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Appendix B Cost and Economic Analysis of Closure

Economic Impact Analysis for Potential Sea Level Rise Resilience Project along the Eureka Arcata Corridor.

Caltrans Headquarters Transportation Economics Branch. 2024.

Summary: This economic impact analysis demonstrates the impact of a single 24-hour closure of the highway due to a sea level rise related event. Escalated to the year 2030 dollars, the cost of traffic delays is estimated at $2.7M per day, with an additional loss of $0.20M in gross regional product and three full-time jobs lost in a 24-hour period.

PROJECT DESCRIPTION AND LOCATION

The Eureka / Arcata corridor is a low-lying segment of highway located in Humboldt County on Route 101 from Post Mile (PM 79.75 to PM 85.00). The corridor connects the Northern California port city of Eureka to the adjacent city of Arcata.

Due to ground surface elevations, exposure to wind waves, and the condition of levees and embankments, this area is especially vulnerable to flooding hazards, with vulnerability expected to increase due to the progressive rise of sea levels.

Humboldt County is also an area of geologic instability, requiring significant expenditures on emergency construction projects and maintenance activities to always keep the highway open for both commerce and motorists.

Caltrans District 1 (D1) request for a preliminary Economic Impact Analysis to aid in the district's evaluation of short- and long-term resilience projects for the Eureka / Arcata Corridor.

A long-term sustainable solution to the rising sea level is a sea level rise resilience project, which is needed to address the following issues:

1. Economic and environmental ramifications of sea level rise and resulting to closure of the Eureka / Arcata corridor
2. Cost and risk of traffic delays and detours to traveling public due to sea level rise and highway closures
3. Increase in both maintenance and emergency project costs to keep the highway open during sea level rises
4. Mitigate severity of large storm events causing sea level rise and landslides

Project Alternatives (Scenario)

Base Condition

No Build Alternative implies maintaining the status quo. In other words, maintenance, operation, and restoration practices are likely to continue. Expenses are anticipated to increase over time with sea levels and landslides becoming more problematic in the future.

This alternative assumes there will be no impacts to the facility in the year 2030. Therefore, no closure of the corridor would be necessary.

No build condition

This economic impact analysis is based on a 24-hour closure of the highway for cleaning and repairs to make it operable for motorists. This highway closure will result in a 50 percent reduction in vehicle trips and a detour adding approximately 50 miles to a five-mile segment of the highway. A percentage of trips would still be made during a closure via alternative routes which will be much longer and congested.

Build Condition

The Eureka /Arcata Corridor SLR Resilience Project currently being explored is used for this preliminary economic analysis. The preliminary capital outlay (construction cost does not include support cost) for the project is estimated to be $125 Million (Escalated to 2030 dollars).

The economic impact analysis provided in this report, considers comparing the impact of sea level rise to the county of Humboldt without a sea level resilience project in place by 2030.

The analysis was performed using Transportation Economic Development Impact System (TREDIS) tool. The metrics used for this analysis were: Vehicle Trips, Vehicle Miles Traveled (VMT) and Vehicle Hours Traveled (VHT), using the Humboldt County Travel Demand Model (HCTDM).

Assumptions in this analysis:

- The Eureka / Arcata corridor located in Humboldt County on Route 101 from Post Mile (PM 79.75 to PM 85.00) would be closed by an SLR event for a period of 24 hours.
- A percentage of trips would still be made during a closure via alternative routes and established road detours
- Humboldt County as a flooding event would be publicized to all residents
- The first year expected to experience an SLR event that causes a closure is 2030

Economic Impact- No build condition with Sea Level Rise (SLR) Condition

Table B1. Humboldt County 24-Hour Economic Impact 2030 ($M)

Annual maintenance Cost	Transportation Delay Benefits/costs	Gross Regional Product[1]
$1M	-$2.7M	-$0.20M

Source: Caltrans Economics Branch 2024

[1] Gross Regional Product- total economic out of a region within a specific time period for instance a year.

In a case of sea level rise without a resilience project in place, cost of traffic delays is estimated at $2.7M per day, with an additional loss of $0.20M in gross regional product and three full-time jobs lost in a 24-hour period.

Transportation delay disbenefits of $2.7M broken down to value of personal & reliability loss (36 percent) vehicle operating costs (21 percent), business time reliability loss (20 percent), Safety costs increase (15 percent), Shipper/ Logistics cost increase (5percent) and environmental costs increase (3 percent).

Table B2. Total Economic Impact Breakout 2030

Business Output[2] $M	Value Added[3] $M	Jobs	Labor Income $
-$0.6M	*-$0.2M*	*-3.0*	*-$88K*

Source: Caltrans Economics Branch 2024

Business output which is the quantity of goods or services produced in a Humboldt County would decrease by $0.6M in a day, while value added (Gross Regional Product) which is the value of goods and services produced in the county would decrease by $0.2M during a 24-hour period.

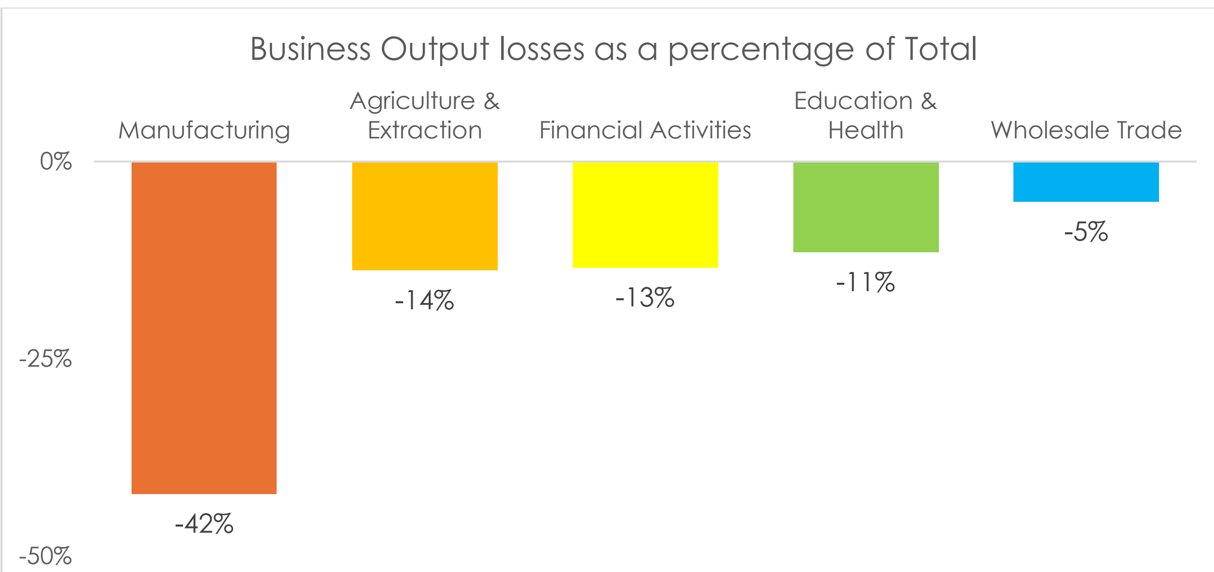

Figure 1. Business Output losses due to Sea level Rise. Source: Caltrans Economic Branch 2024

Of the total business output losses, manufacturing sector accounts for two-fifths or (42 percent) followed by agriculture and extraction (14 percent), followed by financial activities (13 percent)

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[2] Business Output- Output is a quantity of goods or services produced in a specific time period (for instance, a month or day).

[3] Value added- added value refers to the increased utility of a product as it passes through different production stages.

and education and health (11 percent). Only two sectors, retail trade and other services are likely to experience gains in business output with a Sea level rise.

This economic impact analysis is intended to inform decision-making for short and long-term resilience strategies to address the challenges posed by rising sea levels to Humboldt County's economy and the region.

This includes considering various strategies such as maintaining status quo (No Build Alternative) or implementing sea level resilience project to adapt to future conditions. The ultimate goal is to ensure the corridor remains safe and functional for commerce and motorists despite the changing environmental conditions.

Table B3. Summary Table Humboldt County - 24- hour Cost of Sea level Rise (2030).

Variables	Cost of Sea level Rise without a resilience Project
Infrastructure Maintenance	-$1M
Transportation Delay Benefits/Cost	-$3.0M
Gross Regional Product	-$0.2M
Business Output	-$0.6M
Value Added	-$0.2M
Labor Income	-$88K
Jobs (Full-time equivalence)	-3.00

Source: Caltrans Economic branch 2024

For the economic impact assessment provided, below are the assumptions used for the analysis.

1. The economic impact results provided in this report are for county of Humboldt. Business output, gross regional product and jobs provided in this report occur during the sea level rise period as a single 24 hrs. event.
2. The analysis provided for benefits/cost of traffic delays below is based on approximately 5.0-mile stretch Humboldt County on Route 101 from Post Mile (PM 79.75 to PM 85.00).
3. Annual vehicle trips used for this report were taken by multiplying Average Annual Daily Trips (AADT) by 365.
4. Modes have been split between business, commuter and personal using the following ratios (3.0%, 32.3% & 64.7%) based on NHTS 2017's data.
5. For passenger modes the model assumes 50 percent of the trips are internal and 50 percent

are through and outgoing, and trucks 10 percent and 90 percent respectively.

6. Economic Cost Analysis assumptions for value of time are in 2020 dollars:

Table B4. Value of Time

Concept		**Amount**
Cost Per Passenger ($/hour)	All Trucks: Freight	$0.00
	Passenger Car: Business	$37.67
	Passenger Car: Commute	$26.05
	Passenger Car: Personal	$13.03
Buffer Time Cost ($/hour)	All Trucks: Freight	$31.00
	Passenger Car: Business	$37.67
	Passenger Car: Commute	$26.05
	Passenger Car: Personal	$13.03
Cost Per Crew ($/hour)	All Trucks: Freight	$31.00
	Passenger Car: Business	$0.00
	Passenger Car: Commute	$0.00
	Passenger Car: Personal	$0.00

Regional Economic Guidance Document for Climate Adaptation and Transportation Resilience Planning. Prepared by the Energy Policy Initiative Center for the San Diego Association of Governments. September, 2021.

- This guidance document focuses on the economic analyses of climate hazard impacts and
  corresponding adaptation responses.
- The guidance document provides a step-by-step approach for:

    - Framing an economic analysis to address climate hazard impacts and adaptation strategies.
    - Understanding and differentiating the economic approaches available.
    - Selecting the most appropriate economic approach or approaches.
    - Identifying and selecting inputs for the economic analysis in the context of climate adaptation planning.
- This document is not intended to be a primer on economic analyses or provide extensive direction on a specific methodology. Rather, the purpose is to provide specific direction for tailoring economic approaches to meet the community's objectives for climate adaptation planning. Therefore, this guidance document should be used in combination with existing economic analytical frameworks.

From Catharine Crayne: Traffic Demand study of 255/101 interchange S:\PLAN\AllShare\Climate Change\CAIP\References\Route 255 Interchange

Appendix C Summary of Select Guidance and Policy Documents

California State Policies and Guidance
Various policies implemented at the state level have directly addressed not only GHG mitigation, but climate adaptation planning. These policies require State agencies to consider the effects of climate in their investment and design decisions, among other considerations. State adaptation policies that are relevant to Caltrans include:

Executive Order S-13-08 (2008) directs state agencies to plan for sea level rise and climate impacts through the coordination of the state Climate Adaptation Strategy.[15]

Assembly Bill 1482 (2015) requires all state agencies and departments to prepare for climate change impacts through (among others) continued collection of climate data, considerations of climate change in state investments, and the promotion of reliable transportation strategies.[17]

Senate Bill 2046 (2015) establishes the Integrated Climate Adaptation and Resiliency Program to coordinate with regional and local efforts with state adaptation strategies.[18]

SB 1 (2017) Transportation Funding: Requires transportation funding be used where feasible to preserve, protect, and reduce environmental impacts using project features that promote adaptation to withstand the negative impacts of climate change.

EO N-82-20 (2020): Directs the State to accelerate and expand use of nature-based solutions while mitigating greenhouse gas emissions to adapt and become more resilient to the impacts of climate change through conserving 30 percent of California's land and coastal waters by 2030.

California Climate Adaptation Strategy (2024 Draft)**:** Priorities, goals, actions, and success metrics for climate adaptation strategies

Caltrans Climate Guidance

Guidance on Incorporating Sea Level Rise (2011, update coming soon?)

Climate Action Plan for Transportation Infrastructure (2021): Recommends major investments of transportation dollars "to aggressively combat and adapt to climate change while supporting public health, safety and equity."

California Transportation Plan 2050 (2021): Roadmap for achieving transportation system vision. The roadmap provides foundational policy framework for making effective, transparent, and transformational transportation decisions in California; addresses the varied transportation needs of urban, suburban, rural, and Tribal communities; and emphasizes implementation and identifies a timeline, roles, and responsibilities for each plan recommendation.

Design Manual for Hybrid Coastal Protection Strategies (Caltrans 2022): Provides design guidance focused on nature-based adaptation strategies. Combines sea level rise/coastal hazards guidance documents developed by the California Coastal Commission with federal coastal engineering documents.

Adaptation Strategies for Transportation Infrastructure (2023): Educational tool for planners that provides introduction to project-level adaptation strategies. Nature-based solutions should be prioritized wherever feasible; avoid maladaptation.

The State of California Sea Level Rise Guidance: 2024 Science and Policy Update (Ocean Protection Council 2024): This report consists of the best available science on sea level rise and coastal impacts with pragmatic and practical approaches for using this new scientific information in planning and decision-making. There is greater certainty and a narrowing range of the amount of sea level rise through 2050, with a statewide average of 0.8 ft of rise projected in the next 30 years. By 2100, statewide sea levels are expected to rise between 1.6 ft and 3.1 ft (Intermediate-Low to Intermediate Scenarios), and even higher amounts cannot be ruled out. For critical infrastructure, planning between the intermediate and high scenarios is recommended. Beyond 2100, the range of sea level rise becomes increasingly large due to uncertainties associated with physical processes, such as earlier-than-expected ice sheet loss and resulting future sea-level rise. By 2150, statewide sea levels may rise from 2.6 ft to 11.9 ft (Intermediate-Low to High Scenarios), although even higher amounts are possible.

TABLE 2. ***Sea Level Scenarios for N. Spit, Humboldt Bay.***

Median values of Sea Level Scenarios, in feet, for each decade from 2020 to 2150, with a baseline of 2000. All median scenario values incorporate the local estimate of vertical land motion.

YEAR	LOW	INT-LOW	INTERMEDIATE	INT-HIGH	HIGH
2020	0.3	0.4	0.4	0.4	0.4
2030	0.5	0.6	0.6	0.6	0.7
2040	0.7	0.8	0.9	1	1.1
2050	0.9	1	1.2	1.4	1.6
2060	1.1	1.3	1.5	2	2.4
2070	1.3	1.5	1.9	2.7	3.5
2080	1.4	1.8	2.5	3.6	4.7
2090	1.6	2.1	3.1	4.5	6
2100	1.8	2.4	3.9	5.5	7.3
2110	1.9	2.7	4.6	6.5	8.7
2120	2.1	3	5.3	7.3	9.9
2130	2.3	3.3	5.9	8	10.8
2140	2.4	3.5	6.5	8.6	11.9
2150	2.6	3.8	7.1	9.3	12.8

Note that the Eureka-Arcata corridor has a slower rate of vertical land motion in the subsiding direction than the North Spit in Humboldt Bay, so both local and statewide sea level rise projections are referenced.

TABLE 2.1. *(A) Median values (i.e., 50th percentile) for Sea Level Scenarios for California, in feet, relative to a 2000 baseline. These statewide values all incorporate an average value of vertical land motion corresponding to a negligible rate of 0.1 mm (0.0003 ft) per year uplift.*

YEAR	LOW	INT-LOW	INTERMEDIATE	INT-HIGH	HIGH
2020	0.2	0.2	0.2	0.2	0.3
2030	0.3	0.4	0.4	0.4	0.4
2040	0.4	0.5	0.6	0.7	0.8
2050	0.5	0.6	0.8	1.0	1.2
2060	0.6	0.8	1.1	1.5	2.0
2070	0.7	1.0	1.4	2.2	3.0
2080	0.8	1.2	1.8	3.0	4.1
2090	0.9	1.4	2.4	3.9	5.4
2100	1.0	1.6	3.1	4.9	6.6
2110	1.1	1.8	3.8	5.7	8.0
2120	1.1	2.0	4.5	6.4	9.1
2130	1.2	2.2	5.0	7.1	10.0
2140	1.3	2.4	5.6	7.7	11.0
2150	1.3	2.6	6.1	8.3	11.9

Regional and Local Plans, Policies, and Guidance

Sea Level Rise Adaptation Plan for Transportation Infrastructure and Other Critical Resources in the Eureka Slough Hydrographic Area, Humboldt Bay (GHD 2021): This report proposes a framework for sea level rise adaptation plans in the Eureka Slough hydrographic area with a focus on protecting the Jacobs Avenue area and building up levees in critical locations. The plan intends to advance understanding of flood risks and improve preparedness for implementation of adaptation projects. Appendix A of the report contains maps of the region. Appendix B is GHD's observation and log protocol, which contains pictures and drawings of problematic areas. Appendix D is an extensive hazard scenario study for the Eureka Slough and nearby infrastructure. Appendix H is a cost-benefit analysis of proposed projects. Appendix I contains notes from stakeholders taken at outreach meetings. Appendices C, E, F, and G are listed independently as sources in this bibliography as Northern Hydrology and Engineering. (2015), GHD (2021b), GHD, Northern Hydrology and Engineering, & Shea, C. (2022), and GHD (2021a) respectively.

City of Arcata Local Coastal Element (2025 Draft): This Local Coastal Element of the City of Arcata General Plan is a component of the Land Use Plan as described in the Coastal Act, Section 30108.5 and 30108.55. This Element identifies the policy to enact the Coastal Act locally and contains implementation measures where necessary to enact the provisions and policies of the Coastal Act.

City of Arcata Coastal Zoning Ordinance (2025 Draft):

City of Eureka Coastal Land Use Plan (2023 Draft): This Land Use Plan comprises the City of Eureka's updated policy approach for the City's Coastal Zone. This Land Use Plan addresses changed conditions since certification of the previous 1997 Land Use Plan, reflects current community priorities, and anticipates future needs with a planning horizon of 2040. Planning principles include:

- Coordinate with Caltrans to revitalize and beautify the Broadway Corridor to create a sense of place; improve safety and connectivity for bicyclists, pedestrians, and transit riders; and stimulate new development.
- reserve and enhance the beautiful open space, forest, coastal, agricultural, and habitat resources within and surrounding the city.
- Develop infrastructure and public spaces to allow for passive and active recreation opportunities in and near natural settings.
- Provide opportunities for waterfront trail enhancements, connections, and inland extensions.
- Promote multi-modal transportation options and "complete streets" to accommodate walking, biking, vehicles and transit.
- Develop short-, medium-, and long-term adaptation strategies for areas and assets vulnerable to sea level rise, phasing adaptation actions over time based on observed water level thresholds, and selecting measures to maintain the functionality of our infrastructure systems in a manner which maximizes social, environmental, and economic benefits and minimizes costs for current and future generations.
- Protect our community from manmade disasters and prepare for natural disasters, including seismic activity, tsunamis, flooding, and wildfires.

Appendix D Public Engagement Plan

Caltrans partnered with MIG to develop a Public Engagement Plan (PEP) for the CAIP. Originally created in 2021, the PEP is a living document that continues to be refined and updated over time. This appendix presents the most current version of the CAIP PEP.

Public Engagement Plan

Comprehensive Adaptation and Implementation Plan (CAIP)

Introduction

Humboldt Bay has been experiencing nearly the fastest rate of relative sea level rise (SLR) on the entire west coast of the United States. At the same time, the level of the ocean is rising, some of the land around Humboldt is subsiding, leading to a substantial sea elevation change. Multiple SLR vulnerability assessments and adaptation plans related to Humboldt Bay have been produced by local experts, and these analyses have shown that SLR is likely to have a profound effect on the region over a quicker timeframe than many had expected. Caltrans is uniquely positioned to play a significant role in SLR research and adaptation planning.

In climate change, hazard, and SLR assessments by local and state governments, the section of U.S. Highway 101 between the cities of Eureka and Arcata (Eureka-Arcata Corridor) has been identified as a priority asset in terms of risk to SLR and the need for adaptation planning. The Eureka-Arcata Corridor has been identified as “critical” because it is the primary transportation hub in Humboldt County where few alternative routes are available, it contains essential utility lines (e.g. gas, sewer, water, broadband, and electricity), and it contains residential, business, and recreational amenities that could be affected by SLR and flooding. The Eureka-Arcata Corridor is also vulnerable given its proximity to Humboldt Bay – with several sections of lower elevation including sections less than two feet above the mean monthly maximum water level. Most sections of the shoreline along the Eureka-Arcata Corridor are of high or moderate risk.

Caltrans District 1 will build upon the previous efforts and work with the County of Humboldt, City of Eureka, City of Arcata, Humboldt State University, and numerous interested stakeholders to create a Comprehensive Adaptation and Implementation Plan (CAIP) by 2025. Coastal Development Permit (CDP) 1-18-1078 was issued to Caltrans by the California Coastal Commission on September 12, 2019. The CDP covers the Eureka-Arcata U.S. Highway 101 Corridor Improvement Project, which consists of five component projects within a six-mile segment of Highway 101 along the east side of Humboldt Bay. Specifically, the CDP incorporated two climate change-related special conditions: Special Condition 1 – Sea Level Rise and Flooding Impact Monitoring and Reporting; and Special Condition 2 – Long-Term SLR Comprehensive Adaptation and Implementation Plan.

The County of Humboldt recently completed a SLR Adaptation Plan (Phase 1) working with the City of Eureka, Humboldt County Association of Governments (HCAOG), Caltrans District 1, and interested stakeholders within one of the most vulnerable sub-watersheds of Humboldt Bay. The project area for Phase 1 was limited to the shoreline of Humboldt Bay at the northeastern side of the City of Eureka. Phase 2 would expand upon the previous plan and studies to include the entire E/A Corridor between the cities of Eureka and Arcata. Caltrans will also engage and coordinate with local governments working on sea level rise planning and adaptation so that activities are in alignment and can achieve mutual goals.

The project area is situated along the shoreline of Humboldt Bay from the City of Eureka to the City of Arcata. The project plan area includes Highway 101, railroad, airport, marine, and nonmotorized transportation assets, along with utility transmission lines (gas, electrical, water), wastewater pump stations, and a mix of industrial, commercial, residential, agricultural, and wildlife land use.

Public Engagement Goals, Objectives, and Expected Results

The overall goal for the D1 Public Engagement Plan for the Comprehensive Adaptation and Implementation Plan (CAIP) is to achieve a plan that is well-informed by the stakeholders with a high level of interest and expertise, along with the general public, whose support will be needed now and in the future for its implementation. Specifically, affected landowners and other stakeholders will assist in establishing guiding principles, identifying priorities, and supporting the development of viable adaptation project concepts. Key information regarding landscape features, exposure, and sensitivity to sea level rise will be obtained to inform and prioritize project planning.

This will be achieved by implementing the Public Engagement Plan (PEP), creating a plan identity so that materials have a cohesive look; conducting meetings with a cross-departmental Caltrans team, hosting public workshops, participating in complimentary planning efforts, implementing a variety of digital and non-digital activities and tools; and soliciting and incorporating agency, public, and stakeholder feedback on the CAIP.

More specific objectives of the D-1 CAIP Public Engagement Process include:

- Develop the public engagement strategy for the planning process
- Coordinate with and garner input from local government partners and other agency partners, including the California Coastal Commission
- Promote the dialogue and discussion needed for the CAIP using methods identified in this PEP
- Obtain meaningful input from the public
- Educate and update stakeholders and the public about the CAIP efforts thus far
- Simplify complex content related to SLR so that clear, useable input can be received
- Maintain regular communications with internal and external stakeholders
- Document results to support the CAIP

Prior Engagement

Caltrans has already conducted numerous planning activities along the corridor that may provide useful information and local agencies are also convening their own planning efforts. To the best extent possible, this public engagement effort will seek to avoid duplicating efforts and will look for potential points of collaboration. Some current planning activities for Caltrans to reference and stay in alignment with include:

Project	Year	Description
District 1 CAT Plan	2021	This document features a needs assessment that identifies needed improvements for pedestrians and cyclists. The CAIP study corridor includes trails for pedestrians and bicycles.
D1 Vulnerability Assessment	2021	This Summary Report and its associated Technical Report describe climate change effects in District 1. This document provides a high-level review of potential climate impacts to the district's portion of the State Highway System (SHS), while the Technical Report presents detail on the technical processes used to identify these impacts.
Eureka Slough Bridge Replacement	ongoing	Survey of businesses and residents will be conducted.
Humboldt Bay Trail System Planning	ongoing	Planning and construction for trails in the corridor
Sea Level Rise Adaptation Plan for Transportation Infrastructure and Other Critical Resources in the Eureka Slough Hydrographic Area, Humboldt Bay	2018-2021	Humboldt County received funding from the Caltrans Adaptation Planning Grant program to support the preparation of a sea level rise adaptation plan for the Eureka Slough hydrologic sub-unit of Humboldt Bay.
Adaptation Priorities Report	2020	These reports include a prioritized list of potentially exposed assets in each District. The prioritization methodology in these reports considers, amongst other things, the timing of the climate impacts, their severity and extensiveness, the condition of each asset (a measure of the sensitivity of the asset to damage), the number of system users affected, and the level of network redundancy in the area. Prioritization scores are generated for each potentially exposed asset based on these factors and used to rank them.

Project	Year	Description
State Highway System Management Plan (SHSMP)	2020 (Updated every other year)	The SHSMP is a performance-driven and integrated management plan for the State Highway System (SHS). SHS needs, investments, and resulting performance for the 10-year period are presented in the SHSMP.
Humboldt Bay Sea Level Rise Adaptation Planning Project	2010-2013; 2013-2015	Phase I: Humboldt Bay Shoreline Inventory, Mapping and Sea Level Rise Vulnerability Assessment. Phase II: Humboldt Bay Sea Level Rise Inundation Vulnerability Modeling, Mapping and Adaptation Planning
District 1 Climate Change Vulnerability Assessment and Pilot Studies FHWA Climate Resilience Pilot Final Reports	2014	The objective of the study was to identify and classify the potential vulnerabilities of State-owned transportation assets to climate change throughout District 1, which encompasses the counties of Del Norte, Humboldt, Mendocino, and Lake; to identify and evaluate a range of adaption options to address the identified vulnerabilities at four prototype locations.
Potential SLR Local Coast Plan updates for local governments	ongoing	The Cities of Eureka and Arcata and Humboldt County will be updating their Local Coastal Plan to address Sea Level Rise.
CA Coastal Commission Critical Infrastructure Guidance	2021	Caltrans will reference this guidance document in the planning process. The document provides the Commission's direction on how local governments can address sea level rise issues in Local Coastal Programs consistent with the Coastal Act.
Eureka-Arcata 101 Corridor SLR Resilience	PID complete 2025, RTL mid 2030s	0M270 will raise the roadway prism to 12' NAVD88 from PM79.9 – PM85.0 and move the roadway inward to fill the median. This interim SLR resilience project will protect against overtopping that is expected by the early 2030s. This project will be compatible with future CAIP projects.

Key Audiences and Stakeholders

The PEP will identify how to engage the residents living along the corridor, key stakeholders, partner agencies, and potentially affected communities who can support the partnerships and resources needed to develop the CAIP. This section identifies target audiences and stakeholder groups for engagement.

Caltrans – HQ and District 1:

- Planning
- Environmental
- Design
- Maintenance
- Public Information Office (PIO)
- District Native American Liaison

Agency/Technical Partners:

- Chamber of Commerce – Arcata
- Chamber of Commerce – Eureka
- City of Arcata
- City of Eureka
- City of Eureka Public Works and Building Department
- County of Humboldt Board of Supervisors
- FWS – Humboldt Bay National Wildlife Refuge
- Humboldt Bay Harbor, Recreation, and Conservation District
- Humboldt Community Services District
- Humboldt County Association of Governments
- Humboldt County Aviation Advisory Committee
- Humboldt County Department of Public Works – Aviation Division
- Humboldt County Farm Bureau
- Humboldt County Planning Department
- Humboldt County Public Works Department
- Humboldt County Resource Conservation District
- Manila Community Services Department
- McKinleyville Community Services District
- Natural Resources Conservation Service
- North Coast Unified Air Quality Management District
- North Coast Railroad Authority (now the Great Redwood Trail Agency)
- California Air Resources Board
- California Department of Boating and Waterways
- California Sea Grant
- California Coastal Commission (North Coast Office)

- California Coastal Conservancy
- California Department of Transportation
- California Environmental Protection Agency
- California Highway Patrol
- California Natural Resources Agency
- California State Lands Commission
- Department of Conservation
- California Department of Toxic Substances Control – CEQA Tracking Center
- Integrated Waste Management Board
- North Coast Regional Water Quality Board
- Oceans Protection Council
- State Office of Historic Preservation
- Wildlife Conservation Board
- Bureau of Land Management
- National Oceanic and Atmospheric Administration
- NOAA Fisheries Service
- Nuclear Regulatory Commission
- US Coast Guard – Eleventh Coast Guard District
- US Environmental Protection Agency
- US Army Corps of Engineers
- US Congressman Jared Huffman
- US Fish and Wildlife Service

Native American Tribal Governments:

- Bear River Band of the Rohnerville Rancheria
- Big Lagoon Rancheria
- Blue Lake Rancheria
- Trinidad Rancheria
- Hoopa Valley Tribe
- Table Bluff Reservation
- Wiyot Tribe
- Yurok Tribe
- Karuk Tribe
- Native American Heritage Commission

Climate Action and the Environmental Groups:

- Aldaron Laird, Greenway Partners
- Audubon Society
- Buckeye Conservancy
- California Trout, Inc.
- Environmental Protection Information Center

- Friends of Arcata Marsh
- Friends of the Dunes
- HSU Marine & Coastal Sciences Institute/SR Initiative
- Humboldt Bay Initiative
- Humboldt Bay Keeper
- Surfrider Foundation, Humboldt Chapter
- 350 Humboldt
- Center for Environmental Economic Development
- North Coast Environmental Center
- Plan It Green
- Humboldt Watershed Council
- Jacoby Creek Land Trust
- Keep Arcata Beautiful
- Keep Eureka Beautiful
- Mad River Alliance
- Pacific Coast Fish, Wildlife & Wetlands Restoration Center
- Trails Trust
- Great Redwood Trail Agency
- Stillwater Ecosystem Watershed
- Sierra Club North Group, Redwood chapter

Environmental Social Justice Groups and Service Providers:

- Black Humboldt
- Eureka NAACP
- Redwood Community Action Agency
- Seventh Generation Fund
- True North
- Creative Inclusion

Transportation Providers:

- Humboldt Transit Authority
- North Coast Rail Authority
- Local paratransit providers
- Freight Providers

Bicycle and Pedestrian Advocacy Groups:

- Humboldt Bay Bicycle Commuters Organization

Organizations:

- Coalition for Responsible Transportation Priorities
- The Pacific Coast Federation of Fishermen's Associations
- Resident and neighborhood groups
- Community-based organizations
- Agricultural organizations

Local Businesses:

- Saltwater Anglers Association
- Schatz Energy Resource Center
- AT&T
- Verizon
- Alves Resale Lumber
- Ayres Family Cremation
- Bayside Garden Supplies
- Berry RV Storage
- Bobcat of Eureka
- California Trailers
- Carl Johnson Hardware
- Carlson Wireless Technologies
- Coast Seafood
- Coastline Foursquare Church
- Don's Rent All
- Eureka Freightliner
- Eureka Oxygen Company
- Franz Bakery Outlet
- Gas Stoves with Style
- GHD
- Gordon Engineering
- Happy Dog Day Care and Boarding
- Harper Motors
- Hoff Outdoor Advertising
- Hog Island
- HT Harvey and Associates Consulting
- Humboldt River Company
- J's RV Center
- John's Used Cars
- Mid City Honda
- Mid City Motor World
- Mid City Toyota
- Murray Airfield
- Northern Hydrology & Engineering

- Paper Material Handling
- Pawlor
- Point Blue Conservation Science
- PWA/Cascadia Geosciences
- Rainbow Self Storage
- Rental Guys
- Resale Lumber
- Smart Foodservice Warehouse Stores
- Taylor Mari culture
- Tea LAB
- The Farm Store
- U-Haul
- United Rentals
- Lazy J Trailer Ranch

Safety Groups:

- California Highway Patrol
- California Office of Traffic Safety
- Fire Departments
- Police Departments (Eureka and Arcata)
- County Sheriffs

Utility Providers:

- PG&E (gas and overhead powerlines)
- Water lines

Outreach Methods and Engagement Activities

Prior Engagement

Prior public engagement activities included the 2021 District 1 Active Transportation Plan, the Humboldt Regional Bike Plan, the Humboldt Bay Trail Webpage, the Comprehensive Adaptation Implementation Plan (CAIP), the HCAOG Regional Transportation Plan, the Humboldt County General Plan, the District 1 Vulnerability Assessment, and the Humboldt County Sea Level Rise Adaptation Plan.

District 1 Active Transportation Plan (2021):

- Identified needs through a public comment map which received about 70 comments.
  - Driving speeds, turning habits and maintenance issues.
  - 13 public comments on Street Story.
  - Need for low-stress pedestrian and bicycling options.
  - High- and medium-priority active transportation improvements in the District.

  - Slough Bridges to Airport Road, and north extent near G Street are Tier 1.
  - Middle extent of project area is Tier 2.

Humboldt Regional Bike Plan (2018):

- Ongoing existing outreach and educational programs pertaining to bicycling infrastructure and advocacy in the area, including the Humboldt Bay Trail.

Humboldt Bay Trail Webpage

- Timeline detailing previous and future segments and other documentation.

HCAOG Regional Transportation Plan

- Extensive public participation during update of RTP including targeted outreach in addition to multiple committee and board meetings.
  - August, September, October and November, 2021 TAC meetings
  - November, 2021 HCAOG Board meeting

The Humboldt County General Plan

- Informed by Planning Committee meetings available as a public forum on the first and third Thursdays of each month.

District 1 Vulnerability Assessment:

- Online mapping tool that enables California residents to identify areas exposed to climate change.

Humboldt County Sea Level Rise Adaptation Plan:

- Outreach for this planning effort centered on reaching out to four groups: Local Coastal Program agencies, permitting and public agencies, asset owners, and community. This document presents a list of stakeholders and their general concerns.

0M270:

- Public outreach meetings focused on external agencies:
- The Eureka-Arcata Corridor Chat was held with the California Department of Fish & Wildlife, 05/07/2024
- The 0M270 Update #1 was held with CDFW, the City of Arcata, Humboldt County, the Coastal Commission, and CalPoly, 06/26/2024
- The Eureka-Arcata Corridor Update #2 was held with CalPoly, Humboldt County, CDFW, City of Arcata, the Coastal Commission, and the City of Eureka, 07/08/2024
- A fact sheet regarding the project's scope and CAIP was ***tentatively*** distributed to city and county governments and special-interest stakeholders in ***late 2024***

The PEP provides a range of methods and tools to reach diverse audiences. The selected methods are designed to provide opportunities for people with different levels of expertise and interest in the process. Due to the technical content of the CAIP, we expect the majority of the efforts to respond to the needs of more well-informed participants. The process will, however, emphasize providing information that is clear and assessable to help stimulate interest and participation by the general public. This section outlines the engagement activities planned.

Briefings and Presentations to the CA Coastal Commission. Caltrans is required to provide at a minimum an annual progress report to the Commission. D1 will conduct briefings and provide presentations as requested to help ensure this critical partner is well-informed about the planning process and the progress being made. Caltrans will meet regularly with CA Coastal Commission staff throughout the process.

Coordination with Local Governments. The Cities of Eureka and Arcata and Humboldt County may be engaged in updating their Local Coastal Plans to address Sea Level Rise. Caltrans will coordinate with these agencies to share information and strategies to help ensure that planning processes are in alignment and achieve mutual goals.

Native American Tribal Outreach Support. Caltrans will take the lead on Native American consultation and coordination, led by the Native American liaison staff in Caltrans District 1 with advice as needed from the Caltrans HQ Native American Liaison Branch. Coordination should start as early as possible. Caltrans will reference the CA Coastal Commission memorandum on tribal coordination to guide these efforts and inform the CA Coast Commission about any specific issues or concerns from Native American Tribes that are raised.

D1 Website. Materials related to the planning and outreach process will be hosted on the D1 Current Projects website at: https://dot.ca.gov/caltrans-near-me/district-1/d1-projects. This will facilitate information sharing and provide a host location to host and publicize outreach activities.

Outreach Materials. Informational materials to support outreach activities and generate content that can be posted on the D1 website will be developed. Outreach materials will include a basic project fact sheet, Frequently Asked Questions (FAQs), and maps. All work products will be digital files suitable for printing and posting on the website. Text and images will be user-friendly and materials posted on the website will be ADA accessible.

Visualizations and Graphics. D1 will provide graphics and imagery that helps stakeholders and the public better understand how a solution or strategy would be implemented in the planning corridor. Graphics may include simple sketches, photo-simulations, and other formats depending on available resources.

Outreach Communications. The planning process will rely on established D1 communications channels including email communication, e-blasts, media, and social media. The team will work with partners to help publicize these activities.

Public Workshop. Caltrans will host a public workshop to share information about the plan, receive ideas and show visualizations of some of the potential strategies that will be considered.

The workshop should include a PowerPoint presentation, use of digital tools to support participation and polling to learn about community preferences for different strategies and solutions. The workshop ***will tentatively*** be held in 2026.

Online Comment Map. Caltrans will publish a comment map through the organizational AGOL account, which will go live after the technical report is delivered. This map will allow the public to both see and learn about projects and potential alternatives and leave comments regarding these projects, design alternatives, or climate-change related issues in the project area.

Comments on Draft CAIP. The CAIP will include a review process. Caltrans seeks to keep participants engaged throughout the process so they can provide meaningful feedback on the draft plan. The process will rely on established channels and relationships to promote the review period and process for making comments.

Schedule

Caltrans has been directed by the Coastal Commission to complete the CAIP by December 2027. We expect there will be annual activities to engage and update the public, along with ongoing coordination between Caltrans and its partners with technical expertise. The following table provides an approximate schedule for the public engagement activities.

Engagement Timeline	
2021: Introduce the CAIP and Receive Initial Input	
January 13th	Coastal Commission Update
January 15th	Lost Coast Outpost article
September 20th	Brown Bag Lunch at Osher Lifelong Learning Institute, hosted by HSU
October 27th	YouTube live forum
2022: Present Alternative Strategies and Solutions	
May 9th	Website established
July 13th	Coastal Commission Update
August 22nd	Eureka Rotary Club Update
2023: Technical Analysis	

September 7th	HCAOG UPDATE
September 20th	City of Arcata City Council update
2024: Continue Technical Analysis	
March	CAIP TAC Formed, 1st TAC Meeting
April 12th	Humboldt Bay Symposium
May 8th	Coastal Commission update
July	2nd TAC Meeting
December	CAIP Outline: Internal Feedback
2025: Prepare Draft CAIP and Evaluate Adaptation Options	
February	CAIP Outline: CA Coastal Commission & TAC Feedback 3rd TAC Meeting Forward Summary of Cal Poly Humboldt Research
August	Local Coordination: City of Arcata, CDFW
October	Local Coordination: Humboldt County, City of Eureka Coastal Commission Hearing, Dec. 2027 Extension Granted 4th TAC Meeting
December	Draft 1 of CAIP complete Internal review of Draft 1
2026: Public Engagement and Refine CAIP	
January	Internal Planning for Public Workshop Local Coordination: Adjacent parcel owners
February	Internal review of Draft 1 complete
April	CAIP Draft 1 Review: TAC
May	Executive Staff Review Draft 2 for targeted decisions
August	Agencies review CAIP draft

October/November	Public Workshop: Caltrans presentation, supportive visual elements and informational material in event space, includes time for public questions. This presentation will be based on current CAIP draft. Public reviews CAIP draft
2027: Finalize CAIP	
January/February	Final CAIP Updates
November	CA Coastal Commission Hearing
December	Final CAIP complete

Publicity and Outreach Methods

Each of the activities described above will require publicity through established Caltrans channels as well as supplemental outreach efforts in coordination with trusted partners, agency representatives, and local community groups. The project team will work to identify the timing and content for outreach efforts. This section outlines each of the outreach tools that could be used to spread the word about the planning process and foster participation.

Website Updates: The D1 website: https://dot.ca.gov/caltrans-near-me/district-1/d1-projects. will be an important place to post information and updates about the CAIP. D1 should keep the project webpage up to date as project materials are developed.

E-mails: The project team will establish an extensive email list utilizing current contact lists and collecting additional contacts through the survey and mapping/game activity. The team will also coordinate with the Coastal Commission, CBO partners, public agencies and others to ask them to share emails or information on behalf of the project. Caltrans will provide an email address in materials and on the website where a person can sign up to receive information about the CAIP and outreach activities as it becomes available.

Social Media Engagement: Regular posts on Instagram, Facebook and Twitter accounts will be used to keep people engaged in the CAIP and promote SLR awareness and educational material. Posts may focus on project milestones, upcoming community engagement opportunities, and key findings.

Press Releases and Local Media Relations: Caltrans will issue a press release to local media outlets at project milestones to help publicize the survey and community engagement opportunities. In addition to physical copies, a digital version of the fact sheet should be posted on Caltrans District websites, social media channels and submitted to local newspapers.

Performance Metrics

The public engagement process will be assessed according to its ability to reach a broad range of stakeholder groups and achieve targeted objectives. Caltrans will consider the following metrics to track and evaluate public engagement efforts:

- Number of participants and responses
- Number and range of agencies and organizations participating
- Quality of input/contribution (as determined by completeness and specificity) and quantity of input/contribution
- Demographics of respondents and related Title IV data

Plan Updates

The Public Engagement Plan is a living document that will be updated as needed to be responsive to the outreach needs of the project. The strategy will be modified as needed to ensure the team achieves the goals of the PEP. Revisions may also be suggested during regular meetings between Caltrans and the CA Coastal Commission

Appendix E Timeline Tables from the Vulnerability Assessment

Timeline tables show the year and frequency of flood conditions (dry through severe) for various SLR scenarios. This output enables the viewer to identify the approximate decade when target resilience (i.e., fewer than 0.01 days/year of severe flood conditions) is reached under each SLR scenario. Timeline tables for the six vulnerability zones are shown in Table E1 through E6. This output supports identification of "trigger years" for adaptive management action.

Table E1 (a-e). Timeline tables generated using the vulnerability spreadsheet tool. Tables show flood depth over highway travel lanes and the shoulders for Zone W_56, the southbound portion of the Corridor between SR 255 and Bracut. The green row represents the number of days per year in which the water depth is less than or equal to 0.5 inches on the roadway. The orange row represents the number of days per year when the water depths are between 0.5 and 4 (inclusive) inches on the roadway. The red row represents the number of days per year when the water depth on the roadway is greater than 4 inches.

E1a) The lowest road elevation in W_56 is set to 10.12 ft NAVD88 (current roadway conditions). In the current scenario, severe flood conditions are predicted to occur 0.06 days/year (more often than the target resiliency of 0.01/days per year). Note that in the 2100 High SLR scenario, water depth is greater than 4 inches on the roadway 365.21 days in a year.

Relative sea-level change for OPC (2024) scenarios relative to Year 2000

Vulnerability Threshold	Year 2023 0.207 ft SLC	2050 - Int 0.8 ft SLC	2080 - Int 1.8 ft SLC	2100 - Int 3.1 ft SLC	2100 - Int-High 4.9 ft SLC	2100 - High 6.6 ft SLC	2150 - Int-High 8.3 ft SLC	2150 - High 11.9 ft SLC
# d/yr <= 0.5 in	365.08	363.79	341.97	183.23	2.49	< 0.01	< 0.01	< 0.01
0.5 in < # d/yr <= 4 in	0.11	0.85	11.31	50.61	5.18	0.04	< 0.01	< 0.01
# d/yr > 4 in	0.06	0.60	11.97	131.40	357.58	365.21	365.25	365.25

E1b) The lowest road elevation in W_56 is set to 12 ft NAVD88. This is the planned roadway elevation for the Eureka/Arcata 101 SLR Resilience Project (0M270). Severe flood conditions are projected to occur less than 0.01 days/year up until the 2070 Intermediate SLR Scenario (not shown).

Relative sea-level change for OPC (2024) scenarios relative to Year 2000

Vulnerability Threshold	Year 2023 0.207 ft SLC	2050 - Int 0.8 ft SLC	2080 - Int 1.8 ft SLC	2100 - Int 3.1 ft SLC	2100 - Int-High 4.9 ft SLC	2100 - High 6.6 ft SLC	2150 - Int-High 8.3 ft SLC	2150 - High 11.9 ft SLC
# d/yr <= 0.5 in	365.25	365.25	365.13	359.07	190.21	6.23	< 0.01	< 0.01
0.5 in < # d/yr <= 4 in	< 0.01	< 0.01	0.08	3.39	49.95	10.11	0.04	< 0.01
# d/yr > 4 in	< 0.01	< 0.01	0.04	2.79	125.09	348.91	365.21	365.25

E1c) The lowest road elevation in W_56 is set to 16 ft NAVD88. This elevation would provide targeted resilience to 2100 Intermediate-High SLR Scenario; both moderate and severe flood conditions occur less than 0.01 days/year.

Relative sea-level change for OPC (2024) scenarios relative to Year 2000								
Vulnerability Threshold	Year 2023 0.207 ft SLC	2050 - Int 0.8 ft SLC	2080 - Int 1.8 ft SLC	2100 - Int 3.1 ft SLC	2100 - Int-High 4.9 ft SLC	2100 - High 6.6 ft SLC	2150 - Int-High 8.3 ft SLC	2150 - High 11.9 ft SLC
# d/yr <= 0.5 in	365.25	365.25	365.25	365.25	365.25	363.78	285.35	< 0.01
0.5 in < # d/yr <= 4 in	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.86	31.25	0.04
# d/yr > 4 in	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.61	48.65	365.21

E1d) The lowest road elevation in W_56 is set to 17 ft NAVD88. This elevation would provide greater resilience than 16 ft roadway elevation, but moderate and severe flood conditions are still projected to occur more frequently than 0.01 days/year in the 2100 High SLR Scenario.

Relative sea-level change for OPC (2024) scenarios relative to Year 2000								
Vulnerability Threshold	Year 2023 0.207 ft SLC	2050 - Int 0.8 ft SLC	2080 - Int 1.8 ft SLC	2100 - Int 3.1 ft SLC	2100 - Int-High 4.9 ft SLC	2100 - High 6.6 ft SLC	2150 - Int-High 8.3 ft SLC	2150 - High 11.9 ft SLC
# d/yr <= 0.5 in	365.25	365.25	365.25	365.25	365.25	365.19	354.30	1.49
0.5 in < # d/yr <= 4 in	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.04	5.84	3.52
# d/yr > 4 in	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.02	5.11	360.24

E1e) The lowest road elevation in W_56 is set to 18 ft NAVD88. This elevation would provide targeted resilience to the 2100 High SLR scenario; both moderate and severe flood conditions are projected to occur less than 0.01 days/year.

Relative sea-level change for OPC (2024) scenarios relative to Year 2000								
Vulnerability Threshold	Year 2023 0.207 ft SLC	2050 - Int 0.8 ft SLC	2080 - Int 1.8 ft SLC	2100 - Int 3.1 ft SLC	2100 - Int-High 4.9 ft SLC	2100 - High 6.6 ft SLC	2150 - Int-High 8.3 ft SLC	2150 - High 11.9 ft SLC
# d/yr <= 0.5 in	365.25	365.25	365.25	365.25	365.25	365.25	364.56	40.86
0.5 in < # d/yr <= 4 in	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.42	33.79
# d/yr > 4 in	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.27	290.60

Table E2 (a-e). Timeline tables generated using the vulnerability spreadsheet tool. Tables show flood depth over highway travel lanes and the shoulders for Zone W_34, the southbound portion of the Corridor between Bracut and Brainard. The green row represents the number of days per year in which the water depth is less than or equal to 0.5 inches on the roadway. The orange row represents the number of days per year when the water depths are between 0.5 and 4 (inclusive) inches on the roadway. The red row represents the number of days per year when the water depth on the roadway is greater than 4 inches.

E2a) The lowest road elevation in W_34 is set to 9.28 ft NAVD88 (current roadway conditions). Note that in the 2100 High SLR scenario, water depth is greater than 4 inches on the roadway 365.21 days in a year.

Relative sea-level change for OPC (2024) scenarios relative to Year 2000

Vulnerability Threshold	Year 2023 0.207 ft SLC	2050 - Int 0.8 ft SLC	2080 - Int 1.8 ft SLC	2100 - Int 3.1 ft SLC	2100 - Int-High 4.9 ft SLC	2100 - High 6.6 ft SLC	2150 - Int-High 8.3 ft SLC	2150 - High 11.9 ft SLC
# d/yr <= 0.5 in	365.23	365.05	360.36	284.43	22.62	< 0.01	< 0.01	< 0.01
0.5 in < # d/yr <= 4 in	< 0.01	0.10	1.99	21.85	14.36	0.04	< 0.01	< 0.01
# d/yr > 4 in	< 0.01	0.10	2.90	58.97	328.27	365.21	365.25	365.25

E2b) The lowest road elevation in W_34 is set to 12 ft NAVD88. This is the planned roadway elevation for the Eureka/Arcata 101 SLR Resilience Project (0M270). Moderate and severe flood conditions are projected to occur less than 0.01 days/year through the 2080 Intermediate SLR Scenario.

Relative sea-level change for OPC (2024) scenarios relative to Year 2000

Vulnerability Threshold	Year 2023 0.207 ft SLC	2050 - Int 0.8 ft SLC	2080 - Int 1.8 ft SLC	2100 - Int 3.1 ft SLC	2100 - Int-High 4.9 ft SLC	2100 - High 6.6 ft SLC	2150 - Int-High 8.3 ft SLC	2150 - High 11.9 ft SLC
# d/yr <= 0.5 in	365.25	365.25	365.24	364.13	286.06	38.43	< 0.01	< 0.01
0.5 in < # d/yr <= 4 in	< 0.01	< 0.01	< 0.01	0.51	22.51	21.19	0.07	< 0.01
# d/yr > 4 in	< 0.01	< 0.01	< 0.01	0.61	56.68	305.63	365.18	365.25

E2c) The lowest road elevation in W_34 is set to 16 ft NAVD88. This elevation would provide targeted resilience to 2100 Intermediate-High SLR Scenario; both moderate and severe flood conditions occur less than 0.01 days/year.

Relative sea-level change for OPC (2024) scenarios relative to Year 2000

Vulnerability Threshold	Year 2023 0.207 ft SLC	2050 - Int 0.8 ft SLC	2080 - Int 1.8 ft SLC	2100 - Int 3.1 ft SLC	2100 - Int-High 4.9 ft SLC	2100 - High 6.6 ft SLC	2150 - Int-High 8.3 ft SLC	2150 - High 11.9 ft SLC
# d/yr <= 0.5 in	365.25	365.25	365.25	365.25	365.25	363.77	285.65	< 0.01
0.5 in < # d/yr <= 4 in	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.86	31.15	0.04
# d/yr > 4 in	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.61	48.45	365.21

E2d) The lowest road elevation in W_34 is set to 17 ft NAVD88. This elevation would provide greater resilience than 16 ft roadway elevation, but moderate and severe flood conditions are still projected to occur more frequently than 0.01 days/year in the 2100 High SLR Scenario.

Relative sea-level change for OPC (2024) scenarios relative to Year 2000

Vulnerability Threshold	Year 2023 0.207 ft SLC	2050 - Int 0.8 ft SLC	2080 - Int 1.8 ft SLC	2100 - Int 3.1 ft SLC	2100 - Int-High 4.9 ft SLC	2100 - High 6.6 ft SLC	2150 - Int-High 8.3 ft SLC	2150 - High 11.9 ft SLC
# d/yr <= 0.5 in	365.25	365.25	365.25	365.25	365.25	365.19	354.35	1.51
0.5 in < # d/yr <= 4 in	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.04	5.79	3.56
# d/yr > 4 in	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.02	5.10	360.18

E2e) The lowest road elevation in W_34 is set to 18 ft NAVD88. This elevation would provide targeted resilience to the 2100 High SLR scenario; both moderate and severe flood conditions are projected to occur less than 0.01 days/year.

Relative sea-level change for OPC (2024) scenarios relative to Year 2000

Vulnerability Threshold	Year 2023 0.207 ft SLC	2050 - Int 0.8 ft SLC	2080 - Int 1.8 ft SLC	2100 - Int 3.1 ft SLC	2100 - Int-High 4.9 ft SLC	2100 - High 6.6 ft SLC	2150 - Int-High 8.3 ft SLC	2150 - High 11.9 ft SLC
# d/yr <= 0.5 in	365.25	365.25	365.25	365.25	365.25	365.25	364.56	41.14
0.5 in < # d/yr <= 4 in	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.42	33.90
# d/yr > 4 in	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.27	290.21

Table E3 (a-e). Timeline tables generated using the vulnerability spreadsheet tool. Tables show flood depth over highway travel lanes and the shoulders for Zone W_12, the southbound portion of the Corridor between Brainard and Eureka Slough Bridges. The green row represents the number of days per year in which the water depth is less than or equal to 0.5 inches on the roadway. The orange row represents the number of days per year when the water depths are between 0.5 and 4 (inclusive) inches on the roadway. The red row represents the number of days per year when the water depth on the roadway is greater than 4 inches.

E3a) The lowest road elevation in W_12 is set to 10.86 ft NAVD88 (current roadway conditions). Note that in the 2100 High SLR scenario, water depth is greater than 4 inches on the roadway 365.15 days in a year.

Relative sea-level change for OPC (2024) scenarios relative to Year 2000								
Vulnerability Threshold	Year 2023 0.207 ft SLC	2050 - Int 0.8 ft SLC	2080 - Int 1.8 ft SLC	2100 - Int 3.1 ft SLC	2100 - Int-High 4.9 ft SLC	2100 - High 6.6 ft SLC	2150 - Int-High 8.3 ft SLC	2150 - High 11.9 ft SLC
# d/yr <= 0.5 in	365.24	365.11	361.52	296.46	29.38	< 0.01	< 0.01	< 0.01
0.5 in < # d/yr <= 4 in	< 0.01	0.09	1.93	25.33	24.36	0.10	< 0.01	< 0.01
# d/yr > 4 in	< 0.01	0.06	1.81	43.46	311.51	365.15	365.25	365.25

E3b) The lowest road elevation in W_12 is set to 12 ft NAVD88. This is the planned roadway elevation for the Eureka/Arcata 101 SLR Resilience Project (0M270). Severe flood conditions are projected to occur less than 0.01 days/year up until the 2070 Intermediate SLR Scenario (not shown).

Relative sea-level change for OPC (2024) scenarios relative to Year 2000								
Vulnerability Threshold	Year 2023 0.207 ft SLC	2050 - Int 0.8 ft SLC	2080 - Int 1.8 ft SLC	2100 - Int 3.1 ft SLC	2100 - Int-High 4.9 ft SLC	2100 - High 6.6 ft SLC	2150 - Int-High 8.3 ft SLC	2150 - High 11.9 ft SLC
# d/yr <= 0.5 in	365.25	365.25	365.13	359.23	192.25	6.46	< 0.01	< 0.01
0.5 in < # d/yr <= 4 in	< 0.01	< 0.01	0.08	3.33	50.80	10.72	0.04	< 0.01
# d/yr > 4 in	< 0.01	< 0.01	0.04	2.68	122.20	348.07	365.21	365.25

E3c) The lowest road elevation in W_12 is set to 16 ft NAVD88. This elevation would provide targeted resilience to 2100 Intermediate-High SLR Scenario; both moderate and severe flood conditions occur less than 0.01 days/year.

Relative sea-level change for OPC (2024) scenarios relative to Year 2000								
Vulnerability Threshold	Year 2023 0.207 ft SLC	2050 - Int 0.8 ft SLC	2080 - Int 1.8 ft SLC	2100 - Int 3.1 ft SLC	2100 - Int-High 4.9 ft SLC	2100 - High 6.6 ft SLC	2150 - Int-High 8.3 ft SLC	2150 - High 11.9 ft SLC
# d/yr <= 0.5 in	365.25	365.25	365.25	365.25	365.25	363.93	290.39	< 0.01
0.5 in < # d/yr <= 4 in	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.78	29.78	0.04
# d/yr > 4 in	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.55	45.08	365.21

E3d) The lowest road elevation in W_12 is set to 17 ft NAVD88. This elevation would provide greater resilience than 16 ft roadway elevation, but moderate and severe flood conditions are still projected to occur more frequently than 0.01 days/year in the 2100 High SLR Scenario.

Relative sea-level change for OPC (2024) scenarios relative to Year 2000

Vulnerability Threshold	Year 2023 0.207 ft SLC	2050 - Int 0.8 ft SLC	2080 - Int 1.8 ft SLC	2100 - Int 3.1 ft SLC	2100 - Int-High 4.9 ft SLC	2100 - High 6.6 ft SLC	2150 - Int-High 8.3 ft SLC	2150 - High 11.9 ft SLC
# d/yr <= 0.5 in	365.25	365.25	365.25	365.25	365.25	365.20	355.39	1.78
0.5 in < # d/yr <= 4 in	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.03	5.21	3.96
# d/yr > 4 in	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.02	4.65	359.51

E3e) The lowest road elevation in W_12 is set to 18 ft NAVD88. This elevation would provide targeted resilience to the 2100 High SLR scenario; both moderate and severe flood conditions are projected to occur less than 0.01 days/year.

Relative sea-level change for OPC (2024) scenarios relative to Year 2000

Vulnerability Threshold	Year 2023 0.207 ft SLC	2050 - Int 0.8 ft SLC	2080 - Int 1.8 ft SLC	2100 - Int 3.1 ft SLC	2100 - Int-High 4.9 ft SLC	2100 - High 6.6 ft SLC	2150 - Int-High 8.3 ft SLC	2150 - High 11.9 ft SLC
# d/yr <= 0.5 in	365.25	365.25	365.25	365.25	365.25	365.25	364.63	44.42
0.5 in < # d/yr <= 4 in	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.38	35.35
# d/yr > 4 in	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.24	285.48

Table E4 (a-e). Timeline tables generated using the vulnerability spreadsheet tool. Tables show flood depth over highway travel lanes and the shoulders for Zone E_56, the northbound portion of the Corridor between SR 255 and Bracut. The green row represents the number of days per year in which the water depth is less than or equal to 0.5 inches on the roadway. The orange row represents the number of days per year when the water depths are between 0.5 and 4 (inclusive) inches on the roadway. The red row represents the number of days per year when the water depth on the roadway is greater than 4 inches.

E4a) The lowest road elevation in E_56 is set to 11.01 ft NAVD88 (current roadway conditions). Note that in the 2100 High SLR scenario, water depth on the roadway is greater than 4 inches 355.80 days per year.

Relative sea-level change for OPC (2024) scenarios relative to Year 2000								
Vulnerability Threshold	Year 2023 0.207 ft SLC	2050 - Int 0.8 ft SLC	2080 - Int 1.8 ft SLC	2100 - Int 3.1 ft SLC	2100 - Int-High 4.9 ft SLC	2100 - High 6.6 ft SLC	2150 - Int-High 8.3 ft SLC	2150 - High 11.9 ft SLC
# d/yr <= 0.5 in	365.25	365.25	365.12	358.63	185.56	5.66	< 0.01	< 0.01
0.5 in < # d/yr <= 4 in	< 0.01	0.02	0.97	2.07	25.16	3.74	< 0.01	< 0.01
# d/yr > 4 in	< 0.01	< 0.01	0.16	5.47	154.45	355.80	365.21	365.25

E4b) The lowest road elevation in E_56 is set to 12 ft NAVD88. This is the planned southbound roadway elevation for the Eureka/Arcata 101 SLR Resilience Project (0M270). Findings indicate low elevation portions of E_56 are vulnerable to flooding by 2060. A minor grade raise to 12 ft NAVD88 along this zone of the Corridor could provide target resilience to 2090.

Relative sea-level change for OPC (2024) scenarios relative to Year 2000								
Vulnerability Threshold	Year 2023 0.207 ft SLC	2050 - Int 0.8 ft SLC	2080 - Int 1.8 ft SLC	2100 - Int 3.1 ft SLC	2100 - Int-High 4.9 ft SLC	2100 - High 6.6 ft SLC	2150 - Int-High 8.3 ft SLC	2150 - High 11.9 ft SLC
# d/yr <= 0.5 in	365.25	365.25	365.23	363.66	269.89	28.35	< 0.01	< 0.01
0.5 in < # d/yr <= 4 in	< 0.01	< 0.01	0.01	1.55	21.66	14.41	< 0.01	< 0.01
# d/yr > 4 in	< 0.01	< 0.01	< 0.01	1.01	73.98	322.33	365.21	365.25

E4c) The lowest road elevation in E_56 is set to 16 ft NAVD88. This elevation would provide targeted resilience to the 2100 Intermediate-High SLR Scenario; both moderate and severe flood conditions occur less than 0.01 days/year.

Relative sea-level change for OPC (2024) scenarios relative to Year 2000								
Vulnerability Threshold	Year 2023 0.207 ft SLC	2050 - Int 0.8 ft SLC	2080 - Int 1.8 ft SLC	2100 - Int 3.1 ft SLC	2100 - Int-High 4.9 ft SLC	2100 - High 6.6 ft SLC	2150 - Int-High 8.3 ft SLC	2150 - High 11.9 ft SLC
# d/yr <= 0.5 in	365.25	365.25	365.25	365.25	365.25	363.78	285.35	< 0.01
0.5 in < # d/yr <= 4 in	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.86	30.76	< 0.01
# d/yr > 4 in	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.61	49.52	365.21

E4d) The lowest road elevation in E_56 is set to 17 ft NAVD88. This elevation would provide greater resilience than 16 ft roadway elevation, but moderate and severe flood conditions are still projected to occur more frequently than 0.01 days/year in the 2100 High SLR Scenario.

Relative sea-level change for OPC (2024) scenarios relative to Year 2000								
Vulnerability Threshold	Year 2023 0.207 ft SLC	2050 - Int 0.8 ft SLC	2080 - Int 1.8 ft SLC	2100 - Int 3.1 ft SLC	2100 - Int-High 4.9 ft SLC	2100 - High 6.6 ft SLC	2150 - Int-High 8.3 ft SLC	2150 - High 11.9 ft SLC
# d/yr <= 0.5 in	365.25	365.25	365.25	365.25	365.25	365.19	354.30	1.49
0.5 in < # d/yr <= 4 in	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.04	6.42	3.49
# d/yr > 4 in	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.02	5.41	360.25

E4e) The lowest road elevation in E_56 is set to 18 ft NAVD88. This elevation would provide targeted resilience to the 2100 High SLR scenario; both moderate and severe flood conditions are projected to occur less than 0.01 days/year.

Relative sea-level change for OPC (2024) scenarios relative to Year 2000								
Vulnerability Threshold	Year 2023 0.207 ft SLC	2050 - Int 0.8 ft SLC	2080 - Int 1.8 ft SLC	2100 - Int 3.1 ft SLC	2100 - Int-High 4.9 ft SLC	2100 - High 6.6 ft SLC	2150 - Int-High 8.3 ft SLC	2150 - High 11.9 ft SLC
# d/yr <= 0.5 in	365.25	365.25	365.25	365.25	365.25	365.25	364.57	40.86
0.5 in < # d/yr <= 4 in	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.41	33.39
# d/yr > 4 in	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.27	290.81

Table E5 (a-e). Timeline tables generated using the vulnerability spreadsheet tool. Tables show flood depth over highway travel lanes and the shoulders for Zone E_34, the northbound portion of the Corridor between Bracut and Brainard. The green row represents the number of days per year in which the water depth is less than or equal to 0.5 inches on the roadway. The orange row represents the number of days per year when the water depths are between 0.5 and 4 (inclusive) inches on the roadway. The red row represents the number of days per year when the water depth on the roadway is greater than 4 inches.

E5a) The lowest road elevation in E_34 is set to 8.90 ft NAVD88 (current roadway conditions). This elevation provides target resilience to 2070. The Eureka/Arcata 101 SLR Resilience Project (0M270), which will raise the southbound lanes to 12 ft, may provide some protection to northbound lanes and extend the target resilience of E_34 beyond 2070. Note that in the 2100 High SLR scenario, water depth on the roadway is greater than 4 inches 358.59 days per year.

Relative sea-level change for OPC (2024) scenarios relative to Year 2000								
Vulnerability Threshold	Year 2023 0.207 ft SLC	2050 - Int 0.8 ft SLC	2080 - Int 1.8 ft SLC	2100 - Int 3.1 ft SLC	2100 - Int-High 4.9 ft SLC	2100 - High 6.6 ft SLC	2150 - Int-High 8.3 ft SLC	2150 - High 11.9 ft SLC
# d/yr <= 0.5 in	365.25	365.25	365.11	358.36	183.13	5.39	< 0.01	< 0.01
0.5 in < # d/yr <= 4 in	< 0.01	< 0.01	0.02	0.92	9.84	1.22	< 0.01	< 0.01
# d/yr > 4 in	< 0.01	< 0.01	0.11	6.89	172.20	358.59	365.21	365.25

E5b) The lowest road elevation in E_34 is set to 16 ft NAVD88. This elevation would provide targeted resilience to 2100 Intermediate-High SLR Scenario; both moderate and severe flood conditions occur less than 0.01 days/year.

Relative sea-level change for OPC (2024) scenarios relative to Year 2000								
Vulnerability Threshold	Year 2023 0.207 ft SLC	2050 - Int 0.8 ft SLC	2080 - Int 1.8 ft SLC	2100 - Int 3.1 ft SLC	2100 - Int-High 4.9 ft SLC	2100 - High 6.6 ft SLC	2150 - Int-High 8.3 ft SLC	2150 - High 11.9 ft SLC
# d/yr <= 0.5 in	365.25	365.25	365.25	365.25	365.25	363.78	285.65	< 0.01
0.5 in < # d/yr <= 4 in	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.89	30.66	< 0.01
# d/yr > 4 in	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.61	49.32	365.21

E5c) The lowest road elevation in E_34 is set to 17 ft NAVD88. This elevation would provide greater resilience than 16 ft roadway elevation, but moderate and severe flood conditions are still projected to occur more frequently than 0.01 days/year in the 2100 High SLR Scenario.

Relative sea-level change for OPC (2024) scenarios relative to Year 2000								
Vulnerability Threshold	Year 2023 0.207 ft SLC	2050 - Int 0.8 ft SLC	2080 - Int 1.8 ft SLC	2100 - Int 3.1 ft SLC	2100 - Int-High 4.9 ft SLC	2100 - High 6.6 ft SLC	2150 - Int-High 8.3 ft SLC	2150 - High 11.9 ft SLC
# d/yr <= 0.5 in	365.25	365.25	365.25	365.25	365.25	365.19	354.35	1.51
0.5 in < # d/yr <= 4 in	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.04	5.69	3.53
# d/yr > 4 in	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.02	6.09	360.19

E5d) The lowest road elevation in E_34 is set to 18 ft NAVD88. This elevation would provide targeted resilience to the 2100 High SLR scenario; both moderate and severe flood conditions are projected to occur less than 0.01 days/year.

Relative sea-level change for OPC (2024) scenarios relative to Year 2000

Vulnerability Threshold	Year 2023 0.207 ft SLC	2050 - Int 0.8 ft SLC	2080 - Int 1.8 ft SLC	2100 - Int 3.1 ft SLC	2100 - Int-High 4.9 ft SLC	2100 - High 6.6 ft SLC	2150 - Int-High 8.3 ft SLC	2150 - High 11.9 ft SLC
# d/yr <= 0.5 in	365.25	365.25	365.25	365.25	365.25	365.25	364.56	41.14
0.5 in < # d/yr <= 4 in	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.41	33.50
# d/yr > 4 in	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.27	290.42

Table E6 (a-e). Timeline tables generated using the vulnerability spreadsheet tool. Tables show flood depth over highway travel lanes and the shoulders for Zone E_12, the northbound portion of the Corridor between Brainard and Eureka Slough Bridges. The green row represents the number of days per year in which the water depth is less than or equal to 0.5 inches on the roadway. The orange row represents the number of days per year when the water depths are between 0.5 and 4 (inclusive) inches on the roadway. The red row represents the number of days per year when the water depth on the roadway is greater than 4 inches.

E6a) The lowest road elevation in E_12 is set to 8.90 ft NAVD88 (current roadway conditions). This elevation provides target resilience to 2070. The Eureka/Arcata 101 SLR Resilience Project (0M270), which will raise the southbound lanes to 12 ft, may provide some protection to northbound lanes and extend the target resilience of E_12 beyond 2070. Note that in the 2100 High SLR scenario, water depth on the roadway is greater than 4 inches 358.50 days per year.

Relative sea-level change for OPC (2024) scenarios relative to Year 2000								
Vulnerability Threshold	Year 2023 0.207 ft SLC	2050 - Int 0.8 ft SLC	2080 - Int 1.8 ft SLC	2100 - Int 3.1 ft SLC	2100 - Int-High 4.9 ft SLC	2100 - High 6.6 ft SLC	2150 - Int-High 8.3 ft SLC	2150 - High 11.9 ft SLC
# d/yr <= 0.5 in	365.25	365.25	365.12	358.48	184.12	5.47	< 0.01	< 0.01
0.5 in < # d/yr <= 4 in	< 0.01	< 0.01	0.02	0.90	9.84	1.23	< 0.01	< 0.01
# d/yr > 4 in	< 0.01	< 0.01	0.11	6.80	171.22	358.50	365.21	365.25

E6b) The lowest road elevation in E_12 is set to 16 ft NAVD88. This elevation would provide targeted resilience to 2100 Intermediate-High SLR Scenario; both moderate and severe flood conditions occur less than 0.01 days/year.

Relative sea-level change for OPC (2024) scenarios relative to Year 2000								
Vulnerability Threshold	Year 2023 0.207 ft SLC	2050 - Int 0.8 ft SLC	2080 - Int 1.8 ft SLC	2100 - Int 3.1 ft SLC	2100 - Int-High 4.9 ft SLC	2100 - High 6.6 ft SLC	2150 - Int-High 8.3 ft SLC	2150 - High 11.9 ft SLC
# d/yr <= 0.5 in	365.25	365.25	365.25	365.25	365.25	363.81	286.83	< 0.01
0.5 in < # d/yr <= 4 in	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.87	30.35	< 0.01
# d/yr > 4 in	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.60	48.46	365.21

E6c) The lowest road elevation in E_12 is set to 17 ft NAVD88. This elevation would provide greater resilience than 16 ft roadway elevation, but moderate and severe flood conditions are still projected to occur more frequently than 0.01 days/year in the 2100 High SLR Scenario.

Relative sea-level change for OPC (2024) scenarios relative to Year 2000								
Vulnerability Threshold	Year 2023 0.207 ft SLC	2050 - Int 0.8 ft SLC	2080 - Int 1.8 ft SLC	2100 - Int 3.1 ft SLC	2100 - Int-High 4.9 ft SLC	2100 - High 6.6 ft SLC	2150 - Int-High 8.3 ft SLC	2150 - High 11.9 ft SLC
# d/yr <= 0.5 in	365.25	365.25	365.25	365.25	365.25	365.19	354.63	1.56
0.5 in < # d/yr <= 4 in	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.04	5.53	3.62
# d/yr > 4 in	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.02	5.97	360.06

E6d) The lowest road elevation in E_12 is set to 18 ft NAVD88. This elevation would provide targeted resilience to the 2100 High SLR scenario; both moderate and severe flood conditions are projected to occur less than 0.01 days/year.

Relative sea-level change for OPC (2024) scenarios relative to Year 2000

Vulnerability Threshold	Year 2023 0.207 ft SLC	2050 - Int 0.8 ft SLC	2080 - Int 1.8 ft SLC	2100 - Int 3.1 ft SLC	2100 - Int-High 4.9 ft SLC	2100 - High 6.6 ft SLC	2150 - Int-High 8.3 ft SLC	2150 - High 11.9 ft SLC
# d/yr <= 0.5 in	365.25	365.25	365.25	365.25	365.25	365.25	364.58	41.88
0.5 in < # d/yr <= 4 in	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.40	33.86
# d/yr > 4 in	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.27	289.31

Appendix F Multicriteria Evaluation of Adaptation Options

Table F1. Evaluation of adaptation options for Segment 1: Eureka Slough Bridges to Airport Road.

Segment 1 - Eureka Slough Bridges to Airport Road

ADAPTATION STRATEGIES	SOCIETY & EQUITY			
	1		2	
	Support or protect multimodal transportation options?		Access to housing, services, and jobs?	
	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	2	6.54	2	6.54
2. Raised Embankment with Living Shoreline	3	6.54	2	6.54

ADAPTATION STRATEGIES	ECONOMIC					
	3		4		5	
	Maintain essential infrastructure and community assets?		Improve the economy?		Support regional transportation?	
	Evaluate	Weight	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	2	6.54	2	6.54	2	6.54
2. Raised Embankment with Living Shoreline	3	6.54	3	6.54	3	6.54

ADAPTATION STRATEGIES	ENVIRONMENT							
	6		7		8		9	
	Utilize nature-based approach?		Self Mitigating?		Environmental performance?		Coastal squeeze	
	Evaluate	Weight	Evaluate	Weight	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	1	6.54	1	6.54	1	6.54	1	6.54
2. Raised Embankment with Living Shoreline	3	6.54	2	6.54	2	6.54	2	6.54

ADAPTATION STRATEGIES	FEASIBILITY			
	10		11	
	Consistent with existing plans, policies, programs?		Cost?	
	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	2	6.54	3	15.00
2. Raised Embankment with Living Shoreline	2	6.54	2	15.00

ADAPTATION STRATEGIES	ROBUSTNESS					
	12		13		14	
	Provide resilience to multiple hazards?		Flexible/adaptable?		Susceptibility to seismic hazards?	
	Evaluate	Weight	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	2	6.54	2	6.54	2	6.54
2. Raised Embankment with Living Shoreline	3	6.54	2	6.54	2	6.54

ADAPTATION STRATEGIES	SCORE TOTAL	RANKING
1. Raised Embankment	1.89	2
2. Raised Embankment with Living Shoreline	**2.39**	**1**

Table F2. Evaluation of adaptation options for Segment 2: Airport Road to North Fay Slough.

Segment 2 - Airport Road to N. Fay Slough

ADAPTATION STRATEGIES	SOCIETY & EQUITY			
	1		2	
	Support or protect multimodal transportation options?		Access to housing, services, and jobs?	
	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	2	6.54	2	6.54
2. Raised Embankment with Living Shoreline (LS)	3	6.54	2	6.54
3. Raised Embankment with Connection to Bay	2	6.54	2	6.54
4. Raised Embankment with LS and Connection to Bay	3	6.54	2	6.54
5. Viaduct	2	6.54	2	6.54
6. Viaduct with Living Shoreline	3	6.54	2	6.54

ADAPTATION STRATEGIES	ECONOMIC					
	3		4		5	
	Maintain essential infrastructure and community assets?		Improve the economy?		Support regional transportation?	
	Evaluate	Weight	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	2	6.54	2	6.54	2	6.54
2. Raised Embankment with Living Shoreline (LS)	3	6.54	3	6.54	3	6.54
3. Raised Embankment with Connection to Bay	2	6.54	3	6.54	2	6.54
4. Raised Embankment with LS and Connection to Bay	3	6.54	3	6.54	3	6.54
5. Viaduct	2	6.54	3	6.54	2	6.54
6. Viaduct with Living Shoreline	3	6.54	3	6.54	3	6.54

ADAPTATION STRATEGIES	ENVIRONMENT							
	6		7		8		9	
	Utilize Nature Based Approach?		Self Mitigating?		Environmental Performance?		Coastal squeeze	
	Evaluate	Weight	Evaluate	Weight	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	1	6.54	1	6.54	1	6.54	1	6.54
2. Raised Embankment with Living Shoreline (LS)	3	6.54	2	6.54	2	6.54	2	6.54
3. Raised Embankment with Connection to Bay	3	6.54	2	6.54	2	6.54	2	6.54
4. Raised Embankment with LS and Connection to Bay	3	6.54	3	6.54	2	6.54	2	6.54
5. Viaduct	3	6.54	3	6.54	3	6.54	3	6.54
6. Viaduct with Living Shoreline	3	6.54	3	6.54	3	6.54	3	6.54

Table F2 (continued). Evaluation of adaptation options for Segment 2: Airport Road to North Fay Slough.

ADAPTATION STRATEGIES	FEASIBILITY 10 Consistent with existing plans, policies, programs?		FEASIBILITY 11 Cost?	
	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	2	6.54	3	15.00
2. Raised Embankment with Living Shoreline (LS)	2	6.54	2	15.00
3. Raised Embankment with Connection to Bay	2	6.54	2	15.00
4. Raised Embankment with LS and connection to Bay	2	6.54	2	15.00
5. Viaduct	2	6.54	1	15.00
6. Viaduct with Living Shoreline	2	6.54	1	15.00

ADAPTATION STRATEGIES	ROBUSTNESS 12 Provide resiliece to multiple hazards?		ROBUSTNESS 13 Flexible/adaptable?		ROBUSTNESS 14 Susceptibility to seismic hazards?	
	Evaluate	Weight	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	2	6.54	2	6.54	2	6.54
2. Raised Embankment with Living Shoreline (LS)	3	6.54	2	6.54	2	6.54
3. Raised Embankment with Connection to Bay	2	6.54	2	6.54	2	6.54
4. Raised Embankment with LS and connection to Bay	3	6.54	2	6.54	2	6.54
5. Viaduct	3	6.54	1	6.54	3	6.54
6. Viaduct with Living Shoreline	3	6.54	1	6.54	3	6.54

ADAPTATION STRATEGIES	SCORE TOTAL	RANKING
1. Raised Embankment	1.89	6
2. Raised Embankment with Living Shoreline (LS)	2.39	3
3. Raised Embankment with Connection to Bay	2.13	5
4. Raised Embankment with LS and connection	**2.46**	**1**
5. Viaduct	2.24	4
6. Viaduct with Living Shoreline	2.44	2

Table F3. Evaluation of adaptation options for Segment 3: North Fay Slough Channel to North Brainard.

Segment 3 -N. Fay Slough Channel to North Brainard

ADAPTATION STRATEGIES	EQUITY			
	1		2	
	Support or protect multimodal transportation options?		Access to housing, services, and jobs?	
	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	2	6.54	2	6.54
2. Raised Embankment with Connection to Ba	2	6.54	2	6.54

ADAPTATION STRATEGIES	ECONOMIC					
	3		4		5	
	Maintain essential infrastructure and community assets?		Improve the economy?		ipport regional transportatio	
	Evaluate	Weight	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	2	6.54	2	6.54	2	6.54
2. Raised Embankment with Connection to Ba	2	6.54	3	6.54	2	6.54

ADAPTATION STRATEGIES	ENVIRONMENT							
	6		7		8		9	
	Utilize nature-based approach?		Self mitigating?		Environmental performance?		Coastal squeeze?	
	Evaluate	Weight	Evaluate	Weight	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	1	6.54	1	6.54	1	6.54	1	6.54
2. Raised Embankment with Connection to Ba	3	6.54	2	6.54	2	6.54	2	6.54

ADAPTATION STRATEGIES	FEASIBILITY			
	10		11	
	Consistent with existing plans, policies, programs?		Cost?	
	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	2	6.54	3	15.00
2. Raised Embankment with Connection to Ba	2	6.54	2	15.00

ADAPTATION STRATEGIES	ROBUSTNESS					
	12		13		14	
	Provide resilience to multiple hazards?		Flexible/adaptable?		Susceptibility to seismic hazards?	
	Evaluate	Weight	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	2	6.54	2	6.54	2	6.54
2. Raised Embankment with Connection to Ba	2	6.54	2	6.54	2	6.54

ADAPTATION STRATEGIES	SCORE TOTAL	RANKING
1. Raised Embankment	1.89	2
Connection to Bay	**2.13**	**1**

Table F4. Evaluation of adaptation options for Segment 4: North Brainard to South Indianola.

Segment 4 – North Brainard to South Indianola

ADAPTATION STRATEGIES	SOCIETY & EQUITY 1 Support or protect multimodal transportation		SOCIETY & EQUITY 2 Access to housing, services, and jobs?	
	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	2	6.54	2	6.54
2. Raised Embankment with Living Shoreline (LS)	3	6.54	2	6.54
3. Raised Embankment with Connection to Bay	2	6.54	2	6.54
4. Raised Embankment with LS and Connection to	3	6.54	2	6.54
5. Viaduct	2	6.54	2	6.54
6. Viaduct with Living Shoreline	3	6.54	2	6.54

ADAPTATION STRATEGIES	ECONOMIC 3 Maintain essential infrastructure and community assets?		ECONOMIC 4 Improve the economy?		ECONOMIC 5 ipport regional transportatio	
	Evaluate	Weight	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	2	6.54	2	6.54	2	6.54
2. Raised Embankment with Living Shoreline (LS)	3	6.54	3	6.54	3	6.54
3. Raised Embankment with Connection to Bay	2	6.54	3	6.54	2	6.54
4. Raised Embankment with LS and Connection to	3	6.54	3	6.54	3	6.54
5. Viaduct	2	6.54	3	6.54	2	6.54
6. Viaduct with Living Shoreline	3	6.54	3	6.54	3	6.54

ADAPTATION STRATEGIES	ENVIRONMENT 6 Utilize nature-based approach?		ENVIRONMENT 7 Self mitigating?		ENVIRONMENT 8 Environmental performance?		ENVIRONMENT 9 Coastal squeeze?	
	Evaluate	Weight	Evaluate	Weight	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	1	6.54	1	6.54	1	6.54	1	6.54
2. Raised Embankment with Living Shoreline (LS)	3	6.54	2	6.54	2	6.54	2	6.54
3. Raised Embankment with Connection to Bay	3	6.54	2	6.54	2	6.54	2	6.54
4. Raised Embankment with LS and Connection to	3	6.54	3	6.54	2	6.54	2	6.54
5. Viaduct	3	6.54	3	6.54	3	6.54	3	6.54
6. Viaduct with Living Shoreline	3	6.54	3	6.54	3	6.54	3	6.54

Table F4 (continued). Evaluation of adaptation options for Segment 4: North Brainard to South Indianola.

ADAPTATION STRATEGIES	FEASIBILITY			
	10		11	
	Consistent with existing plans, policies, programs?		Cost?	
	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	2	6.54	3	15.00
2. Raised Embankment with Living Shoreline (LS)	2	6.54	2	15.00
3. Raised Embankment with Connection to Bay	2	6.54	2	15.00
4. Raised Embankment with LS and Connection to	2	6.54	2	15.00
5. Viaduct	2	6.54	1	15.00
6. Viaduct with Living Shoreline	2	6.54	1	15.00

ADAPTATION STRATEGIES	ROBUSTNESS					
	12		13		14	
	Provide resilience to multiple hazards?		Flexible/adaptable?		Susceptibility to seismic hazards?	
	Evaluate	Weight	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	2	6.54	2	6.54	2	6.54
2. Raised Embankment with Living Shoreline (LS)	3	6.54	2	6.54	2	6.54
3. Raised Embankment with Connection to Bay	2	6.54	2	6.54	2	6.54
4. Raised Embankment with LS and Connection to	3	6.54	2	6.54	2	6.54
5. Viaduct	3	6.54	1	6.54	3	6.54
6. Viaduct with Living Shoreline	3	6.54	1	6.54	3	6.54

ADAPTATION STRATEGIES	SCORE TOTAL	RANKING
1. Raised Embankment	1.89	6
2. Raised Embankment with Living Shoreline (LS)	2.39	3
3. Raised Embankment with Connection to Bay	2.13	5
4. Raised Embankment with LS and conne	**2.46**	**1**
5. Viaduct	2.24	4
6. Viaduct with Living Shoreline	2.44	2

Table F5. Evaluation of adaptation options for Segment 6: North Indianola to South Bracut.

Segment 6 - North Indianola to South Bracut				
	SOCIETY & EQUITY			
	1		2	
ADAPTATION STRATEGIES	Support or protect multimodal transportation options?		Access to housing, services, and jobs?	
	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	2	6.54	2	6.54
2. Raised Embankment with Living Shoreline (LS)	3	6.54	2	6.54
3. Raised Embankment with Connection to Bay	2	6.54	2	6.54
4. Raised Embankment with LS and Connection to Bay	3	6.54	2	6.54
5. Viaduct	2	6.54	2	6.54
6. Viaduct with Living Shoreline	3	6.54	2	6.54

	ECONOMIC					
	3		4		5	
ADAPTATION STRATEGIES	Maintain essential infrastructure and community assets?		Improve the economy?		Support regional transportation?	
	Evaluate	Weight	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	2	6.54	2	6.54	2	6.54
2. Raised Embankment with Living Shoreline (LS)	3	6.54	3	6.54	3	6.54
3. Raised Embankment with Connection to Bay	2	6.54	3	6.54	2	6.54
4. Raised Embankment with LS and Connection to Bay	3	6.54	3	6.54	3	6.54
5. Viaduct	2	6.54	3	6.54	2	6.54
6. Viaduct with Living Shoreline	3	6.54	3	6.54	3	6.54

	ENVIRONMENT							
	6		7		8		9	
ADAPTATION STRATEGIES	Utilize nature-based approach?		Self mitigating?		Environmental performance?		Coastal squeeze?	
	Evaluate	Weight	Evaluate	Weight	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	1	6.54	1	6.54	1	6.54	1	6.54
2. Raised Embankment with Living Shoreline (LS)	3	6.54	2	6.54	2	6.54	2	6.54
3. Raised Embankment with Connection to Bay	3	6.54	2	6.54	2	6.54	2	6.54
4. Raised Embankment with LS and Connection to Bay	3	6.54	3	6.54	2	6.54	2	6.54
5. Viaduct	3	6.54	3	6.54	3	6.54	3	6.54
6. Viaduct with Living Shoreline	3	6.54	3	6.54	3	6.54	3	6.54

Table F6 (continued). Evaluation of adaptation options for Segment 6: North Indianola to South Bracut.

ADAPTATION STRATEGIES	FEASIBILITY			
	10		11	
	Consistent with existing plans, policies, programs?		Cost?	
	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	2	6.54	3	15.00
2. Raised Embankment with Living Shoreline (LS)	2	6.54	2	15.00
3. Raised Embankment with Connection to Bay	2	6.54	2	15.00
4. Raised Embankment with LS and Connection to Bay	2	6.54	2	15.00
5. Viaduct	2	6.54	1	15.00
6. Viaduct with Living Shoreline	2	6.54	1	15.00

ADAPTATION STRATEGIES	ROBUSTNESS					
	12		13		14	
	Provide resilience to multiple hazards?		Flexible/adaptable?		Susceptibility to seismic hazards?	
	Evaluate	Weight	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	2	6.54	2	6.54	2	6.54
2. Raised Embankment with Living Shoreline (LS)	3	6.54	2	6.54	2	6.54
3. Raised Embankment with Connection to Bay	2	6.54	2	6.54	2	6.54
4. Raised Embankment with LS and Connection to Bay	3	6.54	2	6.54	2	6.54
5. Viaduct	3	6.54	1	6.54	3	6.54
6. Viaduct with Living Shoreline	3	6.54	1	6.54	3	6.54

ADAPTATION STRATEGIES	SCORE TOTAL	RANKING
1. Raised Embankment	1.89	6
2. Raised Embankment with Living Shoreline (LS)	2.39	3
3. Raised Embankment with Connection to Bay	2.13	5
4. Raised Embankment with LS and connection to Bay	**2.46**	**1**
5. Viaduct	2.24	4
6. Viaduct with Living Shoreline	2.44	2

Table F7. Evaluation of adaptation options for Segment 8: North Bracut to Bayside Cutoff.

Segment 8 - North Bracut to Bayside Cutoff

ADAPTATION STRATEGIES	SOCIETY & EQUITY 1: Support or protect multimodal transportation options?		2: Access to housing, services, and jobs?	
	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	2	6.54	2	6.54
2. Raised Embankment with Living Shoreline	3	6.54	2	6.54
3. Raised Embankment with Connection to Bay	2	6.54	2	6.54
4. Raised Embankment with LS and Connection to Bay	3	6.54	2	6.54

ADAPTATION STRATEGIES	ECONOMIC 3: Maintain essential infrastructure and community assets?		4: Improve the economy?		5: port regional transportati	
	Evaluate	Weight	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	2	6.54	2	6.54	2	6.54
2. Raised Embankment with Living Shoreline	3	6.54	3	6.54	3	6.54
3. Raised Embankment with Connection to Bay	2	6.54	3	6.54	2	6.54
4. Raised Embankment with LS and Connection to Bay	3	6.54	3	6.54	3	6.54

ADAPTATION STRATEGIES	ENVIRONMENT 6: Utilize nature-based approach?		7: Self mitigating?		8: Environmental performance?		9: Coastal squeeze?	
	Evaluate	Weight	Evaluate	Weight	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	1	6.54	1	6.54	1	6.54	1	6.54
2. Raised Embankment with Living Shoreline	3	6.54	2	6.54	2	6.54	2	6.54
3. Raised Embankment with Connection to Bay	3	6.54	2	6.54	2	6.54	2	6.54
4. Raised Embankment with LS and Connection to Bay	3	6.54	3	6.54	2	6.54	2	6.54

ADAPTATION STRATEGIES	FEASIBILITY 10: Consistent with existing plans, policies, programs?		11: Cost?	
	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	2	6.54	3	15.00
2. Raised Embankment with Living Shoreline	2	6.54	2	15.00
3. Raised Embankment with Connection to Bay	2	6.54	2	15.00
4. Raised Embankment with LS and Connection to Bay	2	6.54	2	15.00

ADAPTATION STRATEGIES	ROBUSTNESS 12: Provide resilience to multiple hazards?		13: Flexible/adaptable?		14: Susceptibility to seismic hazards?	
	Evaluate	Weight	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	2	6.54	2	6.54	2	6.54
2. Raised Embankment with Living Shoreline	3	6.54	2	6.54	2	6.54
3. Raised Embankment with Connection to Bay	2	6.54	2	6.54	2	6.54
4. Raised Embankment with LS and Connection to Bay	3	6.54	2	6.54	2	6.54

ADAPTATION STRATEGIES	SCORE TOTAL	RANKING
1. Raised Embankment	1.89	4
2. Raised Embankment with Living Shoreline	2.39	2
3. Raised Embankment with Connection to Bay	2.13	3
4. Raised Embankment with LS and connection to Ba	**2.46**	**1**

Table F8. Evaluation of adaptation options for Segment 9: Bayside Cutoff to Jacoby Creek.

Segment 9 - Bayside Cutoff to Jacoby Creek				
	SOCIETY & EQUITY			
	1		2	
ADAPTATION STRATEGIES	Support or protect multimodal transportation options?		Access to housing, services, and jobs?	
	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	2	6.54	2	6.54
2. Raised Embankment with Living Shoreline	3	6.54	2	6.54
3. Raised Embankment with Connection to Bay	2	6.54	2	6.54
4. Raised Embankment with LS and Connection to Bay	3	6.54	2	6.54
5. Viaduct	2	6.54	2	6.54
6. Viaduct with Living Shoreline	3	6.54	2	6.54

	ECONOMIC					
	3		4		5	
ADAPTATION STRATEGIES	Maintain essential infrastructure and community assets?		Improve the economy?		ipport regional transportatio	
	Evaluate	Weight	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	2	6.54	2	6.54	2	6.54
2. Raised Embankment with Living Shoreline	3	6.54	3	6.54	3	6.54
3. Raised Embankment with Connection to Bay	2	6.54	3	6.54	2	6.54
4. Raised Embankment with LS and Connection to Bay	3	6.54	3	6.54	3	6.54
5. Viaduct	2	6.54	3	6.54	2	6.54
6. Viaduct with Living Shoreline	3	6.54	3	6.54	3	6.54

	ENVIRONMENT							
	6		7		8		9	
ADAPTATION STRATEGIES	Utilize nature-based approach?		Self-mitigating?		Environmental performance?		Coastal squeeze?	
	Evaluate	Weight	Evaluate	Weight	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	1	6.54	1	6.54	1	6.54	1	6.54
2. Raised Embankment with Living Shoreline	3	6.54	2	6.54	2	6.54	2	6.54
3. Raised Embankment with Connection to Bay	3	6.54	2	6.54	2	6.54	2	6.54
4. Raised Embankment with LS and Connection to Bay	3	6.54	3	6.54	2	6.54	2	6.54
5. Viaduct	3	6.54	3	6.54	3	6.54	3	6.54
6. Viaduct with Living Shoreline	3	6.54	3	6.54	3	6.54	3	6.54

Table F7 (continued). Evaluation of adaptation options for Segment 9: Bayside Cutoff to Jacoby Creek.

ADAPTATION STRATEGIES	FEASIBILITY 10: Consistent with existing plans, policies, programs?		11: Cost?	
	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	1	6.54	3	15.00
2. Raised Embankment with Living Shoreline	1	6.54	2	15.00
3. Raised Embankment with Connection to Bay	2	6.54	2	15.00
4. Raised Embankment with LS and Connection to Bay	2	6.54	2	15.00
5. Viaduct	2	6.54	1	15.00
6. Viaduct with Living Shoreline	2	6.54	1	15.00

ADAPTATION STRATEGIES	ROBUSTNESS 12: Provide resilience to multiple hazards?		13: Flexible/adaptable?		14: Susceptibility to seismic hazards?	
	Evaluate	Weight	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	2	6.54	2	6.54	2	6.54
2. Raised Embankment with Living Shoreline	3	6.54	2	6.54	2	6.54
3. Raised Embankment with Connection to Bay	2	6.54	2	6.54	2	6.54
4. Raised Embankment with LS and Connection to Bay	3	6.54	2	6.54	2	6.54
5. Viaduct	3	6.54	1	6.54	3	6.54
6. Viaduct with Living Shoreline	3	6.54	1	6.54	3	6.54

ADAPTATION STRATEGIES	SCORE TOTAL	RANKING
1. Raised Embankment	1.82	6
2. Raised Embankment with Living Shoreline	2.33	3
3. Raised Embankment with Connection to Bay	2.13	5
4. Raised Embankment with LS and connection to Bay	**2.46**	**1**
5. Viaduct	2.24	4
6. Viaduct with Living Shoreline	2.44	**2**

Table F9. Evaluation of adaptation options for Segment 10: Jacoby Creek to South G Street.

Segment 10 - Jacoby Creek to South G St.

ADAPTATION STRATEGIES	SOCIETY & EQUITY			
	1		2	
	Support or protect multimodal transportation options?		Access to housing, services, and jobs?	
	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	2	6.54	2	6.54
2. Raised Embankment with Living Shoreline	3	6.54	2	6.54
3. Raised Embankment with Connection to Bay	2	6.54	2	6.54
4. Raised Embankment with LS and Connection to Bay	3	6.54	2	6.54
5. Viaduct	2	6.54	2	6.54
6. Viaduct with Living Shoreline	3	6.54	2	6.54

ADAPTATION STRATEGIES	ECONOMIC					
	3		4		5	
	Maintain essential infrastructure and community assets?		Improve the economy?		Support regional transportation?	
	Evaluate	Weight	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	2	6.54	2	6.54	2	6.54
2. Raised Embankment with Living Shoreline	3	6.54	3	6.54	3	6.54
3. Raised Embankment with Connection to Bay	2	6.54	3	6.54	2	6.54
4. Raised Embankment with LS and Connection to Bay	3	6.54	3	6.54	3	6.54
5. Viaduct	2	6.54	3	6.54	2	6.54
6. Viaduct with Living Shoreline	3	6.54	3	6.54	3	6.54

ADAPTATION STRATEGIES	ENVIRONMENT							
	6		7		8		9	
	Utilize nature-based approach?		Self mitigating?		Environmental performance?		Coastal squeeze?	
	Evaluate	Weight	Evaluate	Weight	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	1	6.54	1	6.54	1	6.54	1	6.54
2. Raised Embankment with Living Shoreline	3	6.54	2	6.54	2	6.54	2	6.54
3. Raised Embankment with Connection to Bay	3	6.54	2	6.54	2		2	6.54
4. Raised Embankment with LS and Connection to Bay	3	6.54	2	6.54	2		2	6.54
5. Viaduct	3	6.54	3	6.54	3	6.54	3	6.54
6. Viaduct with Living Shoreline	3	6.54	3	6.54	3	6.54	3	6.54

Table F10 (continued). Evaluation of adaptation options for Segment 10: Jacoby Creek to South G Street.

ADAPTATION STRATEGIES	FEASIBILITY			
	10		11	
	Consistent with existing plans, policies, programs?		Cost?	
	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	1	6.54	3	15.00
2. Raised Embankment with Living Shoreline	1	6.54	2	15.00
3. Raised Embankment with Connection to Bay	2	6.54	2	15.00
4. Raised Embankment with LS and Connection to Bay	2	6.54	2	15.00
5. Viaduct	2	6.54	1	15.00
6. Viaduct with Living Shoreline	2	6.54	1	15.00

ADAPTATION STRATEGIES	ROBUSTNESS					
	12		13		14	
	Provide resilience to multiple hazards?		Flexible/adaptable?		Susceptibility to seismic hazards?	
	Evaluate	Weight	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	2	6.54	2	6.54	2	6.54
2. Raised Embankment with Living Shoreline	3	6.54	2	6.54	2	6.54
3. Raised Embankment with Connection to Bay	2	6.54	2	6.54	2	6.54
4. Raised Embankment with LS and Connection to Bay	3	6.54	2	6.54	2	6.54
5. Viaduct	3	6.54	1	6.54	3	6.54
6. Viaduct with Living Shoreline	3	6.54	1	6.54	3	6.54

ADAPTATION STRATEGIES	SCORE TOTAL	RANKING
1. Raised Embankment	1.82	6
2. Raised Embankment with Living Shoreline	2.33	2
3. Raised Embankment with Connection to Bay	2.00	5
4. Raised Embankment with LS and Connection to Bay	2.26	3
5. Viaduct	2.24	4
6. Viaduct with Living Shoreline	**2.44**	**1**

Table F11. Evaluation of adaptation options for Segment 11: South G Street to SR 255/101 Separation Bridge.

Segment 11 - South G St to 255 Interchange				
ADAPTATION STRATEGIES	SOCIETY & EQUITY			
	1		2	
	Support or protect multimodal transportation options?		Access to housing, services, and jobs?	
	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	2	6.54	2	6.54
2. Raised Embankment with Living Shoreline	3	6.54	2	6.54
3. Raised Embankment with Upsized Culvert	2	6.54	2	6.54
4. Raised Embankment with Upsized Culvert and L	3	6.54	2	6.54
5. Viaduct	2	6.54	2	6.54
6. Viaduct with Living Shoreline	3	6.54	2	6.54

ADAPTATION STRATEGIES	ECONOMIC					
	3		4		5	
	Maintain essential infrastructure and community assets?		Improve the economy?		ıpport regional transportatio	
	Evaluate	Weight	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	2	6.54	2	6.54	2	6.54
2. Raised Embankment with Living Shoreline	3	6.54	3	6.54	3	6.54
3. Raised Embankment with Upsized Culvert	2	6.54	3	6.54	2	6.54
4. Raised Embankment with Upsized Culvert and L	3	6.54	3	6.54	3	6.54
5. Viaduct	2	6.54	3	6.54	2	6.54
6. Viaduct with Living Shoreline	3	6.54	3	6.54	3	6.54

ADAPTATION STRATEGIES	ENVIRONMENT							
	6		7		8		9	
	Utilize nature-based approach?		Self mitigating?		Environmental performance?		Coastal squeeze?	
	Evaluate	Weight	Evaluate	Weight	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	1	6.54	1	6.54	1	6.54	1	6.54
2. Raised Embankment with Living Shoreline	3	6.54	2	6.54	2	6.54	2	6.54
3. Raised Embankment with Upsized Culvert	3	6.54	2	6.54	2	6.54	2	6.54
4. Raised Embankment with Upsized Culvert and L	3	6.54	2	6.54	2	6.54	2	6.54
5. Viaduct	3	6.54	3	6.54	3	6.54	3	6.54
6. Viaduct with Living Shoreline	3	6.54	3	6.54	3	6.54	3	6.54

Table F9 (continued). Evaluation of adaptation options for Segment 11: South G Street to SR 255/101 Separation Bridge.

ADAPTATION STRATEGIES	FEASIBILITY			
	10		11	
	Consistent with existing plans, policies, programs?		Cost?	
	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	1	6.54	3	15.00
2. Raised Embankment with Living Shoreline	1	6.54	2	15.00
3. Raised Embankment with Upsized Culvert	2	6.54	2	15.00
4. Raised Embankment with Upsized Culvert and L	2	6.54	2	15.00
5. Viaduct	2	6.54	1	15.00
6. Viaduct with Living Shoreline	2	6.54	1	15.00

ADAPTATION STRATEGIES	ROBUSTNESS					
	12		13		14	
	Provide resilience to multiple hazards?		Flexible/adaptable?		Susceptibility to seismic hazards?	
	Evaluate	Weight	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	2	6.54	2	6.54	2	6.54
2. Raised Embankment with Living Shoreline	3	6.54	2	6.54	2	6.54
3. Raised Embankment with Upsized Culvert	2	6.54	2	6.54	2	6.54
4. Raised Embankment with Upsized Culvert and L	3	6.54	2	6.54	2	6.54
5. Viaduct	3	6.54	1	6.54	3	6.54
6. Viaduct with Living Shoreline	3	6.54	1	6.54	3	6.54

ADAPTATION STRATEGIES	SCORE TOTAL	RANKING
1. Raised Embankment	1.82	6
2. Raised Embankment with Living Shoreline	2.33	3
3. Raised Embankment with Upsized Culvert	2.13	5
4. Raised Embankment with Upsized Culvert and L	2.39	2
5. Viaduct	2.24	4
6. Viaduct with Living Shoreline	**2.44**	**1**

Table F12. Evaluation of adaptation options for Segment 12: SR 255/101 Separation Bridge to 7th Street.

Segment 12 - 255 Interchange to 7th St.

ADAPTATION STRATEGIES	EQUITY			
	1		2	
	Support or protect multimodal transportation options?		Access to housing, services, and jobs?	
	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	2	6.54	2	6.54

ADAPTATION STRATEGIES	ECONOMIC					
	3		4		5	
	Maintain essential infrastructure and community assets?		Improve the economy?		Support regional transportation?	
	Evaluate	Weight	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	2	6.54	2	6.54	2	6.54

ADAPTATION STRATEGIES	ENVIRONMENT							
	6		7		8		9	
	Utilize nature-based approach?		Self mitigating?		Environmental performance?		Coastal squeeze?	
	Evaluate	Weight	Evaluate	Weight	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	1	6.54	1	6.54	1	6.54	2	6.54

ADAPTATION STRATEGIES	FEASIBILITY			
	10		11	
	Consistent with existing plans, policies, programs?		Cost?	
	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	3	6.54	3	15.00

ADAPTATION STRATEGIES	ROBUSTNESS					
	12		13		14	
	Provide resilience to multiple hazards?		Flexible/adaptable?		Susceptibility to seismic hazards?	
	Evaluate	Weight	Evaluate	Weight	Evaluate	Weight
1. Raised Embankment	2	6.54	2	6.54	2	6.54

ADAPTATION STRATEGIES	SCORE TOTAL	RANKING
1. Raised Embankment	**2.02**	**1**