2014 TIGER DISCRETIONARY GRANT APPLICATION

Bridge Number 2019
Federal Project STP-1849(800)
Work ID Number 018498.00

PROJECT TITLE: Replacement of Androscoggin River Bridge
Peru – Mexico, Maine

LEAD APPLICANT: Maine Department of Transportation

TYPE OF ELIGIBLE APPLICANT: State Government

AMOUNT OF TIGER FUNDING REQUESTED: $7.66 Million

DATE OF SUBMITTAL: April 22, 2014

PROJECT OVERVIEW

Project Name: Androscoggin River Bridge Replacement
Peru - Mexico, Maine

Project Begin Location: North 44 degrees, 31 minutes, 36 seconds; West 70 degrees, 27 minutes, 50 seconds

Project End Location: North 44 degrees, 31 minutes, 54 seconds; West 70 degrees, 27 minutes, 54 seconds

Androscoggin River Bridge
Peru – Mexico, Maine

General Description: This bridge replacement project addresses several transportation, economic and safety needs for the surrounding communities and industrial mills. The new structure will replace a weight restricted, structurally deficient, and fracture critical bridge and restore service for heavy trucks which is vital to the local wood products industry. It will provide an improved alignment and sight distance for turning trucks, and eliminate an existing at-grade railroad crossing. These improvements will enhance safety for all users; including trucks, emergency response vehicles, school buses, bicyclists, pedestrians and snowmobilers. The improved pedestrian/bicyclist accommodation is an important feature of this project and is in keeping with national trends towards building Green Communities and ensuring Safe Routes to Schools. Additionally, the new bridge would meet all hydraulic design standards by locating the bridge and approach roadway well above the FEMA mapped flood plain.

Androscoggin River Bridge (ARB) carries North Main Street over the Androscoggin River and provides a vital connection between Peru and Mexico, Maine. It has sustained vehicular collision damage to primary vertical and diagonal truss members and several sections of the overhead bracing. The bridge was constructed in 1930. ARB is a 3-span, 574 feet long, steel through-truss bridge founded on concrete abutments and piers. The structure has a curb-to-curb bridge width of only 22 feet, plus a 5-foot sidewalk. The bridge is currently in disrepair with structural deficiencies, collision damage, inadequate width, and a restricted weight limit of 25 tons.

The proposed bridge project will replace the existing bridge with a welded steel girder bridge that will be 844 feet long. The bridge roadway width will be 32 feet curb-to-curb, plus a 5-foot curb-to-rail sidewalk for pedestrians. The roadway will provide two 11-foot lanes and two 5-foot shoulders for bicycles and snowmobiles.

The total cost for replacement together with approach work is estimated at $12.7 million for Alternate D. Less $850,000 for preliminary engineering and $190,000 for right-of-way costs; the remaining cost for construction and construction engineering is estimated at $11.66 million. This application request is for $7.66 million (66 percent) in TIGER funds to supplement the $4.0 million (34 percent) in existing Non-Federal funds, in order to fully fund construction and construction engineering.

Key Threshold Requirements:

- ✓ Eligible Project: **YES**, Bridge project eligible under Title 23, USC
- ✓ NEPA complete or under way: **YES**
- ✓ Included in relevant planning documents: **YES**
- ✓ Ready to obligate all TIGER funds by June 30, 2016: **YES**
- ✓ Non-Federal match provided: **34%** of the construction and construction engineering costs will be borne by the State of Maine

Additional Project Considerations:

- ✓ The current bridge does not provide adequate width for trucks turning onto the bridge.
- ✓ Local mills must detour 8 miles around the weight restricted ARB.
- ✓ The project is multi-modal, providing vehicular, pedestrian, bicycle and snowmobile access connecting two communities and fostering a quality community environment.
- ✓ The project eliminates an at-grade railroad crossing.

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Project Benefits:

1. State of Good Repair
   a) Replacement of an 84 year old bridge at the end of its service life.
   b) Included in all applicable State planning documents and the Federal STIP.
   c) Decreases Maine's percentage of Structurally Deficient bridges to a level closer to New England's and National averages (Maine – 15.2 percent; New England – 11.5 percent, U.S. – 10.5 percent).

2. Economic Competitiveness
   a) Provides reliable access and regional mobility for highway traffic to local industries and employers.
   b) Provides a vital link from Route 108 to U.S. Route 2.
   c) Is in an Economically Distressed Area likely to benefit from its short- and long-term economic activity.

3. Livability
   a) Will provide shoulders and a sidewalk that will provide access for bicycle, pedestrian and snowmobile traffic.
   b) Will improve access for non-drivers and persons with disabilities.

4. Environmental Sustainability
   a) Will minimize adverse environmental impacts and utilize emerging techniques to protect salmon resources.
   b) Will remove the potential risks associated with a failing lead-based paint system.

5. Safety
   a) Will restore load capacity and replace a fracture critical structure.
   b) Will eliminate an at-grade railroad crossing.
   c) The project will include increased shoulder widths and a sidewalk.

6. Project Readiness
   a) The project is currently in the design phase.
   b) The Preliminary Design Report is 30 percent complete.
   c) NEPA is currently underway.
   d) Ability to obligate funds no later than June 30, 2016.

7. Innovation
   a) MaineDOT plans to use Glass Fiber Reinforced Polymer (GFRP) reinforcement bars.
   b) MaineDOT plans to use Fiber Reinforced Polymer (FRP) Bridge Drains.
   c) MaineDOT plans to provide electronic 3D data files to contractors.

8. Partnership
   a) Completes an overall funding package.
   b) Has documented support from elected officials, local government and industry.

9. Benefit/Cost (3 percent Discount Rate):
   a) Total Benefits of $272.2 million.
   b) Total Costs of $14.1 million.
   c) Benefit/Cost Ratio of 19.3.

2014 TIGER DISCRETIONARY GRANT APPLICATION
ANDROSCOGGIN RIVER BRIDGE, PERU-MEXICO, MAINE

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1. PROJECT DESCRIPTION

1.1 Existing Conditions

The Androscoggin River Bridge (ARB) connects the municipalities of Peru and Mexico, Maine via North Main Street over the Androscoggin River. North Main Street is a minor arterial that connects U.S. Route 2 to State Route 108. The existing 574-foot long bridge consists of three steel through-truss spans supported on concrete abutments and piers. The bridge has a concrete deck and a concrete wearing surface.

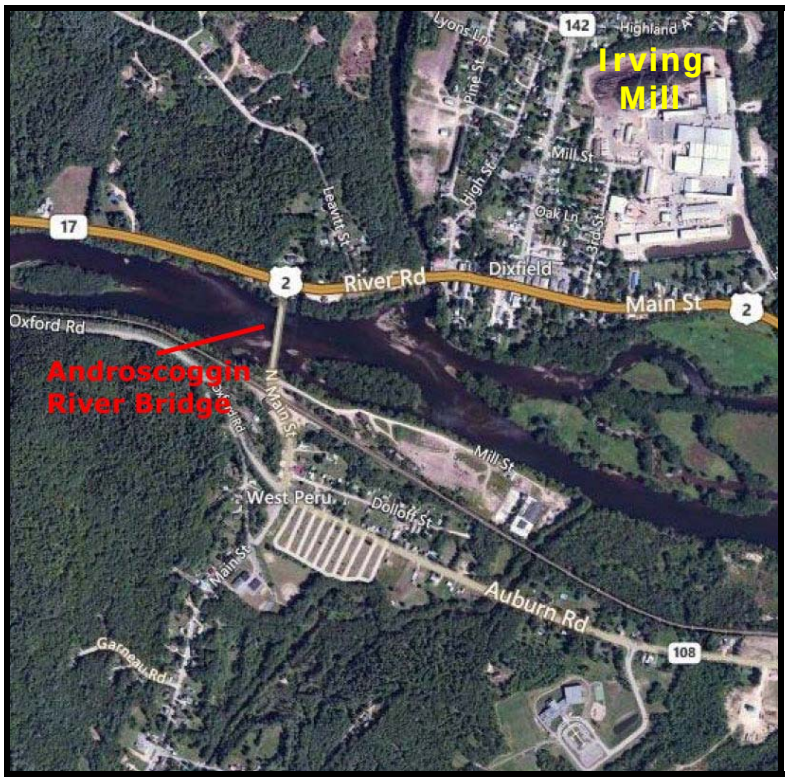


Figure 1: Project Location Map

1.2 Existing Geometric Features

The existing roadway alignment consists of a sharp S-curve heading northerly towards the bridge, and transitions to a tangent alignment across the Androscoggin River. An un-gated, at-grade railroad crossing is located near the center of the S-curve on the south approach to the bridge. On the north end of the bridge, the roadway terminates in a T-shaped intersection with U.S. Route 2 providing an important transportation connection between Peru and the neighboring towns of Mexico and Dixfield. The sight distances are severely restricted at both ends of the bridge due to the narrow 22-foot roadway width and the truss bridge members obstructing the clear view of the roadway. Six vehicular accidents have occurred on the bridge and immediate approach roadways within the past three years due in part to the narrow bridge and poor roadway geometry. The southerly approach roadway also lies within a FEMA mapped flood plain, creating safety concerns during peak flood storm

events. The posted speed of the existing roadway is 30 mph on the southerly approach and 25 mph on the northerly approach.

1.3 Design Standards

Along with evaluating rehabilitation of the existing bridge (Alternative A), five separate roadway alignments (Alternatives B through F) were developed and evaluated during the Preliminary Design Report (PDR) development phase. Several of the proposed alternatives were deemed undesirable due to substantial alterations to the local traffic patterns, including reduced pedestrian accommodation. The five proposed alignments were then narrowed down to Alternative D. Alternative D is located approximately 300 feet downstream of the existing bridge and will maintain the existing traffic patterns between Peru, Mexico and Dixfield. Table 1 provides a comparison of features between the existing condition and the proposed Alternative D.

Table 1: Existing Condition vs. Proposed Condition

Feature	Existing Condition	Alternative D
Bridge Roadway Width	22 feet	32 feet
Sidewalk Width	5 feet	5 feet
At-Grade Railroad Crossing	Yes	No
Fracture Critical Members	Yes	No
Structurally Deficient	Yes	No
Functionally Obsolete	Yes	No
Bridge Structural Capacity	25 Tons (Posted)	HL 93 mod (45 Tons)
Vertical Clearance over Design Flood	-2 feet	10 feet

The proposed alternative would improve safety by providing a wider roadway across the bridge, including 5-foot shoulders suitable for bicyclists. In addition, a non-redundant bridge with fracture-critical members would be removed from the bridge inventory and replaced by a modern structure with improved durability and reduced long-term maintenance expense. Alternative D would also eliminate the at-grade railroad crossing on North Main Street and it would meet all hydraulic design standards by locating the bridge and approach roadway well above the a FEMA mapped flood plain.

1.4 Traffic Capacity

The projected 2014 Average Annual Daily Traffic (AADT) for North Main Street at the Androscoggin River Bridge is 6,430 vehicles per day (vpd). The Design Hourly Volume (DHV) is 9 percent of the AADT. Heavy trucks also comprise 9 percent of the AADT.

The Estimated Time of Completion (ETC) for this project is assumed to be the year 2018. The years 2038 and 2068 were subsequently assumed to be ETC+20 and ETC+50, respectively. Table 2 provides the 2014 traffic volumes as well as those calculated for ETC (2018), ETC+20 (2038), and ETC+50 (2068) using a growth rate of 1 percent per year from 2014 through 2034.

The projected traffic volumes were used in the modeling that forms the basis for the Benefit-Cost Analysis discussed later in this application.

Table 2: Existing and Projected Traffic Volumes				
Volume	YEAR			
	2014	ETC (2018)	ETC+20 (2038)	ETC+50 (2068)
AADT (vpd)	6430	6688	7720	7720
DHV (vpd)	579	602	695	695

1.5 Structural Conditions

The ARB is Structurally Deficient and Fracture Critical. The **superstructure** is in poor condition. Approximately ten of the truss verticals and diagonals have sustained impact damage with several exhibiting permanent twisting and displacement with bent flange edges or notches. End floor beam paint conditions are poor within all three spans. Numerous lower lateral bracing angles have lateral displacement believed to have resulted from impacts from floating debris during high water periods. Numerous sway frames have sustained impact damage. The **deck** is in fair condition. The underside of the deck has numerous spalls with exposed reinforcing. The east sidewalk curb face is cracked and deteriorated with spalls over nearly 150 feet of bridge length. A large bituminous patch is present at the south abutment at the end of the concrete bridge deck. The **substructure** is in fair condition. The south abutment contains a wide vertical crack in the breastwall, which continues across the bridge's bridge seat and up into the backwall. Three of the wingwalls have cracks and spalls with exposed reinforcing. The west end of Pier 2 has spalls and scaling along the full height of the icebreaker edge.

East sidewalk curb face in Span 2 has a long spall with exposed reinforcing extending from L4 to L6. Looking northeast.

The following photographs represent the general condition of this bridge.

At L3 in Span 2 roadway truss, the vertical and diagonal have sustained damage 2′ above the lower chord, with localized twisting of the flanges.

Impact damage to sway frame lower transverse member along with lateral displacement of 6″ in the horizontal plane was observed at Span 3 U3.

West flange of Span 2 roadway truss diagonal U2-L3 is permanently deformed and bent inward by 2½″. Looking north.

West flange of Span 2 roadway truss vertical U3-L3 is permanently deformed and bent outward by 1½″. Looking south.

Span 1 roadway truss U5-L5 has sustained impact damage at railing level with localized twisting over a 3′ length and a permanent bend in the flange tip.

West traffic railing in Span 1 at L5 has a splice in both rails to repair previous impact damage. Note truss vertical is rotated from collision damage. Looking west.

In Span 3 between FB0 and FB1 five spalls with exposed reinforcing were noted between S5 and S6. View is looking south.

Above FB8 in Span 2, a 1′ by 2′ spall was observed in the floorbeam haunch zone between S4 and S5 at top left. Also note concrete patches in both bays.

Both abutments have been temporarily repaired with Dywidag post-tensioned concrete encasement repairs immediately below both truss bearings.

The southwest wingwall is in poor condition with a large deep spall continuous along the top for the full length of the wingwall.

1.6 Project Details

A deterministic life-cycle cost analysis of a bridge rehabilitation alternative was performed to allow for a comparison of other bridge replacement options. The replacement Alternative D has a significantly lower life-cycle cost when compared to the bridge rehabilitation alternative. Rehabilitation of the existing structure was evaluated during the preliminary design development, but was ruled out from further consideration due to the bridge's

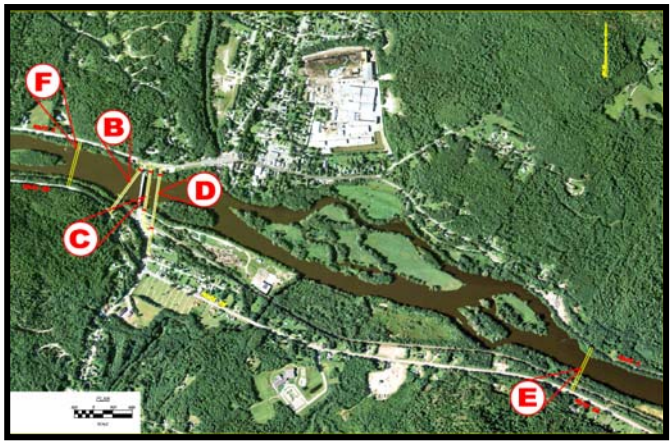
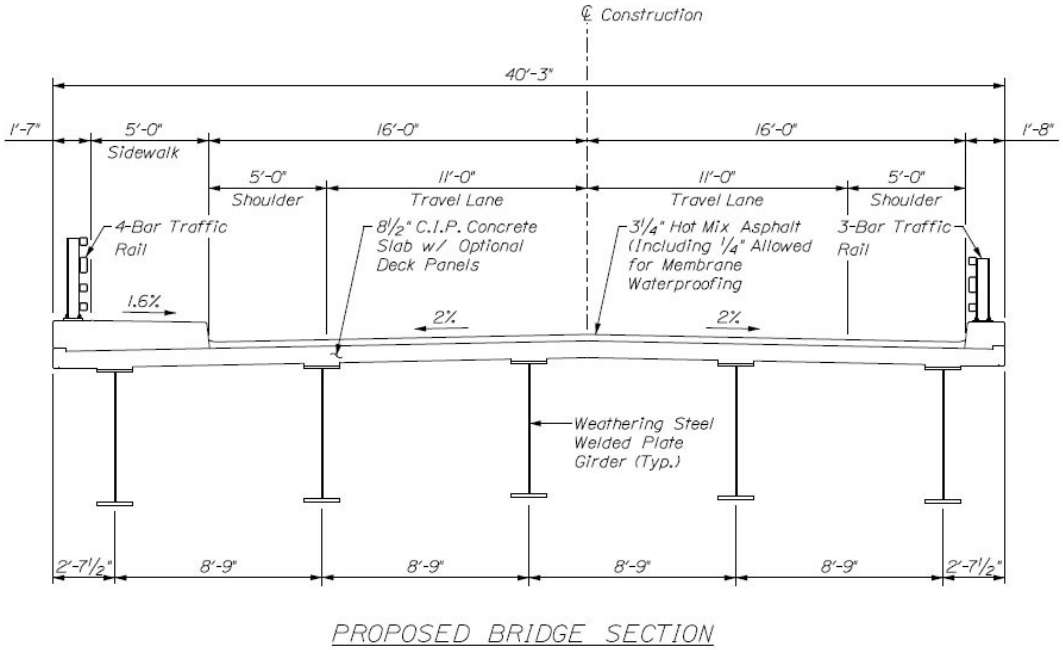


Figure 2: Alignment Alternatives

age, level of deterioration and load capacity. The existing bridge was constructed in 1930, and is nearing the end of its useful life. A weight restriction was placed on the bridge in October 2013, forcing trucks to make a lengthy 8 mile detour. Review of recent inspection reports and structural analysis found that the level of rehabilitation required to remove the weight restriction and increase the service life of the structure was nearly equivalent to the replacement cost. In addition, any rehabilitation would require the bridge to be closed for multiple construction seasons, forcing local traffic to also make a lengthy 8 mile detour. Rehabilitation would not increase the roadway width on the bridge, or remove the fracture critical elements. For these reasons, rehabilitation was eliminated from further consideration. Additionally, the replacement alternative reduces the traffic disruption duration, and significantly reduces future maintenance and inspection concerns.

The recommended alignment Alternative D relocates the crossing approximately 300 feet south of and downstream from the existing bridge. Traffic would be maintained over the existing bridge during the construction of the new bridge and approaches. The proposed structure will consist of a multi-span bridge utilizing structural steel girders and a cast-in-place concrete deck protected by a high performance spray applied membrane. The bridge rail would be three-bar steel traffic rail on the non-sidewalk side and four-bar steel pedestrian/traffic rail on the sidewalk side.

The bridge will be founded on concrete abutments and mass piers, all supported by steel H-piles for scour resistance. The bridge will provide a roadway width of 32 feet curb-to-curb, suitable for bicyclists and seasonal use by snowmobilers. A 5-foot sidewalk will be provided on one side of the bridge for year-round pedestrian use, including frequent use by school children. The improved pedestrian/bicyclist accommodation is an important feature of this project and is in keeping with national trend towards building Green Communities and ensuring Safe Routes to Schools.



PROPOSED BRIDGE SECTION

Figure 3: Proposed Bridge Section

2. PROJECT PARTIES

MaineDOT will continue to consult with stakeholders during the development of this project. Documentation of stakeholder support to date is included as web links under the applicable Selection Criteria subsections.

Federal Highway Administration – Maine Division
Maine Department of Environmental Protection
Maine Department of Inland Fisheries & Wildlife
Maine Historic Preservation Office
Pan Am Railways
Town of Mexico
Town of Peru
U.S. Army Corps of Engineers
U.S. Department of the Interior
U.S. Environmental Protection Agency
U.S. Fish & Wildlife Service

3. GRANT FUNDS AND SOURCES/USES OF PROJECT FUNDS

This breakdown assumes that $7.66 million in a TIGER Discretionary Grant will be awarded to complete the required funding for this project, as follows:

Table 3: Proposed Funding ($ in millions)

	Federal	Non-Federal	TIGER	Total
Preliminary Engineering	$0.68	$0.17	$0	$0.85
Right-of-Way	$0.152	$0.038		$0.19
Construction	$0	$4.0	$7.66	$11.66
Construction Engineering				
TOTAL	$0.832	$4.208	$7.66	$12.7
Percentage of C / CE	0%	34%	66%	100%

The details of the cost estimate are provided.

4. SELECTION CRITERIA

4.1 Long-Term Outcomes

4.1.1 State of Good Repair

According to data from the National Bridge Inspection database, 15.2 percent of Maine's Federally eligible bridges are Structurally Deficient (SD). Advancing this project will remove a major bridge from the SD list and free up scarce financial resources for other statewide bridge needs, which total approximately $105 million per year.

In 2007, MaineDOT's *Keeping Our Bridges Safe* noted the risks associated with fracture-critical bridges and poor connections. The proposed project eliminates those concerns since the replacement structure will be highly redundant and have fewer connections.

4.1.2 Economic Competitiveness

The Androscoggin River Bridge in Peru is one of three bridges on this reach of the river between Rumford and Canton, and is an essential transportation link for forest products moving to and from a series of lumber and paper mills, particularly the Irving Forest Products Mill in Dixfield and paper mills in Rumford and Jay. Additionally, the bridge is a very important link for commuter access to workplaces, students to regional schools, and to the citizens of Peru and Mexico who use the bridge in their everyday pursuits in each community. Finally, the Androscoggin River Bridge provides a vital link connecting Route 108 in West Peru with U.S. Route 2 (part of Maine's Heavy Haul Truck Network) in Mexico.

The town of Mexico with a $17,216 per capita income is an economically distressed area, a phrase defined by 42 U.S.C. 3161. The town of Peru with a $22,518 per capita income is not listed as an economically distressed area. The per capita income adjusted to 80% of the national per capita income yields $22,440.80 as the comparative number, which shows Mexico's per capita income as $5,225 below the adjusted figure: Peru's is $77 above that figure. As a matter of practicality, the figure for Peru is on the margin and belies the true extent to which it too is distressed. The per capita income analysis uses County Subdivision data, which is at the municipal level.

Figure 4: Economically Distressed Areas

The Androscoggin River Bridge is currently posted at 25 tons and closed to larger trucks. The impact of these larger trucks having to use alternate routes is already noticeable. Irving Forests Products has over 400 trucks serving their lumber manufacturing facility with whole logs or finished lumber products. These are trucks that would normally use the bridge but now rely on alternative routes. The diverted trips add an additional 6 to 10 miles at an additional cost of $2 to $3 per mile resulting in an increase in costs in the range of $4,800 to $12,000 per week or $249,600 to $624,500 per year. This added cost affects the mills competitiveness and profit margin. Over the long run, it may affect future investments by slowing the rate of return to levels unacceptable to warrant the investment.

The bridge is a vital link in the community for transporting students to the regional schools that exist on both sides of the river. School administrators are concerned about the potential safety of the bridge and the impacts to the entire busing logistics if it were to be closed. The additional travel times and costs would impact students and add costs for the taxpayers of both communities. This could have an economic impact on the schools, especially if taxpayers insist on budget cuts to meet the additional cost burden.

The Androscoggin River Bridge is an important regional link that is integral to the communities it serves. The closure of this bridge would have non-monetary implications affecting community cohesiveness and alter relationships for people on both side of the river.

4.1.3 Livability

The communities of Mexico and Dixfield are separated from the community of Peru by the mighty Androscoggin River. The bridge directly connects the downtown area of Dixfield with the village area of Peru. This bridge crossing is vital to the economic, social, transportation and community vibrancy of the region.

The proposed replacement of the bridge will improve the connectivity of village areas, serving visitors and residents of the region. Pedestrians and bicyclists will have a safe and inviting environment to travel between the village and downtown areas, and to view and experience the beautiful river in close proximity.

Because of the lack of paved shoulders, the current bridge is inadequate for bicyclists and does not offer the features that a crossing in the heart of these connected communities requires for fostering a quality community environment. The proposed design will address the addition of paved shoulders for bicyclists and a sidewalk for pedestrians, including people with disabilities. The proposed design also will eliminate an at-grade railroad crossing, and put the bridge in closer proximity to the downtown area of Dixfield. The bridge is within a short walking distance of village areas and an established sidewalk system.

This bridge crossing allows citizens on both sides of the river to be connected to area businesses and employers, sustaining economic development and quality of life. This project exemplifies the type of transportation project that can vastly improve livability because it physically and socially links the communities. The effect that this new bridge will have on the livability, quality of life, economic vibrancy, and transportation safety of the communities and region as a whole is transformative and urgently needed.

4.1.4 Environmental Sustainability

MaineDOT recognizes that assuring sustainability of habitats, ecosystems and transportation infrastructure can occur in concert rather than in conflict. Toward that end, MaineDOT endeavors to exercise reasonable stewardship over both natural resources and transportation infrastructure through its commitment to addressing aquatic organisms, wildlife habitat and fish passage in cooperation with natural resource agencies, while weighing all aspects of a proposed project.

4.1.5 Safety

In comparison to the existing bridge, replacing the Androscoggin River Bridge, and thereby spanning the railroad crossing, would improve safety for all users. The current 22-foot curb-to-curb width will be replaced by a 32-foot curb-to-curb width, which will allow two 11-foot travel lanes for cars and trucks and 5-foot shoulders for bicyclists and snowmobilers. The replacement bridge would include a 5-foot sidewalk to the river crossing for safer passage by pedestrians.

Loss of this river crossing would result in an increase of 12,385,823 vehicle-miles traveled (VMT) annually. This added VMT would increase the number of crashes per year, and increase crash costs by $1.3M annually, based on overall Maine crash statistics. Replacing the bridge eliminates this risk.

4.1.6 Project Readiness

MaineDOT is prepared to obligate funding for the proposed project prior to June 30, 2016 and can meet all local, State and Federal requirements by that date.

4.1.6.1 Technical Feasibility

MaineDOT has replaced several large bridges recently; among them, the award winning Penobscot Narrows Bridge and the Norridgewock Covered Bridge. These two projects alone totaled over $100 million and demonstrate the capability of the Department in complex project management and delivery. It is also noteworthy that Maine was the first state in the Nation to fully obligate all ARRA Funding.

4.1.6.2 Financial Feasibility

MaineDOT has non-Federal funding to provide 34 percent ($4,000,000) of the remaining project cost of $11,660,000 for construction and construction engineering to partner with the Federal government on this project.

4.1.6.3 Project Schedule

The proposed project milestones are as follows:

Table 4: Project Milestones	
PDR/Preliminary Plan Complete	October 2014
Formal Public Contact	November 2014
NEPA Complete	December 2015
Environmental Approvals	June 2016
R/W Certified	March 2016
PS&E Complete	June 2016
Obligation of Funds	June 2016
Project Advertising	June 2016
Construction Begin	March 2017
Construction Complete	July 2018

Upon receipt of TIGER grant notification, MaineDOT will proceed quickly to secure all necessary permits, ensuring that any unexpected delays will not put TIGER Discretionary Grant funds at risk of expiring before they are obligated.

4.1.6.4 Assessment of Risks and Mitigation Strategies

The preliminary design study is considering key issues and constraints unique to the bridge site. A broad range of bridge improvement criteria has been evaluated, including rehabilitation and

replacement, location and alignment, span and clearance requirements, hydraulics and bridge scour, constructability, environmental, right-of–way and utility impacts, future maintenance requirements, initial construction cost, life-cycle costs and aesthetics. Other site-specific considerations include socio-economic impacts, geologic site conditions, horizontal and vertical roadway alignment, approach section, approach guardrail transitions, bridge rail requirements, and wearing surface requirements.

The impact of the pier footprint has been minimized by designing long spans. Additionally, steep riprapped slopes are used at abutments and approaches to further minimize environmental impact.

The Androscoggin River, in the area of the bridge, is within the DPS for the Endangered Atlantic Salmon. Through Endangered Species Act Consultation with U.S. Fish and Wildlife Service, Maine FHWA and MaineDOT have made a finding of No Effect because there is no access for salmon.

4.2 Innovations

Corrosion of reinforcing steel is the main reason that concrete structures fail. To maximize the service life of the bridge and to minimize maintenance, MaineDOT plans to use Glass Fiber Reinforced Polymer (GFRP) reinforcement bars and Fiber Reinforced Polymer (FRP) bridge drains. GFRP and FRP are lightweight, strong, durable and inherently corrosion resistant. GFRP will be used in the superstructure; including the deck, curb and permanent transition barriers as reinforcement. MaineDOT recently advertised its first project in 2013 using GFRP reinforcement bars and FRP bridge drains. MaineDOT wants to get more experience using these new composite materials along with trying to encourage the composites industry.

In addition, electronic 3D data files in native CADD or XML format will be provided to contractors who choose to use Automated Machine Guidance technologies for bidding and constructing the bridge approach work.

4.3 Partnership

The project website contains numerous letters confirming stakeholder collaboration and project support. http://www.maine.gov/mdot/tigergrants/tiger2014/perumexico/index.htm

4.4 Results of Benefit-Cost Analysis

A benefit cost analysis was conducted on the Mexico-Peru bridge replacement project. The analysis looks at the project from the standpoint of society as a whole, and accounts for the net benefits and net costs based on the criteria described in the TIGER Grant NOFA, February 25, 2014. The analysis presented here addresses benefits from travel time savings, user costs, crash reduction costs, and emissions reduction. The Benefit Cost Analysis can be found in the Appendix together with the Benefit Cost Analysis spreadsheet. The matrix below summarizes key factors for the analysis.

Table 5: Benefit-Cost Analysis Summary					
Current Status	**Bridge Replacement**	**Type of Impacts**	**Population Affected**	**BCA Factors**	**Page reference in BCA Narrative**
Structurally deficient, functionally obsolete, scour critical, bridge. Width (22′) does not meet the minimum 30′ standard. Load capacity is low.	A five span welded steel girder bridge, 840 feet long by 40.25 feet wide . Improved load capacity.	Without the bridge at this location the public would experience, detours, delays, increased travel costs, and air quality impacts.	The bridge links the towns of Mexico (pop. 2,681) and Peru (pop. 1,541) and is important to the regional economies of Androscoggin County (pop. 107,102)	Estimated dollar value of increased VMT, VHT. Cost of air emissions. Crash cost reduction. Estimated cost of maintenance Total Project Cost	Page 1-2 Page 2 Page 2 Page 2 Page 3

The annual benefits and costs values were discounted at 3% and 7% over a 50 year time horizon. Three percent is the most appropriate rate for the analysis because bridge has a very long life, and in addition, the alternate use of funds would be a public expenditure as opposed to a private investment. The full analysis can be found in the spreadsheet attachment to this application. A summary of the results of this analysis are as follows.

- Total Benefits of $ 272.2 million
- Avoided Air Quality Impacts valued at $11.0 million
- Reduced User Costs estimated at $232.1 million
- Avoided Crash Costs of $37.0 million
- Avoided Maintenance Costs of $35,600
- Total Costs of $ 14.1 million
- Benefit-Cost ratio of 19.3

When discounted at 7%, the benefits and costs are lower. A larger discount rate implies that time preference for future amounts are preferentially discounted more severely. The amounts are show below.

- Total Benefits of $ 137.6 million
- Avoided Air Quality Impacts valued at $5.4 million
- Reduced User Costs estimated at $122.1 million
- Avoided Crash Costs of $19.5 million
- Avoided Maintenance Costs of $19,000
- Total Costs of $ 12.4 million
- Benefit-Cost ratio of 11.0

5. PLANNING APPROVALS

5.1 Environmental Approvals

MaineDOT has completed the Section 106 process and the Maine Historic Preservation Commission has concurred that the project will have No Effect on historic architectural resources. The project has been presented to federal and state resource and regulatory agencies at the MaineDOT Interagency Meeting on April 8, 2014 for permit and approval levels. Maine State permits and U.S. Army Corps of Engineers permit will be obtained by December 2015. No local permits are required.

Table 6: Planning Approvals	
NEPA	December 2015
Design Complete	June 2016
Right-of-Way	March 2016
Obligate Funding	June 2016
Construction Complete	July 2018

5.2 Legislative Approvals

The project is partially funded for preliminary engineering and Right- of-Way in the *MaineDOT Work Plan Calendar Years 2014-2015-2016* which was presented to the Maine Legislature.

5.3 State and Local Planning Approvals

The proposed project is contained in MaineDOT's Work Plan and the Statewide Transportation Improvement Plan (STIP).

6. FEDERAL WAGE RATE CERTIFICATION

As with all Federal projects, MaineDOT complies with all required Federal provisions, including the Davis-Bacon Act.