

Technical Memorandum

December 27, 2021

Project# 230210.040

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3500 NW Stewart Parkway, Roseburg OR 97470

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RE: **Final** Technical Memorandum #1 Project Purpose and Need Statement

INTRODUCTION

The purpose of the South Coast Slide Study project is to develop a plan for transportation resiliency along US 101, between the City of Port Orford and the City of Brookings. Landslides and road failures (Table 1 and Figure 1) along this segment have been an ongoing problem for decades. These events result in full or partial closures of travel lanes and require days or even weeks of maintenance work to be able to fully reopen to passenger car and heavy vehicle travel. As a result, these landslide and road movement incidents have a significant cost to Oregon Department of Transportation (ODOT), disrupt the local and regional economies, strain emergency services, and reduce the mobility of communities to reach critical services.

Sustainable, technically feasible, and cost effective solutions and management strategies will be identified as part of this project to stop, avoid, and/or reduce the recurrence of landslides and improve the adaptability/recoverability of the system before, during and after a landslide. ODOT and the communities directly and indirectly impacted by landslides will work together to enhance the common base of information about the corridor and regional transportation network, document and communicate the opportunities and challenges, and consider new ways of working together to mitigate impacts.

Table 1 Study Landslides

ID Number	Common Name	Unstable Slopes Inventory Record ID	Mile Point	Length (feet)
1	Retz Creek South Slide	SL009-0304-72BB1	304.72	950
2	Coal Point Slide	SL009-0305-53BB1	305.53	634
3	North Brush Creek Hump	SL009-0306-12LN1	306.12	422
4	Brush Creek Slide	Not in database	310.24	60
5	Arizona North Slide (part of Arizona Slide Complex)	SL009-0312-00BB1	312.00	1,478
6	Arizona Inn Slide (part of Arizona Slide Complex)	SL009-0312-27BB1	312.39	1,267
7	Christmas Tree Slide (aka Frankport North)	Not in database	314.10	310
8	Sisters Rock Sink	SL009-0314-32BB1	314.32	317
9	Frankport Slide (aka Frankport South)	SL009-0314-79BB1	314.79	422
10	Woodroof Creek Slide (aka Horneblenzer Slide, Skull Ridge Slide, Squire Slide)	SL009-0315-93BB1	315.93	317
11	Eighty Acres Slide	SL009-0332-55RS1	332.55	264
12	Burnt Hill Slide	SL009-0343-55BB1	342.55	634
13	Hooskanaden Slide	SL009-0343-63BB1	343.63	1,267

Figure 1 Landslide Locations



PROJECT PURPOSE & NEED

US 101, operated and maintained by ODOT, is the primary north-south transportation corridor along the Oregon coast. The roadway is the economic lifeline for the area, serving interregional and interstate trips with relatively high volumes of truck and tourist traffic including:

Passenger Vehicles

- Work commutes (from, to, and between communities along US 101)
- Tourism (to communities along US 101)
- Access to services (school, groceries, healthcare)

Heavy Vehicles

- Freight through US 101
- Freight to communities along US 101 (delivery of goods)
- Freight from communities along US 101 (export of economic goods)
- Emergency vehicles (fire trucks, ambulance)
- Public transport (local/regional buses)

In the event of a full or partial roadway closure, there are limited detour routes that can safely and efficiently accommodate the re-routed traffic volumes and heavy vehicles due to surrounding topography, freight restrictions, travel distances, and other environmental constraints.

To improve resiliency, the ability of the transportation system to recover and regain functionality after a slide, ODOT and the impacted communities will benefit from solutions that minimize the social and economic strain, recovery costs, and delay and disruption to the travelling public, freight, and emergency services. This plan will identify technically feasible and cost-effective projects and management strategies that will:

- Increase landslide recurrence intervals
- Reduce recovery times after events
- Improve safety and operations along US 101, Carpenterville Road, and other viable detour routes
- Identify effective short-term solutions to facilitate passenger, emergency, and freight vehicle travel through the area after an event
- Reduce ODOT operations and maintenance costs
- Reduce socio-economic costs to impacted communities

Lastly, this plan will fill the need for a single easily accessible location to document data related to the study landslides. Data, studies, and previously reviewed alternatives are currently stored in many locations and in a mixture of formats. This project will consolidate and summarize known data sources and documents to better serve the region and respond to public inquiries.

EVALUATION CRITERIA

Evaluation criteria will be used to prioritize slide area mitigation alternatives, detour routes, and roadway improvement alternatives. The evaluation process will use a two-tiered approach by first eliminating alternatives that are “fatally flawed” and then conducting a more detailed review for the remaining alternatives. The purpose of this approach is to identify and document the full range of options considered and remove flawed alternatives early in the evaluation process by identifying easily determined deficiencies that cannot be overcome through project design or other reasonable mitigation efforts. Fatal flaw criteria are a yes/no criteria; if an alternative does not meet these criteria, it will not be carried forward for a more detailed evaluation. Preliminary evaluation criteria are provided below. The evaluation criteria will continue to be refined after the existing conditions inventory work and based on stakeholder input. This will include determining scoring, weighting, and rating procedures.

Slide Area Mitigation Alternatives Evaluation

Based on the existing data and inventory, up to three slide area mitigation alternatives will be developed for each landslide area under static conditions. The potential mitigation alternatives for each landslide area will reflect different levels of mitigation and cost, including preliminary concepts plans and planning level cost estimates. Table 2 outlines the preliminary evaluation criteria that will be used to prioritize alternatives.

Table 2 Slide Area Mitigation Evaluation Criteria

Evaluation Category	Criteria
Tier 1 Criteria – Fatal Flaw Review	
Factor of Safety	Provides very minimal or no improvement to the existing factor of safety
Cost	Mitigation cost is very high to provide minimal increase to the existing Factor of Safety
Construction	Mitigation is not appropriate for the sliding mechanism
Land Use, Natural and Cultural Resources	Significant environmental and/or right-of-way issues
Tier 2 Criteria – Rating and Prioritization	
Factor of Safety	Post-mitigation Factor of Safety or estimated recurrence interval
Cost	Annual maintenance cost
	Construction cost
Mobility	Probability of long-term roadway closure
	Probability of lane reduction
	Probability of speed reduction or other mobility impact
Construction	Feasibility
	Risk of issues during construction
	Impacts to transportation network during construction
Land Use, Natural and Cultural Resources	Impacts to sensitive environmental resources
	Impacts to adjacent land uses/land ownership

Alternative Route Evaluation

Alternative roadway routes will also be identified to serve the project area during a slide event: 1) routes suitable for public and heavy vehicle/freight travel and; 2) routes with restricted access to serve emergency and ODOT operations and maintenance vehicles. Table 3 outlines the preliminary evaluation criteria that will be used to determine if a route is initially viable or not; therefore, there is no Tier 2 evaluation criteria for this step. Routes that are determined viable will be carried forward to evaluate potential mitigation strategies to improve travel conditions, as shown in the next section.

Table 3 Alternative Route Evaluation Criteria

Evaluation Category	Criteria
Detour Route Tier 1 Criteria – Fatal Flaw Review	
Freight	Commercial freight traffic cannot traverse this route, with or without pilot cars, based on geometry, pavement type, and grade. (Not fatally flawed if the route can handle one direction of travel at a time with traffic control measures).
Minimum Standards	Generally, does not meet ODOT design standards even with signage for substandard elements Unpaved
Restricted Access Route Tier 1 Criteria – Rating and Prioritization	
Travel Feasibility	Passable year round Emergency and maintenance vehicles can traverse this route, with or without pilot cars, based on geometry, pavement type, and grade. (Not fatally flawed if the route can handle one direction of travel at a time with traffic control measures).

Roadway Mitigation Alternatives Evaluation on Detour and Restricted Access Routes

Roadway mitigation alternatives will also be identified for viable detour and restricted access routes to help improve travel and safety. Mitigation may include one-side widening, two-side widening, pull outs, sight distance improvements, re-surfacing, and curve corrections. Table 4 outlines the preliminary evaluation criteria that will be used to prioritize alternatives.

Table 4 Roadway Mitigation Evaluation Criteria

Evaluation Category	Criteria
Tier 1 Criteria – Fatal Flaw Review	
Cost	Cost is very high compared to benefit
	Significant risk of slide disruption
Mobility & Safety	Inability for critical traffic volumes and heavy vehicles to traverse the route with roadway mitigation
Land Use, Natural and Cultural Resources	Significant environmental and/or right-of-way issues
	Land ownership constraints
Tier 2 Criteria – Rating and Prioritization	
Cost	Annual maintenance cost
	Construction cost
	Freight travel time and/or distance
Mobility	Passenger vehicle travel time and/or distance
	Mitigation of known safety issues or crash history
Construction	Feasibility
	Risk of issues during construction
	Impacts to transportation network during construction
Land Use, Natural and Cultural Resources	Impacts to sensitive environmental resources
	Impacts to adjacent land uses/land ownership
	Availability of fuel, rest stops, emergency services, and food facilities