

BENEFIT-COST ANALYSIS

PROJECT OVERVIEW

Wells Route 1 Community Gateway: Implementing a Multimodal Vision for Transportation in Wells, ME

The Maine Department of Transportation (MaineDOT) is requesting \$23,703,200 in FY2025 Better Utilizing Investments to Leverage Development (BUILD) Program Funds for the “*Wells Route 1 Community Gateway: Implementing a Multimodal Vision for Transportation in Wells, Maine Project.*” This Project aims to transform a major regional traffic artery into a well-connected multimodal corridor.

The Project work includes:

- › Constructing 5.0 miles of new sidewalks and rehabilitating 3.2 miles of existing sidewalks, installing 11.2 miles of bike lanes to improve safety and promote alternative modes of transportation along Route 1;
- › Adding 10 signalized crosswalks at new or existing crossing locations, 2 new signalized intersections and improved lighting along the corridor to enhance safety;
- › Installing new Adaptive Signal Control Technology (ASCT) to address congestion and safety;
- › Improving existing transit stops;
- › Installing gateway treatments at both ends of the corridor.

The above improvements reimagine the corridor improving safety and providing transportation options for residents and visitors traveling along Route 1.

The benefits and costs of these improvements were quantified using a benefit-cost analysis (BCA) in accordance with the November 2024 U.S Department of Transportation’s recommend methodology.¹ As seen in Table 1 the BCA indicates **the improvements would provide a benefit-cost ratio of 1.32.**

Per the BCA guidance, a discount rate of 3.1 percent was used, and all monetized benefits and costs are in 2023 dollars reflect net present values (NPV). Final design is anticipated to begin in 2025, with construction complete by 2030. The benefits of the project are assumed to start in 2031 and are considered through 2060 (a 30-year analysis period).

A summary of the benefit-cost analysis is provided in Table 1. A full description of the data and assumptions used as part of the benefits and cost calculation are included in the following sections.

¹ U.S. Department of Transportation, Office of the Secretary, “Benefit-Cost Analysis Guidance for Discretionary Grant Programs,” November 2024.

Table 1 Project Costs and Benefits (2023 Dollars, 3.1% Discount Rate)

BENEFITS	
Safety Benefit	\$6,926,869
Travel Time Savings Benefit	\$2,771,601
Pedestrian Journey Quality Benefit	\$10,357,194
Bicyclist Journey Quality Benefit	\$11,590,681
Subtotal of Benefits	\$30,708,760
COSTS	
Capital Cost	\$23,224,789
Subtotal of Costs	\$23,224,789
Net Present Value	\$7,483,971
BENEFIT-COST RATIO	1.32

BENEFITS

The following section summarizes benefits included in the BCA and any assumptions used in the analysis.

Safety Benefit

The Project will improve safety for automobiles by installing two new traffic signals at high crash locations (Route 1 at Chapel Road and Route 1 at South Street). Between 2019 to 2023 a total of 55 automobile crashes were recorded at these intersections. The severity of crashes ranged between Injury and PDO. To estimate the safety benefit of installing two new traffic signals at high crash locations, a crash modification factor (CMF) of 0.56% (CMF ID: 325) was applied to the total number of annual crashes based on severity to estimate future crashes under the build condition. The Injury Crash Type and PDO Crash Type values were applied to No Build and Build condition resulting in a total cost savings of \$13,298,400 (2023 \$) over the 30 years, discounted to \$6,926,869 (2023 \$).

Table 2: Safety Benefits Build vs No Build Costs

Crash Type	Monetized Value (2023 \$)	No Build	Build
Fatality	\$14,806,000	\$0	\$0
Injury	\$329,500	\$659,000	\$263,600
PDO	\$9,500	\$85,500	\$37,620
Total		\$744,500	\$301,220

Travel Time Benefit

Installing Adaptive Signal Control Technology (ASCT) throughout the corridor will result in travel time savings for passenger vehicles. Using Synchro data estimated in 2025, a No Build and Build travel time was calculated. An additional 10% reduction in travel time was applied to the Build condition per the FHWA guidance on ASCT.² It is anticipated the Project will save the

² <https://www.fhwa.dot.gov/innovation/everydaycounts/edc-1/asct.cfm>

passenger vehicles an average of 7 minutes annually.³ The General Travel Time – All Purpose value of \$21.20 per hour (2023) was applied to Build and No Build travel times, leading to a total cost savings of \$5,320,998 (2023 \$) over the 30 years, discounted to \$2,771,601 (2023 \$).

Pedestrian Journey Quality Benefit

The Project will construct continuous 5.5’ sidewalks on approximately 5.1 miles along the corridor. The Project will also construct 10 new Rectangular Rapid Flashing Beacons (RRFB) crosswalks to allow for safer pedestrian crossing along Route 1. As discussed previously two additional signals will be installed at intersections and will include pedestrian crossing phases. The implementation of sidewalks, signalized crosswalks and signals was quantified using the monetized values in the USDOT “Benefit-Cost Analysis guidance for Discretionary Programs” Table A-8 December 2024 and uses pedestrian counts from peak months in 2022 and 2023. It was assumed that expansion of sidewalks and improvement of pedestrian crossings would increase annual pedestrian use in the corridor by 2.5% each year. The improvements above resulted in a total cost savings of \$21,032,069 (2023 \$) over the 30 years, discounted to \$10,357,194 (2023 \$).⁴ Table 3 details the values used to calculate this cost savings.

Table 3: Pedestrian Facility Improvement Values

Improvement Type	Recommend Value per Person- Mile Walked (2023 \$)
Expanded Sidewalk (per foot of added width)	\$0.11
Install Signal for Pedestrian Crossing on Roadway with Volumes >13,00 Vehicles per day	\$0.55

Bicyclist Journey Quality Benefit

The Project will implement 5.6 miles of 5’ bike lanes along the corridor. The implementation of sidewalks was quantified using the monetized values in the USDOT “Benefit-Cost Analysis guidance for Discretionary Programs” Table A-9 December 2024 and uses cyclist counts from peak months in 2022 and 2023. It was assumed the construction of a continuous marked bike lane would increase annual cyclist use in the corridor by 2.5% each year. The Cycling Path with At-Grade Crossing value at \$1.70 (2023\$) was applied to 2.38 miles of added bike lanes resulting in a total cost savings of \$23,536,877 (2023 \$) over the 30 years, discounted to \$11,590,681 (2023 \$).⁵

³ Benefits were only account for 120 days to represent the peak summer season.

⁴ Although 5.1 miles of sidewalk will be installed along the Project area, the USDOT caps mile based benefits at 0.86 miles based on the average length of a walking trip in the 2017 National Household Travel Survey.

⁵ Although 5.6 miles of bicycle lanes will be installed along the Project area, the USDOT caps mile based benefits at 2.38 miles based on the average length of a walking trip in the 2017 National Household Travel Survey.

COST

This section describes the capital costs of the Project. Costs are broken out by Preliminary & Final Design, Construction Engineering, and Construction Costs. The analysis assumes an annual inflation rate of 3% per year to convert between year of expenditure dollars and constant dollars (2023 \$). Table 4 Shows the cost elements included in the capital cost estimate.

Table 4: Capital Costs

Year	Total Cost	Cost in 2023 \$
2025	\$442,732	\$417,317
2026	\$885,464	\$810,325
2027	\$885,464	\$786,723
2028	\$6,552,436	\$5,652,1890
2029	\$12,219,408	\$10,233,562
2030	\$12,219,408	\$9,935,497
Total	\$33,204,912	\$27,835,613

The discounted Capital Cost is \$23,224,789 (2023 \$).

SUMMARY

The improvements to the Route 1 Corridor in Wells, Maine is anticipated to have substantial benefits. The benefits and costs of these improvements were calculated using the BCA guidelines published in the November 2024 *Benefit -Cost Analysis Guidance for Discretionary Grant Programs*. Benefits to the corridor include safety improvements, travel time savings, improved pedestrian quality, and improved cyclist quality. The Project would **produce a benefit cost ratio of 1.32.**

The benefits total \$61,388,343 (2023 \$), discounted to \$30,708,760 (2023\$). This compared to the total capital cost of \$27,853,613 (2023 \$), discounted to \$23,224,789 (2023 \$), yields a net present value of \$7,483,971 and a benefit cost ratio of 1.32.