Rehabilitation of the South Grand Island Bridges

2022
BRIDGE INVESTMENT PROGRAM

PROJECT NARRATIVE

Applicant:

NEW YORK STATE OF OPPORTUNITY. | Thruway Authority

Submitted to:

U.S. Department of Transportation
Federal Highway Administration

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I. BASIC PROJECT INFORMATION

Project Description

Project Overview

This project will rehabilitate and strengthen deteriorated sections of conditionally at-risk, poor-rated elements of the two South Grand Island Bridges (BIN# 5043981 and BIN #5043982). Both bridges are on the National Bridge Inventory under 23 U.S.C. 144(b).

The project scope includes strengthening and repair of both bridges to address condition issues; improving wearing surface friction on both bridges to improve vehicle safety; safety improvements on both bridges for maintenance personnel; seismic resiliency improvements on one bridge; restoring an unusable sidewalk on one bridge and improving bicycle and pedestrian connectivity between existing shared-use trail systems on both sides of the bridges.

The South Grand Island Bridges

The South Grand Island bridges are twin truss arch bridge spans, each carrying one direction of Interstate 190 over the Niagara River. A maximum vertical clearance of 100 feet is provided over a 400-foot-wide navigation channel below.

The South Grand Island Bridges

Construction of the southbound bridge was completed in 1935 and the northbound bridge in 1963. Each structure has a total deck length of 3,437 feet. Both bridges were originally constructed to provide a 24-foot-wide roadway surface. The bridge section is typically comprised of two 10-foot mainline lanes in each direction, with 2-foot shoulders. The two-way Annual Average Daily Traffic (AADT) for 2021 is about 63,000, with 10% truck volume.

The northbound bridge has a 5-foot-wide pedestrian sidewalk on the east side, while the southbound bridge has a 5-foot-wide pedestrian sidewalk (presently closed due to safety concerns) on the west side. Paved shared-use pathways connect both sidewalks to extensive local and regional shared-use trail systems.

The distinctive blue truss bridges are iconic regional landmarks, and they are eligible for listing on the National Register of Historic Places. Detailed information on the original design and construction of the bridges in included in Appendix A.

Project Location

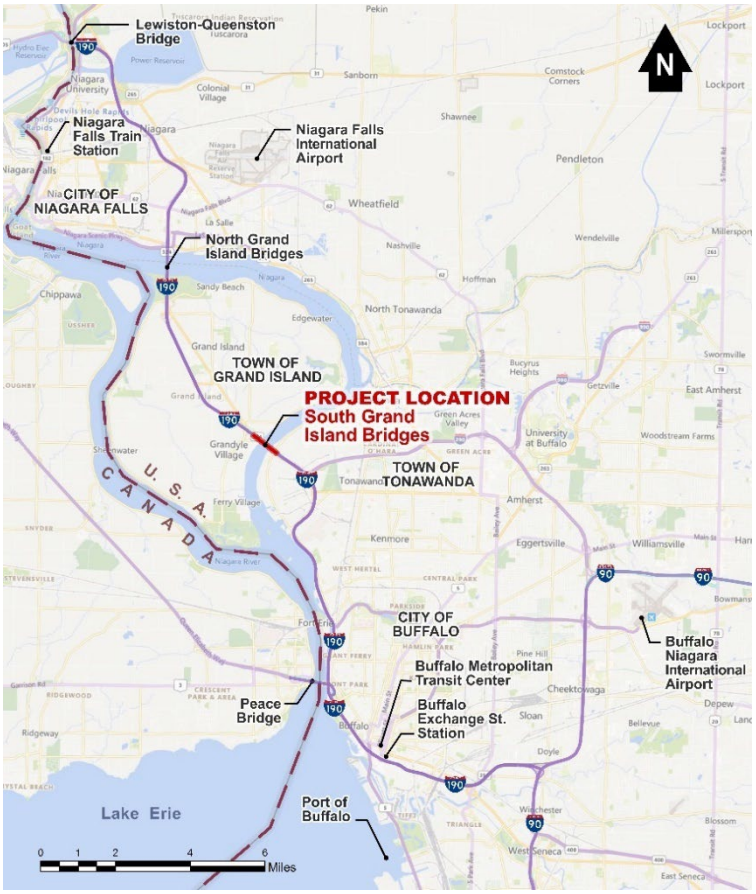
The project is located on I-190, spanning between Milepost 914.35 and Milepost 914.99, in the Towns of Grand Island and Tonawanda, Erie County, New York. Refer to the Location Map on the next page. The Latitude is 42.990491 and the Longitude is -78.936953.

Context

State, Local and Regional Context

The bridges are on a portion of I-190 that is known as the Niagara Thruway, a 28-mile segment of interstate that extends from I-90 in the City of Buffalo (Erie County) to its terminus at the Lewiston-Queenston international border crossing in the Town of Lewiston (Niagara County). I-190 serves as a primary truck freight connector to

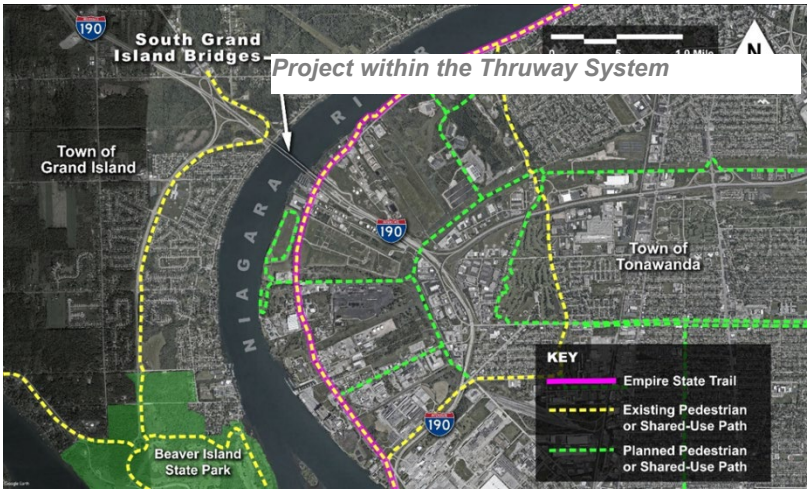
the trans-Canadian highway system, providing direct interstate access to the Lewiston-Queenston Canadian border crossing, one of only two point-of-entry freight border crossings in the region. Two million trucks crossed at these points in 2017, making them both vital to freight movement and the supply chain. Together, these two border crossings rank second economically among US-Canada crossings for truck volume. [1] The nearest highway crossings between the US and Canada are 241 miles to the east, at the Thousand Islands Bridge in NY, and 253 miles to the west at the Ambassador Bridge in Detroit, MI.



Location map

This segment of I-190 is part of the greater 570-mile New York State Thruway System (Thruway). The Thruway is one of the oldest components of the National Interstate Highway System (NHS) and is part of the National Highway Freight Network (NHFN), and the New York State Freight Core Highway Network. In addition, it is the only system in the state that permits tandem trucks (a.k.a., Longer Combination Vehicles or LCVs) to operate on it. The mainline of the Thruway extends 426 miles, from New York City to Buffalo (I-87 and I-90). Other elements of the Thruway System include the New England Thruway (I-95), the Cross Westchester Expressway (I-287), the Garden State Parkway Connector, the Berkshire Connector (I-90), and the Erie Section (I-90s). The Thruway is essential for commerce and travel in the state and region: it connects New York's principal cities, rural areas, and tourist destinations, and one-third of all vehicles using the Thruway are from out of state.

On a local level, this portion of I-190 is part of the most direct interstate connection between I-90 and Niagara Falls, a major tourist destination visited by 9.5 million people annually. The bridges are one of only two connections between Grand Island, with a population of 21,389, and mainland New York. They provide the most direct connection from the island and Niagara Falls to the City of Buffalo, which serves as a regional metropolitan center for employment, shopping, and necessary services.



Existing and planned shared-use trail systems near the bridges

The two sidewalks provided on the structures serve to connect extensive existing shared-use trail systems on both sides of the bridges. These include the regional Niagara River Greenway and the recently completed 750-mile-long Empire

[1] New York State Department of Transportation. "New York State Freight Transportation Plan". August 2019. Page 116.

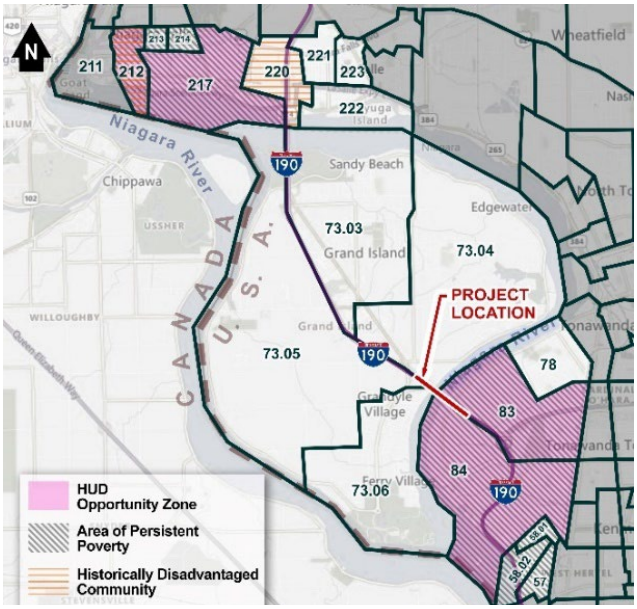
State Trail, which spans the entire state and passes along the south end of the bridges. The nearest connection for non-motorized traffic crossing the Niagara River to access Grand Island is at the North Grand Island Bridges, approximately 5 miles to the north.

Census Information

The project is entirely within the "Buffalo, NY" 2010 Census-designated Urbanized Area (UACE Code 11350).

The project is located within Census Tracts 73.04, 73.06, 83, and 84. The southern half of the project lies within areas, designated as Opportunity Zones by the U.S. Department of the Treasury, that area associated with Census Tracts 83 and 84, in the Town of Tonawanda. The same tracts have been identified as Areas of Persistent Poverty by USDOT.

The project is not located within a Historically Disadvantaged Community, US Department of Housing and Urban Development (HUD) Promise Zone, Choice Neighborhood Grantee Area, or Empowerment Zone. However, this I-190 corridor does serve Historically Disadvantaged Communities, associated with Census Tracts 212 and 220, that are located approximately 5 miles north in the City of Niagara Falls.



Opportunity Zones, Areas of Persistent Poverty, and Historically Disadvantaged Communities near the project location

Context of Other Infrastructure Investments

In 2021, the Authority substantially completed a $355 million project to convert the entire 575-mile New York State Thruway system to cashless tolling. Prior to this, in 2018, the Authority similarly converted the I-190 toll barriers at the South and North Grand Island bridge crossings into all-cashless highway-speed tolling points. In addition to reducing congestion, these projects significantly contributed to the Authority's efforts to reduce greenhouse gas emissions from slowed or idling vehicles at toll barriers. Total annual greenhouse gas emissions were reduced by over 44,000 short tons in 2021.

To further modernize the system, improve resiliency, combat climate change, and provide for community connections across the system, the Authority is advancing the following projects:

- Rehabilitation and seismic resiliency improvements on the North Grand Island Bridges, located approximately 5 miles to the north on the same I-190 corridor. This project also includes replacement of deteriorated lighting fixtures on the North and South Grand Island Bridges with energy-efficient LED fixtures to improve safety for both motorized and non-motorized users. ($36 million - Scheduled completion in 2024)
- Rehabilitation and strengthening of a deteriorated 3.5-mile segment of I-190, on the same corridor between Milepost 901.7 and Milepost 904.2. ($44.28 million - Scheduled completion in 2025)
- Replacement of the Beaver Island State Parkway Bridge over I-190, located near the north end of the South Grand Island Bridges. The new bridge will meet minimum vertical clearance requirements and provide a sidewalk on the bridge that is complaint with Americans with Disabilities Act (ADA) standards. ($9 Million - Scheduled completion in 2023).
- Stabilization of a retaining wall at the Thruway bridge over Scajaquada Creek, approximately 5 miles away on the same I-190 corridor, to improve resiliency. ($5.5 million - Scheduled completion in 2024)

Transportation Challenges and Solutions

- **Challenge #1: Condition of Fracture-Critical Non-Redundant Members and Pin and Hanger Assemblies**

  Recent inspections have identified substantial accelerated deterioration of fracture-critical non-redundant members of both bridges' original superstructure designs. The failure of one component of a fracture-critical primary support system can result in a catastrophic collapse. Both structures were also designed with pin and hanger assemblies, which are also fracture-critical members. Each of these assemblies connect two plate girders of the bridge, providing a necessary expansion joint in the bridge to accommodate movement. The condition of these components is beyond the capability of maintenance forces to address and must be addressed by a Capital Project to reduce the risk of condition rating flags or failure that could require closure of the bridges. Detailed information on the original design of the bridges is included in Appendix A, and recent bridge inspection information is included in Appendix B.

  ### *Challenge #1 Solution*

  This project will complete repairs to all identified conditionally at-risk members. Proposed improvements, such as installing steel plates over areas of section loss and addressing fatigue cracking will restore, and in some instances increase, the full loading capacity of these critical structural elements. With these improvements, the repaired fracture-critical non-redundant steel members will be returned to a state of good repair and require only routine preventative maintenance for the anticipated remaining 75-year service life of the structures.

- **Challenge #2: Condition of Superstructure Structural Steel Members**

  Similar to the fracture-critical non-redundant structural steel members, the remaining superstructure steel elements are experiencing accelerated deterioration. The present asset management cycle for the structures is at a point where a Capital Project is necessary to address steel deterioration to avoid future condition rating flags that would require the structures to have lanes closed or load-rated. Detailed information on recent bridge inspections is included in Appendix B.

  ### *Challenge #2 Solution*

  As part of this project, bridge superstructure steel members that are not fracture-critical non-redundant members will be examined during ongoing in-depth bridge inspections. Areas identified as needing restorative work will be improved using best practices. These other superstructure steel members will be returned to a state of good repair and will require only routine preventative maintenance for the anticipated remaining 75-year service life of the structures

  Example photo from recent bridge inspection (2020)

- **Challenge #3: Structural Seismic Risk**

  The South Grand Island Bridges are considered "Critical" assets by the state. They must provide immediate access after a lower-level seismic event (lesser strength event), and limited access after an upper-level seismic event (higher strength event), to continue to serve as a link for civil defense, police, fire department, and/or public health agencies to respond to a disaster situation. In 2020, the Authority retained the specialized consultant services to conduct a seismic evaluation and recommendations for the southbound bridge. The study determined that the bridge, in its current condition, cannot meet the seismic performance criteria requirements specified for a "Critical" bridge after an upper-level event. Detailed information on the study is included in Appendix C.

  ### *Challenge #3 Solution*

  The 2020 seismic study of the bridge identified retrofit schemes for seismic improvements. This project will complete the recommended repairs (e.g., replacement of crucial bearings and installation of dampers, bearings, shear keys) to the southbound structure. These improvements will help ensure the structure can serve as part of a functioning emergency corridor following an upper-level seismic event.

- **Challenge #4: Bicycle and Pedestrian Accommodation**

The sidewalk on the southbound structure has been closed to the public for over a year due to heaving from extensive deterioration of underlying steel members and build-up of pack rust. The paved pathways that connect the sidewalks on both bridges to existing local and regional shared-use trail systems lack wayfinding signs and amenities for trail users. The path surfaces are deteriorated or uneven in places, and geometric deficiencies have been identified, particularly at the connection points to the bridge sidewalks.

Sidewalk on southbound structure: currently closed due to concrete heaving

Challenge #4 Solution

This project will restore and re-open the sidewalk on the southbound bridge, providing a sidewalk that is fully compliant with Americans with Disabilities Act standards. Feasible geometric improvements to the existing paved pathways connecting the bridges to the shared-use trail systems will be identified, and surface repairs will be made to the pathways to improve safety and accessibility. Wayfinding signs will be provided, along with amenities, such as pull-offs and benches, to improve comfort for trail and sidewalk users.

- **Challenge #5: Safety**

Vehicular Safety: Accident data for this segment of I-190 documents a high incidence of overtaking and rear-end accidents (63% of the recorded crashes). The Authority conducted friction testing in 2018 to measure skid resistance, concluding that skid resistance properties of the existing wearing surface are inadequate. Wearing surface friction properties must be addressed or the prevalence of overtaking and rear-end accidents will remain unacceptably high, resulting in a higher likelihood of injury and vehicle damage for patrons using the bridges.

Bicycle and Pedestrian Safety: As discussed in Challenge #4, the sidewalk on the southbound bridge was closed for public use due to heaving and safety concerns for pedestrian and cyclists using the sidewalk. The paved pathways approaching the bridge sidewalks also have surface and geometric deficiencies.

Maintenance Personnel Safety: Both bridges retain the original physical safety features provided for use by maintenance personnel. These include fixed ladders with cages, which are currently being phased out under Occupational Safety and Health Administration (OSHA) Regulation 1910.28, in favor of ladder safety systems and personal fall arrest systems. Conformance with this OSHA standard is mandatory by 2036.

Challenge #5 Solution

Vehicular Safety: This project will address the high frequency of overtaking and rear-end accidents by improving the wearing surface skid resistance properties. The Authority is currently evaluating the effectiveness, durability, and value of 2 possible methods to address this issue: installing a high-friction overlay material or sawing grooves into the existing wearing surface.

Pedestrian and Bicyclist Safety: As discussed under Challenge #4, repairs to the heaved areas of sidewalk on the southbound bridge structure will eliminate the safety hazard that required its closure, improving accessibility and connectivity for non-motorized users of the bridge. The approach paths will be evaluated for geometric and surface improvements to further enhance safety.

Maintenance Personnel Safety: A total of over 100 safety ladder systems, located on both structures, will be improved to meet current Occupational Safety and Health Administration (OSHA) standards.

- **Challenge #6: Traffic During Construction**

Moving people and vehicles safely and efficiently across the bridges, and through the corridor, during construction will present an additional challenge. There are no convenient access-controlled alternative routes for vehicles going to and from the US/Canadian points of entry, and unintentionally diverting traffic to nearby state and local roads to “go around” the construction area would be undesirable. There

are no viable detours for bicycle and pedestrian traffic, with the closest non-motorized crossing 5 miles away, at the North Grand Island Bridges. Any work to the structures must address regional and local transportation needs, and the bicycle and pedestrian connections that the structures provide must be maintained with minimal disruption.

Challenge #6 Solution

The project will be constructed with a Work Zone Traffic Control plan that emphasizes maintaining traffic flow and safety. To minimize impacts to traffic during peak daytime travel, only nighttime lane closures will be used for deck surface work. Particular attention will be paid to community and bicycle/pedestrian connections provided by the bridges to avoid or minimize any temporary impacts to these routes.

Short-term bridge closures will be required to complete bearing replacements. Crossover alignments will be utilized to shift all traffic to the operational bridge while bearing work is being performed on the other structure.

Project History

Preliminary Design is currently being advanced for this project. In-depth asset management analysis of condition and needs has been completed to help define the work scope, including best practices for restoration and resiliency measures and methods of construction. Stakeholder outreach and environmental reviews have been initiated, and a 2020 Seismic Study and Hazard Analysis was competed. Costs incurred for work performed to date total $1.535 million.

Involved Parties

The Authority will coordinate with the New York State Department of Transportation and the Greater Buffalo-Niagara Regional Transportation Council (the Metropolitan Planning Organization) for the development and implementation of the project. As discussed in Section III, under “Equity, Partnership, and Quality of Life,” coordination with diverse stakeholders will be conducted pursuant to a draft Public Involvement Plan that has been developed for the project. The plan is included in Appendix D – Partnership and Collaboration. Stakeholder outreach has been ongoing, and letters of support from various stakeholders are also included in Appendix D.

II. NATIONAL BRIDGE INVENTORY DATA

South Grand Island Bridges (Northbound Direction)

Identification	
Item 1 – State Code & Name	36 – New York
Item 8 – Structure Number	000000005043982
Item 5A – Record Type	1 – On Structure
Item 3 – County Code & Name	029 – Erie County
Item 6 – Feature Intersected	Stony Point Ext., Shore
Item 7 – Facility Carried	Route I-190
Item 16 - Latitude	42.99606
Item 17 – Longitude	-78.93221
Classification	
Item 112 – NBIS Bridge Length	3437 ft
Item 104 – Highway System of Inventory	1 – On NHS
Item 26 – Functional Classification	11 – Urban Principal Arterial - Interstate
Item 110 – Designated National Network	1 – On National Truck Network
Item 21 – Maintenance Responsibility	31 – State Toll Authority
Item 22 – Owner	31 – State Toll Authority
Age and Service	
Item 27 – Year Built	1963
Item 106 – Year Reconstructed	2008
Item 42 – Type of Service	42A: 5 – Highway-pedestrian; 42B: 6 – Highway-waterway
Item 28A – Lanes on the Structure	2
Item 29 – Average Daily Traffic	34,395 (directional)
Item 109 – Average Daily Truck Traffic	10%
Item 19 – Bypass, Detour Length	"0"
Structure Type and Material	
Item 43 – Structure Type, Main	43A: 4 – Steel Continuous; 43B: 9 – Truss- Deck
Condition (See Section IV – Project Outcome Criteria "Criteria #1: State of Good Repair" for listing of "Poor" or "Severe" Condition Members)	
Item 58 – Deck Condition	7 – Good Condition
Item 59 – Superstructure Condition	5 – Fair Condition*
**Structure has existing "Poor" and "Severe" New York State-rated superstructure elements*	
Item 60 – Substructure Condition	7 – Good Condition
Item 61 – Channel and Channel Protection	8 – Channel protection is stable
Item 62 – Culverts	N – Not a culvert

Geometric Data	
Item 49 – Structure Length	3437 ft.
Item 50 – Curb or Sidewalk Widths	50A: 0 ft.; 50B: 4.6 ft.
Item 51 – Bridge Roadway Width, curb-to-curb	31.8 ft.
Item 52 – Deck Width, out-to- out	26.6 ft.
Item 32 – Approach Roadway Width	33.1 ft.
Item 47 – Inventory Route, Total Horizontal Clearance	24.9 ft.
Item 53 – Minimum Vertical Clearance over Bridge Roadway	18.1 ft.
Item 54 – Minimum Vertical Underclearance	19.5 ft.
Item 55 – Minimum Lateral Underclearance on Right	7.5 ft.
Item 56 – Minimum Lateral Underclearance on Left	0 ft.
Load Rating and Posting	
Item 70 – Bridge Posting	5 – Equal to or above legal loads
Item 41 – Structure Open, Posted, or Closed to Traffic	A - Open
Appraisal	
Item 113 – Scour Critical Bridges	5 – Foundations Stable
Inspections	
Item 90 – Inspection Date	November 2020

South Grand Island Bridges (Southbound Direction)

Identification	
Item 1 – State Code & Name	36 – New York
Item 8 – Structure Number	000000005043981
Item 5A – Record Type	1 – On Structure
Item 3 – County Code & Name	029 – Erie County
Item 6 – Feature Intersected	Stony Point Ext., Shore
Item 7 – Facility Carried	Route I-190
Item 16 - Latitude	42.99577
Item 17 – Longitude	-78.93246
Classification	
Item 112 – NBIS Bridge Length	3437 ft
Item 104 – Highway System of Inventory	1 – On NHS
Item 26 – Functional Classification	11 – Urban Principal Arterial - Interstate
Item 110 – Designated National Network	1 – On National Truck Network
Item 21 – Maintenance Responsibility	31 – State Toll Authority
Item 22 – Owner	31 – State Toll Authority
Age and Service	
Item 27 – Year Built	1935
Item 106 – Year Reconstructed	1988
Item 42 – Type of Service	42A: 5 – Highway-pedestrian; 42B: 6 – Highway-waterway
Item 28A – Lanes on the Structure	2
Item 29 – Average Daily Traffic	34,687 (directional)
Item 109 – Average Daily Truck Traffic	14%
Item 19 – Bypass, Detour Length	"0"
Structure Type and Material	
Item 43 – Structure Type, Main	43A: 3 – Steel; 43B: 10 – Truss-Thru
Condition (See Section IV – Project Outcome Criteria "Criteria #1: State of Good Repair" for listing of "Poor" or "Severe" Condition Members)	
Item 58 – Deck Condition	6 – Satisfactory Condition
Item 59 – Superstructure Condition	6 – Satisfactory Condition*
**Structure has existing "Poor" and "Severe" New York State-rated superstructure elements*	
Item 60 – Substructure Condition	7 – Good Condition
Item 61 – Channel and Channel Protection	8 – Channel protection is stable
Item 62 – Culverts	N – Not a culvert

Geometric Data	
Item 49 – Structure Length	3437 ft.
Item 50 – Curb or Sidewalk Widths	50A: 4.3 ft.; 50B: 0 ft.
Item 51 – Bridge Roadway Width, curb-to-curb	24.9 ft.
Item 52 – Deck Width, out-to- out	31.8 ft.
Item 32 – Approach Roadway Width	36.1 ft.
Item 47 – Inventory Route, Total Horizontal Clearance	24.9 ft.
Item 53 – Minimum Vertical Clearance over Bridge Roadway	17.7 ft.
Item 54 – Minimum Vertical Underclearance	19.3 ft.
Item 55 – Minimum Lateral Underclearance on Right	7.5 ft.
Item 56 – Minimum Lateral Underclearance on Left	“000” ft.
Load Rating and Posting	
Item 70 – Bridge Posting	5 – Equal to or above legal loads
Item 41 – Structure Open, Posted, or Closed to Traffic	A - Open
Appraisal	
Item 113 – Scour Critical Bridges	5 – Foundations Stable
Inspections	
Item 90 – Inspection Date	November 2020

III. PROJECT COSTS

Detailed Budget

The budget for this project was developed using preliminary design information and cost history data of similar work in the same geographic area. A contingency of 20% of project construction costs has been included to conservatively budget for cost increases which may occur due to industry cost escalations or other unknowns. The table below shows prior project costs (costs that have been incurred to date) along with funding sources and their shares in each major project development activity. Prior costs are not eligible for BIP funding. No other ineligible costs are expected to be incurred prior to obligation.

Prior Project Costs $Million				
Tasks	**Project Costs**	**Non-Federal Funds[1]**	**BIP Funds**	**Other Federal Funds**
Corridor studies, scoping activities, and preliminary engineering investigation	$1.535	$1.535	Not eligible	$0.00
Total Prior Project Costs	$1.535	$1.535 (100%)	Not Eligible	$0.00 (0%)

1. Thruway Authority Capital Funds

Future project costs, which are eligible for BIP funding, are shown in the table below, along with funding sources and their shares by each major project development activity.

Future Project Costs $Million				
Project Development Activity	**Project Costs**	**Non-Federal Funds[1]**	**BIP Funds**	**Other Federal Funds**
Construction	$32.2	$9.52	$22.56	$0
Mobilization	$1.2	$0.38	$0.94.	$0
Subtotal: Construction Cost	**$33.4**	**$9.9**	**$26.72**	**$0**
Contingency (20%)	$6.6	$6.6	$0	$0
Subtotal: Award/Construction Cost	**$40.0**	**$16.5**	**$23.5**	**$0**
Preliminary Design	$1.25	$1.25	$0	$0
Final Design	$1.25	$1.25	$0	$0
Quality Control/Admin of Final Design and Contract	$1.0	$1.0	$0	$0
Construction Inspection	$3.5	$3.5	$0	$0
Right of Way	$0	$0	$0	$0
Total Future Project Cost	**$47.0**	**$23.5 (50%)**	**$23.5 (50%)**	**$0 (0%)**

1. Thruway Authority Capital Funds

The Authority has previously expended $1.535 million on preliminary design (pre-BIP grant application) and is committed to expending an additional $23.5 million in Thruway Authority Capital Funds for the subject project. Cumulatively, Authority funding will account for 53% of the overall project costs.

IV. PROJECT OUTCOME CRITERIA

Criteria #1: State of Good Repair

The project will improve the condition of bridges in poor condition or in fair condition and at risk of falling into poor condition within the next three years. Although rigorously maintained, the South Grand Island structures are vulnerable to accelerated deterioration due to their advanced age, original design details, and marine environment location. The condition of these components is beyond the capability of maintenance forces to address and must be addressed by a Capital Project.

While the current NBI ratings for these structures (deck, superstructure, and substructure) range from "Fair" to "Good," they are at risk of falling into poor condition within the next 3 years. These structure types are highly susceptible to ratings that are rapidly reduced from "Satisfactory" or "Fair" to "Poor" condition because the bridges were constructed with superstructures containing fracture-critical non-redundant members. Some of the members on these structures are similar in design to the I-35 Mississippi River Bridge that collapsed in Minnesota in August 2007. Detailed information on the original design and construction of the bridges is included in Appendix A.

Example red flag location - primary member tear

The Authority routinely performs inspections to obtain a comprehensive and intensively detailed state-of-repair examination for an entire bridge structure. The last inspection of both South Grand Island Bridge structures was completed in November 2020, identifying numerous critical bridge condition issues. The inspections for both structures identified:

- 5,653 linear feet of "Poor" and 31 linear feet of "Severe" condition-rated steel elements
- 195 fracture-critical steel gusset plates rated in "Poor" condition
- 25 fracture-critical pin and hanger assemblies rated in "Poor" condition
- 31 bearings rated in "Poor" condition
- 14,838 square feet of sidewalk rated in "Poor" condition

Failure of one component of a fracture-critical primary support system can result in bridge closure or a catastrophic collapse. Other critical condition issues could lead to lane or load restrictions, which would severely impact mobility and freight along I-190.

To safely manage risk for structures of this type, New York State requires more rigorous qualifications for bridge inspectors, as well as more analysis and information for bridge inspection reports, than is required under the NBI inspection protocols. This data collection process serves to provide a more comprehensive understanding of the existing bridge condition and future needs than an NBI inspection provides. The process, which is detailed in Appendix B, has revealed numerous critical bridge condition issues on both bridges. With this additional level of scrutiny, the Authority is able develop and apply a highly accurate systemwide bridge asset management plan to maintain structures with non-redundant fracture-critical elements.

Because of the 2020 inspection findings, in-depth bridge inspections are currently underway to supplement the data previously gathered for the structural condition of fracture-critical non-redundant members, pin and hanger assemblies, and other bridge members. This project will complete repairs to all identified conditionally at-risk members. Proposed improvements, such as installing steel plates over areas of section loss and addressing fatigue cracking will restore, and in some instances increase, the full loading capacity of these critical structural elements. With these improvements, the structures will be returned to a state of good repair and require only routine preventative maintenance for the anticipated remaining 75-year service life of the structures. Detailed

information on the Authority's bridge inspection process, along with inspection conclusions, is included in Appendix B.

The project will also improve seismic protection to provide long-term resiliency to extreme weather events, flooding, or other natural disasters. The structures are classified as "Critical" bridges. The Authority retained specialized consultant services in 2020 to analyze the effect that a seismic event would have on the southbound Grand Island Bridge, and to identify retrofit schemes to mitigate an event's detriment to the structure. It was determined that, without recommended seismic improvements, a vital regional emergency-response transportation corridor is at risk of being severed following an upper level (2500-year) seismic event. This project will incorporate the study's recommended substructure resiliency improvements, including replacement of dampers, bearings, shear keys, and widening joints, to ensure that the bridge will be capable of meeting or exceeding seismic performance thresholds, allowing the bridge to serve as part of a lifeline for emergency response following an upper-level seismic event. Detailed information from the 2020 seismic study is provided in Appendix C.

The project will reduce maintenance costs. As demonstrated in the Benefit Cost Analysis, included in Appendix F, maintenance cost savings for the 20-year analysis period will be $8.5 Million (present worth value).

An asset management maintenance plan will ensure that the state of good repair is retained. The Authority uses a Bridge Asset Management System that employs an objective, integrated decision-making process, which is data-driven and replicable. The goal of the Bridge Asset Management System is to establish long-term programmatic planning and maximize the remaining safe service life of each bridge, while also addressing non-condition related vulnerabilities. Comparable data for each of the 817 Thruway bridges is analyzed in detail by a multi-disciplinary team to determine the type of work needed to keep the structures in safe and serviceable condition. By incorporating 30 years of bridge inspection data, inventory data, structural details and vulnerabilities, highway safety data, along with the capital and maintenance history and operational concerns for each bridge, a plan is developed to prioritize maintenance and Capital projects. Each of the Thruway bridges has a detailed long-range capital and maintenance plan to help ensure it is maintained in a state of good repair.

In conjunction with the Bridge Asset Management System, maintenance engineers and groups within the Authority's Buffalo Division Office work daily to ensure the reliability of the Authority's assets and the safety of its patrons in that region. Given the importance of the Grand Island Bridges to the state, region, and local communities, a dedicated Bridge Management group in the Buffalo Division performs necessary preventive and corrective repairs to protect the structures. Work beyond the capabilities of maintenance forces, such as the work proposed in this project, is completed by Capital improvements, which are designed and overseen by the Authority's Department of Engineering, in conjunction with the Bridge Asset Management plan.

Criteria #2: Safety

This project contributes to the Safety criteria by reducing the number of crashes on or near the bridge. Accident data for this segment of I-190 (Mileposts 914.3 to 915.0), for the pre-Covid period of 2017 through 2019, documents a total of 112 crashes, 22 of them with injuries. Of these incidents, overtaking and rear-end accidents occurred in 63% of the recorded crashes. Given the high prevalence of these accident types, the Authority conducted friction testing in 2018 to measure skid resistance, which is the force that prevents a non-turning (i.e., locked-up) tire from sliding on the pavement's surface. This analysis concluded that skid resistance properties of the existing wearing surface are inadequate (FN < 40) at 19 test locations on the northbound bridge and 23 locations on the southbound bridge. To address the friction deficiency, the Authority will evaluate two options for effectiveness, durability, and value. One alternative is to install longitudinal or transverse cuts (grooves) into the surface to increase pavement skid resistance properties. The second alternative is to install a durable high-friction overlay wearing course.

As reflected in the Benefit Cost Analysis, included in Appendix F, the project is expected to result in a reduction of 4.68 damaged vehicles per year, a reduction of 2.86 injuries per year, and is projected to provide a systematic reduction of 0.04 fatalities per year.

Known and documented safety problems with the bridge will be targeted and the project will protect motorized and non-motorized travelers or communities from health and safety risks. Improvements to the friction of the decks' wearing surface will improve safety for motorized users by reducing the likelihood of crashes, as discussed above.

This project will not include rehabilitation or replacement of the bridge decks and does not require bicycle and pedestrian accommodations pursuant to 23 USC 217(e). However, there are existing sidewalks on the bridges and paved pathways connecting the bridges' sidewalks to existing local and regional shared-used trail systems on both ends of the bridges. The Authority has examined opportunities to improve these accommodations within the project scope. Bicycles and pedestrians are currently accommodated on one protected 5-foot-wide sidewalk on each bridge, which is less than the 10-foot width desirable for shared use. Due to the age and original design of the bridges, the bridge sections are very narrow: they only allow for the 5-foot sidewalks and two 10-foot mainline lanes in each direction, with 2-foot shoulders. Given the available space, there is no opportunity to safely allot additional width to accommodate non-motorized modes of travel. However, the project will restore the sidewalk on the southbound bridge, which has been closed due to heaving and safety concerns, to a safe and accessible condition. Concerns with the safety of the paved paths connecting to the bridge sidewalks, i.e., the alignment of the connection points, will be addressed, as will any irregularities in the surface of the paths. Wayfinding signs, benches and pull-offs will also be added to improve navigation and comfort for non-motorized users.

Safety for maintenance personnel will be improved by replacing over 100 existing non-conforming fixed ladders with cages with ladder safety systems and personal fall arrest systems. This will bring the structures into compliance with the Occupational Safety and Health Administration's regulation 1910.28(b)(9).

Criteria #3: Mobility and Economic Competitiveness

The project will improve the mobility, efficiency, and reliability of the movement of people and freight by eliminating the risk of load restrictions or full closure of a critical local and regional interstate link. It will also reduce the frequency of maintenance activities requiring work zone restrictions that contribute to congestion.

As discussed in Section I - Basic Project Information (Context), the South Grand Island Bridges and the I-190 corridor are part of a vital national, state, and regional freight route, as well as serving as an important regional and local connection for mobility. Restrictions or closure of the bridges would impair mobility and damage the local, regional, and state economies. As discussed in the Benefit Cost Analysis, included in Appendix F, should an event occur without the proposed retrofits being completed, the impacts would be devastating to the corridor and surrounding communities as well as the local and regional economies. The estimated replacement cost of the bridges is nearly $1 billion, and during the 2 years required for inspection and construction, traffic accessing Grand Island would be forced to use a detour that would add approximately 13 miles to their trip. Through-traffic would also need to detour around the island on non-interstate routes in surrounding communities. Non-motorized traffic would have no viable detour, with the closest bicycle and pedestrian crossing from the Grand Island to the mainland located approximately 5 miles away at the North Grand Island Bridges. Detours that would be necessary during repair and/or replacement of the structures would add 0.683 hours of travel for southbound vehicles and 0.583

Trucks and transit bus utilizing the bridges.

hours of travel for northbound vehicles, in a calculated economic impact of over $455 million in transportation costs.

Travel time savings that will be achieved by the project, by reducing maintenance activities and work zone-related delays, are estimated to be 3.995 million Personal Vehicle Hours and 0.367 million Truck Hours over the 20-year analysis period, a $44 million present-worth benefit.

Criteria #4: Climate Change, Resiliency, and the Environment

The project will improve resiliency of at-risk infrastructure. As discussed under Criteria #1, this project will address critical condition issues on fracture-critical non-redundant members and other bridge components. The bridge will be strengthened against the weathering effects and stresses of storm events of increased frequency and intensity, including extreme lake effect snow from Lake Erie. According to a 2021 NYS Department of Environmental Conservation study, "The probability of extreme lake-effect snows, such as those that affected western New York in 2014, is likely to increase in the near future. Models suggest the decreasing trend in ice cover on the Great Lakes will lead to increased lake-effect snow in the next several decades through greater moisture availability." Seismic resiliency improvements will also be made to ensure that the bridge will remain serviceable as an emergency response route following an upper-level seismic event.

Additionally, the project will result in a reduction of greenhouse gasses. The project will contribute to efforts to combat climate change by reducing vehicle emissions (NOx, SO2, PM2.5, and C02) attributed to work zone-related congestion and lane closures. As shown in the Benefit Cost Analysis, included in Appendix F, a net reduction of over 180,000 metric tons in greenhouse gasses is anticipated over the 20-year analysis period. An additional benefit, although not included in the analysis, is expected to result from an increased use of non-motorized transportation as a result of improvements to bicycle and pedestrian accommodations.

Criteria #5: Equity, Partnership, and Quality of Life

The project will engage diverse people and communities. The Authority has developed a Public Involvement Plan, identifying a wide range of potential stakeholders and methods of outreach, including in-person and internet-based communication, to share information about the project, encourage discussion, and gather input from affected or interested groups and individuals. The plan is included in Appendix D – Partnership and Collaboration. The Authority has already engaged numerous stakeholders, including:

- Municipalities along the corridor
- Entities with jurisdiction over adjacent trail systems
- Local and regional business organizations
- Regional infrastructure and transportation coalitions
- Local bicycle advocacy organizations
- Local and regional economic development groups
- Freight and motorist representative organizations
- Local and regional trade organizations
- State and local elected officials

The Authority will work with these stakeholders to identify other groups and individuals with a potential interest in the project, treating the plan as a "living document" to be revised as new stakeholders, points of contact, or methods of communication are identified. This will include working with elected officials and the municipalities to identify the best mode of outreach to communicate with residents of Opportunity Zones and Potential Environmental Justice areas located within the towns. Letters of support from stakeholders are included in Appendix D.

It is the policy of the Authority to ensure equal opportunity and to prevent and eliminate discrimination in all its activities, including the areas of construction, consultants, commodities, and professional services. The Authority ensures its compliance responsibility in meeting the requirements for federal Civil Rights law on its Federal Aid-funded transportation projects, including requirements for the participation of Disadvantaged Business Enterprises (DBEs). The Authority is also fully committed to actively promoting Minority and Women-Owned Business Enterprises (MWBE) and Service-Disabled Veteran-Owned Business (SDVOB) opportunities. Participation goals will be set, results reported, and contracts monitored for this project. Further, the Authority incorporates

targeted training provisions within its contracts to provide a mechanism which allows for underrepresented groups to become skilled in the various construction trades.

Planning and engagement in the project design phase will be used to mitigate and prevent physical and economic displacement. While negative physical or economic impacts of the project are expected to be minimal and temporary, consisting primarily of minor nighttime disruptions to motorized and non-motorized traffic during construction, the Authority will use information gathered from public outreach to identify, avoid, or minimize any impacts to people, homes, or businesses that were not previously identified.

Existing conditions (top) and conceptual image of proposed improvements (bottom) on the paved paths connecting the bridges to existing shared-use trails on the south (Tonawanda) side.

Additionally, the project will incorporate nonvehicular transportation and provide quantifiable benefits to the quality of life of the users. Nonvehicular transportation is a key component of the project. A NYSDOT Complete Streets Checklist, included in Appendix E, was completed to help identify opportunities for improvement to nonvehicular transportation facilities. The project will includes the full restoration of a closed sidewalk on the southbound structure, and improvements to the shared-use paths connecting the sidewalks to adjacent trail systems to enhance safety, comfort, and navigation for non-motorized users. As reflected in the Benefit Cost Analysis in Appendix F, improved access and connectivity are expected to more than triple the estimated daily bike trips from 36 to 133. The improved connection to and from the Empire State Trail (EST), which crosses the state and passes along the south end of the bridges, will present both recreational and economic opportunities to residents of the region. A 2018 user projection report developed for the recently completed 750-mile EST estimated that annual trail users on the segment closest to the bridges, would be 126,434 (44,252 bikes and 82,182 peds)[2].

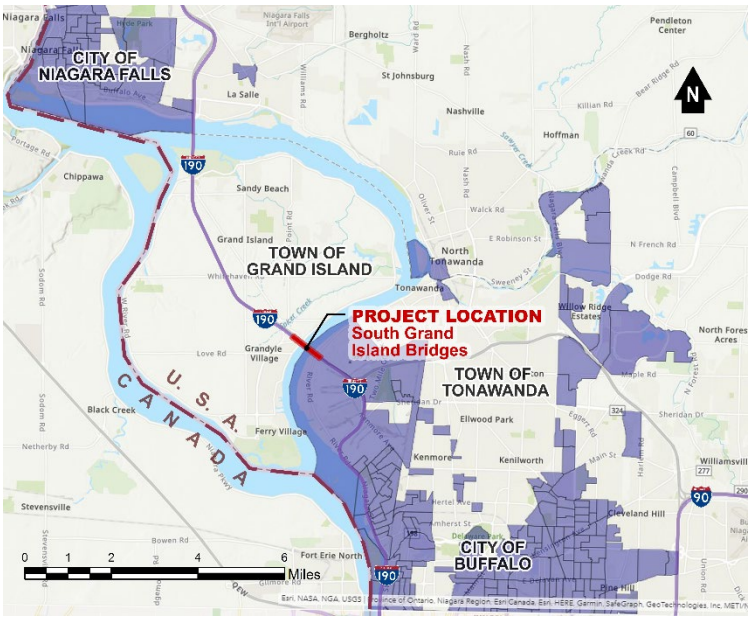
Equitable access to housing and transportation will be advanced. Maintaining the vehicular access and improving bicycle and pedestrian access for the bridges will increase the likelihood that people can - and will - choose non-motorized or public transit options to get to work, recreation, and services.

In addition to the two Opportunity Zones and Areas of Persistent Poverty identified in Section I, the project is located in and near multiple Potential Environmental Justice Areas. These are U.S. Census block groups of 250 to 500 households each that, at the time of analysis in 2020, had populations that met or exceeded at least one of the following statistical thresholds:

- At least 52.42% of the population in an urban area reported themselves to be members of minority groups; or
- At least 26.28% of the population in a rural area reported themselves to be members of minority groups; or
- At least 22.82% of the population in an urban or rural area had household incomes below the federal poverty level.

[2] "Trail User Projections", Empire State Trail, July 2018 https://empiretrail.ny.gov/sites/default/files/2021-09/EST%20Trail%20User%20Projections%20July%202018.pdf

In 2016, the Institute for Transportation & Development Policy (IDTP) found that lower-income households paid a larger portion of their income on transportation expenses than households with higher incomes. IDTP states that "the lowest earning 20% of the population earned an average of $11,933 and spent an average of $3,497 (29%) on transportation costs." [3] Providing safe, accessible non-motorized transportation options can help alleviate some of the transportation cost inequity that exists for lower-income households.



Potential Environmental Justice Areas
Source: New York State Data Clearinghouse

In addition, 3 Niagara Frontier Transportation Authority (NFTA) Metro Bus transit routes use the bridges. NFTA reports that, within .25 miles of stops on these routes, up to 37% of the population lives in poverty and up to 58% is non-white or of Hispanic/Latino origin[4]. Ensuring that these routes over the bridges are maintained helps to ensure that public transit will remain a viable option for lower-income and historically underserved populations that rely on these routes.

The project will provide congestion reduction and improved reliability in the project corridor. As demonstrated in the Benefit Cost Analysis, included in Appendix F, the travel time savings that will be achieved by the project are estimated to be 3.995 million Personal Vehicle Hours and 0.367 million Truck Hours, a $44 million present-worth benefit.

Criteria #6: Innovation

Within the parameters permitted for the Bridge Investment Program, the Authority will consider use of an innovative bidding procedure for this project. The Best Value process has been used successfully for several Thruway projects in the past. Traditional bidding procedures award the contract to the lowest responsible bidder. The Best Value bidding procedure is an innovative process that considers quality and efficiency in addition to cost. While price is still a major factor, a bidder with the lowest overall price may not necessarily be awarded the project: it will be awarded to the bidder who demonstrates the best complete understanding and ability to deliver the best project.

Competitive bids are solicited through a two-part process:

- Part one consists of traditional construction plans, proposal, bid items and quantities.
- Part two consists of a description of technical evaluation factors specific to the project, their relative weights, the weighting of price vs. technical evaluation factors, and instructions to the bidders.

Bidders submit a price proposal and a separate technical submission. The technical submissions are not publicly opened or read. Instead, they are reviewed and scored, based on defined project-specific criteria related to quality, schedule, experience, capability, traffic impacts, and the bidder's overall understanding of the project. The technical evaluation scores are combined with the price proposals to determine the Best Value Bidder. All Best Value Submissions are reviewed and scored by an Evaluation Committee, under the direction of the Authority's Office of Capital and Contracts Management.

This innovative procurement process reduces risk to the Authority. A contractor is selected based, in part, on their complete and written understanding of all critical aspects of the project rather than just price alone. This

[3] "The High Cost of Transportation in the United States", Institute for Transportation & Development Policy, May 2019 https://www.itdp.org/2019/05/23/high-cost-transportation-united-states/
[4] NFTA Route Maps "Favorite Stats" https://platform.remix.com/map/f03586db/line/f6acfc6b?latlng=42.99313,-78.93256,16.836&dir=0&public=true

increases the potential for selecting and awarding to the contractor with the ability to deliver the best overall project. Contractors can propose the use of innovative approaches or techniques that will offer significant benefits in terms of:

- lower costs
- shorter timeframes to complete work
- less disruption to neighboring communities
- less disruption to the movement of people, goods, and services
- improved work quality
- improved safety

Two recent Authority projects that used Best Value bidding, both with project costs of over $50 million, benefitted from construction time savings of up to 37% and price savings of up to 20%.

V. BENEFIT COST ANALYSIS

The project generates benefits that exceed its costs, and therefore results in a quantified net benefit to society. The cost effectiveness and net benefits of the project were estimated through a complete Benefit-Cost Analysis (BCA) as per U.S. Department of Transportation's (USDOT) *Benefit-Cost Analysis Guidance for Discretionary Grant Programs* (March 2022), included in Appendix F. The monetization of the main benefits resulting from the proposed improvements are summarized below:

Benefit Estimates, 2020 Dollars

Benefit Categories	7% Discount Rate*
Reduced Travel Time Costs	$44.0 million
Improved Safety and Avoided Crash Costs	$10.2 million
Reduction in Emissions Costs	$18.1 million
Reduction in Pavement Maintenance Costs	$8.5 million
Seismic Event Travel Time Savings and Reduced Construction Cost	$0.4 million
Ped/Bike Facility Improvements & Mortality Reduction	$3.1 million
Residual Values	$6.3 million
Total Estimated Benefits**	**$90.6 million**

* 7% Discount Rate with the exception of CO2 emissions, which are discounted at 3% per USDOT Guidance.
** Total may not sum due to rounding

A 20-year period of analysis was used in the estimation of the project's benefits and costs, which includes 2 years of construction (including quality control and construction inspection services) and 18 years of operation.[5] Annual costs and benefits are estimated through 2043, in accordance with USDOT BCA Guidance for projects addressing deficiencies. Beyond this point, it is anticipated that additional maintenance will need to be performed.

The project's most significant benefit is travel time savings and emissions reduction for passenger vehicles and trucks due to the avoidance of work zone related detours and delays. The frequency and duration of intermittent repairs creates additional, unnecessary delays and subsequent emissions release along this already congested corridor. The project will also generate a significant improvement in crash cost savings. Historic crash data was provided by the Authority, and future savings were calculated using the Highway Safety Manual (HSM) Predictive Model and applying crash modification factors (CMFs).

The monetized value of seismic retrofit benefits is relatively small due to the low probability of a significant event occurring in the project area. However, should such an event occur without the proposed retrofits being completed, the impacts would be devastating to the bridge and surrounding communities. The estimated replacement cost of the bridges is nearly $1 billion and would result in up to 2 years of bridge closure for inspection and replacement. During this time, traffic would be required to detour to the southbound North Grand Island Bridge to access Grand Island, adding approximately 13 miles to their trip. Through traffic would also need to detour around the island on non-interstate routes to reach their destination.

Considering all monetized benefits and costs, the internal rate of return of the project is estimated at 18.1%. With a 7% discount rate, the project would result in a net present value of $54.7 million and a benefit-cost ratio of 2.53.

[5] Project support costs are assumed to be incurred from 2022 to 2025. Benefits are assumed to begin to accrue in 2026. A twenty-year analysis period was conservatively estimated based on USDOT BCA suggested service life assumptions for transportation infrastructure projects.

Overall Results of the BCA, 2020 Dollars

Project Evaluation Metric	7% Discount Rate*
Total Discounted Benefits**	$90.6 million
Total Discounted Costs	$35.9 million
Net Present Value	$54.7 million
Benefit-Cost Ratio	2.53
Internal Rate of Return	18.1%

* 7% Discount Rate with the exception of CO2 emissions, which are discounted at 3% per USDOT Guidance

The project will generate an additional benefit that has not been monetized due to lack of guidance/ methodology from the US Department of Transportation. This benefit is travel time reliability. The reduction in unscheduled closures for emergency deck repairs will reduce the overall number of incidents along the corridor and improve general travel time reliability. While the travel time savings estimated in the BCA do include time savings from reduced delays from intermittent closures, the BCA does not consider the additional benefit of increased reliability beyond that of its incremental time value. In other words, just the fact that travel along the route is more reliable, and thus a traveler has a lower chance of experiencing a delay during a particular trip, has an intrinsic value to many. Travel time reliability is important for firms that depend on just-in-time deliveries as well as for individuals who need to be on time for work or other appointments. Improved reliability allows drivers to reduce the amount of "buffer" time they need to budget in order to account for unexpected delays. The inclusion of this benefit would increase the overall benefit-cost ratio.

VI. PROJECT READINESS AND ENVIRONMENTAL RISK

Technical Feasibility

As discussed in Sections I and IV, this project has been developed based, in part, on specialized seismic study and recommendations, along with information gathered from bridge inspections. Details on the proposed work can be found in Section I-Basic Project Information (Transportation Challenges and Solutions). The cost estimate, included in Section III, is based on preliminary design information and the cost history of similar projects and work scopes in the same geographic area, and includes a contingency appropriate for the Preliminary Design phase of the project.

The Authority adheres to the FHWA-approved guidance and standards contained in the New York State Department of Transportation's (NYSDOT) *Project Development Manual*, *Highway Design Manual*, and the *New York State Thruway Authority Structures Design Manual (4th Edition)*. Other FHWA- and State-approved guidance manuals, such as the *Manual of Uniform Traffic Control Devices*, will be applied, as appropriate, to this project.

Project Schedule

Major project milestones and their anticipated completion dates are identified in the table below.

No right-of-way acquisition will be required for this project.

Public involvement has begun with outreach to stakeholders and will be conducted for the duration of the project, through construction. For additional detail on these activities, refer to Section IV -Criteria #5: Equity, Partnership, and Quality of Life and the draft Public Involvement Plan in Appendix D.

All necessary activities will be complete to allow the project to advance, with obligation of BIP funding, for construction in 2024.

Project Milestone	Date
Start of NEPA and SEQR (State) Environmental Review Processes	March 2022
Completion of Preliminary Design	January 2023
Completion of Final Design Plans, Specifications, and Estimates	September 2023
NEPA and SEQR (State) Environmental Review Processes Complete Consultations with Regulatory Authorities Complete	September 2023 January 2023
Obligation of BIP Funding	December 2023
Environmental Permitting Complete *(if necessary – no needed permits have been identified)*	January 2024
Project Letting	February 2024
Project Award	April 2024
Start of Construction	May 2024
Completion of Construction	November 2025

Required Approvals

Environmental Permits and Reviews

National Environmental Policy Act. It is anticipated that this project will be classified as a Class II Action under the National Environmental Policy Act (NEPA) as implemented in 23 CFR 771. The Federal Highway Administration (FHWA) would be the NEPA lead agency. The project will be submitted for approval as a NEPA Programmatic Categorical Exclusion on the basis that it is not an action that will individually or cumulatively have a significant environmental effect. It meets the description in 23 CFR 771.117(c)(28) of "Bridge rehabilitation, reconstruction, or replacement or the construction of grade separation to replace existing at-grade railroad crossings, if the

actions meet the constraints in paragraph (e) of this section." The project will result in no significant changes or expansions to the existing infrastructure.

New York State Environmental Quality Review Act. The project is expected to meet all criteria to be classified as a Type II project under the New York State Environmental Quality Review Act (SEQRA) in accordance with 6 NYCRR Part 617, meaning it will not have a significant impact on the environment. The Authority plans to declare itself as the lead agency for SEQRA. Since the project is anticipated to qualify as a Type II action, a State Consistency Review by the Authority is not anticipated to be required, and no further environmental review is required under SEQRA.

A Social, Economic and Environmental Resources Checklist (SEERC) was completed to identify the topics and resources that needed to be analyzed to determine extent of adverse and beneficial impacts. The SEERC is included in Appendix E.

Topics that have been examined for this project include, but are not limited to:

- **Cultural Resources.** The Advisory Council on Historic Preservation (ACHP) adopted the Section 106 Exemption Regarding Effects to the Interstate Highway System on March 10, 2005. However, elements of the Interstate System that are exceptional in some way or meet a national level of significance under the criteria for the National Register of Historic Places are excluded from the exemption and continue to be subject to the requirements of Section 106 and Section 4(f). The Grand Island bridges are significant for their engineering design and because they were part of New Deal-era funding programs with the Niagara Frontier Authority.

  The Authority requested a review of the project from the Division for Historic Preservation of the Office of Parks, Recreation and Historic Preservation (OPRHP). OPRHP found, in a letter dated August 31, 2022, included in Appendix E, that the proposed work will have No Adverse Impact on these historic resources.

- **Protected Coastal Areas**. The project falls partially within New York State Coastal Areas, which are identified by the New York Department of State's (NYSDOS) Coastal Management Program to protect vulnerable natural coastal assets. A portion of the project is located within a New York State Landward Coastal Boundary, and within communities with Local Waterfront Revitalization Programs. A NYS Coastal Atlas Map has been included in Appendix E. The project will require a Coastal Consistency Review by the NYSDOS to ensure that it is consistent with State coastal policies and the Local Waterfront Revitalization Programs. Since the project will maintain the existing infrastructure and will improve access to the river for recreational purposes with improved bicycle and pedestrian accommodations, it is anticipated that the project will be fully compliant with policy and the review will be accomplished in a timely manner.

- **Wetlands.** The project will have no impacts to Federal- or State-regulated wetlands or waterbodies.

- **Endangered, Threatened, and Protected Species**. The Peregrine Falcon is listed as an endangered species in New York State and the Authority supports the state's falcon population by providing a nesting box on the main truss of the South Grand Island Bridge. The Authority will coordinate with the New York State Department of Environmental Conservation (NYSDEC) to ensure that work on the bridges does not disturb nesting falcons.

  A preliminary screening with US Fish and Wildlife Service's (USFWS) Information for Planning and Consultation (IPaC) tool indicates that there are no critical habitat areas in or adjacent to the project area. However, the Northern Longeared Bat, federally threatened bat species, may be present, along with multiple species of birds protected under the Migratory Bird Treaty Act. It is anticipated that the project may affect, but is not likely to adversely affect, one

Peregrine Falcon chicks in a South Grand Island Bridge nesting box

or more of these species. A consultation with USFWS will be conducted under Section 7 of the Endangered Species Act (ESA).

- **Public Involvement.** A description of stakeholder engagement that has occurred, as well as plans for continuing outreach and communication, can be found in Section IV under Criteria #5 and in the draft Public Involvement Plan in Appendix D.
- **Environmental Justice.** All services, programs and activities associated with this project will comply with the requirements of Title VI of the Civil Rights Act of 1964, ensuring that they are offered, conducted, and administered fairly, without regard to race, color, national origin, sex, age, or disability of the participants or beneficiaries. Potential Environmental Justice areas have been identified at or near the project location and are discussed in Section IV under Criteria #5.

State and Local Approvals

The project will be added to the Transportation Improvement Program (TIP) and the Statewide Transportation Improvement Program (STIP). A letter from the New York State Department of Transportation, dated August 29, 2022, and included in Appendix D, affirms that the project meets the eligibility requirements under USC Title 23. The requested $23.5 million toward the $47 million project will be incorporated into the plans when federal funding is allocated.

No additional state or local approvals are required. However, the Authority has engaged potentially impacted communities, including Erie County and the Towns of Grand Island and Tonawanda. Letters of support from these communities are included in the Public Involvement Plan in Appendix D.

Federal Transportation Requirements Affecting State and Local Planning

As discussed above, the project will be included in the TIP and STIP.

Assessment of Project Risks and Mitigation Strategies

A systematic approach to risk management will be used to help minimize costs and avoid potential contract complications or disputes. The project team and project stakeholders will undertake an identification process of all risks that may affect successful implementation of the project, regardless of when such risks may occur. Once risks are identified, their probability and relative impact will be rated and used to determine an overall risk rating. Strategies to mitigate the potential impacts of the risks will be defined. Priority will be given to the high-risk factors, with appropriate attention also devoted to moderate and low risks.

The results of the risk analysis process will be used in preparing contract provisions and any agreements with stakeholders or other third parties. The analysis will be used to identify the type and extent of engineering for different components of the project to avoid and mitigate high and moderate risk factors.

A preliminary assessment of risks that are known at this time has been developed and is shown in the table below. As the project is advanced and additional input is received from stakeholders and partner agencies, the assessment will be revised as necessary.

Preliminary Risk Assessment				
Identified Risk	**Probability Rating[1]**	**Impact Rating[2]**	**Overall Risk Rating[3]** (Probability x Impact)	**Mitigation Strategy**
Utility Delays Design or construction delays caused by slow utility owner response to requests for information or activities	**1**	**2**	**2**	Identify all utilities that will potentially be affected and engage utility owners as early in the process as possible to maximize time available for responses; maintain positive, proactive contact with utility owners during design and construction.
Completion Time Unseasonable weather or severe weather have the potential to slow the progress of construction and delay completion of the project	**2**	**2**	**4**	The project schedule includes an allowance of time for weather variations: only limited types of work are planned during winter, when harsh weather is most likely to affect construction activities.
Availability and Cost of Materials Supply change shortages have the potential to affect the availability of materials such as steel; limited availability and demand may increase prices of certain materials	**2**	**3**	**6**	The project estimate includes a contingency allowance to accommodate materials price fluctuations consistent with recent Authority construction projects. Availability of materials on ongoing projects will be monitored, with Contractor, to identify potential shortages and strategically prioritize procurement when possible.
Community Concerns Community concerns with project impacts have the potential to delay the design process	**1**	**2**	**2**	Continue to communicate openly with stakeholders about impacts and benefits of the project; actively incorporate community feedback into the design and construction processes.

NOTES:

1. Rated on a scale of 1 to 3, with 3 representing the highest probability
2. Rated on a scale of 1 to 3, with 3 representing the highest impact
3. Overall risk rating ≤3 is low
   >3 or ≤6 is moderate
   > 6 is high

VII. PROJECT PRIORITY CONSIDERATIONS

The project will be ready to proceed to final design within 12 months of a Categorical Exclusion Determination, Finding of No Significant Impact, or Record of Decision. A Categorical Exclusion Determination is anticipated by the completion of Preliminary Design in January 2023, when the project is scheduled to enter Final Design. Please refer to the project schedule in Section VI.

The project schedule and budget demonstrate that a two-phased BIP funding approach is feasible, with an initial obligation of BIP funds to complete final design and proceed to the construction phase within 12 months of the initial award of FY 2022 BIP funds. The second obligation of BIP funds for construction will be, based upon the results of preliminary engineering and FHWA approval of the plans, specifications, and estimate for the project, reasonably expected to begin construction within 18 months of the first obligation of BIP funds. Final Design is scheduled to be completed in September 2023, with Construction scheduled to start 6 months later, in May 2024. Please refer to the project schedule in Section VI.

Without a FY 2022 BIP grant, construction of the project is unlikely to commence before September 30, 2025. BIP Grant funding will supplement the Authority's funding to ensure that the time-sensitive and necessary improvements identified in Sections I and III are completed by November 2025. Without BIP funding, limited available funds will require that deteriorating conditions of the bridge are addressed only an emergency-need basis to avoid imminent condition-related flags that may cause bridge closure or load posting. Seismic resiliency improvements will be delayed by at least 10 years, with completion no sooner than 2035. Improvements to accommodations for non-motorized users will be delayed indefinitely, and the Southbound bridge sidewalk will remain closed. A reduced-scope-of-work approach will result in greater impacts to bridge users, including freight, public transportation, and non-motorized users, who will experience compounding impacts in service as the bridge conditions continue to deteriorate.