmont Road), especially in the areas where there are lengthy 3 percent grades.

4.4.2 Travel Times

Travel times for selected origin and destination pairs are shown on Table 4-4. It currently takes considerably longer to travel between Suffern and White Plains by transit (bus) compared to automobile since buses must travel on the same roadways as automobiles but are required to make several stops along the way. Travel times via auto for those in the cross-corridor market (i.e., Suffern to White Plains) would more than double in the 2025 No Build condition from 37 minutes to 80 minutes.

Travel times between Stamford and White Plains are comparable for transit and automobile. However, travel times on the I-Bus are highly variable and actual travel times often exceed scheduled times due to congestion on the roadways because of excessive volume and traffic incidents such as breakdowns, accidents, and enforcement activity.

The commute to Manhattan for those living in the Rockland corridor may take two hours or more via automobile in 2025. In the future, transit would offer an even greater advantage over driving in the Manhattan-bound market than it does today.

4.4.3 Traffic Safety Analysis

Safety considerations play a significant role in the planning and design of transportation projects. For that reason, accident data were collected and complied for the latest three-year period available, which was January 1998 through December 2000, for the I-287 Corridor between Suffern and Port Chester, and information about key roadways and intersections within the study area was complied. Accident rates were computed using the NYSTA database of accident summaries by milepost, NYSDOT – State Accident Surveillance System (SASS) data by reference marker, and traffic volumes from the NYSDOT Traffic Volume report.

In most cases, accident rates were estimated based on the average number of accidents, which occurred at each analysis location during the three-year period 1998-2000. Resultant accident rates were compared against statewide average accident rates for similar facility types. Approximately 39 locations on the mainline and various entrance and exit ramps have accident rates in excess of statewide averages. In addition, there are many locations on state routes and local roadways where accident rates exceed the statewide average.

Table 4-4

Travel Time for Selected Trips
Weekday AM Peak Hour

Trip	Travel Time in Minutes			
	Via Automobile		Via Transit	
	Existing	2025 No Build	Existing	2025 No Build
Suffern to White Plains	37[a]	80	70[1]	104
Stamford to White Plains	29	48	31[1]	50
Spring Valley to Manhattan	82[b]	120[b]	78[2]	78[2]
Suffern to Manhattan	88[c]	128[c]	55[2]	55[2]

Notes:
This table represents a sample (for selected O-D pairs) of the travel times used in the BPM model to estimate travel demand forecasts.

Travel times are considerably longer on holidays and Sundays in the summer. The trip today (Sunday afternoon) between Suffern and White Plains, for example, takes on average 58 minutes based on data collected in June 2004 by the NYSTA.

Assumptions:
a. Existing travel time based on speed data obtained in June 2004 from NYSTA. Other travel times that are subject to roadway congestion were obtained from BPM runs.
b. Using Palisades Interstate Parkway to the GWB.
c. Using I-287, Route 17, and the Lincoln Tunnel.

Sources:
1. Existing bus times:

Suffern to White Plains – Rockland County bus schedule effective February 23, 2004.
Stamford to White Plains – I-Bus schedule effective January 4, 2004.

2. Existing rail times:

Port Jervis, Suffern to Penn Station – Main/Bergen County Line schedule effective December 14, 2003.
Nanuet to Penn Station – Pascack Valley Line schedule effective February 15, 2004.
Tarrytown to GCT – Hudson Line schedule effective April 27, 2003.

The DEIS will further evaluate and fully investigate contributing factors to these safety conditions and recommend mitigation measures to be incorporated into the designs of the alternatives analyzed. The steps that will be followed in the DEIS analysis include the following:

- Perform screening evaluation to select locations for detailed analysis, considering those locations with high accident rates and the potential to be most affected by the project alternatives.
- Review aerial photography, topographic survey, and as-built plans to assess the existing roadway, traffic, and surrounding conditions. Conduct a site inspection to verify these conditions.
- Conduct an accident analysis to determine contributing causes based on the examination of previously computed accident rates. Document the accident patterns, including the collision type, severity, time period, and environmental conditions.
- Identify safety countermeasures based on the results of the analysis. Review DEIS alternatives for opportunities to incorporate safety measures into the design. Calculate the safety benefit-cost ratios per NYSDOT guidelines.
- Coordinate with NYSTA, NYSDOT, and county and regional traffic and safety groups to obtain their input during evaluation of locations exceeding the statewide average and to develop effective countermeasures.

The increased volumes and resulting congestion from the background growth would likely result in higher accident rates, extended peak travel periods, slower speeds, and longer queues than seen today. Increased congestion has a tendency to raise the level of frustration in many drivers, which in turn raises their level of aggression. This corridor already experiences higher-than-average accident rates; increasing frustration and aggressiveness through added congestion and delay would only serve to drive these numbers even higher.

4.4.4 Transit and Alternative Modes Not in Mixed Traffic

The No Build scenario would be subject to highway congestion. The existing transit services that operate in the corridor today would continue to operate in the No Build condition, with increased service levels to meet demand. Buses serving the Manhattan-bound and cross-corridor markets would continue to operate in mixed traffic and be subject to the same delays related to congestion and incidents as automobiles.

Metro-North currently serves west-of-Hudson customers by contracting with NJTransit for operation of the Port Jervis and Pascack Valley Lines. Metro-North's market share for peak period trips to Manhattan from Orange and Rockland Counties is currently about 10 to 15 percent (2004) using Metro-North's Port Jervis, Pascack Valley and Hudson Lines compared to 78 percent for east-of-Hudson counties using Metro-North's Hudson, Harlem, and New Haven Lines. With the opening of the Secaucus Junction, it is anticipated that the market share for Orange and Rockland Counties rail riders would continue to increase, reaching 50 percent by 2025 (No Build). In the year after Secaucus Junction opened, ridership grew by 10 percent on the Port Jervis Line and by 26 percent on the Pascack Valley Line.

In order to meet future demand (overall transit ridership in the corridor is expected to grow approximately 75 percent by 2025) and improve service for west-of-Hudson customers, additional improvements on the

Port Jervis and Pascack Valley Lines are necessary. Several have been identified by Metro-North, but overall, Metro-North's and NJTransit's ability to accommodate future growth is severely limited.

4.4.4.1 Port Jervis Line

The Port Jervis Line, recently acquired by Metro-North from Norfolk Southern on a long term lease (with an option to buy) and operated by NJTransit, has peak service and very limited off-peak and weekend service. The track infrastructure is a single track with a few passing sidings and is in poor condition, having seen only minimal investments over the past 30 years. Metro-North is currently completing a condition assessment of the line to determine the level of capital investment necessary to maintain and improve current levels of service, improve reliability, and expand capacity on the line.

As described in Chapter 3, Metro-North's 20-year needs assessment includes projects that would bring the Metro-North west-of-Hudson system into a state of good repair. These improvements include station rehabilitation, signal improvements, purchase of new rail cars, station parking and yard expansion, and select double-tracking (or construction of passing sidings) within the existing right-of-way. The cost of these is anticipated to be approximately $900 million.

By double-tracking within the existing right-of-way, the Port Jervis Line could operate increased off-peak service; however, this would not improve peak service. There are capacity limitations in New Jersey (Main/Bergen Line) such as signal issues, existence of many grade crossings, and capacity limitations at the Hoboken Terminal and in the tunnels approaching Hoboken. Currently, NJTransit has no planned commitments to alleviate constraints at Hoboken Terminal or the approach tunnels. "THE Tunnel" would increase the capacity by providing direct service to Manhattan. Any such projects to increase capacity would be at NJTransit's initiative.

4.4.4.2 Pascack Valley Line

The Pascack Valley Line, owned and operated by NJTransit, is a single-track line from Spring Valley to Hoboken, with 10 morning departures, 12 evening return trains, limited midday service, and no weekend service (2002 schedule). Given the single track, combined with the Woodbine Yard that is at capacity, there is limited ability to increase peak service or midday service. Even with THE tunnel, there would be a limited ability to increase capacity on this line.

In order to expand capacity, NJTransit's Pascack Valley and Bergen/Main Line right-of-way improvement project proposes the addition of six passing sidings to provide bi-directional traffic flow on the Pascack Valley Line. Most of this work, however, is currently on hold because of strong community and legal opposition in New Jersey, due to the numerous grade crossings. In addition, the line has low track speeds. To increase capacity, many of these grade crossings would need to be eliminated.

Any additional service on the Pascack Valley Line would entail expansion of the Woodbine Yard, which would be extremely difficult and costly to implement, as it is embedded within a community in the heart of Spring Valley. Such expansion would likely trigger the EIS process because of its community and environmental impacts. Increased service would lead to increased traffic and traffic delays at the many at-grade crossings. Increased traffic and delays could mean increased air pollutant and noise levels. Again, any improvements on the NJTransit portion of the line or at Hoboken would be at NJTransit's initiative.

4.4.4.3 West-of-Hudson vs. East-of-Hudson Service

By comparison to the capacity, speed, and service constraints on the Port Jervis Line and Pascack Valley Line, Metro-North's Hudson Line has four tracks between Croton-Harmon and Grand Central Terminal, an excellent modern infrastructure (signals, power, track, etc), and high-speed, frequent peak and off-

peak/weekend service to Grand Central Terminal. It is within Metro-North's ability to expand, improve, and handle future increases in demand on the Hudson Line. The Harlem Line has limited capacity and is not easily expanded. It is only two tracks north of Crestwood to White Plains. To expand capacity on the Harlem Line, a third track from Crestwood to White Plains would be needed (which would require a separate EIS). The quantity of service and capital improvements in Connecticut on the New Haven Line is largely controlled by the Connecticut DOT. Expanding services on the New Haven Line would have minimal impact on the I-287 Corridor.

4.5 TDM/TSM Measures (H2)

TDM/TSM measures would enhance the programs already operating in the corridor, influence the quality of traffic flow (via ramp meters, real-time signal control, and incident management), and provide real-time information to corridor users (electronic signs, advisory radio, etc.). Measures to improve the integration of train and bus schedules would encourage higher transit ridership by making the service more convenient. Ramp metering limits access to the freeway, and spaces the entering vehicles out to improve traffic flow. It is an effective way to increase throughput at a relatively low cost, and it can be an effective inducement to encourage HOV trips. Ramp metering in conjunction with HOT lanes would be a particularly effective combination.

Congestion pricing serves two useful purposes, moving peak period travel to off-peak periods and encouraging the use of E-ZPass, thus significantly reducing delays at toll plazas. There is already congestion pricing for trucks on the Tappan Zee Bridge, and at the Spring Valley Toll Plaza to encourage their shifting to off-peak periods. Auto congestion pricing that matches the George Washington Bridge toll structure would allow drivers to make distance-based decisions instead of cost-based decisions, which would reduce VMT in the region.

While the effects of TDM/TSM measures, including congestion pricing and ramp metering, were not measurable in terms of the transportation indicators analyzed in Level 2 screening, their effectiveness in conjunction with more capital intensive solutions will be examined in detail in the DEIS and are expected to improve the efficiency of the transportation system and help to manage demand.

4.6 Conclusions

In analyzing the key findings, it is necessary to take a broad perspective and consider the long-term economic health and viability of the region, control of urban sprawl that threatens open space in Orange, Rockland and Westchester Counties, and the ability to protect the environment and its resources into future generations. Transportation is at the heart of all these long-range considerations. For example, commerce depends on a work force that has reasonable access to business locations and affordable housing. Without these basics, there is no work force. Businesses without a work force from which to draw and a viable infrastructure would go elsewhere, resulting in significant economic impact to the area.

The potential for uncontrolled development that threatens open space and sustainability of the environment is another concern. Availability of well-planned, accessible transit options enables communities to plan for smart growth, which is an anti-sprawl development approach that is environmentally, fiscally, and economically smart and includes land use planning and mixed-use development. A key feature of smart growth is a sound transportation network, including public transit options.

With or without any proposal that emerges from this study, significant growth is predicted for the corridor. Growth in and around Westchester, Rockland, and Orange Counties would exacerbate the existing transportation situation, which is already problematic. Under the No Build scenario traffic congestion delays at the Tappan Zee Bridge and within the corridor would become more severe.

Without a significant investment in transportation infrastructure throughout the corridor, it would be impossible to get ahead of this trend. This is a simple fact, and one that must be addressed by balancing the optimum situation (totally eliminating congestion in the corridor) against what is feasible and desirable to be achieved (within the context of the goals and objectives of this study). Recognizing these practical constraints, congestion must be alleviated to the extent practicable, and cost-effective improvements to long-term mobility in the corridor must be implemented.

It is in this context that these key findings must be considered:

- Future traffic levels from projected growth in the 2025 No Build condition would result in demand that would exceed capacity throughout the corridor. Capacity constraints would cause lower speeds and substantially greater travel times than are currently experienced. Traffic congestion would spread over more hours in 2025, substantially expanding the peak travel periods that are observed today. Critical stretches of roadway in the corridor, such as the Tappan Zee Bridge, would experience a demand that is over capacity in each and every hour of the peak periods (both AM and PM).

  Commuters would find it increasingly difficult to adjust their schedules to avoid the growing congestion. With this deterioration of traffic conditions on the Thruway, commuters would divert to alternate routes or delay entry to the Thruway, remaining on local arterials longer than they do today. This level of prolonged congestion could impede the future economic and job growth that is projected to occur in the corridor. Additionally, there is no local alternative to the Tappan Zee Bridge to cross the Hudson River – it, in and of itself, is a local bottleneck.

- West-of-Hudson commuter rail service alone has limited ability to meet current and future needs for Manhattan-bound customers. Severe limitations such as capacity constraints at the Hoboken terminal, low track speeds, and numerous grade crossings hamper the ability of the Port Jervis and Pascack Valley Lines to accommodate future growth, improve current levels of service, and improve reliability on the west-of-Hudson lines. Buses, the only available cross-corridor mode of transit, traveling within the general purpose lanes, would be subject to greater delays associated with the increased roadway congestion and travel times that are less reliable than today.

- Mobility is measured not only by how many people can be moved on a transportation system, but also by how well. Predictable and regular travel times in 2025 would be even more important than they are today. Crashes, vehicular breakdowns, summer and holiday travel, and construction and maintenance activities affect the reliability of the corridor's transportation system. These delays routinely account for about 50 percent of all delay in the corridor.

Without alternative modes of transportation in the corridor, the increased capacity resulting from only the highway scenarios would eventually "fill up" with motorists. As a result, highway improvements alone would not provide significant travel time improvements, improve the reliability of the trip, or provide any excess capacity for much growth beyond 2025.

Transit alternatives, particularly those not subject to roadway congestion, would improve overall mobility in the corridor by providing a high-speed and reliable alternative to driving. Transit would significantly increase throughput capacity in the corridor, a primary measure of mobility. Transit alternatives would also accommodate future growth and reduce travel times for users of the new system. The capacity of a CRT system, for example, is approximately 30,000 people per hour per track per direction of travel. The person carrying capacity of a six-lane highway, built to the highest standards, would only be about 8,600 passengers per hour per direction, possibly up to 10,000 if one of the lanes were an HOV lane.


NYACK
HUDSON RIVER
TARRYTOWN
WHITE PLAINS
PORT CHESTER