OUTCOME CRITERIA NARRATIVE

Rural Area

The Project is located in a rural area as defined by <u>www.transportation.gov/grants/infra-urban-and-rural-areas</u>.

Census Tract	Block Group	County Name	Population	Area of Persistant Poverty (Y/N)	Historically Disadvantaged Community (Y/N)	Opportunity Zone (Y/N)	Empowerment Zone (Y/N)
9609	23021960900	Piscataquis	1338	N	Y	N	N
9608	230219608001	Piscataquis	4043	Y	Y	N	N
300	230190300003	Penobscot	4287	N	Y	Y	N
290	230190290001	Penobscot	1801	Y	Y	N	N
285	230190285001	Penobscot	1394	Y	Y	N	N
265	230190265002	Penobscot	1966	Y	Y	N	N
255	230190255002	Penobscot	1848	Y	Y	N	N
9529	23003952900	Aroostook	3096	N	Y	N	N
9551	230299551001	Washington	2849	Y	Y	N	N

Census Tract	Block Group	Promise Zone (Y/N)	Choice Neighborhoods	DOE's Energy Communities (Y/N)	USDA's Rural Partners Network	DOT Thriving Communities
9609	23021960900	N	Maximum Poverty/ELI - 17.80	Ν	N	N
9608	230219608001	N	Maximum Poverty/ELI - 21.43	Ν	N	N
300	230190300003	N	Maximum Poverty/ELI - 12.69	N	N	N
290	230190290001	N	Maximum Poverty/ELI - 24.64	Ν	Ν	N
285	230190285001	N	Maximum Poverty/ELI - 16.36	Ν	Ν	N
265	230190265002	N	Maximum Poverty/ELI - 15.19	Ν	N	N
255	230190255002	N	Maximum Poverty/ELI - 25.10	Ν	N	N
9529	23003952900	N	Maximum Poverty/ELI - 27.78	N	N	N
9551	230299551001	N	Maximum Poverty/ELI - 34.78	N	N	N

Crashes, injuries, fatalities, traffic, harmful emissions, road damage and noise all diminish when freight moves by rail instead of road. This is highlighted in the BCA and is of special importance for rural communities. Freight rail is three to four times more fuel efficient than trucks and yields CO₂ emissions savings of \$170 million over the 30-year life of the Project.

Safety

The Project's safety benefits fall under two overarching and relevant categories. The Project will make Maine roads safer by helping reduce the number of trucks traveling on the state's rural roads. It will also improve rail safety by strengthening railroad infrastructure in Maine.

Road Safety

Following Project completion, additional rail traffic in lieu of trucks will lead to nearly eight million fewer truck trips on central and eastern Maine roads over the 30-year analysis period. This will save the region more than ten billion truck miles and will reduce crashes saving more than 160 lives and preventing more than 560 serious injuries.

Maine averages 156 total roadway fatalities annually. Regarding truck crashes, the Agency

studied the severity of truck crashes between 2017 and 2021, finding the number of crashes in rural areas exceeded those of urban areas by 24 percent. Fatalities in rural

RURAL URBAN DESIGNATION	FATAL CRASHES (K)	SERIOUS INJURY CRASHES (A)	MINOR INJURY CRASHES (B)	POSSIBLE INJURY CRASHES (C)	PROPERTY DAMAGE CRASHES (PDO)	FIVE YEAR TOTAL
RURAL	75	139	438	617	4,176	5,445
URBAN	9	54	171	424	3,512	4,170
UNKNOWN	0	0	1	0	9	10
TOTAL	84	193	610	1,041	7,697	9,625

MaineDOT truck crash severity by urban/rural designation, 2017-2021

areas exceeded those in urban areas by an alarming 88 percent.¹ The Project will greatly reduce the number of trucks on rural roads and thus crashes, consistent with USDOT and National Center for Rural Road Safety goals.

The National Transportation Research Nonprofit, TRIP, examines economic and technical data on surface transportation issues. TRIP notes, "Twenty percent of Maine's rural roads are rated in poor condition – the tenth highest rate in the nation- and 23 percent are in mediocre condition. The rate of traffic fatalities on Maine's non-Interstate, rural roads is more than double the fatality rate on all other roads in the state – 1.67 fatalities per 100 million vehicle miles of travel vs. 0.71. Rural roads are more likely to have narrow lanes, limited shoulders, sharp curves, exposed hazards, pavement drop-offs, steep slopes and limited clear zones along roadsides."² The Project's resulting removal of freight traffic from rural roads will greatly reduce the risk of crashes, fatalities and deteriorating conditions of roads and bridges.

Rail Safety

While there are more than 1,000 train derailments annually in the U.S., most are very minor, cause minimal damage and pose no risk to human safety. But large-scale derailments can cause problems. The Federal government is considering additional rail industry regulations in the wake of a train derailment in East Palestine, Ohio, in February 2023. Fortynine cars derailed, including eight carrying hazardous materials, which resulted in the release of toxic chemicals and the evacuation of more than one-hundred nearby residents. While the initial investigation into the cause of the accident centers on a wheel problem, derailments can also result from weakened track integrity over time. The use of continuous welded rail, new crossties, new turnouts and an adequate ballast base offer several advantages over antiquated track. They include reduced likelihood and severity of train derailments which can cause damage and loss of life as well as a smoother ride which reduces wear and tear of railcar components and track. The Project will



The weight of railcars on deteriorating track and drastic changes in temperature over time often lead to cracks in rail.

¹ <u>https://www.maine.gov/mdot/safety/docs/2023/Truck%20and%20Bus%20Crash%20History%202017-2021.pdf</u>, page 7

² <u>https://tripnet.org/reports/rural-connections-maine-news-release-10-13-2022/</u>

allow safer movement of trains at speeds exceeding the current 25 mile-per-hour limit.

State of Good Repair

MaineDOT and NBM Railways understand the importance of maintaining infrastructure to a state of good repair. As infrastructure ages, the ability to make suitable repairs and the reliability of those decreases. Over time, replacement becomes the only cost-effective remedy. The improvements will create the smoothest and sturdiest surface possible for today's North American rail network standard 286,000-pound freight cars. The work is very common in railroading worldwide because rail, crossties, ballast, turnouts and grade crossings are basic components needing replacement as they age. The work will greatly improve the ability of EMR to maintain current freight levels reliably and take on the increase in the volume of new business the lines will handle efficiently.

Rail and Turnouts

Last year alone the rail line suffered 180 broken rails. Much of the rail in service on the line is more than 70 years old. It is fatigued due to being in use for that amount of time and supporting the weight of today's modern freight cars which are much heavier than those used decades ago. The joints of jointed rail are made by binding pieces of rail together manually with metal bars and bolts which are prone to chipping, cracking and working loose over time under the weight of heavy and long trains. By eliminating joints, rail becomes a consistently smooth surface for miles. It is less prone to problems caused by expansion and contraction due to temperature changes. Eliminating joints also aids in conductivity for electricity that is sent through the rails to detect approaching trains at railroad crossings so crossing signals are activated. Eliminating joints also reduces lateral instability of track.

Turnouts are an important part of railroad track, allowing trains to move in various directions from the main track. Weak turnout components can cause derailments and increase noise pollution. Newer turnouts incorporate more gradual curves and heavier rail, allowing trains to switch tracks more smoothly which enhances railroad safety. Project improvements will last decades – new rail and turnouts can last more than 50 years. These benefits make a rail line much safer than continuing to employ outdated components.

Crossties and Ballast

Crossties are key track components needed to keep rail in proper gauge. They are frequently pounded by train forces and subject to extreme weather conditions. This reduces the strength of track components making them susceptible to causing derailments. Replacing worn out crossties will increase strength and stability to support modern heavier freight cars and locomotives. Adding ballast along the line will help cushion heavy forces and improve the drainage of the track. This is important because the lines suffered two washout-caused derailments in the previous 24 months which led to injuries and fire.

Economic Impacts, Freight Movement, and Job Creation

Economic Impacts

Should the rail deteriorate further, EMR will continue to be hampered by much of the lines' inability to handle today's standard 286,000-pound freight cars. Today that is forcing current and potential customers to move freight using trucks – adding supply chain costs to manufacturers –

an inefficient solution burdening numerous rural communities and the environment. Industries would also be left out of a viable transportation option more cost effective than trucking. That will lead shippers to look elsewhere to locate their industry, perhaps avoiding rail-served locations. This would greatly reduce the connectivity needed to link the region by rail to North American and global markets. This is of great concern for forest product producers which are vitally important to Maine's economy for a number of reasons:³

- The estimated overall annual (2019) economic contribution of Maine's forest products sector, including multiplier effects, was an estimated \$8.1 billion in output, over 31,000 jobs, and \$1.7 billion in labor income.
- The total employment impact of 31,822 jobs in 2019 is equivalent to about 4 percent of the jobs in Maine. Put another way, roughly 1 out of 25 jobs in Maine is associated with the forest products sector.
- Maine's forest products sector had a total, including multiplier effects, value-added impact of an estimated \$2.8 billion. This is equivalent to 4.14 percent of the state's gross domestic product in 2019.

Rail improvements will link businesses to global markets more reliably, making the supply chain more efficient. The rail line helps support the resurgence of jobs taking place in the forest products industry in Maine. New products are being developed and manufactured including wood siding that is more durable and longer-lasting than previous versions, wood fiber-based home insulation, laminated timber, the use of wood cellulose for 3-D printing and jet fuel for aviation.⁴

Improvements to the Millinocket Subdivision will support a large and environmentally-friendly manufacturer. Regional business partners are designing the *One North Forest Products Campus* in Millinocket, future home to an eco-friendly rail-served wood pellet manufacturer. Highland Carbon Solutions will produce and ship sustainable wood pellets by rail from the facility to Searsport on Maine's Atlantic coast to be loaded onto ships for furtherance to European markets. *One North* and HCS are developing the park–located on a greenfield and brownfield site–location of the shuttered Great Northern Paper Mill.⁵ The facility's capital investment is estimated to exceed \$235 million and create more than 100 direct jobs. Avoiding improvements on the line to Millinocket will hamper the facility's ability to connect to global markets. The *One North* project is the subject of a Federal Railroad Administration FY 2022 Consolidated Rail Infrastructure and Safety Improvements "CRISI" grant application titled *Maine Woods to Water Rail Connection Project*.

Freight Movement

Rail traffic is frequently grouped into two categories – short-haul and long-haul – with traffic that moves roughly 350 miles denoting the split. Short-haul rail is often not financially viable

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https://digitalcommons.library.umaine.edu/cgi/viewcontent.cgi?article=1018&context=mcspc_ecodev_artic les, pages 1-2

⁴ <u>https://formaine.org/</u>, video at top of page

⁵ <u>https://maineanencyclopedia.com/tag/great-northern-paper/</u>

because trucks generally provide faster service on shorter freight routes. But given the scarcity (extremely remote areas) and poor condition (often made of dirt) of many roads that reach into Maine's forests – as well as big, heavy trucks serving as the only alternative to rail – the line is extremely valuable and markedly resilient in its ability to move short-haul traffic. Making vast and costly improvements to the state's network of dirt backroads, such as paving them, is not financially viable. Additional rail business is available but infrastructure improvements must be made to increase reliability and ensure EMR can handle traffic growth. The Maine Forest Products Council notes in their *Forest Opportunity Roadmap/Maine* that, "While railroads have been actively working to improve service and capacity throughout Maine, additional investments in Maine's rail network are required before a significant modal transfer to rail is feasible."⁶ Every carload EMR is able to move on its rail network keeps up to four truckloads off local (paved and unpaved) county and state rural roads. That saves on roadway maintenance costs and reduces fuel consumption and harmful emissions.

"The forest trucking sector experiences a wide variation in road conditions, as drivers must navigate roads ranging from the lowest standard private logging roads near the landing sites to the highest standard public roads. The variation in road conditions statewide limits the availability of trucks suitable to maneuver the gradient over the truck haul."⁷ These logging road limitations also increase fuel consumption due to the poor condition of the roads. Improvements to the line will result in a safe and reliable increase in track speed, increase throughput. The Project gives the line the opportunity to become a freight "conveyor belt".

Job Creation

State and regional customers that consistently use the rail line currently employ, and are expected to create, a combined 10,900 current and future direct and indirect jobs by the time the Project is completed. Customers include those employing both large and small headcounts, such as Twin Rivers Paper with 1,100 jobs and Daaquam Lumber with 106 jobs.⁸ ⁹ This number includes the 100 direct jobs created once the wood pellet manufacturer in Millinocket begins operations.

"Maine had 12 pulp and/or paper mills operating in 2010; by 2017 only six remained (Crandall et al., 2017). [Six also remain in 2023.] The effects of these closures have been particularly acute in rural areas, and mill closures have been concentrated in central Maine. While there are many smaller processing facilities (i.e., sawmills) across Maine, the closure of the large pulp and paper mills greatly reduced the demand for raw forest products. Remaining pulp and paper mills are dispersed across the state, increasing the likelihood that raw forest products will have to be transported greater distances."¹⁰ The effect on transportation-related jobs has been significant. The forest products industry directly employs more than 13,000 workers statewide. That is a 47 percent decrease since 2001, primarily the result of mill closures.

⁶ <u>http://formaine.org/wp-content/uploads/2020/09/MFPC-Final-Report-Feb-2020.pdf</u>, page i

⁷ http://formaine.org/wp-content/uploads/2020/09/MFPC-Final-Report-Feb-2020.pdf, page iii

⁸ Twin Rivers Paper, 1,100 jobs, <u>https://www.twinriverspaper.com/about-us/</u>

⁹ Daaquam Lumber, 106 jobs, <u>https://www.cnn.com/projects/ppp-business-loans/businesses/daaquam-lumber-maine-inc</u>

¹⁰ <u>http://formaine.org/wp-content/uploads/2020/09/MFPC-Final-Report-Feb-2020.pdf</u>, Page 1

Climate Change, Resiliency, and the Environment

The effects of climate change are destabilizing global transportation infrastructure. Surface transportation faces a persistent threat and railroads, like roads, must continue to develop and implement improvements to infrastructure that can reliably withstand weather extremes. Maine's railroads face particularly challenging seasonal threats that include excessive rainfall from Atlantic hurricanes as well as flooding caused by rapid seasonal snow and ice melt under hotter temperatures. The effects of weather on railroads in Maine was highlighted by two recent cases where CPKC trains encountered washouts:

- August 2023: a CPKC Railway train derailed and caught fire in Sandwich Academy Grant Township, Maine with the initial cause focusing on a washout of the tracks. Three railroad employees suffered injuries. Three locomotives and six cars derailed.¹¹
- Oct 2022: a Canadian Pacific Railway train derailed near Orneville, Maine, also the result of a washout of the tracks.¹² No injuries occurred. A small amount of diesel fuel leaked from a locomotive.

It is important to note that these derailments all occurred on CPKC Railway lines immediately adjacent to, and handling the same traffic as, the EMR.

Climate Change

In 2019, Governor Janet Mills and the state legislature recognized the most pressing concern facing the state – climate change – and charted a path to immediately elevate the battle against it. As a result, the state created the Maine Climate Council, a group of scientists, business leaders, bipartisan state and local lawmakers and concerned citizens who developed the state's climate action plan titled *Maine Won't Wait*.¹³ The comprehensive Plan details aggressive but achievable goals to combat climate change and help the Pine Tree State meet its GHG emissions reduction targets – with the overarching goal to reduce greenhouse gas emissions ("GHG") by 45 percent by 2030 and 80 percent by 2050 and achieve carbon neutrality by 2045.

Maine's transportation sector produced 49 percent of statewide fossil-fuel GHG emissions in 2019¹⁴ or approximately 7.5 million metric tons of carbon dioxide equivalent (MMTCO2e).¹⁵ Rail transportation produces a tiny fraction of overall GHG emissions but a reliable network is a key component in shifting additional truck traffic to rail to ensure the state meets its climate goals. Medium- and heavy-duty trucks, which represent only six percent of vehicles on the road, generate more than 55 percent of vehicle-related toxic emissions. The Project is targeted to reduce harmful emissions and save more than \$900 million on a discounted basis during the

 ¹¹ <u>https://apnews.com/article/freight-train-derailment-maine-d590c0545b5e21f6ab0b6105f4b3400b</u>
¹² <u>https://fox23maine.com/news/local/canadian-pacific-railway-train-derails-in-maine-orneville-</u>

piscataquis-county-milo-maine-department-of-transportation

¹³ https://www.maine.gov/climateplan/sites/maine.gov.climateplan/files/inline-files/MaineWontWait_December2020_printable_12.1.20.pdf

 ¹⁴ <u>https://www.maine.gov/future/sites/maine.gov.future/files/inline-files/MWW_Climate%20Plan%20Update%20December%202022_digital.pdf</u>, page 5
¹⁵ https://www.maine.gov/climateplan/sites/maine.gov.climateplan/files/inline-

files/9th GHG Report FINAL%20%282%29.pdf, page 29

Project's life.

Resiliency

Rail infrastructure, like that of roads and ports, is engineered to withstand challenging weather events. But extremes caused by climate change are testing even the most durable components of a railroad network. Large sections of tracks in neighboring Vermont were washed away by Tropical Storm Irene in 2011¹⁶ and again by heavy rains in summer 2023. The Pine Tree State recognizes the need to reassess and redesign potentially vulnerable infrastructure going forward, as stated in its climate action plan. "Statewide vulnerability assessments should be conducted for: transportation infrastructure (including roads, bridges, culverts, airports, railroads, ferries, ports and wharfs, maintenance facilities, and public transit systems)..."¹⁷

Environment

Based on the *U.S. Transportation Sector Greenhouse Gas Emissions* publication of the U.S. Environmental Protection Agency (EPA) from 2021, the transportation sector contributed 29 percent of total emissions. Trucks accounted for 23 percent of that 29 percent while rail only contributed two percent.¹⁸

The Project will have a positive impact on the environment. The elimination of gaps in rail will significantly reduce the amount of noise pollution trains produce, making it possible for people living near railroad tracks to experience a quieter environment. The Project will reduce friction between rail and wheel to increase fuel efficiency and trains will emit less pollution into the atmosphere which results in a reduction of greenhouse gas emissions. The installation of continuous welded rail reduces the amount of track maintenance required.

Equity, Multimodal Options, and Quality of Life

Equity

The Project will improve rural areas where there is a much greater likelihood that the only option for drivers is to share roads with trucks. That's because there are far fewer arterial roadways available providing alternatives. Rural Americans rely on the quality of their transportation system more than urban residents because they travel on average 50 percent farther to get to destinations. This subjects rural residents to more miles of deteriorating roads, crumbling bridges and a greater threat of roadway fatalities. The Project will decrease the number of trucks on these roads and create equitable conditions for *all* drivers.

Multimodal Options

Multimodal options are not a component of the Project.

Quality of Life

The Reason Foundation's *Annual Highway Report* notes Maine's highway system ranks 33rd in the nation in overall cost-effectiveness and condition – an eight-position decline from the

¹⁷ <u>https://www.maine.gov/climateplan/sites/maine.gov.climateplan/files/inline-files/MaineWontWait_December2020_printable_12.1.20.pdf</u>, page 93

¹⁶ <u>https://www.weather.gov/safety/flood-states-vt</u>

¹⁸ <u>https://www.epa.gov/system/files/documents/2023-06/420f23016.pdf</u>

previous report in which Maine ranked 25th. The state's two biggest weaknesses are rural arterial pavement condition and structurally deficient bridges. The biggest change over that two-year period has been in pavement quality. Rural arterial pavement quality has fallen from 7th to 46th.¹⁹ The Project will lead to nearly eight million heavy truckloads shifting from rural roads to rail – a tremendous benefit in reducing the deterioration of rural roadways.

Innovation Areas: Technology, Project Delivery, and Financing

Technology

Technological advancements in steelmaking have led to the creation of new rail that is safer and longer-lasting than that produced decades ago. Much of the rail to be replaced under the Project is more than 70 years old. The rail installed will be much stronger and able to withstand heavier loads at faster speeds while suffering much less rail fatigue. This will result in a much more reliable railroad.

The Project includes making 13,725 individual welds to rail joints. Innovations in rail welding technology have greatly increased the strength of a rail weld so the connections remain reliable under today's heavier railcars and wide range of temperatures. The Project will employ an innovative flash-butt welding technique. Under this process, electrical resistance is used to heat and join components. This is the most effective, common and standard type of weld today.



The Project will improve railroad crossings by installing new crossing signals that will make

A typical flash butt weld, showing a seamless and smooth alignment on the top of the rail.

them safer and much more visible day and night. Aging and outdated components at crossings impact rural drivers by activating when these is no train or, worse, not activating when a train is approaching.

Project Delivery

Innovative project delivery is not a component of the Project.

Financing

As MaineDOT frequently does with Federal grant applications, the Agency has innovatively partnered with a private funding source.

¹⁹ <u>https://reason.org/policy-study/26th-annual-highway-report/maine/</u>