

Attachment L

BENEFIT COST ANALYSIS – TECHNICAL NOTES

TECHNICAL MEMORANDUM

To: The City of Crescent City and Elk Valley Rancheria
From: Sean Fisher and Jamie Gomes
Subject: Front Street Improvement Project RAISE Grant
Benefit-Cost Analysis; EPS #222046
Date: April 12, 2022

This technical memorandum provides the Benefit-Cost Analysis (BCA) produced in support of the City of Crescent City (City)'s RAISE grant application for the Front Street Improvement Project (Project).

This analysis was prepared by Economic & Planning Systems, Inc. (EPS), a full-service economic consulting firm with more than 30 years of experience in the fields of land use economics, municipal finance, and real estate market analysis, among others.

The entire BCA is presented herein with the Excel model used to conduct the analysis also provided to facilitate an in-depth review of the methodology applied.

Introduction and Executive Summary

The Project is a joint effort between the City and Elk Valley Rancheria to revitalize Front Street, a key corridor for commerce, recreation, tourism, and Native American history in rural Crescent City. The Project will reconstruct Front Street from G Street to US Highway 101 (US 101). As envisioned, the Project will reimagine the existing 4-lane roadway as a 2-lane roadway with improved pedestrian and cyclist facilities. Front street serves as a critical connector in the City. Development of the Project will serve to improve the quality of life for existing City residents and promote tourism within the region.

No Project—Baseline Conditions

Under the No Project (also referred to as the No Build) alternative, the Project will not develop. In addition, the No Build scenario assumes no other alternative roadway improvements will be completed.

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Proposed Project

The Project will reconstruct Front Street redeveloping the existing underutilized four lane roadway as a landscaped 2-lane road with pedestrian and cyclist improvements. The Project will include new sidewalks, as well as bicycle lanes, promoting a walkable neighborhood and improving safety for pedestrians and cyclists. In addition, the Project includes multiple improvements to the transit center located on Front Street, promoting economic opportunity in the City. The Project includes green space and stormwater improvements along Front Street, which will serve to reduce flooding in the City and improve accessibility.

Under the Project (also referred to as the Build) alternative, the Project will develop.

Findings

Project Effect on Long-Term Outcomes

Front Street is an essential corridor to the region that connects downtown Crescent City to activities and amenities along the waterfront. Completion of the Project will provide quality of life benefits for residents of the City as well as encourage economic vitality and tourism. The Project results in an overall positive benefit, as defined in the BCA Guidance.

For each category of benefit, **Table ES-1** offers a summary matrix illustrating the population affected by each individual impact and associated economic benefits.

Table ES-1: Summary of Project Benefits

Merit Criteria	Economic Benefit	Population Affected	Summary of Results (7% Discount)
Quality of Life	Pedestrian Preference Value - Existing Users	Existing Pedestrians	\$2,176,936
	Pedestrian Preference Value - New Users	New Pedestrians	\$1,088,468
	Cyclist Preference Value - Existing Users	Existing Cyclists	\$565,407
	Cyclist Preference Value - New Users	New Cyclists	\$143,400
Mobility and Community Connectivity	Transit Center Improvements	New and Existing Bus Riders	\$336,637
Safety	Improved Safety Benefits	New and Existing Roadway Users	\$631,222
	Mortality Reduction Benefits	New Pedestrians and Cyclists	\$5,563,713
State of Good Repair	Residual Value of Improvements	Crescent City	\$1,318,906
	Avoided Rehabilitation Costs	Crescent City	\$462,138
Environmental Sustainability	Reduced Vehicle Emissions	Regional Residents and Visitors	\$17,406
Total Project Benefits			\$12,304,232

The BCA attempts to quantify as many of the economic benefits and costs associated with the Project as is feasible, given available data, information resources, and time. The BCA finds a benefit-to-cost ratio of at least 1.15:1 at a discount factor of 7 percent, as recommended per OMB Circular A-94. Depending on the discount factor applied to the future stream of benefits and costs, this ratio could significantly increase, for example, this ratio rises to 1.70:1 at a discount rate of 3 percent.

As is described further in the section below, it is likely the analysis is conservative in its approach, and further monetization of benefits and costs would reveal a higher benefit-to-cost ratio.

Sensitivity of Assumptions

The findings of the BCA are dependent on several key driving assumptions affecting model output. Changing these assumptions will affect the estimates of total costs and total benefits. The model uses assumptions that are as rigorous and specific to local conditions as possible. Sensitivity analyses could be performed by changing many of the assumptions used in the model; however, the model was built using the most conservative of assumptions, and it is assumed the BCA provides an estimate of the minimum benefit-cost ratio that could be achieved.

Benefit-Cost Analysis

The Project is anticipated to be fully operational by 2025. Costs and benefits are estimated for 20 years of Project operations, beginning in 2025 and ending in 2044. The proposed Project analysis results are presented in **Table 1** by benefit and cost category. Benefits and costs are shown undiscounted and discounted using both 7 percent and 3 percent year-end discount factors.

The BCA is intentionally limited and inherently conservative because of these factors:

- In recent years, tourism within the City and the greater Del Norte County has been increasing. As such, it is likely that pedestrian and cyclist estimates included in this analysis would grow over time, resulting in increased pedestrian and cyclist benefits over the analysis period. As no specific analysis of future growth trends has been completed, no growth in pedestrian and cyclist users has been assumed.
- Based on information provided by Redwood Coast Transit, transit ridership has decreased by up to fifty percent due to the COVID 19 pandemic. Transit ridership estimates included in this analysis as provided by Redwood Coast Transit reflect these decreased ridership counts. As the length of time required for transit activity to return to pre-COVID levels is unknown at this time, this BCA does not assume that ridership levels will return to pre-COVID levels during the analysis period.

- Project construction is anticipated to occur in two phases with the initial phase being completed in 2023. As such, the majority of project benefits (approximately 70%) could be realized in 2024 prior to completion of the Project. This BCA does not any benefits until completion of the full Project in 2025.
- The Project includes a number of improvements to stormwater facilities and green spaces along the roadway. The primary quantifiable benefit of these improvements would be a decrease in the number of flooding events annually, allowing for bike and pedestrian traffic on rainy days. As the total number of days in which the Project would be accessible is estimated based on local weather patterns, no additional stormwater benefits were estimated to avoid double counting of included pedestrian and cyclist benefits.

The benefit-cost ratio achieved in the analysis is greater than one, even in the absence of potential additional calculations listed above, which are anticipated to increase total net benefits of the Project. It should be noted that many data restrictions could be overcome with additional time to conduct market research needed to support the previously discussed items.

The sections below discuss the methodology used to estimate the benefits and costs associated with the Project. All costs and benefits are reported in 2020 dollars in this analysis unless otherwise stated.

Key Assumptions

The demand forecast used to calculate individual benefit categories varies based on the affected population and is detailed in the discussion of proposed Project benefits below. Listed below is a brief summary of key assumptions used to calculate multiple Project benefits:

- **Estimated Pedestrian and Cyclist Trips.** Estimated facility pedestrian and cyclist trips are the key estimating factor for the user preference and mortality reduction benefits. Existing daily pedestrian and cycle trip estimates were provided by the City based on pedestrian counts conducted in 2018. The proposed Project will provide significant pedestrian and cycle improvements, which will serve existing City residents and visitors. Based on information provided by the City, it is anticipated that existing daily pedestrian counts will increase by 100 percent and cyclist users will increase by 50 percent, due to the improved roadway conditions. To remain conservative, no additional annual growth is assumed beyond this initial increase. **Table 5** shows the estimated existing and new daily pedestrian and cyclist users.
- **Annual Travel Days per Year.** To estimate the total annual pedestrian and cyclist trips along the Project, the daily user counts are multiplied by the total number of travel days per year. Due to the moderate climate of the City, estimates of total travel days per year for pedestrians and cyclists is based on the number of bad weather days that would inhibit pedestrian or bike activity. To remain conservative, this analysis assumes that bad weather days are considered to be any day in which more than 0.25 inches of rain has fallen, consistent with the national weather service's definition of light rain. Per the

National Oceanic and Atmospheric Administration, since 2000, there has been an average of 50 days per year with more than 0.25 inches of rainfall for the City of Crescent City. As such, total annual pedestrian and cyclist users per year are estimated by applying the estimated 300 travel days to the daily pedestrian and cyclist estimates, a conservative estimate of good weather days. **Table 6** shows the estimated annual pedestrian and cyclist user counts.

The sections to follow offer a detailed accounting of the methodological approach to calculating the different benefits generated by the proposed Project as compared to a No Project alternative.

Proposed Project Benefits

Summarized in **Table 1**, this BCA evaluates a variety of benefits generated by the proposed Project. Each category of Project benefit is described below, with benefits reported reflecting the incremental benefit received over the No Build baseline alternative. All numbers reported are in 2020 dollars unless otherwise specified.

Pedestrian Preference Value

If the Project is developed, new sidewalk facilities will be constructed, improving journey quality and increasing safety for existing and new pedestrians along the Project. The BCA Guidance provides a monetized per mile revealed preference benefit for each new foot of sidewalk width that is applied to the total number of miles traveled by pedestrians, annually. The average annual pedestrian trips along the Project are based on average trip counts, as described previously in this report. To estimate the total miles traveled by pedestrians, the Analysis applies a 0.86-mile trip length assumption to the total annual number of pedestrian trips along the Project. This average length of trip assumption is based on the guidelines set forth in the BCA Guidance and is reflective of the average length of a pedestrian trip in the 2017 National Household Travel Survey. For existing users, the full amount of pedestrian preference benefits is assumed. Per the BCA Guidance, the preference benefit value for new users is equal to one-half of the value for existing users.

Table 2 provides the calculation of the pedestrian preference benefits, as described above.

The total pedestrian preference benefit is estimated at \$5.4 million in undiscounted 2020 dollars and \$2.2 million when discounted using a 7 percent discount factor for existing users.

The total pedestrian preference benefit is estimated at \$2.7 million in undiscounted 2020 dollars and \$1.1 million when discounted using a 7 percent discount factor for new users.

Cyclist Preference

The Project will create access to bicycle facilities that will improve conditions for existing cyclists and will induce new users. The improved bike path benefits will improve journey quality and increase comfort for cyclists along the Project. The BCA Guidance provides a monetized per mile revealed preference benefit that is applied to the total number of miles traveled by cyclists, annually. The average annual cyclist trips along the Project are based on average annual cyclist trip counts, as described previously. To estimate the total miles traveled by cyclists, the Analysis applies a 2.38-mile trip length assumption to the total

annual number of cyclist trips along the Project based on guidelines set forth in the BCA guidance. The average length of trip included is the average length of a cycling trip in the 2017 National Household Travel Survey. This analysis uses the recommended national average length. For existing users, the full amount of cyclist preference benefits is assumed. Per the BCA Guidance, the preference benefit value for new users is equal to one-half of the value for existing users.

Table 3 provides the calculation of the cyclist preference benefits, as described above.

The total cyclist preference benefit is estimated at \$1.3 million in undiscounted 2020 dollars and \$565,000 when discounted using a 7 percent discount factor for existing users.

The total cyclist preference benefit is estimated at \$355,000 in undiscounted 2020 dollars and \$143,000 when discounted using a 7 percent discount factor for new users.

Pedestrian and Cyclist Mortality Reduction Benefit

A portion of new pedestrians and cyclists anticipated to use the Project will be transitioning to active transportation modes from inactive methods of travel, such as car or bus travel. The shift to more active transportation methods improves user health and decreases mortality. The BCA guidance provides a monetization value for mortality reduction per induced pedestrian or cyclist trip to be applied to users 20-74 years of age for pedestrian users and 20-64 years of age for cyclists. To estimate the total number of new pedestrian and cyclist users anticipated to have shifted from non-active transportation modes, the Analysis applies an 89 percent factor, based on national averages, as provided by the BCA Guidance. Similarly, the percentage of users anticipate to fall within the required age range is based on national averages of 68 percent and 59 percent, as provided in the BCA Guidance. The mortality reduction benefit is applied only to new users and as such, all estimated benefits are adjusted by 50 percent, as dictated by the BCA Guidance.

Table 4 provides the calculation of the mortality reduction benefits, as described above.

The total mortality reduction benefit is estimated at \$13.8 million in undiscounted 2020 dollars and \$5.6 million when discounted using a 7 percent discount factor.

Transit Station Improvement Benefits

The Project will improve the transit stop located on Front Street, supporting improved mobility and connectivity. The transit station improvements include a number of benefits that will improve quality of life for bus riders within the City. Similar to pedestrian and cyclist preference benefits described above, the BCA Guidance provides monetized preference values for various transit station improvements to be applied to total annual trip estimates to estimate to arrive at an annual transit station improvement benefit. Based on the following improvements included in the Project, it is estimated that the preference value of transit station improvements is \$2.67 per trip:

- Clocks
- Electronic Real-Time Information Displays
- Information/Emergency Button

- Platform/Stop Seating Availability
- Platform/Stop Weather Protection
- Restroom Availability
- Retail/Food Outlet Availability
- Staff Availability
- Step-Free Access to Station/Stop
- Step-Free Access to Vehicle
- Surveillance Cameras
- Temperature Controlled Environment
- Ticket Machines
- Timetables

Bus ridership estimates include only those bus riders that access the local bus system via the cultural center transit stop. Ridership estimates are conservative estimates based on automatic vehicle location data provided by Redwood Coast Transit. Current ridership estimates are approximately 50 percent of typical estimates as the impacts of the COVID 19 pandemic continue to effect transit ridership. To remain conservative, this analysis assumes current levels of ridership throughout the life of the analysis and does not make adjustments to account for the eventual return to pre-COVID conditions. Bus transit days per year are estimated as all days, excluding Sundays. Transit station improvement benefits are estimated by applying the \$2.67 preference value to total annual ridership estimates.

Table 7 provides the calculation of the transit station benefits, as described above.

The total transit center benefit is estimated at \$833,000 in undiscounted 2020 dollars and \$337,000 when discounted using a 7 percent discount factor.

Avoided Rehabilitation Costs

Existing roadway facilities along the project are beyond their useful life and are in very poor condition, with PASER road ratings of less than 4. Development of the Project would allow for avoided roadway rehabilitation costs. There has not been an assessment of required roadway maintenance costs for the existing roadway completed prior to completion of this BCA. To estimate the potential rehabilitation costs, this analysis applies a maintenance per square yard estimate of \$54, based on the Pavement Condition Report for the Sacramento region completed by the California Department of Transportation. This level of roadway maintenance cost is a conservative assessment as the cost reflects the construction costs to rehabilitate a roadway in poor/fair condition and the existing facility would most likely incur greater costs due to its very poor rating. To remain conservative, the BCA assumes only a one-time cost will be incurred and no further maintenance to the existing road is assumed following the initial remediation. Estimates of the benefits related to avoided rehabilitation costs are computed in **Table 8**.

At the end of the analysis period, the estimated avoided rehabilitation cost benefit is \$648,000 in undiscounted 2020 dollars and \$462,000 when applying a 7 percent discount factor.

Residual Value of Improvements

Because the Project improvements are expected to have a useful life beyond the analysis timeframe, the residual value of the improvements is included as a Project benefit, computed in **Table 9**. The value of the Project improvements is apportioned over the identified useful life using a straight-line depreciation approach. The residual value of the improvements is calculated by subtracting accumulated depreciation at the end of the analysis period from the original Project cost.

At the end of the analysis period, the estimated residual value of the improvements is \$6.7 million in undiscounted 2020 dollars and \$1.3 million when applying a 7 percent discount factor.

Improved Safety Benefit

The proposed improvements will increase safety throughout the Project, reducing collisions. Before Project development, 5 collision incidents were reported along the Project roadway, 3 injury accidents and 2 property damage incidents. The Federal Highway Administration's Crash Modification Factors Clearinghouse provides "crash reduction factors" that reflect the percentage reduction in accident rates resulting from a wide range of roadway modifications. The reduction of a 4-lane cross-section to three lanes reduces all types of accidents by 47 percent. There is no additional benefit estimated for further reduction to two lanes.

Using the methodology as defined in the BCA Guidance, the annual incident reduction was multiplied by the monetized unit value for KABCO level A crash for incidents resulting in injury, and KABCO level O (No Injury) benefits for property damage incidents.

The total safety benefit is estimated at \$1.6 million in undiscounted 2020 dollars and \$631,000 when discounted using a 7 percent discount factor. **Table 10** details the safety benefit calculations.

Reduction in Vehicle Emissions

A mode shift from non-active transportation methods to pedestrian and cyclist facilities will result in a decrease in vehicle trips and vehicle miles traveled, resulting in fewer vehicle emissions. To estimate the vehicle trip reduction, a per vehicle estimate of 1.67 average passengers was applied to the total induced pedestrian and cyclist users. Total vehicle mile reduction is estimated by applying the total roadway length to total annual trip reductions. Reduced vehicle miles traveled will result in a decrease in emissions, creating an external benefit for all regional residents and visitors. Emissions reductions were estimated using the parameter data included in the California Active Transportation Benefit/Cost Analysis Model (Cal-B/C AT) Version 8.1 as provided by the California Department of Transportation. Annual benefit per unit applied to the estimated annual change in metric tons of emissions is based on monetized benefit factors included in the BCA Guidance. The benefit related to the reductions of annual emissions is computed in **Tables 11** and **12**.

The total value of the benefit related to vehicle emissions is estimated at \$43,000 in undiscounted 2020 dollars and negative \$17,000 when discounted using a 7 percent discount factor.

Proposed Project Costs

Project costs consist of the one-time construction costs of the Project and the ongoing operations and maintenance costs incurred to maintain the new roadway. As with the benefits of the Project, only costs that are particular to this Project (such that this Project demonstrates independent utility) are included in the BCA. **Table 13** summarizes the total construction costs for the Project, which are estimated to total approximately \$13.4 million in 2020 dollars. It is assumed that these costs will be distributed over a 2-year construction period (2023-2024).

Table 14 summarizes the anticipated operation and maintenance costs throughout the analysis period. It is anticipated that the Project will require slurry seal maintenance every 7 years and a full overlay in Year 21. As this analysis encompasses the first 20 years of Project operations, slurry seal repair is assumed to happen twice during the BCA time period, and no overlay repair and maintenance is assumed.

The total estimated Project cost is \$13.9 million in undiscounted 2020 dollars and \$10.7 million when applying a 7 percent discount factor.

BCA Conclusions

Construction of the Project will generate benefits totaling \$33.4 million in undiscounted 2020 dollars and \$12.3 million using a 7 percent discount factor. Total Project costs, inclusive of operations and maintenance, amount to approximately \$13.9 million in undiscounted 2020 dollars, and \$10.7 million using a 7 percent discount factor.

After applying the 7 percent discount factor to both Project benefits and costs, the Project generates a BCA ratio of 1.15:1. When applying the 3 percent discount factor, this ratio increases to 1.70:1. Because of the conservative nature of the benefits calculated in this analysis, it is anticipated that this ratio reflects the lower bounds of the achievable benefit:cost ratio and monetization of additional benefits would result in improved outcomes over this baseline.

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Table 1
Crescent City Front Street Improvement Project
Benefit Cost Analysis
Summary of Benefits and Costs

Year	Project Year	PROJECT BENEFITS										Total Benefits	PROJECT COSTS						
		Pedestrian Preference Value - Existing Users	Pedestrian Preference Value - New Users	Cyclist Preference Value - Existing Users	Cyclist Preference Value - New Users	Mortality Reduction Benefits	Transit Center Improvements	Residual Value of Improvements	Improved Safety Benefits	Avoided Rehabilitation Costs	Reduced Vehicle Emissions		Construction	Operations and Maintenance	Total Project Costs	Discounted at 7%		Discounted at 3%	
Table Reference:	Table 3	Table 3	Table 2	Table 2	Table 4	Table 7	Table 9	Table 10	Table 8	Table 11		Table 13	Table 14		Benefits	Costs	Benefits	Costs	
2020	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
2021	1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
2022	2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
2023	3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$6,166,200	\$0	\$6,166,200	\$0	\$5,033,456	\$0	\$5,642,947	
2024	4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$7,213,747	\$0	\$7,213,747	\$0	\$5,503,333	\$0	\$6,409,320	
2025	5	\$269,352	\$134,676	\$69,958	\$17,743	\$688,397	\$41,652	\$0	\$78,101	\$648,173	\$2,154	\$0	\$0	\$0	\$1,390,470	\$0	\$1,682,264	\$0	
2026	6	\$269,352	\$134,676	\$69,958	\$17,743	\$688,397	\$41,652	\$0	\$78,101	\$0	\$2,154	\$0	\$0	\$0	\$867,599	\$0	\$1,090,432	\$0	
2027	7	\$269,352	\$134,676	\$69,958	\$17,743	\$688,397	\$41,652	\$0	\$78,101	\$0	\$2,154	\$0	\$0	\$0	\$810,841	\$0	\$1,058,672	\$0	
2028	8	\$269,352	\$134,676	\$69,958	\$17,743	\$688,397	\$41,652	\$0	\$78,101	\$0	\$2,154	\$0	\$0	\$0	\$757,795	\$0	\$1,027,837	\$0	
2029	9	\$269,352	\$134,676	\$69,958	\$17,743	\$688,397	\$41,652	\$0	\$78,101	\$0	\$2,154	\$0	\$19,000	\$19,000	\$708,220	\$10,335	\$997,900	\$14,562	
2030	10	\$269,352	\$134,676	\$69,958	\$17,743	\$688,397	\$41,652	\$0	\$78,101	\$0	\$2,154	\$0	\$0	\$0	\$661,887	\$0	\$968,835	\$0	
2031	11	\$269,352	\$134,676	\$69,958	\$17,743	\$688,397	\$41,652	\$0	\$78,101	\$0	\$2,154	\$0	\$22,000	\$22,000	\$618,586	\$10,452	\$940,616	\$15,893	
2032	12	\$269,352	\$134,676	\$69,958	\$17,743	\$688,397	\$41,652	\$0	\$78,101	\$0	\$2,154	\$0	\$0	\$0	\$578,118	\$0	\$913,220	\$0	
2033	13	\$269,352	\$134,676	\$69,958	\$17,743	\$688,397	\$41,652	\$0	\$78,101	\$0	\$2,154	\$0	\$19,000	\$19,000	\$540,297	\$7,884	\$886,621	\$12,938	
2034	14	\$269,352	\$134,676	\$69,958	\$17,743	\$688,397	\$41,652	\$0	\$78,101	\$0	\$2,154	\$0	\$0	\$0	\$504,951	\$0	\$860,797	\$0	
2035	15	\$269,352	\$134,676	\$69,958	\$17,743	\$688,397	\$41,652	\$0	\$78,101	\$0	\$2,154	\$0	\$0	\$0	\$471,917	\$0	\$835,725	\$0	
2036	16	\$269,352	\$134,676	\$69,958	\$17,743	\$688,397	\$41,652	\$0	\$78,101	\$0	\$2,154	\$0	\$0	\$0	\$441,044	\$0	\$811,384	\$0	
2037	17	\$269,352	\$134,676	\$69,958	\$17,743	\$688,397	\$41,652	\$0	\$78,101	\$0	\$2,154	\$0	\$427,500	\$427,500	\$412,190	\$135,336	\$787,751	\$258,645	
2038	18	\$269,352	\$134,676	\$69,958	\$17,743	\$688,397	\$41,652	\$0	\$78,101	\$0	\$2,154	\$0	\$0	\$0	\$385,225	\$0	\$764,807	\$0	
2039	19	\$269,352	\$134,676	\$69,958	\$17,743	\$688,397	\$41,652	\$0	\$78,101	\$0	\$2,154	\$0	\$0	\$0	\$360,023	\$0	\$742,531	\$0	
2040	20	\$269,352	\$134,676	\$69,958	\$17,743	\$688,397	\$41,652	\$0	\$78,101	\$0	\$2,154	\$0	\$0	\$0	\$336,470	\$0	\$720,904	\$0	
2041	21	\$269,352	\$134,676	\$69,958	\$17,743	\$688,397	\$41,652	\$0	\$78,101	\$0	\$2,154	\$0	\$19,000	\$19,000	\$314,458	\$4,589	\$699,907	\$10,213	
2042	22	\$269,352	\$134,676	\$69,958	\$17,743	\$688,397	\$41,652	\$0	\$78,101	\$0	\$2,154	\$0	\$0	\$0	\$293,886	\$0	\$679,521	\$0	
2043	23	\$269,352	\$134,676	\$69,958	\$17,743	\$688,397	\$41,652	\$0	\$78,101	\$0	\$2,154	\$0	\$22,000	\$22,000	\$274,660	\$4,641	\$659,729	\$11,147	
2044	24	\$269,352	\$134,676	\$69,958	\$17,743	\$688,397	\$41,652	\$6,689,974	\$78,101	\$0	\$2,154	\$0	\$0	\$0	\$1,575,597	\$0	\$3,931,537	\$0	
Total		\$5,387,040	\$2,693,520	\$1,399,154	\$354,858	\$13,767,949	\$833,040	\$6,689,974	\$1,562,020	\$648,173	\$43,073	\$33,378,801	\$13,379,947	\$528,500	\$13,908,447	\$12,304,232	\$10,710,025	\$21,060,989	\$12,375,666
Discounted Total (7% discount rate)		\$2,176,936	\$1,088,468	\$565,407	\$143,400	\$5,563,713	\$336,637	\$1,318,906	\$631,222	\$462,138	\$17,406	\$12,304,232	\$10,536,789	\$173,236	\$10,710,025				
Benefit to Cost Ratio																	1.15	1.70	

Source: EPS

summ

Table 2
Crescent City Front Street Improvement Project
Benefit Cost Analysis
Annual Pedestrian Preference Value Benefits

Year	Assumptions	Existing Users		New Users		Total	
		Annual Trips	Monetized Preference Value	Annual Trips	Monetized Preference Value	Annual Trips	Monetized Preference Value
	Average Sidewalk/Bike Lane Width	10 Feet					
	Average Length of Walking Trip [1]	0.86 Miles					
	Preference Value of Expanded Sidewalk [2]	\$0.10 per foot of width per mile					
	Adjustment for New Users [3]	50%					
2021		0	\$ 0	0	\$ 0	0	\$ 0
2022		0	\$ 0	0	\$ 0	0	\$ 0
2023		0	\$ 0	0	\$ 0	0	\$ 0
2024 [4]		0	\$ 0	0	\$ 0	0	\$ 0
2025		313,200	\$ 269,352	313,200	\$ 134,676	626,400	\$ 404,028
2026		313,200	\$ 269,352	313,200	\$ 134,676	626,400	\$ 404,028
2027		313,200	\$ 269,352	313,200	\$ 134,676	626,400	\$ 404,028
2028		313,200	\$ 269,352	313,200	\$ 134,676	626,400	\$ 404,028
2029		313,200	\$ 269,352	313,200	\$ 134,676	626,400	\$ 404,028
2030		313,200	\$ 269,352	313,200	\$ 134,676	626,400	\$ 404,028
2031		313,200	\$ 269,352	313,200	\$ 134,676	626,400	\$ 404,028
2032		313,200	\$ 269,352	313,200	\$ 134,676	626,400	\$ 404,028
2033		313,200	\$ 269,352	313,200	\$ 134,676	626,400	\$ 404,028
2034		313,200	\$ 269,352	313,200	\$ 134,676	626,400	\$ 404,028
2035		313,200	\$ 269,352	313,200	\$ 134,676	626,400	\$ 404,028
2036		313,200	\$ 269,352	313,200	\$ 134,676	626,400	\$ 404,028
2037		313,200	\$ 269,352	313,200	\$ 134,676	626,400	\$ 404,028
2038		313,200	\$ 269,352	313,200	\$ 134,676	626,400	\$ 404,028
2039		313,200	\$ 269,352	313,200	\$ 134,676	626,400	\$ 404,028
2040		313,200	\$ 269,352	313,200	\$ 134,676	626,400	\$ 404,028
2041		313,200	\$ 269,352	313,200	\$ 134,676	626,400	\$ 404,028
2042		313,200	\$ 269,352	313,200	\$ 134,676	626,400	\$ 404,028
2043		313,200	\$ 269,352	313,200	\$ 134,676	626,400	\$ 404,028
2044		313,200	\$ 269,352	313,200	\$ 134,676	626,400	\$ 404,028

ped ben

Source: Benefit-Cost Analysis Guidance for Discretionary Grant Programs (US Department of Transportation, March 2022); Bureau of Economic Analysis, National Income and Product Accounts, Table 1.1.9, "Implicit Price Deflators for Gross Domestic Product" (March 2022); City of Crescent City; EPS.

- [1] The average length of a walking trip is estimated based on the national average length of a walking trip as included in the Benefit-Cost Analysis Guidance for Discretionary Grant Programs (US Department of Transportation, March 2022).
- [2] Obtained from the Benefit-Cost Analysis Guidance for Discretionary Grant Programs (US Department of Transportation, March 2022).
- [3] Per the Benefit-Cost Analysis Guidance for Discretionary Grant Programs (US Department of Transportation, March 2022), benefits associated with new roadway users require an adjustment factor of 50%.
- [4] Based on the project development plan, benefits are anticipated to begin occurring after completion of the initial phase of project development. To remain conservative, this analysis does not assume any benefits will occur prior until the year following completion of Project construction. Due to the location of initial construction, initial year benefits will likely exceed the benefits included herein.

Table 3
Crescent City Front Street Improvement Project
Benefit Cost Analysis
Annual Cyclist Preference Value Benefits

Year	Assumptions	Existing Users		New Users		Total	
		Annual Trips	Monetized Preference Value	Annual Trips	Monetized Preference Value	Annual Trips	Monetized Preference Value
	Average Length of Cycling Trip [1]	2.38 Miles					
	Preference Value of Expanded Sidewalk [2]	\$1.42 per mile					
	Adjustment for New Users [3]	50%					
2021		0	\$ 0	0	\$ 0	0	\$ 0
2022		0	\$ 0	0	\$ 0	0	\$ 0
2023		0	\$ 0	0	\$ 0	0	\$ 0
2024 [4]		0	\$ 0	0	\$ 0	0	\$ 0
2025		20,700	\$ 69,958	10,500	\$ 17,743	31,200	\$ 87,701
2026		20,700	\$ 69,958	10,500	\$ 17,743	31,200	\$ 87,701
2027		20,700	\$ 69,958	10,500	\$ 17,743	31,200	\$ 87,701
2028		20,700	\$ 69,958	10,500	\$ 17,743	31,200	\$ 87,701
2029		20,700	\$ 69,958	10,500	\$ 17,743	31,200	\$ 87,701
2030		20,700	\$ 69,958	10,500	\$ 17,743	31,200	\$ 87,701
2031		20,700	\$ 69,958	10,500	\$ 17,743	31,200	\$ 87,701
2032		20,700	\$ 69,958	10,500	\$ 17,743	31,200	\$ 87,701
2033		20,700	\$ 69,958	10,500	\$ 17,743	31,200	\$ 87,701
2034		20,700	\$ 69,958	10,500	\$ 17,743	31,200	\$ 87,701
2035		20,700	\$ 69,958	10,500	\$ 17,743	31,200	\$ 87,701
2036		20,700	\$ 69,958	10,500	\$ 17,743	31,200	\$ 87,701
2037		20,700	\$ 69,958	10,500	\$ 17,743	31,200	\$ 87,701
2038		20,700	\$ 69,958	10,500	\$ 17,743	31,200	\$ 87,701
2039		20,700	\$ 69,958	10,500	\$ 17,743	31,200	\$ 87,701
2040		20,700	\$ 69,958	10,500	\$ 17,743	31,200	\$ 87,701
2041		20,700	\$ 69,958	10,500	\$ 17,743	31,200	\$ 87,701
2042		20,700	\$ 69,958	10,500	\$ 17,743	31,200	\$ 87,701
2043		20,700	\$ 69,958	10,500	\$ 17,743	31,200	\$ 87,701
2044		20,700	\$ 69,958	10,500	\$ 17,743	31,200	\$ 87,701

cycle ben

Source: Benefit-Cost Analysis Guidance for Discretionary Grant Programs (US Department of Transportation, March 2022); Bureau of Economic Analysis, National Income and Product Accounts, Table 1.1.9, "Implicit Price Deflators for Gross Domestic Product" (March 2022); City of Crescent City; EPS.

- [1] The average length of a cycling trip is estimated using national averages included in the Benefit-Cost Analysis Guidance for Discretionary Grant Programs, US Department of Transportation dated March 2022.
- [2] Obtained from the Benefit-Cost Analysis Guidance for Discretionary Grant Programs (US Department of Transportation, March 2022).
- [3] Per the Benefit-Cost Analysis Guidance for Discretionary Grant Programs (US Department of Transportation, March 2022), benefits associated with new roadway users require an adjustment factor of 50%
- [4] Based on the project development plan, benefits are anticipated to begin occurring after completion of the initial phase of project development. To remain conservative, this analysis does not assume any benefits will occur prior until the year following completion of Project construction. Due to the location of initial construction, initial year benefits will likely exceed the benefits included herein.

Table 4
Crescent City Front Street Improvement Project
Benefit Cost Analysis
Annual Pedestrian and Cyclist Mortality Benefits

Year	New User Trip Estimates		Induced Trips		Adult Trips		Total Monetized Value		
	Pedestrian	Cyclists	Pedestrian	Cyclists	Pedestrian	Cyclists	Pedestrian	Cyclists	Total
Percentage Induced Trips [1]			89%	89%					
Applicable Age Range [2]					Ages 20-74	Ages 20-64			
Percentage of New Users in Age Range [2]					68%	59%			
Mortality Reduction Value [3]							\$7.08	\$6.31	
Adjustment for New Users [3]							50%	50%	
2021	0	0	0	0	0	0	\$0	\$0	\$0
2022	0	0	0	0	0	0	\$0	\$0	\$0
2023	0	0	0	0	0	0	\$0	\$0	\$0
2024 [4]	0	0	0	0	0	0	\$0	\$0	\$0
2025	313,200	10,500	278,748	9,345	189,549	5,514	\$671,002	\$17,395	\$688,397
2026	313,200	10,500	278,748	9,345	189,549	5,514	\$671,002	\$17,395	\$688,397
2027	313,200	10,500	278,748	9,345	189,549	5,514	\$671,002	\$17,395	\$688,397
2028	313,200	10,500	278,748	9,345	189,549	5,514	\$671,002	\$17,395	\$688,397
2029	313,200	10,500	278,748	9,345	189,549	5,514	\$671,002	\$17,395	\$688,397
2030	313,200	10,500	278,748	9,345	189,549	5,514	\$671,002	\$17,395	\$688,397
2031	313,200	10,500	278,748	9,345	189,549	5,514	\$671,002	\$17,395	\$688,397
2032	313,200	10,500	278,748	9,345	189,549	5,514	\$671,002	\$17,395	\$688,397
2033	313,200	10,500	278,748	9,345	189,549	5,514	\$671,002	\$17,395	\$688,397
2034	313,200	10,500	278,748	9,345	189,549	5,514	\$671,002	\$17,395	\$688,397
2035	313,200	10,500	278,748	9,345	189,549	5,514	\$671,002	\$17,395	\$688,397
2036	313,200	10,500	278,748	9,345	189,549	5,514	\$671,002	\$17,395	\$688,397
2037	313,200	10,500	278,748	9,345	189,549	5,514	\$671,002	\$17,395	\$688,397
2038	313,200	10,500	278,748	9,345	189,549	5,514	\$671,002	\$17,395	\$688,397
2039	313,200	10,500	278,748	9,345	189,549	5,514	\$671,002	\$17,395	\$688,397
2040	313,200	10,500	278,748	9,345	189,549	5,514	\$671,002	\$17,395	\$688,397
2041	313,200	10,500	278,748	9,345	189,549	5,514	\$671,002	\$17,395	\$688,397
2042	313,200	10,500	278,748	9,345	189,549	5,514	\$671,002	\$17,395	\$688,397
2043	313,200	10,500	278,748	9,345	189,549	5,514	\$671,002	\$17,395	\$688,397
2044	313,200	10,500	278,748	9,345	189,549	5,514	\$671,002	\$17,395	\$688,397

mortality

Source: Benefit-Cost Analysis Guidance for Discretionary Grant Programs (US Department of Transportation, March 2022); Bureau of Economic Analysis, National Income and Product Accounts, Table 1.1.9, "Implicit Price Deflators for Gross Domestic Product" (March 2022); City of Crescent City; EPS.

- [1] Induced trips include only those users who have shifted from non-active transportation modes. proportion of total new trip considered to be induced is based on national averages, following guidance included in the Benefit-Cost Analysis Guidance for Discretionary Grant Programs, US Department of Transportation dated March 2022.
- [2] Per the Benefit-Cost Analysis Guidance for Discretionary Grant Programs (US Department of Transportation, March 2022), mortality reduction benefits are only applicable to adult users. Average proportion of induced users within this age range is based on national user averages.
- [3] Obtained from the Benefit-Cost Analysis Guidance for Discretionary Grant Programs (US Department of Transportation, March 2022).
- [4] Based on the project development plan, benefits are anticipated to begin occurring after completion of the initial phase of project development. To remain conservative, this analysis does not assume any benefits will occur prior until the year following completion of Project construction. Due to the location of initial construction, initial year benefits will likely exceed the benefits included herein.

Table 5
Crescent City Front Street Improvement Project
Benefit Cost Analysis
Average Daily Pedestrian and Cyclist Trips

Year	Pedestrian Users			Cyclists		
	Existing Daily Trips	New Daily Trips	Total	Existing Daily Trips	New Daily Trips	Total
2021	0	0	0	0	0	0
2022	0	0	0	0	0	0
2023	0	0	0	0	0	0
2024	0	0	0	0	0	0
2025	1,044	1,044	2,088	69	35	104
2026	1,044	1,044	2,088	69	35	104
2027	1,044	1,044	2,088	69	35	104
2028	1,044	1,044	2,088	69	35	104
2029	1,044	1,044	2,088	69	35	104
2030	1,044	1,044	2,088	69	35	104
2031	1,044	1,044	2,088	69	35	104
2032	1,044	1,044	2,088	69	35	104
2033	1,044	1,044	2,088	69	35	104
2034	1,044	1,044	2,088	69	35	104
2035	1,044	1,044	2,088	69	35	104
2036	1,044	1,044	2,088	69	35	104
2037	1,044	1,044	2,088	69	35	104
2038	1,044	1,044	2,088	69	35	104
2039	1,044	1,044	2,088	69	35	104
2040	1,044	1,044	2,088	69	35	104
2041	1,044	1,044	2,088	69	35	104
2042	1,044	1,044	2,088	69	35	104
2043	1,044	1,044	2,088	69	35	104
2044	1,044	1,044	2,088	69	35	104

Source: Benefit-Cost Analysis Guidance for Discretionary Grant Programs (US Department of Transportation, March 2022); Bureau of Economic Analysis, National Income and Product Accounts, Table 1.1.9, "Implicit Price Deflators for Gross Domestic Product" (March 2022); City of Crescent; EPS.

Table 6
Crescent City Front Street Improvement Project
Benefit Cost Analysis
Average Annual Pedestrian and Cyclist Trips

Year	Pedestrian Users			Cyclists		Total
	Existing Daily Trips	New Daily Trips	Total	Existing Daily Trips	New Daily Trips	
Travel Days Per Year [1]	300	300		300	300	
2021	0	0	0	0	0	0
2022	0	0	0	0	0	0
2023	0	0	0	0	0	0
2024	0	0	0	0	0	0
2025	313,200	313,200	626,400	20,700	10,500	31,200
2026	313,200	313,200	626,400	20,700	10,500	31,200
2027	313,200	313,200	626,400	20,700	10,500	31,200
2028	313,200	313,200	626,400	20,700	10,500	31,200
2029	313,200	313,200	626,400	20,700	10,500	31,200
2030	313,200	313,200	626,400	20,700	10,500	31,200
2031	313,200	313,200	626,400	20,700	10,500	31,200
2032	313,200	313,200	626,400	20,700	10,500	31,200
2033	313,200	313,200	626,400	20,700	10,500	31,200
2034	313,200	313,200	626,400	20,700	10,500	31,200
2035	313,200	313,200	626,400	20,700	10,500	31,200
2036	313,200	313,200	626,400	20,700	10,500	31,200
2037	313,200	313,200	626,400	20,700	10,500	31,200
2038	313,200	313,200	626,400	20,700	10,500	31,200
2039	313,200	313,200	626,400	20,700	10,500	31,200
2040	313,200	313,200	626,400	20,700	10,500	31,200
2041	313,200	313,200	626,400	20,700	10,500	31,200
2042	313,200	313,200	626,400	20,700	10,500	31,200
2043	313,200	313,200	626,400	20,700	10,500	31,200
2044	313,200	313,200	626,400	20,700	10,500	31,200

Source: Benefit-Cost Analysis Guidance for Discretionary Grant Programs (US Department of Transportation, March 2022); Bureau of Economic Analysis, National Income and Product Accounts, Table 1.1.9, "Implicit Price Deflators for Gross Domestic Product" (March 2022); National Oceanic and Atmospheric Administration; City of Crescent; EPS.

[1] Due to the moderate climate of the City, estimate of total travel days per year for pedestrians and cyclists is based on the number of bad weather days that would inhibit pedestrian or bike activity. To remain conservative, this analysis assumes that bad weather days are considered to be any day in which more than 0.25 inches of rain has fallen, consistent with the national weather service's definition of a light rain. Per the National Oceanic and Atmospheric Administration, since 2000, there has been an average of 50 days per year with more than 0.25 inches of rainfall for the City of Crescent City.

Table 7
Crescent City Front Street Improvement Project
Benefit Cost Analysis
Average Daily and Annual Bus Ridership Estimates

Year	Bus Rider Estimates [1]		Annual Station Improvement Benefits
	Daily Rider Count	Annual Rider Counts	
Transit Days per Year [2]		312	
Preference Value of Station Improvements [3]			\$2.67
2021	0	0	\$0
2022	0	0	\$0
2023	0	0	\$0
2024	0	0	\$0
2025	50	15,600	\$41,652
2026	50	15,600	\$41,652
2027	50	15,600	\$41,652
2028	50	15,600	\$41,652
2029	50	15,600	\$41,652
2030	50	15,600	\$41,652
2031	50	15,600	\$41,652
2032	50	15,600	\$41,652
2033	50	15,600	\$41,652
2034	50	15,600	\$41,652
2035	50	15,600	\$41,652
2036	50	15,600	\$41,652
2037	50	15,600	\$41,652
2038	50	15,600	\$41,652
2039	50	15,600	\$41,652
2040	50	15,600	\$41,652
2041	50	15,600	\$41,652
2042	50	15,600	\$41,652
2043	50	15,600	\$41,652
2044	50	15,600	\$41,652

Source: Benefit-Cost Analysis Guidance for Discretionary Grant Programs (US Department of Transportation, March 2022); Bureau of Economic Analysis, National Income and Product Accounts, Table 1.1.9, "Implicit Price Deflators for Gross Domestic Product" (March 2022); Redwood Coast Transit; City of Crescent; EPS.

[1] Bus ridership estimates includes only those bus riders that access the local bus system via the cultural center transit stop, which will be improved as a part of the proposed Front Street Improvement Project. Ridership estimates are conservative estimates based on automatic vehicle location data provided by Redwood Coast transit. current ridership estimates are approximately 50 percent of typical estimates as the impacts of the COVID 19 pandemic continue to effect transit ridership. To remain conservative, this analysis assumes current levels of ridership throughout the life of the analysis.

[2] Annual transit operation days exclude Sundays.

[3] Obtained from the Benefit-Cost Analysis Guidance for Discretionary Grant Programs (US Department of Transportation, March 2022).

Table 8
Crescent City Front Street Improvement Project
Benefit Cost Analysis
Avoided Rehabilitation Costs

Item	Assumption	Avoided Rehabilitation Cost
Existing Roadway Repair/Replacement Cost		
Cost of Road Repair/Replacement (Per Sq. Yard) [1]	\$54	
Segment Length (Miles) [2]	0.3	
Number of Lanes (12 ft lanes)	5	
Total Sq. Yards	12,003	
Year of Improvement	2025	
Cost of Roadway Repair and Replacement		\$648,173

avoid

Source: Sacramento County Pavement Condition Report, January 2019; Crescent City PASER Road Ratings, Crescent City 2018; EPS.

- [1] Reflects the average cost per square yard of roadway replacement as estimated by California Department of Transportation as reflected in the 2019 Pavement Condition Report completed for the Sacramento Region. Due to the condition and nature of required roadway improvements, actual roadway improvements would exceed the estimates provided for the Sacramento region.
- [2] Roadway segments include on the portions of the roadway with poor or very poor condition ratings (PACER Score of less than 4).

Table 9
Crescent City Front Street Improvement Project
Benefit Cost Analysis
Residual Value of Project in 2045

Item	Formula	Project Costs (2020\$)
Assumptions		
Installation Date	a	2024
End of Analysis Period	b	2044
Useful Service Life (Years)	c	40
Remaining Useful Life at End of Analysis Period (Years)	$d = c - (b - a)$	20
Project Cost (2020\$)	e	\$13,379,947
Annual Depreciation	$f = e / c$	\$334,499
Accumulated Depreciation in 2044	$g = f * (b - a)$	\$6,689,974
Residual Value in 2044	$h = e - g$	\$6,689,974

resid

Source: Crescent City; EPS.

Table 10
Crescent City Front Street Improvement Project
Benefit Cost Analysis
Annual Reduced Incident Safety Savings

Year	Injury Accidents		Property Damage Only		Total Monetized Benefit
	Annual Event Reduction [1]	Monetized Benefit	Annual Event Reduction [1]	Monetized Benefit	
Monetized Benefit [2]		\$ 554,800		\$ 3,900	
2021	0.00	\$ 0	0.00	\$ 0	\$ 0
2022	0.00	\$ 0	0.00	\$ 0	\$ 0
2023	0.00	\$ 0	0.00	\$ 0	\$ 0
2024	0.00	\$ 0	0.00	\$ 0	\$ 0
2025	0.14	\$ 77,672	0.11	\$ 429	\$ 78,101
2026	0.14	\$ 77,672	0.11	\$ 429	\$ 78,101
2027	0.14	\$ 77,672	0.11	\$ 429	\$ 78,101
2028	0.14	\$ 77,672	0.11	\$ 429	\$ 78,101
2029	0.14	\$ 77,672	0.11	\$ 429	\$ 78,101
2030	0.14	\$ 77,672	0.11	\$ 429	\$ 78,101
2031	0.14	\$ 77,672	0.11	\$ 429	\$ 78,101
2032	0.14	\$ 77,672	0.11	\$ 429	\$ 78,101
2033	0.14	\$ 77,672	0.11	\$ 429	\$ 78,101
2034	0.14	\$ 77,672	0.11	\$ 429	\$ 78,101
2035	0.14	\$ 77,672	0.11	\$ 429	\$ 78,101
2036	0.14	\$ 77,672	0.11	\$ 429	\$ 78,101
2037	0.14	\$ 77,672	0.11	\$ 429	\$ 78,101
2038	0.14	\$ 77,672	0.11	\$ 429	\$ 78,101
2039	0.14	\$ 77,672	0.11	\$ 429	\$ 78,101
2040	0.14	\$ 77,672	0.11	\$ 429	\$ 78,101
2041	0.14	\$ 77,672	0.11	\$ 429	\$ 78,101
2042	0.14	\$ 77,672	0.11	\$ 429	\$ 78,101
2043	0.14	\$ 77,672	0.11	\$ 429	\$ 78,101
2044	0.14	\$ 77,672	0.11	\$ 429	\$ 78,101
Total		\$ 1,553,440		\$ 8,580	\$ 1,562,020

safety

Source: Benefit-Cost Analysis Guidance for Discretionary Grant Programs (US Department of Transportation, March 2022); Bureau of Economic Analysis, National Income and Product Accounts, Table 1.1.9, "Implicit Price Deflators for Gross Domestic Product" (March 2022); Statewide Integrated Traffic Records System; Crash Modification Factors Clearinghouse; City of Crescent; EPS.

[1] Annual Event reduction based on accident counts provided by the Statewide Integrated Traffic Records System and an assumed reduction and an assumed incident reduction factors based on data provided by the Crash Modification Factors Clearinghouse.

[2] Obtained from the Benefit-Cost Analysis Guidance for Discretionary Grant Programs (US Department of Transportation, March 2022).

Table 11
Crescent City Front Street Improvement Project
Benefit Cost Analysis
Estimated Change in Emissions

Year	Emissions Reductions [1]								Total Monetized Value of All Reductions
	Carbon Dioxide (CO ₂)		Nitrogen Oxides (NOx)		Particulate Matter (PM _{2.5})		Sulfur Dioxide (SO ₂)		
	Annual Reduction	Monetized Value	Annual Reduction	Monetized Value	Annual Reduction	Monetized Value	Annual Reduction	Monetized Value	
Unit of Measure	Metric Ton		Metric Ton		Metric Ton		Metric Ton		
Annual Benefit per Unit Reduction [2]:		\$52.00		\$15,600		\$748,600		\$41,500	
2021	0	\$0	0.0000	\$0	0.0000	\$0	0.0000	\$0	\$0
2022	0	\$0	0.0000	\$0	0.0000	\$0	0.0000	\$0	\$0
2023	0	\$0	0.0000	\$0	0.0000	\$0	0.0000	\$0	\$0
2024	0	\$0	0.0000	\$0	0.0000	\$0	0.0000	\$0	\$0
2025	37	\$1,912	0.0083	\$130	0.0001	\$97	0.0004	\$15	\$2,154
2026	37	\$1,912	0.0083	\$130	0.0001	\$97	0.0004	\$15	\$2,154
2027	37	\$1,912	0.0083	\$130	0.0001	\$97	0.0004	\$15	\$2,154
2028	37	\$1,912	0.0083	\$130	0.0001	\$97	0.0004	\$15	\$2,154
2029	37	\$1,912	0.0083	\$130	0.0001	\$97	0.0004	\$15	\$2,154
2030	37	\$1,912	0.0083	\$130	0.0001	\$97	0.0004	\$15	\$2,154
2031	37	\$1,912	0.0083	\$130	0.0001	\$97	0.0004	\$15	\$2,154
2032	37	\$1,912	0.0083	\$130	0.0001	\$97	0.0004	\$15	\$2,154
2033	37	\$1,912	0.0083	\$130	0.0001	\$97	0.0004	\$15	\$2,154
2034	37	\$1,912	0.0083	\$130	0.0001	\$97	0.0004	\$15	\$2,154
2035	37	\$1,912	0.0083	\$130	0.0001	\$97	0.0004	\$15	\$2,154
2036	37	\$1,912	0.0083	\$130	0.0001	\$97	0.0004	\$15	\$2,154
2037	37	\$1,912	0.0083	\$130	0.0001	\$97	0.0004	\$15	\$2,154
2038	37	\$1,912	0.0083	\$130	0.0001	\$97	0.0004	\$15	\$2,154
2039	37	\$1,912	0.0083	\$130	0.0001	\$97	0.0004	\$15	\$2,154
2040	37	\$1,912	0.0083	\$130	0.0001	\$97	0.0004	\$15	\$2,154
2041	37	\$1,912	0.0083	\$130	0.0001	\$97	0.0004	\$15	\$2,154
2042	37	\$1,912	0.0083	\$130	0.0001	\$97	0.0004	\$15	\$2,154
2043	37	\$1,912	0.0083	\$130	0.0001	\$97	0.0004	\$15	\$2,154
2044	37	\$1,912	0.0083	\$130	0.0001	\$97	0.0004	\$15	\$2,154
Total	735	\$38,237	0.1663	\$2,594	0.0026	\$1,942	0.0073	\$301	\$43,073

emissions

Source: Benefit-Cost Analysis Guidance for Discretionary Grant Programs (US Department of Transportation, March 2022); Bureau of Economic Analysis, National Income and Product Accounts, Table 1.1.9, "Implicit Price Deflators for Gross Domestic Product" (March 2022); California Department of Transportation California Active Transportation Benefit/Cost Analysis Model (Cal-B/C AT) Version 8.1; EPS.

[1] Emissions reductions estimated using the parameter data included in the California Active Transportation Benefit/Cost Analysis Model (Cal-B/C AT) Version 8.1 as provided by the California Department of Transportation (CAL-B/C AT) Version 8.1.

[2] Obtained from the Benefit-Cost Analysis Guidance for Discretionary Grant Programs (US Department of Transportation, March 2022).

Table 12
Crescent City Front Street Improvement Project
Benefit Cost Analysis
Annual Reduction in Vehicle Miles Traveled

Year	Induced Trips [1]			Annual Vehicle Trip Reduction	Annual Vehicle Miles Reduction
	Pedestrian	Cyclists	Total		
Average Passengers per Auto [2]				1.67	
Roadway Trip Length					0.68
2021	0	0	0	0	0
2022	0	0	0	0	0
2023	0	0	0	0	0
2024	0	0	0	0	0
2025	278,748	9,345	288,093	172,511	117,652
2026	278,748	9,345	288,093	172,511	117,652
2027	278,748	9,345	288,093	172,511	117,652
2028	278,748	9,345	288,093	172,511	117,652
2029	278,748	9,345	288,093	172,511	117,652
2030	278,748	9,345	288,093	172,511	117,652
2031	278,748	9,345	288,093	172,511	117,652
2032	278,748	9,345	288,093	172,511	117,652
2033	278,748	9,345	288,093	172,511	117,652
2034	278,748	9,345	288,093	172,511	117,652
2035	278,748	9,345	288,093	172,511	117,652
2036	278,748	9,345	288,093	172,511	117,652
2037	278,748	9,345	288,093	172,511	117,652
2038	278,748	9,345	288,093	172,511	117,652
2039	278,748	9,345	288,093	172,511	117,652
2040	278,748	9,345	288,093	172,511	117,652
2041	278,748	9,345	288,093	172,511	117,652
2042	278,748	9,345	288,093	172,511	117,652
2043	278,748	9,345	288,093	172,511	117,652
2044	278,748	9,345	288,093	172,511	117,652

VMT

Source: Benefit-Cost Analysis Guidance for Discretionary Grant Programs (US Department of Transportation, March 2022); Bureau of Economic Analysis, National Income and Product Accounts, Table 1.1.9, "Implicit Price Deflators for Gross Domestic Product" (March 2022); Crescent City; EPS.

[1] Induced trips include only those users who have shifted from non-active transportation modes.

[2] Obtained from the Benefit-Cost Analysis Guidance for Discretionary Grant Programs (US Department of Transportation, March 2022). As a conservative assumption, this analysis assumes all induced pedestrian and cyclist would be from shared vehicles.

Table 13
Crescent City Front Street Improvement Project
Benefit Cost Analysis
Project Cost Estimates

Item	Project Construction Costs		
	2023	2024	Total
Capital Expenditures	\$6,166,200	\$7,213,747	\$13,379,947

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Source: City of Crescent City; EPS.

Table 14
Crescent City Front Street Improvement Project
Benefit Cost Analysis
Estimated Annual Maintenance Costs

Item	Maintenance Interval	Estimated Annual Maintenance Expenditures
Crack Sealing	3 Years	\$19,000
Slurry Seal	5 Years	\$22,000
Overlay	12 Years	\$427,500

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Source: Crescent City; EPS.

Table 15
Crescent City Front Street Improvement Project
Benefit Cost Analysis
Cost and Benefit Discount Factors

Year	Project Year	Year-End Discount Factors			
		7%		3%	
		Value	Factor	Value	Factor
2020	0	1.00	1.00	1.00	1.00
2021	1	1.07	0.93	1.03	0.97
2022	2	1.14	0.87	1.06	0.94
2023	3	1.23	0.82	1.09	0.92
2024	4	1.31	0.76	1.13	0.89
2025	5	1.40	0.71	1.16	0.86
2026	6	1.50	0.67	1.19	0.84
2027	7	1.61	0.62	1.23	0.81
2028	8	1.72	0.58	1.27	0.79
2029	9	1.84	0.54	1.30	0.77
2030	10	1.97	0.51	1.34	0.74
2031	11	2.10	0.48	1.38	0.72
2032	12	2.25	0.44	1.43	0.70
2033	13	2.41	0.41	1.47	0.68
2034	14	2.58	0.39	1.51	0.66
2035	15	2.76	0.36	1.56	0.64
2036	16	2.95	0.34	1.60	0.62
2037	17	3.16	0.32	1.65	0.61
2038	18	3.38	0.30	1.70	0.59
2039	19	3.62	0.28	1.75	0.57
2040	20	3.87	0.26	1.81	0.55
2041	21	4.14	0.24	1.86	0.54
2042	22	4.43	0.23	1.92	0.52
2043	23	4.74	0.21	1.97	0.51
2044	24	5.07	0.20	2.03	0.49

factors

Source: Discount Factors - OMB Circular A-94 Revised October 29, 1992.