

General Sullivan Bridge Bicycle and Pedestrian Crossing Project

FY 2023 Rebuilding American Infrastructure with Sustainability and Equity (RAISE) Grant Application

New Hampshire Department of Transportation
February 22, 2023

Benefit-Cost Analysis Technical Memorandum

1.1. Executive Summary

The benefits and costs of the **General Sullivan Bridge** (the Project) were evaluated in a benefit-cost analysis (BCA) in accordance with USDOT's recommended methodology (BCA Guidance).¹ A summary of the analysis is provided in **Table 1**, which details community benefits related to active modes of transportation.

The BCA demonstrates the measurable benefits that the project yields and the costs incurred. The benefits of the Project are assumed to start in 2027 and are considered through 2051 (a 25-year period); costs are incurred beginning in 2023. The Project benefits and costs were discounted using the prescribed 7% discount rate as prescribed in the USDOT BCA Guidance. All monetized benefits and costs are presented in 2021 dollars and reflect net present values.

The Project costs are estimated to be **\$34.7 million in 2021 dollars**. The costs include capital expenses identified in a preliminary cost estimate requested by the New Hampshire Department of Transportation and costs associated with the operation and maintenance of the bridge.

The Project is expected to provide substantial benefits that would stem from creation of a new crossing of the Little Bay allowing bikers and pedestrians to travel freely across Little Bay. The crossing will create great value to residents by linking cultural resources, parks, commercial centers, neighborhoods, and transportation facilities on either side. The Project will encourage a modal shift by providing a separate path for active modes of transportation. In a no-build scenario, alternative routes are significantly longer. The Project will induce more bike and

¹ U.S. Department of Transportation, Office of the Secretary, "Benefit-Cost Analysis Guidance for Discretionary Grant Programs," January 2023.

pedestrian trips by shortening the trip across Little Bay. This shift to more active modes of transportation will bring health benefits to travelers.

When monetized, the total benefits amount to approximately **\$14.3 million** using the prescribed discount rates, yielding a benefit-cost ratio of **0.52**. The assumptions used to quantify the benefits were conservative and pragmatic. A full description of the input data, data limitations, assumptions, and methodologies of the analysis are included in the following sections.

Table 1: Discounted Project Costs and Benefits

Benefit Description	Benefit Value (7% Discount Rate)
Travel Time Savings	
Travel Time Savings	\$3,978,740
Category subtotal	\$3,978,740
Quality of Life	
Cycling Facility Improvement	\$642,401
Active Transportation	\$6,025,229
Category subtotal	\$6.667,629
Residual Value	
Residual Value	\$3,627,270
Category subtotal	\$3,627,270
Total Project Benefits	\$14,273,640
Costs	
Total Costs	\$27,205,689
Total Project Costs	\$27,205,689
Net Present Value	\$12,932,049
Benefit Cost Ratio	0.52

Baseline

The existing bridge crossing has been closed since 2018 as it was structurally deficient. As a temporary solution to maintain a multi-use crossing across Little Bay, a lane of the NB Spaulding Turnpike bridge was borrowed to create a multi-use path through use of concrete Jersey barriers and fencing to separate users from highway traffic. However, since this measure is temporary, this BCA will not use this as the no-build scenario for this project. Instead, the no-build scenario for the Project would be a complete absence of crossing at this location for non-motorized modes of transportation.

Analysis Period

The analysis period begins when the construction NTP is projected to be granted in 2023. The construction is expected to be completed in Fall 2026. The benefits are assumed to start in 2026 and are calculated for a period of 25 years.

Trip Data and Assumptions

The analysis makes use of a 2022 count performed to assess use of the temporary multi-use path provided within the footprint of the Spaulding Turnpike. That count provided combined data for the hourly number of bicyclists and pedestrians using the path over six days in July 2022. The analysis assumes a split of 75% to 25% of cycling trips and walking trips. The trip data from the count is annualized using Count Adjustment Factors from National Bicycle & Pedestrian Documentation Project.

The baseline scenario is that there is no crossing available without the Project. In this scenario, the majority of the active transportation trips on the temporary crossing will have to switch to a different mode of transportation. With construction of this project, most cyclists who would transfer to other modes under the baseline scenario, will continue to use active modes of transportation. Those trips can therefore be counted as trips induced by the Project.

There might however be trips that would not mind taking detours even in the absence of the Project.

1.2. Benefits

Travel Time Savings

For cyclists using a detour to get across Little Bay, the Project will offer a much shorter way to travel between the northern and southern seacoast regions. The shorter journey will result in travel time savings, which this analysis has determined to be **\$3.6 million** discounted at 7%.

Mortality Benefits of Active Transportation

The BCA Guidance recognizes that active modes of transportation are healthier than motorized options. The document recommends values per induced cycling or walking trip in Table A-13. The analysis uses the latest trip count at the temporary mixed-use path to calculate induced trips and use that value along with these recommended values to calculate the mortality benefits associated with active transportation for the Project. The value of this benefit is **\$6 million**.

Benefits From Bicycle Facility

The Project will provide a separated mixed-use path which creates great value for bicyclists. The BCA Guidance provides a way to quantify these benefits by providing a dollar value multiplier for cycling mile in Table A-9. The analysis uses this method to determine that the value of benefits from cycling facility improvement is **\$642 thousand**.

1.3. Costs

The capital cost for this project is projected to be **\$34.7 million** in 2021 dollars – adjusted from 2022 dollars, when the estimate was made. The analysis used a 2.50% annual inflation per Federal Reserve Bank of Philadelphia inflation forecasts². The capital cost is spread between 2023 and 2032.

The operation and maintenance costs for each phase of the Project are evenly spread over the analysis period. The general operation cost over the life of the project is approximately **\$70,000** over the project life.

The grand total cost of the Project in 2021 dollars is **\$34.8 million**. With the 7% discount applied, the net present value for grand total cost is **\$27.2 million**.

Table 2: Project Costs

Grand Total Costs (2021\$)	\$34,99,756
Grand Total Costs (2021\$) - Discounted	\$27,205,689

² Federal Reserve Bank Philadelphia, <https://www.philadelphiafed.org/surveys-and-data/real-time-data-research/inflation-forecasts>