8 Development of DEIS Alternatives

The objective of the Level 2 screening process was to test a variety of scenario elements to inform the decision-making process and develop the alternatives to be advanced for detailed evaluation in the draft environmental impact statement (DEIS). The DEIS alternatives were devised from the many concepts contained within the scenarios and the results of the screening process that led to new design concepts. A full description of the rationale for decision making is presented below for each category of improvement – No Build, TDM/TSM, highway, transit, and river crossing.

The process resulted in the development of DEIS alternatives, which involved capturing the most effective elements found in each scenario. The different modal and physical alignment combinations that emerged to "optimize" each scenario and form the DEIS alternatives are also described. The final subchapter presents a discussion on potential phasing strategies for the identified alternatives.

Key findings that emerged from the screening process include:

- The "solution" must include a set of programs and strategies to improve mobility in the corridor, reduce demand on the highway system, add capacity to the transit system, promote more efficient operations of roads and transit, manage demand, provide flexibility to address changing transportation needs, and deal with crises.

- None of the transit modes alone would provide effective relief for I-87/I-287 congestion. The most significant traffic flow improvements in Rockland County would be realized from the added capacity of a new river crossing, the climbing lanes (most effective in addressing westbound congestion), and the HOT lanes (most effective in addressing eastbound congestion).

- Transit, in a dedicated right-of-way, would significantly improve mobility in the corridor for users of the new system. Transit would offer travelers the choice to opt for fast and efficient transportation as an alternative to driving in heavy traffic. Due to its proximity to Manhattan, growth in the I-287 Corridor will occur with or without an investment in transportation. An effective transit system would provide for smart growth opportunities and promote quality of life in the region.

- While the intra-county and cross-corridor trips would be well served by CRT, LRT, or BRT, the only way to effectively capture the Manhattan-bound market from Orange and Rockland Counties is via CRT. The Manhattan-bound CRT service would enhance the cost-effectiveness of the cross-corridor link and help divert auto trips from the Tappan Zee Bridge as well as the George Washington Bridge and Lincoln Tunnel.

- For BRT, the benefits of providing exclusive bus lanes in Westchester County and a good connection to the Tarrytown Station outweigh their additional costs (i.e., BRT2 outperformed BRT1).

- Duplication of fixed rail service in Rockland County and across the Tappan Zee Bridge is inefficient (i.e., the multi-modal alternatives that carry both CRT and LRT across the bridge would not be cost-effective).

The discussion below identifies the modes, river crossings, and alignments that were eliminated from further consideration, highlights the differences between the choices, and presents the overall rationale for decision making.

8.1 Alternative 1 – No Build

As per NEPA and SEQRA requirements, a No Build alternative will be analyzed in the DEIS. The potential impacts of this alternative were identified in the No Build Scenario (H1) studied in the AA analysis, which was created to establish the baseline against which to measure the impacts of the other scenarios. The No Build scenario would not likely meet the goals and objectives established for the study; one of the key findings of the AA analysis was that both highway and transit improvements were necessary to improve mobility in the corridor.

The key components of the No Build alternative (Figure 8-1) include:

- **Maintenance of the bridge structure and highway** to avoid unacceptable levels of deterioration that would lead to operational and safety deficiencies.
- **Projects in the Transportation Improvement Program** (FY 2004-2006), including programmed highway improvements in Westchester County.

Each of the build alternatives would also contain these improvements, except for the maintenance of the bridge structure under the rehabilitation and replacement.

The capital cost of Alternative 1 is estimated at $0.5-0.7 billion (2004 dollars).

It should be noted that all costs are in 2004 dollars, are preliminary in nature based on conceptual layouts, do not include all cost elements, and are presented only to allow comparisons between various alternatives.

8.2 Alternative 2 - Bridge Rehabilitation with TDM/TSM Measures

This alternative will serve as the FTA baseline alternative for Section 5309 (New Starts) reporting requirements. Rehabilitation of the Tappan Zee Bridge was studied under the H2, M4, and M6 scenarios. The bridge would be retained and structurally rehabilitated to provide an additional 50 to 100 years of reliable service. The rehabilitation would include the retrofit measures necessary to bring the bridge into compliance with the current seismic criteria, as befits a lifeline structure.

TDM/TSM measures were studied in Scenario H2. However, it was concluded that the combination of TDM/TSM measures, ramp metering, and congestion pricing would not be effective in meeting corridor needs as a stand alone option, but together with major capital investments would offer benefits worthy of further consideration. These relatively low-cost strategies will be advanced as part of a package of improvements in all of the DEIS build alternatives.

The key components of Alternative 2 (Figure 8-2) include:

Alternative 1

No Build

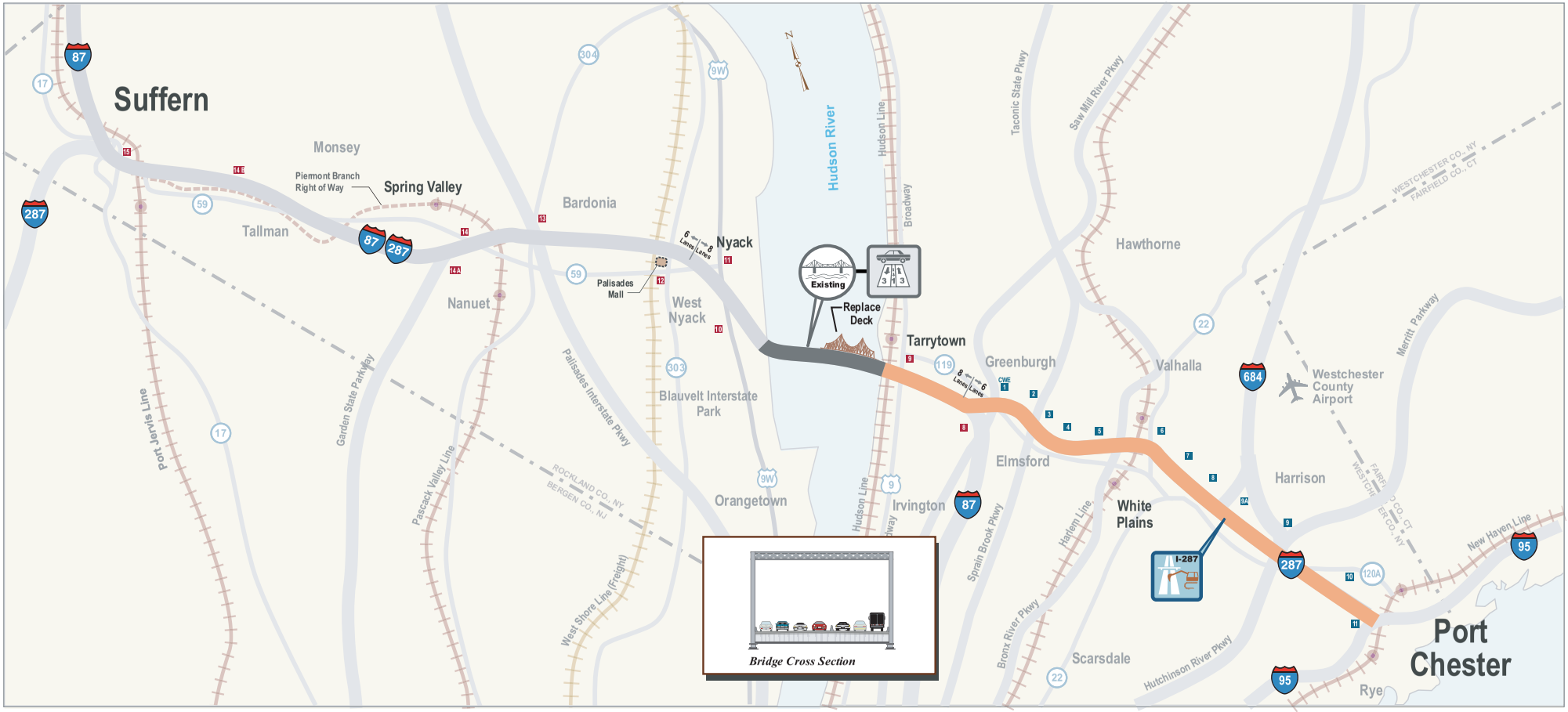
I-287 Programmed Improvements

Safety and Operational Improvements at Selected Locations in Westchester County

Six General-Purpose Lanes, One Reversible Lane

Maintain Bridge

Existing Station



Alternative 1 - No Build

Figure 8-1

Alternative 2

Rehabilitate Tappan Zee Bridge with TDM/TSM Measures

Existing Station

Ramp Metering with HOV Priority Access.

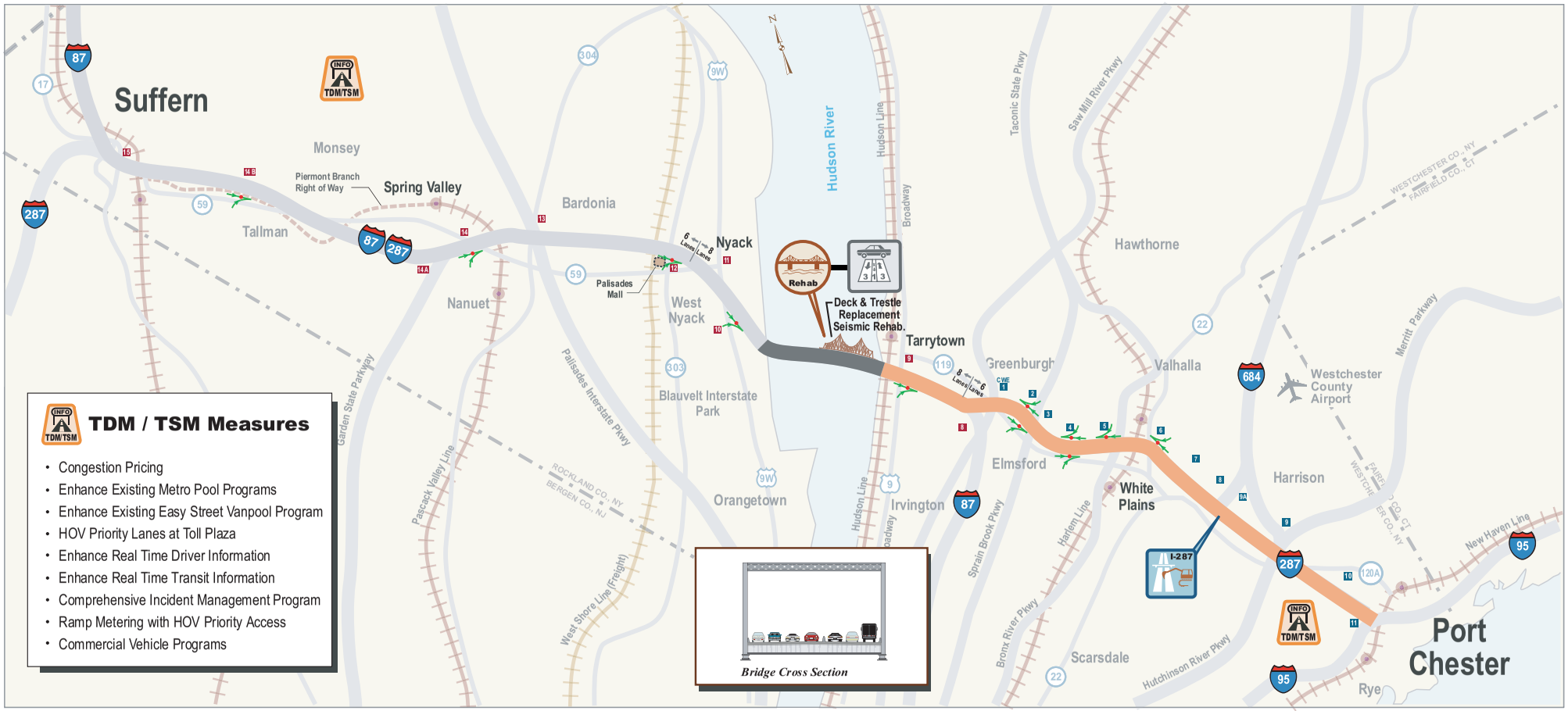
Rehabilitate Bridge

I-287 Programmed Improvements

Safety and Operational Improvements at Selected Locations in Westchester County

Six General Purpose Lanes, One Reversible Lane

Transportation Demand Mgmt. Transportation System Mgmt.



Alternative 2 - Bridge Rehabilitation with TDM/TSM Measures

Figure 8-2

- **Projects in the TIP** (FY 2004-2006).
- **Highway/Bridge** – Rehabilitation of the highway and seismic retrofit of the bridge.
- **Transit** – Proposed transit improvements in the 20-year Metro-North and NJTransit capital needs assessment for west of Hudson.
- **TDM/TSM Measures** – Including I-287 Park & Ride facilities, three-lane highway speed toll plaza, expanded weekend E-ZPass program, ramp metering, congestion pricing, and others.

The capital cost of Alternative 2 is estimated at $2.0-2.5 billion (2004 dollars).

8.3 Build Alternative 3 – Full-Corridor Bus Rapid Transit

The key components of Alternative 3 (Figure 8-3) are:

- **Highway** – Six general-purpose lanes, two BRT/HOT lanes, westbound climbing lane from a replacement Tappan Zee Bridge to Interchange 14A, and new eastbound climbing lane from Interchange 12 to 11 (which connects to the existing eastbound fourth lane) in Rockland County.
- **Transit** – BRT from Suffern to Port Chester with transfer to Tarrytown. Buses would use HOT lanes in Rockland County, a barrier-separated facility (exclusive busway) in portions of Westchester County (alongside I-87/I-287) and exclusive bus lanes on Route 119 in Tarrytown and White Plains. There would be bus entry ramps to the HOT lanes in this alternative, but not in Alternatives 4A, 4B, and 4C. It should be noted that bus origins/destinations include locations both west of Suffern and east of Port Chester. Service connections would be possible to the Port Jervis, Pascack Valley, Harlem, and New Haven Lines. BRT would provide service between Orange and Rockland Counties and employment centers in Westchester County and Connecticut, as well as inter-county trips.
- **TDM/TSM Measures** – Same as Alternative 2**.**
- **River Crossing** – New bridge with two HOT lanes and eight general-purpose lanes. The bridge would also potentially include amenities such as a full-length pedestrian/bicycle path linking Rockland and Westchester, belvederes (periodic widenings) for viewing and respite along the pathway, and designated recreation areas.

The capital cost of Alternative 3 is estimated at $5-6.5 billion (2004 dollars).

8.4 Build Alternative 4A – Full-Corridor Commuter Rail Transit

The key components of Alternative 4A (Figure 8-4) are:

- **Highway** – Same as Alternative 3.

- **Transit** – CRT from the Port Jervis Line at Suffern to Port Chester with a direct connection to the Hudson Line in Tarrytown for a one-seat ride to Manhattan. There would be a new Tappan Zee Station below and just to the north of the existing toll plaza for both Manhattan and I-287 commuter rail services. Connections would be possible to the Port Jervis (direct), Pascack Valley (transfer), Harlem (transfer at White Plains), and New Haven Lines (direct).

  This would provide increased transfer mobility within Westchester County and between Westchester and Connecticut, as well as increased access to Metro-North lines serving Manhattan. It would offer Orange and Rockland County riders a one-seat ride to employment centers in Westchester and Connecticut as well as Manhattan.

- **TDM/TSM Measures** – Same as Alternative 2.

- **River Crossing** – New bridge with two HOT lanes, eight general-purpose lanes, and two rail tracks. The bridge would also potentially include amenities such as a full-length pedestrian/bicycle path linking Rockland and Westchester, belvederes (periodic widenings) for viewing and respite along the pathway, and designated recreation areas.

The capital cost of Alternative 4A is estimated at $11.5-14.5 billion (2004 dollars).

8.5 Build Alternative 4B – Manhattan-Bound CRT with LRT in Westchester

The key components of Alternative 4B (Figure 8-5) are:

- **Highway** – Same as Alternative 3.

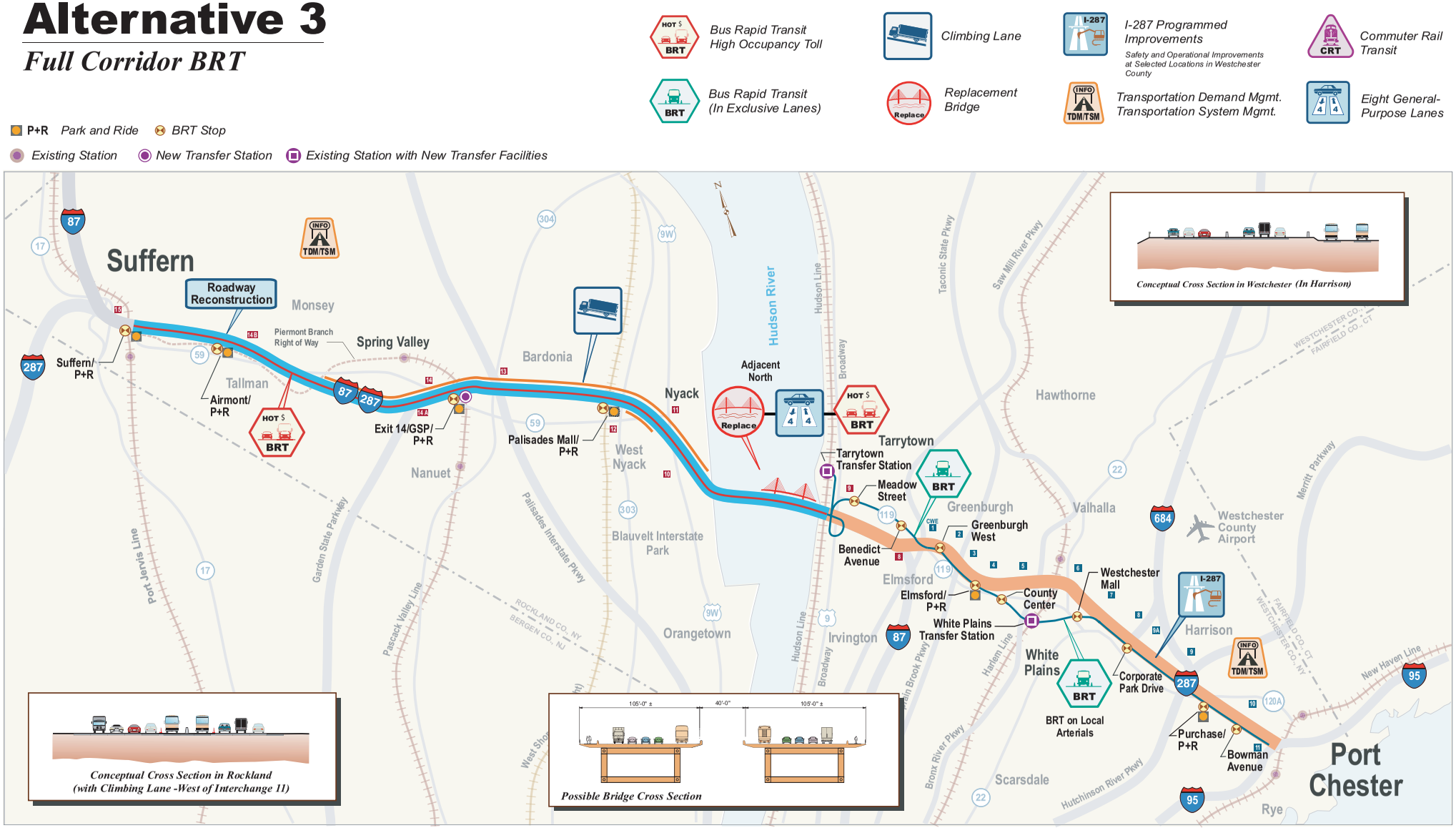
- **Transit** – CRT from the Port Jervis Line at Suffern to the Hudson Line in Tarrytown and LRT from the existing Hudson Line Tarrytown Station to Port Chester. Manhattan-bound CRT would connect to the Hudson Line as in Alternative 4A. There would be a new transfer facility (Tappan Zee Station) for transfer to LRT service near the existing bridge toll plaza.

  The LRT service would start at Tarrytown (allowing transfer to/from the existing Hudson Line) and follow a hybrid high-speed/in-street LRT alignment. The in-street alignment would be used on Route 119 and through White Plains. The high-speed alignment along I-287 would be used in a portion of Greenburgh and for the connection to Port Chester Station (i.e., avoiding use of Route 119 in Elmsford and Route 120A in Port Chester). Future commuter rail service across the I-287 corridor would not be precluded. Service connections would be possible to the Port Jervis, Pascack Valley, Hudson, Harlem, and New Haven Lines.

  This alternative would offer Orange and Rockland County riders a one-seat ride to Manhattan and a transfer to LRT serving employment centers in Westchester and Connecticut. It would provide increased mobility within Westchester County and

Alternative 3

Full Corridor BRT

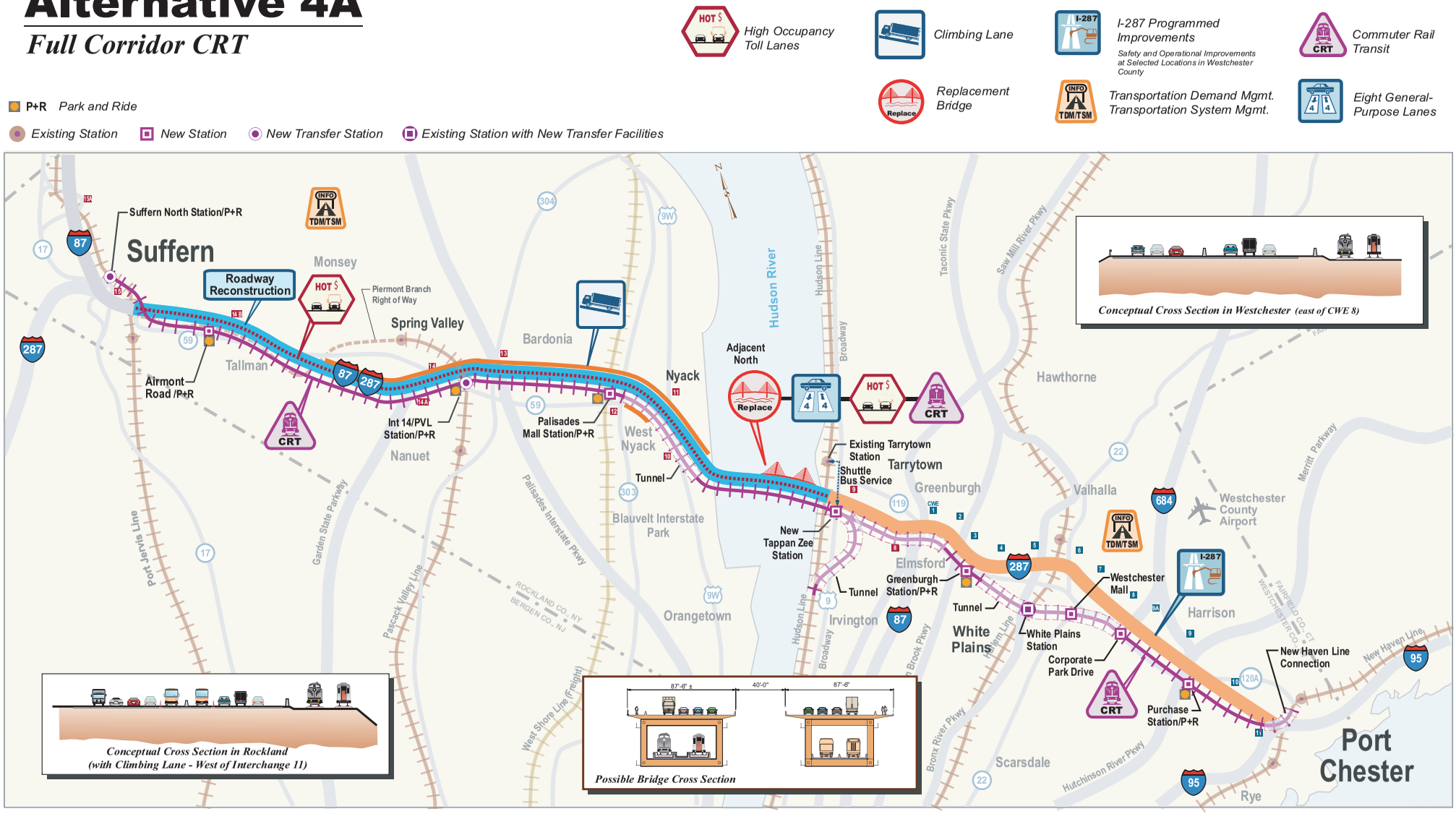


Build Alternative 3 – Full Corridor Bus Rapid Transit

Figure 8-3

Alternative 4A

Full Corridor CRT

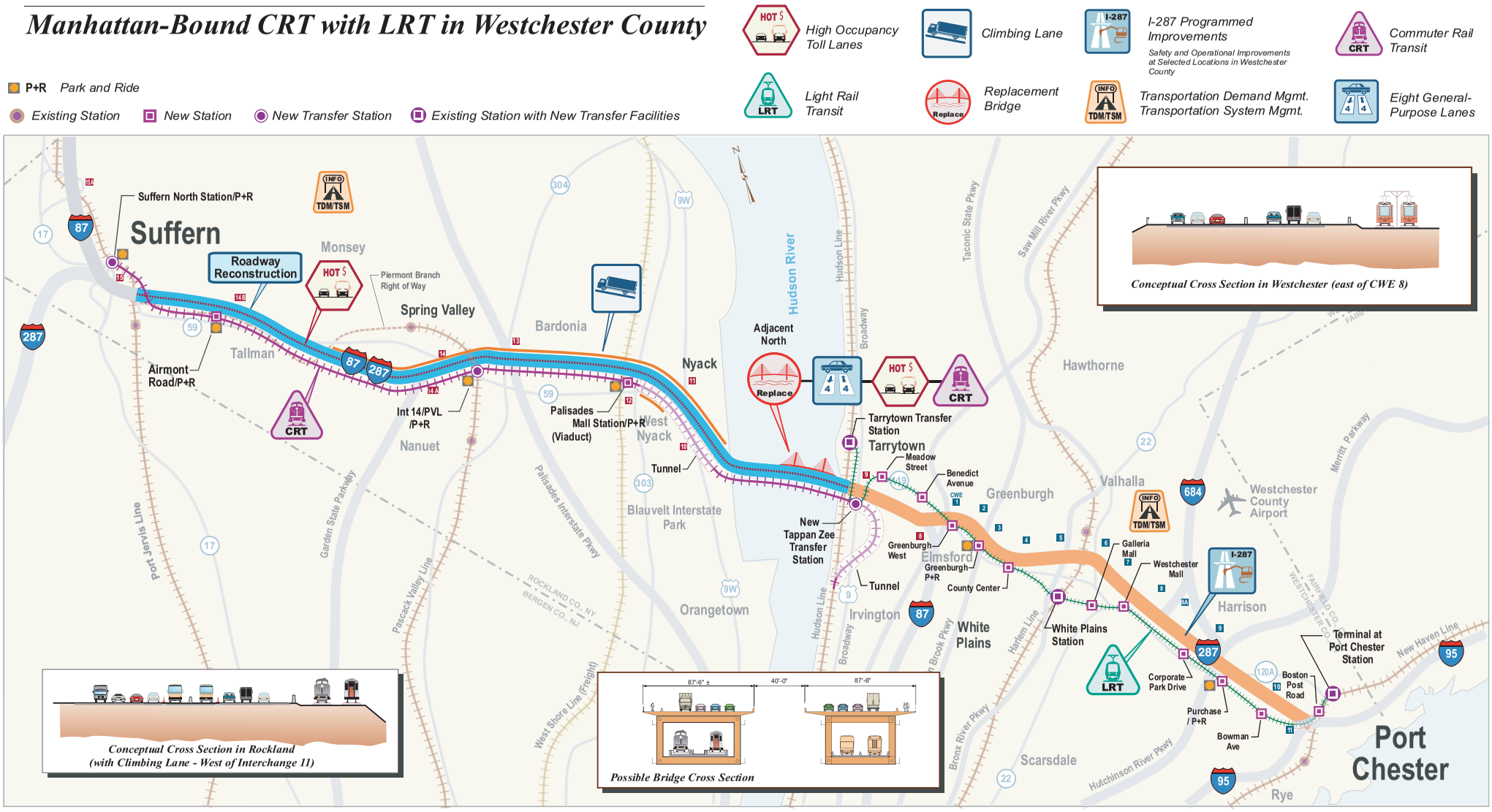


Build Alternative 4A – Full Corridor Commuter Rail Transit

Figure 8-4

Alternative 4B

Manhattan-Bound CRT with LRT in Westchester County



Build Alternative 4B – Manhattan Bound CRT with LRT in Westchester

Figure 8-5

between Westchester and Connecticut, as well as increased access to Metro-North rail lines serving Manhattan. This alternative also provides a transfer from the Metro-North upper Hudson Line service territory at Tarrytown to LRT serving Westchester and Connecticut.

- **TDM/TSM Measures** – Same as Alternative 2.

- **River Crossing** –New bridge with two HOT lanes, eight general-purpose lanes, and two rail tracks. The bridge would also potentially include amenities such as a full-length pedestrian/bicycle path linking Rockland and Westchester, belvederes (periodic widenings) for viewing and respite along the pathway, and designated recreation areas.

The capital cost of Alternative 4B is estimated at $10-12.5 billion (2004 dollars).

8.6 Build Alternative 4C – Manhattan-Bound CRT with BRT in Westchester

The key components of Alternative 4C (Figure 8-6) are:

- **Highway** – Same as Alternative 3.

- **Transit** – CRT from the Port Jervis Line at Suffern to the Hudson Line at Tarrytown and BRT from the existing Hudson Line Tarrytown station to Port Chester. Manhattan-bound CRT would connect to the Hudson Line as in Alternative 4A. There would be a new transfer facility (Tappan Zee Station) for transfer to BRT service near the existing bridge toll plaza.

  The BRT service would start at Tarrytown (allowing transfer to/from the existing Hudson Line) and would follow with a barrier-separated facility (exclusive busway) in portions of Westchester County (alongside I-87/I-287) and exclusive bus lanes on Route 119 in Tarrytown and White Plains. Future commuter rail service across the I-287 corridor would not be precluded. Service connections would be possible to the Port Jervis, Pascack Valley, Hudson, Harlem, and New Haven Lines.

  This alternative would offer Orange and Rockland County riders a one-seat ride to Manhattan and a transfer to BRT serving employment centers in Westchester and Connecticut. It would provide increased mobility within Westchester County and between Westchester and Connecticut, as well as increased access to Metro-North rail lines serving Manhattan. This alternative also provides a transfer from the Metro-North upper Hudson Line service territory to BRT serving Westchester and Connecticut.

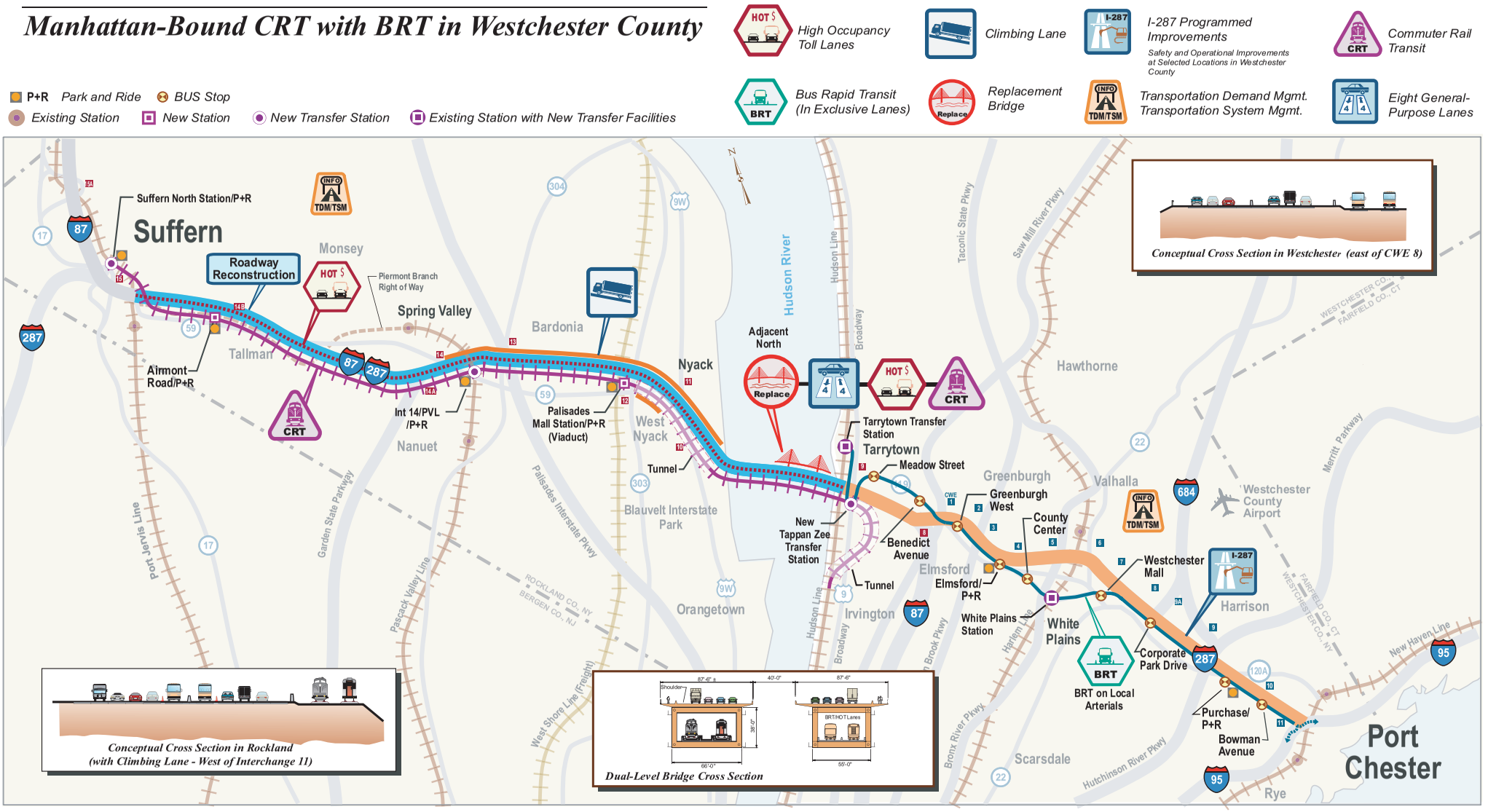
- **TDM/TSM Measures** – Same as Alternative 2.

- **River Crossing** – New bridge with two HOT lanes, eight general-purpose lanes, and two rail tracks. The bridge would also potentially include amenities such as a full-length pedestrian/bicycle path linking Rockland and Westchester, belvederes (periodic widenings) for viewing and respite along the pathway, and designated recreation areas.

The capital cost of Alternative 4C is estimated at $9-11.5 billion (2004 dollars).

Alternative 4C

Manhattan-Bound CRT with BRT in Westchester County



Build Alternative 4C – Manhattan-Bound CRT with BRT in Westchester

Figure 8-6