

ATTACHMENT I
Preliminary Environmental Assessment Report



PRELIMINARY ENVIRONMENTAL ANALYSIS REPORT

1. Project Information

District: 1	County: DN	Route: 101	PM: 12.0 / 15.5	EA: 01-0F280
				Project ID: 0115000099
Project Title: LAST CHANCE GRADE REALIGNMENT				
Project Manager	Sebastian Cohen	Phone # 707-441-3979		
Env. Senior	Rosalind Litzky	Phone # 707-445-5222		
Planner	Jason Meyer	Phone # 707-445-6322		

2. Project Description

2.1 Purpose and Need

Project Purpose:

The purpose of this project is to develop a permanent solution to the instability and potential roadway failure at Last Chance Grade (LCG). The project will consider alternatives that provide a more reliable connection, reduce maintenance costs, and protect the economy, natural resources, and cultural landscapes.

Project Need:

Landslides and road failures at LCG have been an ongoing problem for decades. A geologic study in 2000 conducted for Caltrans by the California Geological Survey mapped over 200 historical and active landslides (both deep-seated and shallow) within the corridor between Wilson Creek and Crescent City. Over the years, Caltrans has conducted a considerable number of planned and emergency construction projects and maintenance activities in the LCG area in order to keep the roadway open. Since 1981, landslide mitigation projects, including retaining walls, drainage improvements, and roadway repairs have cost over \$54 million (\$33 million Emergency Response Projects, \$21 million Non-Emergency Response Projects). A long-term sustainable solution at LCG is needed for many reasons, including the following:

- Economic ramifications of a long-term failure;
- Risk of delay/detour to traveling public;
- Increasing maintenance costs and;
- Increase in frequency and severity of large storm events caused by climate change.

Description of Work

This project proposes to construct a new roadway around the existing Last Chance Grade on a new alignment. Alternatives include a tunnel and a three to fifteen mile long realignment around the failing area. The concept is for a two lane highway with passing lanes. The alternate alignments pass through coastal forests and varying ages of redwood forest including old-growth and previously harvested forests from 16 to 90 years old. The various project alternatives include multiple creek crossings and bridges. The new alignments pass through private timberland and State and National Park lands.

Construction activities will include, but are not limited to: extensive vegetation removal; large tree removal; excavation and fill; tunneling; culvert placement; construction of bridges and retaining walls; placement of various guardrails and median barriers; and compaction of soil and paving for a driving surface.

ALTERNATIVES

Seven alternatives were considered for the project, including an alternative for maintaining the existing alignment—also referred to as the No Build alternative. All build alternatives propose a two-lane highway with an intermittent truck-climbing/passing lane. Each lane would be 12-feet-wide, with 8-foot shoulders (10-foot shoulders in tunnels). There are three proposed roadway widths among the six proposed build alternatives: 40 feet (12-foot lanes, 8-foot shoulders), 44 feet (12 foot lanes, 10-foot shoulders in tunnels) and 52 feet (12-foot lanes, 8-foot shoulders and a 12-foot truck-climbing/passing lane). For alternatives in old-growth redwood forests, shoulders may be as narrow as 4 feet, and a viaduct will likely be proposed to reduce impacts to old-growth redwoods. All alternatives were developed with vertical grades not to exceed 7%, a design speed of 55 mph, a minimum horizontal curve radius of 1,000 feet (with minor exceptions, where noted), and superelevation rates that meet current design standards. At this phase in the project, cut slopes of 1.5:1 (H:V) were assumed, with fill slopes that vary between 1.5:1 to 2:1 (flatter fill slopes were assumed in locations where the terrain would allow additional fill placement).

Viable Alternatives

Alternative A1 (PM 13.47 to PM 15.56): Rudisill Road to LCG Tunnel

This alternative departs U.S. Highway 101 (US 101) with an 850 foot radius horizontal curve at Rudisill Road (PM 13.47) and enters Redwood National Park (RNP) at an elevation of 380 feet. The alignment crosses the California Coastal Trail (CCT), exits RNP after 500 feet, and gains approximately 900 feet of elevation as it climbs the back side of the LCG hill. Connectivity to the CCT will need to be reestablished, possibly with an undercrossing where the fill prism is shallow and narrow. At 2.3 miles along the alignment it heads west and utilizes a 125-foot high bridge (Bridge 1a) over an ephemeral tributary of Wilson Creek, and enters a tunnel (Tunnel 1) before reaching the eastern boundary of Del Norte Coast Redwoods State Park. Tunnel 1 is 2,425-foot-long with a 2.6% grade and a northern portal near US 101 at PM 15.56. The alignment ties back into US 101 on a 900-foot radius horizontal curve. The alignment is 3.2 miles in length and eliminates a 2.1 mile-long segment of existing US 101.

<i>Alternative A1 Summary</i>				
Length (miles)	Roadway Cost (2016)	Structure Cost (2016)	Right of Way Cost (2016)	Total Capital Cost (2016)
3.2	\$189,214,000	\$464,472,000	\$17,919,000	\$671,605,000

Alternative A2 (PM 13.47 to PM 15.92): Rudisill Road to Damnation Trailhead

Alternative A2 is common to Alternative A1 for the initial 2.3 miles of the alignment. The alignment then continues northeast from mile 2.3 and enters a large cut section before crossing an ephemeral tributary of Wilson Creek on a proposed 115-foot high bridge (Bridge 2a). The alignment continues on a side-hill ascent through a small cut, enters a 1,100-foot-long bridge with a 7% grade (Bridge 2b) just prior to Del Norte Coast Redwoods State Park's eastern boundary, and then passes through old-growth forest. The alignment reconnects with existing US 101 within 450 feet of the viaduct at PM 15.92, prior to the Damnation Creek Trailhead pull-out. The alignment is 3.2 miles in length and eliminates a 2.5 mile long segment of existing US 101.

<i>Alternative A2 Summary</i>				
Length (miles)	Roadway Cost (2016)	Structure Cost (2016)	Right of Way Cost (2016)	Total Capital Cost (2016)
3.2	\$170,744,000	\$26,677,000	\$42,392,000	\$239,813,000

Alternative F (PM 14.24 to PM 15.56): Full Tunnel

Alternative F proposes a complete tunnel option to realign US 101. The alternative departs US 101 at PM 14.24 with a northeast bearing to go behind the landslide failure planes. The alignment extends 750 feet before entering the southern tunnel portal (Tunnel 2) at an elevation of approximately 610 feet. The tunnel maintains a grade of 4% until reaching its northern portal at an elevation of approximately 840 feet. Upon leaving the northern portal, the alignment extends approximately 450 feet while ascending at a grade of 5.6% before reconnecting to existing US 101 at PM 15.56. The proposed tunnel is 5,600 feet in length and would generate approximately 200,000 cubic yards of excess excavation material. In the event a location near the alignment cannot be identified, an off-site location will need to be found. The alignment is 1.3 miles in length and eliminates a 1.3 mile segment of US 101. The tunnel's feasibility has not yet been proven, and is complicated by the fact that it passes between the boundary separating the Franciscan Complex Broken Formation and the Melange. Extensive geotechnical studies will be needed to determine if this is a viable alternative.

<i>Alternative F Summary</i>				
Length (miles)	Roadway Cost (2016)	Structure Cost (2016)	Right of Way Cost (2016)	Total Capital Cost (2016)
1.3	\$69,972,000	\$978,070,000	\$13,585,000	\$1,061,627,000

Alternative C3 (PM 13.47 to PM 19.81): Rudisill Road to South of Mill Creek Access

Alternative C3 is common to Alternatives A1 & A2 for the initial 2.3 miles of the alignment. At mile 2.3 the alignment continues north, remaining east of the Del Norte Coast Redwoods State Park, and crosses three ephemeral tributaries of Wilson Creek utilizing two bridges (Bridges C1 & C2). At mile 3.25 the alignment enters the southern portal of a 1,680-foot long tunnel (Tunnel 3) with a 3.9% grade. The tunnel in this alternative is used to avoid a significant cut section through an unavoidable 1,100-foot-high ridge. From the northern tunnel portal, the alignment continues north for 3,000 feet, crossing one ephemeral tributary of Wilson Creek on a bridge (Bridge C3), then swings to the east to avoid old-growth forest within the State Park. Through this section, north of the tunnel, estimated cut and fill lines appear close to the Park boundary. Once survey information is available and design work begun, the alignment and/or profile will be adjusted, as necessary, to avoid direct impact to the Park. The alignment crosses two more ephemeral tributaries of Wilson Creek, turns north, and at mile 4.9 enters previously harvested State Park forest land. At mile 5.4, the alignment extends through a low gap in the ridge while transitioning from the Wilson Creek watershed to the West Branch (WB) Mill Creek / Smith River watershed. The alignment continues northwest crossing a tributary of WB Mill Creek with a bridge (Bridge C4) at mile 6.6. It continues northwest crossing another tributary (no bridge) to mile 6.7. Bridge C4 was added to the alternative after completion of the Advance Planning Study as discussed in Section 14.4 of the PSR. At mile 6.7, at an elevation of approximately 800 feet, the alignment extends northwest and crosses a drainage of WB Mill Creek on a 1,100-foot-long bridge (Bridge 3a) before ascending at 6.9% through a large cut. At mile 7.8, the alignment reconnects with existing US 101 at PM 19.81, approximately 0.4 mile south of the Mill Creek Campground Road intersection, at an elevation of 1,100 feet. The alignment is 7.8 miles in length and eliminates a 6.3 mile long segment of existing US 101.

<i>Alternative C3 Summary</i>				
Length (miles)	Roadway Cost (2016)	Structure Cost (2016)	Right of Way Cost (2016)	Total Capital Cost (2016)
7.8	\$358,009,000	\$401,461,000	\$38,087,000	\$797,557,000

Alternative C4 (PM 13.47 to PM 20.82): Rudisill Road to North of Mill Creek Access

Alternative C4 is common to Alternative C3 for the initial 6.7 miles of the alignment. From mile 6.7, Alternative C4 extends northwest and crosses a drainage of WB Mill Creek on a 564-foot-long bridge (Bridge 4a). At mile 7.5, the alignment crosses Mill Creek Campground Road near its mid-point and continues on a long tangent section. A required public connection to the Mill Creek Campground would be feasible at this location. The alignment then crosses a drainage of WB Mill Creek on a 150-foot-high bridge (Bridge 4b). At mile 7.7, the alignment begins ascending at 5.9% and crosses two more WB Mill Creek drainages (without bridges). At mile 8.6, the alignment reconnects with existing US 101 at PM 20.82. The alignment is 8.6 miles in length and eliminates a 7.4-mile-long segment of existing US 101.

<i>Alternative C4 Summary</i>				
Length (miles)	Roadway Cost (2016)	Structure Cost (2016)	Right of Way Cost (2016)	Total Capital Cost (2016)
8.6	\$413,047,000	\$395,591,000	\$38,678,000	\$847,316,000

Alternative C5 (PM 13.47 to PM 22.73): Rudisill Road to Hamilton Road (Alternative Recommended for Programming)

Alternative C5 is common to Alternative C4 for the initial 7.7 miles of the alignment. From mile 7.7, the alignment extends northeast and crosses a tributary of WB Mill Creek (without a bridge) and enters a large side-hill through-cut. At mile 8.0 the alignment crosses a WB Mill Creek tributary with a 94-foot-high bridge (Bridge 5b). Upon departure from Bridge 5b, the alignment enters a large through-cut, and at mile 8.4 enters a final decent. At mile 9.4 an ephemeral tributary of WB Mill Creek is crossed by a 66-foot-high bridge (Bridge 5c). At mile 9.9 a larger tributary of WB Mill Creek is crossed by a 12-foot-high bridge (Bridge 5d) while the alignment intersects Hamilton Road and extends west. From this point, the alignment follows the general course of Hamilton Road on a relatively flat grade to its intersection with existing US 101 at PM 22.73. Three smaller bridges (Bridges 5e-5g) are anticipated for this last section. The alignment is 11.7 miles in length and eliminates a 9.3 mile segment of existing US 101, including the Cushing Creek area.

<i>Alternative C5 Summary</i>				
Length (miles)	Roadway Cost (2016)	Structure Cost (2016)	Right of Way Cost (2016)	Total Capital Cost (2016)
11.7	\$533,147,000	\$424,106,000	\$44,897,000	\$1,002,150,000

Alternative M (PM 12.0 to PM 15.5): Maintain Existing (No Build)

This alternative will have no planned construction, and US 101 will continue on its existing alignment. Regular maintenance and operations will continue with this alternative, with emergency restoration projects as needed to address changing conditions. Current annual maintenance costs are \$2 million with a projected cost of approximately \$26 million by 2034 (District 1 Climate Change Vulnerability Assessment and Pilot Studies). Engineering solutions such as retaining walls have not been able to provide long-term stability, but will continue to be necessary to provide an adequate highway facility. As the landslides move, the road will require costly repairs and maintenance with potential environmental impacts including old-growth redwood impacts associated with roadway retreats to keep US 101 open. The potential for slide movement which is deep and large enough could result in a major roadway failure requiring complete closure of the roadway indefinitely. A major roadway failure would have economic impacts and require a significant detour that is outlined in the LCG Engineered Feasibility Study, *9.2.3 Economic Impact Study*.

Rejected Alternatives

The Last Chance Grade Feasibility Study evaluated a total of fifteen alternatives—of which eight were eliminated from further study. The criteria used for alternative exclusion includes geotechnical, environmental, engineering, and planning criteria. These alternatives, when compared to the viable alternatives, provided no unique advantage to necessitate further study.

3. Anticipated Environmental Approval

- 3.1 CEQA:** EIR
- 3.2 NEPA:** EIS
- 3.3 CEQA Lead Agency:** Caltrans
- 3.4 Estimated length of time (months) to obtain environmental approval:** 5 to 9 years (A revised schedule would need to be prepared if emergency funding was obtained.)
- 3.5 Estimated person hours to complete identified tasks:** 730,000 hours

4. Special Environmental Considerations*Section 4(f):*

This project has the potential to affect park resources, including old-growth redwoods in Del Norte Coast Redwoods State Park and Redwood National Park (parks). All alignments could remove mature trees, and Alignment A2 may remove approximately three acres of old-growth redwoods. The current alignment runs primarily through Del Norte Coast Redwoods State Park, one of the three state parks managed jointly with Redwood National Park as Redwood National and State Parks. Connecting the new alignment to the old will require converting Park lands into highway. The parks are a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Site, primarily in recognition of the scientific, ecological

and cultural values of old-growth redwood forest. This will require a Section 4(f) Evaluation as part of the environmental impact analysis document. Project effects on visual quality and aesthetics must be considered.

Right of Entry:

The project will require obtaining Right of Way within the Parks, therefore a Right of Entry will need to be obtained.

Endangered Species:

Marbled murrelets (federally threatened, state endangered) may be impacted by nesting habitat removal (A2) and increased predation through edge effects (C3, C4, C5).

The C alignments may have impacts on coho salmon (federally threatened, state threatened) in Mill Creek, which provides most of the spawning grounds for the coho salmon within the Smith River watershed.

There may be state and federally listed plant and wildlife species not yet identified within the project area that may require consultations and mitigation to reduce impacts.

Wildlife Habitat Connectivity:

Wildlife habitat connectivity, specifically for mesocarnivores, will be impacted by Alternatives A1, A2, C3, C4 and C5 due to the length and width of the highway corridor.

Permit to Conduct Scientific Research and Collections:

The project will require extensive access to both park lands and private timberlands to conduct various surveys. The parks will require a permit to conduct scientific research and collections.

Coastal Zone:

All alternatives will need to address issues related to impacts to visual quality, safety, endangered species, cultural resources, wetlands, Environmentally Sensitive Habitat Areas (ESHA), and public access within the Coastal Zone.

Wetlands and Other Waters:

The alignments will cross numerous small streams with bridges and culverts. There are likely numerous wetland seeps within the project area.

Cultural:

There is the potential for alignments to cross important archeological sites.

5. Anticipated Environmental Commitments

All alignments, and especially Alignment A2, will require mitigation for direct impacts to old-growth redwoods. These cannot be replaced in-kind. While the exact mitigation will be determined later in the

environmental process, mitigation could come in the form of: 1) purchasing stands of old-growth redwood and donating to the Park; and/or 2) funding late seral management and research within the parks. The exact acreage of addition to the Park and/or amount of funding will be carefully considered and determined in future project phases.

Alignments C3, C4 and C5 will require mitigation for impacts to coho salmon in Mill Creek. Coho mitigation could come in the form of: 1) high quality stormwater treatment systems; 2) fish passage projects within the Smith River watershed; 3) in-stream habitat restoration projects; and/or 4) funding road removal/watershed improvement projects within the Mill Creek watershed.

All alignments would break up the forest habitat and impact connectivity because of the linear feature of the highway corridor, therefore mitigation would be required for indirect impacts to wildlife connectivity in general. Alignments C3, C4 and C5 would have higher impacts on wildlife connectivity due to their greater lengths. Most of the wildlife in this area will use drainages rather than ridges to traverse the area. Mitigation could come in the form of: 1) reducing cut and fill widths wherever possible; 2) tunneling under ridges rather than cutting through them; 3) bridging over drainages rather than placing culverts and filling them; and/or 4) fixing the off-site wildlife connectivity problems at the Prairie Creek bypass area by installing a new, porous median barrier.

All alternatives will require some form of mitigation for various resources including wetlands and other waters, coastal wetlands, redwood forest habitat, cultural, archeological, and visual. Mitigation for Caltrans projects has historically cost approximately 10 to 20% of the overall project cost. The diverse types of impacts for the various alignments will be mitigated in different ways. These will be developed and discussed in greater depth in the environmental document after studies have been completed. Our current approach is to estimate mitigation costs based on the historic percentages, and some reasoned projections. Funding of mitigation can be split into three main categories:

- Acquisition: funds on the Right of Way Datasheet for purchasing land for mitigation, or lump sum payments to other agencies or entities to implement mitigation projects (buying credits in a mitigation bank.)
- Construction: funds utilized paying a contractor to implement a mitigation plan, such as building a wetland, implementing a planting.
- Support: funds utilized internally within Caltrans developing a mitigation plan, such as design and environmental clearance.

The estimates include a breakdown of these categories. The tunnel alternatives would require a greater percentage of mitigation funding in the construction category. It is assumed that the limited footprint of Alternatives A1 and F would require less acquisition, and some minor mitigation would be implemented.

In contrast, mitigation for A2, C3, C4, and C5 lean more heavily on acquisition funds. These alignments will likely have either a large portion of land purchased and donated to the Park with some initial management funding, or a large sum of money dedicated to Parks to improve watershed characteristics in Mill Creek. Work

in Mill Creek would include efforts to remove the network of old logging roads, and removing and maintaining culverts along those roads.

A1: Mitigation for this alignment will likely be 10% of the project cost. This alignment assumes some effects to old-growth redwood, coastal resources and timberlands. The lower percentage reflects the reduced footprint of the tunnel combined with the higher construction cost of the tunnel. Mitigation costs would be broken up as follows: 25% Acquisition, 50% Construction, and 25% Support.

A2: Mitigation for this alignment will likely be 50% of the project cost. This alignment assumes effects to old-growth redwood, coastal resources and timberlands. The use of a higher percentage is to account for the difficulty of mitigating loss of old-growth redwoods, and the lower cost of construction of this alignment. Mitigation costs would be broken up as follows: 50% Acquisition, 25% Construction, and 25% Support.

C3, C4, C5: Mitigation for these alignments will likely be 15% of the project cost. These alignments assumes some effects to old-growth redwood and 90-year-old redwood forest, wildlife connectivity, coastal resources, watersheds and timberlands. Mitigation costs would be broken up as follows: 50% Acquisition, 25% Construction, and 25% Support.

F: Mitigation for this alignment will likely be 5% of the project cost. This alignment assumes some impact to old-growth redwood and coastal resources. The high cost of construction and relatively low footprint of the alignment lead to smaller effects to the environment, thus a lower percentage. Mitigation costs would be broken up as follows: 25% Acquisition, 50% Construction, and 25% Support.

6. *Permits and Approvals*

This project will require numerous permits and approvals, which includes the following:

- US Army Corps of Engineers: Section 404 Individual or Nationwide Permit
- North Coast Regional Water Quality Control Board: Section 401 Water Quality Certification
- California Department of Fish and Wildlife:
 - Stream and Lakebed Alteration Agreement (1600)
 - California Endangered Species Act consistency determinations for threatened and endangered species determinations, and other consultations for species listed only by California
- California Coastal Commission: Coastal Development Permit: State and Local jurisdictions. Consolidating permit jurisdiction is possible.
- California Department of Forestry and Fire Protection: Timberland Conversion Permit or Public Utility Right of Way Exemption
- US Fish and Wildlife Service: Endangered Species Act, Consultation for impacts to marbled murrelet, and northern spotted owl
- US National Marine Fisheries Service Endangered Species Act and Essential Fish Habitat: Consultation for impacts to Southern Oregon/Northern California Coast coho Evolutionarily Significant Unit
- State Water Resources Board: Construction General Permit

- Redwood National and State Parks:
 - Section 4(f) Agreement
 - Permit to Enter
 - Transfer of Jurisdiction
- Tribal Consultations
- State Historic Preservation Office Consultation

The project may require a National Environmental Policy Act / 404 and Least Environmentally Damaging Practicable Alternative concurrence from the Army Corps of Engineers to address wetlands and other waters impacts regulated by the Clean Water Act. This depends on the number of stream crossings and hillside seeps affected.

7. Level of Effort: Risks and Assumptions

Assumptions:

1. Timely identification and surveying of the project study area so environmental teams can begin surveys.
2. Timely conducting of subsurface geotechnical investigations within old-growth redwoods on tunnel alignments. Obtaining separate permits, preparing an environmental document, close coordination with Parks, and receiving a Permit to enter from Parks could take up to 12 to 18 months.

This project has several substantial risks.

1. All of the alignments, but especially Alignment A2 that includes removal of three acres of old-growth redwoods has substantial risk because it requires a Section 4(f) agreement with parks for use of important park resources; difficulty in adequately mitigating the loss of old-growth; removal or adverse modification of marbled murrelet habitat could result in a jeopardy opinion from USFWS; potential lawsuits under NEPA and CEQA; and environmental groups organizing to stop construction (tree sitters or other activities).
2. Alignments C3, C4, and C5 will have risk in the quantities of excess material and the difficulty of finding a disposal site within the project area; difficulty in mitigation of impacts to wildlife connectivity; and extensive impacts to streams from excavation and installation of culverts and bridges in Mill Creek could result in a jeopardy opinion on coho salmon from NMFS.
3. During the project new species could be listed by the state and federal Endangered Species Act. Additional investigations and consultations may have to be completed that could delay the schedule.
4. All alignments may have impacts to the ocean Area of Special Biological Significance due to water quality concerns within Wilson Creek.
5. Alignment F will require geotechnical drilling to determine whether it is constructible and feasible. This drilling is likely to occur within old-growth redwoods in the park, likely requiring temporary access roads to locations within old-growth redwoods. Geotechnical drilling will require a separate environmental document, a Section 4(f) Evaluation, and a Permit to Enter from the parks.

6. Project mitigation identified in the environmental document and permit conditions will need to be fully funded, and is likely to be a substantial project in and of itself. If a separate project is initiated, a separate environmental document will be required.
7. Mitigation funds are estimated based on our current knowledge of the project area and impacts, combined with historic mitigation estimates in the range of 10 to 20% of the total project cost.
8. Extensive cooperation and collaboration with the various agencies, each with separate mission statements and sometimes conflicting goals, will be essential throughout the project development and implementation phases of the project to obtain successful outcomes for all stakeholders, road users and sensitive resources.

8. PEAR Technical Summaries

These are preliminary assessments of potential impacts to various resources for the purposes of environmental planning and budgeting this proposed project. All resource areas discussed below will need to be considered for study again once the environmental studies phase of the project are initiated by Caltrans. Additional studies could be identified during project scoping conducted pursuant to the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) requirements.

Land Use

The project will directly convert some park and private forest lands to highway uses. There may also be some conversion of private forest to park land. The current highway may be converted to trails or natural areas. There are no other anticipated major changes in land use resulting from this project. The alignments traverse Del Norte Coast Redwoods State Park and Redwood National Park, requiring a full 4(f) analysis and agreement. The alignments also traverse Green Diamond's private timberlands which will require Right of Entry and acquisition of lands. The surrounding lands will continue to be a public park and timberlands.

Growth

There are no anticipated changes in growth from this project. The project will maintain the existing transportation corridor along the north coast.

Farmlands/Timberlands

The project has the potential to permanently convert some timberlands into highway facility, thus removing up to 200 acres from active timber production. This process may involve a Timberland Conversion Permit or Public Utilities Right of Way Exemption under the California Forest Practice Rules regulated by the California Department of Forestry and Fire Protection. Additional investigation into this process is necessary.

Community Impacts

Implementation of this project will not alter existing communities. It will improve the reliability of the transportation corridor, which is critical for adjacent communities. No environmental justice communities have been identified or relocations of housing, commercial, industrial, or non-profit businesses.

Visual/Aesthetics

A Visual Impact Assessment report (VIA) will be required for all alignments considered for this project. The VIA will identify the locations of significant visual resources, identify and quantify potential impacts, and address viewer response to those impacts.

The inventory of visual resources may include:

- Positive and negative views
- Important trees
- Scenic resources
- Opinions generated through public involvement to understand what qualities are important to the local constituents
- Addressing the future use of the existing State Scenic Highway which varies depending on which alternative is selected, thereby reducing the public's experience of this natural resource

The VIA will also identify and evaluate proposed project features which include:

- Location and lengths of potential alignments
- Potential tree removal
- New cut and fill slopes
- Proposed walls, bridge structures and tunnels
- Aesthetic treatment of walls, bridges and guardrails

The VIA will evaluate impacts and the effect on the visual setting and scenic resources. The VIA will propose mitigation measures based on areas of high and low visual impacts and include recommendations to avoid or minimize those impacts.

Cultural Resources

Caltrans will be working closely with our project partners to ensure full compliance with state and federal laws governing cultural resources, specifically CEQA (which includes recent changes through Assembly Bill 52) and Section 106 of the National Historic Preservation Act. No known cultural resources intersect any of the proposed alternatives or end segments. Within the Mill Creek watershed, two archaeological resources have been identified near end segments C4 and C5. These resources have not been evaluated for eligibility for inclusion in the National Register. While these resources are avoided with the proposed end segments for Alternative C, similar resources could be encountered during the archaeological inventory survey.

There are additional aboriginal coastal village sites within the vicinity of the proposed project area. Historic sites recorded in the vicinity include historic refuse scatters; segmented roads, trails, and rail grades; and remnants of historic structures, wells and cisterns.

The following potentially significant resources could be impacted: the DeMartin Ranch, Rellim Lodge, the Hamilton Road historic train trestle, resources associated with logging in the Mill Creek watershed, portions of

the 1894 Crescent City to Trinidad Wagon Road, and the pre- contact/proto-contact trail from Crescent City to Klamath River.

Finally, there are previously recorded ethnographic resources in the upper watershed of Wilson Creek. Waterman (1920) recorded numerous acorn-gathering locations in the Upper Wilson Creek area. These resources were recorded in the early twentieth century and may be part of a larger Traditional Cultural Property, or potentially a Traditional Cultural Landscape. It is not known if these oak groves are still present and utilized, or if they have been removed through logging. It is also possible that potential ethnographic resources are present in the Mill Creek Watershed.

Studies Needed

There have been numerous inventory efforts conducted near the tie-ins of the proposed alignments. Most of the proposed alignments have not been adequately inventoried and it is likely that new, previously unknown resources will be recorded during inventory studies. Such sites could include prehistoric/protohistoric lithic scatters, burial sites, gathering locations, prayer sites, and a range of historic site types such as structural remains, privies and dumps, isolated road segments, trails, and abandoned railroads.

If sites are encountered, it is Caltrans' stated policy that they should be avoided if possible. If cultural resources are found that cannot be avoided, then it will be necessary to conduct Phase II testing, and geo-archaeological investigations will be necessary to assess for National Register of Historic Places (NRHP) eligibility. If these sites are present on the selected alternative, and cannot be avoided, then it will be necessary to develop a Finding of Effect (FOE) Document.

This would likely entail developing a Memorandum of Agreement (MOA) and a treatment plan. These documents will need to be reviewed by the project partners, the regulatory bodies in charge of oversight, the California SHPO, and potentially the Advisory Council.

Each of the alternatives has a moderate to high risk of affecting cultural resources. Archaeological and cultural monitoring will be necessary for construction in areas identified as high sensitivity.

Ethnographic studies will also be necessary to help identify previously unrecorded ethnographic resources in the Wilson Creek and Mill Creek watersheds. Extensive studies will be necessary with the Yurok Tribe, the Elk Valley Rancheria, and the Tolowa Dee-ni' Nation. Members of these Tribes have ancestral and modern links to the project area. Outreach and consultation efforts should also be conducted with the Big Lagoon Rancheria, Trinidad Rancheria and Resighini Rancheria, who also count members with Yurok and Tolowa descent, and State recognized groups such as the Tolowa Nation, the Melochundum Band of Tolowa Indians, and the Howonquet Community Association.

An architectural/historical landscape evaluation will be necessary for the decommissioning of portions of US 101. This old section of highway will likely be relinquished to the Parks, and for PRC 5024 compliance Caltrans must conduct inventory work. Extensive background research and documentation of historic trails, wagon roads, the Olmstead crib walls, the old alignment of US 101, and portions of the current alignment not

previously surveyed in 2010 as part of the Caltrans District 1 Transportation Enhancement Activities Program survey will be necessary as part of the evaluation.

Additional Considerations

For compliance with federal and state cultural resource laws, it will be necessary to consider aspects of this project that have not yet been fully explored such as staging areas, access roads, and other biological mitigation measures. In addition, concurrent federal and state permits (Archeological Resources Protection Act and Department of Parks and Recreation-412A, respectively) will be needed for any cultural resource work within the Parks' property. Due to the nature and complexity of this project, it is strongly recommended that Caltrans and its partners develop an agreement document covering all aspects of cultural resources.

At this time, there are two options for such documents. The first would be to develop a Memorandum of Agreement (MOA) that states the stakeholders accept the current 2014 Caltrans Programmatic Agreement (PA) for this project. A MOA would have the benefit of the California SHPO, FHWA, and the Sacramento and San Francisco Army Corps of Engineers offices having already signed this document. However, given the size and scale of this project, the existing PA may not feasibly address all potential issues to an acceptable level of detail.

The other option is to develop a project specific PA. A project specific PA, with the buy-in and support of project partners, stakeholders and regulatory agencies, would be created specifically for this large and complex undertaking. Further, a project specific PA would establish time frames, peer review and approval procedures of compliance documents, and other important details. This would be a complex negotiation process between the stakeholders, the regulatory bodies responsible for oversight, FHWA, the California SHPO and the Advisory Council. This process would likely take approximately one year to complete, but would serve to streamline the necessary work for this project. At this time, Caltrans has conducted preliminary meetings with project stakeholders and the idea of a project specific PA has been well received. Caltrans should reengage with the project partners to select either approach discussed above as soon as funding for environmental studies becomes available.

Resource Needs

Due to the variety and complexity of required tasks, much of the work required will need to be performed by a consultant as Caltrans District 1 does not have sufficient staffing. A consultant would also provide more effective coordination of task schedules. It is likely that a minimum of 6 to 10 task orders will be necessary for inventory survey, Extended Phase I, geo-archaeological studies, ethnographic studies, archival research, historic archaeological investigations, data recovery/treatment plans. Caltrans would conduct strict oversight of the consultant and conduct all tribal consultation as the federal lead agency. The total calendar time necessary for the completion of the cultural studies will be approximately 48 to 56 months. This time frame will largely depend on the amount of detailed information available from design during the Project Approval & Environmental Document phase.

If details on the alternative alignments, construction easements, access routes, utility relocations, culvert installations, etc., are not provided in a timely fashion by project designers, the completion of the cultural

studies could be delayed. As stated earlier, identification, analysis and determination of mitigation areas will be critical for project development.

Hydrology and Floodplain

There will not be direct impacts to major floodplains for most of the alternatives because the alignments are high on the ridge and bridges will be used for spanning large creeks and waterways. There is the potential for alignment C5 to have impacts within the floodplain of Mill Creek. A Floodplain Evaluation Report will be prepared to address impacts from alignment C5.

Water Quality and Stormwater Runoff

This project will require a Water Quality Assessment Report to comply with NEPA and CEQA. The report will document the evaluation of permanent stormwater treatment structures incorporated into the project to address increases in impervious surface and/or stormwater runoff volumes. This evaluation is also necessary to comply with State Water Resources Control Board (SWRCB) Order No. 2012-0011-DWQ, of the National Pollution Discharge Elimination System (NPDES) No. CAS000003. The feasibility of incorporating appropriate stormwater treatment Best Management Practices (BMPs) will also be required for the project to obtain a Section 401 Water Quality Certification from the North Coast Regional Water Quality Control Board (NCRWQCB). The proximity of the project to tributaries discharging to tributaries of Wilson Creek, Mill Creek, the Smith River, and Areas of Special Biological Significance may require additional actions specific for the project which include the development of stormwater and non-stormwater BMPs to minimize and avoid potential impacts to water quality both during and after construction.

Based on the current project description, the project will have greater than one acre of Disturbed Soil Area during construction. Therefore, the project will be required to obtain coverage under the SWRCB Construction General Permit (CGP) Order No. 2010-0014-DWQ. The CGP requires that receiving water risk level be determined to guide the selection of appropriate sediment and erosion control BMPs implemented as part of the Storm Water Pollution Prevention Plan (SWPPP). Monitoring and reporting for stormwater treatment BMPs may also be required during both construction and post-construction phases of the project.

Potential watershed impacts associated with Alignments F, A1, and A2 would be limited to the Wilson Creek sub-watershed area located within the Point St. George-Frontal Pacific Ocean watershed. The other alternative alignments would have the potential to impact water quality within both the Point St. George-Frontal Pacific Ocean and Smith River-Frontal Ocean watersheds. During the NEPA/CEQA review phase of the project, an initial water quality assessment report (WQAR) will be prepared by Caltrans environmental engineers. This WQAR will discuss the regulatory framework of the project, provide data on surface and groundwater resources within the project area, identify potential impacts/benefits associated with the proposed project, and recommend specific avoidance and/or minimization measures for potentially adverse impacts to water quality.

Several aspects of the proposed alternative alignments will need to be fully evaluated for all potential watershed impacts. Design features that are of specific concern to water quality include, but are not limited to, surface water runoff from impervious surfaces, roadway drainage outfalls and their proximity to sensitive receiving water bodies (e.g., Area of Special Biological Significance). These types of potential impacts are

evaluated under the regulatory framework established by Section 402(p) of the Federal Clean Water Act and California Water Code Section 13376 which establish Waste Discharge Requirements (WDRs) for point source discharges from Caltrans right-of-way (i.e., existing and new facilities and roadways).

Geology, Soils, Seismic and Topography

The project will require extensive amounts of cut and fill through steep mountainous terrain. Some of this terrain may be unstable requiring retaining walls or other engineered facility. A geology study that assesses regional and site-specific geology, soils, seismic hazards, and topography will be required for the environmental phase. Geotechnical site characterization developed for design will require subsurface investigation (geotechnical drilling). Project specific geotechnical drilling will be subject to a separate environmental document and regulatory requirements.

Paleontology

There may be paleontological resources within the study area, and these will need to be investigated during the environmental studies phase. A Paleontological Identification Report (PIR) will first be prepared as an initial screening to determine if the presence of known or reasonably anticipated resources may be impacted. If paleontological resources are determined to be impacted by the project, then a Paleontological Evaluation Report will be prepared to determine the significance of the impacts.

Hazardous Waste/Materials

The project alignments run through relatively natural forest lands, and are unlikely to contain any industrial hazardous waste materials. An Initial Site Assessment will be conducted during the full environmental studies.

Air Quality

The project may slightly increase the length of the highway between Klamath and Crescent City, thus increasing daily traffic emissions. Additionally, the project will have emissions from construction. Both of these will need to be studied during the environmental studies phase of the project. An air quality report that addresses impacts from the project and satisfies state and federal regulatory requirements will be prepared.

Noise and Vibration

There are few sensitive receptors near the project. The Mill Creek Campground is near Alignments C3, C4, and C5, and those alignments would move the highway closer to the campground, potentially increasing highway noise for campers. Currently the highway is approximately 0.8 mile from the campground and the C-alignments are approximately 0.4 mile from the campground. A Noise Study Report will be prepared that addresses impacts from the project that satisfies state and federal regulatory requirements. Impacts to biological resources from noise and vibration are included under the Biological Section.

Energy and Climate Change

The proposed alternative roadway alignments would be up to 2.4 miles longer than the existing alignment. Short term and long term impacts from construction will be studied and determined during the project report

environmental document phase. An Energy Study will be prepared that addresses impacts from the project that satisfies state and federal regulatory requirements.

Biological Environment

Ongoing meetings are being conducted with representatives from Redwood National Park, California State Parks, USFWS, California Department of Fish and Wildlife (CDFW), National Marine Fisheries Service (NMFS), US Army Corps of Engineers (ACOE), North Coast Regional Water Quality Control Board (RWQCB), California Coastal Commission, Elk Valley Rancheria, Tolowa Dee-ni' Nation, and the Yurok Tribe to discuss project impacts, required surveys and potential mitigation.

Surveys

The required surveys will be extensive, and in some cases will require specialized personnel and equipment. Much of this work will need to be contracted out to specialized consultants due to the volume, expertise and schedule required.

Waters and Wetlands

There are likely wetlands and other waters of the U.S. and state jurisdiction within the project limits. There are likely seeps and other wetlands along hillsides within the footprints of the various alternatives. Some of the alternatives will traverse creeks and drainages, which will require bridges or culverts. Wetlands and other waters are under the jurisdiction of the ACOE, the RWQCB, the California Coastal Commission (where resources exist in the Coastal Zone) and the CDFW. These will require mitigation under the Clean Water Act. Wilson Creek flows into the Redwood National Park Area of Special Biological Significance (ASBS) in the Pacific Ocean, which is under regulation by the State Water Resources Control Board.

It is anticipated there will be multiple coastal and ACOE wetlands and other waters of the State and US within the project footprint. These jurisdictional features will need to be identified and delineated. Aerial photography, topographic maps, hydrology layers in ArcGIS map, the National Wetlands Inventory, and other Caltrans projects were reviewed and Caltrans biologists consulted to estimate the number of potential wetlands located within the project area, along with the time it would take to delineate these features.

Potential Biological Resources of Concern

Preliminary queries for rare and sensitive species sightings and records of observations at the project location were conducted using the California Natural Diversity Database (CNDDDB), California Native Plant Society (CNPS) Online Inventory of Rare and Endangered Plants, and United States Fish and Wildlife Services' (USFWS) Information for Planning and Conservation (IPaC). The query was based off the primary 7.5' topographic quad sheets (quad) and the adjacent quads. The quads consisted of: Ah Pah Ridge, Cant Hook Mountain, Childs Hill, Crescent City, Fern Canyon, Gasquet, Hiouchi, Klamath Glen, Requa and Sister Rocks. A thorough Biological Scoping for state and federally listed candidate and Species of Special Concern (SSC) should be conducted at quad and nine quad radiuses (10 mile radius).

The project area consists of suitable habitat for a variety of sensitive natural communities and special status species (Endangered Species Act or other designations). The CNDDDB shows numerous special status species

and natural communities within the vicinity of the project, and many of these could be present within the footprint of the project. Based on Environmental staff experience, species of special status that will need to be evaluated are discussed below. Once mapping of the vegetation communities and floristic surveys are completed additional surveys for special status species could be identified. Environmental staff are currently in the process of reviewing species to determine focused studies with a Biological Working Group that consists of representatives from resource agencies. The list of special status species generated from this effort will be used once the project environmental phase is initiated. An evaluation of direct, indirect, and cumulative impacts to biological resources will need to be addressed in a Natural Environment Study.

Plants and Natural Communities

The alternatives studied encompass mostly forested areas consisting of primarily redwood forest, but also some coastal alder/spruce, and some riparian forest. Within Redwood National and State Parks, the forest contains various age groups including second-growth forests that were harvested 16 to 90 years ago and old-growth forests that have never been logged.

Old-growth redwoods and some younger redwood forest alliances are rare Natural Communities of Special Concern. They provide habitat for some endangered or threatened species such as the marbled murrelet, northern spotted owl, and pacific fisher. The trees are some of the oldest and largest on the planet, reaching over 2,000 years old, with heights greater than 360 feet and diameters larger than 20 feet. Because less than 5 percent of the original old-growth redwood forest remains, it is a very limited resource, which is not renewable due to the time it takes to achieve those characteristics. Redwood National and State Parks are recognized as a World Heritage Site by the United Nations Educational, Scientific, and Cultural Organization.

Most of the area is within the Redwood Forest Alliance and multiple associations are present within the alternatives. Some of these areas will qualify as a High Priority or Natural Community of Special Concern based on guidance by the California Department of Fish and Wildlife. In particular, the stands of old-growth redwoods within the Park are a Natural Community of Special Concern. Other vegetation types that include Natural Communities of Special Concern may be identified when more extensive surveys of the alternatives are conducted.

Western Lily (*Lilium occidentale*) can be found in coastal prairies and scrub habitats within the coastal fog zone. Focused surveys in potential habitat need to be conducted. California Rare Plant Rank (CRPR) plants have the potential to occur within the project footprint. CDFW protocol level surveys will need to be performed within the project footprint and Environmental Study Limits. If any special status plant species are detected appropriate mitigation would need to be developed.

Caltrans botanists were consulted to estimate the time needed to survey redwood forest habitats and coastal habitats. A buffer of 300 feet would be established in coastal areas for botanical surveys, and a 400-foot buffer in redwood forest areas to account for edge effects since redwoods can grow to heights over 375 feet.

A 400-foot buffer was utilized around the cut and fill layer in ArcGIS to calculate the total acreage that would need to be surveyed. The total cut and fill acreage is approximately 410 acres, and with the addition of the 400-foot buffer, the total area in need of botanical surveys would be 2,043 acres.

It is estimated that one to five acres can be surveyed per hour by one person. There will be variability in the level of effort required in different areas and microhabitats. This is the estimate that Green Diamond uses for their intuitive survey method. The project is located in the same habitat, topography, and general area in which Green Diamond operates. The use of this estimate was discussed and generally agreed upon by Caltrans biologists.

There are approximately seven acres of coastal habitat impacted, which would require a 300-foot buffer, and on average would take longer to survey than redwood forest habitat due to the complexity of plant life in coastal habitat. A 400-foot buffer was utilized for the coastal habitat, which approximates the expected increase in survey time.

A professional arborist will also be required to assess any work near large old redwoods for potential root effects.

Birds

Bald Eagle (*Haliaeetus leucocephalus*) are present within the project area, foraging in the river and ocean, and nesting in the tops of large trees. Nesting eagles could be disturbed by the construction activities and nest trees could be removed if within the project footprint. Coordination and consultation with CDFW and USFWS will be required.

Marbled Murrelet (*Brachyramphus marmoratus*) nest in old-growth redwood forests and are present within the Park areas of the alternatives. The USFWS has designated Critical Habitat for the marbled murrelet roughly along the State Park boundaries. Alternative A2 will remove approximately three acres of old-growth redwoods that is marbled murrelet nesting habitat. All of the other alternatives have the potential of removing some old-growth redwood trees, which could be nesting habitat, but at a smaller scale than A2. The project will require formal Section 7 Consultation with USFWS, and may result in an adverse effect to murrelets. The removal of old-growth redwoods along Alternative A2 would result in an adverse modification of designated critical habitat determination under the Endangered Species Act. Segments C3, C4 and the southern portions of C5 are in 80 to 90 year old stands with scattered older trees that may contain suitable nesting trees. In addition to direct removal of nesting habitat, there is also the potential for construction noise to impact nesting murrelets.

Based on initial discussions with USFWS Caltrans liaison, Gregory Schmidt, and Redwood National Park biologist, Keith Benson, as well as the latest scientific research, assessing impacts to marbled murrelet could be conducted by qualified tree climbers able to identify marbled murrelet nests in trees that would be removed. The tree climbers would be able to determine how many nests would be taken by a proposed alignment. Evaluation of project impacts to marbled murrelets should be completed during the environmental studies phase of the project. The approach to evaluating impacts will need to be discussed further with the

resource and partnering agencies prior to conducting any surveys. Stands of old-growth redwood forests are assumed occupied in Alignments A1, A2 and F.

Approximately 75 to 150 large trees have been identified by Caltrans that could be climbed to determine whether they support marbled murrelet nesting. Important areas are at the A1 and F tunnel portal, and the A2 segment. There may also be potential nesting habitat assessments along the C alignments, where they pass through the second growth that may contain larger trees. An assessment of habitat potential will need to be conducted.

Bioacoustic Recording can be used to establish a base line noise level in the project area, and used as a survey method for bird species. Requirements of this type of survey will be similar to those needed for bats (see below).

Northern Spotted Owl (NSO) (*Strix occidentalis*) use older forest types for nesting, foraging and roosting. There are eight historic activity centers near the proposed alternatives that may be affected by the project. Many of these may no longer be active, however there are likely to be a few pairs within the area. The removal of forest habitat within the footprint of the alignments will reduce habitat available for nesting, roosting, foraging, and dispersal of spotted owls. The northern portions of Alternative C3, C4, and C5 would remove large amounts of nesting, roosting and foraging habitat relative to the A and F alternatives. Construction noise could potentially disturb roosting or nesting owls.

Protocol level surveys will be required along the alignments where they intersect with NSO habitat. It is estimated that two years of surveys, with six visits per year during environmental studies, and then again prior to construction, will be necessary.

Western snowy plover (*Charadrius nivosus nivosus*) nest on ocean beaches along the north coast of California and have been detected at Gold Bluffs Beach to south of the project area. There is a small amount of nesting habitat along Wilson Creek beach, but most of this beach is susceptible to inundation during high tide, therefore would not be nesting habitat. Work around Wilson Creek Bridge could disturb plovers from this area. Given the small amount of marginal habitat and disturbance from people using the beach access, impact to plovers here would be negligible. No surveys would be necessary.

Western Yellow-billed Cuckoo (*Coccyzus americanus occidentalis*) nest in mature riparian forest. The tie-in Segment 5 at Hamilton Road could support nesting or migrating Western Yellow-billed Cuckoo.

Willow flycatcher (*Empidonax trailii*) use riparian forest. The tie-in Segment 5 at Hamilton Road could support nesting or migrating willow flycatcher. Removal of this habitat would affect willow flycatchers.

Habitat assessment and surveys for Western Yellow-billed Cuckoo and Willow flycatcher can be done concurrently. Protocol level surveys will require at least two separate surveys at each site: up to six surveys per year. There may be approximately 15 sites at Mill Creek at the end of the C5 alignment. Follow up surveys may be required depending on initial survey results.

The Migratory Bird Treaty Act offers protection to active bird nests. We anticipate breeding birds throughout the project are present from February through August. Vegetation removal should occur outside of the breeding season. This will require vegetation removal to occur in a narrow range between September to October 15—between the end of the nesting season and beginning of the rain season. Given the large area of the project and this small window of time, this will be a difficult task. Caltrans, partners and regulatory agencies will need to work through appropriate ways to address this issue.

Mammals

Bats

Bats are classified as non-game mammals by the CDFW. Bats are afforded protection under various California Fish and Game Code sections, including Sections 86, 2000, 2014, 3007, and 4150. Several sections under Title 14 of the California Code of Regulations also apply, including but not limited to Section 251.1, Article 20; Section 15380; Section 15382; and several sections under the California Public Resources Code, Division 13. There is habitat present for one listed bat species and non-listed bat species.

Townsend's big-eared bat (*Corynorhinus townsendii*) is a State Candidate Threatened species as well as a California Species of Special Concern. According to CNDDDB, the nearest occurrence is from 1945 approximately eight miles south of the project area. They are a cavity dwelling species utilizing basal hollows in large redwood trees and other cavities created by fire and lightning strikes.

Daytime visual surveys will be necessary to determine the presence and location of day, night, and maternity roosts. Bioacoustics monitoring and recording, combined with SonoBat analysis, will determine which species are present.

Mesocarnivores

Pacific fisher (*Pekania pennanti*) use mature forest habitats and are assumed present within the project area. Removal of mature and old forest stands would decrease the amount of habitat available to fisher within the project area.

Humboldt Marten (*Martes americana humboldtensis*) is a California Species of Special Concern (SSC) that use mature coastal redwood forest habitat with a dense shrub layer and are assumed present in the project area.

All alternatives could be a migration barrier to fisher, Humboldt marten and other terrestrial animals causing reduced gene flow and isolating populations. These species primarily travel along drainages. To maintain their connectivity it will be important to utilize bridges and large culverts whenever possible.

Habitat analysis will be required for these species and bait station surveys should be included as part of the analysis to determine presence, and to assess potential impacts. There are 159 acres of 80 to 90 year old redwood forest and 3 acres of old-growth that may need to be assessed.

Fish

Caltrans has a responsibility under Section 7(a) 2 of the Endangered Species Act (ESA) to consult with NMFS if a proposed project may affect listed species or their designated critical habitats. In addition, Caltrans must determine if there are potential effects to essential fish habitat (EFH) designated under the Magnuson Stevens Fisheries Conservation and Management Act (MSA). Furthermore, pursuant to section 2080 of the California Fish and Game Code, Caltrans is required to consult with the California Department of Fish and Wildlife if a proposed action may affect state listed species. If take of a state listed species occurs Caltrans must fully mitigate any impacts.

Alternatives proposed for the project include new alignments thorough the Mill Creek (tributary to Smith River) watershed. Federal and state threated species and critical habitat in the Mill Creek watershed include the Southern Oregon/Northern California Coast (SONCC) coho Evolutionarily Significant Unit (ESU) (*Oncorhynchus kisutch*). The Mill Creek watershed is noted as having high intrinsic potential for the SONCC coho population. The Mill Creek and Wilson Creek watersheds may also have coastal cut-throat trout (*Oncorhynchus clarkii clarkii*) and Klamath mountains province steelhead (*Oncorhynchus mykiss irideus*), which are state species of concern.

EFH for the SONCC coho and Chinook salmon are present within Mill Creek.

Mill Creek is almost entirely public land since the acquisition of 25,000 acres in 2002. It is noted as having high productivity and favorable rearing and spawning conditions for coho, but is far below its carrying capacity. The fisheries and habitat within Mill Creek play an important role in the productivity of coho in the Smith River. Construction and 24-hour operation of a new highway facility within these watersheds may have impacts on salmonid and EFH.

A fisheries habitat analysis will be necessary where the A and C alignments cross waterways. There are 18 mapped crossings that will require fish and habitat surveys. A Biological Assessment will need to be prepared to comply with the requirements of the ESA and EFH Assessment.

Reptiles and Amphibians

Amphibians can be particularly sensitive to erosion, pollution, and habitat loss. There are five amphibians and one reptile listed as SSCs with the potential to occur in the project area including Del Norte salamander (*Plethodon elongates*), foothill yellow-legged frog (*Rana boylei*), northern red-legged frog (*Rana aurora*), Pacific tailed frog (*Ascaphus truei*), southern torrent salamander (*Rhyacotriton variegatus*) and western pond turtle (*Emys marmorata*).

The Pacific tailed frog has a more restricted habitat preference than either the northern red-legged frog or foothill yellow-legged frog as it is usually found in a more riparian setting and is restricted to perennial montane streams. The other two frog species can be found in more varied habitat such as woodlands, grasslands, and rocky substrates.

Both the Del Norte salamander and the southern torrent salamander prefer old-growth forests. The Del Norte salamander is often found in talus and rock rubble of closed, multi-storied canopy forests while the southern torrent salamander prefers well-shaded permanent streams and seepages.

Habitat Assessments will need to be performed to determine where the pre-construction surveys will be necessary. Using the Waters and Wetlands estimate as an approximation for sites with suitable habitat, there are potentially up to 83 sites that would need habitat assessments. Additional survey locations maybe determined once the wetland delineation is completed.

Invertebrates

Populations of western pearshell mussel (*Margaritifera falcata*) exist in Mill Creek. This species has a Global Rank of G4/G5 (Apparently Secure/Secure) and state rank of S1/S2 (Critically Imperiled/Imperiled). The C5 alignment runs along known occurrences. Surveys would need to be conducted in streams that may support the mussel to determine population locations and abundance.

The federally threatened Oregon silverspot butterfly (*Speyeria zerene hippolyta*) inhabits coastal meadows in Del Norte County. Surveys will need to be conducted for their food plant, western dog violet (*Viola adunca*) in coastal habitat where the A and C alignments diverge from US 101 at the project's southern edge.

Wildlife Habitat and Connectivity

Many species of forest wildlife regularly travel through the project areas. Wildlife populations are often patchy and require movement of individuals between patches for genetic diversity and for robustness against demographic stochasticity. Linear transportation corridors can isolate populations, causing genetic bottlenecks and loss of populations. Many of the stream crossings will be bridges, which do provide for wildlife passage underneath through the riparian corridor. Both fish and terrestrial wildlife can pass through natural habitat under a bridge without being exposed to increased predation or vehicle mortality. The movement of mesocarnivores is a primary concern within the project area. Many of these species move along drainages. The use of bridges and large open arch culverts should be implemented whenever possible. The maximum use of tunnels, bridges and drainages will reduce these impacts.

The A and C alternatives will reduce connectivity within the canopy. This would impact species such as red tree vole (*Arborimus longicaudus*) and salamander species that live in the canopy. Any potential mitigation to reduce impacts will need to be considered.

Cumulative Impacts

The project may have cumulative impacts to various resources. These should be included in the various specialist reports. Due to the size and complexity of the project, it may benefit from a separate report investigating cumulative impacts.

Context Sensitive Solutions

There may be an opportunity to have tribal designs on bridges or railings.

Section 4(f)

The project will require a Section 4(f) Evaluation for converting Park lands into a highway facility. Additionally, the project has the potential to effect Park resources.

9. Summary Statement for PSR or PSR-PDS

This project will require the preparation of an EIR/EIS. All the project alignments have the potential for significant impacts to the environment from loss of native habitat and increased impervious surface. All the alignments would require Cultural Resources surveys and consultations, Coastal Development Permit, Endangered Species Consultations, Clean Water Act Section 404 Permit, Clean Water Act Section 401 Water Quality Certification and Stream and Lakebed Alteration Agreement, and a Section 4(f) Evaluation with Parks.

The project will take extensive surveying for cultural and biological resources on park and private lands (Green Diamond Resources Company timberlands). This will require coordination with parks to obtain permits for investigations. Park staff have expressed an interest in assisting in conducting technical surveys. Most alignments would require extensive acquisition of private timberlands, as well as public park lands.

The project has substantial risk of a lawsuit under NEPA and CEQA, public controversy, conflicts with stakeholder groups and partners.

This process, from project initiation through Project Approval and Environmental Document (PAED), will take approximately 8 years. Design and permitting is estimated to take approximately 5 years.

Significant consultation and coordination with partners and regulatory agencies throughout the project is necessary. This may add various risks as the goals and opinions of these organizations may not always be the same. There is already a push from these organizations to be more involved in the current design process in order to “avoid, minimize, and mitigate through design”. This is positive in that it could lower the impacts, but could prolong the design process.

10. Disclaimer

This Preliminary Environmental Analysis (PEAR) provides information to support programming of the proposed project. It is not an environmental determination or document. Preliminary analysis, determinations, and estimates of mitigation costs are based on the project description provided in the Project Study Report (PSR). The estimates and conclusions in the PEAR are approximate and are based on cursory analyses of probable effects. A reevaluation of the PEAR will be needed for changes in project scope or alternatives, or in environmental laws, regulations, or guidelines.

11. Preparers

		Date Scoping Completed
Planner	Jason Meyer	3/4/2016
Air Specialist		
Archaeologists	Dennis Wardlaw and Tim Keefe	3/1/2016
Architectural Historian		
Biologist	Jennifer Barbour	6/3/2016
CIA Specialist		
Floodplain Specialist		
Hazardous Waste Specialist	Steve Werner	2/18/2016
Noise Specialist		
Paleo Specialist		
Visual Specialist	Laura Lazarotto	2/18/2016
Water Specialist	Samantha Hadden	2/19/2016

12. Review and Approval

I confirm that environmental cost, scope, and schedule have been satisfactorily completed and that the PEAR meets all Caltrans requirements. Also, if the project is scoped as a routine EA, complex EA, or EIS, I verify that the HQ DEA Coordinator has concurred in the Class of Action.



Rosalind Litzky
Environmental Branch Chief

6/29/16

Date



Sebastian Cohen
Project Manager

6/29/16

Date

REQUIRED ATTACHMENTS:

- Attachment A: PEAR Environmental Studies Checklist
- Attachment B: Estimated Resources by WBS Code (Submitted under separate cover.)
- Attachment C: Schedule (Gantt Chart) (Not included. Schedule is discussed in Section 3.4)
- Attachment D: PEAR Environmental Commitments Cost Estimate (Standard PSR) (Submitted under separate cover.)

Attachment A: PEAR Environmental Studies Checklist

District: 1	County: DN	Route: 101	PM: 12.5/16.3	EA: 01-0F280
Project Title: LAST CHANCE GRADE				Proj ID: 0115000099

	Not Anticipated	Memo to File	Report Required	Risk L M H	Comments
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Human Environment					
Land Use	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	L	
Coastal Zone	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	M	
Wild & Scenic River Consistency	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	L	
Growth	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	L	
Farmlands/Timberlands	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	M	
Community Impacts	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	L	
Community Character and Cohesion	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	L	
Relocations	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
Environmental Justice	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	L	
Utilities/Emergency Services	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	L	
Visual/Aesthetics	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	H	
Cultural Resources					
Screening Memo	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	M	
Archaeological Survey Report	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	M	
Historic Resources Evaluation Report	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	M	
Historic Property Survey Report	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	M	
Historic Resource Compliance Report	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	M	
Section 106 / PRC 5024 & 5024.5	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	M	
Native American Coordination	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	M	
Finding of Effect	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	M	
Data Recovery Plan	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	M	
Memorandum of Agreement	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	M	
Tribal Lands	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
Other	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
ARPA Permit	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	M	
Physical Environment					
Hydrology and Floodplain	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	M	
Water Quality	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	M	
Stormwater Runoff	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	M	
Geology, Soils, Seismic and Topography	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	M	
Air Quality	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	M	
Noise and Vibration	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	M	
Energy and Climate Change	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	M	
Hazardous Waste/Materials					
Hazardous Waste/Materials	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	L	
ISA (Additional)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	L	
PSI	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	L	

	Not Anticipated	Memo to File	Report Required	Risk L M H	Comments
Other	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
Paleontology					
Paleontology	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	L	
PER	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	L	
PMP	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	L	
Biological Environment					
Natural Environment Study	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	H	
Natural Environment Study (MI)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Section 7 Formal	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	H	
Section 7 Informal	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Section 7 No effect	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Section 10	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
USFWS Consultation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	H	Marbled Murrelets
NMFS Consultation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	H	Coho Salmon
Species of Concern	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	M	
Wetlands & Other Waters/Delineation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	M	
404(b)(1) Alternatives Analysis	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	M	
Invasive Species	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	L	
Coastal Management Plan	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	M	
DFG Consistency Determination	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	H	
HMMP	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	M	
Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Other					
Cumulative Impacts	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	M	
Context Sensitive Solutions	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	M	
Section 4(f)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	H	Needs full 4(f)

Not Anticipated	Memo to File	Report Required	Risk L M H	Comments
-----------------	--------------	-----------------	------------	----------

Permits

Not Anticipated	Required	Risk L M H	Comments
-----------------	----------	------------	----------

1600 Agreement Coordination	<input type="checkbox"/>	<input checked="" type="checkbox"/>	H	
2081	<input type="checkbox"/>	<input checked="" type="checkbox"/>	H	
401 Certification Coordination	<input type="checkbox"/>	<input checked="" type="checkbox"/>	H	
Tribal 401	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
404 Permit Coordination	<input type="checkbox"/>	<input checked="" type="checkbox"/>	H	
Local Coastal Development Permit Coord.	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
State Coastal Development Permit Coord.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	H	
NPDES Coordination	<input type="checkbox"/>	<input checked="" type="checkbox"/>	H	
US Coast Guard (Section10)	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
TRPA	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
BCDC	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
State Lands Commission Lease Agreement	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Bureau of Reclamation Encroachment Permit	<input checked="" type="checkbox"/>	<input type="checkbox"/>		

ATTACHMENT J
Cost Estimates

Last Chance Grade

Alternative A1

01-DN-101 PM 12.0/15.5

ALTERNATIVE DESCRIPTION: Alternative A1 (Rudisill Road to LCG Tunnel)

SUMMARY OF ESTIMATED COST

TOTAL ROADWAY ITEMS (2016)	\$189,214,000
TOTAL STRUCTURE ITEMS (2016)	\$464,472,000
SUBTOTAL CONSTRUCTION COSTS	\$653,686,000
TOTAL RIGHT OF WAY ITEMS (2016)	\$17,919,000
TOTAL PROJECT CAPITAL OUTLAY COSTS	\$671,605,000

I. ROADWAY ITEMS

Section 1 Earthwork	Quantity	Unit	Unit Price	Item Cost
Clearing & Grubbing	79	Ac	\$18,000	\$1,422,000
Roadway Excavation	2,371,000	CY	\$20	\$47,420,000
Subtotal Earthwork				\$48,842,000

Section 2 Pavement Structural Section	Quantity	Unit	Unit Price**	Item Cost
HMA-A	10,606	TON	\$120	\$1,272,720
RHMA-G	5,933	TON	\$120	\$711,960
BWC-O	4,092	TON	\$120	\$491,040
AB (C1-2)	23,440	CY	\$50	\$1,172,000
SEG	60,622	SY	\$2	\$121,244
HMA Dike	144	TON	\$120	\$17,280
Place HMA Dike	11,240	LF	\$4	\$44,960
Subtotal Pavement Structural Section				\$3,831,204

Section 3 Drainage	Quantity	Unit	Unit Price	Item Cost
Drainage (Geotechnical)	1	LS	\$5,493,700	\$5,493,700
Drainage (Hydraulics)	1	LS	\$5,247,500	\$5,247,500
Subtotal Drainage				\$10,741,200

Section 4 Specialty Items	Quantity	Unit	Unit Price	Item Cost
Shoulder Rumble strip	273	STA	\$100	\$27,300
Erosion Control	1	LS	\$2,711,770	\$2,711,770
Highway Planting and Revegetation	1	LS	\$1,791,280	\$1,469,000
Mitigation (Construction)	1	LS	\$45,000,000	\$45,000,000
Temporary Construction BMPs	1	LS	\$7,092,850	\$7,092,850
Subtotal Specialty Items				\$56,300,920

Section 5 Traffic Items	Quantity	Unit	Unit Price	Item Cost
Thermoplastic Striping (4")	657	STA	\$50	\$32,850
Pavement Marker (reflective-recessed)	1,370	EA	\$5	\$6,850
Construct Metal Beam Guardrail (TOTAL)	7,840	LF	\$35	\$274,400

Tie-in Work and Construction Access:				
Portable Changeable Message Sign (PCMS)	2	EA	\$8,000	\$16,000
Temp Flashing Beacon	2	EA	\$7,000	\$14,000
Construction Area Signs	1	LS	\$5,000	\$5,000
Subtotal Traffic Items				\$349,100

Total Sections 1 : 5	\$120,064,424
-----------------------------	----------------------

Traffic Additions (Tie-in Work & Access)				
Traffic Control System	1	LS	\$2,000,000	\$2,000,000
Maintain Traffic	1	LS	\$2,000,000	\$2,000,000
			Subtotal Traffic Additions	\$4,000,000
			TOTAL 1:5 + TRAFFIC ADD.	\$124,064,424
			Time Related Overhead (5%)	\$6,203,221
			Subtotal	\$130,267,645

Section 6 Minor Items				
			\$120,064,424 x (5%) =	\$6,003,221
			Subtotal Minor Items	\$6,003,221
			Subtotal Sections 1 : 6	\$136,270,866

Section 7 Roadway Mobilization				
			\$120,064,424 x (10%) =	\$12,006,442
			Subtotal Mobilization	\$12,006,442
			Subtotal Sections 1 : 7	\$148,277,309

Section 8 Roadway Additions		Item Cost		
Supplemental Work				
	\$136,270,866 x (5%) =	\$6,813,543		
Contingencies				
	\$136,270,866 x (25%) =	\$34,067,717		
Construction Office (3-yr.)		\$35,000		
		Subtotal Roadway Additions		
		\$40,916,260		
	\$ Per Hour	Hours Per Day	Work Days	
GOZEEP setups (Tie-in Work)	\$100	10	20	\$20,000

TOTAL ROADWAY ITEMS \$189,213,569

II. STRUCTURES ITEMS

	Tunnel 1	\$458,444,000
	Bridge 1A	\$6,028,000
		TOTAL STRUCTURES ITEMS \$464,472,000

III. RIGHT OF WAY ITEMS

A. Total Acquisition Cost	\$954,250
B. Appraisal Fees Estimate	\$5,000
C. Mitigation acquisition & credits	\$15,750,000
D. Project Development Permit Fees	\$453,000
E. Utility Relocation (State share)	\$755,000
F. Relocation Assistance (RAP)	\$0
G. Clearance/Demolition	\$0
H. Title and Escrow Fees	\$1,000
TOTAL RIGHT OF WAY ITEMS \$17,918,250	

Anticipated Date of Right of Way Certification
(Date to which Values are Escalated)

Estimate Prepared By: Carlon Schrieve
Estimate Checked By: Jeff Pimintel

Last Chance Grade
Alternative A2

01-DN-101 PM 12.0/15.5

ALTERNATIVE DESCRIPTION: Alternative A2 (Rudisill Road to Damnation Trailhead)

SUMMARY OF ESTIMATED COST

TOTAL ROADWAY ITEMS (2016)	\$170,744,000
TOTAL STRUCTURE ITEMS	\$26,677,000
SUBTOTAL CONSTRUCTION COSTS (2016)	\$197,421,000
TOTAL RIGHT OF WAY ITEMS (2016)	\$42,392,000
TOTAL PROJECT CAPITAL OUTLAY COSTS	\$239,813,000

I. ROADWAY ITEMS

Section 1 Earthwork	Quantity	Unit	Unit Price	Item Cost
Clearing & Grubbing (Includes Large Timber)	87	Ac	\$20,000	\$1,740,000
Roadway Excavation	3,533,000	CY	\$20	\$70,660,000
Subtotal Earthwork				\$72,400,000

Section 2 Pavement Structural Section	Quantity	Unit	Unit Price**	Item Cost
HMA-A	11,844	TON	\$120	\$1,421,280
RHMA-G	6,626	TON	\$120	\$795,120
BWC-G	4,570	TON	\$120	\$548,400
AB (Cl-2)	26,180	CY	\$50	\$1,309,000
SEG	67,700	SY	\$2	\$135,400
HMA Dike	139	TON	\$120	\$16,680
Place HMA Dike	10,870	LF	\$4	\$43,480
Subtotal Pavement Structural Section				\$4,269,360

Section 3 Drainage	Quantity	Unit	Unit Price	Item Cost
Drainage (Geotechnical)	1	LS	\$6,673,300	\$6,673,300
Drainage (Hydraulics)	1	LS	\$4,923,000	\$4,923,000
Subtotal Drainage				\$11,596,300

Section 4 Specialty Items	Quantity	Unit	Unit Price	Item Cost
Shoulder Rumble strip	305	STA	\$100	\$30,500
Erosion Control	1	LS	\$2,973,230	\$2,973,230
Highway Planting and Revegetation	1	LS	\$1,969,370	\$1,582,000
Mitigation (Construction)	1	LS	\$37,500,000	\$37,500,000
Temporary Construction BMPs	1	LS	\$1,781,963	\$1,782,000
Subtotal Specialty Items				\$43,867,730

Section 5 Traffic Items	Quantity	Unit	Unit Price	Item Cost
Thermoplastic Striping (4")	657	STA	\$50	\$32,850
Pavement Marker (reflective-recessed)	1,370	EA	\$5	\$6,850
Construct Metal Beam Guardrail (TOTAL)	8,380	LF	\$35	\$293,300

Tie-in Work and Construction Access:				
Portable Changeable Message Sign (PCMS)	2	EA	\$8,000	\$16,000
Temp Flashing Beacon	2	EA	\$7,000	\$14,000
Construction Area Signs	1	LS	\$5,000	\$5,000
Subtotal Traffic Items				\$368,000

Total Sections 1 : 5	\$132,501,390
-----------------------------	----------------------

Traffic Additions (Tie-in & Access)				
Traffic Control System	1	LS	\$2,000,000	\$2,000,000
Maintain Traffic	1	LS	\$2,000,000	\$2,000,000
Subtotal Traffic Additions				\$4,000,000
TOTAL 1:5 + TRAFFIC ADD.				\$136,501,390
Time Related Overhead (5%)				\$6,825,070
Subtotal				\$143,326,460

Section 6 Minor Items					
				$\$132,501,390 \times (5\%) =$	\$6,625,070
Subtotal Minor Items				\$6,625,070	
Subtotal Sections 1 : 6				\$149,951,529	

Section 7 Roadway Mobilization					
				$\$132,501,390 \times (10\%) =$	\$13,250,139
Subtotal Mobilization				\$13,250,139	
Subtotal Sections 1 : 7				\$163,201,668	

Section 8 Roadway Additions	Quantity	Unit	Unit Price	Item Cost	
Supplemental Work					
				$\$149,951,529 \times (5\%) =$	\$7,497,576
Contingencies					
				$\$149,951,529 \times (25\%) =$	\$37,487,882
Construction Office (2-yr.)					
					\$25,000
Subtotal Roadway Additions				\$7,522,576	
\$ Per Hour Hours Per Day Work Days					
COZEEP setups @ \$100/hr.	\$100	10	20	\$20,000	

TOTAL ROADWAY ITEMS	\$170,744,244
----------------------------	----------------------

II. STRUCTURES ITEMS

	Bridge 2A	\$5,978,000
	Bridge 2B	\$20,699,000
TOTAL STRUCTURES ITEMS		\$26,677,000

III. RIGHT OF WAY ITEMS

A. Total Acquisition Cost	\$1,046,750	
B. Appraisal Fees Estimate	\$10,000	
C. Mitigation acquisition & credits	\$39,375,000	
D. Project Development Permit Fees	\$453,000	
E. Utility Relocation (State share)	\$1,505,000	
F. Relocation Assistance (RAP)	\$0	
G. Clearance/Demolition	\$0	
H. Title and Escrow Fees	\$2,000	
TOTAL RIGHT OF WAY ITEMS		\$42,391,750

Anticipated Date of Right of Way Certification
(Date to which Values are Escalated)

Estimate Prepared By: Carlon Schrieve
Estimate Checked By: Jeff Pimentel

Last Chance Grade

Alternative F

01-DN-101 PM 12.0/15.5

ALTERNATIVE DESCRIPTION: Alternative F (Full Tunnel)

SUMMARY OF ESTIMATED COST

TOTAL ROADWAY ITEMS (2016)	\$69,972,000
TOTAL STRUCTURE ITEMS	\$978,070,000
SUBTOTAL CONSTRUCTION COSTS (2016)	\$1,048,042,000
TOTAL RIGHT OF WAY ITEMS (2016)	\$13,585,000
TOTAL PROJECT CAPITAL OUTLAY COSTS	\$1,061,627,000

I. ROADWAY ITEMS

Section 1 Earthwork	Quantity	Unit	Unit Price	Item Cost
Clearing & Grubbing	6.4	Ac	\$20,000	\$128,000
Roadway Excavation (To Portal)	48,900	CY	\$20	\$978,000
Off Site Disposal (Tunnel Excavation)	200,000	CY	\$25	\$5,000,000
Subtotal Earthwork				\$6,106,000

Section 2 Pavement Structural Section	Quantity	Unit	Unit Price**	Item Cost
HMA-A	1,710	TON	\$120	\$205,200
RHMA-G	960	TON	\$120	\$115,200
BWC-O	535	TON	\$120	\$64,200
AB (CI-2)	4,560	CY	\$50	\$228,000
SEG	9,780	SY	\$2	\$19,560
HMA Dike	21	TON	\$120	\$2,520
Place HMA Dike	1,630	LF	\$4	\$6,520
Subtotal Pavement Structural Section				\$641,200

Section 3 Drainage	Quantity	Unit	Unit Price	Item Cost
Drainage (Geotechnical)	1	LS	\$500,000	\$500,000
Drainage (Hydraulics)	1	LS	\$370,000	\$370,000
Subtotal Drainage				\$870,000

Section 4 Specialty Items	Quantity	Unit	Unit Price	Item Cost
Shoulder Rumble strip	156	STA	\$100	\$15,600
Erosion Control	1	LS	\$30,712	\$30,712
Highway Planting and Revegetation	1	LS	\$22,700	\$22,700
Mitigation (Construction)	1	LS	\$37,500,000	\$37,500,000
Temporary Construction BMPs	1	LS	\$6,000,000	\$6,000,000
Subtotal Specialty Items				\$43,569,012

Section 5 Traffic Items	Quantity	Unit	Unit Price	Item Cost
Thermoplastic Striping (4")	312	STA	\$50	\$15,600
Pavement Marker (reflective-recessed)	650	EA	\$5	\$3,250
Construct Metal Beam Guardrail (TOTAL)	1,550	LF	\$35	\$54,250
Tie-in Work and Construction Access:				
Portable Changeable Message Sign (PCMS)	2	EA	\$8,000	\$16,000
Temp Flashing Beacon	2	EA	\$7,000	\$14,000
Construction Area Signs	1	LS	\$5,000	\$5,000
Subtotal Traffic Items				\$108,100

Total Sections 1 : 5	\$51,294,312
-----------------------------	---------------------

Traffic Additions (Tie-in Work & Access)				
Traffic Control System	1	LS	\$2,500,000	\$2,500,000
Maintain Traffic	1	LS	\$2,500,000	\$2,500,000
Subtotal Traffic Additions				\$5,000,000
TOTAL 1:5 + TRAFFIC ADD.				\$56,294,312
Time Related Overhead (5%)				\$2,814,716
Subtotal				\$59,109,028

Section 6 Minor Items	$\$51,294,312 \times (5\%) =$			\$2,564,716
Subtotal Minor Items				\$2,564,716
Subtotal Sections 1 : 6				\$61,673,743

Section 7 Roadway Mobilization	$\$51,294,312 \times (10\%) =$			\$5,129,431
Subtotal Mobilization				\$5,129,431
Subtotal Sections 1 : 7				\$66,803,174

Section 8 Roadway Additions	Quantity	Unit	Unit Price	Item Cost
Supplemental Work				
$\$61,673,743 \times (5\%) =$				\$3,083,687
Contingencies				
$\$61,673,743 \times (25\%) =$				\$15,418,436
Construction Office (6.5-yr.)				\$65,000
Subtotal Roadway Additions				\$3,148,687
	\$ Per Hour	Hours Per Day	Work Days	
COZEEP setups	\$100	10	20	\$20,000

TOTAL ROADWAY ITEMS	\$69,971,862
----------------------------	---------------------

II. STRUCTURES ITEMS

	Tunnel 2	\$978,070,000
TOTAL STRUCTURES ITEMS		\$978,070,000

III. RIGHT OF WAY ITEMS

A. Total Acquisition, including Cost	\$1,125	
B. Appraisal Fees Estimate	\$0	
C. Mitigation acquisition & credits	\$13,125,000	
D. Project Development Permit Fees	\$453,000	
E. Utility Relocation (State share)	\$5,000	
F. Relocation Assistance (RAP)	\$0	
G. Clearance/Demolition	\$0	
H. Title and Escrow Fees	\$0	
TOTAL RIGHT OF WAY ITEMS		\$13,584,125

Anticipated Date of Right of Way Certification
(Date to which Values are Escalated)

Estimate Prepared By: Carlon Schrieve
Estimate Checked By: Jeff Pimentel

Last Chance Grade

Alternative C3

01-DN-101 PM 12.0/15.5

ALTERNATIVE DESCRIPTION: Alternative C3 (Rudisill Road to South of Mill Creek Access)

SUMMARY OF ESTIMATED COST

TOTAL ROADWAY ITEMS (2016)	\$358,009,000
TOTAL STRUCTURE ITEMS	\$401,461,000
SUBTOTAL CONSTRUCTION COSTS (2016)	\$759,470,000
TOTAL RIGHT OF WAY ITEMS (2016)	\$38,087,000
TOTAL PROJECT CAPITAL OUTLAY COSTS	\$797,557,000

I. ROADWAY ITEMS

Section 1 Earthwork	Quantity	Unit	Unit Price	Item Cost
Clearing & Grubbing (Includes Large Timber)	235	Ac	\$20,000	\$4,700,000
Roadway Excavation	8,023,300	CY	\$20	\$160,466,000
Subtotal Earthwork				\$165,166,000

Section 2 Pavement Structural Section	Quantity	Unit	Unit Price**	Item Cost
HMA-A	37,240	TON	\$120	\$4,468,800
RHMA-G	15,960	TON	\$120	\$1,915,200
BWC-O	11,084	TON	\$120	\$1,330,080
AB (CI-2)	76,630	CY	\$50	\$3,831,500
SEG	164,200	SY	\$2	\$328,400
HMA Dike	364	TON	\$120	\$43,680
Place HMA Dike	28,408	LF	\$4	\$113,632
Subtotal Pavement Structural Section				\$12,031,292

Section 3 Drainage	Quantity	Unit	Unit Price	Item Cost
Drainage (Geotechnical)	1	LS	\$15,603,000	\$15,603,000
Drainage (Hydraulics)	1	LS	\$11,510,000	\$11,510,000
Subtotal Drainage				\$27,113,000

Section 4 Specialty Items	Quantity	Unit	Unit Price	Item Cost
Shoulder Rumble strip	739	STA	\$100	\$73,900
Erosion Control	1	LS	\$8,093,620	\$8,093,620
Highway Planting and Revegetation	1	LS	\$5,306,030	\$5,306,030
Mitigation (Construction)	1	LS	\$54,000,000	\$54,000,000
Temporary Construction BMPs	1	LS	\$8,820,200	\$8,820,200
Subtotal Specialty Items				\$76,293,750

Section 5 Traffic Items	Quantity	Unit	Unit Price	Item Cost
Thermoplastic Striping (4")	1,653	STA	\$50	\$82,650
Pavement Marker (reflective-recessed)	3,444	EA	\$5	\$17,220
Construct Metal Beam Guardrail (TOTAL)	27,700	LF	\$35	\$969,500
Tie-in Work and Construction Access:				
Portable Changeable Message Sign (PCMS)	2	EA	\$8,000	\$16,000
Temp Flashing Beacon	2	EA	\$7,000	\$14,000
Construction Area Signs	1	LS	\$5,000	\$5,000
Subtotal Traffic Items				\$1,104,370

Total Sections 1 : 5	\$281,708,412
-----------------------------	----------------------

Traffic Additions (Tie-in Work & Access)				
Traffic Control System	1	LS	\$2,000,000	\$2,000,000
Maintain Traffic	1	LS	\$2,000,000	\$2,000,000
			Subtotal Traffic Additions	\$4,000,000
			TOTAL 1:5 + TRAFFIC ADD.	\$285,708,412
			Time Related Overhead (5%)	\$14,285,421
			Subtotal	\$299,993,833

Section 6 Minor Items				
			\$281,708,412 x (5%) =	\$14,085,421
			Subtotal Minor Items	\$14,085,421
			Subtotal Sections 1 : 6	\$314,079,253

Section 7 Roadway Mobilization				
			\$281,708,412 x (10%) =	\$28,170,841
			Subtotal Mobilization	\$28,170,841
			Subtotal Sections 1 : 7	\$342,250,094

Section 8 Roadway Additions	Quantity	Unit	Unit Price	Item Cost
Supplemental Work				
		\$314,079,253 x (5%) =		\$15,703,963
Contingencies				
		\$314,079,253 x (25%) =		\$78,519,813
		Construction Office (3-yrs.)		\$35,000
			Subtotal Roadway Additions	\$15,738,963
	\$ Per Hour	Hours Per Day	Work Days	
COZEEP setups	\$100	10	20	\$20,000

TOTAL ROADWAY ITEMS	\$358,009,057
----------------------------	----------------------

II. STRUCTURES ITEMS

	Bridge C1	\$10,708,000
	Bridge C2	\$11,199,000
	Tunnel 3	\$335,962,000
	Bridge C3	\$10,262,000
	Bridge C4	\$11,030,000
	Bridge 3A	\$22,300,000
TOTAL STRUCTURES ITEMS		\$401,461,000

III. RIGHT OF WAY ITEMS

A. Acquisition, including excess lands,	\$2,504,625
B. Appraisal Fees Estimate	\$20,000
C. Mitigation acquisition & credits	\$28,350,000
D. Project Development Permit Fees	\$453,000
E. Utility Relocation (State share)	\$6,755,000
F. Relocation Assistance (RAP)	\$0
G. Clearance/Demolition	\$0
H. Title and Escrow Fees	\$4,000
TOTAL RIGHT OF WAY ITEMS	\$38,086,625

Anticipated Date of Right of Way Certification
(Date to which Values are Escalated)

Estimate Prepared By: Carlon Schriever
Estimate Checked By: Jeff Pimintel

Last Chance Grade

Alternative C4

01-DN-101 PM 12.0/15.5

ALTERNATIVE DESCRIPTION: Alternative C4 (Rudisill Road to North of Mill Creek Access)

SUMMARY OF ESTIMATED COST

TOTAL ROADWAY ITEMS (2016)	\$413,047,000
TOTAL STRUCTURE ITEMS	\$395,591,000
SUBTOTAL CONSTRUCTION COSTS (2016)	\$808,638,000
TOTAL RIGHT OF WAY ITEMS (2016)	\$38,678,000
TOTAL PROJECT CAPITAL OUTLAY COSTS	\$847,316,000

I. ROADWAY ITEMS

Section 1 Earthwork	Quantity	Unit	Unit Price	Item Cost
Clearing & Grubbing (Includes Large Timber)	254	Ac	\$20,000	\$5,080,000
Roadway Excavation	9,817,000	CY	\$20	\$196,340,000
Subtotal Earthwork				\$201,420,000

Section 2 Pavement Structural Section	Quantity	Unit	Unit Price**	Item Cost
HMA-A	32,134	TON	\$120	\$3,856,080
RHMA-G	17,980	TON	\$120	\$2,157,600
BWC-O	12,400	TON	\$120	\$1,488,000
AB (CI-2)	85,700	CY	\$50	\$4,285,000
SEG	183,667	SY	\$2	\$367,334
HMA Dike	366	TON	\$120	\$43,920
Place HMA Dike	28,500	LF	\$4	\$114,000
Subtotal Pavement Structural Section				\$12,311,934

Section 3 Drainage	Quantity	Unit	Unit Price	Item Cost
Drainage (Geotechnical)	1	LS	\$17,087,000	\$17,087,000
Drainage (Hydraulics)	1	LS	\$16,321,000	\$16,321,000
Subtotal Drainage				\$33,408,000

Section 4 Specialty Items	Quantity	Unit	Unit Price	Item Cost
Shoulder Rumble Strip	827	STA	\$100	\$82,700
Erosion Control	1	LS	\$8,694,660	\$8,694,660
Highway Planting and Revegetation	1	LS	\$4,520,000	\$4,520,000
Mitigation (Construction)	1	LS	\$55,125,000	\$55,125,000
Temporary Construction BMPs	1	LS	\$8,868,662	\$8,868,700
Subtotal Specialty Items				\$77,291,060

Section 5 Traffic Items	Quantity	Unit	Unit Price	Item Cost
Thermoplastic Striping (4")	1,829	STA	\$50	\$91,450
Pavement Marker (reflective-recessed)	3,810	EA	\$5	\$19,050
Construct Metal Beam Guardrail (TOTAL)	27,960	LF	\$35	\$978,600
Tie-in Work and Construction Access:				
Portable Changeable Message Sign (PCMS)	2	EA	\$8,000	\$16,000
Temp Flashing Beacon	2	EA	\$7,000	\$14,000
Construction Area Signs	1	LS	\$5,000	\$5,000
Subtotal Traffic Items				\$1,124,100

Total Sections 1 : 5	\$325,555,094
-----------------------------	----------------------

Traffic Additions (Tie-in Work & Access)	Work	Quantity	Unit	Unit Price	Item Cost
Traffic Control System	1	LS		\$2,000,000	\$2,000,000
Maintain Traffic	1	LS		\$2,000,000	\$2,000,000
Subtotal Traffic Additions				\$4,000,000	
TOTAL 1:5 + TRAFFIC ADD.				\$329,555,094	
Time Related Overhead (5%)				\$16,477,755	
Subtotal				\$346,032,849	

Section 6 Minor Items				$\$325,555,094 \times (5\%) =$	\$16,277,755
Subtotal Minor Items				\$16,277,755	
Subtotal Sections 1 : 6				\$362,310,603	

Section 7 Roadway Mobilization				$\$325,555,094 \times (10\%) =$	\$32,555,509
Subtotal Mobilization				\$32,555,509	
Subtotal Sections 1 : 7				\$394,866,113	

Section 8 Roadway Additions	Quantity	Unit	Unit Price	Item Cost
Supplemental Work				
$\$362,310,603 \times (5\%) =$				\$18,115,530
Contingencies				
$\$362,310,603 \times (25\%) =$				\$90,577,651
Construction Office (4-yr.)				
				\$45,000
Subtotal Roadway Additions				\$18,160,530

COZEEP setups	\$ Per Hour	Hours Per Day	Work Days	
	\$100	10	20	\$20,000

TOTAL ROADWAY ITEMS	\$413,046,643
----------------------------	----------------------

II. STRUCTURES ITEMS

	Bridge C1	\$10,708,000
	Bridge C2	\$11,199,000
	Tunnel 3	\$335,962,000
	Bridge C3	\$10,262,000
	Bridge C4	\$11,030,000
	Bridge 4A	\$9,985,000
	Bridge 4B	\$6,445,000
TOTAL STRUCTURES ITEMS		\$395,591,000

III. RIGHT OF WAY ITEMS

A. Total Acquisition Cost	\$2,504,625	
B. Appraisal Fees Estimate	\$20,000	
C. Mitigation acquisition & credits	\$28,940,625	
D. Project Development Permit Fees	\$453,000	
E. Utility Relocation (State share)	\$6,755,000	
F. Relocation Assistance (RAP)	\$0	
G. Clearance/Demolition	\$0	
H. Title and Escrow Fees	\$4,000	
TOTAL RIGHT OF WAY ITEMS		\$38,677,250

Anticipated Date of Right of Way Certification
(Date to which Values are Escalated)

Estimate Prepared By: Carlon Schriever
Estimate Checked By: Jeff Pimentel

Last Chance Grade

Alternative C5

01-DN-101 PM 12.0/15.5

ALTERNATIVE DESCRIPTION: Alternative C5 (Rudisill Road to Hamilton Road)

SUMMARY OF ESTIMATED COST

TOTAL ROADWAY ITEMS (2016)	\$533,147,000
TOTAL STRUCTURE ITEMS	\$424,106,000
SUBTOTAL CONSTRUCTION COSTS (2016)	\$957,253,000
TOTAL RIGHT OF WAY ITEMS (2016)	\$44,897,000
TOTAL PROJECT CAPITAL OUTLAY COSTS	\$1,002,150,000

I. ROADWAY ITEMS

Section 1 Earthwork	Quantity	Unit	Unit Price	Item Cost
Clearing & Grubbing (Includes Large Timber)	321	Ac	\$20,000	\$6,420,000
Roadway Excavation	14,422,000	CY	\$20	\$288,440,000
Subtotal Earthwork				\$294,860,000

Section 2 Pavement Structural Section	Quantity	Unit	Unit Price**	Item Cost
HMA-A	43,245	TON	\$120	\$5,189,400
RHMA-G	24,190	TON	\$120	\$2,902,800
BWC-O	16,684	TON	\$120	\$2,002,080
AB (Cl-2)	115,140	CY	\$50	\$5,757,000
SEG	247,170	SY	\$2	\$494,340
HMA Dike	479	TON	\$120	\$57,480
Place HMA Dike	37,320	LF	\$4	\$149,280
Subtotal Pavement Structural Section				\$16,552,380

Section 3 Drainage	Quantity	Unit	Unit Price	Item Cost
Drainage (Geotechnical)	1	LS	\$23,229,000	\$23,229,000
Drainage (Hydraulics)	1	LS	\$17,746,000	\$17,746,000
Subtotal Drainage				\$17,746,000

Section 4 Specialty Items	Quantity	Unit	Unit Price	Item Cost
Shoulder Rumble strip	1,112	STA	\$100	\$111,200
Erosion Control	1	LS	\$10,519,740	\$10,519,740
Highway Planting and Revegetation	1	LS	\$5,311,000	\$5,311,000
Mitigation (Construction)	1	LS	\$64,500,000	\$64,500,000
Temporary Construction BMPs	1	LS	\$10,308,350	\$10,308,400
Subtotal Specialty Items				\$90,750,340

Section 5 Traffic Items	Quantity	Unit	Unit Price	Item Cost
Thermoplastic Striping (4")	2,465	STA	\$50	\$123,250
Pavement Marker (reflective-recessed)	5,136	EA	\$5	\$25,680
Construct Metal Beam Guardrail (TOTAL)	33,130	LF	\$35	\$1,159,550

Tie-in Work and Construction Access:				
Portable Changeable Message Sign (PCMS)	2	EA	\$8,000	\$16,000
Temp Flashing Beacon	2	EA	\$7,000	\$14,000
Construction Area Signs	1	LS	\$5,000	\$5,000
Subtotal Traffic Items				\$1,343,480

Total Sections 1 : 5	\$421,252,200
-----------------------------	----------------------

Traffic Additions (Tie-in Work & Access)				
Traffic Control System	1	LS	\$2,000,000	\$2,000,000
Maintain Traffic	1	LS	\$2,000,000	\$2,000,000
Subtotal Traffic Additions				\$4,000,000
TOTAL 1:5 + TRAFFIC ADD.				\$425,252,200
Time Related Overhead (5%)				\$21,262,610
Subtotal				\$446,514,810

Section 6 Minor Items	$\$421,252,200 \times (5\%) =$			\$21,062,610
Subtotal Minor Items				\$21,062,610
Subtotal Sections 1 : 6				\$467,577,420

Section 7 Roadway Mobilization	$\$421,252,200 \times (10\%) =$			\$42,125,220
Subtotal Mobilization				\$42,125,220
Subtotal Sections 1 : 7				\$509,702,640

Section 8 Roadway Additions	Quantity	Unit	Unit Price	Item Cost
Supplemental Work				
	$\$467,577,420 \times (5\%) =$			\$23,378,871
Contingencies				
	$\$467,577,420 \times (25\%) =$			\$116,894,355
Construction Office (4 yr.)				
				\$45,000
Subtotal Roadway Additions				\$23,423,871

COZEEP setups	\$ Per Hour	Hours Per Day	Work Days	
	\$100	10	20	\$20,000

TOTAL ROADWAY ITEMS	\$533,146,511
----------------------------	----------------------

II. STRUCTURES ITEMS

	Bridge C1	\$10,708,000
	Bridge C2	\$11,199,000
	Tunnel 3	\$335,962,000
	Bridge C3	\$10,262,000
	Bridge C4	\$11,030,000
	Bridge 4a	\$9,985,000
	Bridge 4b	\$6,445,000
	Bridge 5B	\$10,128,000
	Bridge 5C	\$9,933,000
	Bridge 5D	\$3,288,000
	Bridge 5E	\$1,722,000
	Bridge 5F	\$1,722,000
	Bridge 5G	\$1,722,000
TOTAL STRUCTURES ITEMS		\$424,106,000

III. RIGHT OF WAY ITEMS

A. Total Acquisition Cost	\$2,852,125	
B. Appraisal Fees Estimate	\$20,000	
C. Mitigation acquisition & credits	\$33,862,500	
D. Project Development Permit Fees	\$453,000	
E. Utility Relocation (State share)	\$7,705,000	
F. Relocation Assistance (RAP)	\$0	
G. Clearance/Demolition	\$0	
H. Title and Escrow Fees	\$4,000	
TOTAL RIGHT OF WAY ITEMS		\$44,896,625

Anticipated Date of Right of Way Certification
(Date to which Values are Escalated)

Estimate Prepared By: Carlon Schriev
Estimate Checked By: Jeff Pimintel

ATTACHMENT K
Programming Sheet

PROGRAMMING SHEET

06/27/2016

EFIS ID: 0115000099 EA:01-0F280 County: DN Route: 101 PostMile: 12.50/16.30

Project Manager: COHEN, SEBASTIAN H PM Assistant: FALK-CARLSEN, KARL Project Nickname: LAST CHANCE GRADE
 Project Description - Long: IN DEL NORTE COUNTY FROM WILSON CREEK BRIDGE TO 3.8 MILES NORTH OF WILSON CREEK BRIDGE
 Work Description - Long: REPAIR SLIDES; CONSTRUCT BYPASS
 PPN0: 1112 Program: Planning RTP: No Funding Candidate: No PROGRAM YR: Working Days:
 Open for Time: Yes Subprogram: Major Damage (Permanent Restoration) CT Status: APL RMP: RMP Date:
 10 Yr SHOPP: No AADD: Yes Dist Category: STORM DAMAGE FED Aid Eligible:

MS	MS Description	MS Date
M000	ID NEED	05/05/2015 (A)
M010	APPROVE PID	06/30/2016 (T)
M015	PROG PROJ	01/16/2017 (T)
M020	BEGIN ENVIRO	09/14/2017 (T)
M040	BEGIN PROJ	07/01/2017 (T)
M120	CIRC DPR & DED EXT	08/19/2024 (T)
M200	PA & ED	02/16/2026 (T)
M221	BRIDGE SITE DATA RECEIVE	04/16/2026 (T)
M224	R/W REQTS	08/19/2024 (T)
M225	REGULAR R/W	04/14/2025 (T)
M275	GENERAL PLANS	04/16/2026 (T)
M377	PS&E TO DOE	03/15/2029 (T)
M378	DRAFT STRUC PS&E	02/15/2030 (T)
M380	PROJ PS&E	04/15/2030 (T)
M410	R/W CERT	07/01/2030 (T)
M460	RTL	09/02/2030 (T)
M480	HQ ADVERT	12/02/2030 (T)
M495	AWARD	04/14/2031 (T)
M500	APPROVE CONTRACT	06/16/2031 (T)
M600	CONTRACT ACCEP	10/14/2039 (T)
M700	FINAL REPORT	09/30/2041 (T)
M800	END PROJ	09/29/2042 (T)

	Amount \$k	EST Date
Roadway	533,147	06/01/16
Structures	424,106	06/01/16
Const Total	957,253	
ROW	44,897	05/11/16
Total	1,002,150	

Env Doc: EIR, EIS

Fund Source	PA&ED	PS&E	ROW	CON	ROW Cap	CON CAP
4050201.131	0	0	0	0	0	0
Grand Total:	0	0	0	0	0	0

2031
CC Escalation %: 3.50%
CC Escalated \$: 1,603,733
ROW CAPITAL: 89,516
TOTAL: 1,693,249

Phase	PRIOR	2016	2017	2018	2019	2020	Future	Total	Sup/Cap
Escalation Rate	ACT \$	FTC	(1.50%)	(1.50%)	(1.50%)	(1.50%)	(1.50%)		
0	0	0	669	5,008	5,571	5,670	35,660	52,578	3.11%
1	0	0	0	0	0	0	31,067	31,067	1.83%
2	0	0	0	0	0	0	1,586	1,586	0.09%
3	0	0	0	0	0	0	86,313	86,313	5.10%
TOTAL SUPPORT COSTS:								171,545	10.13%
TOTAL PROJECT COSTS:								1,864,794	

Division	PRIOR	2016	2017	2018	2019	2020	Future	Total
	ACT PYs	FTC PYs	FTC PYs	FTC PYs	FTC PYs	FTC PYs	FTC PYs	PYs
01 ADMN	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02
01 MTCE	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03
01 PPM	0.00	0.00	0.01	0.03	0.03	0.03	2.63	2.74
01 TPLN	0.00	0.00	0.00	1.37	1.72	1.73	37.83	42.65
01 TROP	0.00	0.00	0.00	0.02	0.02	0.02	0.61	0.67
01 TOTALS:	0.00	0.00	0.02	1.42	1.77	1.78	41.13	46.12
03 CONS	0.00	0.00	0.00	0.00	0.00	0.00	84.03	84.04
03 ENVM	0.00	0.00	4.39	18.57	20.55	20.61	326.66	390.78
03 ESRV	0.00	0.00	0.01	0.47	0.49	0.49	7.42	8.88
03 PRJD	0.00	0.00	0.02	4.16	4.42	4.44	71.54	84.58
03 RWLS	0.00	0.00	0.00	0.03	0.03	0.03	1.92	2.00
03 SURV	0.00	0.00	0.00	0.97	0.98	0.98	8.81	11.74
03 TOTALS:	0.00	0.00	4.43	24.20	26.47	26.54	500.39	582.03
59 GS	0.00	0.00	0.01	0.43	0.49	0.49	14.62	16.03
59 METS	0.00	0.00	0.00	0.05	0.05	0.05	15.71	15.85
59 OE	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.17
59 PPM	0.00	0.00	0.03	0.07	0.07	0.07	0.87	1.11
59 SCON	0.00	0.00	0.00	0.01	0.01	0.01	26.11	26.13
59 SDSN	0.00	0.00	0.00	0.64	0.64	0.65	30.03	31.96
59 SP&I	0.00	0.00	0.00	0.11	0.11	0.11	1.88	2.22
59 TOTALS:	0.00	0.00	0.04	1.30	1.37	1.37	89.39	93.48
PROJECT TOTALS:	0.00	0.00	4.48	26.93	29.62	29.70	630.90	721.62

Comments:

ATTACHMENT L
Risk Register

Level 2 Register is Provided; Level 3 Register is Recommended for High Cost Projects (Quantitative Probabilistic Analysis) -To Be Produced Upon Acquisition of Funding & Programming; Level 3 is Beyond Scope of This Document, Given the Following: Lack of Trained Staff (No Risk Management Team), Lack of Sufficiently Accurate Data for Impacts & Costs, Lack of Funding for Consultant & Required Software, and Lack of Available Development Time)			<p align="center"> – Last Chance Grade Re-Alignment Project – Del Norte-101-PM 12.0/15.5; EA 01-0F280K / EFIS Project ID 01 1500 0099 Program Code 20.XX.201.131 SHOPP Permanent Reservation – Project Initiation Document - </p>		PROJECT EA: 01-0F280	Project Manager: Sebastian Cohen	REGISTER OF KNOWN RISKS SIGNIFICANT ISSUES WITH RISK OF REQUIRING FUTURE PCRs				
Risk & Issue Identification			Risk / Issue Assessment			Risk Response					
Risk / Issue			Current Status / Assumptions / Comments			Rationale			Strategy	Response Actions	Risk Owner:
Status: Active ID #1 Type: Threat Category: PM / PDT Title: Geology / Groundwater	<p>Given the complexity and magnitude of the geologic instability, if unforeseen geologic issues are either discovered late in the project development process or otherwise are significant enough to alter project alternatives and the subsequent analysis and decisions made for each alternative, the new info could change CEQA/NEPA timeline; it could alter feasibility of alternatives (both for and against various alternatives, and could overall delay project delivery and increase project costs. Groundwater site characteristics specifically are not well known and could impact project alternatives and project funding, as FHWA has indicated that they would like to see more data before fully ruling out the ability to maintain the existing alignment. Given this, an on-alignment project alternative may become looked upon as a feasible option by FHWA, and this could impact the type of project as well as the amount of funding we receive via the ER Program. Additionally, obtaining additional data requires access roads and permits and can take a long time, as well as be costly.</p>	<p>The project site and challenge to find a stable route around or through LCG is a complex and massive project that will require extensive studies, analysis and reporting on many issues, but especially the subsurface geologic issues. Current assumptions about the geologic characterizations of the site are mainly based on many years of Caltrans' Maintenance Forces and Engineers experience in responding to continual slope movement and subsequent roadway failures, requiring extensive efforts and unique emergency projects to simply keep the roadway open. Via the various projects that have been required, Caltrans has been able to drill and analyze LCG sufficiently enough to determine the main failure planes and geotechnical features that are separate from one another. However, as FHWA Geotech Engineers have indicated, there are additional site characterizations and data they would like to have acquired, compiled and analyzed, in order for them to feel that they fully understand all geotech features and can comment on the feasibility for an on-alignment repair project (need for a new alignment). Caltrans was already going to obtain a majority of the data they want, but our ability to obtain the data ASAP will be a challenge.</p>	Probability: 3-Moderate Cost Impact: 4-Moderate Cost Score: 12 Time Impact: 4-Moderate Time Score: 12	<p>Risks are moderate based upon the fact that additional data will likely illustrate that the existing site is less conducive to an on-alignment project, then has been stated, due to the fact that additional and possibly deeper failure planes may be discovered and mapped. Given the size of the entire 1 mile long section of active landslide (at roadway elevation), there are additional areas that can be drilled, as well as monitoring the entire grade for other parameters, such as groundwater. If an on-alignment alternative is determined by FHWA to be feasible and results in their desire to pursue such a project, additional risks will need to be analyzed and included, and will likely result in much higher probability for risks to occur and cause failures or project issues.</p>	Mitigate	<p>PDT has begun acquiring as much site characterization data ASAP, via various funding sources, including ongoing emergency projects, as well as planned projects. Additionally, we are planning so that once the project is funded and in the PAED phase, all geotechnical characterization work will be initiated ASAP. Support funds for this work will be allocated much earlier in the project than is normally performed.</p>	Risk Owner: PM / PDT / GEOTECH Updated: June, 2016				
Status: Active ID #2 Type: Threat Category: PM / PDT Title: ER Funding	<p>Given the complexity and magnitude of the site and the geotechnical instabilities, all project alternatives are substantial and require funding in the range of a billion dollars, and given the current general limitations of available transportation funding from any source, acquiring adequate funds for any of the initial alternatives considered is a significant challenge. As a result of the 2016 Governor's Proclamation for a State of Emergency (SOE) covering Del Norte County, funding for a project via the Federal ER Program is currently being sought. Meetings and discussions with FHWA are ongoing, however several challenges and issues must be resolved before FHWA will likely approve the type and magnitude of project scoped in this PID. The main risks are that the ER Program is specifically meant to replace the existing highway facility in-kind, essentially only rebuilding what existed prior to the SOE event that triggered the Proclamation. The ER Program does not allow for new ROW (no new alignments); no betterments (improvements, such as wider shoulders, passing lanes, etc...); and the program has a \$100 million project max, per state, per event, per year. Additionally, if any programming of any kind, for any phase of any project that includes the scope of work that we are requesting funding for, is already programmed, ER funding can't be obtained for that project scope. Given the significance of the above listed requirements, and the importance that we acquire exceptions from FHWA to maintain our ability to acquire ER funding, if any obstacles arise in any of the exception request processes; substantial delays, decrease in approved project scope and funding, and even denial for a re-alignment project could occur. Additionally, if ER Funds are not obtained, a unique TBD source, such as a bond or specific congressional allocation would be required. If ER funding is obtained, depending upon the size of the allocation (greater than \$100 million) unique congressional action will be required before project funding approval. This all means that the site could remain as it exists for a significant amount of time and would require continual maintenance and emergency funds to keep the area traversable.</p>	<p>ER funding is currently being sought, as STIP and SHOPP are not realistic. Increased maintenance and emergency projects are expected to be required for the next several years, depending upon if funding is obtained and what delivery requirements come with said funding. ER Funding is currently the only feasible source for a project of this magnitude, although given that transportation funding is a highly political issue with various forms of bills being considered, it is possible that other non-ER Program funds may be viable in the future if the ER Program does not approve funding for a project.</p>	Probability: 3-Moderate Cost Impact: 4-Moderate Cost Score: 12 Time Impact: 4-Moderate Time Score: 12	<p>Funding any transportation project that requires over a billion dollars is a challenge in most climates, but given the current funding climate and the rural project location, this project is especially challenging. Extensive communication with FHWA began prior to the ER Program being opened via the Proclamation, resulting in knowledge of risks, issues, constraints and requirements associated with using ER Program funds.</p>	Mitigate	<p>District/PDT will continue to work with any and every possible funding avenue/opportunity/agency and seek out any and every opportunity to find sufficient funding for a project, including continually working with: FHWA, Congress, Local & State Representatives, and any other potential funding organization.</p>	Risk Owner: PM / PROG Updated: June, 2016				
Status: Active ID #3 Type: Threat Category: PM / PDT / Tribal Title: Tribal Communication / Agreements & Plans / Culturally Significant & Sensitive Sites	<p>Given the fact that there are four federally-recognized tribes within or nearby of the potential project limits, with some of the project alternatives lying within tribal boundaries and ancestral territories, recognizing them as major project stakeholders and fostering and maintaining a professional line of communication with them, not only for the project delivery phases, but also for the construction phases is a critical and essential task for Caltrans. If a proper and respectful relationship is not created and maintained, the risk of mistrust; delays to required agreements and plans, etc... could heavily impact or alter project alternative route locations; could delay the project delivery timeline; and could increase overall project support and capital costs.</p>	<p>Given that early consultation with the local tribes has been ongoing, a significant amount of the known sites have already been mapped and project alternatives have been adjusted such that impacts to known sites have been eliminated or minimized. Once on the ground studies have been initiated, and new/actual culturally significant sites are verified, if new information is obtained that shows that some of the initially assumed sites are not culturally significant, it may be possible to re-adjust some of the alternatives such that some of the project alternative routes bypass more of the unstable LCG area. This would be beneficial in terms of stabilizing a larger portion of LCG, however such an action would take substantial consultation and verification by the Tribes of acceptable study and updated analysis results, which could be highly expensive and take a long time.</p>	Probability: 3-Moderate Cost Impact: 4-Moderate Cost Score: 12 Time Impact: 4-Moderate Time Score: 12	<p>Not all initially identified culturally sensitive & significant sites are positively known to contain artifacts or rise to the level of cultural significance & sensitivity. Due to various opinions by various tribal members having different opinions about what locations should be off limits and are culturally sensitive (protected from any development) it was simply assumed that the location under discussion was sensitive and to be protected. Regardless of any disagreements, it must be a unanimous decision and proven that no culturally sensitive sites are present before any plans for adjusting any alternative alignments will be entertained.</p>	Mitigate	<p>Continual consultation with all Tribes will continue to occur throughout the entire project development process. The tribes will be made aware of plans, studies, and all results of all types of analysis. Caltrans plans to keep the tribes involved and have them assist in as much project development process as possible. Additionally, we want to have all reports and studies posted and made available on our web site, creating as much transparency as possible. Plans and the associated pre-approved actions will be implemented if new sites are discovered during project development.</p>	Risk Owner: PM / PDT / ENVIRO Updated: June, 2016				

Level 2 Register is Provided; Level 3 Register is Recommended for High Cost Projects (Quantitative Probabilistic Analysis) -To Be Produced Upon Acquisition of Funding & Programming; Level 3 is Beyond Scope of This Document, Given the Following: Lack of Trained Staff (No Risk Management Team), Lack of Sufficiently Accurate Data for Impacts & Costs, Lack of Funding for Consultant & Required Software, and Lack of Available Development Time)	<p align="center"> – Last Chance Grade Re-Alignment Project – Del Norte-101-PM 12.0/15.5; EA 01-0F280K / EFIS Project ID 01 1500 0099 Program Code 20.XX.201.131 SHOPP Permanent Reservation – Project Initiation Document - </p>	PROJECT EA: 01-0F280	Project Manager: Sebastian Cohen	<p align="center"> REGISTER OF KNOWN RISKS SIGNIFICANT ISSUES WITH RISK OF REQUIRING FUTURE PCRs </p>
		PROJECT ID#: 01 1150 0099		

Risk & Issue Identification			Risk / Issue Assessment		Risk Response		
	Risk / Issue	Current Status / Assumptions / Comments		Rationale	Strategy	Response Actions	
Status: Active ID #4 Type: Threat Category: PM / PDT Title: Previously Unknown Environmentally Significant Sites - Jeopardy Designation Risk	<p>Given that the existing highway alignment and project alternatives are within; adjacent to; as well as go through highly unique and sensitive environments that contain a large variety of special, rare, endangered and/or protected resources; and given that alternative alignments are either adjacent to or run through parts of the State & National Park, which contains one of the last and largest virgin old growth redwood (OGR) forests, which are highly protected and are a major part of why the park was designated a World Heritage Site by the United Nations Educational, Scientific and Cultural Organization (UNESCO) in 1980; all result in a high probability of challenges and obstacles in acquiring environmental approval for any alternatives where impacts on OGR trees could be avoided. Any impacts to OGR trees could be opposed by several organizations, groups and agencies, including: Parks, due to their own internal policies; the Sierra Club; UNESCO; local, state and international environmental protection organizations, as well as factions from local community members. Additionally, OGR trees are habitat for endangered species, such as the marbled Murrelet, so depending upon the results of impacts by various alternatives, a "jeopardy call" could be determined, which would eliminate the subject alternative that initiated that specific analysis. In addition to OGR trees, the park is also part of the California Coastal Ranges Biosphere Reserve, as well as being home to many unique types of flora and fauna, as well as 75 different mammals, including Roosevelt Elk. In addition, the project is bordered by a rugged and protected section of Pacific Ocean Coastline, which does fall within the jurisdiction of the State Coastal Commission. Given all of the above stated interest in project alternative impacts, it is imperative that the studies, analysis and impacts for each potential alternative be performed professionally and per the current proper format and procedural processes, as well as be accurate in the conclusions, because if any performed studies are not able to stand up to highly critical review and fact checking, any improper, incorrect, or even inconsequential and accidental mistakes could result in delay of project development process and require additional studies, which are likely to be expensive. The number of unique and special resources that are currently known to be listed as threatened or endangered, and therefore need to be analyzed, is already quite extensive; and, given the magnitude of the project and the lengthy estimated duration for PAED, it is possible that new laws or regulations protecting new resources or species, which currently aren't identified as needing studying or analysis for potential impacts, would then require analysis and potentially timely consultation. These all represent additional risks towards achieving PAED as well as potentially altering acceptable route alternatives, project delivery costs and overall capital costs.</p>	<p>The current assumptions are that it will take somewhere between 5 to 9 years to perform all necessary studies, analysis and determination of any impacts on various resources from various project alternatives', as required by NEPA and CEQA laws. This duration estimate is based on the currently known resources needing to be analyzed, the current list of assumed potential alignments, and assumed types of studies that will be required by the various permitting agencies. The duration range stated is generally an expansion of the durations normally encountered for similar types of studies for the identified types of resources. The actual duration it takes to achieve approval of an environmental document for this project could be adjusted faster or slower, depending upon the quantity and experience of available staff, which will be a direct function of available funding sources and the requirements that said funding program may require; and it will highly depend on the types of studies performed to be required and their subsequent approval by the various permitting/environmental resource agencies, as well as buy-in and approval from parks, tribes and adjacent land owners.</p>	Probability: 4-High Cost Impact: 4-Moderate Cost Score: 16 Time Impact: 4-Moderate Time Score: 16	<p>Given the substantial list of resources, the size of the project, and the complexity of all parts of the project and the extensive timeline initially estimated, it is highly possible that new resources / studies / impacts will be encountered, as well as potential disagreement between resource / permitting agencies about acceptable type and level of analysis performed; the conclusions and the recommended mitigation strategies considered acceptable for impacts from various project alternatives; especially so for some of more sensitive, high value resources. When these types of issues occur, it often results in higher support costs, delay in project delivery, and potentially higher capital costs required for additional mitigation and/or longer monitoring periods.</p>	Mitigate	<p>The PDT and all of the various ongoing working groups (especially the Biological Resources Working Group and the Tribal and Parks Partnering Working Group) will continue to regularly meet; discuss project alternative options; discuss site concerns, issues and share knowledge; proactively and progressively work together with all resource agencies to be clear and comprehensive on all alternatives and potential issues/impacts/options. These various meetings will remain in effect in some format, even once the PID is approved and prior to identification of a funding source such that staff are able to charge time to meet, as these meetings and lines of communication that we have established between many groups, agencies and organizations has been critical to-date, and are sure to be even more important and helpful for all later in the project development phases.</p>	Risk Owner: PM / PDT / ENVIRO Updated: June, 2016
Status: Active ID #5 Type: Threat Category: PM / PDT Title: PIO / Public Outreach (Management of: Website; Public Inquiries; Press)	<p>Given the significance of the project and the high level of concern and involvement from the public, as well as some organized community groups who are becoming more involved and even funding their own radio adds, an ever growing amount of press involvement is highly likely, especially once funding is obtained. Some of the press, especially the opinion pieces and letters to the editor that we get from some sources, as well as the fact that the project gets press via local politicians providing input and opinion, along with local activist groups who have an agenda, the risk of incorrect information being spread and subsequent negative sentiment about the status of progress on the project development process has been occurring for several months and is likely to increase, without proactive actions and response activities by the PDT, the PM, and PIO. Without a substantial PIO effort to quickly respond and correct all inaccurate statements made, negative and incorrect information is likely to quickly propagate and become the most common understanding of what's occurring. Continued use of the LCG website is an important item that we must ensure is continued, even once our Planning Consultant (MIG) is not available to assist us in uploading all available documents, making Caltrans progress as transparent as possible. Future plans to maximize the positive attributes of the website are being planned, including: future picture stills/video on a continual update loop; a general project development status update section, and other TBD uses.</p>	<p>Given the experience over the last 2+ yrs., it is clear that continual actions will be required by Caltrans to work with the press and give regular briefings as well as correct inaccurate statements by those with agendas. Luckily, almost all groups want a project to be built, but they have inaccurate and infeasible assumptions or faulty data.</p>	Probability: 3-Moderate Cost Impact: 4-Moderate Cost Score: 12 Time Impact: 2-Low Time Score: 6	<p>Use of a consultant to perform only PIO for a unique single project will be costly, but once correct information and proper presentations are provided to the public, it shouldn't have any impact to project progress.</p>	Mitigate	<p>A unique and solely project allocated PIO is being planned for and will be requested to perform the duties stated under this risk item, however, several other duties will be included in their job description, such as keeping the website updated and running. Note that a non-Caltrans website will be requested, as restraints on CT Websites have constraints that limit their effectiveness and ability to properly maintain.</p>	Risk Owner: PM / PIO Updated: June, 2016

<p>Level 2 Register is Provided; Level 3 Register is Recommended for High Cost Projects (Quantitative Probabilistic Analysis) -To Be Produced Upon Acquisition of Funding & Programming; Level 3 is Beyond Scope of This Document, Given the Following: Lack of Trained Staff (No Risk Management Team), Lack of Sufficiently Accurate Data for Impacts & Costs, Lack of Funding for Consultant & Required Software, and Lack of Available Development Time)</p>		<p align="center">– Last Chance Grade Re-Alignment Project – Del Norte-101-PM 12.0/15.5; EA 01-0F280K / EFIS Project ID 01 1500 0099 Program Code 20.XX.201.131 SHOPP Permanent Reservation – Project Initiation Document -</p>		<p>PROJECT EA: 01-0F280</p>	<p>Project Manager: Sebastian Cohen</p>	<p align="center">REGISTER OF KNOWN RISKS SIGNIFICANT ISSUES WITH RISK OF REQUIRING FUTURE PCRs</p>		
				<p>PROJECT ID#: 01 1150 0099</p>				
<p align="center">Risk & Issue Identification</p>			<p align="center">Risk / Issue Assessment</p>			<p align="center">Risk Response</p>		
	<p align="center">Risk / Issue</p>	<p align="center">Current Status / Assumptions / Comments</p>		<p align="center">Rationale</p>	<p align="center">Strategy</p>	<p align="center">Response Actions</p>		
<p>Status: Active ID #6 Type: Threat Category: PM / PDT Title: Early Access; Permits, Surveys & Geotech Analysis (drilling & monitoring)</p>	<p>Given the magnitude of the site and the need for additional geotechnical data ASAP, to assist in acquiring FHWA Geotechnical concurrence on the status of the subsurface characterizations/feasibility for an on-alignment project (as well as important data for feasibility of all alignment alternatives), and to minimize potential delays in acquiring ER funding and delays in achieving PAED, it's important to acquire permits to enter for access roads and permits/approval to get subsurface drilling underway ASAP. Since this requires permits and approval from various organizations, including the Waterboard, CDFW, CCC and Parks, it is likely to require a substantial effort in itself, and if its delayed, it will likely subsequently delay future milestones and decisions about feasibility of alternatives; decisions about necessary scope; decisions about constructability issues; delay determination of project cost estimates and potential mitigation options, as well as delay the overall project development process timeline.</p>	<p>Early communication with all agencies and organizations is already underway about issues surrounding getting permits and access to perform early surveys and geotech studies, however it is clear that it will take significant staff time on everyone's part to properly provide permits for the stated access. additionally, the support costs for the necessary geotech drilling and analysis is significant, and must occur as early as possible, and not in the 1 phase or late in the 0 phase.</p>	<p>Probability: 4-High Cost Impact: 4-Moderate Cost Score: 16 Time Impact: 4-Moderate Time Score: 16</p>	<p>As discussed, early discussions have been underway with all required stakeholders, and it is clear that permitting agencies and approval will require some critical planning, description of details about how the geotech drilling will occur and what BMPs will be used to eliminate or minimize impacts to several different resources, including OGR trees.</p>	<p>Mitigate</p>	<p>This is priority #1 once project funding is obtained and staff are assigned or a consultant services are made viable for use. Additionally, PDT is continuing to discuss this issue at the various working groups, so all agencies are not surprised when we ask for permits and approvals for access to the various locations for drilling and monitoring of subsurface data ASAP. Additionally, the PDT is actively finding other outside-the-box methods to perform as much additional drilling and data acquisition as possible on the existing alignment, where environmental approval is much easier to obtain.</p>	<p>Risk Owner: Geotech / Enviro / PM Updated: June, 2016</p>	
<p>Status: Active ID #7 Type: Threat Category: PM / PDT Title: Tunnel Construction Techniques / Feasibility of Tunnels (seismic faults, unknown slides / instabilities, etc.)</p>	<p>Given that all but one of the current re-alignment project alternatives includes some form of tunnel construction, and that the underlying geology still requires additional analysis to determine if a tunnel is definitively feasible and cost effective, as well as what type of tunnel construction would be appropriate for the various locations within the various alternatives, there is a risk that additional studies may result in eliminating or drastically altering the acceptable tunnels location, type and costs. Where tunnels are initially proposed, unforeseen and yet to be discovered geologic instabilities or care constraints, including further analysis and modeling of tunnel constraints and required design characteristics, which include the need for a unique maintenance support building that will house specific support units, for responses to any accidents or maintenance needs within a tunnel. could result in a change in the feasibility of some of the proposed tunnels. Results like this would alter scope of some project alternatives; could delay various delivery milestones as well as delay the overall project delivery date; drive up project costs, as the project alternative(s) may now require additional amounts of cut / fill and subsequent disposal of excess material.</p>	<p>Tunnel feasibility has only been tentatively analyzed to-date. Once additional geotech drilling and analysis is completed, tunnel feasibility will be better understood. In some cases, on some alignments, without use of a tunnel, the subsequent costs associated with cut / fill, in terms of potential impacts from more fill and the increased costs for more disposal could result in an infeasible alternative.</p>	<p>Probability: 3-Moderate Cost Impact: 8-High Cost Score: 24 Time Impact: 8-High Time Score: 24</p>	<p>if a project is not a "balanced project" (all excavation can be used as fill within the project limits), and when cut-&-fill techniques are not feasible, due to either impacts to resources or excessive costs because of large amounts of excess excavation, and the subsequent costs associated with haul and disposal of this excess material, tunnels are often considered. However, several other site characteristics must be acceptable, including geologic stability, groundwater elevations, seismic/fault concerns, and other site constraints.</p>	<p>Mitigate</p>	<p>PDT will continue to communicate with all of the existing Working Groups; the many agencies and organizations actively working with us; and try to acquire the necessary approvals to be able to determine various required geotechnical and site characteristics so that we can determine tunnel feasibility ASAP. Additionally, the PDT is planning to work with known tunnel specialists within FHWA and other consultants who can help assist with an appropriate approach for additional analysis that we can perform in-house. Hiring a tunnel specialist consultant will also be entertained, pending available funds.</p>	<p>Risk Owner: PM / PDT / Geotech Updated: June, 2016</p>	
<p>Status: Active ID #8 Type: Threat Category: PM / PDT Title: Mitigation Costs / Old Growth Trees / Opposition</p>	<p>Given the magnitude and the location of the project, the subsequent list of potential resources that will be impacted and potentially require mitigation, project cost-benefit could be extensive and so significant. This, along with the fact that the Old Growth Redwood Trees in the Park, which are part of a UNESCO-identified World Heritage Site, are considered to be a resource where any perceived or agreed to impacts can't be mitigated, all point to estimation for any mitigation costs for this project being problematic. Any estimate that is assumed, regardless of inaccurate and could result in costs that in excess of what is considered acceptable based on the cost-benefit rationale for the project.</p>	<p>Discussion of all resources, but especially the potential impacts and options for acceptable forms of mitigation for old growth redwood trees have been and will remain to be an important item for all of our ongoing working groups, which includes Parks. Impacts to old growth will likely be an international issue, given the WHS designation by UNESCO.</p>	<p>Probability: 3-Moderate Cost Impact: 8-High Cost Score: 24 Time Impact: 4-Moderate Time Score: 12</p>	<p>Old growth redwood tree impacts are considered to have no acceptable mitigation, so by definition, it will be a challenge to get approval on any project alternative that impacts old growth.</p>	<p>Mitigate</p>	<p>Once project funding is acquired, high level presentations and outreach with UNESCO, Dept. of Interior, Congress and other organizations will be determined via a special scoped PDT working group and then quickly implemented. The approach will be to proactively take-on this issue, instead of wait for activism groups / agencies and resource agencies to discover and inquire potential impacts.</p>	<p>Risk Owner: PM / PDT Updated: June, 2016</p>	

Level 2 Register is Provided; Level 3 Register is Recommended for High Cost Projects (Quantitative Probabilistic Analysis) -To Be Produced Upon Acquisition of Funding & Programming; Level 3 is Beyond Scope of This Document, Given the Following: Lack of Trained Staff (No Risk Management Team), Lack of Sufficiently Accurate Data for Impacts & Costs, Lack of Funding for Consultant & Required Software, and Lack of Available Development Time)		<p align="center"> – Last Chance Grade Re-Alignment Project – Del Norte-101-PM 12.0/15.5; EA 01-0F280K / EFIS Project ID 01 1500 0099 Program Code 20.XX.201.131 SHOPP Permanent Reservation – Project Initiation Document - </p>		PROJECT EA: 01-0F280	Project Manager: Sebastian Cohen	REGISTER OF KNOWN RISKS SIGNIFICANT ISSUES WITH RISK OF REQUIRING FUTURE PCRs	
Risk & Issue Identification			Risk / Issue Assessment		Risk Response		
	Risk / Issue	Current Status / Assumptions / Comments		Rationale	Strategy	Response Actions	
Status: Active ID #9 Type: Threat Category: PM / PDT Title: National Parks Policy / Support	<p>Even though both State & National Parks have been heavily involved in our Partnering Working Group, along with Congressman Huffman's Working Group, and our Biological Resources Working Group, and have been very helpful, proactive and supportive in almost every way possible, given the significance of the WHS designation by UNESCO, along with Parks' internal policies, and their upper management's potential concern over OGR tree impacts, as well as political and international pressures, any alternative that impacts virgin OGR trees may be challenging for them to support, as it may be an impact their respective organizations are not able to support, or at least not from their local positions. Even if an alternative appears to be acceptable from a variety/majority of CEQA and NEPA analysis/processes, it may require substantial effort to lobby the Department of the Interior, and/or Congressman who can apply pressure and influence. This could delay project development and/or otherwise reject an acceptable alternative.</p>	<p>Based on input from National and State Parks Superintendents, via our current ongoing Partnerships, they have made it clear that it will take special elevation to their management and legal functional groups to acquire approval of an alternative that has OGR tree impacts.</p>	Probability: 4-High Cost Impact: 4-Moderate Cost Score: 16 Time Impact: 4-Moderate Time Score: 16	<p>State & National Parks' Superintendents provided input.</p>	Mitigate	<p>Once project funding is obtained, along with initiating geotechnical drilling and determining various subsurface characteristics, discussions and presentations to high level management within parks and with the correct contacts, as described above for the Response Actions listed under Risk #8 (above).</p>	Risk Owner: PM / PDT Updated: June, 2016
Status: Active ID #10 Type: Threat Category: PM / PDT Title: Cut-N-Fill Quantities	<p>If tunnels are determined not feasible for any alternative, and/or cut & fill quantities increase for other reasons, project delays and project costs could increase.</p>	<p>Given that tunnels have already been discussed as having minimal geotech analysis and being tentative, and since they are often called for to minimize cut & fill quantities for minimizing impacts to resources and minimizing disposal / haul costs, it is highly possible that this risk could be elevated as more info is obtained.</p>	Probability: 3-Moderate Cost Impact: 4-Moderate Cost Score: 12 Time Impact: 4-Moderate Time Score: 12	<p>Caltrans contains minimal detailed info for all necessary subsurface characteristics around tunnel locations away from the existing alignment.</p>	Mitigate	<p>Geotech and the PDT are pursuing interim analysis measures in an attempt to refine the initial assumptions about tunnel locations and to see if additional info can be obtained that will assist in early analysis of tunnel viability at the various planned locations, such as newer technologies that can be utilized form the air, as well as working with data from the adjacent timber companies</p>	Risk Owner: Design, Enviro, R/W and PM Updated: June, 2016
Status: Active ID #11 Type: Threat Category: PM / PDT Title: Consultants (Full Project Delivery; & Tunnel Expertise)	<p>If FHWA approves ER funding, depending upon the scope and costs of the type of project they approve, and their required project delivery timeline, which based upon previous experience where they required and extremely fast overall delivery schedule, which previously was unfeasible, a unique approach for staffing of the entire PDT will be required, otherwise their likely accelerated schedule may not be feasible. Given the average/normal PAED timeline experienced for delivery of fairly simple and straightforward District 1 Projects, where minimal sensitive resources require analysis and proven mitigation strategies are utilized, PAED and subsequent delivery still requires several years. Considering the extensive list of sensitive environmental resources on this project, if ER Funds are approved, proposal of a unique consultation approach should be presented and requested. Use of a single Consultant Firm, who has the capabilities (appropriate staff, experienced with Caltrans delivery process, and infrastructure) should be utilized to perform and deliver all functional unit's various deliverables. A unique Caltrans Oversight PDT would be required to continually work with the consultant, perform continual monitoring and reporting, and keep Caltrans' interests are being maximized and work is being done as efficient as possible. Additionally, if a rapid delivery schedule is required, another approach worth considering, to maximize efficiency of studies and analysis of resources in the park, as well as significantly increase trust between Caltrans and Parks and possibly some of the tribes, is to involve local professionals (including Parks' biologists) to assist, or at least be involved and have ownership of various studies. This may be a challenge considering they are another Government agency, but such an operation/action would drastically improve the likelihood of rapid NEPA and CEQA timelines. Additionally, initial CPM scheduling for a project of this magnitude, via the use of a specialized consultant should be considered a requirement, otherwise, changes, CCOs, claims and overhead charges by a consultant run the risk of costing the state large sums of money. Specifics will depend upon the type of contract utilized between the state and the consultant, but the simple day-long process of developing the main points of a properly developed CPM schedule is not only a protective measure for frivolous claims, but the development process helps all involved fully understand and buy into their part and the required timeline.</p>	<p>Prior ER funded projects have required rapid timelines, regardless of the magnitude and type of project. Additional analysis and meetings with various functional groups within HQ will be required to perform use of a "turn-key" consultant, as well as use of a specialized CPM scheduler. However, given that Caltrans has limited tunnel expertise, this is a quality justification for such exceptions.</p>	Probability: 3-Moderate Cost Impact: 4-Moderate Cost Score: 12 Time Impact: 4-Moderate Time Score: 12	<p>Hiring a "Turn-key" consultant is not a method Caltrans is able to use, as a standard practice. We generally use specific consultants hired per each functional unit. However, the magnitude of this project warrants, and needs unique and out of the box approaches to be able to efficiently deliver such a challenging project.</p>	Mitigate	<p>A unique and solely project allocated oversight staff will be required, if a turn-key consultant is allowed. District 1 Management (D1 PPM Deputy/ SFP) has already considered and discussed such an approach with HQ and other members of Executive Management. use of several different consultants, per each individual functional unit will not be efficient and will result in delays and extra support costs.</p>	Risk Owner: Design, Enviro, R/W and PM Updated: June, 2016

Impact Definitions					
Rating -->	Very Low	Low	Moderate	High	Very High
Cost Impact of Threat (CO + COS)	Insignificant cost increase	<5% cost increase	5-10% cost increase	10-20% cost increase	>20% cost increase
Cost Impact of Opportunity (CO + COS)	Insignificant cost reduction	<1% cost decrease	1-3% cost decrease	3-5% cost decrease	>5% cost decrease
Schedule Impact of Threat	Insignificant slippage	<1 month slippage	1-3 months slippage	3-6 months slippage	>6 months slippage
Schedule Impact of Opportunity	Insignificant improvement	<1 month improvement	1-2 months improvement	2-3 months improvement	>3 months improvement
Probability	1-9%	10-19%	20-39%	40-59%	60-99%

Risk Matrix						
Probability Rating	5 – Very High	Low Risk	Moderate Risk	High Risk	High Risk	High Risk
	4 – High	Low Risk	Moderate Risk	High Risk	High Risk	High Risk
	3 – Moderate	Low Risk	Moderate Risk	Moderate Risk	High Risk	High Risk
	2 – Low	Low Risk	Moderate Risk	Moderate Risk	Moderate Risk	High Risk
	1 – Very Low	Low Risk	Moderate Risk	Moderate Risk	Moderate Risk	High Risk
		1 Very Low	2 Low	4 Moderate	8 High	16 Very High
Impact Rating						

	Low Risk
	Moderate Risk
	High Risk