



**MaineDOT**



U.S. Department of Transportation  
Federal Railroad Administration  
Consolidated Rail Infrastructure and Safety Improvements  
CRISI 2018

GRANT APPLICATION | September 12, 2018

# Pan Am Railways Mainline Upgrades and Rail Crossing Safety Improvements

U.S. Department of Transportation

Consolidated Rail Infrastructure and Safety Improvements  
CRISI 2018

**I. GRANT APPLICATION COVER PAGE**

**Project Title:** *Pan Am Railways Mainline Upgrades and Rail Crossing Safety Improvements*

**Applicant:** Maine Department of Transportation

**Project Track(s):** 3

**Will this project contribute to the Restoration or Initiative of Intercity Passenger Rail Service?** No

**Was a Federal grant application previously submitted for this project?** No

**If applicable, what state of NEPA is the project in (e.g., EA, Tier 1 NEPA, Tier 2 NEPA, or CE)?** CE

**Is this a Rural Project?** Yes

**What percentage of the project cost is based in a Rural Area?** 74.1%

**Cities, State where the project is located:** State: Maine; Cities: Waterville, Oakland, Belgrade, Monmouth, Greene, Lewiston, Auburn, New Gloucester, N. Yarmouth..

**Urbanized Area where the project is located:** Lewiston, Maine (Population, 59,397, 25.9% of project funds expended).

**Is the project currently programmed in the State Rail Plan, State Freight Rail Plan, TIP, STIP, MPO Long Range Transportation Plan, State Long Range Transportation Plan?** Yes, identified Maine State Rail Plan, State Freight Plan, programmed in STIP, and MaineDOT Work Plan

**Funds Requested:** \$17,468,840

**Funds Matched:** \$18,036,932

**Total Project Cost:** \$35,505,772

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## II. PROJECT SUMMARY

This project is needed to improve safety and reliability along the Pan Am Railways (“PAR”) mainline and improve rural highway at-grade crossings in Central Maine. This project will help retain the region’s competitiveness at a time when the Maine forest products industry is going through a resurgence. The project will upgrade and modernize 75 miles of PAR mainline track by: 1) installing 37 miles of *new* continuous welded rail (“CWR”) to replace the remaining dated jointed rail that is at the end of its useful life, 2) upgrading 25 dated mainline switches to modern switches, 3) reconstructing and modernizing 47 public at-grade rail crossings which will include signal modernization at all crossings and surface reconstruction at 23 of the crossings, 4) extending and upgrading an existing siding by 4,800 feet, 5) replacing and improving signal systems, 6) replacing bridge deck timbers on 8 bridges, and 7) replacing planking and installing modern signage at 42 private/farm rail crossings. The project will enhance the safety of the rail line and will improve the line’s reliability and consistency which will enhance its competitiveness in this rural area of Central Maine.

## III. PROJECT FUNDING

Task #	Task Name/Project Component	Cost	Percentage Total Cost
1	MaineDOT Administration Costs	\$568,092	
2	Rail Replacement: Install continuous welded 115 lb rail to eliminate jointed and/or worn rail.	\$15,859,000	
3	Mainline Switch Replacement: Replace mainline switches with new 115 lb switch packages to ensure Class II condition.	\$2,325,000	
4	Grade Crossing Reconstruction: Reconstruct grade crossings to improve safety and ensure Class II track condition.	\$9,747,328	
5	Extend New Gloucester Siding: Remove existing Penney switch (MP 173.53) and construct new track 4,800 feet east on existing roadbed. Use relay rail cascaded from FML between MP 174.4 and 172.1 to	\$1,005,818	

	construct new track and replace existing rail in the siding. Install a new #15 switch in the FML at MP 174.42 to become the new west end of New Gloucester siding. Replace the existing #10 switch at Blake (MP 172.12) with a #15 switch.		
6	Signal System Improvements: Replace interlockings with modernized equipment at CPF-111, CPF-112, and CPF 113. Install interlocking at Leeds Junction and add additional wayside locations to complete signal system between Leeds Junction and Danville Junction. Install interlockings at both ends of the extended New Gloucester Siding and add additional wayside locations to complete signal system between Danville Junction and Royal Junction.	\$5,695,384	
7	Bridge Deck Replacement: Replace 8 bridge deck timbers.	\$95,150	
8	Private/Farm Crossing Rehabilitation: Replace wood planking and install signage at 42 farm/private crossings to improve safety.	\$210,000	
<b>Total Project Cost</b>			
Total Project Cost		\$35,505,772	100%
Federal Funds Received From Previous Grant		\$0	0%
CRISI Federal Funding Request		\$17,468,840	49.2%
Non-Federal Funding/Match		Cash: \$7,097,648 In Kind: \$10,939,284	39.4% 60.6%
Portion of Non-Federal Funding from the Private Sector		\$17,468,840	49.2%

Portion of Total Project Costs Spent in a Rural Area	\$25,875,243	74.1 %
Pending Federal Funding Requests	\$0	0%

The non-federally funded portion of the project will be funded through a combination of financing from Pan Am Railways in the amount of \$17,468,840, and MaineDOT in the amount of \$568,092.<sup>1</sup>

#### IV. APPLICANT ELIGIBILITY

The Maine Department of Transportation (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. This project has been prioritized by MaineDOT.

#### V. PROJECT ELIGIBILITY

The project will rehabilitate 75 miles of mainline rail of the PAR in Central Maine. The PAR line is FRA Class II track that carries diverse commodities including fragile paper products and Poland Springs water. This project is eligible under the following two sections in the CRISI Notice of Funding Opportunity:

1. **C (3)(a)(v). Highway-Rail Grade Crossing Improvements.** The project will rehabilitate 47 public and 42 private rail crossings. There will be a combination of repair and improvement of grade crossings; flasher, gate and technology upgrades; crossing approach signage and lighting; and improvements to rail crossing panels and surfaces.
2. **C (3)(a)(vii). A Capital Project to Improve Regional Railroad Infrastructure.** The project will convert the remaining 37 miles of mainline track to continuous welded rail (CWR); modernize and extend by 4,800 feet the New Gloucester siding; and replace bridge deck timbers on 8 bridges.

#### VI. DETAILED PROJECT DESCRIPTION

The *Pan Am Railways Mainline Upgrades and Rail Crossing Safety Improvements* project is located in Maine along 75 miles of track running from Waterville to N. Yarmouth, Maine. The project will work to rehabilitate the PAR mainline track, and in turn help the company to better serve customers in this region. PAR is North America’s largest regional railroad system with routes stretching from Saint John, New Brunswick, Maine to New York’s Capital District. PAR consists of the Springfield Terminal (ST) and Pan Am Southern (PAS).<sup>2</sup> Primary commodities handled include paper and pulp, food products, grain, coal, sand and gravel, lumber, chemicals and plastics, petroleum, processed minerals, metals, scrap metal, finished automobiles, intermodal trailers and containers.<sup>3</sup>

<sup>1</sup> See Appendix E, Match Letter.

<sup>2</sup> See Pan Am Railways, Who We Are <http://www.panamrailways.com/who-we-are> (last visited Sept. 3, 2018).

<sup>3</sup> See id.

One of the state's hardest hit industries over the past few decades has been the forest products industry, in particular the pulp and paper. A number of paper mills have closed over the years due to various challenges such as rising energy costs and a decline in demand for the paper products being produced. Several mills have been forced to close or ramp down production while laying off workers. In fact, at the end of the 1990's Maine paper mills employed more than 15,000 people. Over the next 14 years the industry saw a 66 percent decline in employment.<sup>4</sup> Very recently there has been a revitalization of the industry with mills expanding again. These mills are upgrading their technology and diversifying their mix of products to succeed in the global economy.

However, there are still some issues that negatively impact these mills, one of which is the burden of weather issues on infrastructure and the transportation of products by road throughout the state. Updated and reliable infrastructure is critical to the movement of goods in the state and without these upgrades to the rail lines, goods will continue to be moved mostly by highway as they make their way out of the state and to markets domestic and international. Roads that become congested or trucks that get delayed due to weather conditions increase delivery costs and create delays in getting the products to markets. All of this creates an economic burden on industries that are doing business in the region and stop them from moving their product in a timely manner.

Much like many parts of the country, the counties in this northeast region have seen an economic downturn over the past few decades as industries move out and plants close. However, one thing that has not changed for these counties is their continued focus to grow through the revitalization of businesses and the continued expansion and rehabilitation of current infrastructure to better fit today's needs.

Part of this focus has led to the upgrades of a number of paper mills in the state and a shift in what type of paper products are produced. Verso, which had shut down a paper machine in Jay, Maine in 2017, announced the machine will be converted and modernized to produce a new product and will create 120 new jobs. Verso has also made technological upgrades to increase release liner paper capacity of its No. 4 paper machine.<sup>5</sup> These projects will ensure sustainability of the restarted paper machines. With the completion of projects such as these, the need for reliable rail service is more significant.

Another sign of the economic resurgence in the region is the recent purchase of a Rumford paper mill, which employs about 610 workers, by the Nine Dragons Paper Holdings Limited ("Nine Dragons").<sup>6</sup> Nine Dragons was established in 1995 and is the largest paperboard producer in Asia and one of the largest in the world in terms of production capacity.<sup>7</sup> This new ownership promises to revitalize the local economy.

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<sup>4</sup> Naylor Network, Why Are Maine's Paper Mills Closing?, Tappi OvertheWire <http://www.naylornetwork.com/ppi-otw/articles/index-v2.asp?aid=289011&issueID=39260> (last visited September 3, 2018).

<sup>5</sup> Verso Announces Strategic Investments in its Androscoggin mill in Jay, Maine, PRNewswire, Verso Corporation July 18, 2018 <http://investor.versoco.com/2018-07-18-Verso-Announces-Strategic-Investments-in-its-Androscoggin-Mill-in-Jay-Maine> (last visited August 18, 2018).

<sup>6</sup> Chinese Company Nine Dragons Buys Catalyst Paper Mills in US for US\$175 million, Associated Press, South China Morning Post <https://www.scmp.com/news/china/economy/article/2147900/chinese-company-nine-dragons-buys-catalyst-paper-mills-us-us175m> (last visited September 3, 2018).

<sup>7</sup> Nine Dragons Paper (Holdings) Limited, About ND Paper, Company Profile <http://www.ndpaper.com/eng/aboutnd/profile.htm> (last visited September 3, 2018).

It is clear that the counties and towns along this rail line have the potential for significant growth by capitalizing on the revitalization of the local paper mills. Paper mills are poised to once again be significant in both the Maine economy and the economic health of the region as well. There are no Class I railroads in the state, only regional and short line railroads, making these railroads and their connections to Class I's and the national rail system vital to Maine's economy. This project will allow for upgrades and improvements to the PAR mainline between Waterville and North Yarmouth, a key corridor for industries in this region to move their products to market. Moving trucks off the roads and keeping these goods on rail lines instead saves time, money and increases the ability to get the product to market year-round regardless of weather and road conditions. In addition, moving goods by rail instead of truck reduces overall operating costs and improves safety. Removing trucks from the highways also reduces overall congestion on the rural roads in Maine for both residents and tourists to move about the state.

Maine is an aging state and the need to keep young people in the region through the promise of jobs and growing industries that can lead to career and financial stability for the region, is a big hurdle to overcome.<sup>8</sup> New economic opportunities such as those within the forest products industry give this region a real hope of seeing long-term recovery in employment and population numbers. The revitalization and work being done along the PAR mainline will provide this region with increased employment opportunities for local citizens and over time will bring in new customers that invest money into the local economy. When people have more local opportunities for work, they remain in their communities and pursue educational opportunities that help increase their marketability in the workforce.

This rail line also serves a Poland Springs water plant through a truck to rail intermodal facility. The water like the paper poses challenges when being transported, the water is temperature sensitive and must be moved in a timely manner. This business will grow year over year and Poland Spring will have to determine how it can easily and efficiently move its product. If there is no reliable rail service option at the plant, Poland Springs will ship its product 190 miles by truck to its warehouse in Ayer, MA, creating 4.1 million new truck miles traveled by 2022.

Overall this project is a regional approach that has enthusiastic support of its community, county, cities, state agencies and elected officials at the state, local and federal levels (*see* Appendix F, Support Letters). The level of support for this project speaks volumes of the acknowledged need for a functioning regional rail line in Maine.

### Background on the Challenges Addressed by the Project

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<sup>8</sup> According not the U.S. Census Bureau, Maine is the oldest state in the country with a median age of 44 years. [https://factfinder.census.gov/faces/nav/jsf/pages/community\\_facts.xhtml?src=bkmk](https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml?src=bkmk) (last visited August 18, 2018).



The 75 miles of mainline track that will be rehabilitated and modernized through this grant are critical to the entire PAR system running through Maine connecting state industries to trade in Canada and to the rest of the United States via Class I lines. Some of the components on the current line have nearly reached their useful life such as the 37 miles of jointed rail. The jointed rail, some dating back to the 1950's, makes the rail line less efficient and less safe. Continuous welded rail is stronger, smoother, and quieter. It also can reduce maintenance costs by 30 – 75



percent. In general, approximately one quarter of all derailments occur in the United States due to broken rail or broken joints regardless of whether those derailments occur along mainline track, sidings or yards.<sup>9</sup> This project will decrease the risk of derailments along the line by replacing the old, outdated jointed rail with modern continuously welded rail. There are 47 public at-grade rail crossings along the 75 miles of mainline track. A majority of those crossings are located in rural areas (30 of the 47 crossings are rural). These crossings need to be upgraded and modernized to ensure safety of the residents and visitors to this rural part of the state. The project will also improve wayside signaling and will extend a siding by 4,800' that will allow for longer trains to pass. This is particularly important since trains are getting longer as the economy is improving.

#### Expected Users and Beneficiaries of the Project Including all Railroad Operators

Historically there were two Class II railroads in Maine, the Maine Central Railroad and the Boston Maine Railroad, both of which are now part of the PAR system. The mainline track to be rehabilitated by this grant was a branch of the Maine Central Railway. PAR is the main beneficiary and only rail operator of the project. PAR has a strong commitment and history with public-private partnerships and is one of the larger private employers in Maine with over 400 employees in Maine. Residents of Maine will benefit from the project by the increased economic viability of the state.

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<sup>9</sup> See Analysis of Causes of Major Train Derailment and Their Effect on Accident Rates, Transportation Research Record Journal of the Transportation Research Board, Xiang Liu, Rapik Saat, Christopher P.L. Barkan, Dec. 2012, [https://www.researchgate.net/publication/275853718\\_Analysis\\_of\\_Causes\\_of\\_Major\\_Train\\_Derailment\\_and\\_Their\\_Effect\\_on\\_Accident\\_Rates](https://www.researchgate.net/publication/275853718_Analysis_of_Causes_of_Major_Train_Derailment_and_Their_Effect_on_Accident_Rates).

## Specific Components and Elements of the Project

This project includes seven construction components to rehabilitate the main line rail running from Waterville to North Yarmouth, Maine comprising of approximately 75 miles of rail and 89 public and private rail crossings.

### 1) Rail Replacement

Install 37 miles of continuous welded rail (CWR) to eliminate jointed and/or worn rail. Specifically, this work includes installing 400,000 LF of CWR and 260 plug rails, and welded joints. The total cost is **\$15,859,000**.



### 2) Mainline Switch Replacements

Replace 25 mainline switches to ensure Class II condition. Replace with 115 lb switch packages. The total cost is **\$2,325,000**. Switches will be replaced at the following mileposts:

111.5, 111.6, 112.8, 113.1, 118.5,  
119.7, 134.6, 135.5, 141.4, 141.5,  
149.7, 149.9, 150.2, 150.4 (2), 150.7,  
151.1, 152.4, 159.2, 160.1, 163.6,  
164.9, 165.8, 166.6, 176.7.



### 3) Restructure and Modernize 47 Highway/Rail Grade Crossings

Reconstruct grade crossings to improve safety and ensure Class 2 condition. Each crossing is detailed below in section A. Grade Crossing Information. The total cost is **\$9,747,328**.

### 4) Extension of New Gloucester Siding

Remove existing Penney switch at milepost 173.53 and construct new track of 4,800 feet east on the existing roadbed. Use relay rail cascading from FML between milepost 174.4 and 172.1 to construct new tack and replace existing rail in the siding. Install a new #15 switch in the FML at milepost 174.42 to become the new west end of New Gloucester siding. Replace the existing #10 switch at Blake (milepost 172.12) with a #15 switch. Traffic trends and future growth in the region indicate



the need for longer trains. Extending the New Gloucester siding to 11,700 feet will not only accommodate current operations but will also enable the railroad to increase train lengths as business demands warrant. Additionally, this siding expansion will allow larger trains to be staged clear of passenger traffic between Brunswick and Portland. The total cost is **\$1,005,818**.

**5) Wayside Signal System Improvements**

Replace interlockings with modernized equipment at CPF- 111, 112 and 113. Install interlocking at Leeds Junction and add additional wayside locations to complete signal system between Leeds Junction and Danville Junction. Install interlockings at both ends of the extended New Gloucester Siding and add additional wayside locations to complete signal system between Danville Junction and Royal Junction. The total cost is **\$5,695,384**.

**6) Bridge Deck Replacements**

Replace bridge deck timbers. The total cost is **\$95,150**. The deck timber replacement will occur at the following mileposts: 118.12, 130.56, 137.87, 150.25, 156.64, 161.43, 163.72, 177.16.

**7) Private Crossing Rehabilitations**

Replace wood planking and install signage at 42 farm/private crossings to improve safety. The total cost is **\$210,000**.

Proposed Performance Measures

The following proposed performance measures have been used by MaineDOT in previous USDOT discretionary grant awards and are proposed for this project: 1) Reduction in average monthly slow order miles throughout the project corridor, 2) Reduction in travel time in minutes traversing the 75 mile project corridor, 3) Increase in gross tonnage over corridor for the reporting period.

A. Grade Crossing Information

The project will upgrade 47 public and 42 farm/private rail crossings along the line. The scope of work for the public grade crossing improvements was determined by evaluating each grade crossing based on the following factors: a) service life, b) effectiveness of warning devices, c) placement of warning devices, d) type of train detection technology, and e) overall condition. The effectiveness of warning system devices can be determined based on considering the following: a) geometric characteristics of roadway, b) proximity to intersections, c) traffic density, d) train and automobile speeds, e) sight distances for train and auto traffic, and f) historical data points.

Railroad that owns the infrastructure at the crossing	Primary Railroad Operator	DOT Crossing Inventory Number	Roadway at the crossing	Work to be Done	Total Cost
Pan Am Railway <sup>10</sup>	Pan Am Railway	365149X	Chaplin Street	Track, Surface, Signal/AHCP <sup>11</sup> work	\$302,862
		365148R	Main Street	Signal/AHCP work	\$276,082
		365143G	Rice Rips Road	Signal/AHCP work	\$191,145
		365142A	Fairfield Street	Track, Surface, Signal/AHCP work	\$376,848
		365140L	Pleasant Street	Signal/AHCP work	\$63,033
		365139S	Oak Street	Signal/AHCP work	\$348,139
		365786c	Augusta Road Rte. 2	Signal/AHCP work	\$221,751
		365137D	Depot Road	Signal/AHCP work	\$64,093
		365134H	Bartlett Road	Signal/AHCP work	\$22,884
		365133B	Plains Road	Track, Surface, Signal/AHCP work	\$188,911
		365131M	Main Street Rte 7	Signal/AHCP work	\$157,690
		365129L	Summer Street	Signal/AHCP work	\$67,296
		365127X	Central Street	Track, Surface, Signal/AHCP work	\$269,573
		365126R	Main Street	Track, Surface, Signal/AHCP work	\$233,293
		365122N	Annabessacook Road	Track, Surface, Signal/AHCP work	\$316,147
		365122N	Annabessacook Road	Signal/AHCP work	\$103,515
		364758V	Berry Road	Signal/AHCP work	\$97,330
		364759C	Main Street	Track, Surface, Signal/AHCP work	\$267,687
		365119F	Cressey Road	Track, Surface, Signal/AHCP work	\$247,103
		365116K	Leeds Jct. Road	Track, Surface, Signal/AHCP work	\$343,153
		365113P	Spragues Mill Road	Track, Surface, Signal/AHCP work	\$236,982
		365112H	Barrell Shop Road	Signal/AHCP work	\$153,146
		365110U	Sawyer Road	Track, Surface, Signal/AHCP work	\$276,077
		365109A	College Road	Signal/AHCP work	\$121,842
		365108T	Sullivan Road	Track, Surface, Signal/AHCP work	\$212,513

<sup>10</sup> Each crossing is owned and operated by Pan Am Railway.

<sup>11</sup> Ad-Hoc Configuration Protocol

		365102C	Merrill Road	Track, Surface, Signal/AHCP work	\$364,686
		365101V	Stetson Road	Track, Surface, Signal/AHCP work	\$247,857
		365097H	Strawberry Ave.	Track, Surface, Signal/AHCP work	\$367,236
		365093F	Whipple Street	Track, Surface, Signal/AHCP work	\$321,617
		365092Y	Holland Street	Track, Surface, Signal/AHCP work	\$295,514
		365090K	Middle Street	Signal/AHCP work	\$215,393
		365088J	Spring Street	Track, Surface, Signal/AHCP work	\$304,782
		365087C	Hampshire	Signal/AHCP work	\$276,338
		365086V	Library Avenue	Track, Surface, Signal/AHCP work	\$331,849
		365085N	Court Street	Signal/AHCP work	\$84,581
		365084G	Elm Street	Track, Surface, Signal/AHCP work	\$178,843
		365083A	High Street	Track, Surface, Signal/AHCP work	\$132,123
		365082T	Albiston Way	Signal/AHCP work	\$18,420
		365081L	Hackett Road	Signal/AHCP work	\$215,337
		365078D	Sampson Crossing	Signal/AHCP work	\$156,778
		365077W	Black Cat Road	Signal/AHCP work	\$204,268
		365076P	Danville Jct. Road	Signal/AHCP work	\$12,187
			Rte. 231	Signal/AHCP work	\$125,145
		365071F	Morse Road	Signal/AHCP work	\$26,710
		365070Y	Depot Road	Track, Surface, Signal/AHCP work	\$114,616
		365069E	Porter's Mill Road	Signal/AHCP work	\$164,199
		<b>SUBTOTAL</b>			<b>\$9,192,429</b>

			Fire Road*	Track, Surface, Signal/AHCP work	\$218,384
		<b>SUBTOTAL</b>			<b>\$343,529</b>
		<b>TOTAL</b>			<b>\$9,535,958</b>

\*The crossing listed does not have a corresponding FRA Crossing number.

*Below is a general description of the work to be done to upgrade the at-grade rail crossings along the 75 miles of main line track. Additional information can be found at <https://www1.maine.gov/mdot/grants/crisi>*

Various treatments will be used to increase the efficacy of each warning system. At a minimum, each grade crossing will be equipped with two electronic pedestrian bells and twelve-inch LED



flashing lights. Where necessary, additional flashing light units will be added to existing configurations and several crossings will receive new flasher stanchions. Two crossings will be upgraded to gates, and four remaining passive-public crossings will be actively protected with flashing lights. Others, including Central Street in Winthrop, will have cantilevered flashing lights installed to increase warning system visibility. Each appurtenance will be installed in accordance with today's Manual on Uniform Traffic Control Devices standards. Warning system reliability and maintainability is of critical importance. Modern technology deployed in today's grade crossing warning systems improves safety and reliability while reducing maintenance throughout its lifecycle.

Crossings newly equipped with constant warning detection systems will provide motorists with warning of oncoming trains regardless of train speed. PAR's warning times are set at 35 seconds for gated crossings, and 30 seconds for crossings equipped with flashing lights and bells. Providing a consistent warning time to motorists is a significant factor in reducing motorist dwell time and temptation to ignore an activated warning system.

Each grade crossing will be equipped with modern event recording equipment, capable of monitoring system health and train movement profiles. In addition to industry standard recording, the PAR event-recording package includes video monitoring. Grade crossings are now equipped with a stand-alone camera and DVR system, activated either by motion or by the presence of rail traffic. Gate mechanisms not capable of providing input to recording equipment for the purpose of providing positive gate down indication will be replaced. Systems capable of accurate and complete event recording as described allow maintenance personnel to quickly diagnose issues or determine if a report of a malfunction is credible. Having access to comprehensive event recording data insures warning systems can be returned to normal service as safely and expeditiously as possible, resulting in fewer train delays and improved safety for railroad personnel as well as the traveling public. Standard procedure for any malfunction is to require all trains to stop and provide on ground protection until the system can be repaired and/or tested for proper operation.

### *Rail Replacement at Crossings*

In addition to the specific work done to modernize each crossing rail replacement throughout the line will increase reliability and reduce maintenance costs. Replacement of jointed rail will reduce the number of points of failure in each of the grade crossing approaches on the line. Grade crossing warning systems are designed on a fail-safe principal. In crossing approaches with rail joints, each joint must be electrically bonded to the other. In the event of a failure of this connection, the rails become electrically isolated, resulting in an open track circuit, causing the grade crossing warning system to "fail-safe" to its most restrictive state. In total, there are nearly 32,000 feet of jointed rail within crossing approaches; installing continuous welded rail will eliminate nearly 1,600 points of

failure that will no longer have to be maintained. Repeated false activations caused by broken bond wires can desensitize motorists to operation malfunctions leading to motorists circumventing crossing barriers. Finally, battery systems will be upgraded to increase backup capacity from between 108 and 525 percent improving safety, particularly at flasher-equipped crossings in rural zones prone to prolonged power outages.

## VII. PROJECT LOCATION

This project is located in Central Maine and runs through the following counties: Kennebec, Androscoggin, and Cumberland. The project is primarily located within rural areas – 74.1 percent of project funds will be spent in rural areas. The project begins in the freight yard in Waterville, ME and runs through the Lewiston Urban Area (population 59,397) ending in North Yarmouth. Specifically, the project runs along the PAR freight mainline in Waterville at milepost 111.57 to North Yarmouth at milepost 184.40.

This project is a rural freight rail project. According to the U.S. Census Bureau the population of the Maine as of July 2017, was 1,335,907. This makes Maine the most rural state in the country with 61.23 percent of the population living in rural areas.<sup>12</sup> Annually, Maine continues to lose residents, particularly residents living in the more rural areas of the state. Cumberland County accounts for 29 percent of the total employment in the state of Maine and has only seen a modest 3.8 percent increase in population from April 2010 to July 2017.<sup>13</sup> While almost a third of the state's entire employment force is located within Cumberland County, the county remains rural where a lack of access to opportunity and employment is a pressing issue for all residents. Both Kennebec and Androscoggin counties have seen a small to negligible increase in their population since April of 2010.<sup>14</sup>

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<sup>12</sup> United States Census Bureau Quickfacts Maine <https://www.census.gov/quickfacts/me> (last visited August 18, 2018); Census: Maine most rural state in 201 as urban centers grow nationwide, Matt Wickenheiser, Bangor Dailey News, March 26, 2012 <https://bangordailynews.com/2012/03/26/business/census-maine-most-rural-state-in-2010-as-urban-centers-grow-nationwide/> (last visited September 3, 2018).

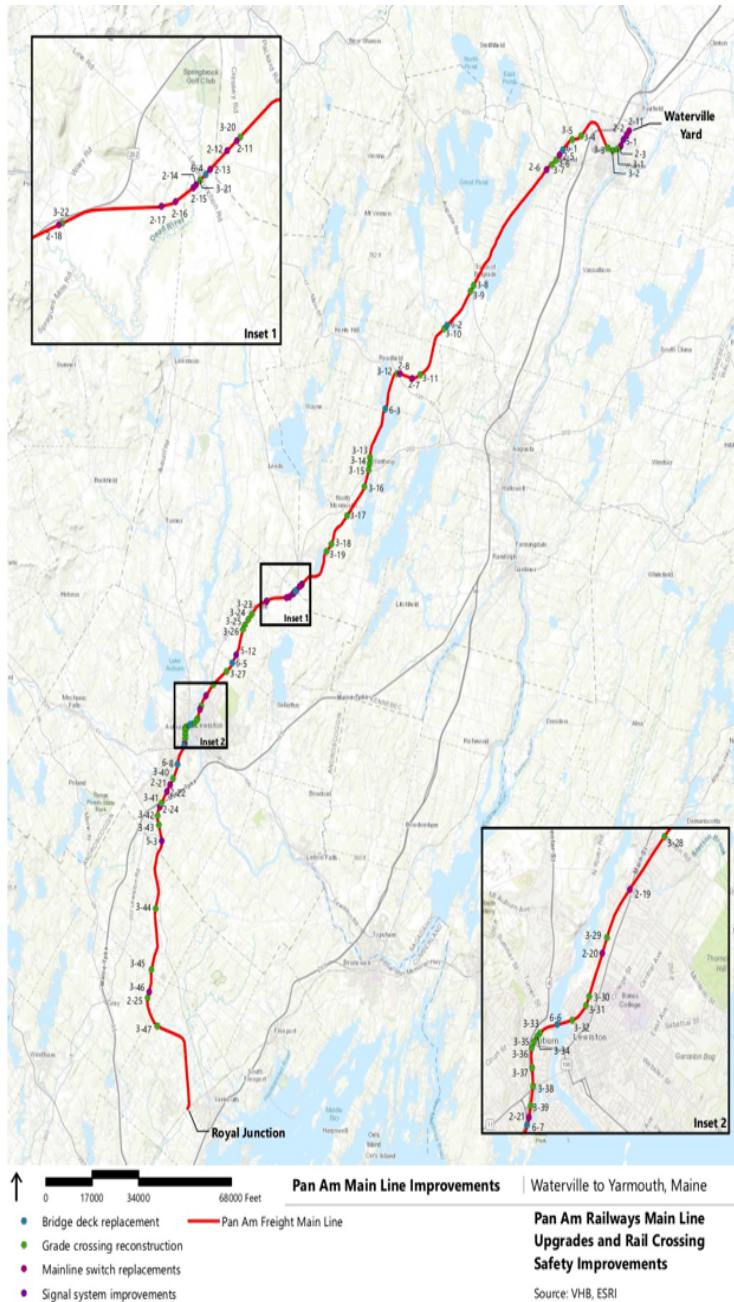
<sup>13</sup> United States Department of Labor, Bureau of Labor Statistics, New England Information Office, County Employment and Wages in Maine- Third Quarter 2017 [https://www.bls.gov/regions/new-england/news-release/CountyEmploymentAndWages\\_Maine.htm](https://www.bls.gov/regions/new-england/news-release/CountyEmploymentAndWages_Maine.htm) (last visited September 3, 2018); United States Census Bureau, Quickfacts Maine, [https://www.census.gov/quickfacts/fact/table/me\\_androscoggincountymaine,kennebeccountymaine,cumberlandcountymaine/RHI625217#viewtop](https://www.census.gov/quickfacts/fact/table/me_androscoggincountymaine,kennebeccountymaine,cumberlandcountymaine/RHI625217#viewtop) (last visited September 3, 2018).

<sup>14</sup> See id.

## VIII. EVALUATION AND SELECTION CRITERIA

### i. PROJECT BENEFITS

While Maine enjoys the benefits of the local connections and dedication of numerous short line and regional (Class II and Class III) railroads, it is one of only three states in the US that does not have a Class I railroad.<sup>15</sup> Without the national reach of a major system and the resulting revenues that arise from such systems, it has proven difficult for Maine's railroads to make investments required to keep lines competitive. The Maine economy that supported rail investment has historically been driven by the pulp and paper industry. Today there are ten remaining pulp and paper mills, fewer than half the number that existed in the state in 1980.<sup>16</sup> Combined with a light density of industry and customer base and a large geography, the railroads in Maine need this financial lift to create the kind of investment required to retain the existing capacity and be able to grow. Through these investments in infrastructure and the resulting improvements in transit time to market, the existing customers in the paper and forest products industry will be more competitive and resilient.



This will afford the railroads more traffic and revenues allowing for further and continuous investment in their properties.

This area also produces the most popular beverage in New York City, Poland Springs water. The movement of Poland Spring water from its Kingfield, Maine plant moves through Waterville,

<sup>15</sup> See Appendix C, Project Schedule/Maps.

<sup>16</sup> "Paper Mill Closings Take Their Toll," Patrick Whittle, The Boston Globe, November 28, 2018

<https://www.bostonglobe.com/metro/2014/11/28/decline-maine-paper-mills-hurts-middle-class/HfQYIktLVEADfC5saBUWJ/story.html>

(last visited September 3, 2018).



Maine via truck to rail intermodal. These intermodal moves are critical to this plant. The efficient movement of water is critical to the business. The transportation of the bottled water is time and temperature sensitive as protecting the temperature of the water from heat in the summer and freezing in the winter months is critically important. Improved rail service in turn drives traffic to the rails and onto the national and international rail network resulting in more capital investment by the railroads. This is a story that has been playing out in the US and Canada for well over a decade. The project better connects the major employers of northern and eastern Maine to the national freight transportation system preserving existing well-paying jobs and creating new jobs in an area that has seen a decline in industry.

Pulp, paper and allied products, lumber, wood and water are the primary commodities originating in Central Maine. They combine for over 30 percent of Maine exports overall and 96 percent of originating rail traffic in Maine.<sup>17</sup> This is important for the country as this region is one of the largest sources of wood fiber east of the Mississippi River and this important resource is needed by industries both within the region and outside of the northeast. Upgrading this rail line will allow products to get to national rail systems of the US and Canada in an efficient, reliable and timely manner. Ultimately the benefits of the project are accrued by shippers and customers not only within the region but to areas beyond.

#### A. EFFECTS ON SYSTEM AND SERVICE PERFORMANCE

The upgrades made by this project will have significant positive effects on the system and service performance of the line. The current state of the track cannot efficiently handle increased traffic volumes if the mainline upgrades are not made. The state of the crossings, the outdated switches and the track conditions cause the line to lack system performance reliability and reduce safety along this 75 miles of mostly rural mainline rail.

#### B. EFFECTS ON SAFETY, COMPETITIVENESS, RELIABILITY, TRIP TIME, AND RESILIENCE

The inconsistency in the quality of the rail line makes it more likely that shippers dependent on just in time and temperature sensitive delivery will bypass the system all together. If the rail service available to Poland Springs in Waterville is not reliable, Poland Springs will be forced to truck the water to its warehouse in Ayer, Massachusetts. This is a highway trip of approximately 190 miles one-way. This creates more than 380 round trip highway miles in 1 truckload of water delivery alone. This translates into more than 3.7 million new truck miles traveled annually.

Paper mill traffic will not be completely lost if the reliability of the rail continues to degrade due to upgrades not occurring. However, PAR has estimated that it will lose approximately 20 percent of current and future business from the paper mills to intermodal traffic. Half of the lost paper mill business will move product that could not reasonably withstand multiple intermodal movements without crumbling or otherwise losing its integrity to the nearest point to be transloaded onto the rail line heading west which is located in South Paris, Maine. This location allows paper products to be loaded directly onto the St. Lawrence and Atlantic Railroad to move product West to Canada and other parts in the United States. This creates 62 miles roundtrip of

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<sup>17</sup> See 2014 Draft Maine State Rail Plan, Maine Department of Transportation, July 2014, <http://maine.gov/mdot/ofbs/docs/draftrailplan2014.pdf> (last visited Sept. 3, 2018).

new truck traffic in a very rural part of the state. The estimated VMT from these movements in Year 3 is 1.5 million. While the rest of the product would travel south to the Class I interchange in Worcester, MA creating 380 miles of new truck miles traveled per truck, per round trip. This modal diversion will result in new truck movements in Year 2. This projected increase in truck traffic will have significant impacts on safety, competitiveness, travel time. These benefits are discussed in detail in the Benefit-Cost Analysis and summarized below.

## 1. Safety

According to the U.S. Department of Transportation, rural roads carry less than half of America's traffic yet they account for over half of the nation's vehicular deaths.<sup>18</sup> The fatality rate on rural roads in the U.S. is 2.6 times higher than on urban streets. Assuming, on average, when hauling paper products one railcar along the route eliminates 3 trucks from the highway system when transporting paper products and that a truck would travel to and from the destination (i.e. make a round trip), then more than 32 million truck-miles are eliminated from the highway system over 20 years when this project is completed.

With regard to Poland Spring water shipments, assuming, one railcar eliminates 1 truck from the highway system. The truck would then travel to and from the destination (i.e. make a round trip), approximately 380 miles roundtrip creating more than 101.62 million unnecessary truck-miles. These excess truck vehicle miles traveled will be eliminated by this project.

Combining the truck movements for paper and water this project will reduce rural truck traffic by 130 million truck-miles. A Federal Motor Carrier Safety Administration study concluded that the number of large trucks involved in crashes resulting in injuries, per 100 million VMT, was 29.1. To be conservative, this application assumes that all the injuries would be minor (i.e. Maximum Abbreviated Injury Scale Level 1. This is a conservative assumption since there would be accidents involving large trucks with more than minor injuries sustained. The economic impact of crashes is \$4,327 per accident, which also assumes that all the crashes are classified as a MAIS Level 1 accident. Using this data, the safety benefits in costs avoided by reducing the likelihood of death, injury and property damage is expected to be approximately \$5.67 million over the course of 20 years. These avoided costs include the costs associated with the likelihood of death and injury along the rail line in a build scenario.

## 2. Competitiveness

This project is critical to the competitiveness of the region. PAR projects a growth in the paper business at 2.4 percent annually and a growth in the water business at 9 percent annually. The growth on the line is expected to be realized with the rehabilitation of this line. This line moves among other products, fragile paper products and Poland Springs water. These commodities must be transported efficiently in rail cars or trucks. The more the products are loaded and unloaded the more likely they are to be damaged. Without the ability to efficiently transport the products in a timely manner, the mills will have more difficulty expanding.

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<sup>18</sup> See U.S. Department of Transportation Federal Highway Administration, Public Roads, <https://www.fhwa.dot.gov/publications/publicroads/08july/alongroad.cfm> (last visited Sept. 3, 2018).

Maine's economy continues to struggle with transportation costs. The rural nature of Maine and its location in the northernmost section of the country has made it difficult for the state to take full advantage of the country's economic recovery. While the forest products industry is critical to the state's economy, the region has experienced a significant decline in the forest products industry over the years. As the consumption of paper products moved away from glossy paper this region began to see a decline in commercial paper production. In 2016 the economic impact of the industry was \$8.5 billion sustaining 33,000 jobs. However, the industry has declined over the past ten years. In 2010 the pulp, paper, and paperboard mills accounted for 21.6 percent of total exports while in 2015 that same industry accounted for 12.4 percent of exports. The industry is critical to the competitiveness of the state. The Economic Development Administration understands the importance of the industry and continues to work with the state to revive it. This project will help make the state and country more competitive by ensuring high quality forest products coming out the mills are delivered to markets in a quick and efficient manner.

The area has seen a recent positive diversification in paper products from glossy paper to other paper products. This has resulted in paper mills expanding production once again.. The expected growth is contemplated in the estimated carload numbers listed in the Benefit-Cost Analysis attached as Appendix A. However, if the project is not completed PAR estimates it will lose at least 20 percent of the paper business to intermodal trucking.

The PAR line also transports Poland Springs water from Waterville to places south of Maine. The total economic impact by Poland Springs water on the state of Maine is \$390 million in 2016.<sup>19</sup> As noted, this product is temperature sensitive and must move efficiently. To remain competitive the line must be upgraded to ensure reliability and safety or PAR will lose all of its water business to trucking.

#### *Switch Modernization and Increase in Operational Efficiency*

The installation of Train Control Systems ("TCS") between CPF 183 and MP 166.95 will improve operational efficiency and safety. Three of the four hand-operated main track switches currently located in this segment do not have signal protection. With the installation of TCS, three hand-operated switches will be located within new controlled points, and the fourth switch will be located within automatic block signal territory. Placing these switches within TCS will improve safety and efficiency by providing stop signal indications when switches are improperly lined for main line train movements, and allow for increased speeds when switches are properly lined.

The New Gloucester siding is strategic for PAR operations and is frequently used for train meets and passes. Hand operated switches exist at each end of the siding. These switches must be operated manually by crew members. To enter the siding, a train must stop; a crew member must dismount and operate the switch. The train will then pull into the siding while the crew member waits at the switch. Once clear of the main track, the crewmember must return the switch to normal position, report to the train dispatcher, and walk back to the engine. Typically, due to operational considerations, the crew member may be authorized by the train dispatcher to leave the switch

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<sup>19</sup> Poland Spring added \$201 million directly to the Maine Economy in 2016, MaineBiz, [http://www.mainebiz.biz/article/20171212/NEWS01/171219983/poland-spring-added-\\$201-million-directly-to-maine-economy-in-2016](http://www.mainebiz.biz/article/20171212/NEWS01/171219983/poland-spring-added-$201-million-directly-to-maine-economy-in-2016), Dec. 12, 2017.

lined and locked for the siding, eliminating the need to wait for the whole train to clear and walk back to the engine. While this practice helps expedite the move and reduces the risk of trip, slips and falls, it does create an inefficiency for the next train that approaches the switch that has been left in reverse position, as that train must stop and return the switch to normal position before proceeding. Additionally, the dispatcher must conduct extra operational procedures and safeguards to protect the position of the reversed switch and notify other movements before allowing them to proceed.

By installing controlled points with dual controlled switches at each end of the siding, the meet/pass process will be more efficient. Trains will no longer have to stop in order to hand line switches. Instead the switch position will be controlled and train movements will be remotely authorized eliminating the current process of dictating written movement authorities over railroad radio.

In addition to extending TCS east of Danville, the current Automatic Block Signaling (“ABS”) system will be extended through Leeds Junction to include the installation of a power switch at Leeds. As it is planned that meet pass activities will take place within the expanded TCS territory, extending the ABS system is an economical alternative to TCS, and will provide the desired safety upgrade and efficiencies needed for current and future operations. In addition, by installing a power switch/controlled point at Leeds Junction, trains will no longer stop in order to hand line the Rumford Branch switch. The train dispatcher will no longer have to perform the operational tasks associated with tracking the position of this switch, instead they will be able to determine and effect switch position.

Operational Benefits of the CRISI work scope.

- TCS expansion will provide a safer method of train control and reduce crew idle time when requesting and receiving authorities.
- The elimination of hand-throw switches between MP 165.7 and MP 183.25 will improve safety for train movements and train crews and eliminate train idling at these switch locations.<sup>20</sup>

### 3. Reliability

This project will improve reliability of the line by upgrading the main line rail to continuous welded rail (“CWR”). This will allow the line to increase and maintain consistent speeds to 25 MPH, now speeds that fluctuate between 17 MPH and 25 MPH. The CWR will also reduce maintenance needs and the occurrences of slow orders and stoppages due to maintenance and repairs along the line.

As noted, Poland Springs water must be shipped efficiently since it is a temperature sensitive product it cannot be allowed to get too hot or to freeze in the winter months. Therefore, if the rail becomes too unreliable due to the poor condition of the track then PAR anticipates it will lose all of the Poland Springs business. PAR ships the water from Waterville to a distribution center in

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<sup>20</sup> This will save PAR 30 minutes per switch handling. This savings has not be quantified in the BCA but will be a significant savings.

Ayer, MA. If the PAR line is too unreliable, Poland Springs will truck the water 190 miles to Ayer, MA. The effect of an unreliable rail line will add 380 round trip vehicle miles along rural roads and the interstate. This means that in Year 2, the water shipments alone will add 3.437 VMT to the roads in Maine, much of them rural.

Rail reliability is critical to the sustainability of short line railroads. Short lines and regional railroads exist because they account for the shorter distances that have ceased to make operational sense to Class I lines. Therefore, the competition for the Class II and III railroads in Maine is truck traffic. If the rail becomes too unreliable due to maintenance concerns or slow operability, shippers will choose to move commodities by truck to end destination or to the next closest Class I connection. This is the situation in this grant application. The attached Benefit-Cost Analysis (Appendix A) details the external cost of diverting traffic onto trucks. The products in this application are unique in that they rely on being able to get to market quickly and are temperature sensitive. Reliability of the rail is paramount to the logistics network for these products. If the rail is not reliable enough, the shippers will shift to using trucks to get their products to the final destinations or to rail interchanges. This modal shift will not only impact the competitiveness of the shippers, but because it will add 6,712 trucks by Year 2 to these rural roads, the No-Build Scenario will have a significant negative impact on the highway safety in this region. These additional trucks translate into a social safety cost of \$162,933. Therefore, the effect of an unreliable line due to rail that has reached its useful life has a ripple effect on the safety of the region.

#### 4. Trip Time

This project creates significant travel time savings by reducing maintenance, track outages and slow orders to assist in avoiding losing commodities to truck traffic. Over the course of 20 years the project will realize a savings of more than \$27.8 million due to fewer truck trips made through the state and into Massachusetts.

#### 5. Resilience

The project will replace and upgrade a significant portion of this regional rail line that connects the railroads in this part of Maine to the south and west. This will improve the resiliency of the entire system. Maine is unique in that it has no Class I railroads. The reliability and resilience of this Class II railroad is critical to the movement of goods throughout the state. Maine is also the northernmost state in the United States. The harsh winters slow rail and highway traffic. By removing trucks from the roads this project will help reduce highway maintenance costs by approximately \$14,000 in Year 2.

##### ii. ABILITY TO MEET EXISTING OR ANTICIPATED DEMAND

The improvements proposed in this application are necessary to meet increased anticipated demand along the rail line due to a resurgence in forest products throughout Maine. PAR anticipates a 2.4 percent (paper products) and a 9 percent (Poland Springs Water) increase in carloads year over year. The modernization of the rail to continuous welded rail and the upgrades to the switches and crossings will allow PAR to meet the anticipated increase in carloads due in

part to the paper mills coming back on line increasing mill production.

b. TECHNICAL MERIT

- i. STATEMENT OF WORK – The detailed Statement of Work is attached as Appendix B.
- ii. PROJECT READINESS AND PROJECT TRACK – This project is eligible for Track 3 – Final Design/Construction. The project will be ready for construction by the 2<sup>nd</sup> quarter of 2019.<sup>21</sup> Final Design must be completed for the project. A draft CE is attached as Appendix D.
- iii. TECHNICAL QUALIFICATION AND EXPERIENCE OF KEY PERSONNEL/ORGANIZATION

MaineDOT will oversee the project and is a cabinet-level state agency with primary responsibility for statewide transportation by all modes of travel. The overall Project will be managed by the Multimodal Program of the MaineDOT Bureau of Project Development. The Multimodal Program Manager, Jeff Tweedie has assigned the Assistant Multimodal Program Manager, Nathaniel Benoit, P.E. as the team's Project Manager. The Multimodal Program has had significant previous experience in large rail improvement projects including: 1) Project management and oversight of the \$37.4M Maine Regional Railways, Tiger VII project with FRA to upgrade rail infrastructure in central and northern Maine across three short line railroads, 2) Project management and oversight with FRA on the awarded Maine Railroad Bridge Capacity Project under USDOT's 2017 FASTLANE program, 3) \$60M rehabilitation of rail track, signal and bridges between Portland, ME and Boston, MA for the Downeaster Passenger Rail Service, 4) \$38M Downeaster Passenger Rail Service extension from Portland, ME to Brunswick, ME, 5) Project management and oversight of a \$30M rehabilitation of the State-owned Rockland Branch rail line, 6) Project management and oversight of a \$10.5M Tiger II FRA project to upgrade rail track from Millinocket, Maine to Madawaska, Maine.

These along with ongoing capital, maintenance and grade crossing safety improvement projects across the State of Maine have given the Multimodal Program the tools and experience to keep this project on schedule and on budget. Additionally, the project management team will include Nate Moulton and Brian Reeves, P.E. from MaineDOT's, Office of Freight and Business Services. Mr. Moulton has 25 years of experience in managing Federal and State transportation projects and grants many of these FRA projects. Mr. Reeves is a licensed professional engineer with several years of experience providing engineering and oversight to transportation projects and currently manages MaineDOT's rail program. Additional staff are available within the MaineDOT Bureau of Project Development as needed for any material testing, vehicular traffic control/signage, engineering, and/or Right of Way issues that may arise during construction of the project. Additional needs for project engineering, oversight and inspection will be provided by contracts through professional engineering firms with lengthy experience and history of working with MaineDOT on rail improvement projects.

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<sup>21</sup> See Appendix C, Project Schedule/Maps.

PAR's Project Manager for this project will be Mr. Ted Krug. Mr. Krug is the Chief Engineer of Design and Construction for Pan Am Railways. Mr. Krug is a licensed Professional Engineer with extensive experience managing railroad improvement projects similar this project, many of his past projects involve USDOT funding.

iv. BUSINESS PLAN CONSIDERS PRIVATE SECTOR PARTICIPATION IN FINANCING, CONSTRUCTION OR OPERATION

The business plan for this project fully anticipates private investment. This project will be completed on a private sector railroad. PAR has committed a private sector match via an MOU with MaineDOT. PAR will finance all operations and the match dollars to complete the construction.

v. LEGAL, FINANCIAL AND TECHNICAL CAPACITY

There are no outstanding legal issues regarding the work proposed. The work will be done within the railroad right-of-way. Financing for the match is committed (see Appendix E, Match Letter). PAR has the technical capability to perform the work proposed. MaineDOT has the capacity to manage the grant and project to ensure on time delivery. Key personnel qualifications are discussed in the technical qualifications section on page 22. MaineDOT is a proven partner and has demonstrated its capacity to fulfill the grant requirements.

c. SELECTION CRITERIA

- i. PROPOSED FEDERAL SHARE – The proposed federal share is 49 percent. There are no federal funds outside this CRISI request involved in this project.
- ii. PROPOSED NON-FEDERAL SHARE – The proposed non-federal share, or match, for this grant application is 51 percent.
- iii. NET BENEFITS – The net benefits are detailed in the benefit cost analysis. A summary of these benefits can be found in the chart on page 25.

iv. SUPPORTS ECONOMIC VITALITY

This rail project supports the economic vitality of Maine by ensuring that the paper mills and Poland Springs water have reliable rail transportation to move out of Maine either to other parts of the United States or to Canada. Increased volumes projected as a result of this project will necessitate the addition of 13 full time equivalent employees by 2025. There is a more robust discussion about economic vitality in the “Competitiveness” section above.

v. LEVERAGES FEDERAL FUNDING

This project like past MaineDOT projects leverages federal funds by providing a 51 percent match to the federal dollars. The funds will go to improving the rail line that is owned, operated and maintained by a private railroad. MaineDOT has entered into an MOU with PAR for funding the

non-federal portion of the project.<sup>22</sup>

#### vi. FUTURE OPERATIONS AND MAINTENANCE COSTS PLAN

The annual expenses for the five year period from 2013 through 2017 spent on track inspections and maintenance work on the Freight Mainline between Waterville and Royal Junction was \$346,820 - \$100,421 on track inspections and \$246,399 on track maintenance. Over the same period from 2013 through 2017, the annual expenses for capital improvement was \$2,498,122. Projecting the anticipated maintenance and capital improvement expenses for the next 20 years, we assume the cost of inspections for regulatory compliance will be largely unchanged, but that the cost of associated track maintenance work will be reduced by 50% due to the improvements to be made by this project. PAR projects the annual maintenance costs going forward to be approximately \$223,620, adjusted accordingly for inflation.

For the projected capital improvement expenses over the next 20 years, the following assumptions are made: 1. 5% of the rail not being replaced by the project will be replaced within the next 20 years (approximately 20,000 LF of rail) - \$800,000, 2. All crossing panels not being replaced by the project will be replaced within the next 20 years (26 crossings at approximately \$80,000 each) - \$2,080,000, 3. No capital expenses for switch replacements, as they will all be new, so any work required on the switches within the next 20 years will be maintenance work, 4. All bridge decks not being replaced by the project will be replaced within the next 20 years (11 bridge decks) - \$150,000, 5. Three times in the next 20 years PAR will perform tie installation projects, installing 500 ties per mile each time through the project area (111,000 ties total) - \$12,210,000, 6. A surfacing crew will surface the entire project area over the course of three years on a continuing cycle - \$6,000,000. Adding these projected costs and taking an average over 20 years, Pan Am anticipates their annual capital improvement costs will be approximately \$1,062,000, adjusted accordingly for inflation.

- vii. PERFORMANCE AND MEASURABLE OUTCOMES\*\* Please see Appendix B, Budget/Statement of Work for these outcome measurements.

#### IX. PROJECT IMPLEMENTATION AND MANAGEMENT

The project agreements with the PAR will have a defined scope, maximum participating share from the FRA and MaineDOT, and project schedule. Each agreement will require the railroad to complete the entire scope of work, be responsible for any project overruns, and credit the project the value of salvaged materials. The project schedule and budget will be monitored on an on-going basis by the railroad and at bi-weekly progress meetings with the MaineDOT Resident inspector. Project billings will be validated by approved work progress reports that will be provided by PAR as outlined in the project agreement with MaineDOT. The work progress reports will be checked for accuracy by the MaineDOT Resident inspector for material quantities, labor and equipment utilization and/or unit cost items completed.

Procedures for submitting and processing change orders will be addressed in the project agreement

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<sup>22</sup> Appendix E, Match Letter.



between PAR and MaineDOT. The procedures will generally conform to those in the MaineDOT Standard Specifications. It is the intent of MaineDOT to keep changes to the project scope to a minimum by carefully fine tuning all estimates to ensure accuracy of labor, equipment, materials and schedule. The responsibility for procurement and materials management will rest with the MaineDOT Project Manager. All procurement will be done in accordance with MaineDOT's procurement policies and FRA CRISI grant requirements.

Construction inspectors will monitor all work to ensure PAR complies with the scope of work in its agreement with MaineDOT. Project field records will be maintained by the Resident and construction inspectors and will include inspection logs, quantity tracking spreadsheets, budget spreadsheets, copies of all correspondence and all project records.

There are several potential risks associated with the project including: funding risk, schedule risk, quality of materials and workmanship risk, stakeholder risk and environmental risk. Risks will be managed in a variety of ways including detailed agreements and specifications so quality materials are procured and expectations and responsibilities are clear amongst all parties. During construction, bi-weekly progress meetings will be held with PAR, contractors and the MaineDOT inspectors and managers. Quarterly progress reports and monthly billing will be developed by MaineDOT and submitted to FRA. The MaineDOT Resident inspector and the rest of the construction monitoring team will track actual construction progress versus the proposed schedule on a bi-weekly basis. If construction progress is not meeting their proposed schedule, the Resident and MaineDOT will coordinate with PAR to develop an action plan to get back on schedule

Stakeholder Risk will be managed by outreach to the public by PAR, the MaineDOT Project Manager and the MaineDOT Resident inspector. Vehicular safety risk and traffic interruptions at highway grade crossings will be managed by public outreach and by requiring a Traffic Control Plan (TCP) to be submitted for acceptance by MaineDOT. Finally, the railroad will be required to submit to MaineDOT a Soil Erosion and Water Pollution Control Plan (SEWPCP) in order to limit risks to the environment from construction activities.

## X. PLANNING READINESS

### Technical Feasibility

All engineering and design studies will be completed by the time contracts are executed with the USDOT. This project can go to construction by the 2nd quarter of 2019.

### Project Schedule

A Gantt chart can be found in Appendix C. The project will be complete by 4<sup>th</sup> Quarter 2021.

## XI. ENVIRONMENTAL READINESS

This project is expected to qualify for a Categorical Exclusion (CE) as all work will be done on the existing railroad right-of-way. The draft CE worksheet is attached as Appendix D.

## XII. SUMMARY OF BENEFIT-COST ANALYSIS

Benefits are discussed in narrative form in the application and, when possible, are quantified in the attached benefit-cost analysis Excel worksheet.<sup>23</sup>

### GENERAL ASSUMPTIONS

#### Discount Rate

A discount rate of 7.0% was used in the Benefit-Cost Analysis as recommended by the USDOT guidance for CRISI grants (Benefit-Cost Guidance June 2018).

#### Truck-Railcar Conversion

1 railcar = 3 trucks (Paper)

1 railcar = 1 truck (Water)

#### Growth

The estimated annual growth in railcars carrying high value paper products for the first 5-years of the project is a very conservative 2.4 percent. The estimated annual growth in railcars carrying Poland Spring water for the first 5-years of the project is 9 percent.

#### Trucking Speed

Assumes average speed of 55 MPH since most of the trip is on rural highways. Due to normal traffic congestion in the region, actual speed could be lower which would increase the Benefit-Cost Ratio.

#### Injury Severity

The severity of all injuries involving a train are assumed to be MAIS 5 given that train-trespasser incidents are usually of a severe nature. The severity of injuries involving truck ranges from loss of life to MAIS 1. The Benefit-Cost Ratio would increase if just one of the estimated rail caused injuries were at a lower severity.

#### Evaluation Period

The evaluation period for the project includes both the grant award and agreement period (one year), construction time (one year), and the post-construction period (eighteen years of operations) that lasts until 2038.

### BENEFIT-COST ANALYSIS OUTPUTS

#### Travel Time

The average speed trains moving across their entire system is estimated to be 25 MPH. It is assumed that two locomotive engineers are on each train. For truck movements, it is assumed there is no team driving due to the short distances needed to travel. The travel time benefit was calculated by assessing the total route miles for movements, the average speed of the transportation mode, and the average hourly salary for train and truck employees. This allowed travel time costs to be

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<sup>23</sup> See Appendix A, Benefit-Cost Analysis.

calculated. Upgrading the mainline track creates a savings of \$27.82 million over the twenty-year period contemplated in the Benefit-Cost Analysis.

Safety

Under the No-Build scenario, there are a significant number of truck miles, which is the mode of transportation that is less safe than trains. The cost savings in avoidance are \$5.67 million over a twenty-year period.

Emissions

The Benefit-Cost Analysis assessed the difference in truck operations (No-Build scenario) and train operations (Build scenario). Trucks emit significantly higher emissions than rail locomotives and the number of locomotives used in a given year to move the trains is less than the number of trucks needed for a dedicated fleet. This results in higher emissions for the No-Build scenario even though the Build scenario assumes the trains travel on a slightly longer route than trucks. This would create both higher emissions and a concentrated greenhouse gas emissions footprint in a rural community.

Operating Costs

The Benefit-Cost Analysis used operating cost estimates for both truck and rail movements. Another option would have been to use a straight fuel consumption analysis. Trains move one ton of freight 471 ton-miles on one gallon of fuel whereas trucks move one ton of freight 145 miles on one gallon of fuel. This would have created a significantly higher Benefit-Cost Ratio given the difference in fuel consumption. Instead, the operating cost estimates were used since it considers more than just fuel.

**BENEFIT-COST RATIO**

The Benefit-Cost Ratio for this project is 2.95.

	<b>Costs</b>	<b>Benefits</b>	
<b>CAPEX</b>	\$33,182,964		
<b>Travel Time Savings</b>		\$27,815,004	
<b>Safety Savings</b>		\$5,673,557	
<b>Emissions Savings</b>		\$3,840,943	
<b>Operating Costs Savings</b>		\$60,408,131	
<b>TOTAL</b>	<b>\$33,182,964</b>	<b>\$97,737,636</b>	
<b>Benefit-Cost Ratio</b>			<b>2.95</b>

### XIII. SUPPORTERS

The Maine DOT request for a CRISI grant 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. Additional support letters will be sent directly to the Federal Railroad Administration and will be posted onto the Maine CRISI website at <https://www1.maine.gov/mdot/grants/crisi/>.

Maine Senate Majority Leader, Garrett Mason  
Maine State Senator, Shenna Bellows  
Maine State Senator, Eric Brakey  
Maine State Senator, Catherine Breen  
Maine State Senator, Roger Katz  
Maine State Senator, Thomas Saviello  
Maine Assistant House Republican Leader, Ellie Espling  
Maine Assistant Majority Leader, Jared Golden  
Maine State Representative, Sue Austin  
Maine State Representative, Roger Fuller  
Maine State Representative, Michael Perkins