Tappan Zee Bridge / I-287 Corridor Project

Fall 2010 Update
Today’s Agenda

1. The need for the project
2. Bridge Option Recommendations
3. Transit Alignment Option Recommendations
4. Highway Improvement Recommendations
5. Status of Financing
Existing Bridge vs. Required Bridge

Existing Bridge:
- 7 Lanes
- Movable Barrier

Required Bridge:
- 8 Lanes
- 2 BRT Lanes
- Safety Shoulders
- Pedestrian / Bike Lanes
The Bridge Must Be Replaced

The Causeway is over Half the Length of the Bridge
The Causeway **Must be Replaced** in all Cases
The Bridge Must Be Replaced

The Superstructure Requires Extensive Modifications
While Significant Vulnerabilities are Retained
The Bridge Must Be Replaced

Rehabilitation Options Require Extensive New Construction Retaining *Serious Vulnerabilities* in the Remaining Superstructure
The Bridge Must Be Replaced

1. Rehabilitation of existing bridge in-kind is not viable
   • Does not meet project purpose and need
   • Retains serious vulnerabilities

2. Rehabilitation options require extensive new work
   • Costs are comparable to replacement options
   • River impacts comparable in all options

3. Rehabilitation options retain serious vulnerabilities
   • Existing main span retained is non-redundant
   • Retained structure will continue to deteriorate

4. Replacement options have high life cycle (150 yrs)
Replacement Bridge Capacity / Need for Transit

Both options provide:
• 4 Traffic Lanes
• 2 Lanes for BRT (HOV)
• 2 Tracks for CRT
• Safety Shoulders
• Pedestrian and Bicycle Path

• Capacity of 8 lane bridge is limited
• Traffic demand will exceed 160,000
• Impractical to provide more lanes
• Would need to widen I-87 and I-287
• Adding capacity for cars not feasible

New Transit is only way to relieve congestion and improve mobility in the corridor
New Transit is Essential for the Future

• Congestion in the Corridor is already significant and will continue to worsen.

• The replacement bridge will not provide additional relief.

• Only new transit systems will help improve mobility by affording alternative transportation choices in the future.

• Transit can also help promote and control smart growth.
Scoping Results - June 2009
Replace the Tappan Zee Bridge

Possible Single-Level Configuration

Possible Dual-Level Configuration

Transit for Future Mobility

Full-Corridor BRT and CRT from Suffern to Grand Central Terminal
Alternatives Development Roadmap

Scoping Closure

Scoping Summary Report

Design and Operating Criteria

Transit Alignment Options

Highway with Transit Accommodations

Highway Improvements

DEIS Alternatives A,B,C,D,E

Bridge Options

Start of EIS
Public Outreach

- Bridge/transit reports available on www.tzbsite.com
- Open houses/working meetings for general public in Ramapo, Clarkstown, Orangetown, Greenburgh, White Plains, and Rye
- Working Meetings targeted to Environmental Justice populations
- Ongoing SAWG meetings

Transit-Related Outreach

- 20 transit-related meetings with towns/villages across corridor
- Coordination with County Planning Departments
- Input from Participating Agencies
- Transit Oriented Development Training Initiative

Bridge-Related Outreach

- Series of meetings with villages and towns adjacent to bridge
- Input from Cooperating Agencies on Hudson River ecology issues
- Input from Consulting Parties and National Historic Landmark properties
Bridge Configurations
**Single Level Options**

1. CRT Center
   - Three-Columns

2. CRT South
   - Three-Columns

3. CRT Center
   - Two-Columns per Pier

**Dual Level Options**

4. Stacked

5. CRT in North Bay

6. Transit below (CRT and BRT)
# Feasible Alternatives for DEIS – Evaluation Criteria

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**Differentiating Criteria**
Criteria not evaluated as common to all options
Feasible Alternatives for DEIS: Consultants’ Recommendations on Options

**Single Level Options**

1. CRT Center Three-Columns
2. CRT South Three-Columns
3. CRT Center Two-Columns
Option 1 – Single level
Recommended for Elimination

Reasons for recommendation

- Option 1 has 180 columns compared to 120 in Option 3 resulting in greater impacts to river ecology, longer construction duration and larger total cost.
- Because of restricted access, the center CRT structure would have to be constructed as part of the initial construction but would remain unused for a number of years pending the full introduction of CRT.
- Separation of CRT and Highway structures is structurally inefficient, reduces the flexibility of highway operations, and limits access for emergency services.
Option 2 – Single level
Recommended for Elimination

Reasons for recommendation

- Option 2 has 180 columns compared to 120 in Option 3 resulting in greater impacts to river ecology, longer construction duration and larger total cost.
- Separation of CRT and Highway structures is structurally inefficient particularly at the Main Spans, reduces the flexibility of highway operations, and limits access for emergency services.
- Option 2 has the potential to provide the least amount of transit accommodation required by the Project’s Purpose and Need statement as the entire, separate CRT structure could be deferred to a future date. Deferment would substantial increase property and aquatic impacts.
Option 3 – Single level
Recommended to be further evaluated in DEIS

Reasons for recommendation

- Two lines of columns reduce potential aquatic impacts to Hudson River compared to both Options 1 and 2
- Efficient and fully integrated substructure that supports all modes
- Safest emergency access for all modes
- Maximum future transportation flexibility and significant transit accommodation
- Minimum impact at landings for single level options as no gaps between structures
- Allows for deferment of CRT while avoiding up front construction of unused structural components required in Option 1
- Future implementation of CRT is from the highway decks without the property or aquatic impacts required in Option 2
Dual Level Options

4  Stacked

5  CRT below in North Bay

6  Transit below (CRT and BRT)
Option 4 – Dual level
Recommended for Elimination

Reasons for recommendation

• Option 4 has 120 columns compared to 66 in Options 5 and 6 resulting in greater impacts to river ecology, longer construction duration and larger total costs

• Because a central tower is not possible at the Main Spans, the resulting structural form is difficult to construct and lacks redundancy

• Because it is necessary to build the north highway deck first at the landings access to construct the CRT deck below is difficult

• Because of restricted access, the lower CRT structure would have to be constructed as part of the initial construction but would remain unused for a number of years pending the full introduction of CRT
Option 5 – Dual level
Recommended to be further evaluated in DEIS

Reasons for recommendation

- Deep deck structure results in long spans minimizing the number of columns required (66) compared to Option 4 (120)
- Minimum number of columns shortens construction duration and minimizes river ecology impacts
- Fully integrated substructure supports all modes on common columns
- Superstructure form inherently has the structural stiffness required to meet CRT displacement limitations
- Maximizes future transportation flexibility and redundancy as all highway lanes are on the same level

Dual Level Option
CRT North on Two-Columns
Option 6 – Dual level
Recommended for Elimination

Reasons for recommendation

• BRT on lower level limits flexibility for highway operations compared to Option 5 where all highway lanes are on one level.
• Vulnerable to intentional events facilitated by BRT on the lower level with potential for disproportionate consequences to full bridge operations.
Replacement TZB – DEIS Configuration
Consultants’ Recommended Options

Single Level Option

Dual Level Option
Both recommended options include:

- Replacement TZB is on the north of the existing TZB
- At the landings the Replacement TZB is in the same location as that of the Existing TZB
Replacement TZB Options – Vertical Profile

- Both recommended options include a flatter profile than the existing TZB
- Flatter profile is advantageous for traffic flow and safety
Transit Alignment Options
CRT and BRT Service Plans

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* Additional trains in 2030 and 2035 using the Trans-Hudson Express Tunnel

Bus Rapid Transit Service Plan

Commuter Rail Transit Service Plan
Transit Alignment Options Evaluated
Hillburn to Airmont
Recommended: CRT in Piermont Line Right-of-Way

Options Evaluated:
CRT in Piermont Line ROW
CRT on Wayne Avenue
Piermont Line Option takes three structures (2 businesses and 1 dwelling unit)
Wayne Avenue Options takes 16 structures (6 businesses and 64 dwelling units)
Piermont Line Option is $170 M less costly
Piermont Line Option has flatter CRT profile

Recommended: CRT in Piermont Line Right-of-Way
Airmont to Monsey
Recommended: CRT Over Airmont Road

Options Evaluated:

CRT over Airmont Road
CRT under Airmont Road

- Under Option requires a tunnel beneath Airmont Rd and deep cuts and a long tunnel to Route 59 in Monsey
- Over Option is close to Thruway grade; has 1 year shorter construction duration and less costly by $1.0 billion
**Monsey to West Nyack**

**Recommended:** CRT on South Side

**Options Evaluated:**
- CRT in Thruway Median
- CRT on South Side of Thruway
Monsey to West Nyack
Recommended: CRT on South Side

- Thruway relocation and reconstruction is required for Median, not for South Side
- Thruway/CRT operations, maintenance and access favor the South Side

- CRT stations on south side are simpler to construct with simpler passenger access.
- BRT access ramps from HOV/HOT lanes are split and doubled to clear Median CRT
- South side construction duration is up to 3 years shorter
- South side construction cost is $1.0 to $1.7 billion less
Under WSL negative impacts include:
• Long 2-mile tunnel to the west; longer tunnel to the east
• Strawtown Road to be lowered 10 to 15 feet
• Tunnel to the west intersects two major water courses
• Interchange 14 CRT station not feasible at preferred location
• Construction one year longer
• Costs an extra $680 million

Options Evaluated:
CRT Over West Shore Line
CRT Under West Shore Line
Recommended: Busway on North Side of Thruway

Options Evaluated: North side, south side and median

Busway on North advantages include:
- Thruway relocation not required
- BRT Airmont, Monsey and Interchange Stations are preferable on north side
- Palisades Mall and Nyack Stations are on south side for all options
- Shortest construction duration and $500 million less costly
Tarrytown
Recommended: CRT Hudson Line Connector in Tunnel

Options Evaluated:
CRT Connector in Tunnel
CRT Connector on Trestle

Tunnel has:
• Minimal visual impacts
• Fewer in-river impacts
• Less noise impacts
Tarrytown
Recommended: South Cross BRT Connector

Options Evaluated:
North Direct BRT Connector
South Cross BRT Connector

South Cross:
- Incorporates integrated access
- Avoids area of tight ROW
- Reduces construction complexity

North Direct:
- Reduces flexibility for bridge pier locations
- More visual impact at Tappan Landing
Tarrytown Busway
Recommended: Benedict Avenue near Interchange 8

Options Evaluated:
Benedict Avenue
I-287 ROW

- Benedict Avenue Station more easily accessible in center of office parks
- Along Interchange 8 there is limited area for alignment and poor station location. Hotel rear access impacted
White Plains
Recommended: Bi-directional bus lanes on Hamilton Ave

Options Evaluated:

- Bi-directional Bus Lanes on Hamilton Avenue
- Bus Lanes on Hamilton Avenue and Main Street
- Dedicated lanes on Main Street and Hamilton Avenue and bi-directional on Hamilton Avenue were evaluated:
  - Bus lanes on Hamilton Avenue and Main Street create severe traffic impacts on Main Street
  - Bus lanes on Hamilton Avenue (bi-directional) have less impacts to downtown traffic
  - Project will assume bi-directional on Hamilton Avenue for EIS, but will be refined in Tier 2 transit analyses

Bus Lanes Alternative will access downtown from the west using Main Street and Hamilton Avenue. Busway Alternative will evaluate an underpass beneath the Harlem Line to WP Transportation Center
Elmsford and Greenburgh
Recommended: BRT Bus Lanes Alignment

- Through Elmsford and Greenburgh Route 119 is too congested for dedicated bus lanes
- Busway alignment provided adjacent to south side of I-287 and then to the north side for the Hillside Station
Elmsford and Greenburgh
Recommended: BRT Bus Lanes Alignment - Typical Cross Sections

Bus Lanes Alignment in Elmsford at Winthrop Avenue

Bus Lanes Alignment in Greenburgh at Yosemite Park
Elmsford and Greenburgh
Recommended: BRT Busway Alignment

East of the Benedict Avenue alignment the busway continues adjacent to the north side of I-287 through Elmsford and Greenburgh.
East of White Plains BRT is in dedicated bus lanes on Westchester Avenue to Exit 10. BRT then becomes a busway adjacent to the north side of I-287, and north along the west side of the Metro-North New Haven Line to the Port Chester Station.
East of Downtown White Plains
Recommended: BRT Bus Lane Alignment – Typical Cross Sections

Bus Lanes on Westchester Avenue at Butcher Avenue (eastbound)

Bus Lanes (as a Busway) along North Side I-287 at South Ridge Street
East of Downtown White Plains
Recommended: BRT Busway Alignment

BRT in a busway adjacent to south side of I-287, then crosses to the north side near Exit 10. Busway continues to Metro-North Port Chester Station, similar to the Bus Lane alignment.
East of Downtown White Plains

Recommended: BRT in Busway Alignment – Typical Cross Sections

Busway at Butcher Avenue

Busway along west side of Metro-North New Haven Line
(View Looking North)
Highway Improvement Options
Highway Improvement Options Evaluated

[Map showing various highway improvement options, including Interchange 13 Auxiliary Lanes, Improvements to Interchange 11, Interchange 10 Reconfiguration, Westbound Climbing Lane, and Eastbound Climbing Lane.]
Westbound and Eastbound Climbing Lanes

Reduction in truck speeds greater than 10 mph would occur at:
• WB highway between TZB and Route 59 in Monsey
• EB between Interchange 14B and Route 59-Monsey, and Interchanges 11 and 12

Projected high volumes and poor operating conditions would occur:
• WB PM peak period between the Bridge and Interchange 14A
• EB AM peak period between Interchange 14A and the bridge

Accident rate is higher than Statewide Average

Analysis of Warrants (Standards) considers:
• Reduction in truck speed on a steep grades
• High vehicle volumes and congestion levels
• Accident rates above the Statewide Average
Recommendations for Interchange 10 Reconfiguration
Recommended Improvements to Interchange 11

Existing & Future Conditions:
- Eastbound ramps meet Rt 59 at five-leg intersection creating long delays on Rt 59 and Mountain View Ave.
- Projected traffic on ramp spills backs onto the Thruway, and the intersection fails operationally.
- Westbound ramp intersection at High Avenue functions adequately.

**Recommended Eastbound Improvement:**
- Eastbound ramps relocated 600 ft to West Broadway Street intersection.
- Intersections operate at acceptable levels and traffic flow improves on ramps, along Rte 59 and Mountain View Ave.
- Improvements require property acquisition and modifications to Rte 59.
Auxiliary lanes separate the weave/merge operations in a separate roadway parallel to the highway. Traffic analyses show their effectiveness:

- Weaving area separated from mainline traffic creating smoother, safer traffic flow
- Requires interchange ramps to be reconstructed and entry and exit lanes to be lengthened

Properties adjacent to the interchange are acquired/impacted.
Interchange 14X Evaluation: Not recommended to be advanced

Justification

FHWA Policy for new Interchanges:
- Improve conditions on the interstate
- Not added to alleviate local congestion

Results of traffic analyses:
- Worse conditions at Interchange 14B from higher volumes exiting in the AM and PM
- Slower speeds and longer delays on WB Thruway during PM peak period
- Many vehicles would enter 14X WB and exit at 14B using Thruway to bypass Route 59
- Minimal change in speed and travel times on Route 59
Planning for the Future

• The bridge must be replaced - there is no other viable solution.

• New transit services are essential to help reduce congestion and provide mobility choices.

• It is imperative that a workable Financial Plan be developed to make this plan a reality.
Finance Status
We remain on track

• Recent developments with ARC does not impede this Project. *(And we will learn from this!)*

• We are steadily working through:
  – The environmental process
  – Assessment of options for financing
  – Narrowing our range of options

• Maintaining momentum through “tiering”
  • Environmental process / financing / construction
“Tiering”

Transit-Ready Bridge & Highway
Followed by Bus Rapid Transit
Followed by Commuter Rail Transit

Financing to be addressed in parallel:

• focus on funding for the Transit-Ready Bridge and Highway first followed closely by funding for BRT

• Goal of having BRT operational when bridge opens
Estimating the Project Cost

$8.3 billion  Transit-Ready Bridge & Highways
1.0       BRT
6.7       CRT

$16.0 billion  (in current costs)

Depending on schedule, cost elements increase due to inflation. Timing of project – especially for each major phase – is yet to be determined.
First Phase: Transit-Ready Bridge & Highway

As described earlier in this presentation, this includes:

– Replacement bridge designed to accommodate BRT and CRT

– Rockland County highway improvements to the Thruway
Focus on Transit-Ready Bridge & Highway Financing

- Current cost estimate is $8.3 billion
- Will explore opportunities for cost savings
- Assess traditional and innovative financing options
- Investigate “extraordinary” financing solutions
- Determine feasibility of tackling financing through further breakdown of the tiered elements
We Know

This is an extraordinary challenge

An extraordinary solution will be required

Multiple funding sources are needed

We continue to explore financing strategies
Finding The Money

• Explore traditional and innovative ideas
• Complete the EIS process
• Get ready for any and all opportunities
  – Federal reauthorization
  – Innovative programs like ARRA ($760B in 2009)
• Keep narrowing the focus
• Full court press developing partnerships
  – Federal, other states, local support
IDEAS: Engage Washington

Federal funding is the single most important revenue source.

Support possibilities for significant new grants and loans

• Direct Aid
  – Member items or specific earmarks

• Reauthorization
  – Advocate / prepare for new mega-project funding
  – Pursue “Project of National Significance” status
  – Pursue project grants
  – Pursue low cost loans (TIFIA, etc)
  – Support National Infrastructure Bank
IDEAS: Develop National Support

Partner with:
Transportation officials from neighboring states
(Massachusetts, Connecticut, New Jersey, Pennsylvania)
Coalition of Northeast Governors (CONEG)
American Association of State Highway and Transportation Officials (AASHTO)
Northeast Association of Transportation Officials (NASTO)

Support in Washington for:
Federal Transportation Reauthorization Issues
“Project of National Significance” Program
And other mutually beneficial initiatives
IDEAS: Expand / Align Regional Support

Engage State and Local Officials
Engage Business and Industry Representatives
Invite Organizations and Concerned Citizens, such as:

AAA
Mid-Hudson Pattern for Progress
Regional Plan Association
Rockland Business Association
Rockland Economic Development Corporation
Scenic Hudson
The Business Council of New York State, Inc.
Tri-State Transportation Campaign
Westchester Business Council
Westchester County Association
Questions?