

Table of Contents

PROJECT DESCRIPTION 2

- What Will TIGER Fund Support? 3
- Expected Users of the Project..... 3
- Description of Transportation Challenges the Project Aims to Address 4
- How the Project will Address the Challenges? 5
- Whether the Project Promotes Ladders of Opportunity 5
- Relevant Data such as Passenger or Freight volumes, Congestion Levels, Infrastructure Conditions, and Safety Experience..... 6

PROJECT LOCATION 7

- Proposed Location and Connections to Existing Transportation Infrastructure 7
- Description of National, Regional, or Metropolitan Area in which the Project is Located..... 10

PROJECT PARTIES 10

GRANT FUNDS AND SOURCES/USES OF PROJECT FUNDS 10

SELECTION CRITERIA 11

- Primary Selection Criteria 11
- Secondary Selection Criteria 17

BENEFIT-COST ANALYSIS 18

PROJECT READINESS 19

FEDERAL WAGE RATE CERTIFICATIONS 25

PROJECT DESCRIPTION

The New Hampshire Department of Transportation (NHDOT) and the Vermont Agency of Transportation (VTrans) propose to reconstruct and widen the I-89 Lebanon-Hartford bridges, which span the Connecticut River between New Hampshire and Vermont.

Originally constructed in 1966, the bridges are in poor condition. As a consequence of their age and the harsh northern climate, the deterioration has progressed to the extent that they are now considered structurally deficient. The project involves reconstructing the bridges with new concrete deck and steel girders, improving geometry and operations of the existing Interstate ramps in close proximity to the bridges, improving the nonstandard roadway cross section geometry of the existing structures, improving stormwater runoff treatment, improving access to both the Exit 20 Lebanon NH area and Interstate 91 in Hartford VT, and reducing the crash potential within the area.

This bridges are critical facilities for the movement of people and goods locally, regionally, nationally and internationally. They are located along the major Boston to Montreal international trade route corridor, and serve as a junction to Interstate-91 and Interstate-93 as well as linking to New England’s major seaports and intermodal facilities, which connect New England with Canadian trade markets.

The bridges also serve the Lebanon micropolitan statistical area, the nation’s largest such area with a population of 218,466 in New Hampshire and Vermont. They are critically important to the connectivity, economy, and quality of life in both New Hampshire and Vermont. Commuters use these bridges to reach employment, medical services, education and training opportunities. Businesses in the area similarly use the bridges daily to facilitate delivery of goods and services throughout the region. The bridges serve as a link to the downtown areas of Lebanon, NH and White River Junction, VT for retail, tourism, and service industries.

In addition to commuter traffic and freight, local transit and intercity buses rely on this corridor, as well the passenger and freight Railroad terminal in White River Junction, making it a truly intermodal and multimodal corridor.



Aerial view of the I-89 Bridges Over the Connecticut River

It is therefore critical to urgently reconstruct the I-89 bridges. The safe and dependable operation of these complex structures is critical to providing connectivity for the regional transportation system between the two states and the larger trade corridor. TIGER funding will accelerate the reconstruction of the bridges.

The reconstruction of the I-89 bridges will:

- Improve reliability and safety
- Address significant deficiencies in the regional transportation system by reconstructing the structurally deficient and functionally obsolete bridges.
- Address regional transportation needs, and ensure the continued economic vitality of these two communities and the region.
- Facilitate the movement of goods to national and international export markets.
- Provide/create jobs in the region for the entire duration of construction activities.
- Enhance the livability of these two communities and the wider region.
- Meet USDOT goals on system preservation, and targeting federal funding towards critical interstate highways.

New Hampshire and Vermont believe this application meets the criteria for the TIGER VIII Grant Program and further, that it represents the type of project envisioned. Receipt of TIGER Grant funds will also allow both states to focus near-term toward addressing the needs of other bridges, that would otherwise not be possible without TIGER funding for this project.

What Will TIGER Fund Support?

NHDOT and VTrans are requesting \$12 million in TIGER funds to implement the estimated \$34.4 million project. TIGER funds are anticipated to finance approximately 35% of the project, and will support part of the construction phase.

Expected Users of the Project

The bridges are located along one of the busiest stretches of I-89. Some 38,048 Annual Average Daily Traffic (AADT) (13.9 million trips annually) are dependent on the bridges. Passenger vehicle traffic accounts for the majority of the trips as regional commuter flows are critical to the population base of 218,466 (the nation's largest micropolitan area) for employment opportunities straddle the state borders.

In addition, intercity bus carriers rely on the bridges. Greyhound and Megabus provide intercity bus service in and through the area, making between 5-6 daily return trips and transporting approximately 100,000 passengers annually to major markets in Boston and New York.

Local and commuter transit services also rely on the bridges. Advance Transit, the local and commuter transit service provider for the region, makes 27 daily trips across the I-89 bridges, linking communities and commuters in New Hampshire with those in Vermont. Some 200,000 trips are made annually on this service. The White River Junction Amtrak station similarly attracts approximately 15,000 annual trips from a regional traveler base.

Truck flows (local/regional deliveries, and national/international trade) account for 10% of the AADT (1.4 million annual trips) along the corridor, the majority of which neither originate nor are destined for New Hampshire or Vermont. The bridges are located along the Boston to Montreal international trade route, and serve as a junction to I-91 and I-93, which connects New England with Canadian trade markets. According to the Bureau of Transportation Statistics, 440,000 trucks cross Vermont’s borders using I-89 (and connecting I-91). The criticality of these bridges extends far beyond New Hampshire and Vermont as they serve as a conduit for trade along the entire eastern seaboard.

The bridges are also a major link that tie New England’s major seaports and intermodal facilities. Without the bridges, freight traffic would need to detour 100 or more miles or rely on secondary highways not suited for major commercial flows.

Description of Transportation Challenges the Project Aims to Address

Structurally and functionally obsolete highway bridges are a national problem where a significant number of bridges are in this condition. Compounding the problem in northern New England are harsh winter environments that accelerate bridge deterioration. With insufficient resources to maintain all highway bridges, DOTs have had to prioritize bridge rehabilitation and replacement projects. Many of these bridges are critical in that they are relied on for regional, national, and international goods movement, dwarfing their importance to the immediate communities they serve. They sustain the National Freight Network by having continuous interstate corridors free of weight restrictions.

For these reasons, both New Hampshire and Vermont have prioritized interstate bridges for reconstruction and replacement, but funding is insufficient to repair them all. The worst case



Local and regional transit services are dependent on the I-89 bridges

scenario for the I-89 bridges is weight posting and closure, which would cause serious harm to New Hampshire and Vermont communities, and to international trade as trucks would need to divert to other interstate highways. Addressing the problem now prevents both the risk of weight posting and escalating costs in the future.

How the Project will Address the Challenges?

This project will bring the I-89 bridges to a state of good repair, and address operational, safety, and economic development concerns. It will ensure that the bridges will not require additional major rehabilitation for decades to come. The operational and safety improvements will ensure that communities in New Hampshire and Vermont continue to prosper by enabling connections to major employers and downtowns (as well as allow for their long-term growth), enable local and intercity transit, and



Lebanon’s Downtown is highly dependent on tourism

intercity rail to continue their vital role of transporting people to their workplaces, medical facilities, and education and training opportunities.

It will also ensure that the vital Boston to Montreal international trade corridor operates unimpeded.

Whether the Project Promotes Ladders of Opportunity

The project promotes the following key ladders of opportunities for the area:

Connecting Communities

Connectivity and accessibility are critical components of this project. The I-89 bridges provide access to communities that straddle the Connecticut River, providing access to essential services and places of employment. Maintaining these bridges in a state of good repair, improving operations of the interchanges, and improving safety all have positive impacts on travel through this area for both business and personal endeavors including work, shopping, school, medical treatment, and recreational activities. In addition, this area contains one of the largest VA Hospitals in White River Junction Vermont (which services Northern New England area) as well as one of the top cancer research and children’s hospital in the region - Dartmouth Hitchcock Medical Center in Hanover New Hampshire. Dartmouth Hitchcock is the only Level 1 Trauma Center in the region, and one of only three in New England. The proposed

improvements will ensure residents continue to be provided with safe and efficient access to these facilities.

Commuters, local transit, intercity transit, and passenger rail are all used to transport residents to essential services and places of employment. These services are particularly essential for persons with limited mobility options and low-income populations which rely extensively on regional transit services on both sides of the border.

Revitalizing Communities

Community revitalization can only occur if spending is targeted in the appropriate areas. By focusing on reconstruction efforts of existing infrastructure, both NHDOT and VTrans avoid the need to build new highway and bridge infrastructure, which encourages sprawl.

Relevant Data such as Passenger or Freight volumes, Congestion Levels, Infrastructure Conditions, and Safety Experience

Please refer to the attached Bridge Rehabilitation Study Report for detailed information on infrastructure conditions and safety analysis.

Originally constructed in 1966, the I-89 bridges are in poor condition. As a consequence of their age and harsh northern climate, the deterioration has progressed to the extent that the bridges are now structurally deficient. The bridges are in urgent need of new concrete deck and steel girders, improved geometry, widening, improved stormwater runoff treatment, and improves access to both the Exit 20 Lebanon NH area and Interstate 91 in Hartford VT.



Bridge abutment showing cracks and spalls

Within the project area, there were a total of 65 reported crashes with 18 injuries in the period between 2007 and 2011. The non-standard roadway cross section on these bridges, coupled with the deficient acceleration/deceleration lengths on the adjacent ramps, account for a significant number of these crashes. Both of these deficiencies will be corrected with the widening of the bridges and the installation of auxiliary lanes, thereby reducing the potential for crashes and injuries.

The I-89 bridges are located along one of the busiest stretches of I-89. Some 38,048 Annual Average Daily Traffic (AADT) (13.9 million trips annually) are dependent on the bridges for travel. Passenger vehicle traffic accounts for the majority of the trips as regional flows. Truck flows (local/regional deliveries, and national/international trade) account for 10% of the AADT (1.4 million annual trips) along the corridor, the majority of which neither originate nor are destined for New Hampshire or Vermont. The bridges are located along the Boston to Montreal international trade route, and serves as a junction to I-91 and I-93, which connects New England with Canadian trade markets. According to the Bureau of Transportation Statistics, 440,000 trucks cross Vermont's borders using I-89 (and connecting I-91). The criticality of these bridges extend far beyond New Hampshire and Vermont, as they serve as a conduit for trade along the entire eastern seaboard.

Intercity bus transportation is provided by Greyhound and MegaBus. Combined, these providers provide 6 daily-return trips and transport an estimated 100,000 passengers annually. In addition, Advance Transit, the local and regional provider in the two-state area provides approximately 200,000 trips annually.

The White River Junction Rail Station serves as the Amtrak Station for the daily Vermonter Amtrak Service – the St-Albans-Washington, DC service which connects communities in Vermont, New Hampshire, Massachusetts, and Connecticut. Approximately 15,000 trips annually are made at this station.

PROJECT LOCATION

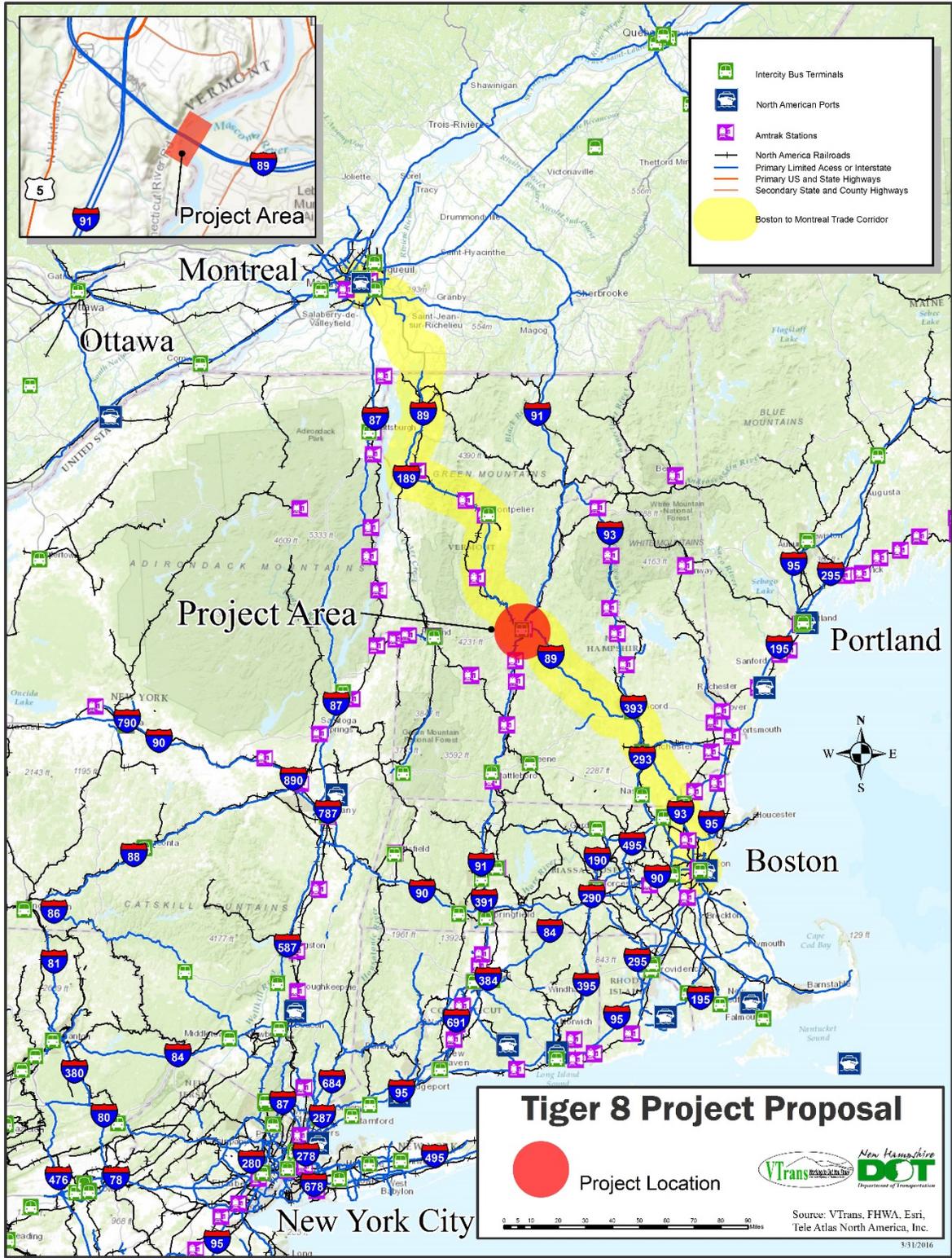
Proposed Location and Connections to Existing Transportation Infrastructure

The project's location spans the Connecticut River between New Hampshire and Vermont, and connects a number of communities including Lebanon, NH and White River Junction, VT (see map below). These two areas form the heart of the 218,466 strong Lebanon micropolitan statistical area – the largest such area in the country.

The bridges are critical facilities for the movement of people and goods locally, regionally, nationally and internationally. They are located along the major Boston to Montreal international trade route corridor, and serve as a junction to Interstate-91 and Interstate-93 as well as linking to New England's major seaports and intermodal facilities, which connect New England with Canadian trade markets. The bridges are also critical for the local, regional, and intercity bus service, and passenger rail.

Project Location Map

I-89 LEBANON-HARTFORD BRIDGE RECONSTRUCTION & WIDENING TIGER 8 APPLICATION



Description of National, Regional, or Metropolitan Area in which the Project is Located.

The I-89 bridges serve the Lebanon micropolitan statistical area, the nation’s largest such area with a population of 218,466 in NH and VT (the msa includes Grafton County, NH, and Orange and Windsor Counties, VT). The median household income in the region is \$55,726 (2014), slightly higher than the median income for the United States (\$53,657).

Major businesses in the area include Dartmouth-Hitchcock Medical Center (8,000), Dartmouth College (3,500), VA Medical Center (700), and Timken Aerospace (600).

PROJECT PARTIES

NHDOT and VTrans are the principal executive transportation agencies for their states. Under state statutes in their respective states, both NHDOT and VTrans are authorized to seek federal aid for modernization of highways and bridges.

GRANT FUNDS AND SOURCES/USES OF PROJECT FUNDS

This project has a total cost of \$34.4 million, of which \$12 million will come from TIGER funding, and \$22.4 million will come from New Hampshire and Vermont state and federal funding sources. TIGER investments represent approximately 35% of the project’s financing. There are no other pending discretionary federal funding requests. Some federal formula funds are dedicated towards this project as detailed below.

Total Project Costs by State

	PE	ROW	Construction	Total
New Hampshire	\$1,968,400	\$20,000	\$24,168,000	\$26,156,400
Vermont	\$621,600	\$20,000	\$7,632,000	\$8,273,600
Total	\$2,590,000	\$40,000	\$31,800,000	\$34,430,000

Source of Funds

	VT	NH	
TIGER	\$3,000,000	\$9,000,000	
GARVEE Bonds	\$0	\$12,408,000	
Federal Formula	\$4,262,080	\$1,590,720	
Toll Credits	\$0	\$3,157,680	
State Funds	\$1,011,520		
	<u>\$8,273,600</u>	<u>\$26,156,400</u>	\$34,430,000

SELECTION CRITERIA

A strong multimodal transportation system promotes economic vitality and viability, and ultimately results in more livable communities who benefit from that system. Transportation projects have the dual benefit of directly supporting jobs during construction, in addition to supporting local and regional economies through improved movement of goods, services, and people. Deficient links in transportation system infrastructure restricts travel and can significantly impact a region’s economic development and growth. Ensuring that transportation infrastructure remains in a state of good repair is a critical element in providing opportunities for economic competitiveness and viable economic



Large spall in the bridge span

growth. The proposed rehabilitation of the I-89 bridges helps restore the ability of these communities to remain competitive and promotes sustainable economic growth for the region.

Primary Selection Criteria

State of Good Repair

The purpose of the proposed project is to improve highway safety and preserve the structural integrity of the existing bridges, while maintaining the vital, high-volume transportation link between New Hampshire and Vermont, and facilitate international trade along the eastern seaboard.

The need for the project is as follows:

- The bridges are currently on New Hampshire’s Red List and considered structurally deficient based on the deteriorated superstructure.
- The existing inside and outside shoulder widths on both bridges are nonstandard at only 3’-0” wide.
- The on-ramp from northbound Interstate 91 (I-91) to southbound Interstate 89 (I- 89) has an insufficient merge distance.

- There is less than the desirable 2,000 feet between the southbound on-ramp from I-91 and the off-ramp to Exit 20.
- There are crashes occurring on the southbound on-ramp from I-91 as a result of geometric deficiencies.

The I-89 bridges are in poor condition (both structurally deficient and functionally obsolete) and an increasing amount of funding is required each year to maintain them in a usable condition. Each year, however, the condition gets worse as these bridges show their age and the work required to maintain them exceeds the funding and personnel available. The bridges have reached the point where a full superstructure and deck replacement is required and is beneficial from a short and long term standpoint as shown in the attached Benefit-Cost Analysis. The southbound bridge also has a fixed automated spray technology (FAST) anti-icing system which is costlier to operate and maintain than traditional chloride treatments alone. With the proposed replacement of the bridge superstructure, and deck and the intended improvements to the existing roadway geometry and drainage system, the anti-icing system can be removed.

If the bridges were not reconstructed or the project was delayed, significant on-going treatments will be required. For example, a crack seal treatment would need to be performed in 2019 at a cost of \$100,000 and a bridge wearing course treatment would need to be performed in 2022 at a cost of \$400,000. Even then the poor



Rust and scale under relief joint

condition of the bridges may eventually require weight posting, severely limiting their ability to adequately function as a connection between these communities, and threatening future transportation network efficiency, mobility of goods and accessibility.

The new concrete deck and steel girders, which form the core components of this project, will be designed to improve the bridges' ability to withstand occurrences and recurrences of emergency or major disaster impacts due to climate change. The scour analysis and subsequent scour countermeasure design will provide the structures with additional scour resistance against major flooding events. The existing bridges provide no scour countermeasure and are susceptible to scour from flood events. This project therefore improves the resilience of the bridge.

The reconstruction of the bridges also includes the construction of two new stormwater treatment facilities to handle stormwater runoff from paved roadway surfaces. The proposed infiltration ponds will provide improved water quality by increasing the removal of total suspended solids, total nitrogen, and total phosphate from highway runoff into the Connecticut River.

The project is consistent with relevant plans to maintain the bridges in a state of good repair. The project is included in both the NHDOT Ten-Year Transportation Improvement Plan (2015-2024) and the VTrans Capital Improvement Plan. It is also included in both state’s State Transportation Improvement Program. In addition, the project is consistent with both the New Hampshire and Vermont Long Range Transportation Plans System Preservation Goals (providing appropriate investment in infrastructure to preserve the physical condition and operability of the transportation system).

The project is appropriately capitalized up front and uses asset management approaches that optimize its long-term cost structure (see attached Rehabilitation Report). Both NHDOT and VTrans have a sustainable source of revenue available for the operations and maintenance of the project. This consists primarily of FHWA formula funds and state transportation revenues.

Economic Competitiveness

The project includes auxiliary lanes across both bridges. These auxiliary lanes will stretch between both interchanges and provide improved levels of service and more consistent travel speeds through the corridor. Improving the ability of vehicles on the mainline and ramps to traverse this area in a more efficient manner will result in a reduction of travel times and costs and will allow local, regional, national and international commercial users to reduce transportation costs, improve their logistics practices, and expand markets for both domestic and international shipments (see attached BCA).

These bridges serve as a vital link between New Hampshire and Vermont’s tourism sectors, and will provide a safer, more efficient connection between these attractions and their users. In addition, these bridges form one of the major links in the commercial shipping corridor between Canada, Vermont, New Hampshire and points further south throughout New England. The proposed improvements will therefore maintain long-term efficiency, reliability, and cost



Major employers and healthcare providers such as Dartmouth-Hitchcock Medical Center rely on the I-89 bridges

competitiveness of goods.

The Lebanon Municipal Airport, located off Exit 20 in New Hampshire is the state’s third largest airport. The Airport is a large economic contributor to the region with nearly \$2.4 million spent in 2013 by airport visitors. It hosts three major aviation service providers and is a critical resource for the Dartmouth-Hitchcock Advanced Response Team. Many businesses in the region rely on Lebanon Municipal Airport for the transportation of goods or persons, including educational and healthcare institutions, large retailers, and financial firms. The proposed improvements will provide a safer, more efficient connection between New Hampshire, Vermont, and the region, which is key to maintaining the economic stability and growth of this airport.

Economic benefits will also accrue from the safety component of this project. Savings from avoided crashes directly affect the local communities that provide the emergency service response. The savings are associated with fewer emergency response calls, and result in lower taxes, allowing communities to stay competitive in attracting and retaining businesses and homeowners.

The project is also vital in ensuring improved access for residents with transportation disadvantages through reliable and timely access to employment centers, education and training opportunities, and other basic needs of workers. Advance Transit, the local and regional provider in the two-state area, provides approximately 200,000 trips annually with

access to employers, medical care, and education and training. The transit routes are optimized to ensure access to these locations. In addition, Greyhound and MegaBus provide 6 daily-return trips and transport an estimated 100,000 passengers annually. The Rail Station in White River Junction similarly provides access to regional services. These providers allow area residents to reach a wider pool of education and training opportunities, and medical centers.

In the short-run, this project is anticipated to create approximately 100 jobs in construction, and engineering services. In the long-run, it will sustain the Boston-Montreal trade corridor, and sustain long-term job creation and economic opportunities in New England and beyond. It will also help the United States compete in a global economy by facilitating efficient and reliable freight movements, and reducing the costs of transporting export cargoes.



Public Transit is the only means of transportation for many residents

These bridges are also critically important to the connectivity, economy, and quality of life for both New Hampshire and Vermont residents, particularly the downtown areas of Lebanon, NH and White River Junction, VT which are dependent on tourism and service industries.

Economic Distress and Opportunities

The Lebanon-White River Junction area has been reshaped considerably in the past few decades. Primarily a manufacturing hub, the region has transitioned to a mixed industrial-service economy. The availability of a strong transportation infrastructure linking communities, states, local businesses, and the world in general, has helped facilitate this transformation.

While the region is not an Economically Distressed Area per federal requirements, it has fallen behind in growth and employment. In the past 5 years, total New Hampshire and Vermont jobs increased 2.8% and 3.6% respectively. By contrast, total jobs in Grafton County, NH increased by 1%, and in Windsor County, VT declined by 0.5%. While many areas of the country continue to enjoy the growth associated with the economic recovery, this has not occurred in the Lebanon-White River Junction area.

Quality of Life

This project improves the quality of life of area residents by supporting two of the six ‘Livability Principles’ developed by USDOT, along with the Department of Housing and Urban Development (HUD) and the Environmental Protection Agency (EPA) as part of the Partnership for Sustainable Communities – 1) Enhancing Economic Competitiveness, and 2) Supporting Existing Communities.

Livability and community cohesion go hand in hand. The quality of relationships among people in a community, as indicated by the frequency of positive interactions, the number of neighborhood friends and acquaintances, and one’s sense of community connection, is a significant indicator of a region’s livability. Both Lebanon and White River Junction have vibrant

downtown areas and well-established neighborhoods. The I-89 bridges connect these communities and contributes to their overall livability by linking the downtown areas, businesses, organizations, civic groups, and individuals.



White River Junction depends on tourism to sustain its economy

Maintaining these bridges in a state of good repair, improving the operations of the interchanges, and improving safety all have a positive impact on travel through this area for

business and personal endeavors including work, shopping, school, medical treatment, and recreational activities. In addition, this area contains one of the largest VA Hospitals in White River Junction Vermont as well as one of the top cancer research and children’s hospital in the region - Dartmouth Hitchcock Medical Center in Hanover New Hampshire. The proposed improvements will continue to provide safe, efficient access to these facilities, ensuring that residents and visitors continue to obtain excellent medical care.

Improved operations of the mainline and ramp intersections will reduce the travel times and make the travel safer for many of the individuals in and around Lebanon and White River Junction who rely on the highway and ramps for their daily commute, as well as for trips to education, shopping, medical appointments, and other services.

A major benefit of this project is the transportation choices and access to essential services for residents, particularly for transportation disadvantaged groups. Advance Transit, the local and regional provider in the two-state area, provides approximately 200,000 trips annually with access to employers, medical care, and education and training. The transit routes are optimized to ensure access to these locations. In addition, Greyhound and MegaBus provide 6 daily-return trips and transport an estimated 100,000 passengers annually. The Rail Station in White River Junction similarly provides access to regional services. These providers allow area residents to reach a wider pool of education and training opportunities, and medical centers.

Environmental Sustainability

The project includes components that will improve water quality and avoid and mitigate environmental impacts. The reconstruction of the bridges also includes the construction of two new stormwater treatment facilities to handle stormwater runoff from paved roadway surfaces. The proposed infiltration ponds will provide improved water quality by increasing the removal of total suspended solids, total nitrogen, and total phosphate from highway runoff into the Connecticut River.

Improving the water quality of the Connecticut River is important to both New Hampshire and Vermont. The Connecticut River is a flagship natural resource throughout New England, just

as the Chesapeake Bay is to the mid-Atlantic region. Running 410 miles from the Canadian border to Long Island Sound, it is the region's longest river and one of only 14 American Heritage Rivers designated nationally, recognized for



The Connecticut River, viewed from a New Hampshire-Vermont bridge

its distinctive natural, economic, agricultural, scenic, historic, cultural and recreational qualities. In May 2012, U.S. Interior Secretary Ken Salazar designated the Connecticut River as America's first National Blueway, stating that the restoration and preservation efforts on the river were a model for other American rivers.

Safety

The non-standard roadway cross section on these bridges coupled with the deficient acceleration/deceleration lengths on the adjacent ramps has led to a large number of accidents. Within the project area, there were a total of 65 reported crashes with 18 injuries in the period between 2007 and 2011. Both of these deficiencies will be corrected with the widening of the bridges and the installation of auxiliary lanes, thereby reducing the potential for crashes and injuries.

Auxiliary lanes and wider shoulders also have the additional benefit of providing room for emergency vehicles across the Connecticut River during local emergencies and major disasters. The additional width also provides room for the movement of traffic if an emergency (accident) were to occur on the bridges.

The safety analysis was conducted to determine if any of the existing deficiencies contribute to the crashes in the area. One area in particular, the on-

ramp from northbound I-91 to southbound I-89, indicates that the poor geometry likely contributes to the high number of multiple vehicle crashes.



Crashes occur on the I-89 bridges and the adjacent areas.

Secondary Selection Criteria

Innovation & Partnership

One of the most telling signs of the importance of this project to the region is the partnership that has been developed between New Hampshire and Vermont to jointly apply for funding to implement this project of major regional significance, and even greater national significance by virtue of its criticality to national and international trade.

New Hampshire and Vermont (along with Maine) are involved in an innovative partnership to further highway performance and safety. Referred to as “Tri-State Partnership” the States are involved in, and jointly participate in, continuous and comprehensive assessment of system performance, knowledge base transfers, training exercises, coordinated materials procurement, and implementation and support of the Managing Assets for Transportation System (MATS) - a long-term asset performance system.

New Hampshire and Vermont are using a combination of state transportation revenues, federal formula funds, toll credits, and GARVEE bonds to supplement TIGER funding for this project. Only 35% of the project costs are anticipated to come from TIGER funds. New Hampshire and Vermont do not have sufficient funding on their own to implement this nationally significant project in a timely manner, and as such, TIGER 8 funds are vital.

In addition to several meetings among NHDOT and VTrans project staff and executive staff, a public information meeting was held in June 2014 to allow the public to have input into the project design.

This application enjoys widespread support from many stakeholders in these communities and elected officials at all levels of state and local government. (See the attached letters of support).

BENEFIT-COST ANALYSIS

A benefit-cost analysis was performed using the guidelines of the Notice of Funding Availability. The analysis focuses on the reconstruction of the existing bridges, including the full replacement of the steel superstructure, concrete deck replacement, and bridge widening to provide improvements to the existing geometry while maintaining the required travel lanes during construction. The project is evaluated by comparing the existing conditions, which is considered the baseline, and a future scenario where the superstructure has been repaired and concrete deck has been replaced. It is anticipated that if no major capital improvements are made, these bridges would need to be down posted and ultimately closed. Because the bridges carry interstate traffic, the long term closure and rerouting of traffic on other state and local routes was not considered a viable option.

The evaluation period of benefits and cost of a project are typically for a period that includes the construction of the project and the operational period which is 20-50 years on average. For this analysis the analysis period includes the project development stage with the construction anticipated to begin in 2019 and be completed in 2023 and a 50-year operation life.

The reconstruction of the two I-89 bridges over the Connecticut River results in a Benefit-Cost Ratio (BCR) of 1.71, with a BCR of 0.34 at a 7 percent discount rate, and a BCR of 0.71 at a 3 percent discount rate. Please refer to the attached Benefit-Cost Analysis for more detail.

PROJECT READINESS

Technical Feasibility

NHDOT commissioned the I-89 Rehabilitation Study Report (2014) which examines the technical feasibility of this project. The report lays out the project feasibility (also examining other alternatives such as full replacement), sets out the design criteria and basis of design, and develops cost estimates which were further refined to bring them to 2016 levels. Contingency levels have been applied to all phases of this project to reduce cost risk.

Both NHDOT and VTrans have cost risk-mitigation measures in place. Both agencies have sufficient flexibility to shift funding between projects to accommodate unforeseen cost overruns, and can also shift funding between programs if necessary (both state and federal funds). Both agencies use an active budget monitoring process whereby finance and budget staff meet regularly with program management staff to monitor expected costs at both a project and overall program level of detail. This careful monitoring allows both agencies to identify in advance when and where potential budgetary adjustments may become necessary, and plan for the changes in advance to avoid sudden and more disruptive funding shifts.

The following statement of work focuses on the technical and engineering aspects of the project and describes the project components.

I-89 LEBANON-HARTFORD BRIDGE RECONSTRUCTION & WIDENING TIGER 8 APPLICATION

Bridge Preliminary Plans Quantity Estimate					
Bridge Quantities and Cost 4/1/2016					
Lebanon/Hartford - Contract 16148					
Bridge Nos. 044/104 & 044/103					
INTERSTATE 89 N.B & S.B. over the CONNECTICUT RIVER					
ITEM NO.	ITEM DESCRIPTION	UNIT	UNIT PRICE	TOTAL QUANTITY	TOTAL COST
207.3	UNCLASSIFIED CHANNEL EXCAVATION	CY	\$27.50	1,400	\$ 38,500
209.201	GRANULAR BACKFILL (BRIDGE) (F)	CY	\$40.00	1,900	\$ 76,000
403.11	HOT BITUMINOUS PAVEMENT, MACHINE METHOD	TON	\$150.00	1,710	\$ 256,500
403.911	HOT BITUMINOUS BRIDGE PAVEMENT, 1" BASE COURSE (F)	TON	\$180.00	600	\$ 108,000
500.02	ACCESS FOR BRIDGE CONSTRUCTION	U	\$1,750,000.00	1	\$ 1,750,000
502	REMOVAL OF EXISTING BRIDGE STRUCTURE	U	\$1,820,000.00	1	\$ 1,820,000
503.20X	COFFERDAMS		\$1,100,000.00	1	\$ 1,100,000
504.1	COMMON BRIDGE EXCAVATION (F)	CY	\$20.00	2,800	\$ 56,000
504.2	ROCK BRIDGE EXCAVATION	CY	\$100.00	300	\$ 30,000
510.1	PILE DRIVING EQUIPMENT	U	\$280,000.00	1	\$ 280,000
510.61	FURNISHING & DRIVING STEEL BEARING PILES	LB	\$1.00	890,000	\$ 890,000
510.65	DRIVING-POINTS FOR STEEL BEARING PILES	EA	\$225.00	160	\$ 36,000
510.9	PILE SPLICES	EA	\$250.00	136	\$ 34,000
512.02	PREPARATION FOR CONCRETE REPAIRS, CLASS II	SY	\$600.00	310	\$ 186,000
520.0302	CONCRETE CLASS AA APPROACH SLABS (QC/QA) (F)	CY	\$350.00	200	\$ 70,000
520.12	CONCRETE CLASS A, ABOVE FOOTINGS (F)	CY	\$650.00	2,700	\$ 1,755,000
520.213	CONCRETE CLASS B, FOOTINGS (ON SOIL) (F)	CY	\$350.00	1,800	\$ 630,000
520.7002	CONCRETE BRIDGE DECK (QC/QA) (F)	CY	\$800.00	2,100	\$ 1,680,000
528.51	PRESTRESSED CONCRETE DECK PANELS (F)	SF	\$17.00	68,200	\$ 1,159,400
538.6	BARRIER MEMBRANE, HEAT WELDED - MACHINE METHOD (F)	SY	\$20.00	10,300	\$ 206,000
544	REINFORCING STEEL (F)	LB	\$1.10	359,000	\$ 394,900
544.11	REINFORCING STEEL MECHANICAL CONNECTORS (F)	LB	\$6.00	15,000	\$ 90,000
544.2	REINFORCING STEEL, EPOXY COATED (F)	LB	\$1.30	550,000	\$ 715,000
547	SHEAR CONNECTORS (F)	EA	\$5.00	61,000	\$ 305,000
548.21	ELASTOMERIC BEARING ASSEMBLIES (F)	EA	\$4,000.00	84	\$ 336,000
550.1	STRUCTURAL STEEL (F)	LB	\$1.60	3,400,000	\$ 5,440,000
561.301	PREFABRICATED FINGER EXPANSION JOINT (F)	LF	\$1,400.00	230	\$ 322,000
563.23	BRIDGE RAIL T3 (F)	LF	\$165.00	1,780	\$ 293,700
565.232	BRIDGE APPROACH RAIL T3 (STEEL POSTS)	U	\$4,500.00	4	\$ 18,000
606.413	SINGLE SLOPE CONCRETE MEDIAN BARRIER, PRECAST	LF	\$300.00	950	\$ 285,000
606.4175	PORTABLE CONCRETE BARRIER FOR TRAFFIC CONTROL - ANCHORED	LF	\$50.00	1,990	\$ 99,500
1002.1	REPAIRS OR REPLACEMENTS AS NEEDED - BRIDGE STRUCTURES	\$	\$50,000.00	1	\$ 50,000
1010.41	QUALITY CONTROL QUALITY ASSURANCE (QC/QA) FOR CONCRETE	\$	\$85,000.00	1	\$ 85,000
				Subtotal =	\$20,595,500
Note: 1) Superstructure Item Payment Breakdown is 76% NHDOT, 24% Vtrans		Minor Items, CE & Contingency (15%) =		\$3,089,325	
2) Substructure Item Payment Breakdown is per Substructure Unit. Abut A, Piers 1, 2, 3, 4 are Owned by NHDOT. Pier 5 & Abut. B Owned by Vtrans				Subtotal =	
3) Project Wide Item Payment Breakdown is 76% NHDOT, 24% Vtrans				\$23,684,825	
4) Unit Costs Based on Year 2016 Costs				Mobilization (8%) =	
				\$1,894,786	
				BRIDGE TOTAL =	
				\$25,579,611	
				SAY = \$ 25,600,000	

I-89 LEBANON-HARTFORD BRIDGE RECONSTRUCTION & WIDENING TIGER 8 APPLICATION

Highway Slope and Drain Estimate					
Roadway Quantities and Cost 4/14/2016					
Lebanon/Hartford - Contract 16148					
Bridge Nos. 044/104 & 044/103					
INTERSTATE 89 N.B & S.B. over the CONNECTICUT RIVER					
ITEM NO.	ITEM DESCRIPTION	UNIT	UNIT PRICE	TOTAL QUANTITY	TOTAL COST
201.1	CLEARING AND GRUBBING (F)	A	\$6,000.00	1	\$ 3,000
202.31	FILL ABANDONED PIPE	CY	\$200.00	48	\$ 9,600
202.41	REMOVAL OF EXISTING PIPE 0-24" DIAMETER	LF	\$15.00	1,500	\$ 22,500
202.5	REMOVAL OF CATCH BASINS, DROP INLETS, AND MANHOLES	EA	\$300.00	24	\$ 7,200
202.7	REMOVAL OF GUARDRAIL	LF	\$2.00	8,400	\$ 16,800
203.1	COMMON EXCAVATION	CY	\$10.00	13,100	\$ 131,000
203.2	ROCK EXCAVATION	CY	\$50.00	105	\$ 5,250
203.5554	GUARDRAIL EAGRT OFFSET PLATFORM, TL 3	U	\$7,000.00	4	\$ 28,000
203.6	EMBANKMENT IN PLACE (F)	CY	\$10.00	7,400	\$ 74,000
214.	FINE GRADING	U	\$100,000.00	1	\$ 100,000
304.1	SAND (F)	CY	\$20.00	3,500	\$ 70,000
304.4	CRUSHED STONE (FINE GRADATION)(F)	CY	\$25.00	4,700	\$ 117,500
304.5	CRUSHED STONE (COARSE GRADATION)(F)	CY	\$25.00	2,900	\$ 72,500
403.X	HOT BITUMINOUS PAVEMENT, MACHINE METHOD	T	\$75.00	19,300	\$ 1,447,500
403.99	TEMPORARY BITUMINOUS PAVEMENT	T	\$80.00	2,860	\$ 228,800
417	COLD PLANING BITUMINOUS SURFACES	SY	\$4.00	15,200	\$ 60,800
603.0021	12" R.C. PIPE, 2000D	LF	\$60.00	54	\$ 3,240
603.0022	15" R.C. PIPE, 2000D	LF	\$65.00	4,700	\$ 305,500
603.0022	18" R.C. PIPE, 2000D	LF	\$70.00	960	\$ 67,200
603.0022	24" R.C. PIPE, 2000D	LF	\$95.00	1,700	\$ 161,500
603.3012	15" R.C. END SECTIONS	EA	\$700.00	4	\$ 2,800
603.3012	18" R.C. END SECTIONS	EA	\$800.00	3	\$ 2,400
603.3012	24" R.C. END SECTIONS	EA	\$1,000.00	4	\$ 4,000
603.8022	15" PLASTIC PIPE (SMOOTH INTERIOR)	LF	\$45.00	30	\$ 1,350
603.8022	18" PLASTIC PIPE (SMOOTH INTERIOR)	LF	\$50.00	70	\$ 3,500
604.0007	POLYETHYLENE LINER	EA	\$200.00	52	\$ 10,400
604.12	CATCH BASINS, TYPE B	U	\$3,000.00	40	\$ 120,000
604.125	CATCH BASINS, TYPE B 5 FT DIAMETER	U	\$3,250.00	1	\$ 3,250
604.15	CATCH BASINS, TYPE E	U	\$3,000.00	35	\$ 105,000
604.155	CATCH BASINS, TYPE E 5 FT DIAMETER	U	\$3,250.00	1	\$ 3,250
604.324	DRAINAGE MANHOLE, 4 FT DIAMETER	U	\$2,500.00	10	\$ 25,000
604.4	RECONSTRUCTING / ADJUSTING CATCH BASIN	LF	\$450.00	7	\$ 3,150
604.9101	OUTLET CONTROL STRUCTURE	U	\$4,000.00	2	\$ 8,000
606.1254	BEAM GUARDRAIL (TERMINAL UNIT TYPE EAGRT, TL 3) STEEL	U	\$2,000.00	4	\$ 8,000
606.127	BEAM GUARDRAIL (TERMINAL UNIT TYPE G-2) STEEL	LF	\$600.00	5	\$ 3,000
606.18	*31" W-BEAM GUARDRAIL WITH 8" OFFSET BLOCKS (STEEL POST)	LF	\$16.00	6,300	\$ 100,800
606.28	*31" DOUBLE FACED W-BEAM GUARDRAIL WITH 8" OFFSET BLOCKS	LF	\$22.00	1,200	\$ 26,400
606.413	SINGLE SLOPE CONCRETE MEDIAN BARRIER, PRECAST	LF	\$80.00	2,400	\$ 192,000
606.417	PORTABLE CONCRETE BARRIER FOR TRAFFIC CONTROL	LF	\$25.00	7,200	\$ 180,000
609.01	STRAIGHT GRANITE CURB	LF	\$35.00	415	\$ 14,525
609.216	STRAIGHT GRANITE SLOPE CURB 6" HIGH	LF	\$20.00	2,500	\$ 50,000
609.811	BITUMINOUS CURB, TYPE B (4" REVEAL)	LF	\$8.00	5,000	\$ 40,000
615.1	FULL TRAFFIC SIGN STRUCTURE	U	\$100,000.00	2	\$ 200,000
615.2	CANTILEVER TRAFFIC SIGN STRUCTURE	U	\$70,000.00	1	\$ 70,000
Subtotal =					\$4,108,715
	TRAFFIC CONTROL & WORK ZONE SIGNING	2%	\$82,174	1	\$82,174
	EROSION CONTROL	2%	\$82,174	1	\$82,174
	TRAFFIC ITEMS	5%	\$205,436	1	\$205,436
Sub-total =					\$4,478,499
	CONTINGENCIES	10%	\$895,700	1	\$895,700
Subtotal =					\$5,374,199
	CONSTRUCTION ENGINEERING	6%	\$322,451.95		\$322,452
Subtotal =					\$5,696,651
CONSTRUCTION BID ITEMS					
698.11	FIELD OFFICE TYPE A	MON	\$2,500.00	44	\$ 110,000
698.2	PHYSICAL TESTING LABORATORY	MON	\$900.00	42	\$ 37,800
1010.15	FUEL ADJUSTMENT	\$	\$1.00	250,000	\$ 250,000
1010.2	ASPHALT CEMENT ADJUSTMENT	\$	\$1.00	50,000	\$ 50,000
1010.3	QUALITY CONTROL QUALITY ASSURANCE (QC/QA) ASPHALT	\$	\$1.00	57,000	\$ 57,000
Subtotal =					\$504,800
Note: 1) Mobilization costs are included in the Bridge section of the estimate					
2) Item Payment Breakdown is per location of effort					
3) Project Wide Item Payment Breakdown is 76% NHDOT, 24% Vtrans					
ROADWAY TOTAL =					\$6,201,451
SAY = \$					6,200,000

Financial Feasibility

NHDOT and VTrans have put forward a project finance plan which includes TIGER funds, federal formula funds, GARVEE bonds, toll credits, and state funds. Both agencies have stable and reliable capital and operating funding – both federal and state – to maintain this project through its lifecycle. The primary funding for interstate bridge maintenance are National Highway Performance Program funds, provided by FHWA by apportionment. Through 2020 (FAST Act), New Hampshire and Vermont will receive approximately \$1.1 billion in NHPP funds. Other FHWA formula funds (such as the STBGP funds) can also be used for interstate bridge maintenance. Some \$545 million in STBGP funds will be made available to both States through 2020 FAST Act apportionments.

In addition to federal funds, NHDOT and VTrans maintain state transportation revenues – a flexible source of highway funding that can be used for future capital and operating requirements. These funds total approximately \$500 million between the two States annually.

The financial condition of both NHDOT and VTrans is excellent. Neither agency has any debt, and the New Hampshire and Vermont State bond ratings are AA and AA+ respectively (Standard and Poor).

Both NHDOT and VTrans have experience in managing discretionary grants, including TIGER grants. Recent TIGER grants include:

- Memorial Bridge Replacement (NHDOT, 2010) \$20 million
- Sarah Mildred Long Bridge (NHDOT, 2014) \$25 million
- Western Vermont Freight-Passenger Rail Project (VTrans, 2015) \$10 million
- Western Corridor Rail Rehabilitation (VTrans, 2013) \$9 million

This project has a total cost of \$34.4 million, of which \$12 million will come from TIGER funding, and \$22.4 million will come from New Hampshire and Vermont state and federal funding sources. TIGER investments represent approximately 35% of the project’s financing. Please refer to the technical feasibility section of this grant application for a detailed cost estimate for each project component.

Total Project Costs by State

	PE	ROW	Construction	Total
New Hampshire	\$1,968,400	\$20,000	\$24,168,000	\$26,156,400
Vermont	\$621,600	\$20,000	\$7,632,000	\$8,273,600
Total	\$2,590,000	\$40,000	\$31,800,000	\$34,430,000

Source of Funds

	VT	NH	
TIGER	\$3,000,000	\$9,000,000	
GARVEE Bonds	\$0	\$12,408,000	
Federal Formula	\$4,262,080	\$1,590,720	
Toll Credits	\$0	\$3,157,680	
State Funds	\$1,011,520		
	<u>\$8,273,600</u>	<u>\$26,156,400</u>	\$34,430,000

Project Schedule

The following project schedule has been developed, informed by both the Rehabilitation Report and NHDOT/VTrans staff analysis:

- April 2016 - Draft NEPA (Categorical Exclusion) submitted
- September 2016 - Completion of NEPA
- September 2016 - Wetland permits (ACOE 404, NHDES, USCG, Vermont stormwater and Flood Hazard) application submitted Preliminary Plans, Specification & Estimate (PS&E) submittal
- May 2017 - PS&E submittal
- July 2017 - Securing easement and access agreement with Railroad property in Vermont
- October 2018 - Contract advertisement based on current funding with TIGER grant
- December 2018 - Contract Award
- January 2019 - Construction of trestle begins
- April 2020 - Foundation and substructure efforts for widen portion completed
- October 2020 - Completion of Phase 1, new superstructure completion, (median widen)
- October 2021 - Completion of Phase 2, replacement of existing superstructure
- October 2022 - Completion of Phase 3, replacement of existing superstructure
- July 2023 - Completion of Phase 4, new median barrier installed
- September 2023 - Project Completion

The schedule also accounts for continued operation during construction. The facility is too important to be closed during construction. This will be addressed by filling in the median during Phase 1 of the efforts, allowing the current narrow 30’ wide bridges to maintain existing traffic configurations until Phase I is completed. Once Phase 1 is completed, traffic will be moved to the newly completed section to allow for superstructure replacement and abutments rehabilitation to take place on the northbound bridge. Once Phase 2 is completed, northbound traffic will be shifted to newly reconstructed bridge and the southbound bridge will be placed in

median area for superstructure reconstruction. Once Phase 3 is completed, the median concrete barrier will be constructed along with final lane stripping.

Funding for this project will be obligated well before the obligation deadline of September 30, 2019. Pre-construction activities are not anticipated to take substantial time, as the NEPA document for this project is anticipated to be a Categorical Exclusion, and no permanent right-of-way is needed (only temporary right-of-way from the railroad operating below will be required).

Note that this project schedule is only possible with TIGER funds.

Required Approvals

Environmental Permits and Reviews

No significant impacts to the natural, social, or economic environment are anticipated, and the appropriate NEPA document anticipated is a Categorical Exclusion. NHDOT is in the process of finalizing documentation to request a Class II (Categorical Exclusion), pursuant to the NEPA, by April 2016. By September 2016, NHDOT will begin the process of obtaining required permits (ACOE 404, NHDES, USCG, Vermont stormwater and Flood Hazard). This process is anticipated to occur over a 6-12 month period.

Legislative Approvals

Approvals for this project have been obtained. The I-89 bridge is included in the New Hampshire Department of Transportation's (NHDOT) current Ten Year Transportation Improvement Plan, the VTrans Capital Improvement Plan, and in both state's State Transportation Improvement Program. These plans contain project priorities, and are based on input from the Regional Planning Commissions, numerous public meetings in both State, and approval by the State Legislatures and Governors.

A potential risk for projects of this scale is cost overruns. However, NHDOT and VTrans have mitigation strategies in place to deal with any potential risk. The project includes cost contingencies, which can buffer unforeseen increases in materials and labor costs. In addition, both agencies have stable funding – both federal and state – to offset any unforeseen increase in project costs. The primary funding for interstate bridges are National Highway Performance Program funds, provided by FHWA by apportionment. Through 2020 (FAST Act), New Hampshire and Vermont will receive approximately \$1.1 billion in NHPP funds. Other FHWA formula funds (such as the STBGP funds) can also be used for interstate bridge maintenance.

Some \$545 million in STBGP funds will be made available to both States through 2020 FAST Act apportionments.

In addition to federal funds, NHDOT and VTrans maintain state transportation revenues – a flexible source of highway funding that can be used for future capital and operating requirements. These funds total approximately \$500 million between the two States annually.

FEDERAL WAGE RATE CERTIFICATIONS

NHDOT and VTrans adhere to all federal wage rate requirements and have included federal wage rate certifications with this application.