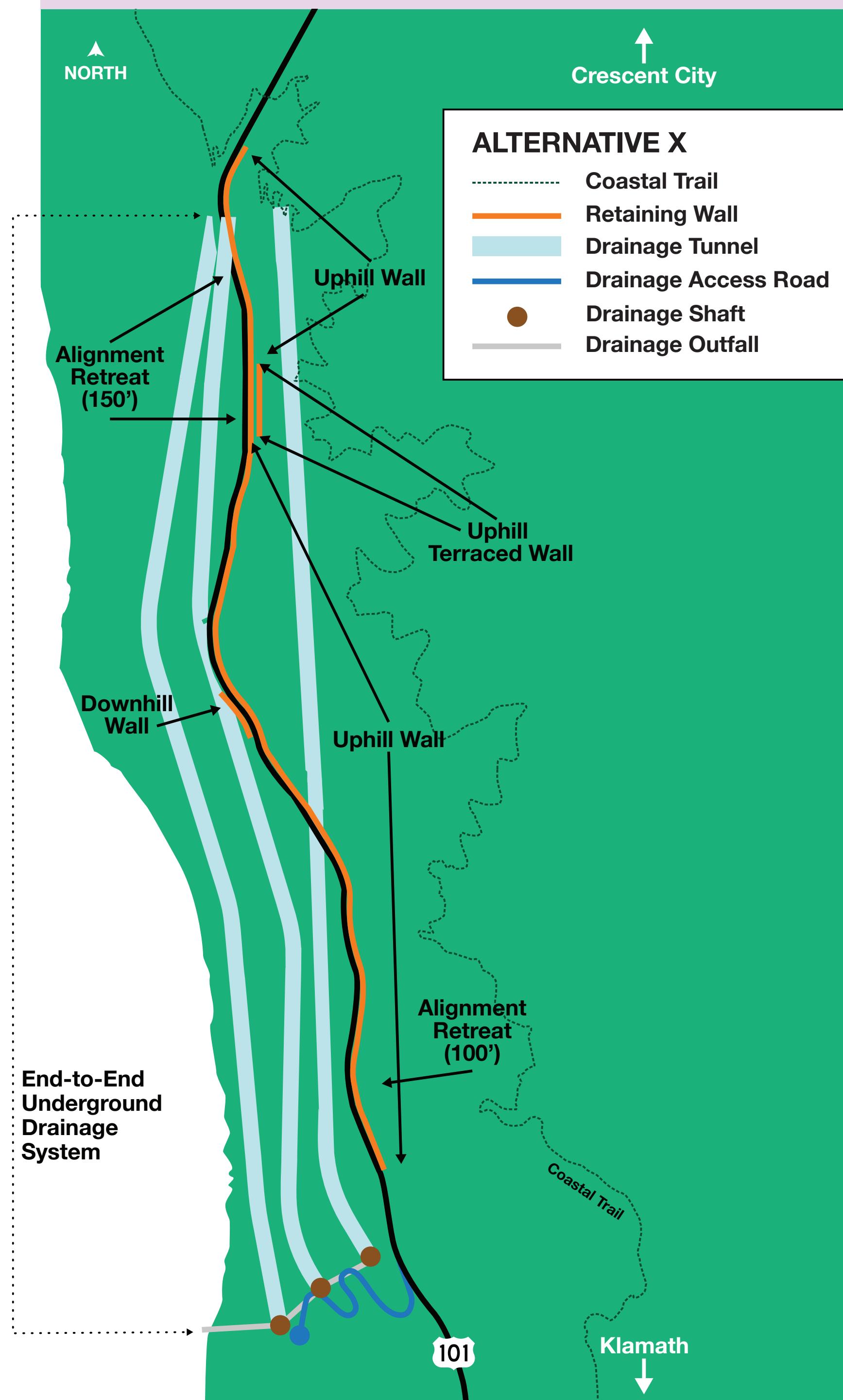


# Last Chance Grade Alternatives

## Alternative X

### Re-engineered Roadway

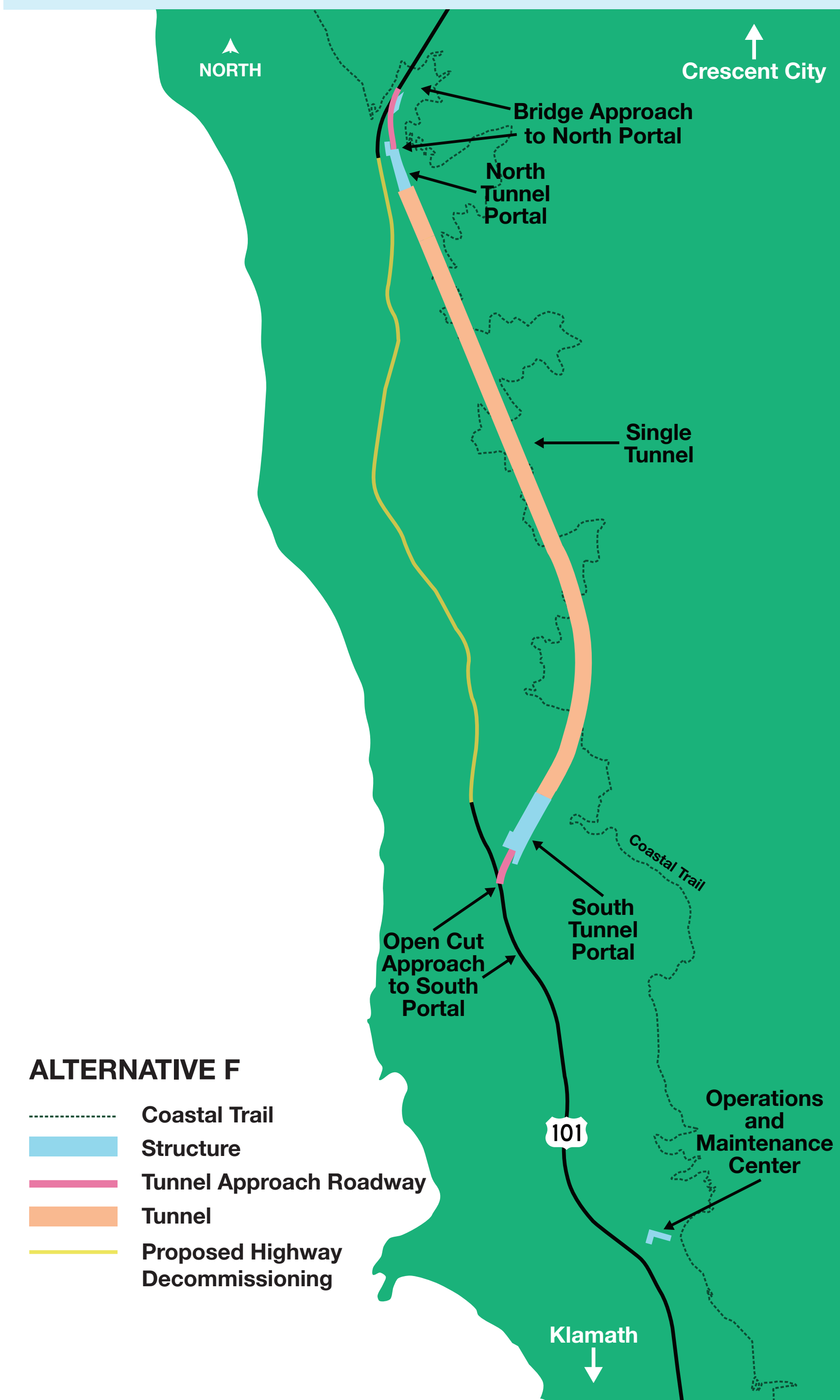
- Within/adjacent to existing roadway
  - 1.6 mile continuous retaining wall
- “Landslide controls”
  - Underground drainage system



## Alternative F

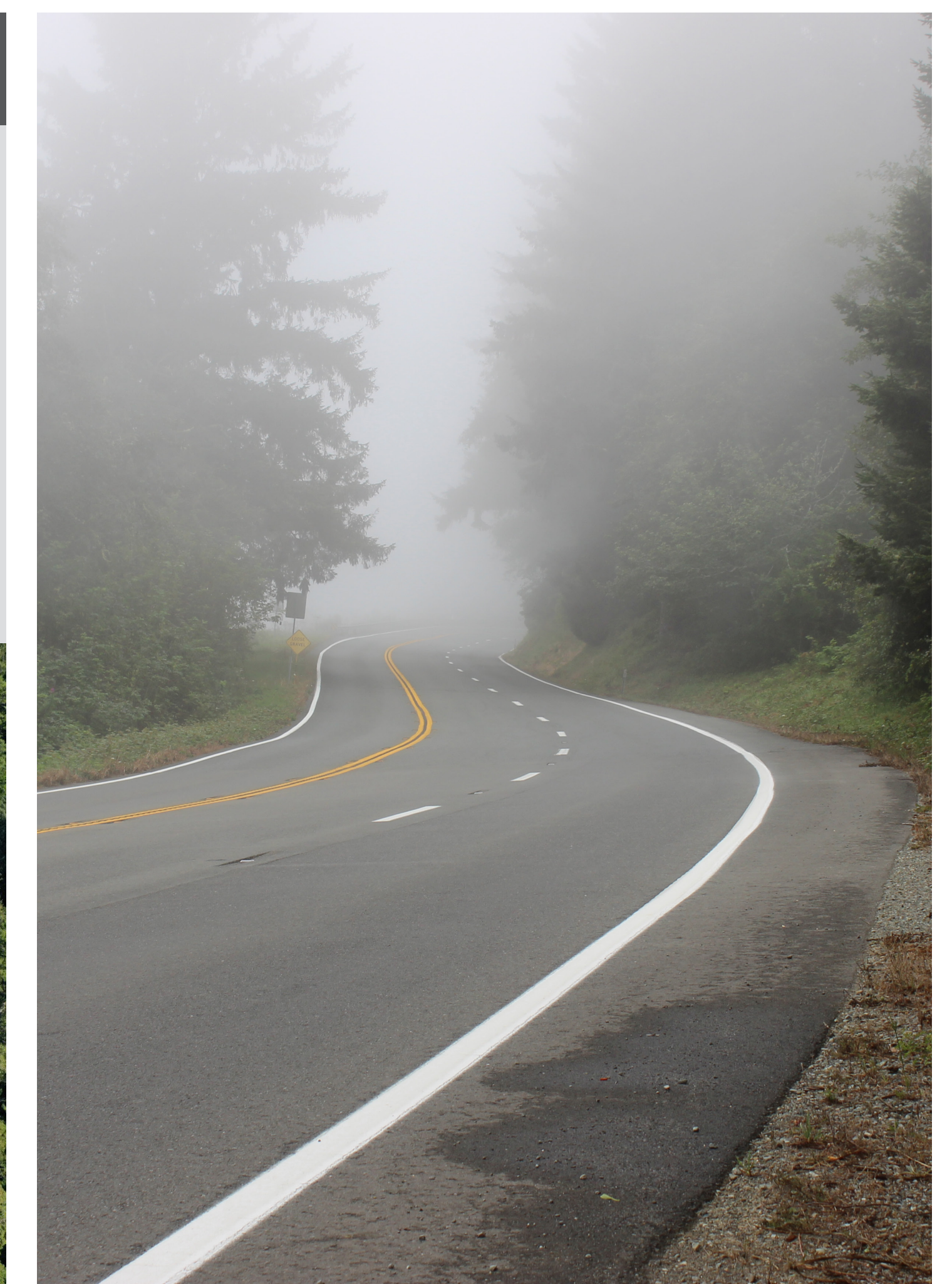
### Tunnel Option

- Off-alignment bypass
- Portals near existing alignment
- Would include ped/bike pathways
- Bridge at north portal



## “No Build”

- No project would be constructed. Regular maintenance and operations would continue, with emergency restoration projects conducted as needed to address landslides and roadway failures. (similar to past few decades)



# Project Purpose and Need



## Project Purpose

Provide a long-term sustainable solution at Last Chance Grade that will:

- Provide a more **reliable connection**
- Reduce **maintenance costs**
- Protect the **economy, natural resources, and cultural resources**



## Project Need

A long-term sustainable solution will address:

- Economic ramifications of a long-term failure and closure
- Risk of delay/detour to the traveling public
- Increasing maintenance and emergency project costs
- Increases in the frequency and severity of large storm events caused by climate change

When Last Chance Grade is closed, there is a 449 mile, 8-hour detour between Crescent City and Klamath.



# Last Chance Grade Milestones



## Studies/Temporary Solutions

- Efforts to address long-term mobility on U.S. 101 at Last Chance Grade have been ongoing for decades.
- **1987- 2003:** Caltrans studies and considers 28 different alternatives.
- **2010:** Caltrans constructs a series of five retaining walls.

## Partnership Formation

- **2014:** Caltrans establishes the Last Chance Grade Partnership between agencies, key leaders, stakeholders and the community to help create and implement a longer-term solution.

## Project Launch

- **2015:** Caltrans formally kicks off the Last Chance Grade Project with a series of three public workshops, and formation of stakeholder working groups.
- **2019:** Caltrans launches environmental and engineering studies to assess and mitigate impacts.

## Collaboration

- **2016-Present:** Caltrans hosts annual Open Houses and publishes regular updates to provide project information and promote public participation, questions, and comments.

## Key Steps in Last Chance Grade Project

### PLANNING PHASE



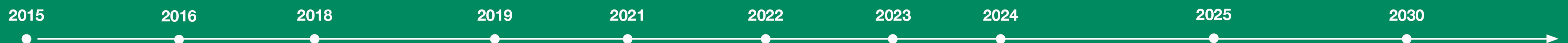
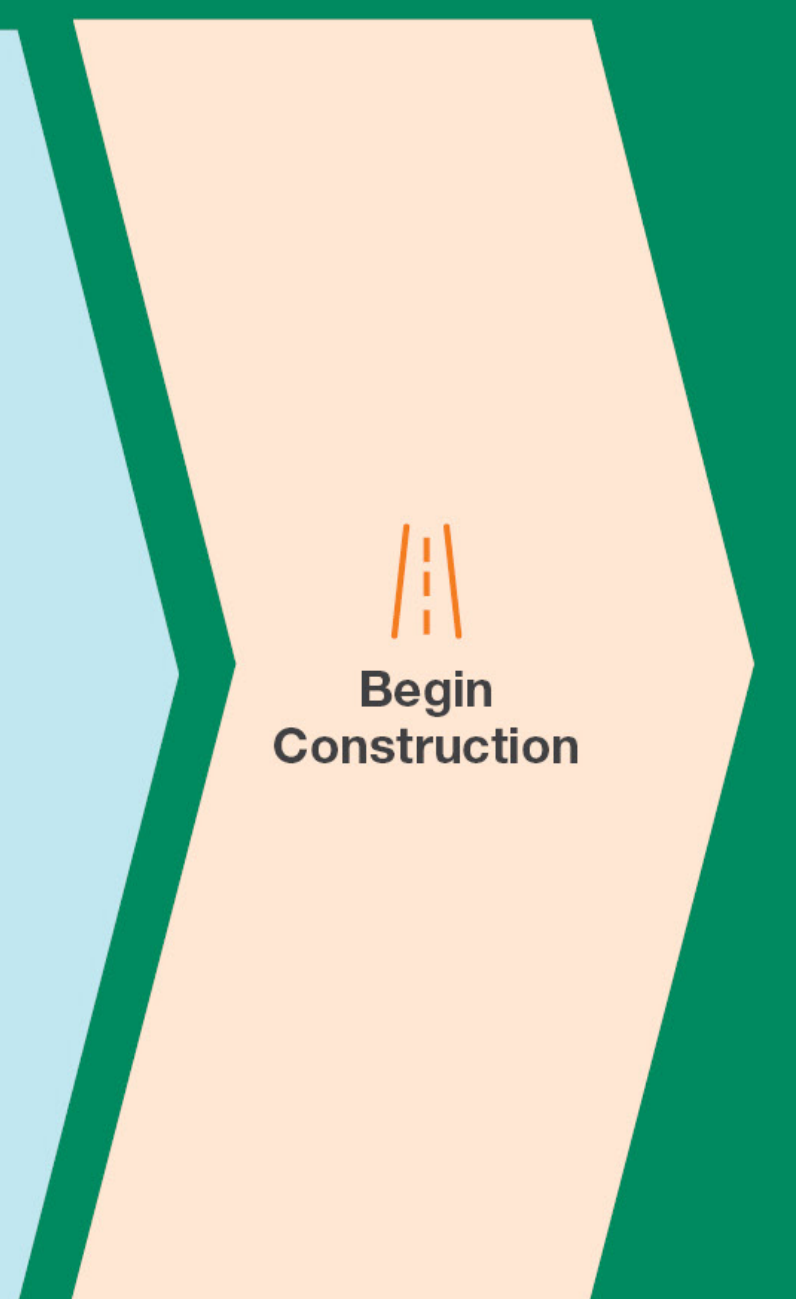
### ENVIRONMENTAL PHASE



### DESIGN PHASE



### CONSTRUCTION



# Public Engagement and Stakeholder Collaboration



## Collaboration

Early and continuing coordination with the public and government agencies is an essential part of the environmental review process. Broad-based collaboration has helped Caltrans to shape the alternatives under consideration, determine the necessary environmental documentation, and to identify potential impacts and measures to avoid, minimize, and mitigate those impacts.

Key Activities include:

- ◆ Interagency coordination meetings
- ◆ Public workshops and annual Open Houses
- ◆ Ongoing stakeholder meetings
- ◆ Annual and quarterly progress updates
- ◆ Dedicated website at [LastChanceGrade.com](http://LastChanceGrade.com)



Extensive collaboration and input have been a hallmark of the LCG process. From early workshops to help assess 14 preliminary alternatives to visual simulations, onsite tours and mitigation workshops, feedback has been critical in refining alternatives to the current two.

## Working Groups

Stakeholder working groups play a critical role by providing crucial input into development and refinement of alternatives.

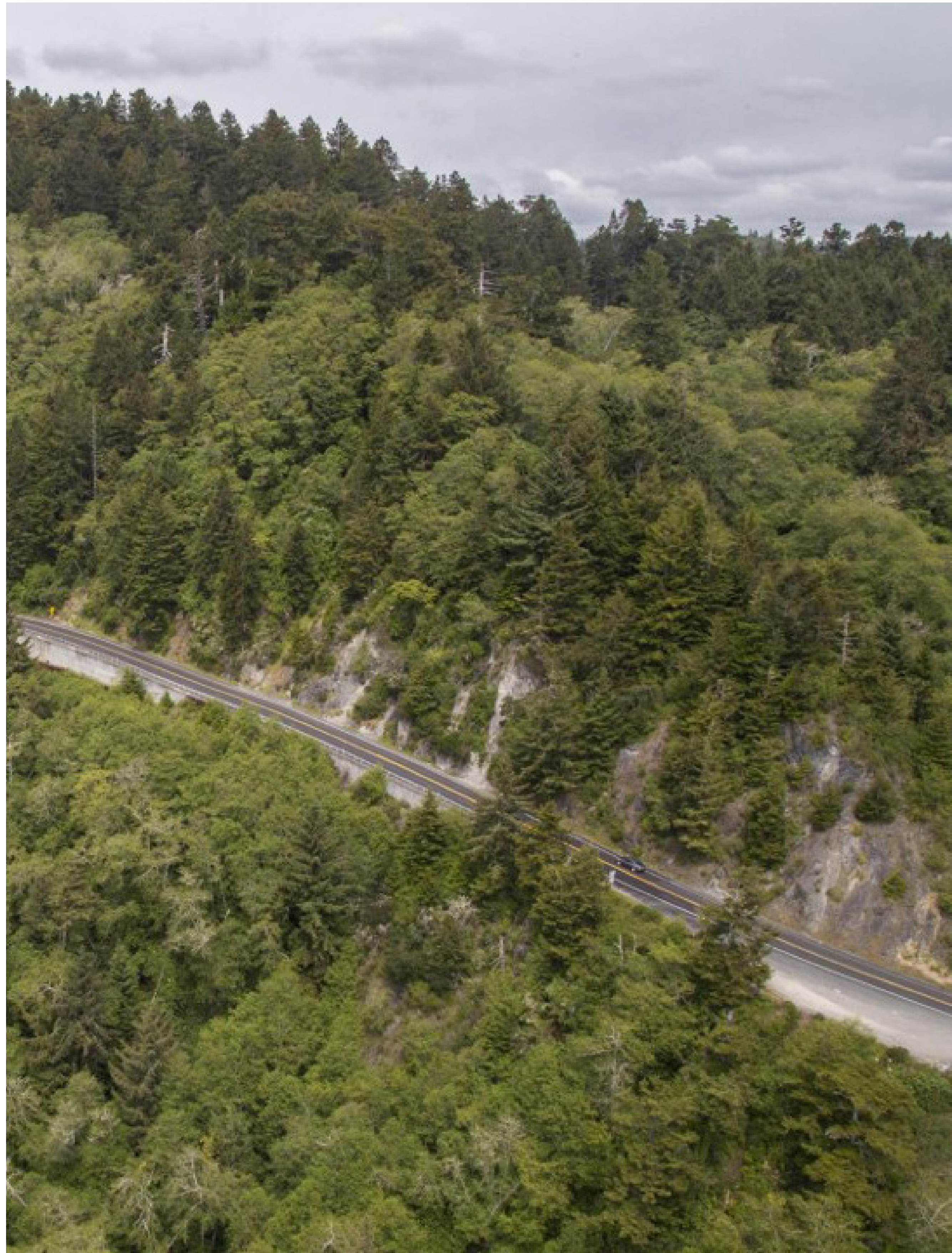
Groups include:

- ◆ **Partners (landowners and managers)** - State and National Parks, Tribes, local businesses
- ◆ **Biological and Cultural Working Group** - agencies and Tribes
- ◆ **Congressman Huffman's Stakeholder Group** - Tribes, environmental and civic organizations, local businesses, and local, regional, and state government agencies

# How to Submit a Comment

## Comment Period

- Caltrans invites comments on the Last Chance Grade Permanent Restoration Project Draft Environmental Document.
- The comment period for the Draft Environmental Document began on **December 15, 2023** and ends on **February 13, 2024**.
- **All comments must be submitted via mail or e-mail.**
- Comments received during the comment period will be considered and relevant environmental issues raised will be responded to in the Final Environmental Document (publication anticipated fall 2025).



## Two options for submitting comments

### Email



Send an email to  
[DEDcomments@lastchancegrade.com](mailto:DEDcomments@lastchancegrade.com)

### Letter



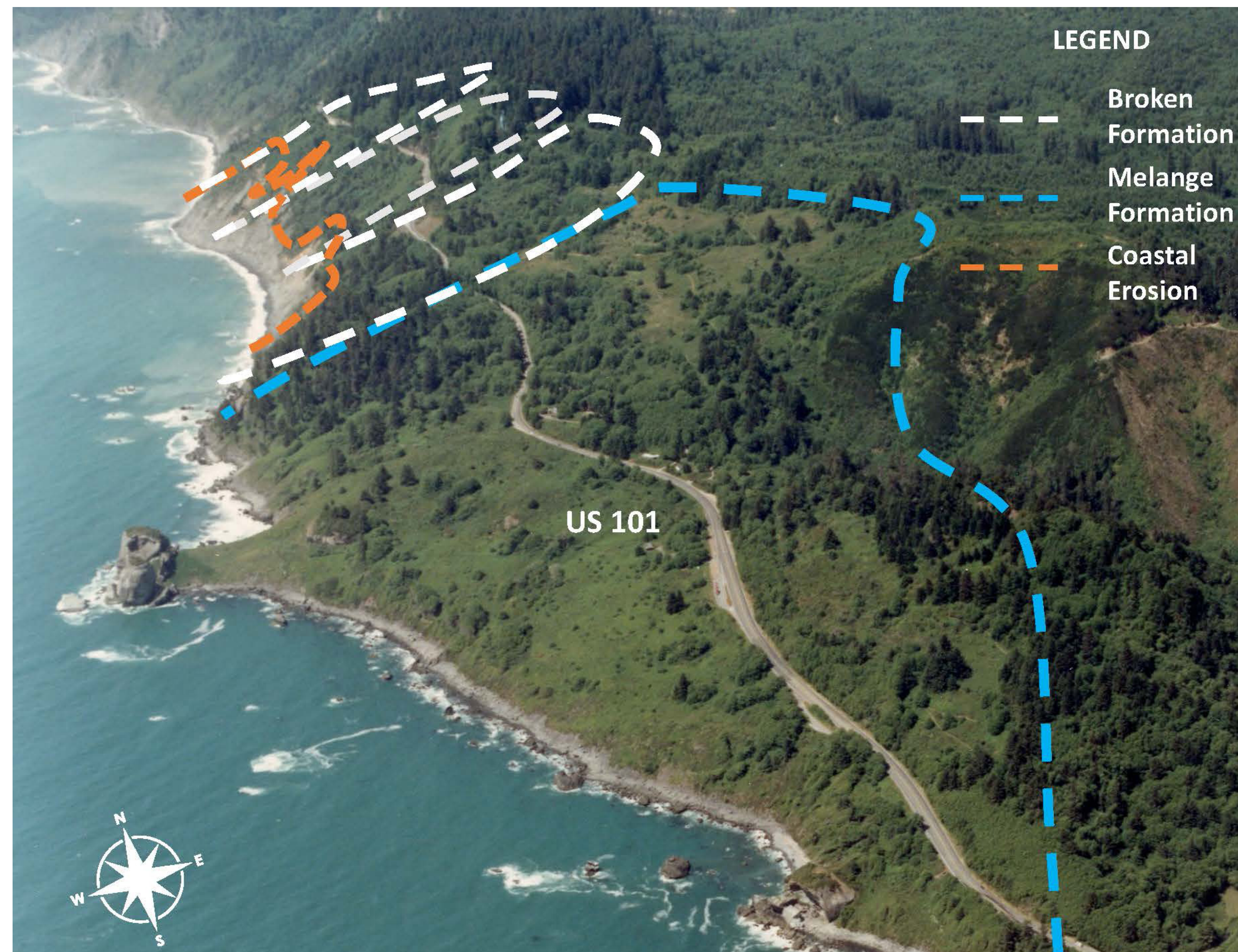
Send a written comment to:  
**Caltrans District 1**  
**Attention: Steve Croteau**  
**P.O. Box 3700**  
**Eureka, CA 95502-3700**

# Geotechnical Considerations and Next Steps

Last Chance Grade traverses an area with several active landslides.

Managing these landslides to keep U.S. 101 open has proven to be a costly and time-consuming endeavor.

## Location of Landslides



- Last Chance Grade is located within a complex of landslides
- The landslide complex is comprised of slides of varying depths
- The cliffs at the base of the slope are experiencing increasing coastal erosion
- The dashed lines in photo are the approximate landslide boundaries

## Geotechnical Investigations



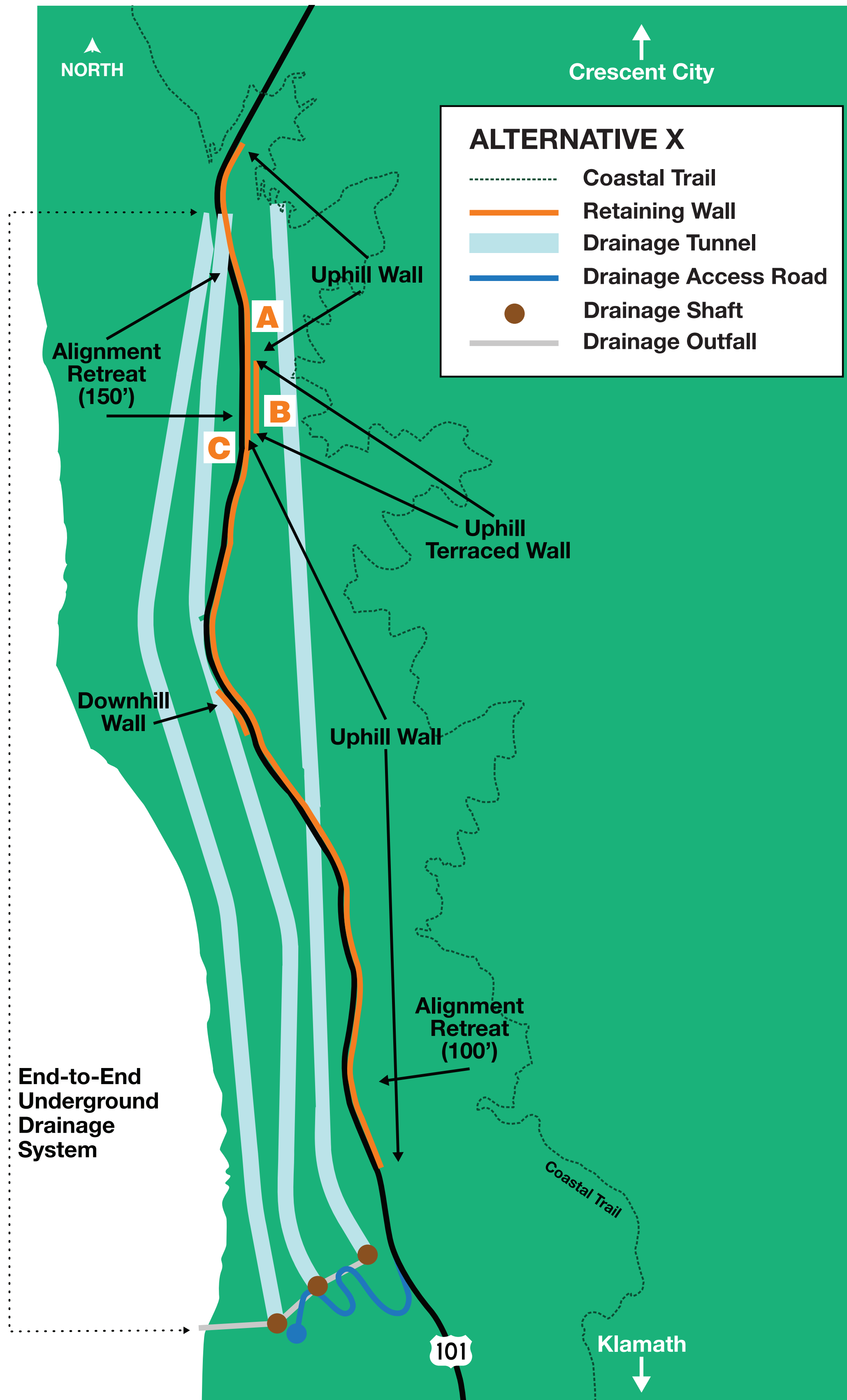
While Caltrans has completed geotechnical borings in the area to learn more about the landslides, both Alternatives X and F require additional geotechnical investigation. The photo shows an example of drilling equipment used, set on a platform that helps keep impacts minimal.

For Alternative X, additional geotechnical investigation is required to further develop the design of the proposed underground drainage system and retaining walls.

For Alternative F, additional geotechnical investigation is required to develop the design of the proposed tunnel and structures located near the north and south portals.

# Alternative X

Photos in the top row, taken in 2022, show the approximate location of features proposed as part of Alternative X. At that time, construction was underway to repair damage caused by landslide activity. The simulated images in the bottom row show the same locations with simulations of those features.



## Conditions in 2022



Southbound view near north end of proposed 150' highway realignment



Northbound view from south end of proposed 150' highway realignment



Southbound view from point just south of proposed 150' highway realignment

## Simulated with Alternative X



Proposed Highway Realignment and Multi-Tiered Retaining Wall viewed from Southbound U.S. 101



Proposed Highway Realignment and Multi-Tiered Retaining Wall viewed from Northbound U.S. 101

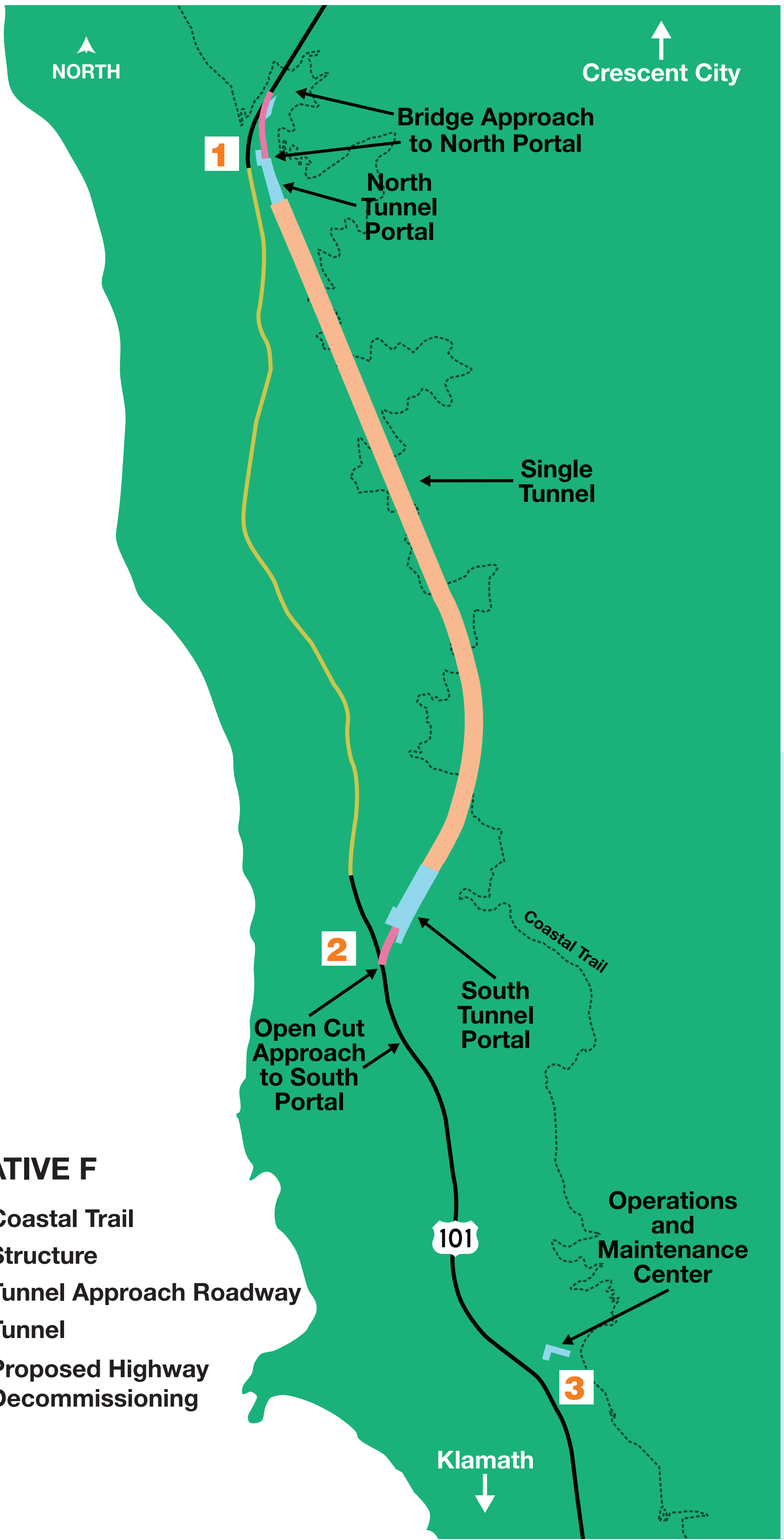


Proposed Highway Realignment and Retaining Wall viewed from Southbound U.S. 101

# Alternative F



Photos in the top row, taken in 2022, show the approximate location of features proposed as part of Alternative F. The simulated images in the bottom row show the same locations with simulations of those features.



## Conditions in 2022



Southbound view



View from northbound U.S. 101, looking northeast



Northbound view

## Simulated with Alternative F



Proposed North Tunnel Portal and Approach



Proposed South Tunnel Portal and Approach



Proposed Operations and Maintenance Center (OMC)





U.S. 101 at Last Chance Grade runs through Redwood National and State Parks, known and treasured for their trees, particularly old growth redwoods.

- To keep Last Chance Grade reliably open for decades to come, Alternatives X and F would each require removal of some large trees with a diameter of at least 4 feet at 4.5 feet above the ground, (referred to as diameter at breast height or DBH).
- In developing alternatives, Caltrans made every effort to minimize the number of large trees that would need to be removed.
- Alternative F would remove almost twice the number of conifers 4 feet or more in DBH than Alternative X.

## Estimated Number of Trees Four Foot in Diameter and Greater to be Removed

		DOUGLAS-FIR	SITKA SPRUCE	COASTAL REDWOOD	WESTERN HEMLOCK
<b>ALTERNATIVE X</b>	DBH RANGE IN FEET				
	8.0-8.9			1	
	7.0-7.9			1	
	6.0-6.9		2	1	
	5.0-5.9	2	3	3	
4.0-4.9	3	4	1		
<b>ALTERNATIVE F</b>	DBH RANGE IN FEET				
	8.0-8.9			2	
	7.0-7.9		1		
	6.0-6.9		1	3	
	5.0-5.9	1	7	7	1
4.0-4.9	2	9	4	2	

# Wetlands

While primarily known for its trees, the lands around Last Chance Grade also include waters and wetlands that contribute to the special character of the area. Alternatives X and F have been designed to avoid wetlands and waters to the maximum feasible extent, but each would still impact/disturb small amounts of such areas.



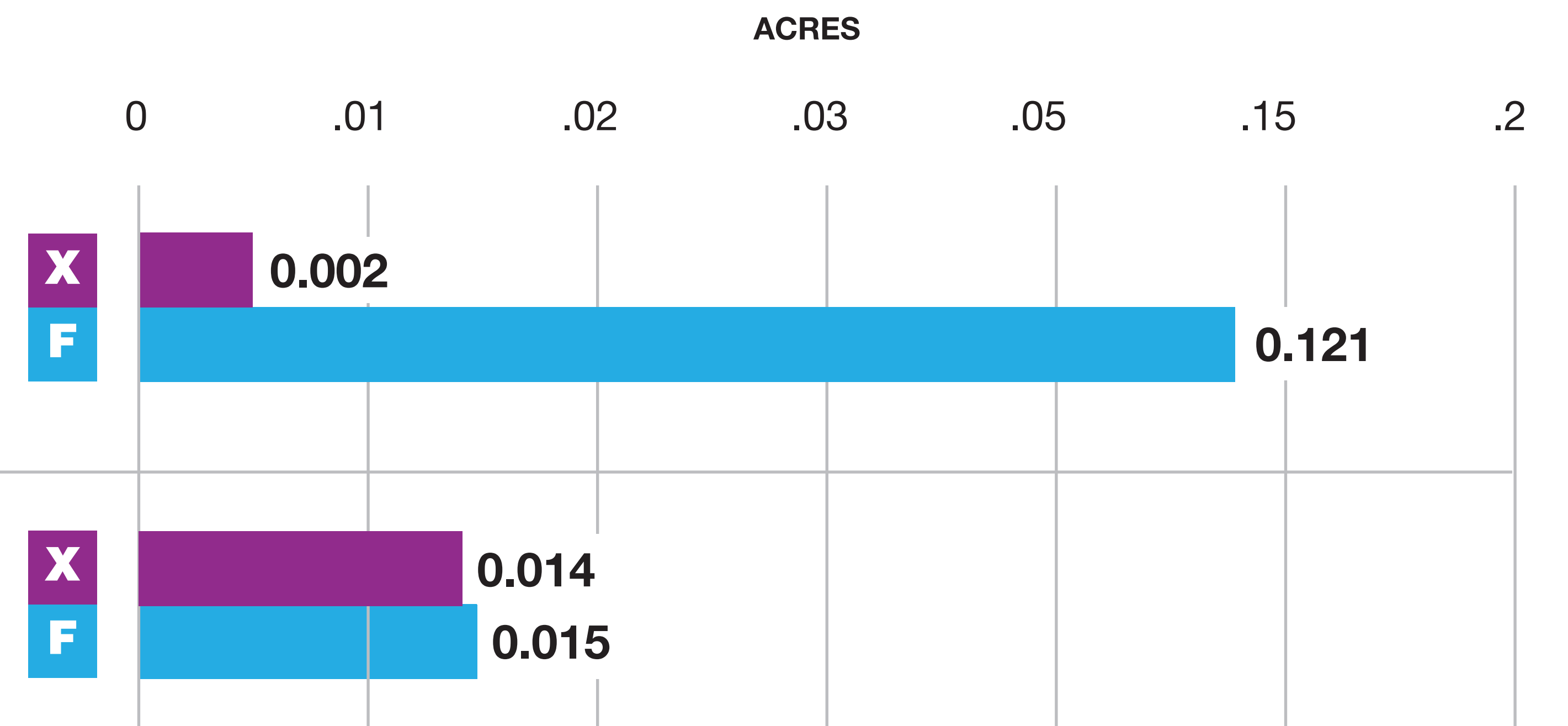
## Wetlands Impacts



### Potential Impacts to Waters of the US (wetlands and non-wetland waters)

Estimated acres of **permanent** impacts

Estimated acres of **temporary** impacts



# Special Status Species

A wide variety of animals live and/or dwell in the forest lands around Last Chance Grade. Elk, deer, bears, bats, birds, and many other species common to Del Norte County are known to inhabit the area.

Several special status species, protected by federal and/or state laws, also are known to have habitat in the area—including the northern spotted owl and the marbled murrelet.



## Marbled Murrelet

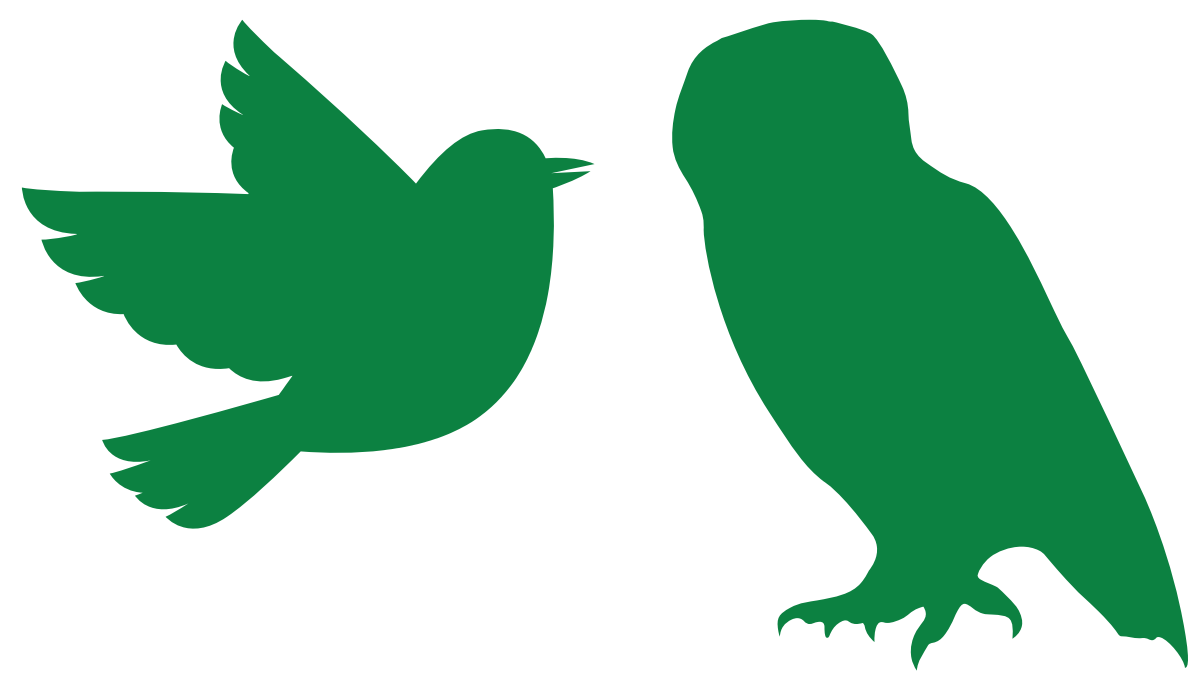
- Found in mature, coniferous forests
- Builds nests in treetops, cavities, and snags
- Present in the Last Chance Grade area



## Northern Spotted Owl

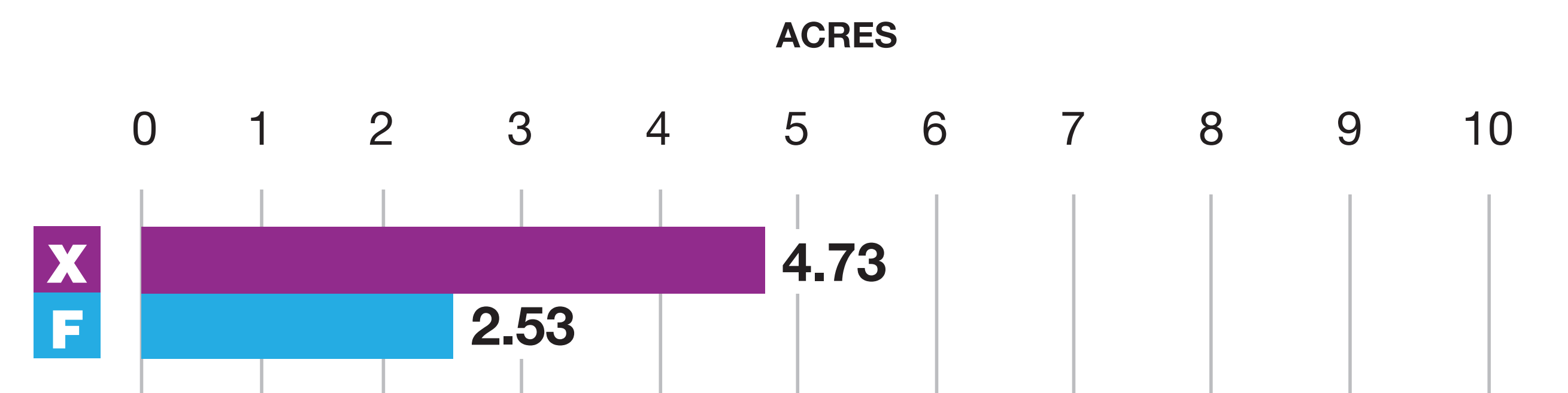
- Found in coniferous forests
- Builds nests in treetops, cavities, and snags
- Not detected during surveys, but it is assumed the species may be present in the Last Chance Grade area

## Habitat Impacts



### Suitable Habitat for the Marbled Murrelet and Northern Spotted Owl

Estimated acres of redwood, Douglas-fir, and Sitka spruce forest permanently affected



# Mitigation for Loss of Late Successional Forest: Coast Redwoods and Other Conifers

There is no feasible alternative that fully avoids impacts to late successional (mature to old growth) conifers including redwoods, Sitka spruce, and Douglas-fir. These trees and their associated habitats cannot be recreated in the near term.

Caltrans anticipates that the mitigation strategy for late successional forest communities would include one or both of the following options:

- **Option One:** Fund forest restoration projects that accelerate the development of late successional characteristics in younger-aged stands. Funding thinning projects in dense, early successional stands would:
  - accelerate tree growth
  - increase tree vigor
  - increase biodiversity for botanical and wildlife species
  - accelerate the development of habitat that support species such as marbled murrelet
- **Option Two:** Preservation of existing late successional forest habitat. Preservation would be accomplished through the purchase of existing late successional conifer forests in Del Norte or Humboldt counties that are threatened by logging or development, with the intent of conveying such acreage to an agency or organization that would manage it in perpetuity.



Organizations working in Del Norte and Humboldt counties seek to speed up the long-term conversion of second growth redwood forests (top image) toward a future more like conditions of a mature late successional forest (bottom image). Replanted second growth forests typically feature densely planted trees lacking mature canopies and forest floors lacking in quality habitat.

*Photo credit: Redwood Rising*

# Sensitive Natural Communities

Alternatives X and F would result in permanent impacts and/or habitat conversion of four sensitive natural vegetation communities:

- Redwood forest (early/late successional)
- Red alder forest with salmonberry-red elderberry understory
- Sitka spruce forest (early/late successional)
- Coastal brambles

Sensitive Natural Community	Permanent Impacts/ Habitat Conversion (acres)	
	Alternative X	Alternative F
Redwood forest (late and early successional)	0.09	1.11
Red alder forest	1.57	2.98
Sitka spruce forest (late and early successional)	0.89	1.13
Coastal brambles	1.09	0.25



Late Successional Redwood Forest



Early Successional Redwood Forest



Red Alder Forest



Sitka Spruce Forest



Coastal Brambles

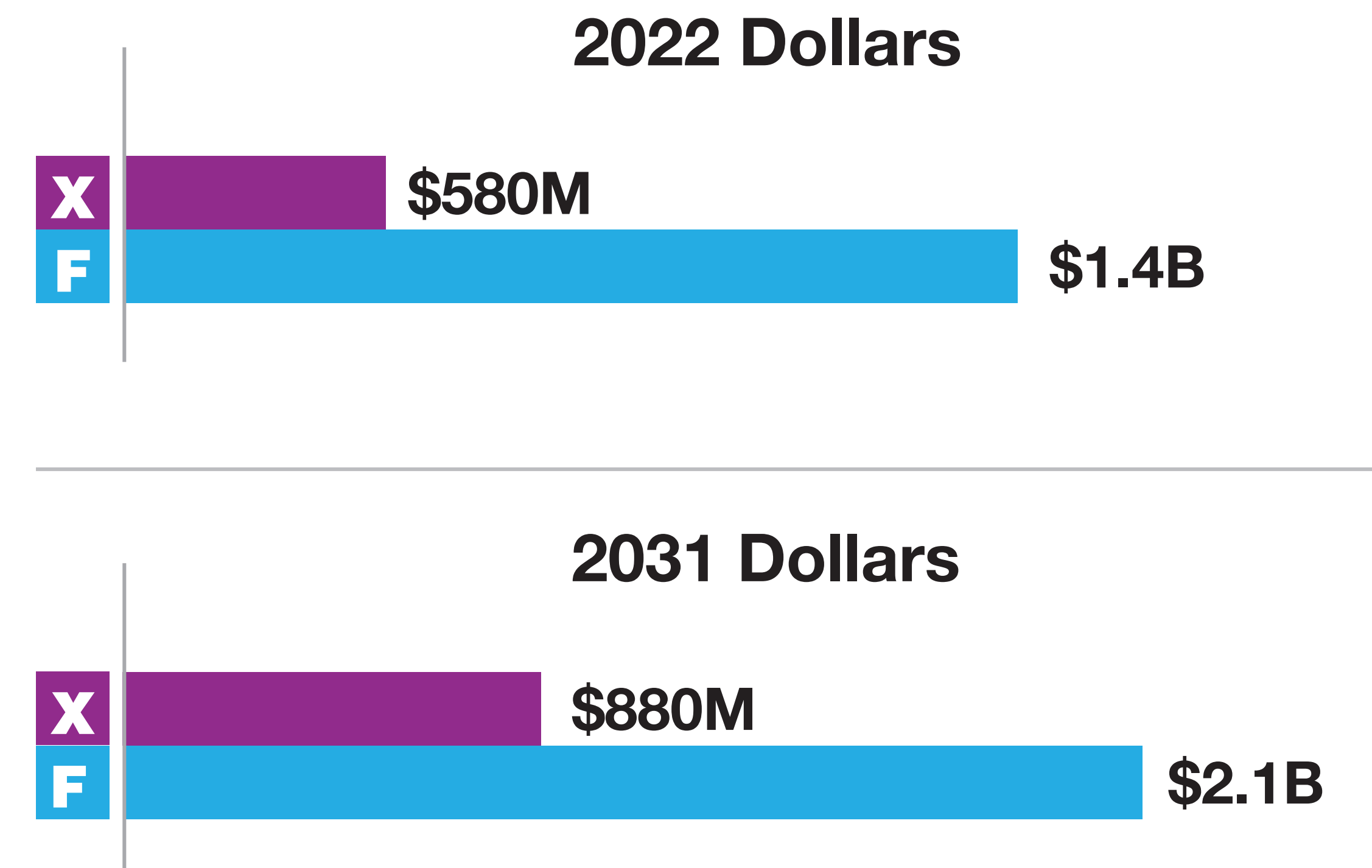
# Costs and Construction



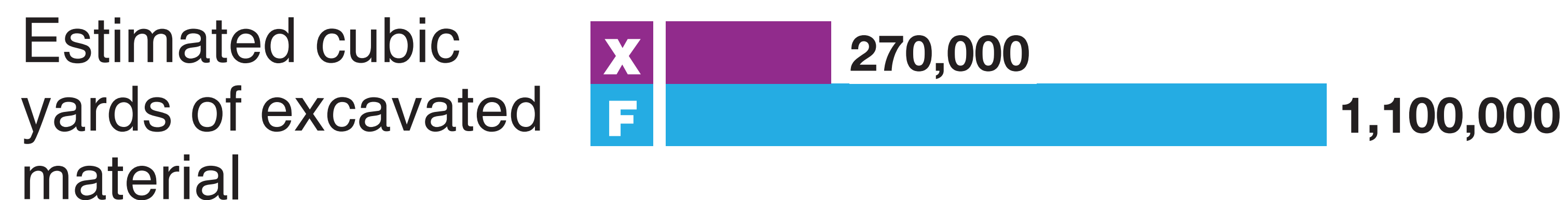
## Costs\*

Design and construction costs (Bottom Line Total Cost)

\* Other cost estimates under development include annual maintenance costs, operational costs, mitigation costs, and total lifecycle costs (at 75 year design life).

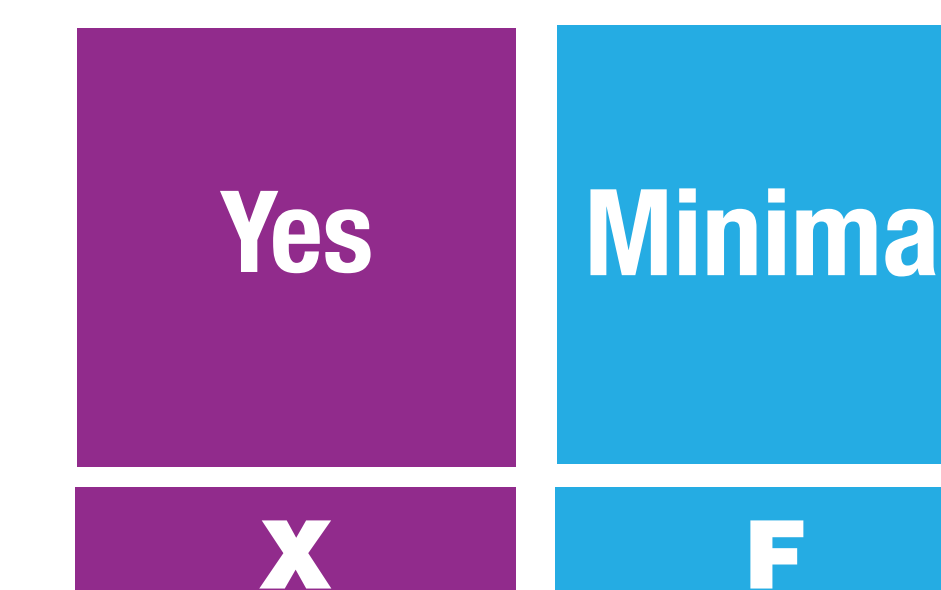


## Volume of Excavated Materials



## Lane Closures During Construction

Lane closures during construction



Length of time for reduced lanes

