TAPPAN ZEE HUDSON RIVER CROSSING PROJECT
Scoping Information Packet

Rockland County, New York and Westchester County, New York

Lead Agency: Federal Highway Administration
Project Sponsors: New York State Department of Transportation and New York State Thruway Authority

October 2011
1-1 INTRODUCTION

This Scoping Information Packet introduces the Tappan Zee Hudson River Crossing Project. This document describes the purpose and need for the project (Section 1); the alternatives under consideration (Section 2); the framework for the project’s environmental analysis (Section 3); and the public involvement program for the project (Section 4).

The purpose of the project is to maintain a vital link in the regional and national transportation network by providing an improved Hudson River crossing between Rockland and Westchester Counties, New York. The project would address the structural, operational, mobility, safety, and security needs of the Tappan Zee Hudson River Crossing.

1-2 PROJECT HISTORY

The Tappan Zee Bridge opened to traffic in 1955 as part of the New York State Thruway extension between Suffern, New York and Yonkers, New York. Over the years, the bridge and its highway connections have been the subject of numerous studies and transportation improvements. Improvements to the Tappan Zee Bridge included the installation of a movable barrier to allow for operation of a seven-lane cross section with four lanes in the peak direction, electronic toll collection, and variable pricing for commercial vehicles. Despite these improvements, congestion has grown steadily and the aging bridge structure has reached the point where major reconstruction is needed to sustain this vital link in the transportation system.

In April 2000, a Long Term Needs Assessment and Alternatives Analysis was completed by the New York State Governor’s I-287 Task Force. The report concluded that while there was no single preferred solution for addressing the transportation needs in Tappan Zee Bridge/I-287 Corridor, both a short-term aggressive Transportation Demand Management (TDM) program and longer-term capital improvements were needed. All of the long-term alternatives evaluated by the Task Force called for replacement of the existing Tappan Zee Bridge because it was concluded that rehabilitation of the existing bridge would be highly disruptive, perhaps as costly, and not as beneficial in mobility enhancement or meaningful congestion relief as compared to a replacement bridge.

On November 28, 2000, the New York State Thruway Authority (NYSTA) and the Metropolitan Transportation Authority Metro-North Commuter Railroad (MNR) announced that an Environmental Impact Statement (EIS) would be undertaken to identify and evaluate alternatives to address the mobility needs of the I-287 Corridor, as well as the structural and safety needs of the Tappan Zee Bridge. The alternatives contained in the I-287 Task Force report, as well as those suggested by elected
officials, transportation and environmental groups, community groups, and the public, were considered and an approach to evaluating and advancing alternatives was established. On December 23, 2002, the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) published a Notice of Intent (NOI) to prepare an Alternatives Analysis (AA) and EIS for the Tappan Zee Bridge/I-287 Corridor in the Federal Register.

Over the next few years, project development continued with increasing involvement by the New York State Department of Transportation (NYSDOT). Alternatives for transit modes along the corridor were identified, as were a set of highway and bridge improvements. Also, in 2005, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) was enacted, which incorporated changes in the metropolitan planning and environmental review processes for transportation projects. FHWA and FTA determined that a revised NOI should be published to update the public and interested agencies on the alternatives development, to identify NYSDOT as the Project Director, and to incorporate the provisions of SAFETEA-LU. The revised NOI was published on February 14, 2008.

Since 2008, FHWA, FTA, NYSDOT, NYSTA, and MNR have advanced design options and have undertaken assessments of the affected environment, including detailed data collection. A number of reports were prepared and made public to document project advancement and provide opportunities for input from the interested public and agencies.

Throughout project development, FHWA, FTA, NYSDOT, NYSTA, and MNR have engaged in a robust public outreach effort. Public involvement has taken multiple forums and formats, including one-on-one and large group settings. Two community offices, one in Nyack and one in Tarrytown, were established to provide information to those interested in the project. A website and newsletters have provided written updates to the interested public, and there has been a robust media campaign. The project sponsors solicited input from stakeholders through five Stakeholders’ Advisory Working Groups that met regularly to guide project development efforts, meetings with elected officials and community groups, and individual meetings as requested. Large public forums such as meetings and workshops were held a number of times at various locations to continue to inform the public. In total, there have been hundreds of public and stakeholder meetings to date, and the project sponsors have compiled a mailing list of more than 5,000 interested individuals and organizations.

In 2011, while advancing financial analysis, it was determined that funding for the corridor project (bridge replacement, highway improvements, and new transit service) was not possible at this time. The financing of the crossing alone, however, was considered affordable. Therefore, it was determined that the scope of the project should be limited, and efforts to replace the Hudson River crossing independent of the transit and highway elements should be advanced. On October 12, 2011, FHWA and FTA published an NOI to rescind the Tappan Zee Bridge/I-287 Corridor Project, thereby concluding the environmental review process for the combined study of bridge, highway, and transit elements.

On that same date, FHWA published a new NOI for the Tappan Zee Hudson River Crossing Project to examine alternatives for an improved Hudson River crossing
between Rockland and Westchester Counties. As described in the NOI, FHWA, acting as the federal lead agency, and NYSDOT and NYSTA, acting as the co-sponsoring agencies, are preparing an EIS to identify alternatives for an improved Hudson River crossing and to document the potential environmental consequences of these alternatives. Although the Tappan Zee Hudson River Crossing Project will undertake an independent environmental review, the study will rely on previous relevant documents prepared for the Tappan Zee Bridge/I-287 Corridor Project. The Tappan Zee Hudson River Crossing EIS will serve as the basis for FHWA’s Record of Decision under the National Environmental Policy Act of 1969 (NEPA; 42 USC §4321 et seq.). This EIS will also satisfy environmental review requirements of the New York State Environmental Quality Review Act (SEQRA; 6 NYCRR Part 617).

1-3 BACKGROUND AND PLANNING CONTEXT

The Tappan Zee Bridge is located in the State of New York, crossing the Hudson River between the Village of South Nyack in Rockland County on the west and the Village of Tarrytown in Westchester County on the east (see Figures 1-1 and 1-2). The Tappan Zee Bridge carries Interstate 87 (New York State Thruway) and Interstate 287.

1-3-1 TRANSPORTATION CONTEXT

Interstate 87 is the main route through the Hudson Valley, connecting New York City and Canada. It begins at Interstate 278/Robert F. Kennedy Memorial Bridge (formerly Triborough Bridge) in the Bronx, New York and extends 333 miles northward to the Canadian border at Champlain, New York.

Interstate 287 is a 99-mile, circumferential route through the New York and New Jersey metropolitan area. It begins at the New Jersey Turnpike/Interstate 95 in Edison Township, New Jersey and circles the western and northern portions of the metropolitan area, terminating in Rye, New York at Interstate 95. It serves suburb-to-suburb trips in addition to long-distance trips (i.e., between New Jersey and points west and Connecticut and points north and east) that wish to bypass the routes directly through New York City.

The Tappan Zee Bridge provides the only interstate highway crossing of the Hudson River for the 48-mile stretch between the George Washington Bridge (Interstate 95) and the Newburgh-Beacon Bridge (Interstate 84). It is a vital link between the population and employment centers of Rockland and Westchester Counties and is a major route for freight movement.

During the past 20 years (1990 to 2010), traffic volumes have grown by almost 30 percent on the Tappan Zee Bridge (see Figure 1-3), and the bridge now carries approximately 138,000 vehicles per day. Volumes are highest during the morning eastbound commute and the evening westbound commute, but the bridge is prone to severe congestion during non-commuter periods as well. As shown in Figure 1-3, the Tappan Zee Bridge carries more than 5,000 vehicles per hour during 15 hours (7 AM to 10 PM) of a typical weekday.

The bridge serves as a major freight route between points east and west of the Hudson River. It is a primary over-land gateway to New England for goods delivered to the Port
of New York and New Jersey. The bridge is also a bypass route around New York City for trucks traveling between New England and points south and west of New York City.

1-3-2 REGIONAL CONTEXT

Rockland and Westchester Counties have experienced considerable growth in both population and employment over the last 60 years, resulting in substantial increases in traffic volumes across the Tappan Zee Bridge. The population in Rockland County has more than tripled from about 89,000 in 1950 to 299,000 in 2010 (+235 percent). Westchester County’s population increased from about 626,000 in 1950 to 962,000 in 2010 (+53 percent). During the same period, Westchester County experienced a major increase in commercial development. The completion of interstate highways through Westchester County (i.e., I-95, I-87, I-287, and I-684) led to a surge in corporate headquarter relocations to the area, particularly in White Plains.

The New York Metropolitan Transportation Council (NYMTC) projects that both population and employment growth will continue (see Figure 1-4). Between 2010 and 2047, the populations of Rockland and Westchester Counties are expected to increase by 50,000 and 134,000 residents, respectively. Employment is projected to increase by 47,000 jobs in Rockland County and by 160,000 jobs in Westchester County during this timeframe. This growth in population and employment will increase daily volumes across the Tappan Zee Bridge for the next several years.

1-4 PURPOSE

The purpose of the project is to maintain a vital link in the regional and national transportation network by providing an improved Hudson River crossing between Rockland and Westchester Counties. The existing bridge was built in 1955 and now serves more than 138,000 vehicles per day. While safe to the traveling public, the bridge does not meet current standards for its design or traffic operations. The project would correct structural, operational, mobility, safety, and security features of the existing Tappan Zee Bridge.

1-5 NEED

1-5-1 STRUCTURAL DEFICIENCIES

The existing Tappan Zee Bridge falls short of current engineering standards relative to seismic and security criteria. In addition, an extensive and costly maintenance and capital program has been required to keep the bridge’s structural elements in a state of good repair.

In the mid-1980s, notable deterioration of the Tappan Zee Bridge was recorded, prompting the beginning of an extensive repair program by NYSTA. Subsequently, targeted repairs were made to all segments and components of the Tappan Zee Bridge, including the concrete deck, steelwork, bearings, columns, and piles. Through the mid-1990s, these continuous repairs by NYSTA were sufficient to improve the overall condition of the Tappan Zee Bridge. However, major rehabilitation of the deck bearings, barriers, steelwork, and concrete was initiated in September 2007 due to the high rate of deterioration. The overall condition of the Tappan Zee Bridge continues to decline, with extensive, iterative repairs required to keep the bridge safe for the near-term.
Figure 1-2

Existing Bridge Plan, Profile, and Photographs
Figure 1-3
Traffic Volumes
Figure 1-4
Population and Employment Growth:
2010 to 2047
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Between 2000 and 2010, NYSTA spent over $500 million to maintain the bridge, and NYSTA estimates that an additional $1.3 billion must be spent over the next decade to keep the existing bridge in a state of good repair.

Based on criteria provided in the NYSDOT Load and Resistance Factor Design (LRFD) Bridge Design Specifications, the Tappan Zee Bridge is classified as a “critical bridge.” A critical bridge must continue to be functional after a major earthquake (known as the “safety” event for seismic design purposes) to serve as a primary route for civil defense and emergency response. While the current conditions of the Tappan Zee Bridge are safe to the traveling public due to the ongoing rehabilitation program, several structural issues need to be addressed. The existing bridge does not meet the current seismic performance standards for safety and functionality for a critical bridge, as defined by the NYSDOT LRFD Bridge Design Specifications.

The Tappan Zee Bridge lacks structural and operational redundancy to easily sustain extreme natural events such as hurricanes and earthquakes or man-made events such as fires or vessel collision. Structural redundancy is the physical strength to sustain these events, and operational redundancy is the availability of alternative traffic movement if repairs are needed. Lacking these redundancies, the bridge is vulnerable to damage from such events, and as a consequence, traffic disruption or full closure could result while any repairs are undertaken.

1-5-2 OPERATIONAL AND SAFETY DEFICIENCIES

The Tappan Zee Bridge does not meet current NYSDOT bridge and highway standards with respect to such essential characteristics as lane and shoulder widths. It currently operates with seven lanes, ranging in width from 11 feet, 2 inches to 12 feet. Thus, some of its lanes are narrower than the standard 12-foot lane. The bridge has no shoulders, meaning that through lanes are blocked in the event of a disabled vehicle and that emergency vehicles must use through lanes to attend to accidents or other incidents on the bridge. The bridge has a median consisting of a movable barrier with one foot of clearance on either side. This falls short of NYSDOT’s minimum standard for bridges, which consists of a fixed median, a 4-foot left shoulder and a 10-foot right shoulder.

From 2001 to 2009, more than 2,700 accidents occurred between Interchange 9 (Route 9) in Tarrytown and Interchange 10 (Route 9W) in Nyack, the segment that includes the Tappan Zee Bridge, its approaches, and its toll plaza. Accident rates are a function of the number of accidents over a period of time, length of highway, and the traffic volume at that location. From 2001 to 2009, the calculated accident rate on this 3.89-mile roadway segment was more than twice NYSTA’s statewide average (see Figure 1-5).

Responding to accidents on the bridge is also difficult. Lacking shoulders or dedicated emergency lanes, responders must use the heavily traveled general traffic lanes to reach the accident scene. This delays response times considerably. Since damaged or disabled vehicles cannot be moved to a shoulder, they block the general traffic lanes until they can be removed from the bridge, resulting in lengthy traffic delays. Heavy congestion on the bridge and its lack of emergency lanes and shoulders also adversely affects emergency calls and response times between Rockland and Westchester Counties.
1-5-3 SECURITY DEFICIENCIES

The Tappan Zee Bridge is a critical infrastructure element within the corridor and region. As a result of the region’s limited river crossings, the Tappan Zee Bridge provides a vital link to communities east and west, as well as north and south, of the bridge. In addition, substantial truck traffic crosses the Tappan Zee Bridge. If the Tappan Zee Bridge were to become inoperable, the consequences would be severe to the regional and national transportation networks and economies.

The FHWA and United States Department of Defense has designated the Strategic Highway Network (STRAHNET), which is intended to provide defense access, continuity, and emergency capabilities for movement of personnel and equipment in both peace and war. STRAHNET is a 61,000-mile system spanning the United States. Interstates 87 and 287, including the Tappan Zee Bridge, are elements of STRAHNET. As such, planning for the future of the Tappan Zee Hudson River crossing is a critical need of the national defense network.

The existing bridge lacks structural redundancy that can avert extreme events and lacks safety measures to aid in response to such events. These deficiencies in combination with the prominence of this crossing as a critical roadway link stress the need to incorporate modern security infrastructure at this Hudson River crossing.

1-5-4 MOBILITY DEFICIENCIES

Traffic patterns during a typical weekday peak period (6 AM to 10 AM and 4 PM to 8 PM) demonstrate the predominant nature of travel in the corridor. The volumes are higher eastbound during the morning commute period toward the larger employment centers in Westchester County and New York City. Westbound traffic volumes are higher in the evening commute period as workers return home. In response to the corridor’s peak travel pattern and to better handle growing volumes, the NYSTA added a seventh (median) lane to the previously six-lane bridge in 1992. NYSTA uses a movable barrier system to assign this median lane to the peak traffic direction, providing four eastbound lanes in the morning peak and four westbound lanes in the evening. Despite the addition of a travel lane in the peak direction, the bridge remains highly congested with frequent travel delays and a poor level of service, particularly during the evening commuter period.

The Tappan Zee Bridge collects tolls in one (eastbound) direction. The existing bridge toll plaza in Tarrytown provides 10 toll-collection lanes within the toll plaza itself. The toll plaza generally operates with four E-ZPass lanes and six cash or cash/E-ZPass lanes. There are also two dedicated, higher speed (35 mph) E-ZPass lanes between the toll plaza and the inside median of the interstate highway (see Figure 1-6). Under peak travel demand periods in the morning weekday peak hour, the toll plaza generally handles the flow of traffic with minimum delay, given that almost 90 percent of the drivers have an E-ZPass. The greater challenge is on weekends, when the traffic volumes are lower, but E-ZPass usage is less than 60 percent. As such, queues of cash-paying drivers eventually block access to the E-ZPass lanes, spilling back onto the bridge and creating traffic delays that reach well into Rockland County.

The existing Tappan Zee Bridge does not allow for multi-modal travel. While buses do operate across the bridge, they use general traffic lanes. Despite the presence of well-
Accident Rates

Figure 1-5

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Aerial View of Toll Plaza

Existing Toll Plaza Operations
connected trailway systems on either side of the Tappan Zee Bridge, cyclists and pedestrians are prohibited from the bridge itself because pedestrians and cyclists are not permitted on interstate highways. The nearest Hudson River crossings for cyclists and pedestrians are the George Washington Bridge, 15 miles to the south, and the Bear Mountain Bridge, 18 miles to the north.

1-6 GOALS AND OBJECTIVES

Project development is being guided by three goals with objectives that address the deficiencies of the existing bridge described above. The goals and their supporting objectives are as follows:

- **Ensure the long-term vitality of this Hudson River crossing by:**
  - Providing for sufficient strength and stability compliant with current standards to carry transport loading;
  - Providing for a robust and redundant structure to survive extreme natural events, including earthquakes and hurricanes;
  - Providing for a robust and redundant structure to survive extreme manmade events, including fires, vessel collisions, vehicular overloads, and vehicular accidents;
  - Ensuring compliance with NYSTA operational requirements; and
  - Providing for a serviceable structure with a life span in excess of 100 years before major maintenance is required.

- **Improve transportation operations and safety on the crossing by:**
  - Ensuring compliance of horizontal and vertical geometry with current engineering design standards, as practicable;
  - Providing for horizontal geometry that maximizes sight distances;
  - Providing for vertical geometry that minimizes grade changes;
  - Providing for standard, 12-foot traffic lanes;
  - Providing for adequate separation of eastbound and westbound traffic;
  - Providing for shoulders that meet current engineering design standards;
  - Eliminating reversible traffic lanes;
  - Providing for security infrastructure to monitor bridge operations; and
  - Providing for improved emergency response.

- **Maximize the public investment in a new Hudson River crossing by:**
  - Providing a cost-effective crossing that maximizes value over the lifespan of the structure;
  - Minimizing effects on existing highways;
  - Maximizing the use of existing right-of-way;
  - Sequencing construction to minimize effects on vehicular traffic operations;
  - Reducing maintenance requirements and operating costs;
  - Providing for trans-Hudson access for cyclists and pedestrians; and
  - Providing a crossing that does not preclude future trans-Hudson transit services.
While developing and evaluating alternatives based on the above goals and objectives, FHWA, NYSDOT, and NYSTA will remain cognizant of the potential effects of alternatives on the built and natural environment. Project planning efforts will consider potential effects on social, economic, and environmental conditions, and the EIS will document these effects.
2-1 INTRODUCTION

This section of the Scoping Information Packet describes the alternatives to be evaluated in the Environmental Impact Statement (EIS) for the Tappan Zee Hudson River Crossing Project. The development and evaluation of project alternatives is central to the National Environmental Policy Act (NEPA) process. Four alternatives have been considered for the Tappan Zee Hudson River crossing as follows:

- **No Build Alternative.** The No Build Alternative would involve the continued operation of the existing seven-lane bridge with ongoing maintenance to keep the bridge in a state of good repair;

- **Rehabilitation Alternative.** The Rehabilitation Alternative would upgrade elements of the existing bridge to meet current design standards and improve the bridge’s safety and mobility;

- **Tunnel Alternative.** The Tunnel Alternative would replace the existing Tappan Zee Bridge with a new tunnel between Rockland and Westchester Counties; and

- **Replacement Bridge Alternative.** The Replacement Bridge Alternative would replace the existing Tappan Zee Bridge with a new bridge or bridges near its existing location.

Previous studies prepared in connection with the Tappan Zee Bridge/I-287 Corridor Project concluded that the Rehabilitation and Tunnel Alternatives are not prudent because of their costs and construction risks compared to a replacement bridge. These past decisions have been reviewed in the context of the current project, and it is determined that the previous conclusions remain valid. Therefore, the EIS will not consider a Rehabilitation or Tunnel Alternative.

Previous studies identified a number of feasible options for a replacement bridge. As the Replacement Bridge Alternative is considered a viable and a prudent option, it is recommended to carry forward for detailed evaluation in the EIS. Consistent with NEPA requirements, the No Build Alternative will be carried forward to the EIS. The No Build Alternative will also serve as a baseline to evaluate the benefits and potential impacts of the Replacement Bridge Alternative.

2-2 ALTERNATIVES CONSIDERED AND ELIMINATED

2-2-1 REHABILITATION ALTERNATIVE

The Alternatives Analysis for Rehabilitation and Replacement of the Tappan Zee Bridge Report (March 2009) identified four rehabilitation options to enhance the structural integrity and operation of the existing Tappan Zee Bridge. These ranged from an option that would simply upgrade the structural elements of the existing bridge with no...
increase in the number of lanes to options that included both upgrades to the superstructure of the bridge and construction of a new, parallel bridge that in combination with the existing bridge would address traffic operations on this river crossing.

The Alternatives Analysis for Rehabilitation and Replacement of the Tappan Zee Bridge Report (March 2009) was part of the Scoping Summary Report for the Tappan Zee Bridge/I-287 Corridor Project. It was widely distributed and the subject of intensive public and agency review and comment.

The report concluded that the Rehabilitation Alternative would not be prudent and should be eliminated from further consideration. The Rehabilitation Alternative would replace much of the existing structure—up to 80 percent of it in certain cases, and therefore, would cost nearly the same as an entirely new bridge. While the Rehabilitation Alternative would meet most current design standards, it would not achieve the same engineering performance as a replacement bridge nor would it meet all the project goals outlined in Section 1, as described below.

The Rehabilitation Alternative would fail to meet the project goal of “ensuring the long-term vitality of this Hudson River crossing” for the following reasons:

- The Rehabilitation Alternative would be designed to comply with seismic criteria, which are based on strength. However, the Rehabilitation Alternative would lack ductility, which allows bridge members to endure changes in shape without breaking. Therefore, the Rehabilitation Alternative would be vulnerable during an extremely long or intensive earthquake.

- The Rehabilitation Alternative options that have a single structure would lack service redundancy. If the bridge were heavily damaged by a natural or man-made event, it could need to be closed for repairs. If the bridge were closed, there would be no alternative routing for traffic at this location along the Hudson River.

The Rehabilitation Alternative would fail to meet the project goal of “improving transportation operations and safety on the crossing” for the following reasons:

- The Rehabilitation Alternative would lack alternative load path redundancy (i.e., the ability of bridge members to be supported by multiple means such as a deck supported both by a deck truss and by a bridge cable). As such, the Rehabilitation Alternative would not adequately address security concerns. Its closure would severely affect the traffic operations across the region.

The Rehabilitation Alternative would fail to meet the project goal of “maximizing the public investment in a new Hudson River crossing” for the following reasons:

- The life span of bridge components retained in the Rehabilitation Alternative would be shorter than those of a new bridge. To maximize the public investment in a new Tappan Zee Hudson River crossing, the desired life span of the new structure is at least 100 years before major maintenance or rehabilitation is needed. However, components of the Rehabilitation Alternative would need major maintenance or replacement in as few as 50 years.

- The construction duration for the Rehabilitation Alternative would be one year longer than for a replacement bridge.
There is much uncertainty in rehabilitation projects as the extent of damage to certain bridge components may not be fully known until they are actually replaced. This uncertainty would have the potential to substantially increase the construction cost and duration of the Rehabilitation Alternative.

The Rehabilitation Alternative with two bridges would be more costly than an entirely new bridge and have the same deficiencies described above in terms of life cycle and vulnerabilities.

Given these considerations, the Rehabilitation Alternative would not meet the project’s purpose and need, and it will not be considered in the EIS.

**2-2-2 TUNNEL ALTERNATIVE**

A new bored or immersed tunnel between Rockland and Westchester Counties was previously studied. The Tunnel Alternative would consist of five separate tubes with two lanes each or an immersed tunnel with two chambers. To provide for a maximum desired highway grade and to accommodate the topography of the affected area, the bored tunnel would stretch seven miles from Interchange 12 (NY 303/Palisades Center Drive) in Rockland County to east of Interchange 9 (Route 9) in Westchester County. In contrast, the immersed tunnel would be shallower and would come to surface closer to the shoreline. However, it would require extensive shoreline and in-water work.

Compared to the Rehabilitation and Replacement Alternatives, the Tunnel Alternative would take longer to construct at a higher cost. The Tunnel Alternative would require acquisition of substantial right-of-way for its approach structures, portals, and ventilation structures. The tunnel’s construction would impact the Talleyrand Swamp and the Rockland and Westchester County shoreline of the Hudson River where its ventilation structures would be sited. In the permanent condition, Interchanges 9 (Route 9), 10 (Route 9W), and 11 (Route 9W/NY 59) would be removed and connectivity in eastern Rockland County and western Westchester County would be considerably impaired.

The Tunnel Alternative would offer less operational flexibility than a bridge. Traffic would be separated into two or five tubes, resulting in less flexibility to maintain traffic flow through the tunnel and difficult traffic control at the portals. The tunnel would have a 3 percent grade over a long distance, making speed control difficult for trucks. The separation of highway operations into separated tubes or chambers over a long distance would make emergency response much more challenging than for a bridge. For these reasons, the Tunnel Alternative would be less effective than a bridge at meeting the project goal of “improving transportation operations and safety on the crossing.”

While the Tunnel Alternative would meet some of the goals and objectives of the project, it would fail to meet the goal of “maximizing the public investment in a new Hudson River crossing” for the following reasons:

- The Tunnel Alternative would require higher construction costs and a longer duration of construction activities than a replacement bridge. As such, this alternative would not be cost-effective or yield maximum benefit in relation to its financial investment.
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- The Tunnel Alternative would result in greater disruption to surrounding land uses than a replacement bridge, as extensive construction would be required outside of the existing New York State Thruway right-of-way, thereby requiring greater land acquisition.

- The Tunnel Alternative would not provide an opportunity to implement a shared-use pathway for cyclists and pedestrians.

Given these considerations, the Tunnel Alternative would not meet the project’s goal to maximize the public investment in this Hudson River crossing. Thus, the Tunnel Alternative will not be considered in the EIS.

2-3 ALTERNATIVES RECOMMENDED FOR STUDY IN THE ENVIRONMENTAL IMPACT STATEMENT

As described above, the Rehabilitation and Tunnel Alternatives are not recommended for further study in the EIS. The following describes the No Build and Replacement Bridge Alternatives, which will be studied in the EIS.

2-3-1 NO BUILD ALTERNATIVE

The No Build Alternative would retain the existing Tappan Zee Bridge in its current configuration with ongoing maintenance, as practicable, to ensure its continued safe use by the traveling public. However, given the age of the bridge and its vulnerabilities in extreme events, it is possible that the crossing could be closed altogether at some point in the future. Although the No Build Alternative does not meet the project’s purpose and need, NEPA requires it be evaluated in the EIS. The No Build Alternative also serves as the baseline condition against which the potential benefits and impacts of the Replacement Bridge Alternative are evaluated.

2-3-2 REPLACEMENT BRIDGE ALTERNATIVE

The Replacement Bridge Alternative would result in a new bridge crossing of the Hudson River between Rockland and Westchester Counties. A number of design parameters have been considered to develop the location and general configuration of the Replacement Bridge Alternative to be studied in the EIS.

2-3-2-1 LOCATION

The planning for the Replacement Bridge Alternative considered a footprint that would maximize the use of existing New York State Thruway Authority (NYSTA) right-of-way while minimizing effects on existing highway infrastructure in Rockland and Westchester Counties. Replacement bridge alignments both north and south of the existing Tappan Zee Bridge were considered. It has been determined that an alignment north of the existing bridge is more prudent for the following reasons:

- There is available NYSTA right-of-way to the north of the existing highway on both sides of the Hudson River to accommodate construction of a new crossing. Sufficient right-of-way is not available on the south side of the existing highway at the Rockland landing.

- A north alignment allows for a straight approach to the Westchester toll plaza. A south alignment would result in a conflict between the new crossing’s horizontal
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curvature and the approach to the toll plaza, which would not meet design and safety standards.

- Construction storage and staging areas are available north of the existing bridge on both sides of the Hudson River. Staging for a southern alignment could require temporary or permanent acquisition of property.

Therefore, the EIS will study a Replacement Bridge Alternative located to the north of the existing Tappan Zee Bridge.

2-3-2-2 GENERAL CONFIGURATION

Section 1, “Purpose and Need,” identified structural, safety, operational, and mobility deficiencies of the existing Tappan Zee Bridge. Design parameters have been developed to identify a general configuration for a Replacement Bridge Alternative that would correct the deficiencies of the existing crossing.

Redundancy

Redundancy is a key consideration for the structural integrity and operational flexibility of a replacement bridge.

Structural redundancy (member redundancy, load path redundancy, and hardening and dispersion) would provide the bridge with the strength to withstand extreme events such as earthquakes, hurricanes, vessel collision, and fires. It would be achieved through a design that would include vertical and horizontal bridge elements that complement and support each other. In this way, the bridge would maintain its structural redundancy throughout the structure even if a single member should fail. Structural redundancy would be achieved through a new bridge that meets current seismic and safety design standards.

Service redundancy would provide the bridge with the ability to maintain traffic flow during both routine maintenance and extreme events. As described in Section 1, “Purpose and Need,” the Tappan Zee Hudson River crossing is a vital link between Rockland and Westchester Counties for 138,000 vehicles per day and is the only interstate crossing for a 48-mile stretch of the Hudson River. A full closure of the bridge would result in major disruption to traffic, long detours, and potentially an hour or more increase in travel time. To that end, the Replacement Bridge Alternative must include provisions to ensure that the crossing is not subject to full closure to the maximum extent feasible.

Twin bridge structures would provide superior operational redundancy as compared to a single structure. In the event that an incident or extreme event would require the closure of one span, the second span could remain open to traffic. At the same time, this redundancy would provide for flexibility in bridge maintenance. With a single bridge, NYSTA must carefully plan and stage maintenance activities to avoid major disruptions to traffic. As a result, repairs often take longer, cost more, and must be more limited in scope than if a temporary closure could be implemented. With two structures, NYSTA would have much greater flexibility in planning for the bridge’s long-term maintenance as well as future contract work and therefore would ensure the structural and operational integrity of this vital link over a longer timeframe.
For these reasons, the EIS will consider a Replacement Bridge Alternative that includes two separate spans across the Hudson River.

Minimum Width

NYSTA would maintain traffic flow across the Hudson River to the maximum extent feasible, even if one of the two bridge spans must be closed. To provide adequate capacity for such short-term traffic operations, a minimum of seven highway lanes would be needed across the river. In order to accommodate this service redundancy, the road deck would need a minimum width of 82 feet to provide for seven, temporary highway lanes in the event that one structure would be inoperable. This minimum dimension would be provided on both of the new spans to achieve this desired feature of the new crossing.

At present, bicycles and pedestrians are prohibited on the Tappan Zee Hudson River crossing although there are existing multi-use trails near the bridge on both sides of the river. To maximize the public investment in a new crossing, the New York State Department of Transportation (NYSDOT) and NYSTA would provide a shared-use (bicycle/pedestrian) path across one of the spans of the replacement bridge. To meet current design standards for the path and to provide adequate separation from traffic lanes, the Replacement Bridge Alternative must provide a minimum of 12 feet of additional width for the shared-use path (including the path, barrier, and a safety buffer); however, 14 feet is currently planned.

To meet these operational requirements, the EIS will consider a Replacement Bridge Alternative with two spans. The span that includes a shared-use path would be 96 feet wide, and the span that does not include the shared-use path would be 82 feet wide.

Gap

To provide adequate clearance to inspect and maintain the superstructure of each of the two new bridge structures, a gap is needed between them. NYSDOT’s bridge design criteria call for a minimum 16-foot gap between parallel bridge structures.

The gap between the two structures would affect the manner in which potential future transit modes could be provided in the corridor. As described in the Section 1, “Purpose and Need,” one of the project’s objectives is to provide a crossing that “does not preclude future trans-Hudson transit services” in the corridor. There are three options that would not preclude future transit on this corridor:

1) Provide the infrastructure for future transit on the new highway bridges without reducing the number of general traffic lanes;
2) Provide the infrastructure for future transit across a third parallel bridge that would be constructed at a later date and would serve as an exclusive right-of-way; or
3) Span the gap between the two new highway bridge structures at a later date to provide the infrastructure for future transit modes.

The implementation of any of these options for future transit modes would require a separate and independent environmental review process when a proposal for transit services is developed and advanced in the future.
Section 2: Alternatives Development and Evaluation

Consistent with and in furtherance of the project’s goal to “maximize the public investment in a new trans-Hudson crossing,” planning for a wider gap between these structures to facilitate the third option for transit service is considered prudent at this time. Therefore, a 42-foot gap would be provided between the highway structures at main span. The gap would narrow as it approaches the landings, but the transit structure could be provided at a lower elevation (i.e., below the highway deck) at these locations.

There would need to be additional strengthening of the initial bridge structures to support any future transit service, at a cost of approximately $200-$300 million. Should implementation of transit occur in the future, construction of transit infrastructure would cost an additional approximately $500-$700 million (in 2012 dollars). This additional strengthening and the future construction of a transit corridor within the gap would be much less expensive than the cost of a new transit bridge over the river, which would cost approximately $2-$3 billion. Furthermore, the additional strengthening would add to the desired robustness of the new structure. Therefore, in support of the project’s goal to “maximize the public investment in a new Hudson River crossing” and to incorporate flexibility for the planning of any future transit service, it is considered appropriate to provide for a 42-foot gap between the new bridge structures.

2-3-2-3 SHORT SPAN BRIDGE VS. LONG SPAN BRIDGE

With consideration of the general configuration as described above, there are two options for the Replacement Bridge Alternative that would meet the structural and operational requirements of a new crossing. These options differ in two basic ways: 1) the distance between their piers (short vs. long); and 2) the potential number of levels of bridge operations (single vs. dual). These options—Short Span and Long Span—are described below.

- The Replacement Bridge Alternative—Short Span Option would be two single-level structures separated by a 42-foot gap at their main spans. Under typical operation, each structure would have four traffic lanes and wide shoulders to facilitate emergency vehicle access. The north bridge structure would serve westbound traffic, and the south bridge structure would serve eastbound traffic. A bicycle/pedestrian path would be provided on the north bridge structure. The north bridge structure would be 94 feet wide and the south bridge structure would be 82 feet wide.

The Short Span option would not preclude future transit service across the Tappan Zee Hudson River crossing.

- The Replacement Bridge Alternative—Long Span Option would be two new truss bridges with two levels each. The dual structures would be separated by a minimum gap of approximately 42 feet at the main span. The northernmost structure would be 96 feet wide. Under normal operations, it would support four westbound lanes and a shared-use (bicycle and pedestrian) path on the upper level. The southernmost structure would be 82 feet wide, and under normal operations, it would support four eastbound lanes. Both structures would include wide shoulders to facilitate emergency access.
The Long Span option would not preclude future transit service across the Tappan Zee Hudson River crossing.

The Short Span and Long Span options each have advantages and disadvantages in terms of engineering, cost, and environmental considerations. The Short Span option is less expensive than the Long Span option. However, it results in more piers in the Hudson River, and therefore, has greater potential for adverse effects on the river. While both options would achieve the desired structural and operational redundancies, the Long Span option would have greater structural strength since it is a dual level bridge. In order to carefully consider their relative advantages and disadvantages of the Short Span and Long Span bridge designs, the EIS will consider both of these options for the Replacement Bridge Alternative.

CONCLUSION

The EIS will consider two options for a Replacement Bridge Alternative—Short Span and Long Span.
Section 3: Environmental Analysis Framework

3-1 INTRODUCTION

Potential environmental, social, and economic impacts of the Tappan Zee Hudson River Crossing Project will be evaluated in an Environmental Impact Statement (EIS). This section describes the analysis framework for the EIS, which will evaluate potential impacts of the project alternatives described in Section 2 of this Scoping Information Packet. This section begins with a description of the environmental review process and permits and approvals needed for the Tappan Zee Hudson River Crossing Project (the “project”), followed by the framework for the analyses to be included in the EIS.

3-2 ENVIRONMENTAL REVIEW PROCESS

3-2-1 NATIONAL ENVIRONMENTAL POLICY REVIEW ACT

The New York State Department of Transportation (NYSDOT) and the New York State Thruway Authority (NYSTA) will be requesting certain approvals from the Federal Highway Administration (FHWA) and other federal agencies for implementation of the project. These federal approvals are subject to environmental review under the National Environmental Policy Act (NEPA). The procedural provisions of NEPA (set forth in 40 CFR §§ 1500-1508) require federal agencies to consider the environmental consequences of their actions, including not only direct and indirect effects, but also cumulative effects.

The project is classified as a NEPA Class I project in accordance with 23 CFR Part 771.115, which requires an EIS to determine the likely impacts a project will have on the environment. As this project involves facilities on an interstate highway, FHWA is serving as the federal lead agency for NEPA review.

The steps in the NEPA process are described below.

- **Notice of Intent.** The EIS process began with publication of a Notice of Intent (NOI) in the Federal Register. The NOI for the project was published in the Federal Register on October 12, 2011.

- **Scoping.** The NOI for this project also includes a notice of scoping, which initiates the public comment period on the scope of the project. This Scoping Information Packet introduces the public to the project and includes a description of its purpose and need, its goals and objectives, alternatives to be considered in the EIS, and the framework of analysis for the EIS. The public is invited to comment on the alternatives under consideration and the scope of analysis for the EIS. The public can provide comments in writing or at the public scoping meetings. FHWA is responsible for ensuring that the EIS responds to all relevant comments on this Scoping Information Packet.
• **Draft Environmental Impact Statement.** Following scoping, a Draft Environmental Impact Statement (DEIS) will be prepared to assess the environmental effects of the project consistent with NEPA and other appropriate regulations and requirements. FHWA will coordinate review by other federal resource agencies during preparation of the DEIS. After FHWA approves the DEIS, a Notice of Availability will be published in the Federal Register, establishing a public review period for the DEIS.

• **Public Review.** The public review of the DEIS includes distribution of the document to government agencies, elected officials, civic and interest groups, and members of the public. FHWA will establish a public comment period for the DEIS. The public comment period will be a minimum of 45 days, and a hearing will be held during the public comment period, at which members of the public can offer oral testimony on the findings of the DEIS. Comments will also be accepted in writing.

• **Final Environmental Impact Statement.** After the public comment period on the DEIS closes, a Final Environmental Impact Statement (FEIS) will be prepared. The FEIS will include the comments and responses on the DEIS and any necessary revisions to the DEIS to address the comments. After it is reviewed by FHWA, the FEIS will be published and a Notice of Availability will be printed in the Federal Register.

• **Record of Decision.** No sooner than 30 days after publishing the FEIS, FHWA will prepare its decision document, known as the Record of Decision (ROD). The ROD will describe the preferred alternative for the project, its environmental impacts, and any required mitigation commitments. The ROD will also respond to any public comments on the FEIS and will provide a process to evaluate any subsequent changes in the project consistent with NEPA. The ROD will conclude the NEPA process.

### 3-2-2 STATE ENVIRONMENTAL QUALITY REVIEW ACT (SEQRA)

In 1975, the New York State legislature enacted the State Environmental Quality Review Act (SEQRA) which requires New York governmental agencies to identify potential environmental effects that would result from their discretionary actions, and to the extent that adverse impacts are identified, avoid or mitigate those impacts to the maximum extent practicable, consistent with social, economic, environmental, and other considerations. State agencies must review their discretionary actions in accordance with SEQRA, unless such actions fall within certain statutory or regulatory exemptions, before undertaking, funding, or approving the actions.

The project is classified as a SEQRA Type I action (6 NYCRR Part 617.4), indicating that it has the potential for environmental impacts that should be evaluated under SEQRA. Therefore, this EIS will also meet the requirements of SEQRA.

In accordance with 6 NYCRR Part 617.15, the NEPA and SEQRA processes are coordinated. Accordingly, when an EIS for an action has been prepared under NEPA, a New York State agency has no obligation to prepare an additional EIS under SEQRA, provided that the NEPA EIS is sufficient to make required SEQRA findings. For all actions under SEQRA, no involved New York State agency may undertake, fund, or approve the action until review under SEQRA is complete and SEQRA findings have been issued.
PERMITS AND APPROVALS

Implementation and construction of the Tappan Zee Hudson River Crossing Project is subject to a number of state and federal permits and approvals in addition to complying with the requirements of NEPA and SEQRA. Where feasible, the permit and approval requirements are being coordinated with the analysis prepared for the EIS. However, there may be additional coordination or documentation prepared to support permits and approvals following the ROD for the Tappan Zee Hudson River Crossing Project. The list below is a summary of the regulatory requirements identified thus far that may be applicable to this project.

- **Clean Air Act and New York State Air Permits (42 USC § 7506(c); 40 CFR Part 93; New York State Environmental Conservation Law (ECL) Article 19; 6 NYCRR Parts 201).** New transportation projects must conform to the applicable State Implementation Plan (SIP).

- **Clean Water Act (33 USC §§ 1251-1387):** The New York State Department of Environmental Conservation (NYSDEC) administers provisions of the Clean Water Act in New York State. Under Section 401 of the Act, any applicant for a federal permit or license for an activity that may result in a discharge to navigable waters must provide to the federal agency issuing a permit a certificate (either from the state where the discharge would occur or from an interstate water pollution control agency) that the discharge would comply with Sections 301, 302, 303, 306, 307, and 316 (b) of the Clean Water Act. Section 404 of the Act requires authorization from the Secretary of the Army, acting through the U.S. Army Corps of Engineers (USACE), for the discharge of any dredged or fill material into waters of the United States. Activities authorized under Section 404 must comply with Section 401 of the Act.

- **Coastal Zone Management Act (16 USC §§ 1451 et seq.; 15 CFR Part 930; New York Executive Law Article 42; 19 NYCRR Part 600).** Projects affecting New York’s coastal zone must be consistent with the Coastal Zone Management Act, through the New York State Department of State’s (NYSDOS) Coastal Management Program and local municipalities’ approved Local Waterfront Revitalization Plans (LWRP). NYSDOS, in consultation with any local municipalities that have adopted an LWRP that could potentially be affected, will make a determination of the project’s consistency with the Coastal Zone Management Act.

- **Eminent Domain Procedures Law:** Any state action that results in property to be acquired through exercise of eminent domain in New York State must be executed in full compliance with the Eminent Domain Procedure Law (EDPL).

- **Endangered Species Act (16 USC §§ 1531-1544; 50 CFR Part 402).** Section 7 of this act requires FHWA to consult with the U.S. Fish and Wildlife Service (USFWS) for projects that may jeopardize threatened or endangered species, or destroy or adversely modify their critical habitats. Coordination with the National Marine Fisheries Service (NMFS) will also be required for this project due to its location in a marine environment.

Address Environmental Justice in Minority Populations and Low-Income Populations,” 62 CFR Part 18377, April 15, 1997). These Orders require that impacts and benefits from a federal transportation project are equitably distributed among all population groups and that minority or low-income areas are not overburdened with the adverse aspects of project alternatives. FHWA is responsible for complying with the Executive Order.

- **Floodplains (Executive Order 11988 of 1977; USDOT Order 5650-2, “Floodplain Management and Protection,” April 23, 1979).** Federal and state agencies must regulate and limit the location of a project in a floodplain to avoid any adverse impacts associated with the occupancy and modification of floodplains. FHWA will make a floodplain determination for the project in accordance with Executive Order 11988.

- **Freshwater Wetlands Law (ECL, Article 24).** A freshwater wetlands permit is required from NYSDEC for any disturbance to state-regulated freshwater wetlands or their associated 100-foot buffer areas.

- **Grant or License of Land Underwater (New York State Public Lands Law § 6-75.7b).** A license or grant may be required from the New York State Office of General Services for use of state-owned land under water.

- **Incidental Take Permit (6 NYCRR Part 182.11).** NYSDEC may issue a permit that authorizes the incidental take of a species listed as endangered or threatened in 6 NYCRR Part 182. An incidental take permit must include an endangered or threatened species mitigation plan that NYSDEC has determined will result in a net conservation benefit to the listed species.

- **Magnuson-Stevens Fishery Conservation and Management Act (16 USC §§ 1801-1884).** This act mandates an identification of Essential Fish Habitat (EFH) for managed aquatic species and requires measures to conserve and enhance the habitat needed by fish carry out their life cycle. The Act requires consultation with the National Oceanic and Atmospheric Administration (NOAA) and NMFS for any effects on EFH.

- **Marine Protection, Research and Sanctuaries Act (16 USC §§ 1431, et seq. and 33 USC §§ 1401, et seq.).** Ocean dumping of dredged material is prohibited by this Act unless a Section 103 permit is issued. Section 103 permits are issued by USACE subject to approval by the U.S. Environmental Protection Agency (USEPA). The USACE District office is responsible for coordination of all federal actions, including USEPA concurrences, pertaining to Section 103 applications.

- **National Historic Preservation Act (16 USC § 470A; 36 CFR Part 800).** Projects potentially affecting historic and archaeological resources must comply with the National Historic Preservation Act Section 106 review process. FHWA is responsible for carrying out the Section 106 review for this project in consultation with the New York State Historic Preservation Officer (SHPO) at the New York State Office of Parks, Recreation and Historic Preservation (OPRHP).

- **Rivers and Harbors Appropriation Act of 1899 (33 USC § 403).** Authorization is required from the U.S. Coast Guard (Section 9 Permit) and the USACE (Section 10
Permit) for the construction of a structure over a navigable waterway of the United States.

**Smart Growth Public Infrastructure Policy Act (ECL § 6-0101 et seq.):** The Smart Growth Public Infrastructure Policy Act was enacted by the State of New York to maximize social, economic, and environmental benefits from public infrastructure development while minimizing adverse impacts related to sprawl. Under this act, no state infrastructure agency shall approve, undertake, support, or finance a public infrastructure project, unless, to the extent practicable, the public infrastructure project is consistent with 10 smart growth infrastructure criteria that are spelled out in §6-0105 of the Act.

**State Pollutant Discharge Elimination System (6 NYCRR Part 750).** A State Pollutant Discharge Elimination System (SPDES) permit will be required for construction since construction would involve more than one acre of land. The applicability of an individual SPDES permit for operation of the proposed bridge will be confirmed through consultation with NYSDEC.

**Tidal Wetlands Law (ECL Article 25).** Under the Tidal Wetlands Act, NYSDEC administers a permit program regulating activities in tidal wetlands and their adjacent areas. NYSDEC requires a permit for almost any activity which will alter the wetlands or the adjacent areas.

**Uniform Relocation and Assistance and Real Property Acquisition Policies Act of 1970 (42 USC § 4601 et seq.):** Federally funded or federally assisted projects that require property acquisition through eminent domain must comply with the Uniform Relocation and Assistance and Real Property Acquisition Policies Act of 1970.

**Wetlands (Executive Order 11990 of 1977; USDOT Order 5660.1A, “Preservation of the Nation’s Wetlands,” August 24, 1978).** Federal and state agencies must avoid the adverse impacts associated with the destruction or modification of wetlands unless there is no practical alternative and all possible measures to minimize harm have been taken. FHWA is required to make a formal wetland finding for major projects.

**U.S. Department of Transportation Act—Section 4(f) (49 USC § 303; 23 CFR Part 771.135).** Section 4(f) prohibits the Secretary of Transportation from approving any program or project that uses any publicly owned land from a public park, recreation area, wildlife and waterfowl refuge, or historic site of national, state, or local significance unless there is no feasible and prudent alternative to the use of such land, and unless the program includes all possible planning to minimize harm to the site or resource. FHWA will make a Section 4(f) finding for this project.

### 3-3 METHODOLOGY

The environmental analysis will consider all potential direct, indirect, and cumulative effects of the project upon the social, economic, and environmental resources within the defined study area.
3-3-1 STUDY AREA

To account for both in-water and upland effects of the project’s construction and operation, a study area has been generally defined as the area along and extending ½ mile north and south of the Interstate 87/287 (New York State Thruway) right-of-way generally between Interchange 10 (U.S. Route 9W) in Rockland County and Interchange 9 (U.S. Route 9) in Westchester County (see Figure 3-1). Some impact assessments are confined to direct areas of disturbance, while others may include a larger area to account for the potential effects on nearby sensitive uses that may be subject to potential impacts from construction or operation of the project.

3-3-2 ANALYSIS YEARS

The EIS will consider both the short-term (construction) and long-term (operational) impacts of the no build and build alternatives.

- **2013-2017—Construction Years.** The short-term (construction) analysis will be undertaken for the period during which bridge construction would occur (2013 to 2017). Where a quantified assessment is prepared for potential construction impacts, a peak period condition will be identified and assessed. For other construction impacts, the EIS will reflect potential effects throughout the construction period.

- **2017—Estimated Time of Completion (ETC) / Opening Year.** The operational and permanent effects of the project alternatives (i.e., build year conditions) will be evaluated in 2017, the anticipated opening year for a new Tappan Zee Hudson River crossing.

- **2047—Estimated Time of Completion +30 (ETC +30) / Long-Term Horizon Year (2047).** Consistent with FHWA and NYSDOT guidance, the EIS will include an assessment of conditions well into the future to determine the long-term impacts of the project on the surrounding built and natural environment.

3-3-3 ASSESSMENT METHODOLOGY AND IMPACT CRITERIA

FHWA and other federal agencies have promulgated specific methodologies and criteria to assess potential environmental effects under NEPA, which would be followed in completion of the technical analyses in the EIS. Where specific criteria are not provided by federal agencies, the EIS will rely on the NYSDOT’s *Environmental Procedures Manual (EPM)*. If no methodology is available either at the federal level or as part of the EPM, then previously approved EISs would be consulted to determine a proper means to evaluate the project alternatives. The individual chapters of the EIS will identify the procedures followed to assess the project and the criteria used to identify its potential impacts.

The general format of each EIS chapter will be as follows:

- Affected Environment: This section will evaluate the existing conditions within the study area, as defined above or as defined specifically for each subject area. This will provide the baseline data on which potential project impacts will be determined.
Section 3: Environmental Analysis Framework

- Environmental Consequences: This section will provide an analysis of potential impacts associated with each project alternative. This section will also consider the no build condition, which describes future conditions without the project.

- Mitigation: Where potential adverse impacts are identified, proposed measures that would avoid, minimize, or mitigate these adverse impacts will be discussed in this section.

3-4 ENVIRONMENTAL ANALYSIS

The subject areas to be evaluated in the EIS are described below. Each chapter of the EIS will focus on potential impacts related to operation (i.e., the post-construction condition) of the project. The construction impacts chapter will identify the potential construction-period (i.e., temporary) impacts on relevant environment resource areas.

3-4-1 TRANSPORTATION

The transportation analysis will include assessments of vehicular traffic (including trucks), marine transport, bicyclists, and pedestrians. The project would not result in increases in peak-direction capacity or long-term operational changes to traffic patterns or transit services. The project is intended to improve traffic safety and operations by creating a Hudson River crossing more consistent with current highway and bridge design standards while also providing structural and operational redundancy.

Existing traffic conditions will be evaluated based on NYSTA, NYSDOT, and Westchester and Rockland County resources, along with data collected in the field, as needed. Traffic forecasts will be based on a recalibrated version of the New York Metropolitan Transportation Council’s (NYMTC’s) Best Practice Model (BPM) for use in the Westchester/Rockland County study area. Since the project would not increase peak-direction capacity, traffic volumes under the build alternative would be essentially unchanged from the no build alternative. Therefore, the build-year analysis will be based on the projected no build traffic volumes.

Construction has the potential to affect movement along the Hudson River shipping channel (to be evaluated in the Construction chapter), but the navigable channel would return to existing conditions once construction is complete. The impact analysis will also evaluate potentially improved movement of goods by truck along the I-87/287 corridor. The analysis will qualitatively assess the potential benefits and impacts of the project on transportation infrastructure and services on and near the project.

Although not required for an interstate highway, a shared bike/pedestrian path would be included with the project to connect existing and future pathways on each side of the Hudson River. The current bridge does not provide a bicycle and pedestrian pathway. Therefore, the analysis will describe proposed changes to the bridge and approaches, including both traffic and pedestrian spaces. This section will also discuss the improved pedestrian and bike trail connectivity between Westchester and Rockland Counties.

3-4-2 COMMUNITY CHARACTER

The community character analysis will evaluate potential impacts related to land use, zoning, public policy, community facilities and services, neighborhood character, and community cohesion. Potential impacts on social groups, neighborhoods, and housing
will be evaluated based on FHWA Technical Advisory T6640.8A. Because the project would replace an existing use, and the majority of upland work would occur within the existing New York State Thruway right-of-way, potential adverse impacts would be primarily short-term during construction. This chapter will analyze whether any existing uses would be permanently displaced or relocated as a direct result of the project. In addition, this chapter will evaluate whether the project would significantly alter community character or affect operation and functionality of any municipal facilities and services. Further, this chapter will analyze compatibility of the project with any local zoning ordinances and any other applicable local or regional public policy documents. As part of this analysis, future development plans and anticipated future public policy actions that would affect land use and development trends in the study area will be described. Mitigation measures to minimize any adverse impacts to land uses or local, state, or regional development plans will be discussed in this chapter.

3-4-3 LAND ACQUISITION, DISPLACEMENT, AND RELOCATION

The project may require acquisition, displacement, permanent easements or relocation of properties as a result of the modified alignment of the proposed bridge approaches. Analysis of these potential impacts will consider provisions of the federal Uniform Relocation and Assistance and Real Property Acquisition Policies Act of 1970 (42 U.S.C. 4601) and the New York State Eminent Domain Procedures Law (EDPL). This chapter will evaluate potential impacts related to permanent land acquisition or displacement. The number and type of acquisitions will be identified, including both partial and complete property takings. GIS data will be used to the extent possible, with confirmations obtained through field verifications and through correspondence with local assessors’ offices, as necessary. Feasibility and potential impacts of relocating displaced land uses will be assessed. This chapter will describe efforts to avoid or minimize land acquisition and provide a discussion of additional mitigation measures as appropriate.

3-4-4 PARKLANDS AND RECREATIONAL RESOURCES

This chapter will evaluate potential effects on parklands and recreational resources in the study area, including the Hudson River. Potential impacts may include displacement of a recreational resource or change in character of a recreational use. Any mitigation measures to minimize or avoid adverse impacts will be discussed. This chapter will describe any future local or regional parkland enhancement plans or planned recreational projects (e.g., trailways, parks, etc.) within the affected environment and how the project would affect those initiatives. This chapter will also describe any planned pedestrian or bike paths on the proposed bridge that would improve connectivity between parks and areas of open space. Considerations associated with federal regulations established under Section 4(f) of the U.S. Department of Transportation Act will be identified in this chapter and discussed further in the Section 4(f) Evaluation.

3-4-5 SOCIOECONOMIC CONDITIONS

The analysis of socioeconomic conditions will assess potential impacts related to population and employment characteristics of the study area. This chapter will be based on guidance from FHWA’s Environmental Toolkit and NYSDOT’s Project Development Manual. Potential impacts on community demographics and housing will be evaluated
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Based on FHWA Technical Advisory T6640.8A. Demographic and economic information for the study area will be based on data from the most recent available U.S. Census, resources from the New York State Department of Labor (NYSDOL), and projections from NYMTC.

This chapter will evaluate potential socioeconomic impacts on both a local and regional scale. Potential adverse impacts as well as potential economic benefits from the project will be discussed. Adverse impacts to local businesses may result from changes in travel patterns that discourage patrons, particularly during construction. Benefits may include employment for construction workers as well as increased patronization to local businesses from construction workers. As part of the impacts analysis, potential effects on jurisdictions’ tax bases as result of land acquisitions and displacement of businesses or individuals will be evaluated. Any potential for induced economic growth as result of the project will be discussed. Appropriate mitigation measures to minimize any identified adverse economic impacts will be presented in this chapter.

3-4-6 VISUAL RESOURCES

The project may result in the replacement of an existing bridge in a similar alignment, although the new bridge would have a different appearance, thereby altering the visual character of a bridge that has been a prominent fixture in the existing viewscape. The effect of the change in the structure on the surrounding visual environment, and whether it may affect or block views to existing visual resources, will be evaluated. A visual resource analysis will be conducted pursuant to the guidelines of USDOT for visual analysis under NEPA. The visual analysis will follow guidelines suggested by USDOT/FHWA Technical Advisory T6640.8A (October 30, 1987), FHWA recommended procedures cited in Guidance Material on the Preparation of Visual Impact Assessments (1986), and the NYSDOT Engineering Bulletin (EB) 03-052.

The existing environment of each visible project element and its surrounding study area will be described. Existing visual resources and important view corridors or viewsheds in the study area will be identified, and existing views toward any potentially visible project elements from surrounding neighborhoods will be discussed. Topography, vegetation, and existing buildings and structures will be taken into consideration, and viewer groups and duration of views will be identified. The existing visual character of the study area will be captured through use of photographs and other graphics, as needed.

Major viewer groups and different levels of sensitivity will be evaluated, such as commuters from the highway, or residents with views of the highway. A Visual Impacts Assessment (VIA) will be prepared based on NYSDOT’s visual assessment policy (Engineering Instruction 02-025 and Engineering Bulletin 03-052). The VIA will consider visual significance based on the quality of a resource, duration of views, and sensitivity of viewer groups. Photo-simulations and other graphics will be used, as needed, to demonstrate potential visual impacts. If potential negative impacts are identified, appropriate and feasible mitigation measures to reduce those impacts will be discussed.
3-4-7  HISTORIC AND CULTURAL RESOURCES

This chapter will focus on two primary areas of study: historic resources and archaeological resources.

3-4-7-1  HISTORIC RESOURCES

The analysis of historic resources will be undertaken in accordance with Section 106 of the National Historic Preservation Act (NHPA) (regulations at 36 CFR Part 800 – Protection of Historic Properties) and Section 4(f) of the U.S. Department of Transportation Act (regulations at 23 CFR Part 774 – Parks, Recreation Areas, Wildlife and Waterfowl Refuges, and Historic Sites). The New York State Historic Preservation Office (NYSHPO) is the implementing agency of Section 106 in New York State. Section 4(f) is discussed further in the Section 4(f) Evaluation chapter.

Section 106 of the NHPA of 1966 requires that federal agencies consider the effects of their actions on properties listed on or determined eligible for listing in the State and National Registers of Historic Places (S/NR). The applicant will undertake a formal consultation under Section 106 to solicit input from the NYSHPO to identify the potential adverse effects of the project and to develop measures to avoid, minimize, or mitigate any adverse effects.

An Area of Potential Effect (APE) for historic resources will be established in consideration of direct and indirect impacts. This chapter will identify any locally, state, and federally designated historic and architectural resources within the project’s APE, including resources listed on or determined eligible for listing in the S/NR. Locally-designated resources will be identified through consultation with affected municipalities. The historic resources survey and screening will be performed in accordance with the standards of Section 106 as well as the New York State Education Department (NYSED) Cultural Resources Survey Program Work Scope Specifications for Cultural Resource Investigations on NYSDOT Projects (March 2004). In addition, any known architectural resources designated or determined eligible for listing as a National Historic Landmarks (NHL) will be identified. This chapter will evaluate potential impacts to any historic resources, including direct impacts (e.g., demolition, alteration, or damage from construction), indirect impacts (e.g., change in setting or character of the surrounding area), and cumulative impacts. The historic status of the existing Tappan Zee Bridge will be discussed as well as any potential adverse effects related to its removal. Mitigation measures to minimize any potential adverse effects to historic resources will also be discussed in this chapter.

3-4-7-2  ARCHAEOLOGICAL RESOURCES

This section of the Historic and Cultural Resources chapter will identify any potentially sensitive archaeological resources in the archaeological APE. The APE will be based on the expected limits of disturbance of the project. The APE will include both upland areas as well as affected portions of the Hudson River where any archaeological resources may be submerged. In addition to complying with regulations implementing Section 106 and Section 4(f), the archaeological assessments and surveys will be conducted pursuant to the standards of the NYSED Cultural Resources Survey Program Work Scope Specifications for Cultural Resource Investigations on NYSDOT Projects (March 2004).
Archaeological resources will be identified through Phase IA archaeological surveys, as well as Phase IB surveys, if necessary. Further archaeological testing and analysis will be conducted based on the outcome of the initial surveys and as design of the project progresses. Potential adverse effects will be assessed in consultation with the NYSHPO, Tribal Government Organizations, and other Section 106 consulting parties. If any areas of archaeological sensitivity could be disturbed by the project’s construction, measures to minimize or mitigate these potential adverse effects will be identified.

3-4-8 AIR QUALITY

NEPA requires an assessment of potential impacts on air quality to demonstrate compliance with the Clean Air Act, including State Implementation Plans. The air quality analysis will follow guidance from the USEPA, NYSDOT’s EPM, and NYSDOT’s Environmental Science Bureau (ESB). The analysis will consider the potential impacts and benefits of the project on air quality and examine whether the project could result in any new exceedances of or any exacerbation in any existing exceedances of National Ambient Air Quality Standards (NAAQS). Since the project would not involve an increase in peak-direction capacity, an analysis for microscale carbon monoxide (CO) and particulate matter (PM$_{2.5}$ and PM$_{10}$) will focus on the new bridge alignment and approach roadways in Westchester and Rockland Counties. This analysis will be conducted for the project’s estimated time of completion (ETC) and ETC+30. Mitigation measures to reduce or avoid any air quality impacts will be described in this chapter.

3-4-9 NOISE AND VIBRATION

While the project would not result in any substantive changes to traffic patterns or volumes, the change in the bridge alignment may affect ambient noise levels at sensitive receptors in close proximity to the bridge approaches. The noise and vibration analysis will be conducted in accordance with the most recent Noise Impact Assessment Protocol adopted by the NYSDOT ESB, 23 CFR 772 (Procedures for Abatement of Highway Traffic Noise and Construction Noise, July 2010), and FHWA’s Highway Traffic Noise: Analysis and Abatement Guidance (January 2011).

This chapter will describe existing ambient noise in the study area based on measurements at sensitive receptors adjacent to the roadway. Existing and future noise conditions will be evaluated using the FHWA Traffic Noise Model (TNM). The impact assessment will be based on 2047 traffic volumes with and without the new proposed bridge alignments. Mitigation measures for any noise impacts, including a noise wall analysis, will be conducted and discussed in this chapter.

3-4-10 ENERGY AND CLIMATE CHANGE

This assessment will include a qualitative discussion of the potential benefits and/or impacts on energy consumption and greenhouse gas emissions. It will include a discussion of energy consumption and greenhouse gas production for both marine and vehicular traffic over the long-term operational phase of the project. Direct energy consumption associated with vehicle operations will be estimated based on forecasts of vehicle miles traveled. Indirect energy consumption during construction will also be estimated. The analysis will be consistent with NYSDOT guidance. Mitigation measures to minimize or avoid any adverse impacts will be discussed in this chapter.
3-4-11 TOPOGRAPHY, GEOLOGY, AND SOILS

This chapter will examine the existing topographic, geologic, and soil characteristics of the study area and potential impacts associated with these features. Many of the geologic and soils considerations are related to construction, which will be discussed more fully in the Construction chapter. This analysis will include a discussion of geologic and soil characteristics in terms of their suitability for construction, the quantity of earth material to be exported (including bedrock), permanent regrading or disturbance to steep slopes, and mitigation measures that would reduce any potential adverse effects. Sources for this analysis will include the U.S. Geological Survey (USGS), the New York State Museum (NYSM), the Natural Resources Conservation Service (NRCS), and local government.

3-4-12 WATER RESOURCES

The Water Resources chapter will analyze issues related to surface water and groundwater resources (including aquifers), floodplains, and stormwater runoff. The analysis of impacts to water resources will consider regulations pursuant to all applicable state and federal statutes including the Clean Water Act (CWA) and the New York State Environmental Conservation Law (ECL). A list of anticipated permits and approvals required is provided in Section 3-1-1 above.

Existing water resources and quality classifications will be identified and described based on data from NYSDEC, the USACE, the USEPA, and field investigations, as needed. Floodplain mapping will be based on Flood Insurance Rate Maps (FIRMs) prepared by the Federal Emergency Management Agency (FEMA).

Evaluation of potential impacts to water resources will include analysis of direct permanent disturbance resulting from construction of the project, sediment scouring around bridge piers, and potential water quality impacts related to stormwater runoff from new impervious surfaces. The effect of stormwater runoff on both upland water resources and the Hudson River will be assessed. This chapter will describe post-development stormwater runoff volumes, potential pollutant loading quantities, and potential erosion and sedimentation concerns. Any mitigation measures to attenuate and treat stormwater runoff will be described in this chapter. As applicable, a conceptual Stormwater Pollution Prevention Plan (SWPPP) will be discussed in this chapter, and measures detailed to minimize any water quality impacts will be summarized in the Water Resources chapter.

3-4-13 ECOLOGY

The Ecology chapter will assess potential impacts to freshwater and tidal wetlands, terrestrial vegetation and wildlife habitat, aquatic wildlife and habitat, and threatened and endangered species. This chapter will consider the project's location within a sensitive estuarial ecosystem and will discuss all mitigation measures aimed at minimizing adverse impacts. The greatest potential for impacts is expected to be associated with the construction period.

Identification and evaluation of upland and aquatic ecological resources will be conducted through coordination with NYSDEC and its Natural Heritage Program (NHP), the USFWS, NMFS, the USACE, and any other applicable agencies. Anticipated permits associated with these agencies are listed in Section 3-1-1 above.
Existing conditions will be confirmed with field surveys, as necessary. An Essential Fish Habitat (EFH) assessment per the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) and a Section 7 Biological Assessment (BA) for Atlantic and shortnose sturgeon performed through consultation with NMFS, as required, will be summarized in this chapter. Any potential impacts to ecological resources and proposed mitigation measures to reduce or avoid any adverse impacts will also be discussed in this chapter.

3-4-14 HAZARDOUS AND CONTAMINATED MATERIALS

Standards for identifying potential hazardous and contaminated materials concerns have been established in the American Society for Testing and Materials (ASTM) Standard E1527-05, entitled Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process (ASTM E1527). The hazardous and contaminated materials analysis will summarize results of a database review and any previous studies or investigations in the area to document any hazardous or contaminated soils or substances within the proposed area of construction, including within the existing bridge. The EIS will identify protocols and measures to be undertaken during construction to avoid adverse effects on human health from project-related exposure to hazardous materials. Handling requirements for potentially hazardous or contaminated materials will be identified, which will outline the procedure for removal of these substances during construction.

3-4-15 CONSTRUCTION EFFECTS

Construction impacts, though temporary, can result in adverse impacts to surrounding areas. The primary significant impacts related to construction activities are typically traffic, noise, air quality, and disturbance of contaminated materials.

The analysis will be based on certain assumptions made in consultation with the contracting community and will include a schedule of construction activities, estimated number of workers on-site, the number of truck trips to and from the site by type of truck, and the number and types of equipment being used on-site, as well as the location of construction activities. In addition, the quantity of marine traffic (barges, tugs, etc.) associated with construction of the proposed bridge will also be evaluated. The analysis will account for the various types of equipment, the size and type of the engines, the time of use, and any unusual features of the equipment. Measures to avoid, minimize and/or mitigate potential impacts will also be included. The construction chapter will evaluate the potential construction impacts on all subject areas covered in the EIS, as applicable, including the following.

- **Transportation:**
  - **Vehicular Traffic.** This assessment will consider traffic related to construction workers and deliveries, taking into account the time of day that construction traffic would be greatest. Potential impacts related to any road closures will be identified and evaluated. Mitigation measures to avoid any traffic impacts will be discussed. This analysis will also provide a description of how traffic flow will be maintained along the bridge and approaches during construction.
  - **Marine Traffic.** It is expected that a portion of supplies will be delivered by barge or ship. In addition, the majority of construction work would occur in or
above the Hudson River. This section will analyze the number of barges/tugs/boats expected and potential impacts related to the Hudson River’s role as an important navigational waterway in the Northeast.

- **Community Character:** This section will discuss potential temporary construction impacts related to land use, neighborhood character, community facilities, and public policy. Mitigation measures to minimize or avoid any adverse impacts will be described.

- **Land Acquisition, Displacement, and Relocation:** This section will describe any potential temporary easements or land takings that would be required during construction. Potential impacts associated with temporary land acquisition will be discussed. Mitigation measures to minimize or avoid any adverse impacts will be described.

- **Parklands and Recreational Resources:** A discussion of potential impacts to parklands and recreational resources during the construction period will be included in this section. Mitigation measures to minimize or avoid any adverse impacts will be described.

- **Socioeconomic Conditions:** This section will evaluate potential economic impacts (both adverse and beneficial) that would result from construction. Economic impacts based on construction cost estimates will be assessed using the IMPLAN model. The analysis will include a discussion of potential employment during construction and potential impacts on local businesses. Mitigation measures to minimize or avoid any adverse impacts will be described.

- **Visual Resources:** The potential for construction of the project to affect important views and visual resources in the study area will be evaluated in this section. Mitigation measures to minimize or avoid any adverse impacts will be described.

- **Historic and Cultural Resources:** Potential construction-period impacts on historic resources will be considered. Historic resources within and adjacent to the project site will be evaluated for their sensitivity to potential adverse impacts from construction vibrations, as well as visual-related impacts associated with construction activities. Mitigation measures to minimize or avoid any adverse impacts will be described.

- **Air Quality.** An air quality analysis will be conducted to determine the potential for air quality impacts due to construction activities for the project, including construction traffic (mobile sources) on local roadways. The analysis of emissions within the construction zone will be quantitative and based on peak equipment usage and reasonable worst-case meteorological conditions.

Air pollutant sources include combustion exhaust associated with non-road engines (e.g., cranes) and on-road engines operating on-site (concrete delivery trucks), as well as on-site activities that generate fugitive dust (e.g., excavation, demolition). The pollutants of concern will include carbon monoxide (CO), particulate matter (PM), and nitrogen dioxide (NO2). The ambient concentrations of each pollutant will be determined for peak construction periods based on an emissions profile. The potential for impacts will be determined by a comparison of the predicted total concentrations to the NAAQS, and by comparison of the predicted increase in
concentrations to applicable federal, state, and local thresholds. The air quality analysis will also include a discussion of strategies to reduce project-related air pollutant emissions associated with construction activities and any potential mitigation measures that can be applied during the construction period.

- **Noise and Vibration.** Noise generated from the construction activity on nearby sensitive receptors will be determined utilizing the FHWA’s RCNM and the CadnaA model. Based on a review of construction plans, sensitive receptor locations will be identified for impact assessment. At each location, reasonable worst-case noise from construction activities will be determined. Construction noise impacts will be assessed using relevant federal and state guidance. Mitigation measures to minimize or avoid any adverse impacts will be described.

- **Energy and Climate Change:** Following NYSDOT guidance, this section will include an evaluation of energy consumed for construction and greenhouse gas production. Any mitigation measures to reduce or avoid any potential adverse impacts related to energy consumption and greenhouse gas emissions will be discussed.

- **Topography, Geology, and Soils:** Potential impacts to topography, geology, and soils during construction are primarily related to soil erosion and stabilization. Any potential impacts as well as any appropriate mitigation measures will be discussed in this section.

- **Stormwater and Water Resources.** Potential water quality impacts will be considered. This discussion will include an analysis of stormwater runoff, potential erosion and sedimentation, and turbidity of the Hudson River related to construction activities. Any measures to avoid or minimize any water quality impacts will be described, including a conceptual level SWPPP in accordance with NYSDEC requirements.

- **Ecology.** Because of the sensitive estuarial marine environment in the area of the existing and proposed bridge, a detailed assessment of potential impacts to fish and other aqua-fauna and flora will be included in the Construction chapter. Hydro-acoustic impacts from pile driving, dredging, and habitat disturbance will be among the areas of focus. Mitigation measures that can be implemented to minimize or avoid any adverse impacts to sensitive ecological resources will be described.

- **Hazardous Materials.** In coordination with the work performed for hazardous materials, above, actions to be taken during project construction (including deconstruction of the existing Tappan Zee Bridge) to limit exposure of construction workers to potential contaminants will be summarized. Mitigation measures to minimize or avoid any adverse impacts will be described.

### 3-4-16 ENVIRONMENTAL JUSTICE

Pursuant to Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations (February 11, 1994), and in accordance with the Council on Environmental Quality (CEQ) and USDOT guidance, an environmental justice analysis will be prepared to identify and address any disproportionate and adverse impacts on minority or low-income populations that could result from the
Demographic and economic characteristics will be based on the most recent available U.S. Census data and any other applicable sources.

This analysis will first identify whether there are environmental justice communities in the vicinity of the project. The analysis will then examine the potential effects of the project for the full range of environmental topic areas and determine whether the project would result in disproportionately high direct or indirect effects on minority and low-income populations. Potential mitigation measures to minimize or avoid adverse impacts to these communities will also be discussed in this chapter.

3-4-17 COASTAL ZONE MANAGEMENT

This chapter will address the project’s compliance and compatibility with the Coastal Zone Management Act of 1972 (CMZA), administered in New York State by NYSDOS, due to the project’s location within the New York State Coastal Boundary. Consistency with coastal management policies will be evaluated based on the New York State Department of State Coastal Zone Management Program Federal Consistency Assessment Form. This chapter will also identify any LWRPs established under the Waterfront Revitalization and Coastal Resources Act of 1981 that are within the vicinity of the study area and evaluate the project’s consistency with these municipal waterfront planning initiatives. Any potential adverse impacts and measures that will be taken to mitigate these impacts will be discussed in this chapter.

3-4-18 INDIRECT AND CUMULATIVE EFFECTS

CEQ regulations (40 CFR Part 1500-1508) define indirect impacts as those that are “caused by an action and are later in time or farther removed in distance, but are still reasonably foreseeable.” Generally, these impacts are induced by a project. Indirect effects can occur within the full range of impact areas, such as changes in land use, economic conditions, traffic congestion, air quality, noise, vibration, and water and natural resources. This chapter will evaluate any indirect effects, both adverse and beneficial, that may occur as a result of the project. Because the project would replace an existing use and would not increase peak-direction capacity, there are not expected to be any induced growth effects.

NEPA also requires consideration of cumulative effects of a project. Cumulative impacts may result from the incremental consequences of an action when added to other past and reasonably foreseeable future actions (40 CFR 1508.8). The analysis will address cumulative impacts to both environmental resources and socioeconomic conditions that could be potentially affected by the project in combination with other reasonably foreseeable projects.

3-4-19 OTHER NEPA CONSIDERATIONS

In accordance with NEPA guidelines, this chapter will analyze Unavoidable Adverse Impacts and the Irreversible and Irretrievable Commitment of Resources as well as Short-term Uses versus Long-term Productivity. Unavoidable impacts would result when there are no feasible or practical project alternatives that would avoid certain impacts. Irreversible and irretrievable commitment of resources will occur as some human and environmental resources would be committed to the project and would remain unavailable for future use. Such resources would include manpower and labor hours, materials used in construction, etc.
3-4-20 SECTION 4(f) EVALUATION

Section 4(f) of the U.S. Department of Transportation Act of 1966 prohibits the Secretary of Transportation from approving any program or project that uses any publicly owned land from a public park, recreation area, wildlife and waterfowl refuge, or historic site of national, state, or local significance unless there is no feasible and prudent alternative to the use of such land, and unless the program includes all possible planning to minimize harm to the site or resource. A Section 4(f) evaluation will be prepared and will build on the findings in the Historic and Cultural Resources chapter, as well as the Parks and Recreational Resources chapter. In compliance with Section 4(f), this evaluation will assess potential impacts to any publicly owned parks and recreation lands, wildlife refuges, and historic sites that are afforded protection under said act. Where Section 4(f) resources are identified, the evaluation will discuss whether there are any feasible or prudent project alternatives that would avoid use of affected properties. Where prudent or feasible alternatives for avoidance of a resource cannot be identified, the evaluation will identify all possible planning efforts to minimize harm to the resource.
Section 4: Public Involvement and Agency Coordination

4-1 INTRODUCTION

Public involvement is an integral part of the transportation planning process. Accordingly, the goal of the public and agency involvement program for the Tappan Zee Hudson River Crossing Project is to ensure open, collaborative, and meaningful public and agency participation throughout the environmental review process.

The public and agency participation efforts for this project have been developed in compliance with legislation and policies that guide public involvement in project development, including but not limited to the following:

- National Environmental Policy Act of 1969 (NEPA), which requires federal agencies to conduct the environmental review process in coordination with the public and with other agencies;
- Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) of 2005, which broadened public and agency involvement guidance set forth in the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and the Transportation Equity Act for the 21st Century (TEA-21);
- Section 106 of the National Historic Preservation Act (NHPA) of 1966, 16 USC § 470(A); and
- Executive Order 12898 of 1994 (“Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations”).

4-2 SAFETEA-LU AGENCY COORDINATION

4-2-1 PURPOSE OF COORDINATION PLAN

Section 6002 of SAFETEA-LU increases opportunities for the public and federal, state, and local agencies to have active and early involvement in the NEPA process and to get input on the project’s Purpose and Need, environmental study methodology, and alternatives under consideration. Section 6002 requires the development of a coordination plan for all highway and transit projects for which an Environmental Impact Statement (EIS) is being prepared under NEPA. Accordingly, the lead federal agency (the Federal Highway Administration [FHWA]) and the state sponsors, the New York State Department of Transportation (NYSDOT) and New York State Thruway Authority (NYSTA), have prepared this coordination plan to describe the process and communication methods they will follow to disseminate information about the project, as well as to solicit and consider input from the public and other agencies. The coordination plan will be in effect throughout the environmental review process, beginning with scoping and ending with the Record of Decision. The plan is a flexible, “living” document that can be amended as needed as the project progresses.
FHWA will identify and invite appropriate federal agencies and NYSDOT and NYSTA will identify and invite New York State agencies to participate in the Section 6002 process by serving as cooperating or participating agencies. According to Council on Environmental Quality (CEQ) regulations (40 CFR § 1508.5), “cooperating agency” means any federal agency, other than a lead agency, that has jurisdiction by law or special expertise with respect to any environmental impact involved in a proposed project or project alternative. “Participating agencies” are those federal, state, or local agencies or federally recognized Native American tribes (Tribal Government Organizations; TGOs) with an interest in the project. Cooperating agencies are participating agencies, though not all participating agencies are cooperating agencies. Cooperating and participating agencies are responsible for identifying, as early as practicable, any issues of concern regarding the project’s potential environmental or socioeconomic impacts that could substantially delay or prevent an agency from granting a permit or other approval. Meetings will be held with the agencies throughout the environmental review process to update them on the status of the project and discuss other topics as appropriate.

4-2-2 PROJECT HISTORY
See Section 1, “Purpose and Need,” of this Scoping Information Packet for a detailed history of the project.

4-2-3 KEY RESOURCE CONCERNS
As discussed previously in Section 3, the EIS will contain an analysis of the project’s potential impacts on a wide range of social, environmental and economic considerations. The following topics have the potential to affect the project schedule:

- Hudson River Ecology;
- Water Quality;
- Navigable Waters;
- Historic and Archaeological Resources;
- Air Quality;
- Noise and Vibration; and
- Construction Impacts.

4-2-4 METHODOLOGY
Section 3, “Environmental Analysis Framework,” of this Scoping Information Packet provides an overview of the methodology of the environmental analyses to be conducted for and documented in the EIS.

4-2-5 LEAD/COOPERATING/PARTICIPATING AGENCIES
As described above, SAFETEA-LU provides for enhanced coordination of public and agency participation in the NEPA process. Table 4-1 lists the agencies that will be invited to be involved in the SAFETEA-LU Section 6002 process for this project as either a cooperating agency or participating agency, along with the reason for their requested involvement. These tables will be updated as necessary upon receipt of confirmations of either cooperating or participating status by the invited agencies.
## Section 4: Public Involvement and Agency Coordination

### Table 4-1
Lead and Cooperating Agencies

<table>
<thead>
<tr>
<th>Agency</th>
<th>Role</th>
<th>Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal Highway Administration (FHWA)</td>
<td>Lead Agency</td>
<td>Manage environmental review process; prepare EIS and decision document; provide opportunity for public and agency involvement, arbitrate and resolve issues</td>
</tr>
<tr>
<td>New York State Department of Transportation (NYSDOT)</td>
<td>Project Sponsor</td>
<td>Manage environmental review process; prepare EIS and decision document; provide opportunity for public and agency involvement, arbitrate and resolve issues</td>
</tr>
<tr>
<td>New York State Thruway Authority (NYSTA)</td>
<td>Project Sponsor</td>
<td>Manage environmental review process; prepare EIS and decision document; provide opportunity for public and agency involvement, arbitrate and resolve issues</td>
</tr>
</tbody>
</table>
| New York State Department of Environmental Conservation (NYSDEC) | Cooperating Agency | Provide comments on:  
  - Purpose and Need  
  - Range of Alternatives  
  - Methodologies  
  - Level of detail for analysis of alternatives  
  - Identification of issues that could substantially delay or prevent granting of permit/approval.  
  - Opportunities for collaboration  
  - Mitigation  
  New York State environmental permits |
| United States Coast Guard (USCG)             | Cooperating Agency | Provide comments on:  
  - Purpose and Need  
  - Range of Alternatives  
  - Methodologies  
  - Level of detail for analysis of alternatives  
  - Identification of issues that could substantially delay or prevent granting of permit/approval.  
  - Opportunities for collaboration  
  - Mitigation  
  Section 9 Bridge Permit; Responsible for navigation in the Hudson River |
| United States Army Corps of Engineers (USACE) | Cooperating Agency | Provide comments on:  
  - Purpose and Need  
  - Range of Alternatives  
  - Methodologies  
  - Level of detail for analysis of alternatives  
  - Identification of issues that could substantially delay or prevent granting of permit/approval.  
  - Opportunities for collaboration  
  - Mitigation  
  Section 103 of Marine Protection, Research and Sanctuaries Act; Section 404 Permit; Section 10 Rivers and Harbors Act Permit |
| US Fish and Wildlife Service (USFWS)         | Cooperating Agency | Provide comments on:  
  - Purpose and Need  
  - Range of Alternatives  
  - Methodologies  
  - Level of detail for analysis of alternatives  
  - Identification of issues that could substantially delay or prevent granting of permit/approval.  
  - Opportunities for collaboration  
  - Mitigation  
  Participate in the federal review of the Section 404/10 Corps Permits. |
<table>
<thead>
<tr>
<th>Agency</th>
<th>Role</th>
<th>Responsibilities</th>
</tr>
</thead>
</table>
| National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS) | Cooperating Agency | Provide comments on:  
- Purpose and Need  
- Range of Alternatives  
- Methodologies  
- Level of detail for analysis of alternatives  
- Identification of issues that could substantially delay or prevent granting of permit/approval.  
- Opportunities for collaboration  
- Mitigation  
Consultation on Endangered Species Act and Essential Fish Habitat; Incident Take Statement; Participate in the federal review of the Section 404/10 Corps Permits. |
| US Environmental Protection Agency (EPA) | Cooperating Agency | Provide comments on:  
- Purpose and Need  
- Range of Alternatives  
- Methodologies  
- Level of detail for analysis of alternatives  
- Identification of issues that could substantially delay or prevent granting of permit/approval.  
- Opportunities for collaboration  
- Mitigation  
Section 309 of the Clean Air Act; Participate in the federal review of the Section 404/10 Corps Permits. |
| New York State Office of Parks, Recreation and Historic Preservation (SHPO) (Section 106 Consulting Party) | Cooperating Agency | Provide comments on:  
- Purpose and Need  
- Range of Alternatives  
- Methodologies  
- Level of detail for analysis of alternatives  
- Identification of issues that could substantially delay or prevent granting of permit/approval.  
- Opportunities for collaboration  
- Mitigation  
Responsible for Section 106 review pursuant to National Historic Preservation Act and Section 14.09 review pursuant to the New York State Historic Preservation Act. |
| New York State Department of State (NYSDOS) | Cooperating Agency | Provide comments on:  
- Purpose and Need  
- Range of Alternatives  
- Methodologies  
- Level of detail for analysis of alternatives  
- Identification of issues that could substantially delay or prevent granting of permit/approval.  
- Opportunities for collaboration  
- Mitigation  
Responsible for review pursuant to the Coastal Zone Management Act. |
| New York State Office of General Services | Cooperating Agency | Provide comments on:  
- Purpose and Need  
- Range of Alternatives  
- Methodologies  
- Level of detail for analysis of alternatives  
- Identification of issues that could substantially delay or prevent granting of permit/approval.  
- Opportunities for collaboration  
- Mitigation  
Responsible for Grant of Lands Under Water. |
Section 4: Public Involvement and Agency Coordination

In addition, as part of the coordination plan, FHWA and the project sponsors will be inviting agencies to become participating agencies. In accordance with SAFETEA-LU Section 6002, participating agencies are defined as any federal, state or local agency or Native American tribe that has an interest in the project.

Agencies will identify a contact person or decline in writing. In accordance with SAFETEA-LU Section 6002, cooperating agencies are also participating agencies. Any agency that is invited to be a cooperating or participating agency but does not respond will have the opportunity to provide comments with the public. The participating agency list will be developed and updated as needed throughout the duration of the project. In addition, a cooperative agreement will be drafted and signed by all cooperating agencies.

4-2-6 COORDINATION POINTS AND COMPLETION DATES

SAFETEA-LU establishes milestones within the environmental review process for involvement and review opportunities. Table 4-2 summarizes key coordination points and project milestones. Anticipated completion dates are included for informational and resource planning purposes. Timeframes and review periods are established in accordance with SAFETEA-LU unless covered under existing agreements (i.e. review periods established in the NYSDOT/FHWA/SHPO Section 106 Agreement). Note that this table documents activities related to the release of the revised NOI and SAFETEA-LU compliance. It does not document historic project activities.

<table>
<thead>
<tr>
<th>Coordination Point</th>
<th>Anticipated Completion Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notice of Intent Publication</td>
<td>October 12, 2011</td>
</tr>
<tr>
<td>Scoping Information Packet Publication</td>
<td>October 13, 2011</td>
</tr>
<tr>
<td>Development of purpose and need</td>
<td>November 15, 2011</td>
</tr>
<tr>
<td>Identification of the range of alternatives.</td>
<td>November 15, 2011</td>
</tr>
<tr>
<td>Collaboration on methodologies</td>
<td>November 15, 2011</td>
</tr>
<tr>
<td>Completion of the DEIS</td>
<td>January 2012</td>
</tr>
<tr>
<td>Identification of the preferred alternative and the</td>
<td>June 2012</td>
</tr>
<tr>
<td>level of design detail</td>
<td></td>
</tr>
<tr>
<td>Completion of FEIS</td>
<td>July 2012</td>
</tr>
<tr>
<td>Completion of the ROD</td>
<td>August 2012</td>
</tr>
<tr>
<td>Completion of permits, licenses, or approvals after</td>
<td></td>
</tr>
<tr>
<td>the ROD.</td>
<td>August 2012</td>
</tr>
</tbody>
</table>

4-3 SECTION 106 COORDINATION

Section 106 of the National Historic Preservation Act (NHPA; 36 CFR § 800) requires federal agencies to take into account the effects of their undertakings on historic properties that are listed in or meet the eligibility criteria for listing in the National Register of Historic Places (NRHP). The Section 106 process has a specific public involvement component. In particular, regulations require that FHWA, in consultation
with the New York State Historic Preservation Officer (NYSHPO) and TGOs, as applicable, identify appropriate points for seeking public input and for notifying the public of the proposed actions associated with the Tappan Zee Hudson River Crossing Project. The regulations also require that the lead agency seek and consider the views of the TGOs, NYSHPO, and the public in a manner that reflects the nature and complexity of the project and its effects on historic properties. The lead agency must provide the public with information about the project and its effects on historic properties, and seek public comment and input. Public outreach for purposes of NEPA can be used to satisfy the public involvement requirements under Section 106, as long as the NEPA document contains adequate information about the project’s effects on historic properties.

Furthermore, Section 106 requires that agency officials work with NYSHPO to identify parties to participate in the Section 106 process (“Consulting Parties”). Consulting Parties may include local governments, federally recognized Indian tribes, and individuals and organizations with a demonstrated interest in the project due to the nature of their legal or economic relation to the project or affected historic properties, or their concern with the project’s effects on historic properties. The project will invite appropriate entities to participate in the project as Consulting Parties, in addition to NYSHPO and the Advisory Council on Historic Preservation (ACHP), and will hold project status update and other meetings as appropriate throughout the environmental review process.

4-4 EXECUTIVE ORDER 12898, ENVIRONMENTAL JUSTICE

Executive Order 12898 (“Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations”) requires federal agencies to involve the public on project issues related to human health and the environment. The U.S. Department of Transportation’s “Final Order on Environmental Justice” indicates that project sponsors should elicit public involvement opportunities, including soliciting input from affected minority and low-income populations in considering project alternatives. The Tappan Zee Bridge Hudson River Crossing Project will engage environmental justice communities through targeted media outlets and will provide special services (i.e., translation) for these communities as necessary to engage their participation in public involvement activities.

4-5 PUBLIC INVOLVEMENT ACTIVITIES

Public involvement activities for the Tappan Zee Bridge Hudson River Crossing Project will build upon the extensive outreach efforts that were undertaken for the Tappan Zee Bridge/I-287 Corridor Project. These efforts included assembling a mailing list of more than 5,000 contacts including elected officials, public agency contacts, stakeholder and community groups, and individuals. Previous efforts also included hundreds of meetings and briefings, large and small, and the establishment of several stakeholder groups, including a Stakeholder Committee, five Stakeholders’ Advisory Working Groups (focused on Environmental, Traffic and Transit, Land Use, Finance, and Bridge issues), an Inter-Metropolitan Planning Organization (IMPO), the Westchester Rockland Tappan Zee Futures Task Force, and a Bicycle Pedestrian Advisory Panel.
Continuing the commitment to an open, participatory process, the Tappan Zee Hudson River Crossing Project will solicit early and continued feedback from the public and from agencies; encourage open discussion of project details and issues; and provide opportunities for comments and questions. Tools that will be used to implement the public involvement program include:

- **Public meetings / open houses will be held at project milestones.** The Scoping Briefings in Rockland and Westchester Counties are an early opportunity for the public to participate in the project development. Members of the public will be able to give written and/or oral comments on the scope of the project and to suggest all reasonable alternatives for consideration in the Draft Environmental Impact Statement (DEIS). In addition to the Scoping Briefings, the public will be invited to comment during the circulation of the DEIS; at the public hearings on the DEIS, which will be held in Rockland and Westchester Counties; and during the circulation of the Final Environmental Impact Statement (FEIS). Comments raised in the public hearings and during the DEIS comment period will be responded to in the FEIS. Major meetings will be advertised in local newspapers to ensure maximum public participation in the environmental review process.

- **Targeted meetings with stakeholders will be held throughout the environmental review process.** Anticipated meetings include get-togethers with the villages and towns adjacent to the bridge, briefings with elected officials, and meetings with representatives of municipal agencies such as the planning and transportation departments of Rockland and Westchester Counties, special interest groups, community groups, and with other interested parties as appropriate. The project’s Stakeholder Committee, formed during the Tappan Zee Bridge/I-287 Corridor Project and including over 500 members, and Stakeholders’ Advisory Working Groups, also formed earlier, will meet as appropriate. Agency coordination meetings will include briefings of the Cooperating and Participating Agencies as well as the Section 106 Consulting Parties.

- **Project hot line.** A toll-free project phone number, 877-TZB-DOT5 or 877-892-3685, has been set up for members of the public to reach project representatives during office hours, with messages returned promptly.

- **Project website.** A project website (www.tzbsite.com) has been established so that the public can keep up to date on the project. Visitors can sign up for the mailing list on the website and submit comments via a Contact Us feature, which sends their e-mails to the project sponsors. The site will be updated regularly and will include announcements of project meetings as well as project documents, which will be posted as they become available.

- **Mailing list.** A project mailing list, totaling more than 5,000 names and addresses, was compiled during the Tappan Zee Bridge/I-287 Corridor Project. The mailing list includes elected officials, public agency contacts, stakeholder and community groups, media, and individuals. Included within the list are organizations, media, and individuals that have relevance and connections with environmental justice communities in the study area. The mailing list will be used to distribute meeting announcements and information about the project. An e-mail list is also available for
“e-mail blasts” that will announce upcoming meetings and other information. Both lists will be updated continually.

- **Informational materials will be produced at key points during the project development process.** Content will include written information on the project as well as visuals (photos, maps, and charts) and contact information. Presentations, meeting handouts, and other materials will be developed as appropriate to keep the public fully informed about project developments. Comment sheets will be made available at public meetings to encourage public input.

- **Media outreach.** When appropriate, a media outreach effort will be conducted. This will involve contacting the media when there are new project developments to communicate, as well as issuing press releases at major milestones. This effort includes newspapers serving low-income and minority communities.

- **Repositories.** Local repositories throughout the project area will enable members of the public to examine project documents, including EIS documents, and other informational materials. The repositories will include local libraries, town halls, and other locations.

### 4-6 CONTACT INFORMATION

For further information on the project, please visit the project website at [www.tzbsite.com](http://www.tzbsite.com) or please contact:

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Written comments on this Scoping Information Packet should be submitted to Michael Anderson at the New York State Department of Transportation.