

Freight Reliability Actions for MainE (FRAME)

Basic Project Information:	
Project Name	Freight Reliability Actions for Maine (FRAME)
Sponsor	Maine Department of Transportation
Was an INFRA application for this project submitted previously?	No
Project Costs:	
<i>INFRA Request Amount</i>	\$41,740,500
<i>Estimated federal funding (excl. INFRA)</i>	\$13,913,500
<i>Estimated non-federal funding</i>	\$13,913,500
<i>Future Eligible Project Cost (Sum of previous three rows)</i>	\$69,567,500
<i>Previously incurred project costs (if applicable)</i>	\$2,400,000
<i>Total Project Cost (Sum of 'previous incurred' and 'future eligible')</i>	\$71,967,500
Are matching funds restricted to a specific project component? If so, which one?	No
Project Eligibility:	
Approximately how much of the estimated future eligible project costs will be spent on components of the project currently located on National Highway Freight Network (NHFN)?	\$69,567,500
Approximately how much of the estimated future eligible project costs will be spent on components of the project currently located on National Highway System	\$48,001,575
Approximately how much of the estimated future eligible project costs will be spent on components constituting railway-highway grade crossing or grade separation projects?	\$0
Approximately how much of the estimated future eligible project costs will be spent on components constituting intermodal or freight rail projects, or freight projects within the boundaries of a public or private freight rail, water (including ports), or intermodal facility?	\$0
Project Location:	
State(s) in which the project is located	Maine
Small or large project	Large
Urbanized Area in which project is located, if applicable.	Rural
Population of Urbanized Area.	N/A
Is the project located (entirely or partially) in an Opportunity Zone?	Yes; 23017965600, 23017965500, 23019000300, 23011024102, 23019007100
Is the project currently programmed in the: • TIP • STIP • MPO Long Range Transportation Plan • State Long Range Transportation Plan • State Freight Plan	N/A Yes N/A No (MaineDOT does not include specific projects in the LRTP) No

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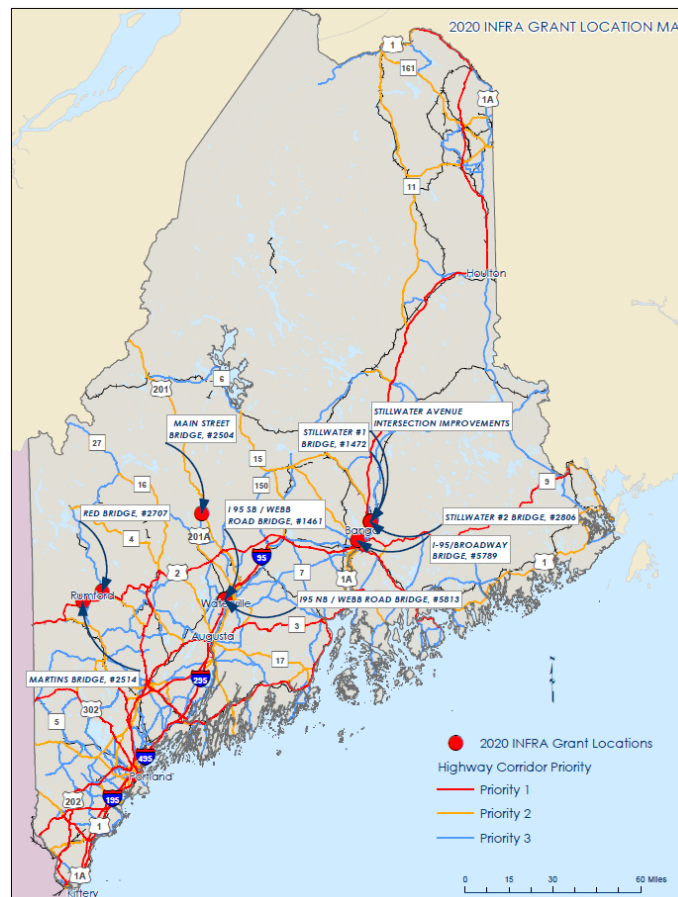
U.S. Department of Transportation
INFRASTRUCTURE FOR REBUILDING
AMERICA “INFRA” GRANT
APPLICATION

Project Name:	Freight Reliability Actions for MainE (FRAME) Project
Project Type:	State of Good Repair
Project Location:	Rural, Maine 1 st and 2 nd Congressional Districts
Funds Requested:	\$41,740,500 – 60% of Total Eligible Project Cost
Other Federal Funds Matched:	\$13,913,500 – 20% of Total Eligible Project Cost
Non-Federal Funds Matched:	\$13,913,500 – 20% of Total Eligible Project Cost
Total Future Eligible Project Cost	\$69,567,500
Non-Federal and Other Funds	
Previously Incurred:	\$2,400,000
Total Project Cost:	\$71,967,500

Contact: Mr. Andrew Bickmore, Director of Results and Information
Maine Department of Transportation
16 State House Station
Augusta, ME 04333
Telephone: 207-624-3293
E-mail: Andrew.Bickmore@maine.gov

DUNS #: 8090459660000

Freight Reliability Actions for MainE (FRAME)



Project Summary

Maine Department of Transportation (MaineDOT) is seeking \$41,740,500 from a U.S. Department of Transportation (USDOT) Infrastructure for Rebuilding America (INFRA) grant. The total future eligible cost of the project is \$69,567,500, 40% of which (\$27,827,000) will be paid by MaineDOT and other Federal funds. It is estimated that \$2,400,000 will be spent prior to grant award and is not included in the matching funds.

The *Freight Reliability Actions for MainE (FRAME) Project* will:

- a) Replace eight (8) aging bridges which have deteriorated almost to the end of their useful lives, are functionally obsolete, and further attempts to repair or rehabilitate some of these bridges will not restore their capacities to meet today's clearance requirements or geometric standards.
- b) Improve the safety and mobility of a critical intersection, and interconnecting roads, adjacent to two (2) of the project bridges,
- c) Improve the accessibility and long-term prospects for the economy in economically challenged rural regions by improving freight movement that is vital to industry and global competitiveness.
- d) Realize the USDOT stated goal of improving and facilitating freight movement across critical freight corridors into, within and out of the state of Maine.

The *Freight Reliability Actions for MainE (FRAME) (Project)* will replace six (6) bridges on the National Highway System (NHS) and two (2) bridges on Critical Urban Freight Corridors on the National Highway Freight Network, as well as provide safety and mobility improvements at an intersection on a Critical Urban Freight Corridor on the National Highway Freight Network. The aging bridges will be replaced with new, safe, and modern bridges.

Four (4) of the project bridges, as well as the intersection safety project, provide access to two of Maine's remaining pulp and paper mills. These mills rely heavily on these bridges and intersection for both transportation of raw materials and finished goods within the state and beyond. Any detours would create additional costs in the form of truck-miles on area roads, additional roadway safety concerns for other areas in the region, and higher production expenses that are burdensome to the employers in the area.

This project will ensure improved transportation efficiencies for manufacturing localities in rural Maine to remain competitive. Additionally, it will guarantee continued access to rural communities for Maine residents and visitors to Maine. These improvements satisfy USDOT's stated goal of *supporting economic vitality at the national and regional level* by facilitating the movement of goods and people and maintaining critical transportation access and service in rural communities across the state. Innovations in the bridges and intersection will satisfy the goal of *deploying innovative technology*, and Programmatic Agreements will help satisfy *innovative project delivery*.

This Project will create long lasting positive impacts on communities and industries in the surrounding regions and ensure the preservation and creation of jobs and economic viability in this very rural part of the nation.

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Project Narrative

I. Project Description

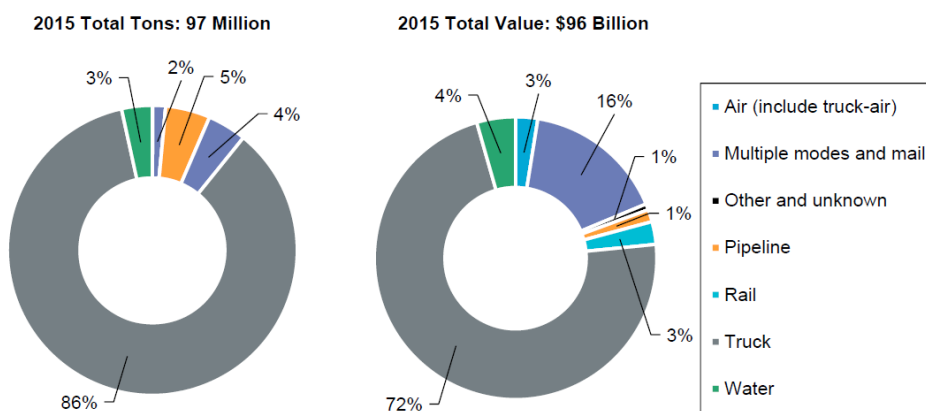
a) Project Details and Background

This large project consists of eight (8) Bridge Replacement projects and one (1) Highway Safety and Intersection Improvements project. These projects are in rural areas and located in and/or near a qualified opportunity zone(s). All eight (8) bridges and the intersection are located on the National Highway Freight Network. Additionally, six (6) of the bridges are on the National Highway System. As such, this project is critical to maintaining the state's highway freight corridors that support the majority of Maine's freight and transportation. Forest products, seafood, agricultural and other commodities are transported within, into and out of the state on these highway systems. Maine's international trade with Canada is also a vital component of freight movement in Maine. This project will generate national and regional economic, mobility and safety benefits. The project is cost effective and contributes to all the goals listed under 23 U.S.C. 150. The criteria used to select the specific bridges included in this project include: their importance to their region's economic vitality; their deteriorating structural condition; their status of not meeting current safety standards; their benefit-cost ratios as components to the overall project; and their individual abilities to contribute to the goals under 23 U.S.C. 150.

Maine's freight network is the lifeblood of the state. It provides critical access by which goods flow into and out of the state, and also offers local access to goods, services and employment, thereby bolstering Maine's economy. Maine's highways are used to transport the majority of freight, capturing more than 80% of all freight tonnage moved within the state.¹

Mode Split by Weight and Value in Maine- 2015

2



Source: FHWA Freight Analysis Framework Version 4.3; Consultant analysis.

Bridge postings and closures pose major threats to Maine's freight network, requiring costly reroutes and decreased mobility on existing roads. This project replaces eight (8) aging bridges on critical freight

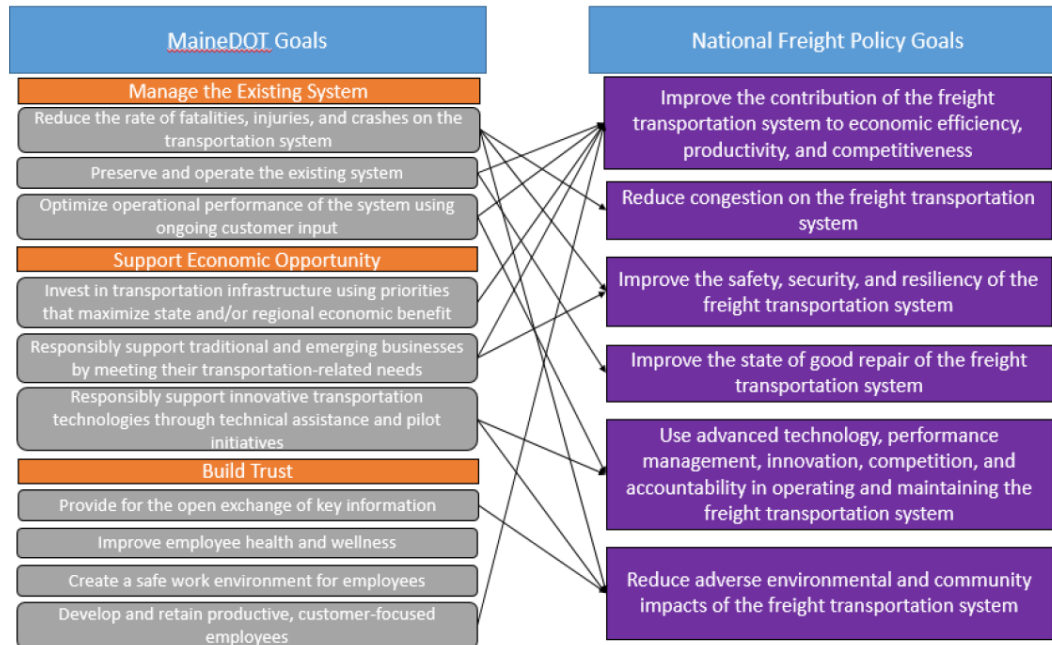
¹ *Maine Integrated Freight Strategy*, November 2017, <https://www.maine.gov/mdot/ofbs/docs/FreightStrat.pdf>, page ES-3

² *Maine Integrated Freight Strategy*, November 2017, <https://www.maine.gov/mdot/ofbs/docs/FreightStrat.pdf>, Figure 2.2, page 2-3

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corridors across the state. Additionally, it includes an intersection and road safety component located on the same key freight corridor as two (2) of the project's bridge replacements. The bridges and intersection project are all located in rural areas of the state³, each critically important to maintaining the flow of goods and people into that region of the state. Each component of the Project aligns with MaineDOT's Goals, and with the National Freight Policy Goals as listed below:

4



Source: <https://www.fhwa.dot.gov/fastact/factsheets/nhfpfs.cfm>.

The eight (8) bridge replacements are located in the communities of Rumford, Solon, Waterville, Bangor and Old Town. The project bridges require replacement due to substandard geometry, roadway width and clearance issues, bridge foundation challenges that make some of them susceptible to undermining, concrete spalling with exposed rebar, delamination and severe cracking, protective coating failure, piers that are cracked and deteriorating, steel corrosion, collision damage, and insufficient bridge capacity. Structural engineers have evaluated each project bridge within the last inspection cycle in accordance with the *Manual for Bridge Evaluation* published by the American Association of State Highway and Transportation Officials (AASHTO). These Evaluations have concluded that the bridges have deteriorated almost to the end of their useful lives and replacements are warranted. Additionally, it is more cost-effective and efficient to complete the adjacent Stillwater intersection project with the Old Town (Stillwater #1 and #2) bridge replacements.

³ INFRA Grants Urbanized Areas, <https://www.transportation.gov/policy-initiatives/buildamerica/infra-urbanized-area>; last visited 27-January 2020

⁴ *Maine Integrated Freight Strategy*, November 2017, <https://www.maine.gov/mdot/ofbs/docs/FreightStrat.pdf>, Figure 1.1, page 1-3

Individual Project Components

Bridge #	Bridge Name	Town	County	Facility Carried	Feature Intersected
1461	I-95 SB / Webb Road	Waterville	Kennebec	I-95 SB	Webb Road
5813	I-95 NB / Webb Road	Waterville	Kennebec	I-95 NB	Webb Road
2504	Main Street	Solon	Somerset	Route 201	Fall Brook
2514	Martins	Rumford	Oxford	Route 2	Ellis River
2707	Red	Rumford	Oxford	Route 2	Swift River
5789	I-95 / Broadway	Bangor	Penobscot	I-95 NB/SB	Broadway / Route 15
1472	Stillwater #1	Old Town	Penobscot	Route 2/ Stillwater Ave	South Channel Stillwater River
2806	Stillwater #2	Old Town	Penobscot	Route 2/ Stillwater Ave	North Channel Stillwater River
n/a	n/a	Old Town	Penobscot	Route 2/ Stillwater Ave	Route 2A/ College Ave

Quantitative and Other Facts⁵

- The Project, conservatively, has a benefit-cost ratio of 24.97 to 1 and yields upwards of \$1.2 B in benefits based on an NPV at a 7% discount rate over 30 years⁵.
- Savings will result from reduced maintenance costs, reductions in travel time and mileage for rerouted vehicles, reductions in mileage-driven highway injuries and fatalities, and reduced pollutant emissions.
- Non-Federal spending on the Project is \$13,913,500 committed by MaineDOT .
- Eligible matching funds are \$27,827,000, 40 percent of the total eligible project cost.
- Previously incurred expenses are \$2,400,000.
- The Project is in Kennebec, Penobscot, Oxford and Somerset Counties in Maine.
- The Project is in Maine's First and Second Congressional Districts, represented by U.S. Representatives Chellie Pingree and Jared Golden, respectively.
- The state is represented by U.S. Senators Susan Collins and Angus King.
- This is a Rural project.
- Total Eligible Future Cost of the Project: \$69,567,500.

b) Statement of Work

The eight (8) project bridges are functionally obsolete (one with fracture-critical members), are nearing the end of their useful lives, and in need of replacement. None of the existing bridges traffic safety features meet current acceptable standards. The intersection safety project will provide a safer and more functional intersection for vehicles, bicycles and pedestrians, and increase mobility in a region that has simply outgrown this increasingly traveled intersection.

⁵ See Appendix A, Benefit-Cost Analysis.

This project meets the Goals listed under 23 U.S.C. 150.

Many repairs to the bridges and intersection have been implemented over the past 90 years. However, the rate of deterioration has accelerated to the point that the preferred and cost-effective solution is replacement. Specific details and photos relating to the current condition of each bridge and intersection, as well as the proposed designs, may be found in *Appendix G, Project Summaries*.

In general, the bridges and intersection are exhibiting the following deficiencies contributing to their overall inadequacy:

- *Poor Condition of Structural Members* – One of the project bridges is considered a fracture critical bridge. A fracture critical bridge is defined by the FHWA as a steel member in tension, or with a tension element, whose failure would probably cause a portion of, or the entire bridge, to collapse. The bridge stringers show either poor condition, significant deterioration, or moderate deterioration.
- *Geometric Constraints* – the geometry of several of the bridges as well as the Stillwater intersection is substandard and limits accessibility and rideability. The width of the roadways is inefficient. The vertical clearance below several of the bridges is substandard and some bridges have visible collision damage from over-height loads. Clearances need to be increased to accommodate modern truck standards. These constraints do not serve today's modern freight and passenger vehicles, pedestrians or bicyclists safely or efficiently.
- *Extensive Deteriorating Repairs and Retrofits* – many repairs to the bridges have been made over the last 90 years, but the increased deterioration in the condition of the bridges cannot feasibly be slowed by increasing the extent of preservation and rehabilitation measures.



Upstream view of [Fracture Critical] Red Bridge



View of Stillwater Intersection from College Ave



I-95 / Webb Road Bridges from Webb Road

Main Street Bridge

The Solon, Main Street Bridge carries Route 201, a primary commercial trucking route that connects the southern coastal region of Maine to points north in Quebec, Canada. Heavy commercial trucking accounts for fifteen percent of the daily vehicle use on this route. Route 201 is on both the NHS and NHFN and it is a critical rural freight corridor accounting for more than 80% of all Ethanol shipments into and out of the state.⁶ It serves as a vital conduit for forest products bound for mills in Skowhegan and Madison. Route 201 also experiences some of the highest rates of non-interstate

congestion and crashes, being the primary route to the Canadian Province of Quebec.⁷

Route 201 is the major connector for Somerset County, especially north of Skowhegan. It provides a reliable and safe route for freight, local transportation, international transportation, tourism, etc. Also, from Solon north (including Bridge #2504) it is a National Scenic Byway (Old Canada Road). MaineDOT, Kennebec Valley Council of Governments (KVCOG), and a Byway Committee are in the process of producing a new/updated corridor management plan for this byway. The main vision for this plan is highlighting the economic impacts of this corridor as it currently stands, and the potential economic impacts it can provide.



Main Street Bridge

Route 201 is effectively the Main Street for the large number of towns located on Route 201. If the Main Street Bridge was to close, that would create an 18+ mile detour from each side of the brook. It is the major route used by visitors from Quebec City to all parts of Maine and points south.

Martins Bridge

This bridge is located in Rumford on Route 2, which serves as the major East/West Highway in the State of Maine and connects Maine with northern New Hampshire. A significant regional impact that could result if the bridge is not replaced is that logging trucks could not use this route to access the Rumford Mill. Virtually all the wood chips for the Rumford Mill are transported on the Martins Bridge over the Ellis River coming from West Paris via Richard Carrier Trucking. Poland Spring trucks use Route 2 to access their facility on Route 5 in Rumford – as well as when they travel via

⁶ *Maine Integrated Freight Strategy*, November 2017, <https://www.maine.gov/mdot/ofbs/docs/FreightStrat.pdf>, page B-6

⁷ *Maine Integrated Freight Strategy*, November 2017, <https://www.maine.gov/mdot/ofbs/docs/FreightStrat.pdf>, pages 3-43 - 3-51

Route 232 or if they need to go east on Route 2.



Martins Bridge

The detour route for heavy trucks using a similar priority road would be Routes 26 / 219 and Route 4 and would add a considerable distance to the trip.

Another regional impact includes the bridge location in relation to Sunday River, a popular recreational and ski resort area in Newry (primary access via Route 2). Sunday River is a major employer of Rumford/Mexico local residents year-round and in particular during the winter.

Red Bridge

Located in Rumford and similar to Martins Bridge, this bridge serves as part of the Route 2 East/West corridor. Route 108 is a natural

detour and would not add a significant number of miles to thru traffic. However, using Route 108, traffic would bypass the downtown area of Mexico which potentially impacts the local economy. Also, Martins Bridge is an important link between Route 2 and Routes 17 and 120, which provide access to communities and natural resources to the north of Rumford and Mexico. From a community perspective, the natural detour is not a preferable crossing due to the high volume of traffic around the mill. Consequently, a very significant proportion of passenger and commercial traffic through the area will cross the bridge.

I-95/Broadway Bridge

The I-95 bridge over Broadway in Bangor is a major part of the Interstate infrastructure in Bangor and the loss of it, either permanently or temporarily will severely impact traffic flows throughout the city. The immediate surrounding area dependent on this bridge includes St. Joseph's Hospital, Husson University, Bangor High School, Bangor Christian School, John Bapst High School, and plethora of retail establishments west of I-95, two large churches, and convenient access to downtown Bangor. As a historic footnote, Broadway was the first I-95 interchange in Bangor targeted for development in the early 1960s and it is that early development that shaped subsequent development and traffic patterns in the City.



Red Bridge

At the time I-95 was built, it was located on the “outskirts” of the city between residential and

farming areas and the former Dow Air Force Base. With the closing of Dow in 1968, the city of Bangor established Bangor International Airport. This was the first step in repurposing the large land areas on the west side of Bangor for new and more intensive uses, including additional shopping centers, and residential and commercial subdivisions. I-95 was no longer on the edge of the action, but instead squarely in the center. The highway bisects the city and is used routinely to connect to the other four (4) interchanges directly, helping motorists avoid longer and slower travel over in-town city streets.



I-95 / Broadway Bridge

Disruption in service provided by the Broadway bridge would force much of the I-95 traffic onto city streets, substantially lengthening travel times and distances. To exacerbate the situation, there are no convenient short detour routes around this bridge. To travel from the Hogan Road interchange to the north to the Union Street interchange to the south of the Broadway bridge, would add miles and substantial travel time.

The importance of the Broadway bridge cannot be overstated. The

northern half of the State of Maine is reliant on goods and services flowing to and from the region. Disruption of the supply chain would add considerable costs to an already economically stressed region. The short-term disruption during the construction of a new bridge is within an acceptable range of tolerance; long-term weight limitations or bridge closures would have negative consequences on the supply chain and would force traffic detours that would negatively impact the city of Bangor.

Stillwater Bridges

The two Stillwater River bridges are positioned in tandem on Stillwater Avenue, which is the prime route connecting the Stillwater exit on I-95 to the Penobscot Indian Nation, the University of Maine, and the communities of Old Town, Milford, Bradley, and points north on the east side of the Penobscot River. These communities and facilities are island communities that can be accessed on other routes from the north, west and south, but each of these routes has limitations that impact time and distance costs.

Stillwater Avenue is classified as a Minor Arterial (non-NHS) with an AADT on both bridges exceeding 16,000. Closure or severe weight limitations could result in a doubling of traffic in downtown Orono and would



Aerial View of Stillwater Bridges

detrimentally impact the existing Level of Service.

The Penobscot Indian Nation (PIN) is centered on Indian Island in the Penobscot River north of Old Town. They are organized as a federally recognized tribe in Maine and as a First Nations band government in the Atlantic provinces and Québec. The Nation's territory includes land holdings along the Penobscot River and all the islands within the river nearly 60 miles north to Medway, as well as other lands across the state. The PIN population is approximately 2,500 with approximately 610 residents living on the Island. Jobs on the Island are primarily governmental, administrative and education. An indeterminate number of artisans and crafters also manufacture their products in home-based industry. The work force for the most part is employed in various occupations in the surrounding region. Major employers include the University of Maine, ND Paper, logging contractors, construction companies, medical, and a wide range of others. The primary route for PIN residents to the greater job market would use the Stillwater bridges. Absent these bridges, travel time and costs would negatively affect this work force.

The University of Maine, comprised of eight colleges, is the state's flagship university. Campus enrollment is approximately 11,500. The primary route to the University is on Stillwater Avenue from I-95 to Route 2A (College Avenue). The bridges are a crucial link in the supply chain of food, fuel, and supplies, which if disrupted would increase costs and time to provide those services. As noted, the displacement of traffic from Stillwater Avenue to downtown Orono would negatively affect traffic flow on Route 2 in that community and affect travel times and travel costs.

Residents and businesses in the city of Old Town, located on Orson Island, and in the mainland communities of Milford and Bradley to the north, would be impacted by bridge closure or load limitations. The populations for those communities are 7,636, 3,042, and 1,511, respectively. With limited manufacturing in these communities, most of the working age population disperse throughout the region for work. Some of the work force have jobs at the University and ND Paper and provide labor to a densely developed and very busy retail sector located on Stillwater Avenue. Stillwater Avenue is a principal conduit for residents who work throughout the greater Bangor area, whose population including surrounding communities is upwards of 40,000.

The Sunkhaze Meadows National Wildlife Refuge is located in the town of Milford. It contains 11,485 acres and protects the second-largest peatland in Maine. This nationally significant wetland is accessed via Stillwater Avenue from I-95 to Milford, where visitors are directed over local roads to the refuge. There are no visitor numbers available for the refuge. The Stillwater Bridges provide access to the refuge, which are Federal Lands.

Stillwater Avenue/College Avenue Intersection

The signalized Intersection is located 0.15 miles north of the Stillwater Bridges. Stillwater Avenue and College Avenue to the east is 3-lanes, a straight/right lane and a left turn lane. College Avenue Extension to the west is two-lanes. AADT on Stillwater are 15,544 north, 15,492 south; College Avenue 8,206 east, 1,027 west.

College Avenue, as the name suggests, is the gateway to the University of Maine (UMaine). Stillwater Avenue is the major access route from the west and from the interstate to College Avenue, north of the UMaine campus. Stillwater Avenue is also a major conduit for Old Town residents to and from I-95. This intersection is primarily the starting point for the commercial and retail enterprises within the town. Beginning with the McDonald's immediately adjacent to the intersection and continuing north on Stillwater Avenue for approximately 1.7 miles, this is an area of classic commercial strip development with numerous commercial and residential entrances.



Aerial View of Stillwater Intersection

III. Project Parties

MaineDOT has initiated communication with environmental agencies and interested parties, including stakeholders, municipalities and local businesses and residents in each of the project communities. Project communities include: Rumford, Solon, Waterville, Bangor and Old Town. Public meetings have been initiated for the individual project components in each community, and more details are in *Appendix G, Project Summaries*.

IV. Grant Funds, Sources and Uses of all Project Funding

The overall Project budget is summarized below. Please refer to *Appendix H, Budget* for individual project component breakdowns.

Overall Project Budget

**Not including expenditures to date and anticipated expenditures prior to grant award*

Project Phase	Amount
Preliminary Engineering (PE)	\$5,410,000
Right-of-Way (ROW)	\$990,000
Construction Engineering (CE)	\$5,621,000
Construction (CON)	\$57,546,500
Total	\$69,567,500

Grant Funds Sources and Uses

	Prior Expenditures*	Eligible Match			
	MaineDOT / Other Federal	MaineDOT	Other Federal	INFRA	Total Eligible
Preliminary Engineering (PE)	\$2,400,000	\$541,000	\$4,869,000	\$0	\$6,400,000
Right-of-Way (ROW)		\$99,000	\$891,000		
Construction Engineering (CE)		\$1,124,200	\$1,124,200	\$41,740,500	\$63,167,500
Construction and Demolition		\$12,149,300	\$7,029,300		
TOTAL Future Eligible Project Cost		\$13,913,500	\$13,913,500	\$41,740,500	\$69,567,500
% of Total Eligible Project Cost		20%	20%	60%	100%

**Includes expenditures to date and anticipated expenditures prior to grant award*

Non-Federal Funding – \$13,913,500

Non-Federal funding for the Project comes from MaineDOT. MaineDOT is a cabinet-level state agency with primary responsibility for statewide transportation by all modes of travel. MaineDOT employs approximately 1,900 people and expends or disburses more than \$600 million per year, including federal, state, and local funds. The primary source of transportation funding in Maine is gas tax revenue, which by statute can only be used for highways and bridges. The funding source for the Project will be State General Obligation Bonds, representing 13% of the value in the current *MaineDOT Work Plan: 2020 Edition*. In Maine, that comes from state bonds approved by the legislature and taxpayers from 2015-2019. Due to its significant

economic and transportation impact on the entire state and region, the Project has been prioritized by MaineDOT. This Project will be included in the next Statewide Transportation Improvement Program (STIP) and is consistent with MaineDOT's long-range plan.

MaineDOT's portion of the Project is \$13,913,500 and MaineDOT is committed to providing those funds and to completing the Project⁸.

V. Merit Criteria

a) Introduction

The Freight Reliability Actions for MainE (FRAME) Project satisfies USDOT's stated goal of *supporting economic vitality at the national and regional level* by facilitating the movement of goods and people in numerous rural regions across the state. Focused on one of the most economically challenged regions in the northern U.S., the Project is regionally significant and addresses past underinvestment and aging rural transportation infrastructure that has allowed for a slow and steady decline in connecting rural Americans to each other and the rest of the country. Like USDOT, MaineDOT recognizes the need to grow rural economies by strengthening the movement of job-supporting freight; improving reliable and affordable transportation; and enhancing the health and the safety of residents with modern highways and bridges. The project bridges are all in need of replacement and the intersection is in need of improvements. They are built to last century's design standards, creating important safety issues for those using the bridges. Safety issues are accelerating and becoming more expensive to remedy each year that the aging bridges continue to deteriorate during service. This Project leverages the financial resources of the federal government to bring funds from the State of Maine. MaineDOT is confident in the success of the Project and will commit to accountability measures.

b) Merit Criteria

1) Support for National or Regional Economic Vitality

"Maine's freight assets are the backbone of the State's economic vitality".⁹ Each year, millions of tons of goods travel over Maine's roads, contributing millions of dollars to Maine's economy. The state's transportation system is a major component of retaining and attracting businesses. The overwhelming majority of freight travels over Maine's roads, and the replacement of the eight (8) project bridges and constructing the intersection safety improvements will allow for the continuation of critical freight corridors within the state. The benefits of the Project are overwhelmingly positive, as indicated in the following explanation of the Benefit Cost Analysis.

⁸ See Appendix D, Match Commitment Letter

⁹ Maine Integrated Freight Strategy, November 2017, <https://www.maine.gov/mdot/ofbs/docs/FreightStrat.pdf>, page ES-1

Results of Benefit Cost Analysis

	Costs	Benefits
CAPEX	\$45,846,401	
O&M	\$1,586,056	\$2,367,917
Travel Time Savings		\$1,057,128,308
Safety		\$20,450,444
Emissions		\$3,660,984
Operating Costs		\$100,607,451
TOTAL	\$47,432,457	\$1,184,215,105
Benefit-Cost Ratio		24.97

Explanation of Methodology

The results of the Benefit-Cost Analysis (BCA) yield a conservatively calculated 24.97 to 1.0 ratio. An analysis period of 30 years was used with future cost and benefit values discounted to net present value (NPV) using a discount rate of 7%. The analysis examined the AADT traffic levels for each bridge and increased them linearly between 2019 and 2048 at a rate of 0.5% per year based on Maine Statewide Travel Demand Model forecasts. The increase in vehicle miles traveled and vehicle hours traveled per user due to a bridge closure was generated by the Maine Statewide Travel Demand Model. The analysis assumed necessary maintenance repairs to address safety issues for the remaining service life of the bridge, after which the bridge would be closed to traffic to ensure public safety. Included in the replacement bridge maintenance costs was a wearing surface replacement after 15 years of service and a wearing surface mill and fill after another 7 to 8 years of service.

Summary of Benefits

A key goal of the Trump Administration is to reduce America's dependence on foreign oil, which will serve the purpose of increasing the country's energy security. The project moves the United States closer to seeing a real reduction in the nation's dependency on foreign oil by reducing unnecessary fuel use due to detours and intersection delays.

a) Operating Costs

Costs to operate vehicles according to the BCA Guidance for Discretionary Grant Programs includes costs such as fuel, maintenance, tires and depreciation. Using the BCA Guidance suggested values, this project will result in operating costs savings of \$100 million over the course of 30 years. Commercial Trucks' operating costs account for \$26.75 million of this savings. These costs savings are significant for the State of Maine.

Maintenance savings are a critical component of any highway infrastructure project. Maintenance costs for aging bridges are constantly increasing and make it difficult for the state to budget for large capital projects. Included as benefits in the BCA are the reduction in maintenance costs for each bridge as the new structures will incur less on-going maintenance costs than the continual repairs and rehabilitation that the existing bridges will require under their current condition. These

benefits were determined by a full life cycle cost analysis of maintaining the structures throughout the 30-year analysis period. In addition to the construction costs, they include significant funding for biennial inspection, annual washings and periodic preservation treatments such as wearing surface mill and overlay.

b) Travel Time Savings

The elimination of truck-miles from the highway decreases travel time for the average highway user thus improving mobility. The travel time that is critical to this project is avoiding the detour time, the capacity queuing time, slower thru traffic and intersection delays for passenger and truck users of the bridges. Overall, the project will save \$1.06 billion in travel time costs over the course of 30 years. Commercial Truck travel time accounts for \$91.5 million of this savings.

c) Safety

In Maine, the number of fatal crashes per 100 million vehicle miles traveled, averaged over 5 years from 2013 to 2017, is 0.93. Using this data, the dollar value of lives saved by this project over 30 years is expected to be more than \$16 million. Based on 5 years of State of Maine data, the average number of crashes that resulted in injuries per 100 million miles traveled was 56. To be conservative, this application assumes that all the injuries would be minor (i.e. Maximum Abbreviated Injury Scale Level 1). The value of preventing injuries is \$2,921,000 over the course of 30 years. The economic impact of these crashes is \$4,400 per accident, which accounts for property damage only. The benefit of eliminating these crash impacts over the course of 30 years has a value of \$1,323,000. The overall net cost associated with safety over the 30-year project period is over \$20.4 million.

d) Pollutant Emissions

Most heavy trucks are powered by diesel engines, which are major sources of emissions of nitrogen oxides (NO_x), sulfur dioxide and particulate matter (PM). NO_x reacts with volatile organic compounds to form ground-level ozone, commonly known as smog. The emission rates used in this analysis were generated using MOVES2014b, the U.S. Environmental Protection Agency's (EPA) mobile source emissions factor model, by Maine DEP personnel.¹⁰ The avoided net costs of emissions of sulfur dioxide and volatile organic compounds over the 30-year life of the project are projected to be approximately \$66,000. Likewise, the avoided costs of emissions of nitrogen oxide (NO_x) over the course of the 30-year life of the project are projected to be approximately \$1.3 million. And the avoided costs of particulate matter (PM) emissions are valued at approximately \$2.3 million. The overall net cost associated with emissions over the 30-year project period is over \$3.6 million.

2) Leveraging of Federal Funding

The FRAME Project is a strong use of federal funds as \$55,654,000 of federal investment is leveraging \$13,913,500 of non-Federal spending on the Project, 20% of the total future eligible cost. Those funds are available as a result of MaineDOT's prioritization of state bond funding. The opportunity to obtain private or other non-Federal funding for the Project was limited and

¹⁰ See 2020 Emissions Rates.xlsx in Appendix A, BCA

impractical in the challenging economic environment of these rural communities. MaineDOT has a long history of successfully completing USDOT discretionary grant projects on time and within budget and can be fully relied upon to ensure that the non-Federal match and funding for the Project is met.

3) Potential for Innovation

The project bridges and intersection are still in the preliminary design phase; however several innovations are being considered for implementation including:

- Corrosion resistant reinforcing (either GFRP or stainless steel) in the bridge superstructures
- Fiber Reinforced Polymer (FRP) bridge drains
- Conventional and accelerated bridge construction alternatives are being evaluated, including innovative construction techniques which have been successfully used throughout the country
- Integral bridge abutments (i.e., jointless bridge)
- Use of 2D modeling for the hydraulic analysis of the bridges
- Investigating the possible use of A709 50 CR for use as pipe piles for pile bents in possible two span options
- Bundling of the Old Town Stillwater Bridges/ Intersection Projects
- Bundling of the Rumford-Mexico, Red Bridge and Rumford, Martins Bridge projects into a single project

The parties involved in this grant application are also applying an innovative means regarding the NEPA/permitting for this project through Programmatic Agreements:

Programmatic Agreements

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. MaineDOT and various other state and federal departments have executed agreements to expeditiously but thoroughly review environmental impacts from projects. MaineDOT will take advantage of the following agreements, where applicable, to streamline the environmental review and approval process:

- a) Programmatic Agreement between the Federal Highway Administration, Maine Division and the Maine Department of Transportation Regarding the Processing of Actions Classified as Categorical Exclusions for Federal-Aid Highway Projects
- b) Cooperative Agreement between U.S. Department of the Interior Fish and Wildlife Service (USFWS), FHWA and the MaineDOT State Transportation Reviews by the USFWS in Maine 2015-2020
- c) Cooperative Agreement between USFWS, FHWA and the MaineDOT State Transportation Reviews by the USFWS in Maine 2016-2021
- d) Maine Atlantic Salmon Programmatic Consultation finalized January 23, 2017.

-
- e) Programmatic Agreement for the State of Maine concerning identification of listed and proposed species and designation of non-federal representative under the Federal Endangered Species Act between FHWA, Maine Division USACE, MaineDOT,
 - f) USFWS, NOAA's National Marine Fisheries Service Programmatic Agreement for the State of Maine Between MaineDOT, FHWA Maine Division, USFWS Regarding Endangered Species Act Section 7 Consultation for Canada Lynx
 - g) Memorandum of Agreement for Stormwater Management Between the MaineDOT, MTA and Maine Department of Environmental Protection
 - h) Nationwide Programmatic Section 4(f) Evaluation for use of Historic Bridges

4) Performance and Accountability

Lifecycle Cost Plan

MaineDOT has performed a Lifecycle Cost Plan for all project components, which totals nearly \$54,000,000¹¹. The Lifecycle Cost Plan is based on a 100-year design life for bridges. Details for each individual project component are outlined in *Appendix F, Lifecycle Cost*.

Dedicated Funding Source and Plan for Operation and Maintenance of the Project

MaineDOT has dedicated NHPP funding from FHWA. MaineDOT's Asset management strategy is described on their website at: <https://www.maine.gov/mdot/about/assets/docs/>. The strategy is based on Highway Corridor Priority (HCP) and Customer Service Levels (CSL):

HCP: MaineDOT has gathered and analyzed straightforward, common-sense factors including the economic importance of the road as determined from input from regional economic development districts, federal functional classification, heavy haul trucking use and the amount of relative traffic on the road by region. With this and other data, MaineDOT has classified all 23,400 miles of Maine public highways into five, easy to-understand priority levels.

CSL: The next step is defining easy-to-understand customer service levels appropriate to the priority of the state's roads (1-5). We are using another intuitive scale: A, B, C, D and F. Using existing data on the safety, condition and service of the road, we can determine its customer service level. The result is a fair, consistent measure of how a road compares to other roads of the same priority across the state.

The department's *Transportation Asset Management Plan* outlines the plan for all NHS highways and bridges and can be found at https://www.maine.gov/mdot/publications/docs/plansreports/MaineDOT_Transportation_Asset_M_Plan.pdf.

Accountability Measure

MaineDOT has chosen to commit to an accountability measure related to project schedule; specifically related to meeting project construction begin and end dates. MaineDOT is confident that construction will begin for the first project component by mid-2022, and that construction will end for the last project component by the end of 2027 as indicated in Project Schedules (see *Appendix C, Schedules*).

¹¹ See *Appendix F, Lifecycle Cost Plan*

VI. Project Readiness

Obtaining Project input from stakeholders and communicating well with the public is always a primary goal of Project planners. Please see *Appendices C and G* for more specifics on the status of each Project component.

a) Technical Feasibility

Each Project component has begun Preliminary Engineering and made sufficient progress to demonstrate project readiness. More details on each Project component may be found in *Appendices C and G*.

b) Project Schedule

Individual schedules for each Project component may be found in *Appendix C, Schedule*.

MaineDOT has initiated communication with environmental agencies and interested parties. Baseline data collection to identify natural and cultural resources potentially affected by the Project is complete. This information will be used to avoid and minimize impact while meeting the purpose and need at each of the bridge locations and at the intersection.

c) Required Approvals

The individual project schedules (*see Appendix C, Schedules*) incorporate enough time for MaineDOT and FHWA to work directly with respective agencies and the public to address any potential issues that arise during NEPA and Permitting to maintain the overall Project delivery schedules.

1) National Environmental Policy Act (NEPA)

While the Project components have cumulative benefits if done together, the intersection and bridges have independent utility and will be classified separately as Categorical Exclusions in accordance with 23 CFW 771.117(d)13. FHWA Maine Division will be the lead agency for NEPA. The anticipated dates for NEPA completion are listed in the Project Schedules provided in *Appendix C, Schedules*.

2) U.S. Coast Guard

MaineDOT anticipates receiving a U.S. Coast Guard permit exemption from FHWA for the Stillwater Bridges in Old Town. The Main Street Bridge in Solon, and the Martins and Red Bridges in Rumford cross non-navigable waters and will not require Coast Guard Permits. The I-95 / Webb Road Bridges in Waterville and the I-95 / Broadway Bridge in Bangor carry I-95 over existing roads.

3) Section 106 of the National Historic Preservation Act

MaineDOT and FHWA have initiated the Section 106 process by notifying towns, Federally recognized Tribes and the Maine Historic Preservation Commission (MHPC). Preliminary identification of historic resources is complete. None of the bridges in the FRAME Project are

eligible for listing in the National Register of Historic Places, although the Main Street Bridge in Solon is located adjacent to a National Register Eligible Historic District. MaineDOT will avoid and minimize impacts from the bridge replacement that would alter the character-defining features that convey the significance of the historic district and its contributing resources. This includes avoiding physical impacts to contributing resources and avoiding major changes to the setting.

The Stillwater Avenue Intersection project has two National Register-eligible properties within its Area of Potential Effect (APE). MaineDOT will avoid and minimize potential adverse effects to these resources during design.

The Martins Bridge in Rumford requires archaeological screening. MaineDOT/FHWA will work with MHPC to determine if National Register-eligible archaeological resources are present. If present MaineDOT will avoid and minimize impacts or work with MHPC to mitigate unavoidable impacts.

4) Section 4(f) of the U.S. Department of Transportation Act
Identification of Section 4(f) resources is complete. The Section 106 resources described above are also Section 4(f) resources. In addition, there are ballfields adjacent to the Red Bridge in Rumford that are protected by Section 4(f). MaineDOT will explore all reasonable and prudent alternatives to avoid use of property protected by Section 4(f). If a use is required, MaineDOT will work with FHWA Maine Division to obtain approval under Section 4(f).

5) Endangered Species Act
Each of the projects is located within the range of the Federally threatened Northern Long-Eared Bat. MaineDOT anticipates that the intersection and each of the bridge projects may affect but are not likely to adversely affect Northern Long-Eared Bats and that each project will be eligible for Streamlined Section 7 Consultation pursuant to the U.S. Fish and Wildlife Service Northern Long-Eared Bat 4(d) Rule.

The Stillwater Bridges and the Stillwater Ave Intersection project are located within the range of Federally-listed Gulf of Maine Distinct Population Segment (DPS) of Atlantic salmon and are located within designated Critical Habitat. Informal Section 7 Consultation with U.S. Fish and Wildlife Service regarding potential effects to Atlantic Salmon will be required.

6) Essential Fish Habitat (EFH)
The Stillwater Bridges in Old Town, the Main Street Bridge in Solon, and the Red Bridge in Rumford are located within designated Essential Fish Habitat for Atlantic Salmon. MaineDOT will consult with the National Marine Fisheries Service on potential effects to EFH.

7) Section 404 Clean Water Act Permit (Army Corps of Engineers)
Main Street Bridge in Solon, Martins and Red Bridge in Rumford, and the Stillwater Bridges in Old Town will require Section 404 Permits from the Army Corps of Engineers. MaineDOT anticipates that the bridges will be eligible for Category 2 Permits under the Maine Programmatic General Permit.

8) Natural Resources Protection Act Permit (Maine Department of Environmental Protection)
Main Street Bridge in Solon, Martins and Red Bridge in Rumford, and the Stillwater Bridges in Old Town will require approval under the Maine Natural Resources Protection Act. MaineDOT

Freight Reliability Actions for MainE (FRAME)

anticipates that the projects will be eligible for Permit-By-Rule Chapter 305, Section 1, which is a streamlined permit process for State Transportation Facilities.

9) Federal Transportation Requirements Affecting State and Local Planning

The Project is not required to be listed in the state long-range transportation plan. The Project will be listed in the next Statewide Transportation Improvement Program (STIP), as well as in the Bangor Area Comprehensive Transportation System (BACTS) MPO Transportation Improvement Plan (TIP), to be approved in April 2020. The Project components are already listed in the current *MaineDOT Work Plan: 2020 Edition* available here: <https://www.maine.gov/mdot/projects/workplan/>.

Risks & Mitigations

Environmental uncertainty

Risk	Mitigation
Due to the presence of Atlantic salmon at the Stillwater Bridges in Old Town, Section 7 ESA Consultation and Section 404 permitting may limit the time of year that certain activities may be completed in the water	✓ Minimize permanent in-water structures, plan construction sequence to avoid sensitive times for salmon life stages, implement avoidance and minimization measures during construction to reduce potential effects from in-water work ✓ Begin early coordination with U.S. Fish and Wildlife and Maine Department of Marine Resources to obtain best available information on species presence and activity in the project area and incorporate measures to avoid and minimize effects early in design
Presence of cultural resources protected by Section 106 of the National Historic Preservation Act and Section 4(f) of the U.S. Department of the Transportation Act	✓ Identify cultural resources early in the design process to avoid and minimize potential effects during design. ✓ Begin early coordination with Maine Historic Preservation Commission to inform design and expedite review timeframes.

VII. Large Project Requirements

The Project satisfies several statutory requirements enumerated at 23 U.S.C. 117(g):

1. The Project generates regional economic mobility and safety benefits because it maintains critical freight access to several rural, economically challenged areas of Maine. It will deliver eight (8) safer bridges and one (1) safer intersection for motorists, pedestrians, and bicyclists.

2. The Project is cost effective as stated in the BCA with \$1,184,000,000 of benefits (discounted at 7% over 30 years) and a benefit-cost ratio of 24.97.
3. The Project satisfies the following national goals under 23 U.S.C. 150:
 - 1) Safety – traffic fatalities or serious injuries, the Project makes each of the bridges and the intersection safer. Safety standards imbedded into components of bridge designs, such as standard width lanes, standard guard rails, shoulders, all aid in elevating safety. New intersection signaling will improve both safety and mobility.
 - 2) Infrastructure Condition – the Project aims to maintain a portion of the highway infrastructure asset system in a state of good repair.
 - 3) Congestion Reduction – completion of the Project will reduce wait times at the Stillwater intersection, and eliminate the potential for bridge load postings or reroutes that could result from further deterioration or closure of the bridges.
 - 4) System Reliability – the Project improves the efficiency and reliability of the surface transportation system by creating safer, and more reliable bridges and an intersection on Critical Rural Freight Corridors around the state.
 - 5) Freight Movement and Economic Vitality – the Project improves the national freight network by maintaining and improving several key components of Maine’s National Highway System and National Highway Freight Network. It does so in a rural region that requires freight access via the project bridges and intersection to reach and compete in national and international markets. Maintaining and improving this access helps several rural communities across the state better compete in today’s challenging economy. A key to Maine’s regional economic development is having a viable transportation network.
 - 6) Environmental Sustainability – Please refer to Sections V and VI of this narrative for additional details regarding Environmental Sustainability.
 - 7) Reduced Project Delivery Delays – Several major projects with multiple stakeholders and overlapping capital projects require significant coordination to meet deadlines and manage risk. To ensure timeline delivery of Project design, the team has employed the following three key strategies:
 - Hosting regular meetings and partnering sessions with stakeholders, agency partners and project designers, used to coordinate needs, identify conflicts and constraints, assess project delivery risks, and stay apprised of decision-making efforts and their impacts on overall project schedule and delivery.
 - Creation of a project risk register to provide foresight with respect to potential project issues, streamlining project delivery through early identification of challenges. For additional information, please refer to *Section VI, Risks and Mitigations*.
4. Preliminary Engineering – Preliminary Engineering has begun for each of the project components except Martins Bridge in Rumford, which will be kicking off soon. For more information on the status of each component of the Project, please refer to *Appendix C, Schedules*.
5. Funding
 - a. Non-Federal funding for the Project comes from MaineDOT. The opportunity

to obtain private funding for the Project was not feasible. For more detailed information on fund sources and amounts, please refer to *Section IV, Grant Funds, Sources and Uses of Project Funds*.

- b. Contingency Amounts at the 10% level are imbedded in the Project costs to cover unanticipated cost increases.
6. Ease and Efficiency of Funding – Maine and MaineDOT have been investing consistently in bridge improvements and replacements but additional funding sources are needed to continue to keep the 2,450 state bridges, 80% of which are in rural areas, in a state of good repair.¹² Of the 2,450 state bridges, MaineDOT owns 2,377 and of those, 12.8% are still considered structurally deficient according to 2019 data. The *MaineDOT Work Plan: 2020 Edition* has dedicated an estimated \$545 million (including previously awarded federal grant funding) for 148 capital bridge projects, including the FRAME Project bridges, and another average \$10.1 million annually in bridge and structural maintenance, as well as an average of \$6.1 million annually in bridge infrastructure inspections and inventory.

In 2019, the Legislature, with the support of the Governor, established the Blue Ribbon Commission to Study and Recommend Funding Solutions for the State's Transportation Systems. See Resolve 2019, Chapter 97 (formerly LD 945). This bipartisan Commission of legislators, transportation professionals, and stakeholders was charged with studying how to reform and adequately supplement funding for the state's transportation infrastructure. In December 2019, after meeting throughout the Fall of 2019, the Commission issued a report that contained the following unanimous findings to date: Finding #1 Assuming an annual \$100-million general obligation bond package, the current unmet annual transportation funding need in Maine is approximately \$232 million. The annual shortfall for bridge projects is upwards of \$67 million, while the shortfall for traffic/mobility/capacity/ITS Improvements approach \$28 million annually¹³.

Without Federal funding, the FRAME Project alone would consume such a large portion of total available state bridge funding, that it would either delay funding for other needed bridges and highway projects, or would more likely continue to delay funding for the individual components of this Project. Therefore, the Project would not be easily or efficiently completed without Federal funding nor in a timely manner. Further, it is clear that there is a critical need for bridge investment throughout Maine given the number of structurally deficient bridges in the state.

7. Project Begin Date – Construction is scheduled to begin on the first bridge in the Project in mid-2022, well before the September 30, 2023 date of obligation of funds.

¹² USDOT FHWA National Bridge Inventory, <https://www.fhwa.dot.gov/bridge/nbi/no10/fccount16.cfm>

¹³ *MaineDOT Work Plan: 2020 Edition*, page xvii, <https://www.maine.gov/mdot/projects/workplan/>

Freight Reliability Actions for MainE (FRAME)

Grant Request Supporters*

MaineDOT's grant request for INFRA funds is supported by a diverse group of elected officials, shippers and stakeholders due to the significant economic impact the Project will have on the region. This list of supporters includes:

Members of Congress (*Letters will be sent to the Secretary's office*)

U.S. Senator Susan Collins

U.S. Senator Angus King

U.S. Congresswoman Chellie Pingree

U.S. Congressman Jared Golden

State Elected Officials/Offices

Governor Janet Mills

State Senators Scott Cyrway, James Dill, Brad Farrin, Geoffrey Gratwick, and Lisa Keim

State Representatives Michelle Dunphy, Victoria Kornfield, Joseph Perry and Bruce White

Government

City of Bangor

City of Old Town

Town of Orono

Town of Rumford

Town of Solon

City of Waterville

Chambers of Commerce

Androscoggin Council of Government (AVCOG)

Kennebec Valley Council of Government (KVCOG)

River Valley Chamber of Commerce

Professional Organizations

Maine Better Transportation Association

Maine Motor Transport Association

Corporations

FirstPark, Oakland, ME

Hannaford Brothers Company

ND Paper (Rumford Mill)

Poland Spring (Nestle Waters North America)

Sunday River

Schools/Universities

University of Maine

Regional School Unit (RSU) 10

* As additional letters of support are submitted, they will be forwarded to USDOT with the Project name clearly labeled.

Appendix

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Grant applications materials may also be found at the “Current
MaineDOT Grants” webpage:
<https://www.maine.gov/mdot/grants/>