3 Level 2 Screening Process – Scenarios and Criteria

In order to implement the Level 2 screening process, it was necessary to (1) develop the scenarios identified at the end of the Level 1 screening process in sufficient detail to permit the necessary transportation, engineering, environmental, and cost analyses associated with the Level 2 screening process and (2) develop a set of Level 2 evaluation criteria to compare the impacts of the scenarios against one another. This involved advancing conceptual designs for highway, bridge, and transit elements, developing conceptual level service plans for those scenarios with transit components, and extensive computer modeling to forecast travel demand. It is important to note that no single scenario presented here represents the "optimal" transportation solution for the corridor. Rather, the scenarios were defined in such a way as to present sufficient information for each of the technical disciplines to perform Level 2 screening and gain an understanding of the implications of a full range of corridor solutions.

Conceptual designs for the scenarios were accomplished based on design guidelines developed by the study team and NYSTA and Metro-North staff as a basis for defining possible river crossings, highway improvements, and transit alignments. These guidelines cover trackwork, structures, clearances, curvatures, stations, and storage and maintenance facilities. The alignments were designed to minimize costs and the need for property acquisition by staying within the right-of-way of existing transportation facilities wherever possible. Station locations for the transit options were chosen based on a set of siting criteria that included consideration of land availability, proximity to residential/commercial/retail centers, vehicular access, and spacing between stations, which varied depending on the transportation mode. These designs are described in detail in the following subchapters.

Conceptual level service plans for each of the scenarios containing transit were developed with the objectives of:

- Providing frequent, high-speed east-west service between Orange and Rockland Counties and Westchester County and Connecticut (in particular to/from White Plains, Greenwich, and Stamford).
- Providing frequent, high-speed direct service to Grand Central Terminal for west-of-Hudson travelers.
- Providing direct connections or convenient transfers, whenever possible, to all of Metro-North's five existing north-south lines, resulting in a transit grid in Rockland and Westchester Counties.
- Maximizing feeder bus and shuttle service connections with the new service to reduce travel times.

Line haul run times for each transit mode were calculated based on the track speeds, equipment acceleration/deceleration rates, grades, and number of assumed station stops.

For each of the scenarios, Subchapter 3.1 presents a detailed description of the transportation elements and the corresponding operating characteristics of the transportation modes included. Subchapter 3.2 contains a detailed description of the river crossing elements.

The conceptual designs, service plans and travel demand forecasts were used to evaluate each scenario based on the Level 2 screening criteria (Subchapter 3.3) that were developed with stakeholder input to reflect the goals and objectives established for the study. The criteria reflect four broad categories – transportation performance, engineering considerations, environmental conditions, and cost. It is important to note that the conceptual designs and service plans described here were later refined after the original scenarios were developed (see Chapters 5, 6, and 7).

3.1 Level 2 Scenarios – Highway and Transit Elements

This section provides a detailed description of the highway and transit elements of all scenarios.

3.1.1 No Build Scenario (H1)

The No Build scenario (Figure 3-1) was used as the basis of comparison against which all other scenarios were measured. The No Build scenario includes planned improvements in the corridor in the event that none of the elements of the build scenarios go forward. In addition, the No Build scenario includes regional transportation projects that would affect travel patterns in the corridor, regardless of whether any elements of the build scenarios go forward.

Projects included in the Transportation Improvement Program FFY 2004-2006, MTA Capital Program, and NYSTA projects likely to be built by 2025 are included in the No Build scenario. This scenario also includes changes to the railroad's operations plans, in particular, service enhancements that would be required to meet projected 2025 No Build demand levels. Projects that will be implemented by Westchester and Rockland Counties related to maintaining and enhancing the bus services that operate in the corridor are also included in the No Build scenario. Appendix B contains a list of projects that were included in the No Build analysis for the AA process. (That list will be updated for the DEIS.) NYSTA and Metro-North planned improvements that directly affect the corridor are described below.

3.1.1.1 NYS Thruway Planned Improvements

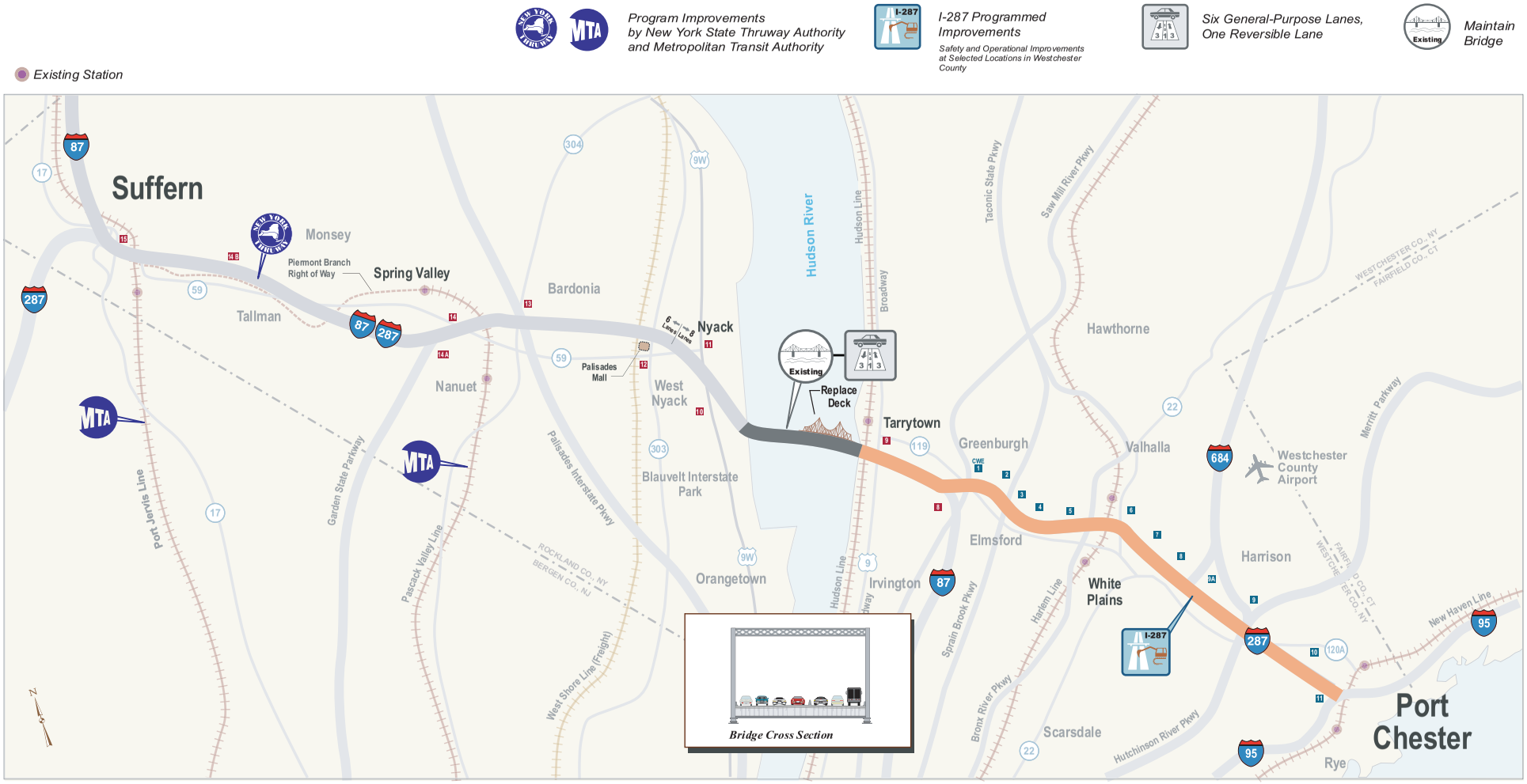
Tappan Zee Bridge Preservation

The No Build scenario would protect the bridge from unacceptable deterioration, extending its service life for another 50 years (see Subchapter 3.2 for more detail).

Roadway Improvements in Rockland

The No Build scenario would provide for the ongoing maintenance of I-287/I-87 in Rockland County to keep the existing infrastructure operational over the long term. The pavement section between the west end of the bridge and Interchange 14A would be reconstructed within the next 3 to 4 years. The segment of pavement between Interchange 14A and Suffern, which would be under going repairs in 2005, would also need to be rehabilitated in the next 10 years. Most of the section of I-287/I-87 north of the Tappan Zee Bridge has narrow shoulders; in order to reconstruct the pavement and maintain traffic flow along this segment, a supplementary lane would be added during construction. In addition, the following bridges along I-287/I-87 would be replaced and/or widened to keep the roadway in a state of good repair and operational:

- Route 59 (Main Street) overpass.
- Route 303 overpass.



Scenario H1 - No Build

Figure 3-1

- Conrail Railroad overpass.
- I-287/I-87 overpass of Hackensack River.
- I-287/I-87 overpass of Strawtown Road.
- Route 304 overpass.
- I-287/I-87 overpass of North Middletown Road.
- CSX Railroad overpass.
- I-287/I-87 overpass of Pascack Road/Pascack Creek.
- Garden State Parkway overpass.
- Scotland Hill Road overpass.
- I-287/I-87 overpass of Route 45.

Cross Westchester Expressway (I-287/I-87 Interchange and I-287 Corridor)

In April 1998, the FHWA issued a ROD for the I-287/CWE-New York State Thruway, which selected the Six-Lane Alternative for improvements in the I-287 Corridor between Route 303 in Rockland County and Route 120 in Westchester County. This project is providing for safety and traffic operational improvements to correct features causing higher-than-average accident rates while maintaining the same number of general purpose (GP) lanes and roadway capacity. The majority of the improvements are to be implemented on the I-287/CWE. HOV lanes were eliminated during the EIS process.

Subsequent to the ROD, the NYSTA and the NYSDOT conducted further studies in the corridor to determine whether additional operational and safety improvements warranted consideration. These studies culminated in a revised ROD, issued by the FHWA in March 2000, which provided for additional improvements for the section of the corridor between the Tappan Zee Bridge and the Saw Mill River Parkway, resulting in the recently completed reconstruction of Interchange 8. Figures 3-2 and 3-3 depict the operational and safety improvements approved by the FHWA. These improvements are being implemented in stages by NYSDOT, Region 8. The eastern-most 2 miles of I-287, from Route 120 (Exit 10) to I-95, is a six-lane divided highway that was rehabilitated in 1988. In the ROD for I-287 this portion of the expressway was found to be in excellent condition and no improvements were proposed.

I-95/New England Thruway

Improvements will be made to the I-287/I-95 interchange in Rye. The last mile of the New England Thruway will be reconstructed and the bridge over the Hutchinson River Parkway will be rehabilitated.

3.1.1.2 Metro-North Planned Improvements

2000-2004 Capital Improvement Projects

In 2003 the State of New York arranged for a long-term lease of the Port Jervis Line, which is currently owned by the Norfolk Southern Railroad. This allowed Metro-North to make much-needed improvements to the track and structures on the line, which will improve service. Concurrent with the opening of the Secaucus Junction Station for service in December 2003, which provides West-of-Hudson customers with a two-seat ride to New York's Penn Station, Metro-North began increasing train service on the Port Jervis and Pascack Valley Lines. Metro-North ridership on the Port Jervis Line has increased by nearly 120 percent since 1984 and by nearly 30 percent in the last five years. Traffic has also grown significantly on the Pascack Line – 26 percent between 2004 and 2005 – since the opening of the Secaucus Junction Station.

Metro-North improvements that will affect the corridor are located primarily in the west-of-Hudson service area and include:

- **Rolling Stock** – Metro-North is making a series of investments in its west-of-Hudson fleet that will accommodate projected ridership to 2025 and provide west-of-Hudson customers with an almost entirely new fleet.

- **Infrastructure and Capacity Improvements** – Metro-North will contribute to a series of capacity improvement projects on the Main, Bergen County, and Pascack Valley Lines. These include installation of a track connection at Waldwick Interlocking, installation of two additional track crossovers at Ridgewood Junction Interlocking that will facilitate parallel train moves, installation of a second track from Paterson Junction to Interlocking XW (a distance of 1.7 miles), and installation of positive train stop (PTS) and automatic train control (ATC) on the Main Line. Improvements to the Pascack Valley Line would include installation of passing sidings and PTS and ATC.

- **Station and Parking Improvements** – Since 1988 Metro-North has implemented parking improvement and expansion projects at almost every Metro-North-owned facility. Metro-North owns and/or controls only about 40 percent of the parking facilities at its New York State stations, but this share is increasing through their Systemwide Private Operator Program. Major parking projects completed or underway include the 350-space Port Chester Garage (a joint public/private initiative) and 2,735 new and/or improved parking spaces for west-of-Hudson service.

- **Customer Amenities** – Metro-North will enhance customer amenities at all stations on the Port Jervis and Pascack Valley Lines in New York State (except the newly constructed Middletown/Town of Walkill Station).

2005-2024 Twenty-Year Needs Assessment Projects

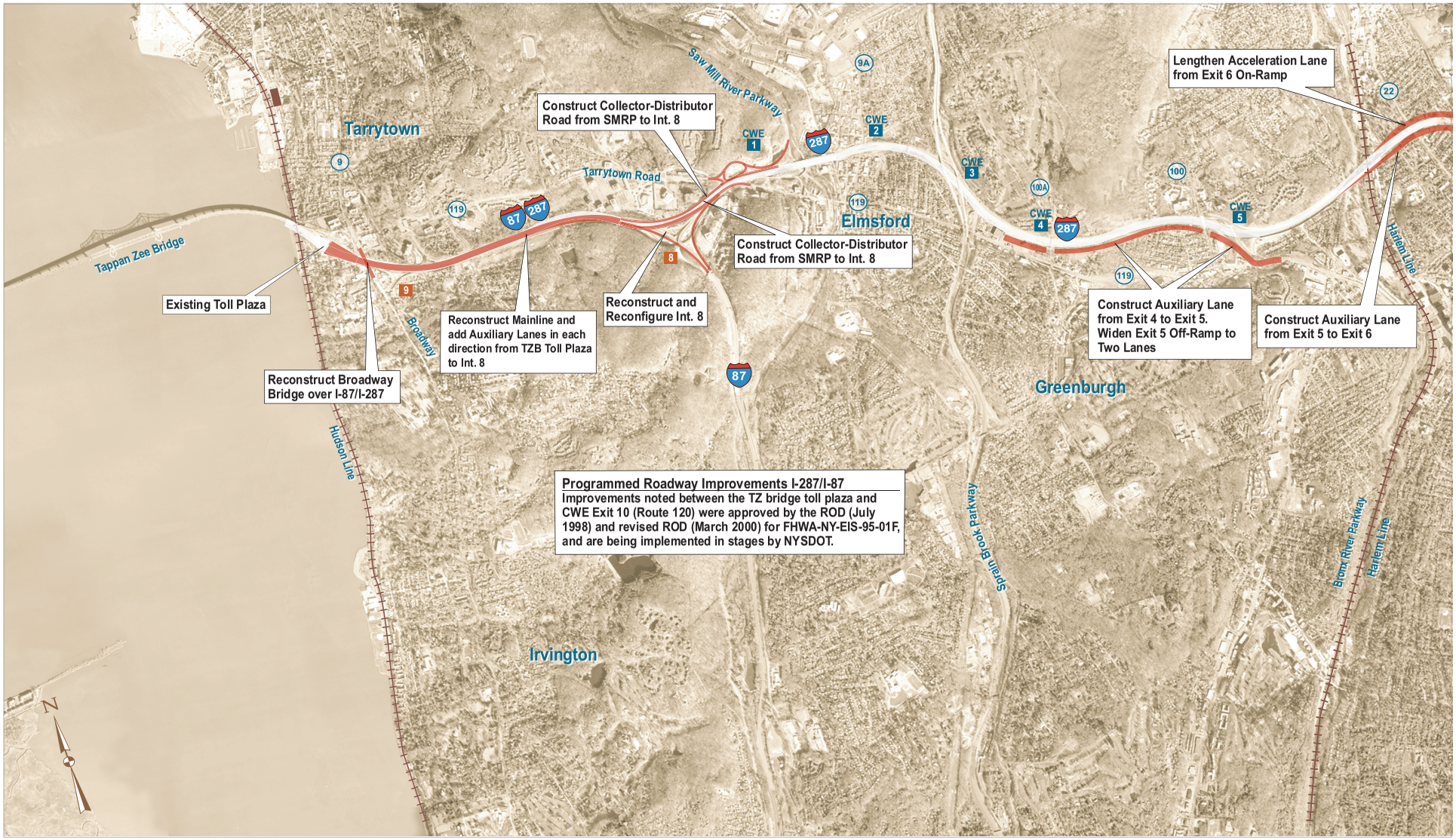
A number of longer-term improvements are planned by Metro-North Railroad for their west-of-Hudson system that would directly affect service in the study corridor. These include:

- **Port Jervis Line Acquisition** – recently acquired by Metro-North from Norfolk Southern on a long term lease (with an option to buy) and operated by NJTransit.

- **Rolling Stock** – Metro-North's seating standards will be maintained by providing additional trains to west-of-Hudson customers; a requirement for 8 locomotives and 37 coaches is projected.

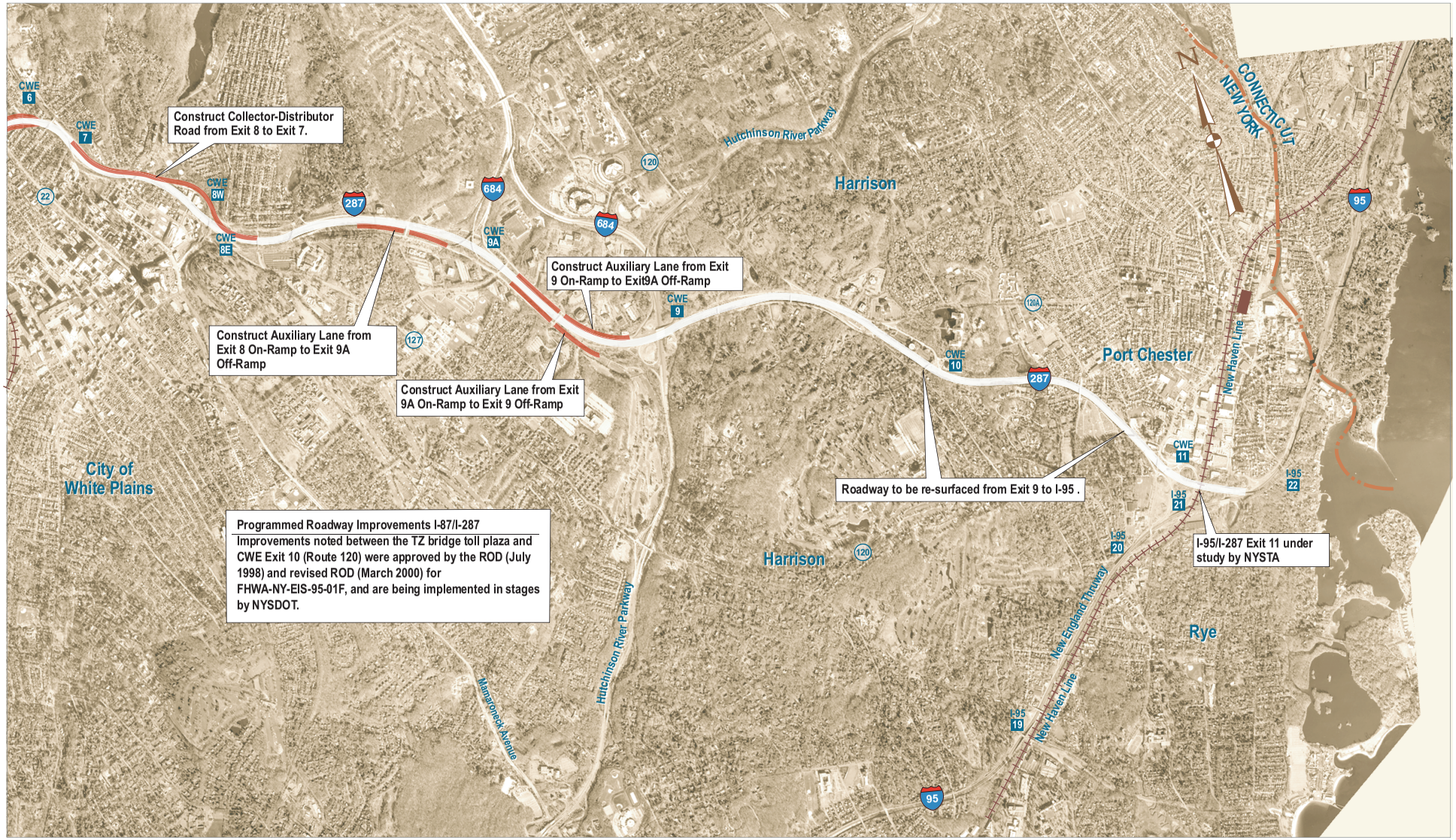
- **Storage and Maintenance Yard Expansion** – Metro-North will provide additional storage and a maintenance facility on the Port Jervis Line to accommodate the new rolling stock and the increase in service expected by 2025. However, the expanded fleet (an additional 30 coaches and 5 locomotives) on the Pascack Valley Line would require expansion of the Woodbine Yard, which is highly problematic.

- **Station and Parking Improvements** – Metro-North will continue implementing parking improvement and expansion projects. Due to land constraints on the Pascack Valley Line, parking garages will be considered.



Programmed Improvements - Westchester West

Figure 3-2



Programmed Improvements - Westchester East

Figure 3-3

- **Systemwide Improvements** – Metro-North plans to install new high-level platforms and canopies at all west-of-Hudson Line stations as part of a package to improve safety, customer service, and operations from Pearl River to Spring Valley on the Pascack Valley Line and from Sloatsburg to Port Jervis on the Port Jervis Line.

- **Track Improvements Program** – Metro-North's track standards will be met by replacing track and upgrading system components to reduce maintenance and to improve reliability and customer satisfaction. This cyclical project, which will improve the track to the limits specified by the Federal Railroad Administration (FRA), continues the rehabilitation program undertaken in the 2000-2004 and 2005-2009 Capital Programs.

Both Metro-North and NJTransit have identified the need for additional improvements on the Port Jervis and Pascack Valley Lines. These projects, which are in the early planning stage, include:

- The need to eliminate grade crossings on the Pascack Valley Line in New York and New Jersey to improve safety and traffic concerns related to the increased service frequency.

- Potential expansion of Hoboken Terminal and line capacity (including Bergen Tunnel) to handle the increased service.

West-of-Hudson 2025 Service Plan

Metro-North plans to increase service on the Pascack Valley and Port Jervis Lines to keep pace with projected ridership demand. Peak period service is expected to nearly double from the 6 trains operating today to 11 trains on the Port Jervis Line (i.e., to 15-minute headways during peak hours and 45-minute headways on the shoulders of the peak). On the Pascack Valley Line, service is expected to increase from the 7 trains operating today to 12 trains during the four-hour peak periods (i.e., 15-minute headways during peak hours and 45-minute headways on the shoulders of the peak).

3.1.2 Rehabilitate Tappan Zee Bridge with TDM/TSM Measures (H2)

The intent of this scenario is to test relatively low-cost transportation improvements in the corridor as a means to compare their benefits against the more capital-intensive scenarios. In this scenario, existing bridge elements would be upgraded to current applicable structural and safety codes and specifications to improve safety and enhance the bridge's service life for another 50 years (as described in Subchapter 3.2). The scenario would also include implementation of a series of TDM/TSM measures (Figure 3-4).

3.1.2.1 TDM/TSM Measures

The objective of TDM measures is to improve the flow and operations of vehicular traffic through any, or a combination of any, of the following means:

- Reducing the amount and frequency of travel.
- Shifting the time of travel.
- Reducing the use of single-occupant vehicle travel.
- Increasing the use of alternative modes such as walking/cycling, carpools, vanpools or transit.

TSM measures focus on optimizing operations of the transportation system. Many TSM measures involve implementation of intelligent transportation systems (ITS), which is, simply put, the application of technology (computers, software, communications, and sensor technology) to surface transportation. ITS includes a variety of measures, some pertaining to "intelligent vehicles" and others to "intelligent infrastructure."

The TDM/TSM programs that already exist in the corridor served as the baseline for the definition of additional TDM/TSM measures to be considered. Existing programs include:

- **MetroPool**, a state-funded program to improve commute quality by promoting alternatives to driving alone.

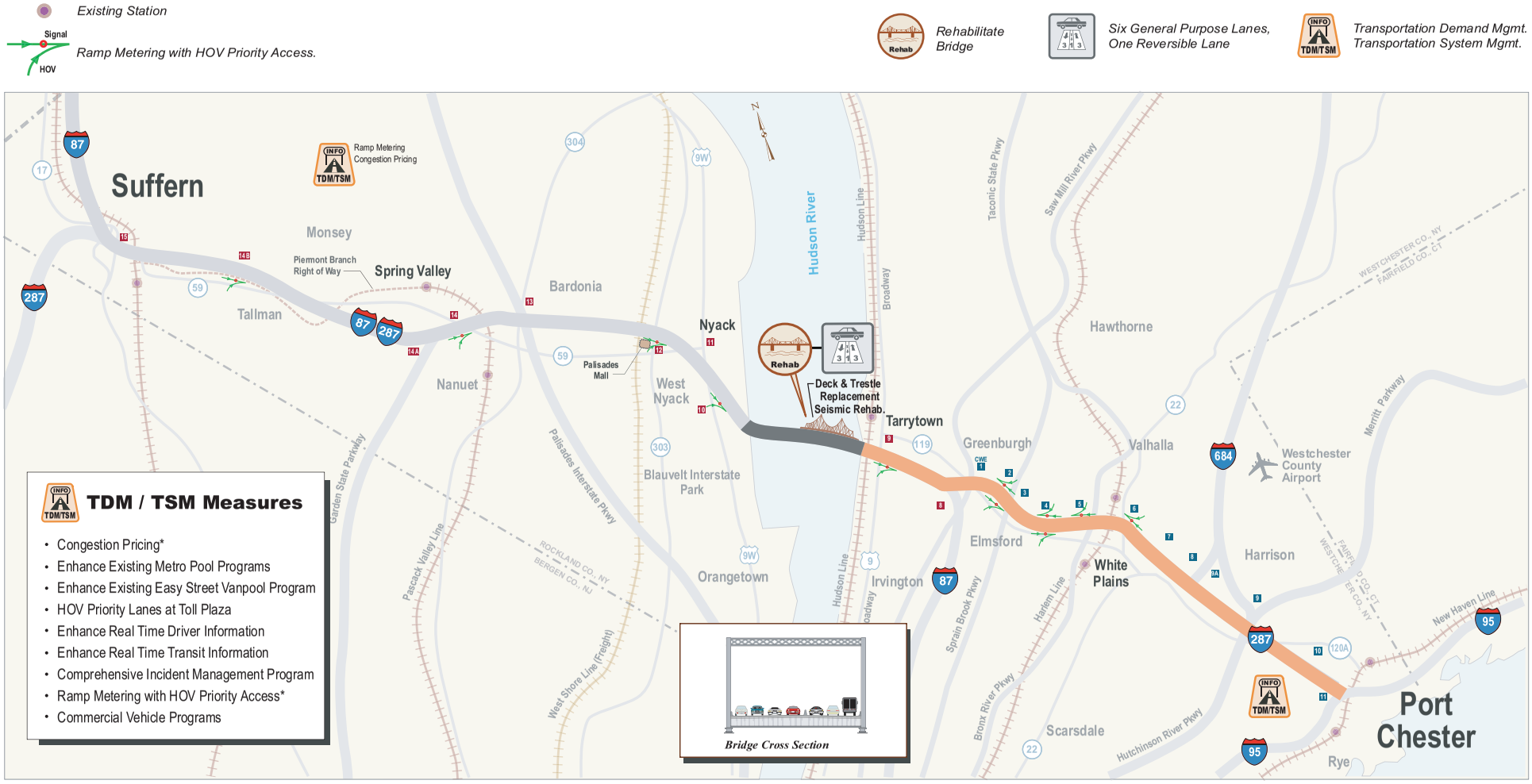
- **Easy Street NY,** a vanpool program (coordinated by MetroPool) that began in late October 2002.

- **ITS elements,** including TV cameras (closed circuit) on the Tappan Zee Bridge and on the Westchester side of the bridge; signs informing drivers to tune their radios to a highway advisory radio (HAR) that disseminates current traffic information; variable message signs (VMS) between Suffern and the bridge to notify drivers of incidents, construction, or weather concerns; Transcom System for Managing Incidents and Traffic (TRANSMIT) monitors, recording the speeds of E-ZPass users and transmitting the information to monitors in the toll plaza offices; and the Roadway Weather Information System (RWIS) on the bridge.

The most promising individual measures that passed the Level 1 screening were packaged together into a comprehensive TDM/TSM program for analysis in Level 2 screening. New and enhanced TDM/TSM measures under this scenario would include:

- **Congestion Pricing at Toll Plaza** – Congestion pricing is a means of encouraging travel on toll facilities during off-peak hours by implementing a toll structure of higher rates during peak hours compared to off-peak hours. Currently, commuters enrolled in the E-ZPass program pay a $3.60 toll, rather than the $4 cash toll, at any time of the day. Frequent commuters benefit from a discount, paying only $40 for 20 trips in the E-ZPass lane, and $10 for 20 trips in the cash lanes in three-occupant vehicles. This is significantly lower than the $6 cash toll and $5 E-ZPass toll on the George Washington Bridge and Lincoln Tunnel in peak periods (E-ZPass users pay a $4 toll on the George Washington Bridge and Lincoln Tunnel off peak). Under this scenario, tolls on the Tappan Zee Bridge would be increased to match the George Washington Bridge pricing scheme.

  Trucks on the Tappan Zee Bridge currently pay a premium to cross the bridge during peak hours, as do trucks westbound at the Spring Valley tolls. These peak hour premiums do divert truck traffic from peak to off-peak.



* Applicable to selected scenarios only.
All other measures applicable to all scenarios except H1.

Scenario H2 - Rehabilitate Tappan Zee Bridge with TDM/TSM Measures

Figure 3-4

- **Enhancement of Existing Metro Pool Programs** – Funding to the MetroPool programs would be increased to develop an education and promotion program specific to the corridor and its users, increase employer participation in the voluntary Employer Trip Reduction (ETR) MetroPool programs through more extensive corridor outreach activities, and develop a car-sharing program administered as part of the suite of MetroPool programs currently available.

- **Enhancement of Existing Easy Street Vanpool Program** – The Easy Street program is in its early stages. Increasing the pace and scale of its implementation by increasing its current funding levels would permit the purchase of more vans and expansion of its services in the corridor.

- **HOV Priority Lanes at Toll Plaza** – Priority lanes for high occupancy vehicles could be developed at the toll plaza to give those vehicles a travel time advantage and increase their travel time reliability. Currently, HOVs must use a cash lane to verify their occupancy.

- **Expanded Real-Time Driver Information** – A series of measures would be implemented to provide "real-time" information to users to enable them to optimize their travel choices. Signing and broadcast points would be added, designed to enhance the ability of drivers to seek alternatives when such alternatives are still possible. Warnings north of Suffern on I-87 would divert travel to NJ 17 or I-287 south, for example. Increased publicity and access to Internet kiosks at park-and-ride locations and intermodal centers would also be provided.

  The program designed to identify incidents and enhance emergency response via speed data gathering would be enhanced by increasing the number of transmitter locations and/or enhancing the monitoring facility. Commuters would be notified via e-mail of traffic conditions on their route before they get into their cars, or notified in the car, via consoles of incidents, of alternative routes and real-time traffic information.

- **Enhancement of Real-Time Transit Information** – The success of bus-to-train operations is based on the ability of the rider to connect conveniently between modes, without lengthy waits and missed connections. Providing the operator of the bus or train with better information on the schedule reliability of the other mode could significantly enhance this convenience, so that schedule adjustments could be made as necessary. There is also an advantage to keeping the rider informed; less uncertainty leads to increased customer satisfaction.

  Train operation technology would be used to notify bus operators of train delays via an electronic transmission of train arrival data to the stations in advance. When this information is communicated to the bus operator, either through an electronic sign or a voice communication, the bus would be held to await the delayed train so that train riders would not miss their connection. An electronic sign would be used to notify the traveler

of the arrival of the next train, which would facilitate the boarding process. Buses would be equipped with global positioning system (GPS) transponders so that their locations could also be monitored. Under this measure, bus arrival times would be transmitted to electronic signs at bus stops or intermodal centers, informing passengers of the expected arrival time of the next bus. This information could also be available on the Internet.

- **Comprehensive Incident Management Program** – Incident management programs respond to incidents on the roadway with immediate assistance. Electronic monitoring detects a change in travel speeds or the location of a stoppage so that tow trucks, emergency vehicles, and police can immediately be directed to the location to clear the incident and restore the normal flow of travel. The lack of shoulders on the Tappan Zee Bridge intensifies problems on the bridge, reducing reliability of travel in the corridor. Incident management today consists of monitoring of the TRANSMIT sensors and TV monitors and responding to incidents when they occur. Implementing a comprehensive incident management program would expand current efforts and monitor, evaluate, and decrease response times for optimum safety and performance.

- **Ramp Metering** – Ramp metering became popular in the 1960s and has been successfully implemented in several North American cities. With ramp metering, traffic signals would be installed at the entrance to the I-287/I-87 ramp. Signal timing would be designed to allow one vehicle at a time to proceed down the ramp to merge with traffic on the mainline, with the rate determined by the level of congestion on the roadway. Spacing the entering vehicles would smooth the flow on I-287/I-87 and prevent a decline in level-of-service. Real-time traffic sensors would monitor the situation and automatically adjust signal cycles to avoid a bottleneck at the ramp entrance/terminal. Priority lanes would be developed at key entrance ramps via roadway widening to allow HOVs to bypass queues. Ramp metering and priority lanes would be provided at the following I-287/I-87 interchanges:

  - Interchange 14B eastbound (Airmont Road).
  - Interchange 14 eastbound (Route 59).
  - Interchange 12 eastbound (Route 303).
  - Interchange 10 eastbound (Route 9W).
  - Interchange 9 eastbound (Route 9).
  - Exit 2 eastbound and westbound (Saw Mill River Road).
  - Exit 4 eastbound and westbound (Knollwood Road).
  - Exit 5 westbound (Hillside Avenue).
  - Exit 6 westbound (Route 22/Broadway).

Ramp Metering

- **Commercial Vehicle Programs** – The only real alternative route to the Tappan Zee Bridge for trucks is the I-84 corridor from Pennsylvania across New York to Connecticut. The I-95 corridor, across the George Washington Bridge and Cross Bronx Expressway, is much more congested. By adjusting tolls and providing promotional materials, trucks would be encouraged to use the I-84 corridor rather than the Tappan Zee Bridge/I-287 Corridor. The resulting loss of revenue to the Thruway would be offset by reduced congestion and increased capacity for automobiles and decreased wear and tear on the Thruway.

- **Dedicated E-ZPass Approach Lane** – This measure was recommended by Rockland County as a means to reduce toll plaza delays and reward E-ZPass users. The dedicated lane would extend for the length of the bridge.

- **Expanded Marketing of E-ZPass to Weekend Travelers** – This measure, also recommended by Rockland County, would target weekend travelers at Thruway rest stops to encourage them to use E-ZPAss. Use of E-ZPass on the weekends is considerably lower than on weekdays, which contributes to delays experienced on Sunday evenings, particularly during the nice weather.

With the exception of ramp metering and congestion pricing, these TDM/TSM measures were included as part of each of the scenarios described below. Ramp metering and congestion pricing were tested with selected scenarios.

3.1.3 Highway Improvements (H3)

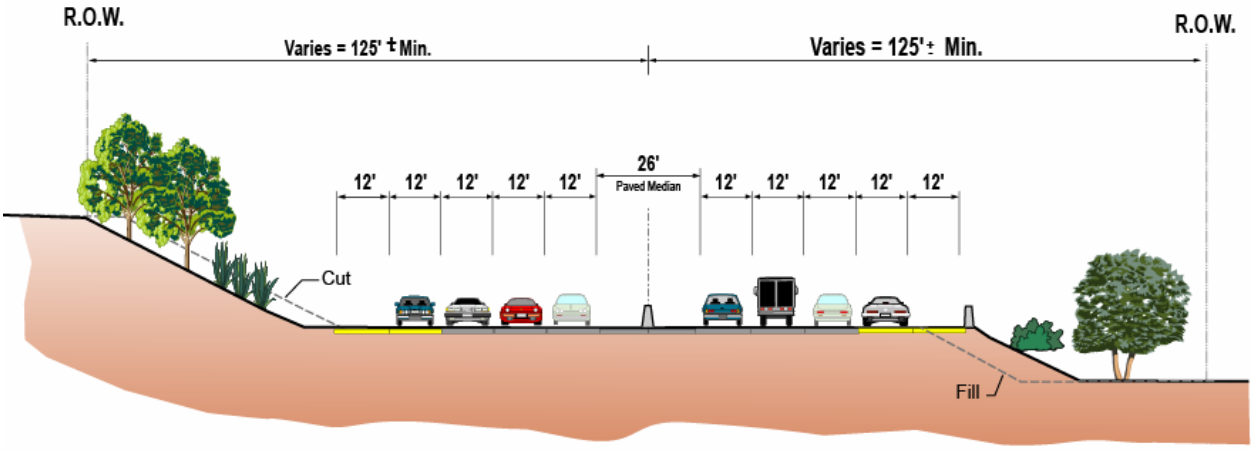
The intent of this scenario was to test a replacement bridge (described in Subchapter 3.2) and a series of highway improvements in Rockland County that were not included in the No Build scenario against the goals and objectives established for the study. The highway improvements were designed to improve traffic flow and safety in the corridor. Rockland and Orange Counties are two of the fastest growing counties in the region; vehicle miles traveled (VMT) in Rockland County is expected to increase by more than 25 percent in 2025 as compared to today. Roadway improvements in Westchester beyond those described for the No Build scenario (the I-287/CWE programmed improvements) were not developed for this or any other scenario. Figure 3-5 contains sample cross-sections of Scenario H3. Figure 3-6 is a schematic of Scenario H3.

3.1.3.1 Rockland County Roadway Improvements

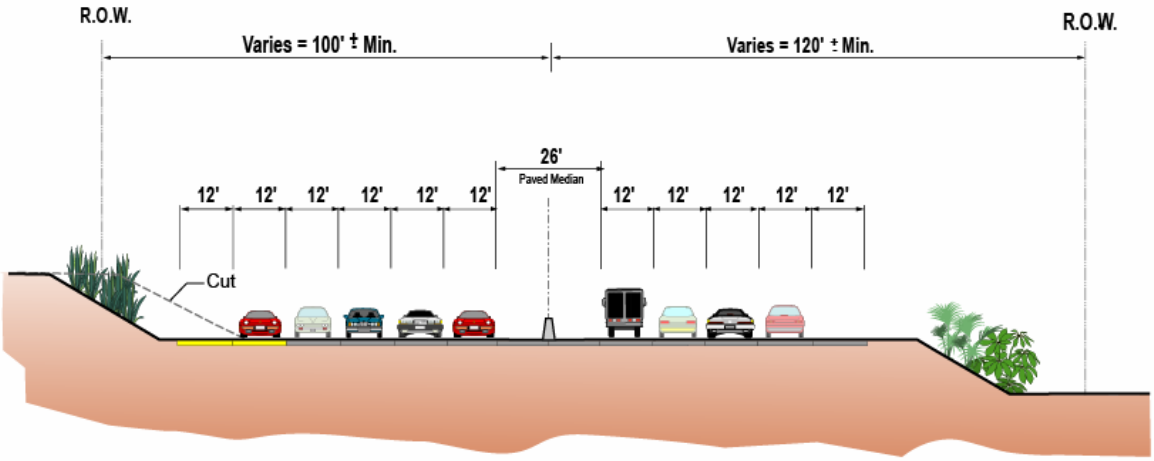
In general, the roadway improvements would include roadway widening to provide additional lanes, reconstructing the roadway pavement and drainage system, and improving the roadway geometrics to current standards. The proposed roadway improvements would be designed in accordance with latest NYSTA design criteria. A direct impact of the widening would be the need to modify interchange ramps and lengthen or widen each of the I-87/I-287 bridges in the Rockland corridor. Elements of H3 include:

- **Roadway Widening** – The existing 12-mile, six-lane section between Interchange 15 in Suffern and Interchange 11 in Nyack would be widened to eight lanes by adding a general-purpose lane in each direction. Westbound, the widening would begin just west of Interchange 11 where the existing fourth lane is dropped and would continue to Interchange 15, where a major fork would provide three lanes northbound onto I-87 and two lanes westbound onto I-287. Eastbound, the five lanes that currently taper to three

Rockland



Additional general purpose lanes (shown in yellow)
Interchange 15 to Interchange 11
(Looking East)



Additional general purpose lanes (shown in yellow)
with westbound climbing auxilarly lane
Interchange 11 to Tappan Zee Bridge
(Looking East)

Rockland - Typical Highway Sections

Figure 3-5

Scenario H3 - Highway Improvements

Figure 3-6

lanes east of the I-87/I-287 merge at Suffern would only drop one lane and continue as a four-lane section to Interchange 11.

The proposed widening would create lane balance and continuity within the corridor by providing four lanes in each direction from Interchange 15 in Suffern to the I-287/I-87 split at Interchange 8 in Westchester. It would also eliminate the "lane drop" in the westbound direction that creates a traffic-slowing "bottleneck" at Interchange 11 during peak hours.

- **Westbound Climbing Lane** – Supplementing the eight-lane section, a westbound climbing lane is proposed from the Tappan Zee Bridge to Interchange 14A (Garden State Parkway). The climbing lane would begin at the west approach of the Tappan Zee Bridge as the four lanes coming off the new bridge widen to five lanes. The climbing lane would continue for 7 miles through Interchanges 10, 11, 12, 13, and 14 as the right lane of a five-lane westbound section of I-287. The climbing lane would end at Interchange 14A. While it would not be continuously uphill, it would be a continuous lane for slow moving vehicles. Each of the proposed climbing lane segments will be analyzed to determine if it would be justified based on criterion established by AASHTO in their publication *A Policy on Geometric Design of Highways and Streets* (2004). There have been suggestions from community representatives to extend the lane an additional 1.8 miles to the Spring Valley truck toll barrier. This proposal has potential merit and would be considered in the DEIS.

- **Roadway Reconstruction** – The Thruway pavement, median, and drainage features would be reconstructed for the full 13.6-mile length of the Rockland corridor. The improvements would include reconstruction of 19 bridges over the Thruway and 13 Thruway bridges over crossroads or watercourses. The reconstructed Thruway would incorporate design criteria that meet or exceed the minimum standard requirements of the NYSTA, thereby eliminating or correcting non-standard features in the roadway that were identified during the study. These improvements include:

  - Providing standard 12-foot inside and outside shoulder widths throughout the entire length of the corridor.
  - Providing superelevation on each of the horizontal curves between Interchange 11 and Interchange 15.
  - Providing standard underclearance for all bridges over the Thruway.

- **Roadway Profile Modifications** – Meeting the minimum NYSTA underclearance requirement of 16 feet (16 feet 6 inches where feasible) for all bridges over the Thruway would raise the profile of the crossing roads by as much as 2 feet, and more for those bridges where the under clearance has been measured to be less than the previous minimum of 14 feet 6 inches. It would provide a uniform height limit for vehicles on the Thruway. If the additional vertical clearance were to be achieved solely by raising the bridges, considerable profile modifications to the crossroads would be required, which could result in significant impacts to ramp connections and adjacent roadways and driveways. As an alternative solution to minimize these potential impacts, the Thruway profile could be lowered.

- **Improvements and Modifications to Rockland Interchanges** – A direct result of the roadway widening is the need to modify interchange ramps to meet the new I-287 cross

section and the NYSTA design criteria. Each interchange would have modifications to their entrance and exit ramp radii and acceleration and deceleration lane lengths. Modifications would improve exit/entrance speeds and would mitigate issues with merging traffic flows.

- **Widening through the Spring Valley Toll Barrier** – In order to widen the westbound roadway to four lanes and to maintain the existing roadway alignment through the truck toll barrier in Spring Valley, the toll plaza area would be reduced by removing one of the six toll booths and relocating the concrete barrier that separates the plaza from through traffic.

- **Transition to Replacement Bridge** – The I-287 mainline profile in Rockland approaches the river on a steep downgrade and levels off before the shoreline. The alignment meets the shoreline on a tangent facing southeast and then curves to the east on the causeway of the bridge. The proposed replacement bridge alignment is north of the existing bridge and would require realigning the roadway from a point south of the Broadway (Route 9W) bridge to meet the bridge touchdown. The proposed reconstructed roadway cross section with eight lanes and 12-foot shoulders would transition directly to the bridge approach cross section.

3.1.3.2 Westchester County - New Toll Plaza

The replacement bridge would include a reconstructed and reconfigured toll plaza. Some of the features and functional requirements and impacts associated with its configuration include the following:

- The toll collection would be in the eastbound direction and located approximately at the same location in Tarrytown.

- The toll barrier would be configured and designed for highway-speed (open-tolling) EZ Pass and traditional cash paying technologies.

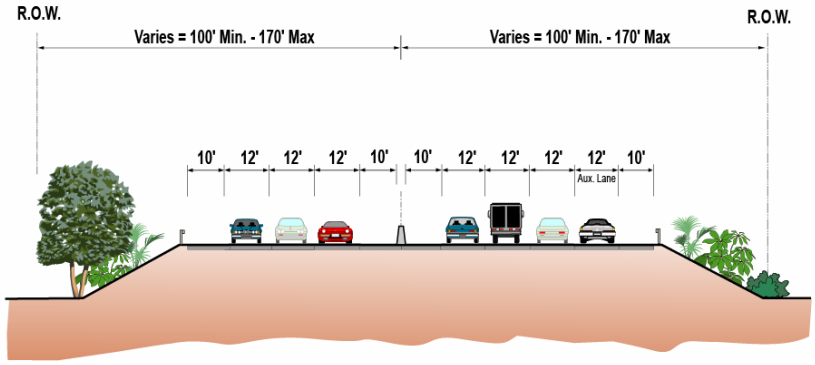
- The combined need for adequate queuing length at the approach and the length necessary for cash paying vehicles departing from the plaza to merge safely with the faster moving EZ Pass traffic would increase the effective length of the plaza to more than 5,000 feet. This extended plaza footprint would necessitate lengthening the Broadway (Route 9) bridge and modifying the Interchange 9 off-ramp.

- Ancillary space adjacent to the plaza would contain upgraded operating and maintenance facilities.

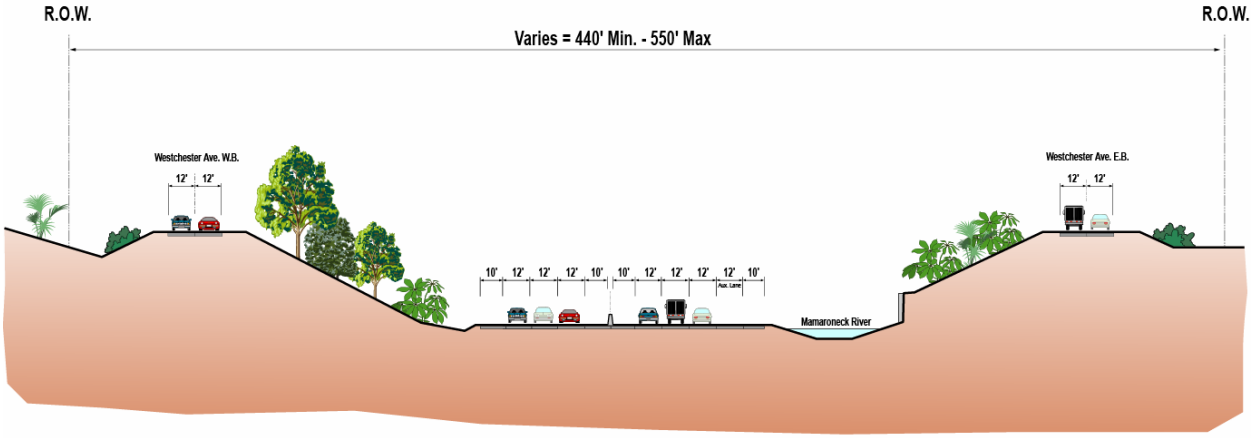
3.1.3.3 Programmed Roadway Improvements in Westchester County

No roadway improvements were identified in Westchester County during this study. Because a Record of Decision (ROD) had already been filed for programmed improvements, the segments with programmed improvements (see Figures 3-2 and 3-3) have been incorporated into the baseline conditions for traffic simulation modeling. Figure 3-7 contains sample cross-sections.

Westchester



Programmed Improvement - Eastbound Auxiliary Lane
Exit 4 to Exit 6
(Looking East)



Programmed Improvement - Eastbound Auxiliary Lane
Exit 8E to Exit 9
(Looking East)

Westchester - Typical Highway Sections

Figure 3-7