

# TAPPAN ZEE HUDSON RIVER CROSSING PROJECT

Final Environmental Impact Statement  
and Section 4(f) Evaluation



**VOLUME I**

Rockland and Westchester Counties, New York



**Federal Lead Agency:** Federal Highway Administration

**Joint Lead Agencies:** New York State Department of Transportation  
and New York State Thruway Authority

**July 2012**

Final Environmental Impact Statement and Final Section 4(f) Evaluation

for

Tappan Zee Hudson River Crossing Project  
Interstate 87/287, Rockland and Westchester Counties, New York  
PIN: 8TZ1.00

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U.S. Department of Transportation, Federal Highway Administration

New York State Department of Transportation

New York State Thruway Authority

Cooperating Agencies

Advisory Council on Historic Preservation (ACHP);  
National Marine Fisheries Service (NMFS);  
U.S. Army Corps of Engineers (USACE);  
U.S. Coast Guard (USCG);  
U.S. Environmental Protection Agency (USEPA);  
U.S. Fish and Wildlife Service (USFWS)  
New York State Department of Environmental Conservation (NYSDEC);  
New York State Department of State (NYSDOS);  
New York State Office of General Services (NYSOGS); and  
State Historic Preservation Officer (SHPO) of the New York State Office of Parks,  
Recreation and Historic Preservation (OPRHP).

7/24/12  
Date of Approval

Donald R. Bell  
New York State Thruway Authority

7/24/12  
Date of Approval

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This Final Environmental Impact Statement (FEIS) examines the potential environmental effects of proposed alternatives for the Tappan Zee Hudson River Crossing Project, and where adverse impacts are identified, it discusses measures to mitigate them. The purpose of the project is to maintain a vital link in the regional and national transportation network by providing a new Hudson River crossing between Rockland and Westchester Counties, New York, that addresses the limitations and shortcomings of the existing Tappan Zee Bridge and meets the structural, operational, safety, security, and mobility needs of the Tappan Zee Hudson River Crossing. This report supports the Replacement Bridge Alternative as the preferred alternative.

This document is available for public review until September 4, 2012 after which time a Record of Decision will be issued. Questions or comments regarding this FEIS should be sent to Michael Anderson, New York State Department of Transportation, 4 Burnett Boulevard, Poughkeepsie, New York 12603 or [tzbsite@dot.state.ny.us](mailto:tzbsite@dot.state.ny.us). The Record of Decision will address any new or substantive comments made during the public review period.

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EXECUTIVE ORDER 11990  
WETLANDS  
STATEMENT OF FINDINGS

TAPPAN ZEE HUDSON RIVER CROSSING  
ROCKLAND AND WESTCHESTER COUNTIES, NEW YORK

The project was reviewed for compliance with Executive Order 11990, Protection of Wetlands, and the U.S. DOT Order 5660.1A. Under Executive Order 11990, Federal actions (in which impacts to wetlands are unavoidable) require a “finding” that there are no practicable alternatives to the proposed construction in wetlands and that the proposed action included all practical means to reduce harms to wetlands.

The project has been carefully studied with respect to its effects on wetlands. The project involves unavoidable temporary impacts to 0.076 acres of wetlands to the small stream and forested wetland corridor (totaling 0.23 acres) in Westchester County. These impacts are due to upland construction of the temporary access road for the temporary work platform at the Westchester Bridge Staging Area, which was chosen instead of filling the land for the roadway. The temporary platform will be a pile-supported structure, instead of on fill, to avoid and minimize impacts to the wetland area and maintain wetland hydrology. Only 0.004 acres will be a direct impact due to the pilings. There will also be platform coverage of 0.13 acres with a direct impact of 0.007 acres due to pilings on NYSDEC mapped littoral zone tidal wetlands. This work is necessary to fulfill the purpose and need of the proposed project, to address the structural, operational, safety, security and mobility needs of the Tappan Zee Hudson River Crossing.

The project was designed to minimize impacts by requiring only temporary wetlands that will be restored. Mitigation for wetland impacts followed a sequential approach of 1) avoidance, 2) minimization, and 3) compensation.

The extent of measures to minimize harm to the wetlands includes compensatory mitigation for the temporary disturbance during construction in accordance with the joint mitigation rule (Federal Register dated April 10, 2008, 73 FR 19594 through 19705). The mitigation measures that would be explored in coordination with the USACE as part of the compensatory mitigation plan would likely include the removal of the temporary access road decking and support structures, rehabilitation activities such as removal of construction and demolition debris, channel and bank stabilization, removal of invasive plant species, and restoration of a native plant community. Therefore, there would be no permanent adverse effect to wetlands.

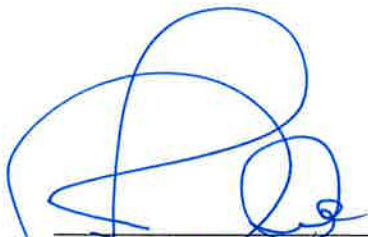
Further, implementation of erosion and sediment control measures (e.g., silt fences and straw bale dikes) and stormwater management measures implemented through the development of a stormwater pollution prevention plan (SWPPP) would minimize the potential for stormwater

runoff from construction of the access road to affect the small stream and forested wetland corridor at the Westchester Bridge Staging Area. All design and mitigation measures will incorporate the requirements of the NYSDOT Standard Specification for Temporary Soil Erosion and Water Pollution Control and the New York State Standards and Specifications for Erosion and Sediment Control.

A wetland planting plan using species native to this region of New York would also be developed with USACE for the temporary loss of 0.076 acres of the small stream and forested wetland corridor at the Westchester Bridge Staging Area.

The projected total wetland impacts (including both the small stream and forested wetland corridor and the NYSDEC mapped littoral zone tidal wetlands) would be small in size (0.206 acres) and temporary and restored post-construction. The direct impacts due to pilings would be 0.011 acres. Remaining wetlands would retain their functions and values. There would be no net loss to functions and values of impacted wetlands.

Based upon this information contained in this Final EIS in support of the preceding summary, I find that (1) there is no practicable alternative to such construction and (2) that the construction of the proposed alternative contains all practicable measures to minimize harm to wetlands which may result from such use.



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Jonathan D. McDade  
Division Administrator  
Federal Highway Administration

2/12/2012  
(DATE)

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## List of Acronyms

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AADT	Average Annual Daily Traffic
AASHTO	American Association of State Highway and Transportation Officials
acc/MVM	Accidents per Million Miles of Vehicle Travel
ACHP	Advisory Council on Historic Preservation
ACM	Asbestos-Containing Materials
ACS	American Community Survey
ADCP	Acoustic Doppler Current Profiler
ANOVA	Analysis of Variance
AOSS	Alpine Ocean Seismic Survey, Inc.
APE	Area of Potential Effect
AREMA	American Railway Engineering and Maintenance-of-Way Association
ASI	Aqua Survey, Inc.
AST	Aboveground Storage Tank
ASTM	American Society for Testing and Materials
AWQS	Ambient Water Quality Standards
BA	Biological Assessment
BAT	Best Available Tailpipe
BMB	Bear Mountain Bridge
BMP	Best Management Practice
BO	Biological Opinion
BOEM	Bureau of Ocean Energy Management
BPM	Best Practices Model
BRT	Bus Rapid Transit
CAA	Clean Air Act
CAF	Coastal Assessment Form
CBS	Chemical Bulk Storage
CEA	Critical Environmental Area
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CHASP	Construction Health and Safety Plan
CHPE	Champlain-Hudson Power Express
CMP	Coastal Management Program (New York State)
CO	Carbon Monoxide
CO <sub>2e</sub>	Carbon Dioxide Equivalent
CPP	Construction Protection Plan
CTTP	Census Transportation Planning Package
CWA	Clean Water Act
CZMA	Coastal Zone Management Act (Federal)
dB	Decibel
dBA	A-Weighted Decibel
DEIS	Draft Environmental Impact Statement

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DER-10 ..... Technical Guidance for Site Investigation and Remediation (NYSDEC)  
DFO ..... Department of Fisheries and Oceans (Canada)  
DO ..... Dissolved Oxygen  
DOI..... U.S. Department of the Interior  
DPF ..... Diesel Particulate Filter  
DPM ..... Diesel Particulate Matter  
DPS..... Distinct Population Segments  
EB ..... Engineering Bulletin  
ECL ..... Environmental Conservation Law (New York State)  
EDPL..... Eminent Domain Procedure Law (New York State)  
EFDC ..... Environmental Fluid Dynamics Code  
EFH..... Essential Fish Habitat  
EI..... Engineering Instruction  
EIA ..... Energy Information Administration  
EIS ..... Environmental Impact Statement  
EPC..... Environmental Performance Commitment  
ERL ..... Effects Range-Low  
ERM ..... Effects Range-Median  
ESA..... Endangered Species Act  
ESC..... Erosion and Sediment Control  
ETC..... Estimated Time of Completion (2017 analysis year)  
ETC+30..... Estimated Time of Completion plus 30 years (2047 analysis year)  
FAA ..... Federal Aviation Administration  
FAN ..... Federal Aid Notification  
FCAF..... Federal Consistency Assessment Form  
FEIS ..... Final Environmental Impact Statement  
FEMA ..... Federal Emergency Management Agency  
FHWA ..... Federal Highway Administration  
FHWG ..... Fisheries Hydroacoustic Working Group  
FIRM ..... Flood Insurance Rate Map  
FPPA..... Farmland Protection Policy Act  
FTA ..... Federal Transit Administration  
GHG ..... Greenhouse Gas  
GIS..... Geographic Information Systems  
GRA ..... Geoaerchology Research Associates  
GreenLITES ..... Green Leadership in Transportation Environmental Sustainability  
(NYSDOT)  
GWB ..... George Washington Bridge  
HABS ..... Historic American Building Survey  
HAER ..... Historic American Engineering Record  
HAP ..... Hazardous Air Pollutant  
HARS ..... Historic Area Remediation Site  
HC ..... Hydrocarbons  
HEC-18 ..... Hydraulic Engineering Circular No. 18 (FHWA)  
HOT ..... High-Occupancy Toll Lane  
HOV ..... High-Occupancy Vehicle Lane  
HRBMP ..... Hudson River Benthic Mapping Project

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ICG.....	Interagency Consultation Group
IMPLAN.....	Impact Analysis for Planning
ITS .....	Intelligent Transportation System
ITT.....	Immersed Tube Tunnel
JCC .....	Jewish Community Center on the Hudson
LDEO .....	Lamont-Doherty Earth Observatory
LED .....	Light Emitting Diode
LEP .....	Limited English Proficiency
L <sub>eq(1)</sub> .....	An hourly measure representing a constant noise level with the same sound energy as the fluctuating noise sources recorded during the same hourly period
LOS.....	Level of Service
LRFD.....	Load and Resistance Factor Design
LWCA.....	Land and Water Conservation Act
LWRP.....	Local Waterfront Revitalization Plan
MBTA .....	Migratory Bird Treaty Act
MIG .....	Minnesota IMPLAN Group
MLLW.....	Meaner Lower Low Water
MLW.....	Mean Low Water
MNR.....	Metro-North Railroad
MOA.....	Memorandum of Agreement
MOBILE6 .....	Mobile6.2 Emission Model (USEPA)
MOU.....	Memorandum of Understanding
MOVES-RREGGAE .....	MOVES Roadway and Rail Energy and Greenhouse Gas Analysis Extension
MP.....	Milepost
MPO.....	Metropolitan Planning Organization
MPRSA .....	Marine Protection, Research and Sanctuaries Act
MRCE .....	Mueser Rutledge Consulting Engineers
MSATs .....	Mobile Source Air Toxics
MSL.....	Mean Sea Level
MTA .....	Metropolitan Transportation Authority
MVEB.....	Motor Vehicle Emissions Budget
MW.....	Megawatts
NAA.....	Non-Attainment Area
NAAQS .....	National Ambient Air Quality Standards
NAC .....	Noise Abatement Criteria
NAS.....	Noise Attenuation Systems
NAVD 88 .....	North American Vertical Datum of 1988
NBB.....	Newburgh-Beacon Bridge
NCHRP .....	National Cooperative Highway Research Program
NEPA .....	National Environmental Policy Act
NGVD 29.....	National Geodetic Vertical Datum of 1929
NHA .....	National Heritage Area
NHD .....	National Hydrographic Dataset
NHL.....	National Historic Landmark
NHPA .....	National Historic Preservation Act
NJDOT .....	New Jersey Department of Transportation
NMFS.....	National Marine Fisheries Service



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NO.....	Nitric Oxide
NO <sub>2</sub> .....	Nitrogen Dioxide
NOAA.....	National Oceanic and Atmospheric Administration
NOI.....	Notice of Intent
NONROAD.....	NONROAD2008 Emission Model
NOx.....	Nitrogen Oxides
NRHP.....	National Register of Historic Places
NRCS.....	Natural Resources Conservation Service
NWI.....	National Wetland Inventory
NYCDEP.....	New York City Department of Environmental Protection
NYMA.....	New York Metropolitan Area
NYMTC.....	New York Metropolitan Transportation Council
NYNHP.....	New York Natural Heritage Program
NYSDEC.....	New York State Department of Environmental Conservation
NYSDOS.....	New York State Department of State
NYSDOT.....	New York State Department of Transportation
NYSGS.....	New York State Geological Survey
NYSHPA.....	New York State Historic Preservation Act
NYSM.....	New York State Museum
NYSOGS.....	New York State Office of General Services
NYSP.....	New York State Police
NYSTA.....	New York State Thruway Authority
OEM.....	Original Equipment Manufacturer
OPRHP.....	New York State Office of Parks, Recreation and Historic Preservation
OSHA.....	Occupational Safety and Health Administration
OWL.....	Orange-Westchester Link
PAH.....	Polycyclic Aromatic Hydrocarbon
PANYNJ.....	Port Authority of New York and New Jersey
PCB.....	Polychlorinated Biphenyl
PCE.....	Tetrachloroethylene
PE.....	Permanent Easement
PFAC.....	Program Finance and Administration Committee (NYMTC)
PIDP.....	Pile Installation and Demonstration Program
PIP.....	Public Involvement Plan
PM.....	Particulate Matter
PM <sub>2.5</sub> .....	Particulate matter with an aerodynamic diameter less than or equal to 2.5 micrometers
PM <sub>10</sub> .....	Particulate matter with an aerodynamic diameter less than or equal to 10 micrometers
ppb.....	Parts per Billion
ppm.....	Parts per Million
PPV.....	Peak Particle Velocity
PSU.....	Practical Salinity Unit
PWA.....	Public Works Administration
RAP.....	Remedial Action Plan
RBSA.....	Rockland Bridge Staging Area
RCNM 1.1.....	Road Construction Noise Model (FHWA)

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RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Condition
RFP	Request for Proposals
RFQ	Request for Qualifications
RM	River Mile
RMA	Research Management Associates
rms	Root Mean Square
ROD	Record of Decision
RTP	2010-2035 Regional Transportation Plan "A Shared Vision for the Future"
RUCSCO	Restricted Use Commercial Soil Cleanup Objective
S/NR	State and National Registers of Historic Places
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act—A Legacy for Users
SAV	Submerged Aquatic Vegetation
SBB	South Broadway Bridge
SCFWH	Significant Coastal Fish and Wildlife Habitat
SCM	Supplementary Cementitious Materials
SEL	Sound Exposure Level
SELcum	Cumulative Sound Exposure Level
SELSS	Single Strike Sound Exposure Level
SEQRA	State Environmental Quality Review Act
SGAC	Smart Growth Advisory Committee
SHPO	State Historic Preservation Office New York
SIP	State Implementation Plan
SLM	Sound Level Meter
SMMP	Site Management and Monitoring Plan
SMPs	Stormwater Management Practices
SO <sub>2</sub>	Sulfur Dioxide
SO <sub>x</sub>	Sulfur Oxides
SPCC	Spill Prevention, Control, and Countermeasures
SPDES`	State Pollutant Discharge Elimination System
SPL	Sound Pressure Level
SPP`	Suspended Particulate Phase
SSA	Sole Source Aquifer
SSC	Suspended Solid Concentration
SVOC	Semivolatile Organic Compound
SWMDM	Stormwater Management Design Manual (New York State)
SWPPP	Stormwater Pollution Prevention Plan
TBM	Tunnel Boring Machine
TEM	The Environmental Manual (NYSDOT)
TEQ	Toxicity Equivalent
TGO	Tribal Government Organization
THPO	Tribal Historic Preservation Officer
TIP	Transportation Improvement Program
TMDL	Total Maximum Daily Load
TNM 2.5	Traffic Noise Model (FHWA)
TOC	Total Organic Carbon
TOGS	Technical and Operational Guidance Series (NYSDEC)

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TP .....	Total Phosphorus
TQSA .....	Tilcon Quarry Staging Area
TRB .....	Transportation Research Board
Trba.....	Brunswick Formation
Trp.....	Palisade Diabase
TSS .....	Total Suspended Solids
TZx.....	“Tappan Zee Express” Bus Service
ULSD .....	Ultra-Low-Sulfur Diesel
UMASS .....	University of Massachusetts
USACE.....	U.S. Army Corps of Engineers
USCG.....	U.S. Coast Guard
USDA .....	U.S. Department of Agriculture
USDOT .....	U.S. Department of Transportation
USEPA.....	U.S. Environmental Protection Agency
USFWS .....	U.S. Fish and Wildlife Service
USGS .....	U.S. Geological Survey
USPAP .....	Uniform Standards of Professional Appraisal Practice
UST .....	Underground Storage Tank
UUSCO .....	Unrestricted Use Soil Cleanup Objective
VdB .....	Velocity Level in decibels
VIA .....	Visual Impacts Assessment
VMS .....	Variable Message Signs
VMT .....	Vehicle-Miles Traveled
VOC .....	Volatile Organic Compound
VPH.....	Vehicles per Hour
WA .....	Wildlife Bio-Accumulation
WBSA .....	Westchester Bridge Staging Area
WISA.....	Westchester Inland Staging Area
WNSA .....	West Nyack Staging Area
WQv .....	Water Quality volume
WZTC.....	Work Zone Traffic Control