

Technical Memorandum #:3

Conceptual Trail Options

Dean to Dunes Trail Plan
City of Reedsport/ODOT



FINAL
November 2017



SCJ ALLIANCE
CONSULTING SERVICES

Final Technical Memorandum #:3 Conceptual Trail Options

Project Information

Project: **Dean to Dunes Trail Plan**
Prepared for: **City of Reedsport**
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Reviewing Agency

Jurisdiction: City of Reedsport
Oregon Department of Transportation

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Project Reference: SCJ #762.01, Phase 10

Path: Document2

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This project is partially funded by a grant from the Transportation and Growth Management (TGM) Program, a joint program of the Oregon Department of Transportation and the Oregon Department of Land Conservation and Development. This TGM grant is financed, in part, by federal Fixing America's Surface Transportation Act (FAST Act), Federal Transit Administration, and State of Oregon funds.

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1. INTRODUCTION

1.1 PROJECT OVERVIEW

The Dean to Dunes Trail Plan (DDTP) is intended to lay the groundwork for a recreational trail that will connect the City of Reedsport (City) to surrounding natural resources and activity centers, including the Dean Creek Elk Viewing Area to the east on Oregon Highway 38, and the Oregon Dunes off US 101 near Winchester Bay to the south and west. The DDTP will build upon other trail-related planning efforts within the City, including the *Waterfront and Downtown Plan*, the *Levee Loop Trail System Plan (LLTP)*, and the *Pedestrian Safety Study*.

Once constructed, the Dean to Dunes Trail (DDT) will provide a safe, convenient, and continuous non-motorized transportation alternative for trips within and external to the community. The project is anticipated to support and encourage recreation and tourist activities, both locally and over longer distances including the US 101 Oregon Coast Bicycle Route, which traverses the entire length of the state and passes through the study area. The project supports goals of the two designated scenic byways that meet in Reedsport—US 101, which is a nationally-designated All America Scenic Byway, and OR 38, the state-designated Umpqua River Scenic Byway. The project will also expand commuting options in the region.

1.2 PURPOSE OF THIS REPORT

The purpose of Technical Memorandum #3 is to identify and evaluate a range of trail development options along the approximate ten-mile highway corridor between the Oregon Dunes at Winchester Bay and the Dean Creek Elk Viewing Area. This report builds on the information provided in the documents referenced above and in two prior technical reports prepared for the DDTP – Technical Memorandum #1 and Technical Memorandum #2.

Technical Memorandum #1 identified project goals and objectives, broadly discussed study area characteristics (including identification of seven planning segments for the trail corridor), and established an evaluation process and criteria for assessing the impacts and potential benefits of each alternative trail concept.

Technical Memorandum #2 inventories and summarizes existing conditions of the DDT study area that are relevant to the development of the DDTP. The report documents and describes:

- Existing local, state and federal plans, policies and regulations
- Transportation and land use features in the study area
- Natural and cultural resource features
- Community demographics that may relevant to the development of the DDT

Technical Memorandum #2 evaluates potential opportunities and constraints associated with these factors that will influence trail siting and development.

After agency and public review of Technical Memorandum #3, a preferred trail alignment option will be identified and documented in Technical Memorandum #4. This memorandum will detail the preferred

trail alignment concept and will include a discussion of community connectors, trail amenities such as signing, lighting, fencing, etc., and will provide “planning level” cost estimates.

1.3 REPORT ORGANIZATION AND CONTEXT

This report is divided into five chapters, with **Chapter 1** being this Introduction.

Chapter 2 identifies a variety of trail types that could be implemented within the DDT corridor, along with a menu of potential trail amenities. Amenities are presented in the form of a toolbox and each is discussed individually. Amenities include but are not limited to security lighting and fencing; wayfinding, informational and hazard signing; benches or other furniture; bicycle parking, racks and lockers; viewpoints and other items including those recommended in the LLTP and other local planning documents that should be integrated with the DDTP. Discussion includes:

- A simple descriptive narrative that addressed where, when and why an amenity should be considered
- Graphic representative through sketch or photograph
- Recommended materials
- Benefits and constraints with a focus on applicability to the DDTP corridor

Chapter 3 lays out a range of trail alignment options for each segment of the DDTP corridor. The discussion includes key features or characteristics of the trail segment, identification and description of trail alignment options, and presentation of trail development opportunities and constraints. Discussion also includes integration with multimodal plans for the center of Reedsport (as described in the *Levee Loop Trail Plan* and other relevant documents) that link the eastern and western segments of the DDT.

Chapter 4 presents an evaluation of each trail alignment option using the process and criteria identified in Technical Memorandum #1. Any potential impacts to a levee will also be discussed. This information will next be taken to the Planning Advisory Committee, City Council and a public Open House.

2. TRAIL FEATURES AND AMENITIES

This chapter presents a discussion of the various trail types that are being considered for development along the Dean to Dunes trail corridor, as well as trail amenities that will enhance the user experience.

2.1 TRAIL TYPES

The DDT corridor passes through a variety of terrain along differing roadway types. The east end of the corridor (along OR 38) is largely a rural two-lane facility with 55 mph speeds, varying rights-of-way and pavement widths, and differing physical opportunities and constraints – all of which affect opportunities for trail development. The middle of the corridor (along OR 38 and US 101) runs through the City of Reedsport and has lower speeds, varying widths, presence or absence of existing sidewalks and on-street bicycle lanes, and other issues which given this section a strongly urban character. The west end of the corridor is similar to the east end with 55 mph speeds and some sections that have noticeably steep grades and narrow pavement widths.

The wide variations in context for the DDT require that consideration be given to several different trail types to meet the unique needs of each corridor segment. As indicated and discussed in Technical Memorandum #1, the preferred trail type is a multiuse path that is separated from the roadway to the extent possible. This multi-use path could follow the highway alignment within ODOT right-of-way, or use another right-of-way such as a city street or river levee. In general, the preferred trail alternative:

- Is 10 to 12 feet wide to accommodate a variety of user types
- Provides an off-highway experience
- Has an asphalt surface

For trail segments where the preferred trail type is not feasible, other trail solutions—listed here in approximate descending order of desirability—may be used:

- Street-adjacent multiuse trail (with at least five feet of separation from the roadway)
- Variations from the standard multiuse trail type, such as reduced width or alternate surfaces; or special treatments, such as boardwalks, bridges, and flood-resistant structures
- Solutions with pedestrians and bicycle users separated onto different routes
- Shared-use roadways, bicycle lanes/sidewalks, or other on-street solutions (widened shoulders, for instance)

Each trail type is discussed in greater detail below. This discussion is intended to establish the basic standards for designing and building different trail types that are compatible with the varying landscapes along the trail corridor.

2.1.1 Preferred DDTP Trail Type

The **preferred DDTP trail type** is a multiuse trail meeting the needs of touring, commuter, recreational, and family bicyclists and pedestrians (as well as those using strollers, skates, skateboards, and other non-motorized means of transport). The preferred multiuse trail would be:

- Separated from the roadway by distance or barrier, providing a completely off-highway experience.
- 10 to 12 feet wide, with 2-foot-wide graveled shoulders.
- Paved with an asphalt surface.
- Sited in existing publicly-owned or controlled property or right-of-way.
- At or below ADA-compliant maximum grade (e.g., 5 percent) and designed with structures (ramps, retaining walls, landings, etc.) satisfying ADA requirements.

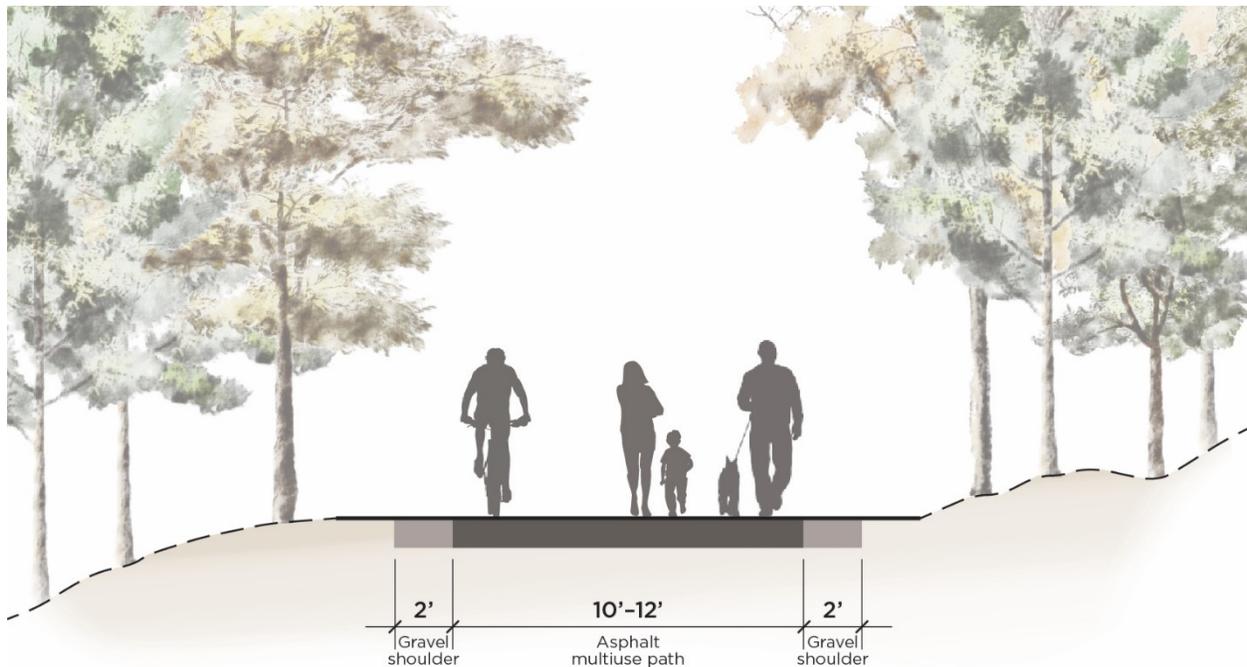


Figure 2-1. Preferred DDTP Trail Cross-Section

2.1.2 Other Trail Types

A wide variety of constraints—prior development, environmental features, etc.—will likely necessitate trail type variations in order to develop a continuous and fully functional multiuse trail accommodating all users. Based on the various existing environmental conditions in the study area, these variations may include:

- **Street adjacent multiuse trail** – Would use the same materials and dimensions as the preferred multiuse trail, but would closely parallel a roadway, separated by at least a 5-foot-wide buffer. Buffers can consist of pavement markings or simple barriers such as bollards, although a more substantial physical barrier—such as vehicle parallel parking spaces or landscaping—is preferred. This trail type would be appropriate adjacent to low-speed roadways, or where constraints (such as prior development or narrow right of way) prevent complete separation from the highway.

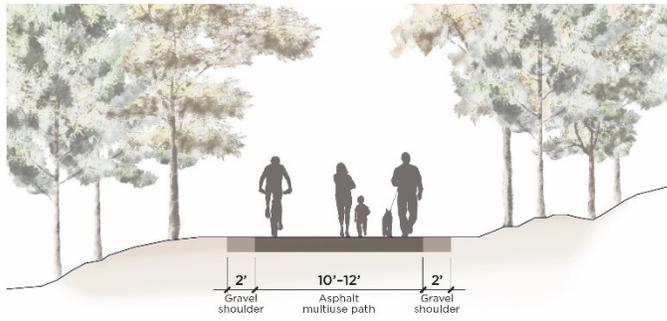
- **Flood-resistant multiuse trail** – Refers to a multiuse trail through areas subject to periodic inundation. Trail surface materials may differ from the preferred multiuse trail type including use of reinforced concrete; the trail may be elevated and/or additional structures for cross-drainage may be included.
- **Multiuse boardwalk** – Would provide a low, elevated multiuse structure set on piers across wetlands, floodplain areas and other sensitive lands, or in areas where topographic constraints make this a preferable option to extensive earthwork and retaining walls that would otherwise be needed to provide sufficient trail width. Boardwalk material may include wood, steel, concrete, or some combination of these materials. This trail type is appropriate where constraints necessitate crossing sensitive environmental areas or steep slopes that require minimal impact.
- **Local trail** – This facility could have either a paved or soft surface with a minimum width 8 feet (per *ODOT Bicycle and Pedestrian Design Guide, 2011*). This trail type is suitable for recreational and family trips through constrained areas, or for short connections to key destinations that are not directly accessed by the multiuse trail. Use of this narrower trail type usually requires a nearby route suitable for higher speed commuter and touring bicyclists.
- **On-street solutions** – Where options for providing a trail separated from the roadway are limited, a variety of alternatives within the road right-of-way are possible, including:
 - Bike lanes, designated by signing and road surface striping, with parallel pedestrian sidewalks.
 - Buffered bike lanes, offer greater physical separation from vehicular traffic or parked cars by providing a 2 to 3-foot painted buffer between the bicycle lane and either or both the travel lane and a parking lane. Buffered bicycle lanes also provide space for cyclists to pass one another without encroaching into the travel lane.
 - Shared roadway solutions or widened roadway shoulders allowing trail users to utilize vehicle roadways, with signing and surface striping to ensure safety. Advisory shoulders could also be considered. This solution is only practical and safe on low-speed, low-traffic roadways.

Conceptual cross section illustrations and specifications for selected trail types are presented in the following figures. At time of design and engineering, the trail and required trail structures (bridges, boardwalks, ramps, retaining walls, signage, etc.) should comply with current AASHTO, MUTCD, and ODOT design standards.

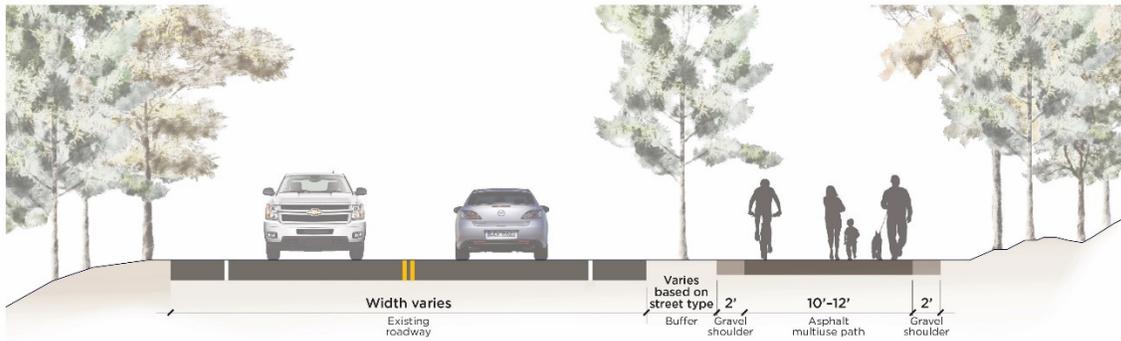
2.2 TRAIL FACILITIES AND AMENITIES

A wide variety of facilities and possible amenities are under consideration in the development of trail alignment options for the DDTP. The *Levee Loop Trail Plan (LLTP)* provides substantive information about major trail facilities and amenities that are applicable and appropriate within the urban portions of the corridor, particularly the City of Reedsport. Some of these may also be applicable to rural portions of the DDT corridor. The discussion that follows incorporates some of the ideas from the LLTP within a larger discussion of trail facilities and amenities for the entire corridor.

Figure 2-2. Alternate Trail Cross-Section Options

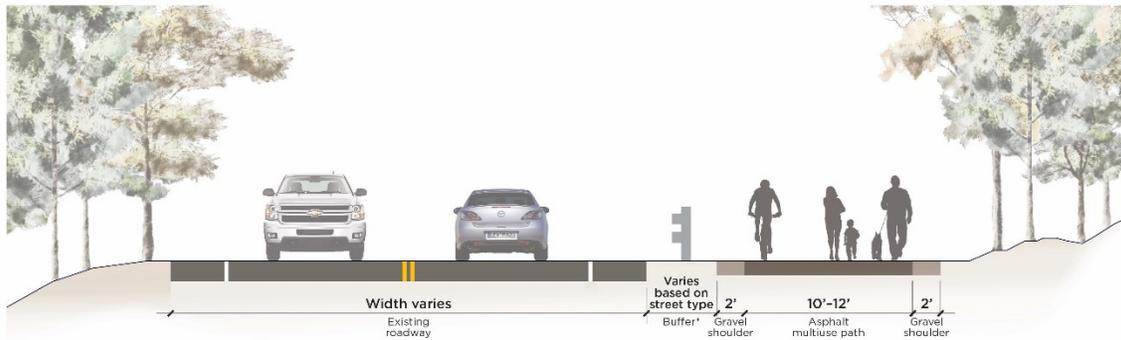


Preferred Multiuse Trail

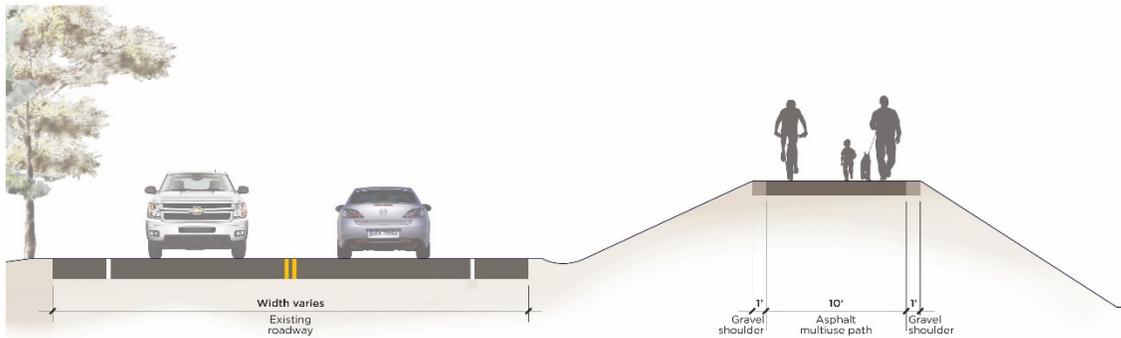


Street Adjacent Trail - Lower Speed Streets

Note: Landscaped buffer may be replaced with painted/striped buffer on low speed streets

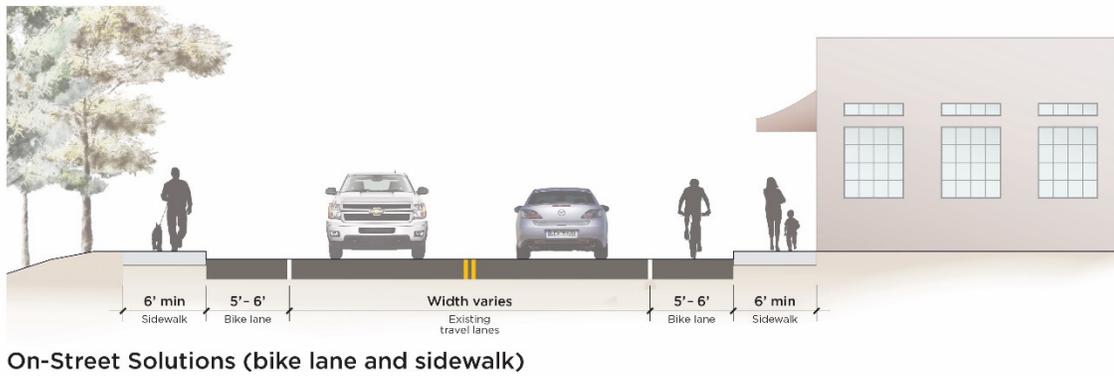
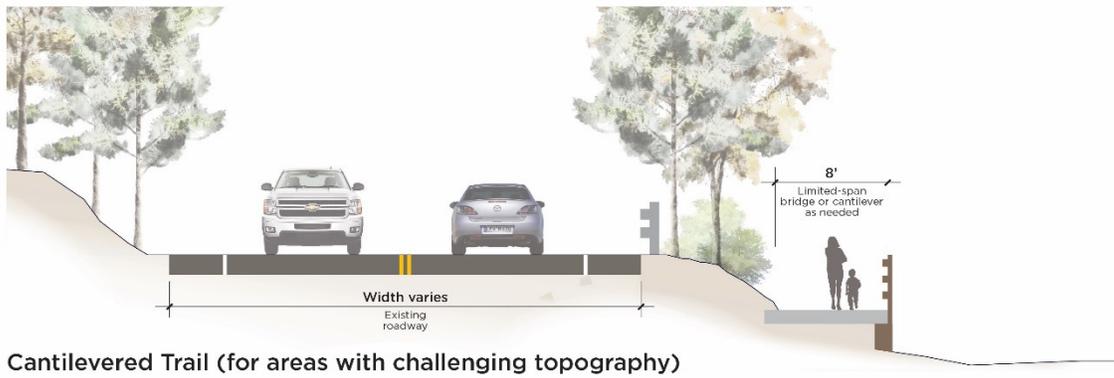
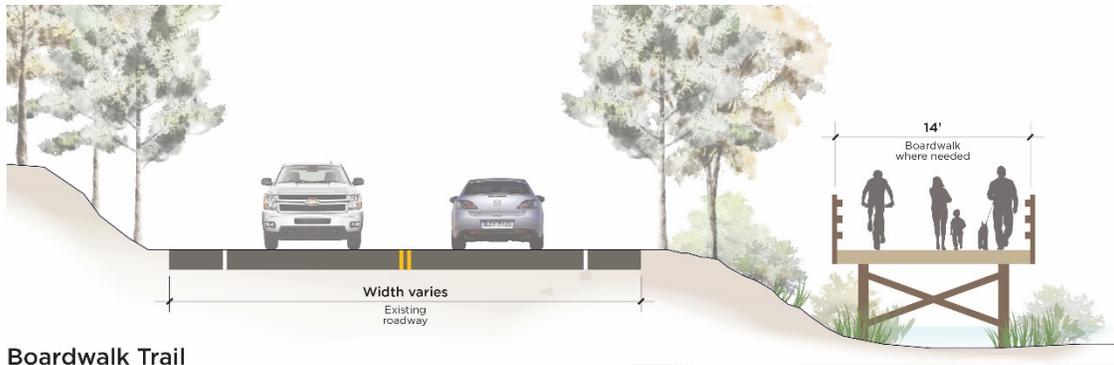


Street Adjacent Trail - Higher Speed Streets



Levee Trail

Figure 2-2 Continued. Alternate Trail Cross-Section Options



2.2.1 Key Trail Facilities

The following paragraphs discuss key facilities that are under consideration in the DDTP corridor, including areas where this corridor plan must integrate with the Levee Loop Trail (LLT).

Trailheads

According to the LLTP, one new trailhead facility is planned for the LLT north of US 101 near the Scholfield Creek Bridge (located at west end of Segment B near the transition to Segment C). This trailhead will also provide vehicle parking and some other amenities serving the recommended non-motorized boat launch in the same general location. Preferred trailheads features and amenities include:

- Safe access roadways separating vehicular and trail user traffic
- Vehicle parking (paved or gravel)
- Secure bicycle storage
- Restroom facilities
- Benches, shelters and picnic facilities
- Interpretive facilities and wayfinding signage
- Directional signing
- Security lighting
- Drinking water

Non-motorized Boat Launch

One new all-purpose non-motorized boat launch is planned for the LLT at the west end of Segment B near the transition to Segment C. The preferred all-purpose launch would be located on the south side of US 101 opposite the proposed new trailhead discussed above. The trailhead and launch site can effectively share many facilities and amenities. The preferred Segment 4 non-motorized boat launch features include facilities and amenities shared with Segment 4 trailhead (*in italics*) as well as facilities unique to this location:

- *Accesses and driveways accommodating turning movements of vehicle-hauled trailers*
- *Boat unloading areas*
- Space to assemble gear and ready for launch
- *Vehicle parking*
- *Restroom facilities*
- Benches, shelters, and picnic facilities
- Interpretive facilities and wayfinding signage
- Directional signing
- Security lighting
- Drinking water

Restrooms

Restrooms are expensive to build and maintain, and are also subject to vandalism and other inappropriate uses. To reduce maintenance costs and vandalism, restrooms should be located in highly

visible and accessible locations. For trails, the best locations for restrooms are usually in association with trailheads or other high-activity areas. Existing and proposed restrooms in the DDT corridor include:

- Existing restrooms at the Dean Creek Elk Viewing area at the east end of the corridor.
- Existing restroom at the Umpqua Discovery Center on Riverfront Way near the transition of Segment A and Segment B. This facility was identified in the LLTP and is located near a proposed levee trail access location. As it is located off the DDT corridor, signage indicating the availability of this facility would be needed.
- Existing restrooms at the Salmon Harbor Marina and two Douglas County campgrounds located along Salmon Harbor Drive west of Winchester Bay, Half Moon Bay and Windy Cove.
- Existing restrooms at the Umpqua Lighthouse State Park campground.
- Restrooms are proposed in the LLTP near a recommended levee trailhead near US 101 and the Scholfield Creek Bridge (at the west end of Segment B near the transition to Segment C). This trailhead will be visible from nearby commercial uses and City streets.

Levee Access Ramps

Levee access ramps and proposed trail alignment along several of the levees surrounding Reedsport were identified in the LLTP. The plan identifies trail name signage at the access points to the levees which are proposed at the west end of Segment B near the transition area with Segment C. Additional signing with an overall trail map with trail lengths and accessibility information was also suggested for inclusion when trail signage is developed. The LLTP notes that, since US Army Corps of Engineers (USACE) standards preclude footings dug into the levee, any signage will need to be located off of the levee berm, most probably at the toe of the levee ramp. In addition, signs at other locations in the City or along the DDT should direct trail users to LLT accesses.

Levee access ramps and appropriate signage will also be needed if the DDTP ultimately identifies the Umpqua River levee along the north side of OR 38 east of Reedsport as the preferred trail alignment. Consideration needs to be given for integrating this access and signage with the proposed levee trail system in Reedsport.

All levee access ramps need to be located and conceptually designed to comply with USACE and Americans with Disabilities Act (ADA) requirements. As per USACE direction, ramps must not cut into the levee prism. As noted in the LLTP, there are two general challenges to locating any amenity features on the levee crown or levee berm slopes:

- The crown is only 8 to 12 feet wide. Once an 8 to 10-foot-wide paved multiuse trail is built there will be little or no room for most trail amenities.
- USACE generally does not permit any improvements that have to bore or cut into the levee prism. This could extend to even modest concrete footings for sign poles and bench legs. As the LLT develops, the City and/or ODOT will need to consult closely with USACE to find amenity solutions that satisfy regulations.

Trail Crossings

The following sections discuss conceptual design guidance for a variety of roadway and other trail crossings. Specific treatments should be determined on a case-by-case basis during design engineering for individual improvements.

Intersection crossing: Where trail crossings at four-way intersections are required, signalized treatments are preferred, particularly for arterial and collector classification roads. Signalized treatments could include RRFB's (Rectangular Rapid Flashing Beacons) instead of full signals. Local street intersections will be controlled with four-way stop signs, or with pedestrian activated beacons for more heavily trafficked streets. Appropriate road surface markings and signage indicating shared bicycle and pedestrian use will be installed.

Midblock crossings: Various DDT alignments will require crossing the highway in order to take maximum advantage of existing physical limitations in the corridor. These limitations include primarily right-of-way and pavement width and topography including steep slopes adjacent to the roadway. Various "midblock" or highway crossing design options could be considered consistent with AASHTO and ODOT design guidance. FHWA mid-block roadway crossing guidance should also be reviewed. Factors to consider include: line of sight and stopping sight distance, adequate advanced warning of the crossing location for both motorists and trail users (which could include passive or active signage such as a Rectangular Rapid Flashing Beacon or RRFB, or other user-activated signal), refuge island design, illumination, marked pavement crossing, and other design elements.



Grade separation: Physical separation of trail users and vehicular traffic provides the greatest degree of protection for walkers and bicyclists, but it comes at a cost. The development of design concepts for the DDT should consider using topography where possible to incorporate grade-separated highway crossings where they are needed.

2.2.2 Trail Amenities

Trail amenities such as directional or interpretive signing, rest or picnic areas and viewpoints will help to make the DDT a welcome place to recreate and travel along. The following discussion of trail amenities includes a simple narrative of each amenity type, graphic representation of each, typical materials, benefits and constraints, and order of magnitude costs. Conceptual locations for amenities in each corridor segment are presented in Chapter 3. Amenities include, but are not limited to:

- Signage including wayfinding, hazard and informational. Wayfinding signs should include mileage information
- Kiosks and interpretive materials which may also include a Dean to Dunes Trail medallion for branding and wayfinding purposes
- Rest areas and viewpoints

- Trail furniture including benches, picnic area, bicycle parking, racks and lockers, and other furniture
- Lighting/illumination
- Retaining walls and other structures
- Fencing and railing
- Gateway treatment

Thematic Elements

Amenities proposed for the DDTP should be coordinated with the type and style of amenities proposed in the LLT area (i.e., uniform design materials and themes). This coordination can help to develop a unique brand or identify for the entire corridor between Dean Creek and the Oregon Dunes and establish a sense of place for the Reedsport area.

As noted in the LLTP, the LLT *“will include a variety of special features, structures, and improvements to make the route accessible, safe, and pleasant to use. These features can work together to support an overall trail design framework that communicates a unified sense of place, appearance, and experience”*. While the LLTP suggests a river-oriented theme based on proximity to the Umpqua River, McIntosh Slough and Scholfield Creek, a broader theme could be developed for the entire corridor that identifies the meeting place of a major river and the ocean. Dunes, elk and other wildlife such as salmon should be a part of that theme. This theme can be reflected in signing graphics, interpretive information and in the details on benches, boardwalk railings, community gateways and other trailhead facilities.

Signage

Signage along the DDT corridor is intended to serve a variety of purposes including:

- Regulatory or hazard signing.
- Wayfinding to direct trail users to major destinations like the Reedsport city center or the Winchester harbor. Wayfinding signage can include mileage as well as directional information.
- Informational signage to provide specific trail information and indicate where trail-related services may be found.
- Interpretive signage to enrich the users trail experience by offering information about the trail environment, views, or unique experiences.

Regulatory and warning signage and pavement marking: This signage should conform to AASHTO’s *Guide for the Development of Bicycle Facilities*, the *Manual of Uniform Traffic Control Devices*, the *Oregon MUTCD*, the *Oregon Bicycle and Pedestrian Design Guide*, and ADA standards, as appropriate. Regulatory signs should provide information to motorists about the presence of the trail and potential users, assist with improving safety at roadway crossings and/or intersections (such as trail-sized stop signs for conflict locations), provide clues to safer use of the trail (such as the R9-7 sign that separates pedestrians from bicyclists and emphasizes trail etiquette), and many other functions. Pavement marking should be used where appropriate to delineate the trail space at the edge of the road, to provide buffering from the travel way, to separate travel directions, or to impart other useful information.

Wayfinding signage: Wayfinding systems serve an important and crucial role well beyond responding to the need for basic navigation, identification, and information. Wayfinding elements can enrich and enhance our experiences with our environments. Wayfinding signage is useful to identify major points of interest such as parks, heritage areas, and business centers. Trail wayfinding, which is meant to be read at a slower pace, can provide useful information not only about destinations, but also about distances.

Wayfinding sign consistency is very important as it helps to create and sustain an expectation by users about where and how to find information. A well-defined and comprehensive municipal wayfinding system contributes to creating a consistent urban brand, a sense of organization, improved vehicular flow and safety while maintaining a perception of quality for the system, the city and its amenities. Thus, the development of wayfinding signage for the DDT should be coordinated with other similar signage along the Oregon Coast and within the immediate project vicinity, while also emphasizing the local “brand”.

Informational signage: Informational signage provides assistance to the trail user in identifying where they are along the trail system and where they may find needed services. On the DDT, this signage could be used to identify trail amenities near the trail corridor (particularly for those not located directly on the trail like the Umpqua Discovery Center). Information signage can come in



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the form of a trail marker to reassure trail users they are still on the trail or it can also provide an overall map of the system and show the location of trail-related facilities such as water, the cycle stop, or restrooms.

Interpretive signage: This signage is intended to provide the traveler with information about the built and/or natural environment that is served by the trail. This signage can be located at viewpoints or other places where it could serve both trail users and motorists (where the trail is located near the highway). Typical examples of interpretive signing can: tell the story of the area, point out interesting natural features or identify opportunities for further exploration of the area.



Because one of the trail alignment options suggested in Segment A would use a portion of the levee that parallels OR 38, it's important to note that the USACE restricts the placement of signage on levee crowns. As identified in the LLTP, a system of pavement markings may be the most practical and cost-effective way to sign that portion of the trail. The LLT logo suggested in the Plan could be designed to encompass the entire DDT and used to mark trail pavement. With the advent of smart phone and GPS devices, some communities have also placed GPS identifiers at regular intervals so the police or fire/ambulance staff can respond to emergencies by getting a specific location. Trailheads, trail ramp accesses, and roadway crossings can use more conventional signs on posts.



Kiosks and Interpretive Facilities

Similar in function to interpretive signage, a kiosk typically provides more information to inform the traveler about the area. Kiosks can be co-located with rest areas, viewpoints, picnic grounds or other areas that might attract a larger number of travelers. Given the limitations to siting kiosks and other interpretive facilities on the levee crown, the LLTP recommends that these types of facilities should be part of other trail “entry” improvements – signing, lighting, furniture, etc. – at levee access ramps.



Rest Areas and Viewpoints

For trails through a scenic area, intermittent viewpoints are important amenities where trail users can rest and enjoy the view. Viewpoints can be as simple as a widened section of asphalt or even compacted gravel, allowing pedestrians and bicyclists to step off trail travel lanes. Improvements can also include benches, shelter or picnic areas and/or interpretive signage. For views from the levee, the narrow crown offers little room to create even simple viewpoints and approval by USACE of more structured viewpoints over the edge of the levee crown would be highly unlikely. Several potential viewpoints are identified on DDTP segment maps.



Rural Highway Turnout/Rest Area

Trail Furniture

A variety of trail furnishing can improve the trail user experience. Trail furniture can include benches, trash receptacles, shelters, picnic tables, and other items including public art. Furniture should be practical and minimize operational and maintenance costs. In some instances, rocks and logs can be used for sitting and resting purposes instead of manufactured benches, which are vulnerable to

vandalism and deterioration in isolated areas. Furniture can also be used to support interpretive information and/or the community and trail “brand”.

- Seating
 - May include benches, seat walls, boulders, logs or other built features
 - Typically located at trailheads, wildlife or natural area viewing locations and other areas of interest
 - Provide adequate space for strollers and wheelchairs in a manner that does not impede trail use
 - Seat walls shall include skate deterrents as appropriate
- Trash receptacles
 - Preferably located at trailheads and mid-block crossings; may be considered near wildlife/natural area viewing locations if high use is anticipated
 - Should not be located directly adjacent to benches and seating areas
 - Should be located for ease of maintenance service and access
- Shelters and picnic tables
 - Located at viewpoints or areas where sufficient space for a rest area function is desirable.
 - Materials should be durable and minimize on-going maintenance needs.
- Bike racks
 - Typically located at parks along trail corridors, trailheads and where restrooms are located
 - Should be located in a manner that does not impede trail use
- Artwork
 - Should be considered in the overall design of a trail project, as appropriate, and can be incorporated as part of the site furnishings (benches, bike racks, kiosks, etc.); as trail elements (bridge, boardwalk, walls, etc.); as stand-alone features (sculpture, mural, etc.); or as educational features (interpretive elements, environmental features, etc.)
 - Consider using local artists to provide works that make the trail network uniquely distinct and representative of the district’s character



Reedsport Cycle Stop and Public Art

Lighting/Illumination

Lighting is often suggested to help make trails safe and accessible in a 24-hour basis. Safety and security lighting is often provided where trails cross public streets or within developed areas where evening use may be desirable. Lighting may also be desirable on levee access ramps and the approaches to the ramps. Lighting may be inappropriate in rural or natural areas, given visual impacts and potential disturbance to wildlife and habitat values. It should be noted that while “visiting” trail users may prefer a well-lighted trail, local residents may find the lighting intrusive. Another consideration to improve the

trail user experience and limit impacts on neighbors is to utilize “dark sky” compatible lighting. This lighting is designed to illuminate trail surfaces and shoulders while minimizing upward light pollution and improving vistas of the night sky.

Retaining Walls and Other Structures

The DDT may include a variety of unique features, structures, and improvements to make the route accessible, safe, and pleasant to use. These features can work together to support an overall trail design framework that communicates a unified sense of place, appearance, and experience. The illustration at

the right is of a bridge over Elk Creek on OR 38 east of Reedsport. Pylons at each corner of the bridge approaches were designed to reflect wildlife and local enterprises in the neighboring community of Elkton and the surrounding area. This illustrates the simplicity of making strong thematic statements even with bridge structures that are relatively utilitarian.



Public Art on Elk Creek Bridge on OR 38

The various trail alignment options for the DDTP may require retaining walls, bridges (potentially for grade-separation from the highway), and boardwalks or other structure to laterally extend the roadway cross-section where topography is constrained. Large expanses of retaining walls that are visible to the traveling public can be made more visually pleasing and support the trail’s thematic elements by using surface designs that reflect the trail’s wildlife and habitat or the Reedsport community. Along narrower trail sections (particularly any that might serve pedestrians only), wood or rock retaining walls may be the better choice.

Fencing and Railing

Fences or railings along trails may be needed to prevent access to/from high-speed roadways or to provide protection along steep side slopes and waterways. Fences or railings should only be used where they are needed for safety reasons. They should be placed as far away from the trail as possible; with a minimum offset of two feet. Many of these principles apply to cut-sections of trail where retaining walls are required: minimum two feet offset, with a rub-rail whenever possible. Safety railings are typically used along



boardwalks, at the top of retaining walls or steep slopes where the trail surface is 30 inches or more above ground grade, have a minimum height of 42 inches, and other features.

Guard rails along the highway edge might also be considered to provide protection of trail users from high speed traffic where there is insufficient lateral width to provide a separate facility for walkers and bicyclists.

Gateway Treatment

Community gateways are usually landscaped sign installations that announce to motorists that they are entering a community. Although often installed for community development and community pride purposes, effective community gateways will communicate to motorists that they are making a transition from a rural roadway to a city street where land use, pedestrian, and motor vehicle activities will be more intense. The motorist should, in turn, respond by slowing down. Gateway signage is often accompanied by signage for speed reduction and/or boulevard type treatment that may add sidewalks, bike lanes, intersection traffic control, on-street parking, lighting or other clues that create a narrowed “gateway” effect and indicate that a speed reduction is appropriate.



Two gateways are anticipated for the Reedsport area. One on the east side of town where the rural portion of OR 38 transitions into a city street was included in the LLTP. Another is proposed for the west side of Reedsport where US 101 enters the city.

2.2.3 Trail Attractions

There are several destinations within the DDT study area that will either generate or draw trail users. These facilities include schools, parks or recreation areas, job centers, retail facilities, and residential complexes. These were initially identified in Technical Memorandum #2 and the list has been updated for this report. Table 2-1 identifies key activity centers by segment. These are graphically illustrated in each of the detailed trail options maps in Chapter 3.

Table 2-1. Key Activity Centers

<i>Segment A</i>	
1	Dean Creek Elk Viewing Area
<i>Segment B</i>	
2	Umpqua Discovery Center and Rainbow Boat Launch
3	Reedsport Industrial Area
4	Rainbow Plaza and US Post Office
5	Reedsport City Offices, Library, and Fire Department
6	Douglas County Housing Authority - Housing
7	Douglas County Justice Court
8	Douglas County Housing Authority - Housing

Table 2-1 Continued. Key Activity Centers

Segment B Continued	
9	Mast Redevelopment Site
10	Oregon Dunes Visitor Center
11	Champion Park
12	Umpqua Mobile Villa
13	Umpqua Shopping Center and Cycle Stop
14	Coho RV and Marina
Segment C	
15	Lions Park
Segment D	
16	Reedsport Junior and Senior High School
17	Highland Elementary School
18	Highland Park
19	Highland Mobile Park
20	Bicentennial Park
21	Lower Umpqua Hospital
Segment E	
22	Oregon Coast RV Resort
23	Salmon Harbor RV Park
Segment F	
24	Oak Rock County Park
25	Salmon Harbor Marina
26	Windy Cove RV Park and Campground
27	Marina Activity Center
28	Winchester Bay RV Resort
29	Old Coast Guard Pier
Segment G	
30	Discovery Point Resort and RV
31	Umpqua River Lighthouse and Museum
32	Ziolkouski Beach Park
33	Umpqua Beach Day Use Area
34	Half Moon Bay County Park and Campground

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3. TRAIL ALIGNMENT ALTERNATIVES

This chapter lays out a range of trail alignment options for segments of the Dean to Dunes Trail corridor. These alignment options were developed in response to project goals of developing a continuous trail system that provides a high-quality user experience, capitalizes on the area's unique aesthetic resources, and encourages use by a variety of non-motorized user types and abilities. The trail system should:

- Link key destinations such as residential neighborhoods, employment centers, shopping areas, recreation opportunities, government offices, community services, schools, and other local activity centers,
- Connect to existing trail and other active transportation facilities in the project area, while providing the most direct route practicable and maximizing the use of public rights-of-way,
- Include an off-highway trail experience wherever practicable,
- Ensure the safety and security of all trail users, including the identification of trailheads, access points, and roadway crossings that are well-designed, visible, safe, and convenient,
- Avoid or minimize impacts to environmental and cultural resources, and
- Provide appropriate amenities to enhance the trail users experience

Currently, the only opportunity for bicyclists and pedestrians to access areas in and near the City is on a narrow shoulder along the high-speed highways. Once constructed, the Dean to Dunes Trail will provide a convenient, non-automobile transportation alternative within and external to the community.

3.1 OVERVIEW OF TRAIL ALIGNMENT OPTIONS

Figure 3-1 provides an overview of potential trail alignment options for the Dean to Dunes corridor. The figure is intended to serve as a guide to the more detailed segment-by-segment graphics that follow, and illustrates:

- General location and limits of each option including a unique identifier number
- Relationship of the option to existing public right-of-way, city limits and urban growth boundaries
- General relationship to existing streams and topography (more detailed information is provided in the detailed graphics)
- Trail segments

3.2 DETAILED TRAIL ALIGNMENT OPTIONS AND FATAL FLAW SCREENING

This section provides more detailed information about the alignment options within each corridor segment. Information presented in the following figures includes:

- Location and limits of each option including a unique identifier number, alignment of the option and grade where this information is useful, preliminary trail cross-section and trail type including pavement, buffering and/or other safety features, and potential roadway crossings and other relevant features related to the alignment of the trail.
- Trail amenities and general locations.
- Public rights-of-way and jurisdictional boundaries including initial identification of locations where right-of-way acquisition might be necessary.
- Key features of the physical environment including topography and grades, wetlands, streams or other potential environmental permitting or resource-related issues.
- Local attractors that could be served by the alignment option including such things as boat launch sites, viewing areas, the cycle stop, restrooms, traveler services, etc.
- Potential highway crossing locations.
- Integration with existing and pending active transportation facilities in the vicinity of the alignment option including sidewalks, bicycle lanes, highway/street channelization and pavement width (including pending road diet on US 101 in the vicinity of 22nd Street), signalized traffic control and cross-walks, and other relevant features.
- Integration with planned bicycle and pedestrian facilities such as the Levee Loop Trail.
- Community gateways (including the planned gateway identified in the *Waterfront and Downtown Plan*)

Each of the alignment options within Segments A through G are described and discussed in the sections that follow and are illustrated in the accompanying figures. A planning level assessment of the alignment options was prepared and “fatal flaw” screening criteria were applied in order to narrow the list of options to only those that are expected to have the greatest potential for successfully meeting project goals. Options that did not pass the fatal flaw screening were eliminated from further consideration. Options that passed were evaluated in greater detail and further discussed in Chapter 4.

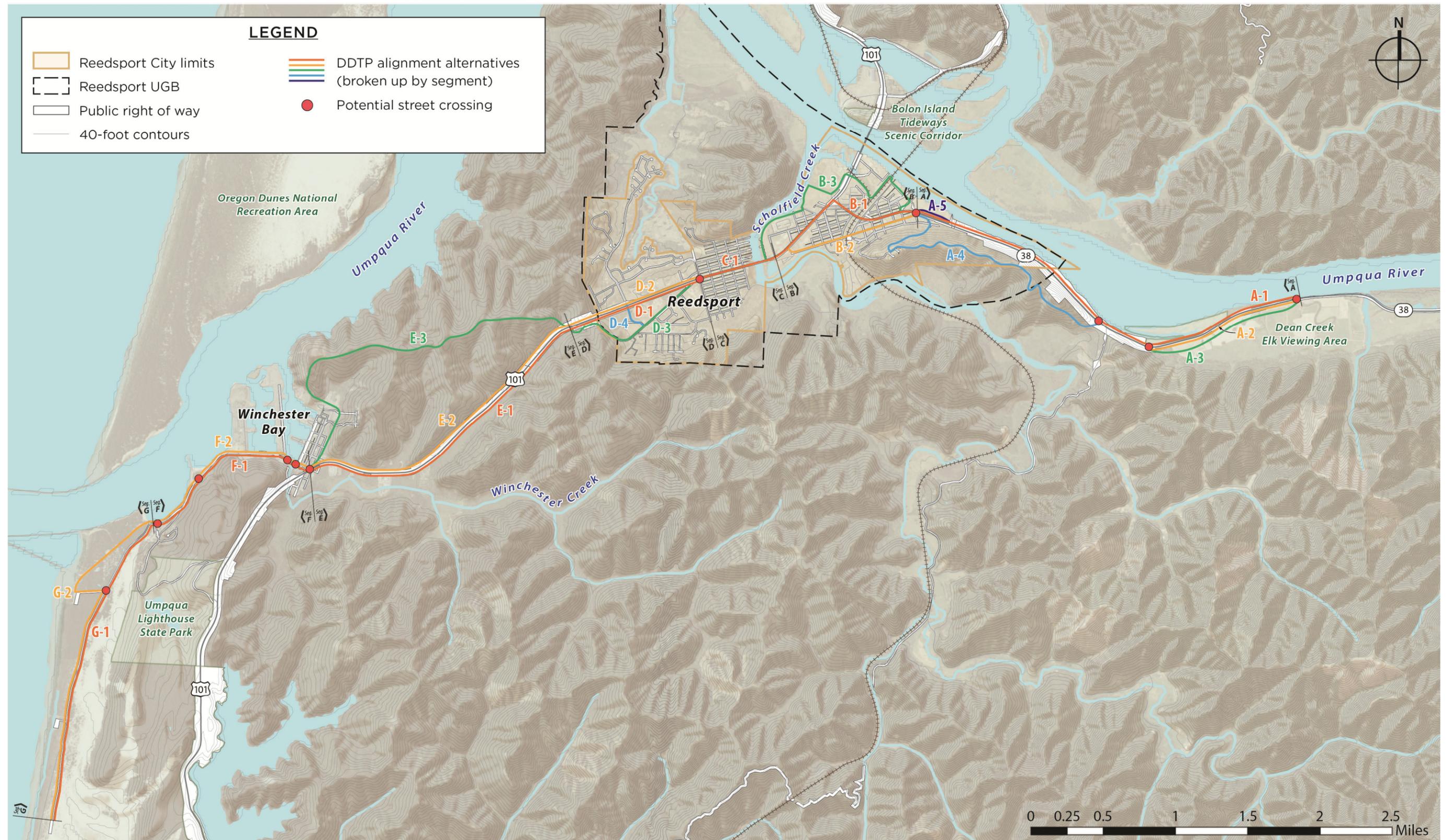
Table 3-1. Fatal Flaw Screening Criteria

Criteria
1. Directness of the route between likely trip origins and destinations
2. Likely extent of property acquisition and/or easement required
3. Grades steeper than 20%

3.2.1 Segment A – OR 38, Dean Creek to Reedsport

The east end of the corridor (along OR 38) is largely a rural two-lane highway with 55 mph speeds, varying rights-of-way and pavement widths, and differing physical opportunities and constraints – all of which affect opportunities for trail development. Speeds drop to 40 mph at the west end of this segment. Existing daily traffic volumes are approximately 4,000 vehicles. Five trail alignment options were identified in this segment which have different challenges in connecting to the Dean Creek Elk

Figure 3-1. Dean to Dunes Corridor Trail Alignment Options



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Viewing Area on the east end and to Segment B in Reedsport on the west end. As shown in Figure 3-2, each option uses the highway right-of-way in differing ways:

- **Option A-1:** Adjacent to OR 38 on the north side of the highway (Reedsport to Dean Creek with a highway crossing at Dean Creek)
- **Option A-2:** Adjacent to OR 38 on the south side of the highway (highway crossing east of Reedsport to Dean Creek)
- **Option A-3:** Off south side of OR 38 through Dean Creek Elk Viewing Area (highway crossing at west end of viewing area property to Dean Creek)
- **Option A-4:** Use local and unimproved roadway, partially Crestview Drive, through hills on south side of OR 38 (western terminus of Segment A to area between the old weigh station and Scholfield Road)
- **Option A-5:** Umpqua River levee on north side of OR 38 (Reedsport to eastern end of levee)

The discussion below further describes each trail alignment option in Segment A, identifies pros and cons and indicates whether the alignment option passed a first level screen intended to assess fatal flaws.

Option A-1

Option A-1 would provide a continuous trail corridor between the Dean Creek Elk Viewing Area and a location in Reedsport that is near both the end of the proposed LLTP system and the pending ODOT bicycle and pedestrian improvements along OR 38 between 3rd Street and Railroad Avenue. This trail would be located on the north side of the highway for the entire distance due to limited right-of-way and steep slopes on the south side of OR 38 that would constrain non-motorized travel in some portions of this segment. A highway crossing would be required on either end (see Appendix A for sample illustrations of potential trail crossing locations).

One crossing would be needed as the trail approaches the city to connect with the pending OR 38 improvements at 3rd Street. Future demand for the 3rd Street crossing could include not only trail users but also pedestrian and/or bicycle traffic generated by the future hotel and other associated development along the waterfront on the river side of the existing levee.

Another crossing would be needed at the eastern terminus of the trail to access the Dean Creek Elk Viewing Area and associated amenities located on the south side of OR 38. The appropriate eastern terminus for a trail project would be located at the far east end of the viewing area next to the restrooms and interpretation center.

Crossing improvements at both locations could include illumination, crosswalk striping, signage, a refuge island, and flashing beacon or user-activated signal.

Opportunities

- Can take advantage of connections to the proposed LLTP facilities, particularly on the levee that surrounds Reedsport, and ODOT's pending improvements to OR 38 in Downtown Reedsport. Details of the connections should be determined during project design.

- Serves potential viewpoints that could be created at locations such as the former highway weigh station.
- Directly serves potential boat or kayak launch location opposite Dean Creek Elk Viewing Area.
- Many portions of the alignment have sufficient width to provide a 10 to 12-foot trail, buffering would be needed.

Constraints

- Portions of the trail alignment have narrow shoulders and a steep drop-off towards the river. This may require some widening of the lateral space along the highway through the use of retaining walls and/or boardwalk facilities.
- Would require a highway crossing to link users with the elk viewing area. Further investigation of an optimal crossing location needs to occur as consideration must be given to having good line of sight and reducing the potential for driver distraction due to the presence of large animals.
- It may be challenging to provide illumination at highway crossings at the east end of the corridor.

Conclusions from Fatal Flaw Screening

1. *Directness of the route* – provides the most direct alignment between Reedsport and Dean Creek.
2. *Magnitude of property acquisition and/or easement required* – Little or no property acquisition is expected.
3. *Grades* – All grades are expected to be less than 20 percent.

This option **PASSES** the fatal flaw screening and will be considered further for a more detailed assessment of trail alternatives that is presented in Chapter 4.

Option A-2

Option A-2 would encompass the eastern portion of Segment A, located on and adjacent to the south side of OR 38. Option A-2 would connect to the A-1 alignment via a highway crossing at the west end of the Dean Creek area. Consideration could also be given to providing a crossing further west where good line of sight exists and/or where topography may provide opportunities for grade-separation.

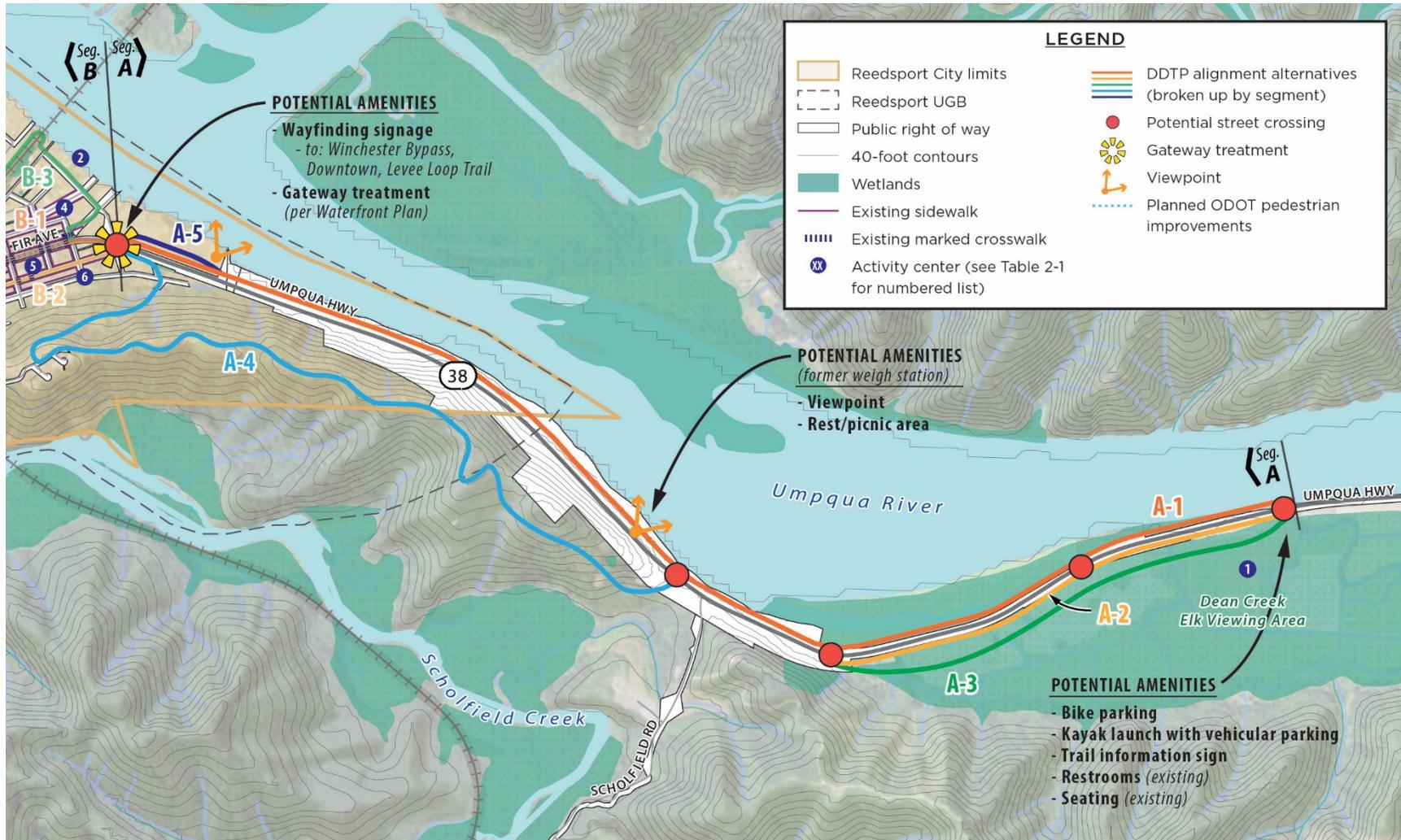
Opportunities

- Provides a good connection to the elk viewing area while eliminating the need to cross the highway in an area where drivers may be distracted by the presence of animals.
- Sufficient highway right-of-way and level topography would provide the opportunity to develop his alignment option and buffer it from highway traffic.

Constraints

- Would require a highway crossing to link users to the A-1 alignment. Further investigation of an optimal crossing location needs to occur which should minimize exposure of walkers and bicyclists to high speed traffic.
- It may be challenging to provide illumination at highway crossings at the east end of the corridor.

Figure 3-2. Segment A – Trail Alignment Options



Conclusions from Fatal Flaw Screening

1. *Directness of the route* – serves provision of a direct alignment between Reedsport and Dean Creek, similar to Option A-1.
2. *Magnitude of property acquisition and/or easement required* – Little or no property acquisition is expected.
3. *Grades* – All grades are expected to be less than 20 percent.

This option **PASSES** the fatal flaw screening and will be considered further for a more detailed assessment of trail alternatives that is presented in Chapter 4.

Option A-3

Option A-3 is similar to Option A-2 as it lies along the south side of OR 38 through the Dean Creek Elk Viewing Area and would connect to the Option A-1 alignment via a highway crossing at the west end of the Dean Creek area. The key difference is that where it approaches the west end of the viewing area, the trail would drop down off the highway grade and travel along a new paved alignment until reaching the existing paved parking area. This trail would continue from that point as a shared use bicycle, walking and vehicular circulation facility. Vehicles would be moving at slow speeds as this area is devoted to localized circulation and parking. Fencing would be installed from the point where the trail drops down below highway grade to the parking lot to protect users from stray elk.

Opportunities

- Provides a good connection to the elk viewing area while eliminating the need to cross the highway in an area where drivers may be distracted by the presence of animals.
- Increases separation from the highway and closer proximity to the key activity of elk viewing.

Constraints

- Would require a highway crossing to link users to the A-1 alignment. Further investigation of an optimal crossing location needs to occur which should minimize exposure of walkers and bicyclists to high speed traffic.
- May require wetlands permitting to construct.
- Located within designated 100-year floodplain.
- It may be challenging to provide illumination at highway crossings at the east end of the corridor.

Conclusions from Fatal Flaw Screening

1. *Directness of the route* – serves provision of a direct alignment between Reedsport and Dean Creek, similar to Options A-1 and A-2.
2. *Magnitude of property acquisition and/or easement required* – Little or no property acquisition is expected as this area lies within the boundaries of the elk viewing site which is owned and operated by the U.S. Department of the Interior, Bureau of Land Management.
3. *Grades* – All grades are expected to be less than 20 percent.

This option **PASSES** the fatal flaw screening and will be considered further for a more detailed assessment of trail alternatives that is presented in Chapter 4.

Option A-4

Option 4 uses Crestview Drive and an unimproved roadway through hills on south side of OR 38 (from either 6th Street at Elm Avenue or Crestview Access Road at Elm Avenue to OR 38 east of old weigh station and west of Scholfield Road).

Opportunities

- Bypasses the area with a relatively narrow right-of-way on OR 38 and steep slopes adjacent to the highway.
- Uses a low volume road with an off-highway feel.
- Could be a separated path or could share the existing roadway. Would require that unimproved portions of the road be paved.

Constraints

- Very steep grades with an average range of 13 to 16 percent and a maximum grade of over 52 percent (see Appendix B for an illustration).
- Would require right-of-way acquisition as some portions at the east end of this alignment option are privately-owned.
- Offers little scenic value.

Conclusions from Fatal Flaw Screening

1. *Directness of the route* – this route is very circuitous.
2. *Magnitude of property acquisition and/or easement required* – The area appears to be either public road right-of-way or owned by the City of Reedsport at the west end. It also appears to be privately owned at the east end, so it is expected that right-of-way acquisition would be necessary.
3. *Grades* – portions of the corridor would exceed 20 percent.

This option **FAILS** the fatal flaw screening and will not be considered further.

Option A-5

Option 5 parallels OR 38 immediately east of the City of Reedsport and uses the existing Umpqua River levee on north side of the highway. The option is approximately 1450 feet long and (via an end of levee ramp) would connect to Reedsport in generally the same location as Option A-1.

Opportunities

- Can take advantage of connections to the proposed LLTP facilities, particularly on the levee that surrounds Reedsport, and ODOT's pending improvements to OR 38 in Downtown Reedsport. Details of the connections should be determined during project design.
- Good view as this alignment is higher and closer to the water.
- Alignment is located off-highway to provide a more pleasant user experience.

Constraints

- The levee crown has a very narrow area that could be paved (i.e., between 8 and 12 feet in width). No amenities including signage or separated rest/view area could be placed on the levee.
- There is the need for levee ramps at the existing gate near the mid-point along the length of the levee or closure of this waterfront access point to provide a continuous trail connection.

Conclusions from Fatal Flaw Screening

1. *Directness of the route* – can serve as a portion of Option A-1 and would provide a direct alignment between Reedsport and Dean Creek.
2. *Magnitude of property acquisition and/or easement required* – Would require coordination with the USACE for use of the levee.
3. *Grades* – All grades are expected to be less than 20 percent.

This option **PASSES** the fatal flaw screening and will be considered further for a more detailed assessment of trail alternatives that is presented in Chapter 4.

Segment A/B Transition Area (Eastern Gateway to Reedsport)

Within this area, a community gateway feature as proposed in the City's *Waterfront and Downtown Plan* could be developed. Wayfinding and informational signage should be installed to facilitate the transition from Segment A to Segment B. Signage should direct users to:

- The Winchester Way bypass, Reedsport's commercial corridor, or the Levee Loop Trail
- Destinations like public restrooms, food, water, the cycle stop and other community attractors and trail amenities.

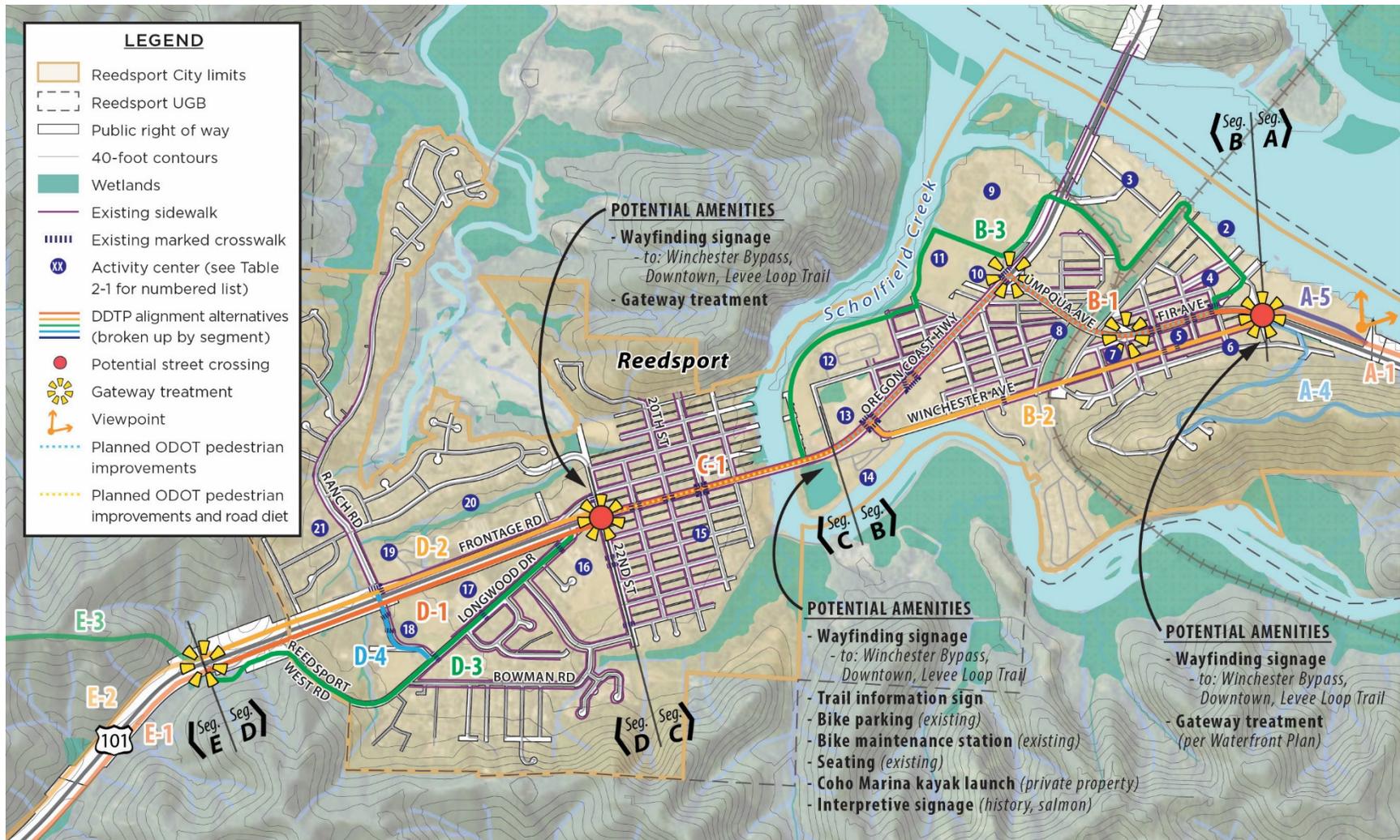
3.2.2 Segment B – Downtown Reedsport

Segment B is located in the center of the DDT corridor entirely within the City of Reedsport between Riverfront Way and Scholfield Creek. This segment includes OR 38 and US 101, as well as several other potential connections for the DDT between Segments A and C. In this segment, OR 38 has one travel lane in each direction with speeds of 25 mph. The portion of this highway between Railroad Avenue and 3rd Street will shortly be improved by ODOT to add bicycle and pedestrian improvements. Average daily traffic volumes range from about 3,600 to 5,400 vehicles. US 101 in Segment B has two travel lanes in each direction with bicycle lanes and sidewalks. Left-turn channelization is also provided at key intersections. Speeds along the highway are 30 mph. Average daily traffic volumes range from 8,500 to 10,700 vehicles. Potential connections between Segments A and B are illustrated in Appendix A.

Three trail alignment options were identified in this segment to address both the existing infrastructure and planned improvements, such as those identified in the adopted LLTP. As shown in Figure 3-3, each option uses publicly-owned right-of-way in differing ways:

- **Option B-1:** Pending improvements along OR 38 and US 101
- **Option B-2:** Proposed Levee Loop Trail improvements along Winchester Avenue
- **Option B-3:** Proposed Levee Loop Trail improvements on the levee surrounding downtown

Figure 3-3. Segments B-D –Trail Alignment Options



Building on the prior work done for the LLTP and the pending ODOT improvements, the key issue to be addressed for Segment B in this technical memorandum rests with the choice of one of these options as the designated DDT.

Option B-1 offers an alignment along the state highways that is distinct from the LLTP (except for a short portion of OR 38 between 3rd Street and 6th Street) and provides a direct connection that can be uniquely branded as the DDT. Selection of this option would direct travelers into the downtown area and its services and amenities including the cycle stop. The portion of the option located along US 101 is currently designated as the Oregon Coast Bike Route. This option is part of the pending ODOT project and is not dependent on DDT improvements. Buffering of bicycle lane improvements could be considered with this option.

Option B-2 would use Winchester Avenue between 2nd Street and US 101 at the Scholfield Creek Bridge. This option would rely on the improvements proposed in the LLTP and would serve as a lower speed, lower volume alternative to travel on OR 38 and US 101 through Segment B. This street passes through an area that has less activity and fewer amenities than the state highway corridor. This option would be developed as part of the LLTP and is not dependent on DDT improvements.

Option B-3 uses the proposed levee loop trail around the west side of the city as another alternative to the direct connection provided by OR 38 and US 101. This alignment would be separated from the public street system and would offer a view of Scholfield Creek and McIntosh Slough. This option is part of the adopted LLTP and is not dependent on DDT improvements.

3.2.3 Segment C – US 101, Scholfield Creek to 22nd Street

Segment C runs along US 101 from the north side of the Scholfield Creek Bridge to the intersection of US 101 with 22nd Street. Speed through this segment is 30 mph and average daily traffic volumes range from 10,600 to 11,200. As shown in Figure 3-3, Option C-1 is the only trail alignment that has been identified in this segment as US 101 provides the only crossing over Scholfield Creek. The pending ODOT improvement project on US 101 in Segment C includes:

- Converting the four-lane section between 16th and 22nd Streets to three lanes including one travel lane in each direction, a center turn lane, two bicycle lanes, and space for on-street parking (Road Diet).
- Modifying traffic signals at 19th Street and 22nd Street to match the three-lane conversion
- Adding and adjusting street lights at 20th, 21st and 22nd Streets.
- Building curb extensions and a pedestrian island (refuge) with flashing pedestrian beacons (RRFB) at 20th Street.

Sidewalks are currently provided along US 101 through Segment C.

Segment C/D Transition Area

Part of ODOT's plan for improvements to Segment C will include a transition back to the existing highway cross-section on the west side of 22nd Street. In this transition area it will be important to identify upcoming amenities through the use of wayfinding and informational signage.

3.2.4 Segment D – US 101, 22nd Street to Reedsport West Road

Segment D includes the western portion of the City of Reedsport and the UGB, and marks the area where US 101 transitions to a two-lane highway with increasingly rural characteristics. Speeds increase to 40 mph east of the Ranch Road overcrossing and 55 mph west of the overcrossing. Average daily traffic volumes are approximately 11,200 near the eastern end of Longwood Road, dropping to 8,100 at the southern city limits.

Four trail alignment options were identified in this segment which have different challenges in connecting to Segment C in Reedsport on the east end and Segment E on the west end. As shown in Figure 3-3, each option uses highway and local street rights-of-way in differing ways. Options include:

- **Option D-1:** Adjacent to US 101 on the southeast side of the highway (22nd Street to Reedsport West Road)
- **Option D-2:** Frontage road on the northwest side of US 101 (22nd Street to Reedsport West Road)
- **Option D-3:** Along Longwood Drive/Reedsport West Road (west of 22nd Street to US 101)
- **Option D-4:** Along Ranch Road (Frontage Road to Longwood Drive)

Option D-1

This option is intended to provide the most direct connection between Segment C and Segment E, and utilizes the existing US 101 highway right-of-way between 22nd Street and Reedsport West Road. As it moves to the southwest, the state highway gains elevation resulting in a long uphill grade, ranging from 2 to 4 percent, for southwest bound traffic. About halfway through this segment, there is a bridge over Ranch Road where bicyclists travel in fairly close proximity to vehicular traffic. This trail alignment could include a design option that provides for a separate non-motorized vehicle bridge distinct from the existing bridge to enhance bicycle safety and comfort.

Before reaching the intersection with Reedsport West Road, the existing highway alignment passes through a narrow “pinch point” with high cliffs on either side. From the perspective of a non-motorized traveler, there appears to be very little separation from high speed traffic and the traveling environment is not comfortable. Options to improve comfort through this area could include maximizing the available paved highway cross-section (currently 40-feet) by realigning the roadway centerline and adding a two-way bicycle and pedestrian path along the southeast side of the highway with a physical separation from motorized traffic. Other options for alignment of the path through this area could include retaining existing highway shoulders with added widening to accommodate one-way bicycle traffic and buffering to improve safety, but this option may have physical limitations. It would also require a highway crossing at Reedsport West Road to connect to Option E-1 in the next segment.

Opportunities

- Provides service to local destinations as it’s adjacent to school and Highland Park.
- Offers the most direct route between Reedsport and Winchester Bay.
- Is the currently designated Oregon Coast Bike Route.

Constraints

- US 101 is above grade with a bridge over Ranch Road and existing pavement width (guardrail to guardrail) is approximately 40-feet. There is only a limited area for trail and/or safety buffering, and it may be necessary to consider relocating highway centerline to provide adequate shoulders.
- There are steep banks on either side of the highway in a portion of this segment (“pinch point”) that may give bicyclists or walkers a sense of insecurity.

Conclusions from Fatal Flaw Screening

1. *Directness of the route* – serves provision of a direct alignment between Reedsport and destinations to the south.
2. *Magnitude of property acquisition and/or easement required* – Little or no property acquisition is expected.
3. *Grades* – All grades are expected to be less than 20 percent with a maximum grade of 4 percent.

This option **PASSES** the fatal flaw screening and will be considered further for a more detailed assessment of trail alternatives that is presented in Chapter 4.

Option D-2

This option would follow the existing Frontage Road that lies parallel to and northwest of US 101 from 22nd Street to Ranch Road. Bicycles would share space with motor vehicles on this low volume, 25 mph road, while pedestrians would use the existing separated sidewalk on the west side. West of Ranch Road, a multi-use trail alignment would be developed to come back up to grade and rejoin US 101 near where the highway narrows in Option D-1 or would continue to rise, paralleling the highway to the Reedsport West Road intersection.

Opportunities

- Separates active transportation system users from the highway on a local, low volume street.
- Appears to be entirely located within existing highway right-of-way.

Constraints

- Extremely steep south of Ranch Road, with a maximum grade of 36 percent.
- This option only works if the trail alignment in Segment E is on the west side of the highway (i.e., the logging road or the utility corridor) to avoid an at-grade highway crossing at Reedsport West Road.

Conclusions from Fatal Flaw Screening

1. *Directness of the route* – Direct alignment between Reedsport and destinations to the south.
2. *Magnitude of property acquisition and/or easement required* – Little or no property acquisition is expected.
3. *Grades* – Some portions of the segment are expected to have grades that exceed 20 percent.

This option **FAILS** the fatal flaw screening south of Ranch Road and will be not considered further. The area north of Ranch Road may be considered in combination with other alignment options to create a hybrid alternative.

Option D-3

This option would use the Longwood Drive/Reedsport West Road alignment from west of 22nd Street to the intersection with US 101. Bicyclists and pedestrians would transition from Segment C at the 22nd Street signalized intersection so that all users would be on the southeast side of US 101. A short two-way multiuse path would need to be constructed between 22nd Street and the beginning of Longwood Drive at which point all users would travel on this local street. Northeast of Ranch Road pedestrians can use existing sidewalks and there is sufficient width in the existing roadway cross-section for bicyclists to use the roadway. South of Ranch Road, two alignment sub-options could be considered:

1. **Sub-Option 1:** Develop a shared use pathway along the northwest side of the road (adjacent to the cemetery) while retaining two-way traffic as far south as the existing residences. From that point on, Reedsport West Road would serve one-way traffic resulting in traffic diversions for residents that use this roadway to get between the neighborhood and US 101.
2. **Sub-Option 2:** Acquire additional right-of-way along the side of Reedsport West Road to construct a separated two-way path between Ranch Road and US 101.

Opportunities

- Provides an off highway experience on a lower volume, lower speed local street.
- Is located adjacent to and serves both the high school and Highland Park.
- The area north of Ranch Road has fairly wide right-of-way.

Constraints

- Needs a new pathway connection between the end of Longwood Drive and 22nd Street along the southeast side of US 101 to connect to the signalized intersection at 22nd Street where trail users can safely cross the highway.
- May require conversion of a portion of Reedsport West Road on the south end to one-way operations.
- Would require property acquisition to keep a two-way cross-section on Reedsport West Road.
- Short portions of this alignment have grades between 10 and 12 percent (for roughly 200 feet).
- Would likely reduce on-street parking if a separated two-way path were constructed rather than bike lanes.

Conclusions from Fatal Flaw Screening

1. *Directness of the route* – not as direct as an alignment along US 101 but provides a more comfortable cycling environment.
2. *Magnitude of property acquisition and/or easement required* – Little or no property acquisition is expected except if a shared use pathway is provided along Reedsport West Road at the south end.
3. *Grades* – All grades are expected to be less than 20 percent

This option **PASSES** the fatal flaw screening and will be considered further for a more detailed assessment of trail alternatives that is presented in Chapter 4.

Option D-4

This option would use Ranch Road between the existing US 101 Frontage Road and Longwood Drive to connect Options D-2 and D-3 and provide an alternative to US 101. There is sufficient right-of-way along this street to provide two vehicle travel lanes and two bike lanes, but some adjustment may be needed to existing parking adjacent to Highland Park to reduce bike/auto conflicts (i.e., convert this parking to back-in only).

Opportunities

- Connects Frontage Road with Longwood Road, providing the opportunity for a reasonable, off-highway trail alignment.
- Sufficient ROW to provide both vehicle travel lanes and bike lanes.

Constraints

- Would require parking modification adjacent to the park, and a restriction of any on-street parking.

Conclusions from Fatal Flaw Screening

1. *Directness of the route* – Provides a connection between Options D-2 and D-3 to offer a choice to the more direction connection on US 101.
2. *Magnitude of property acquisition and/or easement required* – Little or no property acquisition is expected.
3. *Grades* – All grades are expected to be less than 20 percent.

This option **PASSES** the fatal flaw screening and will be considered further for a more detailed assessment of trail alternatives that is presented in Chapter 4.

Segment D/E Transition Area (Western Gateway to Reedsport)

Could incorporate a community gateway similar to that recommended for the transition area between Segments A and B. Wayfinding and informational signage should be installed to facilitate the transition from Segment D to Segment E. Signage should direct users to destinations like public restrooms, food, water, the cycle stop and other community attractors and trail amenities.

3.2.5 Segment E – US 101, Longwood Road to Salmon Harbor Drive

Segment E includes the US 101 corridor generally between the Reedsport city limits and Winchester Bay. US 101 is a two-lane highway with 55 mph speeds, dropping to 45 mph as the highway approaches Winchester Bay. Adjacent land uses are largely rural with some tourism and business support services, primarily along the southeast side of the highway. A few residences exist along the northwest side of the highway near Winchester Bay. US 101 has a northbound passing lane from north of Winchester Bay to just south of Reedsport West Road. There are estuarine wetlands along a portion of the southeast side of the highway,

There is a southbound passing lane that starts at 8th Street in Winchester Bay and continues southward out of the DDTP study area. Average daily traffic volumes range from 10,900 vehicles north of 8th Street in Winchester Bay to 5,100 south of Broadway Street, also in Winchester Bay.

Three trail alignment options were identified in this segment which have different challenges in connecting to Segment D in Reedsport on the east end and Segment F on Salmon Harbor Drive in Winchester Bay. As shown in Figure 3-4, each option uses highway and local street rights-of-way in differing ways. Options include:

- **Option E-1:** Adjacent to US 101 on east side of the highway (Reedsport West Road to Salmon Harbor Drive)
- **Option E-2:** Power corridor above grade of US 101 along west side of the highway (west end of Reedsport West Road to US 101 in the vicinity of the Oregon Coast RV Park)
- **Option E-3:** Logging road west of US 101 (Reedsport West Road to Broadway Avenue in Winchester Bay)

Option E-1

This option would run along the southeast side of US 101 adjacent to the highway between Reedsport West Road to Salmon Harbor Drive. It would provide close views of the estuarine area which lies along the east side of the highway approximately halfway through the segment. It would also provide direct access to the Oregon Coast RV Resort, a small industrial area, and the Salmon Harbor RV Park, all of which are located on the east side of the highway. To provide the greatest degree of separation and protection for non-motorized travelers (particularly bicyclists) further detailed design of this option may require shifting the highway right-of-way to increase lateral width on the southeast side. Alternately, there may be some sections which the highway width is narrow and adjacent to wetlands, requiring some sort of boardwalk treatment.

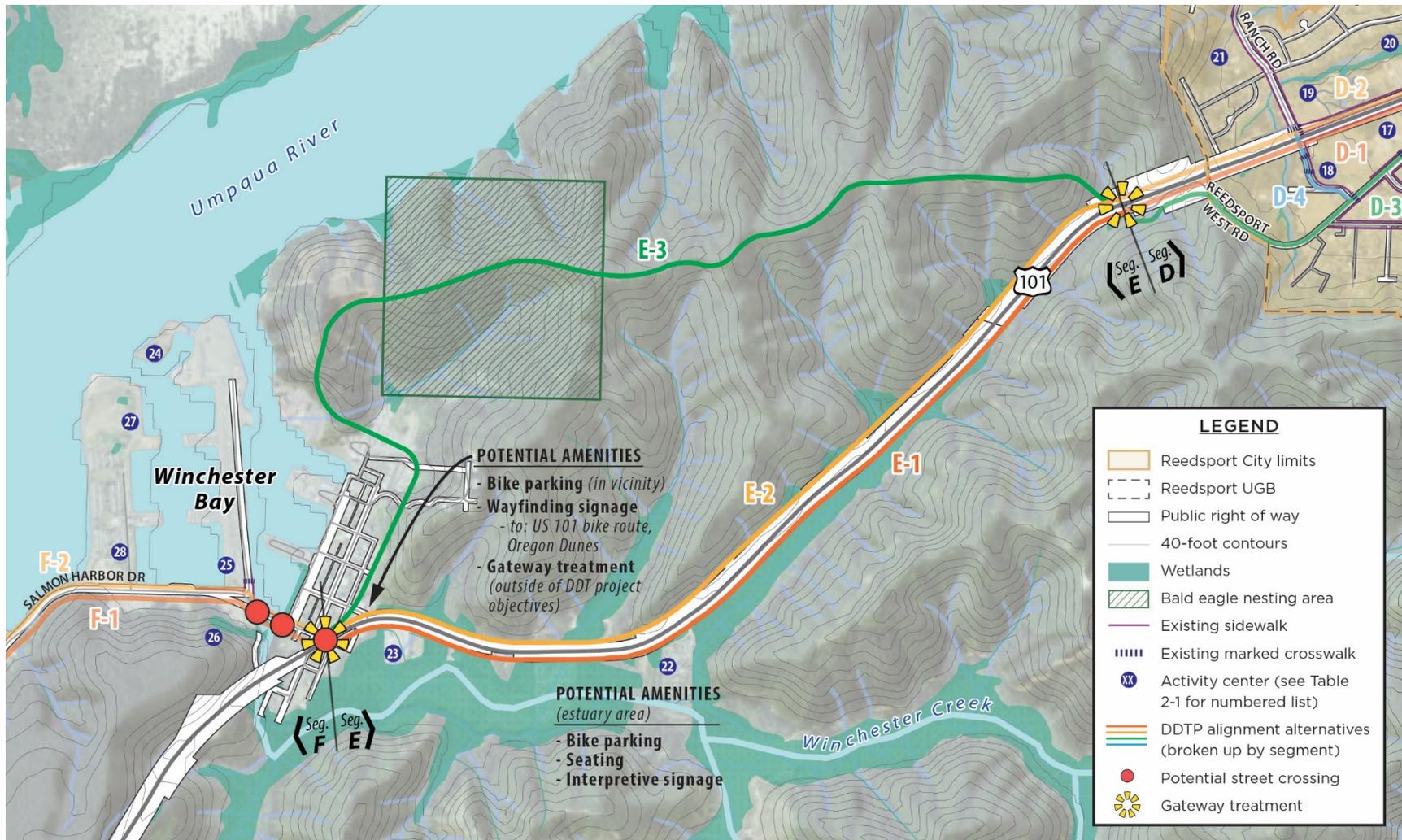
Upon entering Winchester Bay, the trail could continue south to the intersection with Salmon Harbor Drive at which point a formalized highway crossing could be installed. A crossing would provide enhanced visibility for both trail users and ATV users who rent vehicles from one of the businesses on the east side of US 101. A sketch of a potential crossing concept is included in Appendix A. It should be noted that the east side of the highway has no clear delineation for driveways serving two existing businesses (ATV rentals). This can lead to potential conflicts between vehicular and bicycle traffic through this area. Additionally, there is a very tight (10-foot) separation between the edge of highway and Oregon Coast Powersports which could constrain trail width if the trail is continued along this side of the highway.

To avoid this area, consideration could be given to providing a highway crossing at 8th Street and continuing the trail along the west side of US 101 to Salmon Harbor Drive.

Opportunities

- Provides a direct connection between Segment D and Winchester Bay.
- Lies adjacent to an estuary which could provide the opportunity for an interpretive center and/or rest facilities if there is a boardwalk and/or walking trail/park element in this area. This area provides good opportunities for bird-watching.
- Would provide a direct access to the RV parks on the east side of US 101.
- Is the currently the designated Oregon Coast Bike Route, and has limited change in grade.

Figure 3-4. Segment E – Trail Alignment Options



Constraints

- May have wetland permitting issues, particularly for implementation of a boardwalk concept in areas where available space for a trail is narrow.
- Access management issues along the east side of the highway.
- Must cross US 101 to reach Winchester Bay and the dunes.
- May require some highway widening and/or installation of elevated structure or fill along the east side of the highway where there is a drop-off to provide sufficient lateral width for buffering from 55 mph speed traffic. This may also impact existing trees along the highway.

Conclusions from Fatal Flaw Screening

1. *Directness of the route* – provides a direct alignment between Reedsport and Winchester Bay.
2. *Magnitude of property acquisition and/or easement required* – Little or no property acquisition is expected.
3. *Grades* – All grades are expected to be less than 20 percent.

This option **PASSES** the fatal flaw screening and will be considered further for a more detailed assessment of trail alternatives that is presented in Chapter 4.

Option E-2

This trail alignment option would follow the existing powerline that runs west of and parallel to US 101 from the Reedsport West Road intersection to the vicinity of the Oregon Coast RV park. Beyond the end of the powerline corridor, the trail would be located adjacent to the highway to the intersection with Salmon Harbor Drive. Depending on the trail alignment option selected for Segment D, a crossing of US 101 could be necessary to reach this corridor at Reedsport West Road.

Opportunities

- Located off highway and largely within existing public right-of-way.
- The route is fairly direct
- The route would not require crossing US 101 at Winchester Bay

Constraints

- May require property acquisition at the south end where the powerline corridor rejoins US 101.
- The majority of this alignment is very steep with maximum grades in excess of 60 percent.
- This alignment is disconnected from land uses that are adjacent to the highway in this segment including the existing RV parks and industrial development. It is also remote from the estuarine environment which would limit interpretive opportunities. The purpose of this alignment would be largely for through travel.

Conclusions from Fatal Flaw Screening

1. *Directness of the route* – Provides a relatively direct alignment between Reedsport and Winchester Bay.
2. *Magnitude of property acquisition and/or easement required* – Little or no property acquisition is expected.
3. *Grades* – Grades are expected to exceed 20 percent.

This option **FAILS** the fatal flaw screening and will not be considered further.

Option E-3

This option would follow an existing logging road west of US 101 between the intersection with Reedsport West Road and Broadway Avenue in Winchester Bay. This road generally runs along the ridgelines with a steep grade at both ends. It is anticipated that there could be good views of the Umpqua River and/or Pacific Ocean from this trail. The road is privately-owned and any trail would require an easement.

Opportunities

- Provides an off-highway experience through a natural forest including an area with identified eagle nesting
- Traverses a ridgeline so may have potential for good viewpoints
- Provides added service to local neighborhoods in Winchester Bay
- Would not require crossing of US 101 at Winchester Bay

Constraints

- Offers a very circuitous and likely a longer route than using US 101
- Sections are very steep with grades of 20 percent on the eastern end near US 101
- Is disconnected from adjacent land uses and doesn't serve existing development along US 101 or the estuarine wetlands
- Is privately owned

Conclusions from Fatal Flaw Screening

1. *Directness of the route* – very circuitous.
2. *Magnitude of property acquisition and/or easement required* – Privately-owned, would require an easement for active transportation use.
3. *Grades* – Grades are expected to exceed 20 percent.

This option **FAILS** the fatal flaw screening and will not be considered further.

Segment E/F Transition Area (Winchester Bay)

Option E-1 will require a crossing of US 101 at Winchester Bay. Issues associated with this include:

- Access management issues adjacent to the businesses on the east side of the highway. There is an existing pinch point between the highway fog line and one building of approximately 10 feet in width.
- Any highway crossing from the east side of US 101 to the west side in Winchester Bay will require coordination with ODOT and Douglas County to maximize safety and adequately accommodate non-motorized travelers, ATVs, and large recreational vehicles. Sketch level illustrations of potential crossing locations are illustrated in Appendix A. At the County's suggestion the design vehicle for any intersection modifications should be a 60-foot RV.
- Wayfinding signage will be needed to direct users to amenities in Winchester Bay and the dunes, and/or to continue on the US 101 Oregon Coast Bike Route.
- A gateway treatment may be possible.

3.2.6 Segment F – Winchester Bay

Segment F follows Salmon Harbor Drive from its intersection with US 101 to Discovery Point Lane. Salmon Harbor Drive is a two-lane county road signed for 25 mph. On its north side, this road connects US 101 to the Winchester Bay RV resort, Oak Rock County park, the Salmon Harbor marina, and the Old Coast Guard pier, and the beach. There is an existing pedestrian pathway along the north side of this street with an 8-foot-wide pedestrian bridge over Winchester Creek. Further west, the shoulder of the north side of the street has been designated for ATV use with a designated speed of 15 mph. ATV traffic uses the north side of the street due to the narrow shoulder on the south side of the road in the vicinity of the County's sewerage treatment facility that constrains traffic in that area.

The south side of Salmon Harbor Drive connects US 101 to the Windy Cove RV Park and Campground (operated by Douglas County), and provides access to the Umpqua River Lighthouse and Museum via Lighthouse Road.

Two trail alignment options were identified in this segment. As shown in Figure 3-5, each option uses the existing road right-of-way in differing ways:

- **Option F-1:** Adjacent to Salmon Harbor Drive on the south side of the street (US 101 to Discovery Point Lane)
- **Option F-2:** Adjacent to Salmon Harbor Drive on the north side of the street (US 101 to Discovery Point Lane)

Option F-1

This option follows the south side of Salmon Harbor Drive from US 101 to Discovery Point Lane. A new and wider shared use bridge would be provided over Winchester Creek to provide separation between bicyclists and pedestrians.

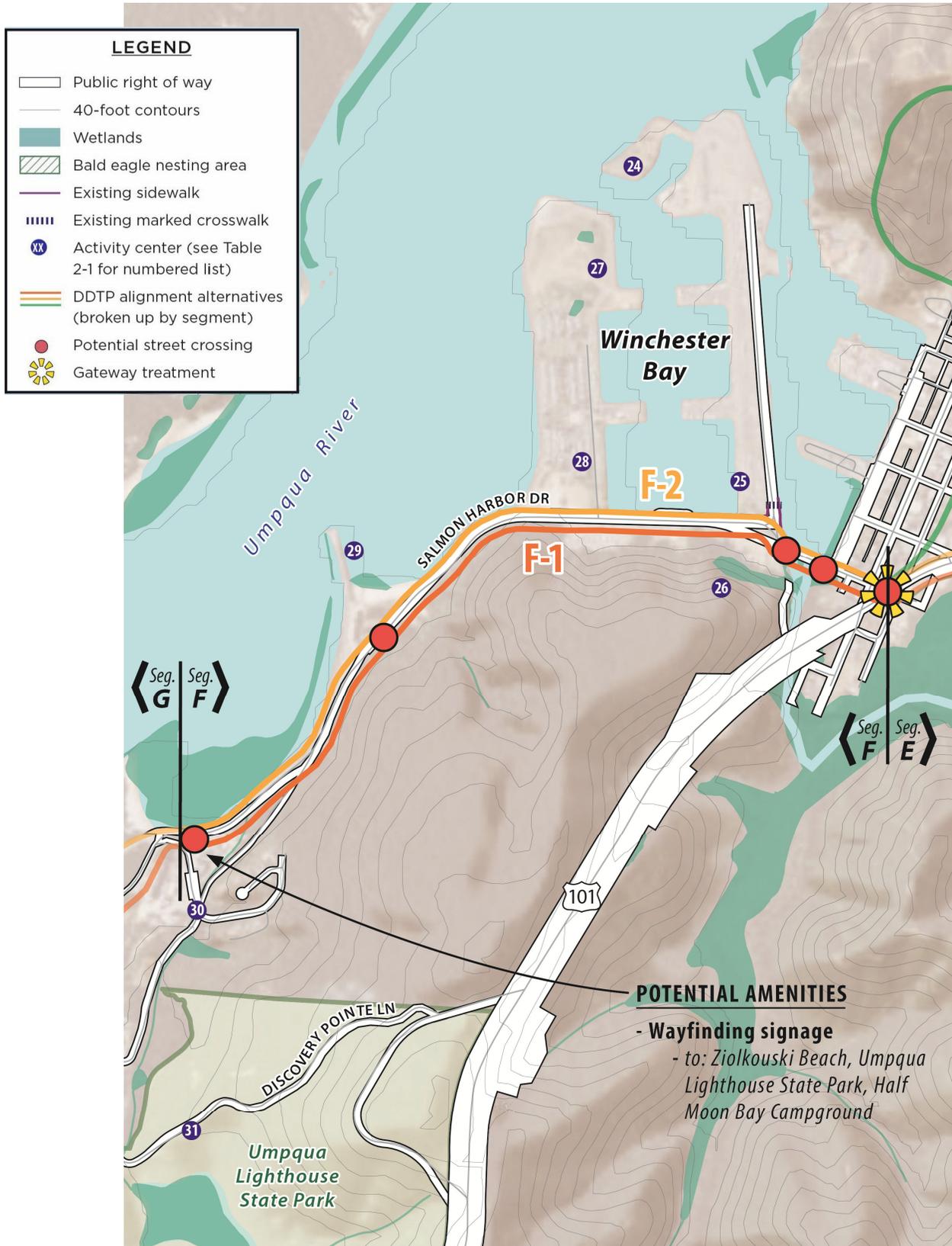
Opportunities

- Separates bicyclists and pedestrians from the existing ATV trail.
- Provides opportunities for fish viewing at Winchester Creek Bridge.
- Provides a direct connection to Douglas County's Windy Cove campground.
- Provides direct access to Lighthouse Road and the Umpqua River Lighthouse Museum and to Discovery Point Lane.

Constraints

- Would require a new and wider bridge over Winchester Creek which would add cost to the project.
- Would require a street crossing to reach the marina, the Winchester Bay RV Resort and other land uses and amenities north of Salmon Harbor Drive.
- Would require a street crossing to reach the existing Old Coast Guard fishing pier.
- Conflicts with ATV's may occur near the western end of this segment where these vehicles transition to the ATV use area and must interact with motor vehicles on the street and bicyclists/pedestrians on the trail.

Figure 3-5. Segment F – Trail Alignment Options



Conclusions from Fatal Flaw Screening

1. *Directness of the route* – Provides a direct alignment between Winchester Bay and the dunes.
2. *Magnitude of property acquisition and/or easement required* – Little or no property acquisition is expected.
3. *Grades* – All grades are expected to be less than 20 percent.

This option **PASSES** the fatal flaw screening and will be considered further for a more detailed assessment of trail alternatives that is presented in Chapter 4.

Option F-2

This option lies adjacent to the north side of Salmon Harbor Drive between US 101 to Discovery Point Lane utilizing the existing pedestrian bridge to cross Winchester Creek.

Opportunities

- Provides opportunities for viewing of fish and marina operations at Winchester Creek Bridge.
- Provides direct access to the marina, Winchester Bay Resort and its amenities, and the fishing pier.
- Provides direct connection to Douglas County's Half Moon Bay campground in Segment G without a street crossing.

Constraints

- The existing pedestrian bridge crossing of Winchester Creek is narrow (8-feet in width) and could create pedestrian and bicycle conflicts at the pinch point.
- There could be a conflict with the existing ATV trail, but this option separates active transportation users from most ATV activity near the west end of the segment.
- Requires a street crossing to access Lighthouse Road, Discovery Point Lane and associated development, and Douglas County's Windy Cove campground.

Conclusions from Fatal Flaw Screening

1. *Directness of the route* – Provides a direct alignment between Winchester Bay and the dunes.
2. *Magnitude of property acquisition and/or easement required* – Little or no property acquisition is expected.
3. *Grades* – All grades are expected to be less than 20 percent.

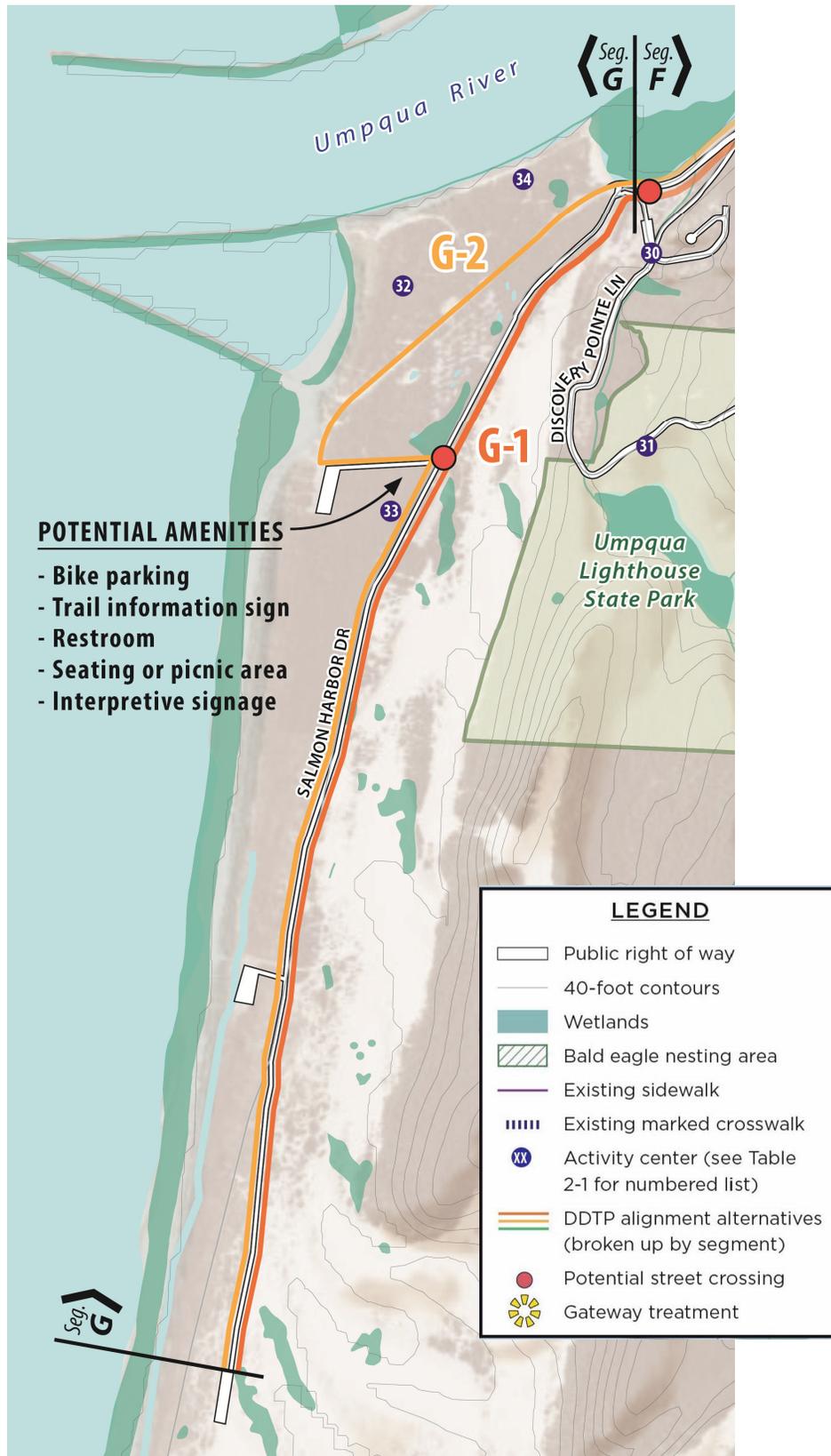
This option **PASSES** the fatal flaw screening and will be considered further for a more detailed assessment of trail alternatives that is presented in Chapter 4.

3.2.7 Segment G – Oregon Dunes

The final, westerly segment of the DDT would provide access to the Oregon Dunes National Recreation Area. Two trail alignment options were identified in this segment. As shown in Figure 3-6, each option uses the road right-of-way in differing ways:

- **Option G-1:** Adjacent to Salmon Harbor Drive on the either side of the road (Discovery Point Lane to beach parking area).

Figure 3-6. Segment G – Trail Alignment Options



- **Option G-2:** Adjacent to Triangle Road and Ziolkouski Beach access (Discovery Point Lane to beach parking area)

Option G-1

This option lies adjacent to Salmon Harbor Drive between Discovery Point Lane and the beach parking lot at the OHV Staging Area #3/sand campground in the Suislaw National Forest. The trail could be built on the either side of the road. The existing road is approximately 22-feet wide with a designated speed of 25 mph. Traffic in this area includes a mix of motorized vehicles, ATVs, pedestrians and bicyclists and is particularly active during summer months and Dune Fest.

Opportunities

- Existing grade is very flat.
- Is a low speed and low volume road that provides a tourism/visitor experience.
- Provides direct access to the Oregon Dunes.
- Could use existing 22-foot wide roadway for shared bicycle use. May want a separate path for pedestrians.
- Provides direct access to Half Moon Bay campground.

Constraints

- Potential for conflict with ATV activity, particularly keeping ATVs off the pedestrian/bicycle trail if one is provided.
- May have wetland permitting issues which need further investigation during design.

Conclusions from Fatal Flaw Screening

1. *Directness of the route* – Provides a direct alignment between Winchester Bay and the dunes.
2. *Magnitude of property acquisition and/or easement required* – Little or no property acquisition is expected.
3. *Grades* – All grades are expected to be less than 20 percent.

This option **PASSES** the fatal flaw screening and will be considered further for a more detailed assessment of trail alternatives that is presented in Chapter 4.

Option G-2

This option uses the existing, unpaved Triangle Road that connects Salmon Harbor Drive west of Discovery Point Road with the beach and the west side of Half Moon Bay campground.

Opportunities

- Existing grade is relatively flat.
- Is a low speed and low volume road that provides a tourism/visitor experience.
- Provides direct access to the beach and the Half Moon Bay campground.

Constraints

- Road is unimproved and unpaved, and would require development of a paved path.
- Does not provide direct access to the dunes

Conclusions from Fatal Flaw Screening

1. *Directness of the route* – Does not offer a direct connection from Winchester Bay to the dunes.
2. *Magnitude of property acquisition and/or easement required* – Little or no property acquisition is expected.
3. *Grades* – All grades are expected to be less than 20 percent.

This option **FAILS** the fatal flaw screening and will not be considered further.

3.3 DEVELOPMENT OF TRAIL ALIGNMENT ALTERNATIVES

A total of fourteen trail alignment options passed the fatal flaw screening. Some of these options provide for a complete trail connection within a specific segment, while others serve only part of a segment and must be combined with other options to provide a full connection. This section discusses the process of combining alignment options to create trail alternatives within each segment. These alternatives will be further evaluated in Chapter 4 using criteria developed earlier in the study and documented in Technical Memorandum #1.

3.3.1 Summary of Fatal Flaw Screening Analysis Results

Segment A – Dean Creek Elk Viewing Area to Reedsport

Running along the north side of OR 38, Option A-1 provides a complete connection between Dean Creek and Reedsport. Through the fatal flaw analysis, Option A-1 was determined to be the only viable alignment for the middle portion of Segment A while Options A-2, A-3, and A-5 provide alternatives to Option A-1 on either end of Segment A. On the east end, Options A-2 and A-3 would route the trail along the south side of OR 38 as the highway approaches Dean Creek. On the west end, Option A-5 places the trail along the levee top on the north side of the highway near Reedsport for improved views of the Umpqua River. Each of the east end options (Option A-1, A-2, and A-3) and the west end options (Option A-1 and A-5) will be further considered in the evaluation of trail alternatives in Chapter 4.

Segment B – Downtown Reedsport

Three options passed the fatal flaw screening in this segment but two of them (Option B-2 and Option B-3) have already been recommended for implementation in the LLTP. Option B-1 provides a distinctly different alignment than the other two options, and would offer the DDT its own alignment with the ability to create its own identify. Option B-1 also maximizes use of ODOT's pending highway improvements and amenities in the city's center. On that basis, Option B-1 is the only option recommended to be carried forward in the DDTP for Segment B.

Segment C – Scholfield Creek to 22nd Street

Due to short length of this segment and the pending road diet improvements along US 101, Option C-1 is the trail alignment option recommended to be carried forward in the DDTP for Segment C.

Segment D – 22nd Street to Reedsport West Road

Three options and a portion of one option passed the fatal flaw screening in this segment. Option D-1 provides a complete connection between Reedsport and Winchester Bay using the US 101 alignment. The northern portion of Option D-2 (north of Ranch Road), Option D-3 and Option D-4 can be combined

to offer an effective alternative to Option D-1 using the alignments of the US 101 west Frontage Road, Ranch Road, and Longwood Drive/Reedsport West Road. Two alignment alternatives will be carried forward for further analysis in Chapter 4. Option D-1 will be referred to as Alternative D-On-Highway, while the combination of the remaining trail options will be referred to as Alternative D-Off-Highway.

Segment E – Reedsport West Road to Winchester Bay

Option E-1 which runs along the southeast side of US 101, was identified as the only viable alignment concept for this segment. Accordingly, Option E-1 is the only option recommended to be carried forward in the DDTP for Segment E.

Segment F – Salmon Harbor Drive from US 101 to Discovery Point Lane

Option F-1 and Option F-2 both run alongside Salmon Harbor Drive between US 101 and Discovery Point Lane, with Option F-1 on the south side of the street and Option F-2 on the north side. Both options are recommended to be carried forward for more in-depth analysis in Chapter 4.

Segment G – Discovery Point Lane to Beach Parking

Option G-1 which runs along Salmon Harbor Drive, was identified as the only viable alignment concept for this segment from Discovery Point Lane to the end of the DDT at the beach parking south of Half Moon Bay campground. Accordingly, Option G-1 is the only option recommended to be carried forward in the DDTP for Segment G. This trail option could be located on either side of the street subject to further design investigation.

3.3.2 Overview of Trail Alignment Alternatives for Further Analysis

The fatal flaw analysis identified preferred trail alignments for Segments B, C, E, and G, but recommended that further evaluation be conducted for Segments A, D, and F as follows:

- Alternative A-1 (at east and west ends of Segment A on OR 38)
- Alternative A-2 (at east end of Segment A on OR 38)
- Alternative A-3 (at east end of Segment A on OR 38)
- Alternative A-5 (at west end of Segment A adjacent to OR 38)
- Alternative D-On Highway (trail option D-1)
- Alternative D-Off Highway (combination of trail options D-2, D-3 and D-4)
- Alternative F-1
- Alternative F-2

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4. EVALUATION OF TRAIL ALIGNMENT ALTERNATIVES

Each of the trail alignment alternatives that were identified through the fatal flaw screening process described in Chapter 3 will be further evaluated in this chapter using criteria initially identified and discussed in Technical Memorandum #1. The criteria included in that document were designed to inform a thoughtful evaluation process with flexibility to address the diversity of conditions that exist in the study area.

Chapter 4 presents a discussion of key evaluation criteria that were determined to be the most useful in differentiating among the remaining alignment alternatives in each segment. These evaluation criteria are outlined and described in Section 4.1, while Section 4.2 describes the evaluation process that was used to determine how well the trail alternatives meet each of the criteria. Section 4.3 then describes the results of the evaluation process.

4.1 COMPARATIVE EVALUATION CRITERIA

The following list identifies evaluation criteria that were used to assess the broad performance and potential impacts associated with various trail alignment alternatives leading to the selection of a preferred trail alignment. These criteria are not listed in any particular priority order, but are built on the project's objectives and represent the range of issues that must be addressed in the study area corridor.

The description of each evaluation criterion includes a general clarifying statement, followed by a list of characteristics that would: 1) positively impact the strength of a trail alternative in comparison to other alignment alternatives, and 2) be the most useful in differentiating among trail alternatives.

User Experience

User experience describes the relative quality of a trail alternative from the perspective of the trail user. The trail should be designed for multiple user types, including walkers, joggers, rollerbladers, and bicyclists, as well as accommodate varying levels of abilities and comfort levels. Trail characteristics that contribute to a high quality user experience include:

- Avoids noise and safety impacts related to higher speed/higher volume roadways and/or adjacent land uses
- Optimizes recreational/scenic value of the corridor
- Connects to locations with unique attributes
- Avoids prolonged stretches of steep increase in grade

Safety and Security

Safety is an important consideration in the location and design of a trail project. The trail should avoid known safety issues or natural hazards. Factors that can positively impact trail user safety and security include:

- Improves safety or corrects a known hazard for all non-motorized users including significant grade changes/drop-offs
- Maximizes separation from the roadway

- Avoids at-grade major road crossings or mid-block crossings (or accommodates at existing controlled crossings)
- Avoids driveway conflicts

Connectivity

The trail should provide continuous routes linking trail users to key destinations, including places of employment, residential areas, recreational areas, and centers of activity. It should maximize commuter and recreational value by linking neighborhoods and communities to regional destinations and transportation opportunities. Factors that improve trail connectivity include:

- Connects to community attractors and amenities
- Connects to other active transportation facilities including the planned Levee Loop Trail

Directness of Travel

Related to trail connectivity, directness of travel means the trail should provide as direct a route as possible, linking to key destinations as efficiently as possible. The shortest distance between two points typically rates strongest. Factors that improve the directness of a trail alternative include:

- Avoids out-of-direction or circuitous travel, and/or improves directness over existing conditions
- Provides optimal commuter efficiency

Environmental and Cultural Resource Impacts

Trail routes can have positive and/or adverse impacts on existing natural habitats, other environmental features, and cultural resources. Factors that improve an alternative's strength in this arena include:

- Avoids or minimizes impact to critical natural areas and/or offers opportunities for restoration
- Avoids or protects cultural and historic resources
- Works with the natural terrain to the extent possible and minimizes the need to impact/adjust slopes
- Creates opportunities for interpretive signage and education

Plans and Regulations

The preferred trail alternative should be consistent with applicable local trail/parks plans, comprehensive plans, transportation plans, and land uses. Factors include:

- Maintains consistency with goals and policies of adopted local and regional plans
- Leverages planned Levee Loop Trail and planned ODOT improvements along trail corridor
- Complies with AASHTO, MUTCD, and ODOT standards

Property Ownership Impacts

When possible, the trail should be placed on land already publicly owned or within existing easements or rights of way. Factors that contribute to a strong trail alternative in this capacity include:

- Minimizes impacts to private property
- If property must be acquired, minimizes number of individual private property or easement acquisitions required, or size of land area that must be acquired
- If not already owned or under an easement, affords the potential to obtain property ownership and access

Cost and Funding Availability

These criteria are associated with the relative cost of building and maintaining a given trail alternative as compared to other possible routes; more cost-efficient alternatives rate more strongly. Funding availability should also be taken into consideration. Cost/funding factors that improve the strength of a trail alternative include:

- Minimizes capital costs of trail development relative to other alternatives
- Capitalizes on existing funding opportunities, such as grants or partnership opportunities
- Minimizes long-term maintenance costs through durability of materials and low-impact design principles
- Minimizes the need for mitigation efforts, such as replacing or restoring wetlands degraded as an outcome of trail construction
- Minimizes the need for property acquisition

4.2 EVALUATION PROCESS

The evaluation process used to assess DDT alignment alternatives is qualitative, rather than quantitative. Each alternative has been evaluated against the criteria identified above and compared to each other. In this way, the evaluation process can serve as a springboard for discussion about the merits and flaws of each alternative, and allow individual reviewers, decision-makers, and the general public to exercise judgment regarding the particular criteria that are most important in making a final trail alignment recommendation.

The tables that follow summarize the assessment of each alignment alternative in relation to the evaluation criteria. The evaluation matrices are organized as follows:

- Table 4-1: East End of Segment A
- Table 4-2: West End of Segment A
- Table 4-3: Segment D
- Table 4-4: Segment F

The tables include a qualitative conclusion about each alternative expressed symbolically from best to poorest. The tables also include a short summary of the key rationale for the qualitative conclusion.

Table 4-1. Evaluation of Trail Alignment Alternatives in the East End of Segment A

Evaluation Criteria	Alternative A-1 North Side Adjacent to OR 38 near Dean Creek	Alternative A-2 South Side Adjacent to OR 38 near Dean Creek	Alternative A-3 South Side Adjacent to OR 38 thru Dean Creek Lot
User Experience			
	Optimizes scenic values of corridor along river.	Further from scenic river views, connects directly to elk viewing.	Further from scenic river views, connects directly to elk viewing.
Safety & Security			
	Can provide protection from roadway, but requires at-grade highway crossing to reach the elk viewing area.	Can provide protection from roadway, but requires an at-grade highway crossing west of elk viewing area.	Greater separation from highway but requires an at-grade highway crossing west of elk viewing area.
Connectivity			
	Provides a continuous link.	Provides a continuous link.	Provides a continuous link.
Directness of Travel			
	Part of a direct route through Segment A.	Part of a direct route through Segment A.	Part of a direct route. Relies on travel through parking lot.
Environmental & Cultural Impacts			
	Appears to avoid most adverse impacts.	Appears to avoid most adverse impacts.	Appears to avoid most adverse impact, but may affect wetlands approaching west end of parking lot.
Consistency with Plans & Regulations			
	Consistent with County and state goals to improve multimodal connectivity and safety.	Consistent with County and ODOT goals.	Consistent with County and ODOT goals. Uses parking lot at elk viewing area.
Property Ownership Impacts			
	Within highway ROW	Within highway ROW	Within highway and/or BLM ROW
Costs & Funding Availability			
	Part of a lengthy highway improvement that may be costly. Must look for rural, recreational funding.	No substantive difference from A-1.	Minor difference from A-1 and A-2 since this option could use existing parking lot pavement.



Table 4-2. Evaluation of Trail Alignment Alternatives in the West End of Segment A

Evaluation Criteria	Alternative A-1 North Side Adjacent of OR 38	Alternative A-5 North Side Set Back from OR 38 on Levee
User Experience		
	Optimizes scenic values of corridor along river.	Optimizes scenic values of corridor along river with added viewpoint on levee.
Safety & Security		
	Can provide protection from roadway, but requires at-grade highway crossing to connect with LLT and/or ODOT improvements along OR 38 west of 3 rd Street.	Provides complete separation from highway but requires at-grade highway crossing to connect with LLT and/or ODOT improvements along OR 38 west of 3 rd Street.
Connectivity		
	Part of a continuous link, can connect with LLT.	Part of continuous link, can connect with LLT. Requires users to travel up and down twice to use the levee including both ends and the existing gate in the middle.
Directness of Travel		
	Direct route through Segment A.	Slightly less direct route through Segment A due to need to get on and off the levee twice.
Environmental & Cultural Impacts		
	Appears to avoid most adverse impacts.	Appears to avoid most adverse impacts.
Consistency with Plans & Regulations		
	Consistent with City, County and ODOT goals to improve multimodal connectivity and safety. Leverages LLT and ODOT improvements.	Consistent with City, County and ODOT goals to improve multimodal connectivity and safety. Leverages LLT and ODOT improvements.
Property Ownership Impacts		
	Within highway ROW	Requires easement from USACE
Costs & Funding Availability		
	Part of a lengthy highway improvement that may be costly. Must look for rural, recreational funding.	Minor added expense in comparison to A-1 since this option would require ramps to/from levees.

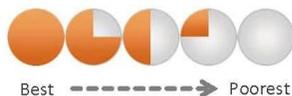


Table 4-3. Evaluation of Trail Alignment Alternatives in Segment D

Evaluation Criteria	Alternative D – On Highway (South side of US 101)	Alternative D – Off Highway (Combines Options D-2/Frontage Road, D-3/Longwood Drive, and D-4/Ranch Road)
User Experience		
	Some steep grades. Users are close to high speed and high volume traffic.	Some steep grades at south end. Users are close to lower speeds and volumes.
Safety & Security		
	Relocation of roadway centerline could provide greater separation of trail from traffic on the south side. Separated bridge could be provided over Ranch Road.	Generally separated from high speed/high volume traffic but there is a ROW “pinch point” on Reedsport West Road at the south end.
Connectivity		
	Very restricted connectivity since is largely on an elevated structure or fill.	Substantial service to destinations in the south end of Reedsport on both sides of US 101.
Directness of Travel		
	Direct service.	More circuitous service and longer distance between Segments C and E.
Environmental & Cultural Impacts		
	No substantive impacts expected. No interpretive opportunities.	No substantive impacts expected. Limited interpretive opportunities.
Consistency with Plans & Regulations		
	Consistent with City, County and ODOT goals to improve multimodal connectivity and safety. Leverages ODOT Road Diet improvements.	Consistent with City, County and ODOT goals to improve multimodal connectivity and safety. Leverages ODOT Road Diet improvements.
Property Ownership Impacts		
	None expected.	Possible ROW impact along Reedsport West Road if space for separated trail is provided.
Costs & Funding Availability		
	Centerline relocation would represent a minor cost but the added bridge would be more expensive. May have both urban and rural recreational and utilitarian funding opportunities.	The cost of improvement needs to most of this segment would be minor, except for adding a trail along Reedsport West Road which could be relatively expensive. May have both urban and rural recreational and utilitarian funding opportunities.

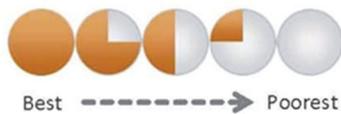
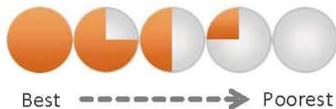


Table 4-4. Evaluation of Trail Alignment Alternatives in Segment F

Evaluation Criteria	Alternative F-1 South Side of Salmon Harbor Drive	Alternative F-2 North Side of Salmon Harbor Drive
User Experience		
	Good quality experience.	Potential conflicts with ATVs.
Safety & Security		
	Must include a new bridge over Winchester Creek to keep users completely separate from the road.	Potential ATV conflict, particularly with pedestrians. 8-foot pedestrian bridge over Winchester Creek may result in ped/bike conflicts.
Connectivity		
	Generally good connections to a variety of destinations in the corridor segment.	Connects to more destinations without a street crossing. Also provides access to potential bike camping area and marina trail.
Directness of Travel		
	Direct access is provided through the corridor segment.	Direct access is provided through the corridor segment.
Environmental & Cultural Impacts		
	No substantive impacts expected.	No substantive impacts expected.
Consistency with Plans & Regulations		
	Generally consistent with County plans and regulations. Requires a street crossing to reach most activities in the Winchester Bay area.	Consistent with County plans for economic development and tourism to the Winchester Bay area including bike camping.
Property Ownership Impacts		
	None are anticipated.	None are anticipated.
Costs & Funding Availability		
	Adds a new bridge which would increase costs in comparison to Alternative F-2.	Likely lower cost than Alternative F-1.



4.3 EVALUATION SUMMARY

The evaluation illustrates that there are slight advantages and disadvantages to the various trail alignment alternatives which merit further discussion. If we were to use a purely quantitative method and assume all of the evaluation factors carry equal weight, assigning between 1 and 5 points for each of the eight evaluation factors for a total of 40 points, the alignment alternatives score as follows:

Table 4-5. Comparison of Results from Trail Alignment Alternatives Evaluation

Segment A (East)	A-1	A-2	A-3
	35	34	33
Segment A (West)	A-1	A-5	
	35	31	
Segment D	On-Highway	Off-Highway	
	31	30	
Segment F	F-1	F-2	
	36	38	

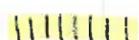
However, the qualitative analysis was not intended to provide a definitive conclusion or recommendation for a Dean to Dunes Trail Concept. Rather, it was intended to guide further discussions with the project's Planning Advisory Committee and the Reedsport City Council, and to inform the public engagement effort. These discussions will provide guidance to the project team in determining which evaluation criteria might carry more weight (or be more important) than others. Through consideration of the relative importance of each criterion, trade-offs leading to a trail recommendation can be identified. A discussion of trade-offs would be particularly helpful in highly constrained segments where a given trail alternative may rate well for most categories but very poorly or even be significantly flawed for one or two others yet still end up as the preferred choice. For example, when evaluating directness of travel, it's possible that a detour or slightly longer route may be preferable if it provides more functionality with respect to connectivity, environmental features, safety and security, and other factors that may outweigh the benefits of the shortest travel distance.

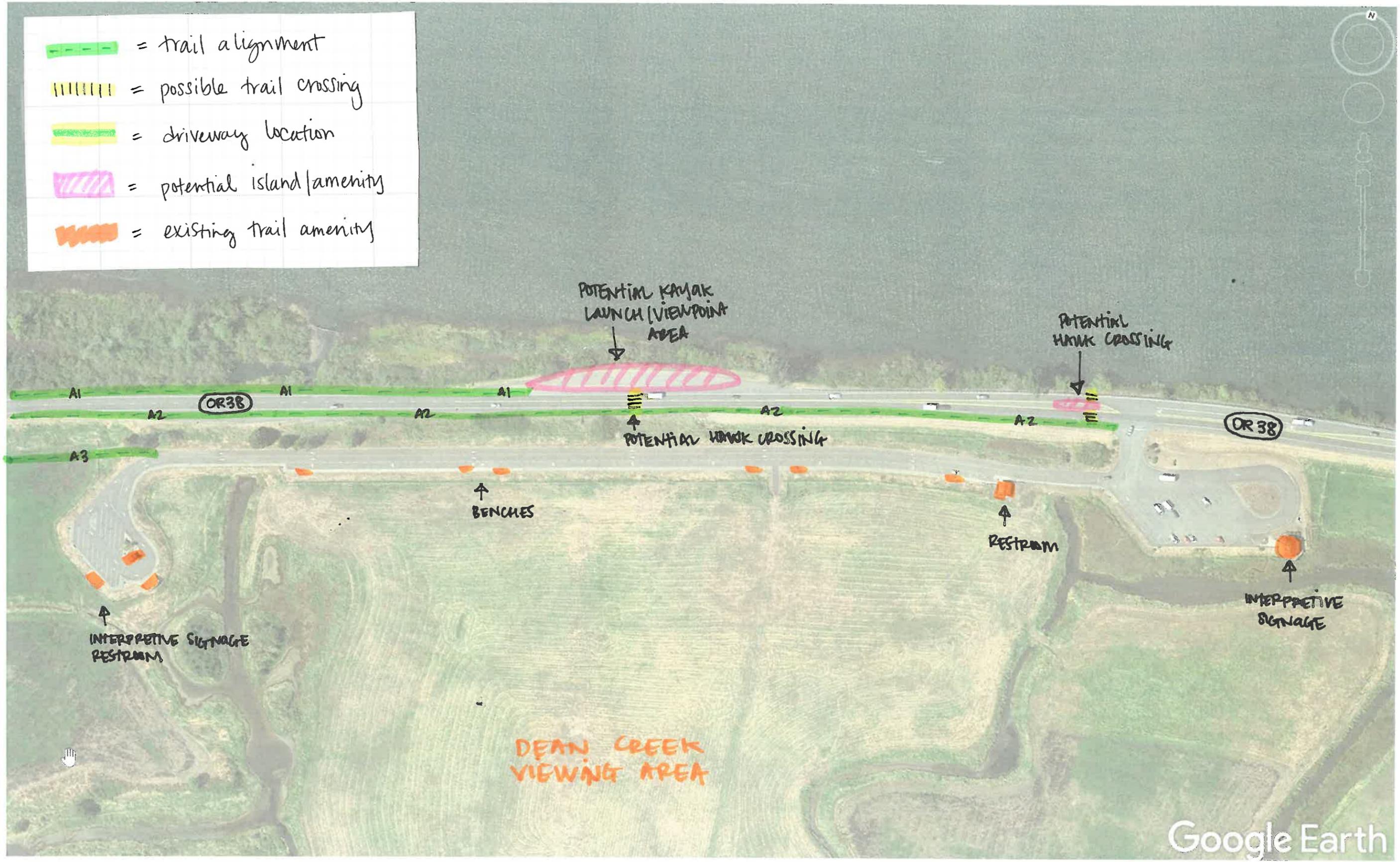
The next step in the DDTP process will be to hold stakeholder and public meetings to discuss the trail concepts identified and evaluated in this technical memorandum. The results of that discussion will be presented in Technical Memorandum #4 to be prepared in late 2017.

APPENDIX A
HIGHWAY CROSSING IDEAS

Dean Creek Elk Viewing Area

(OR 38)

-  = trail alignment
-  = possible trail crossing
-  = driveway location
-  = potential island/amenity
-  = existing trail amenity

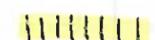


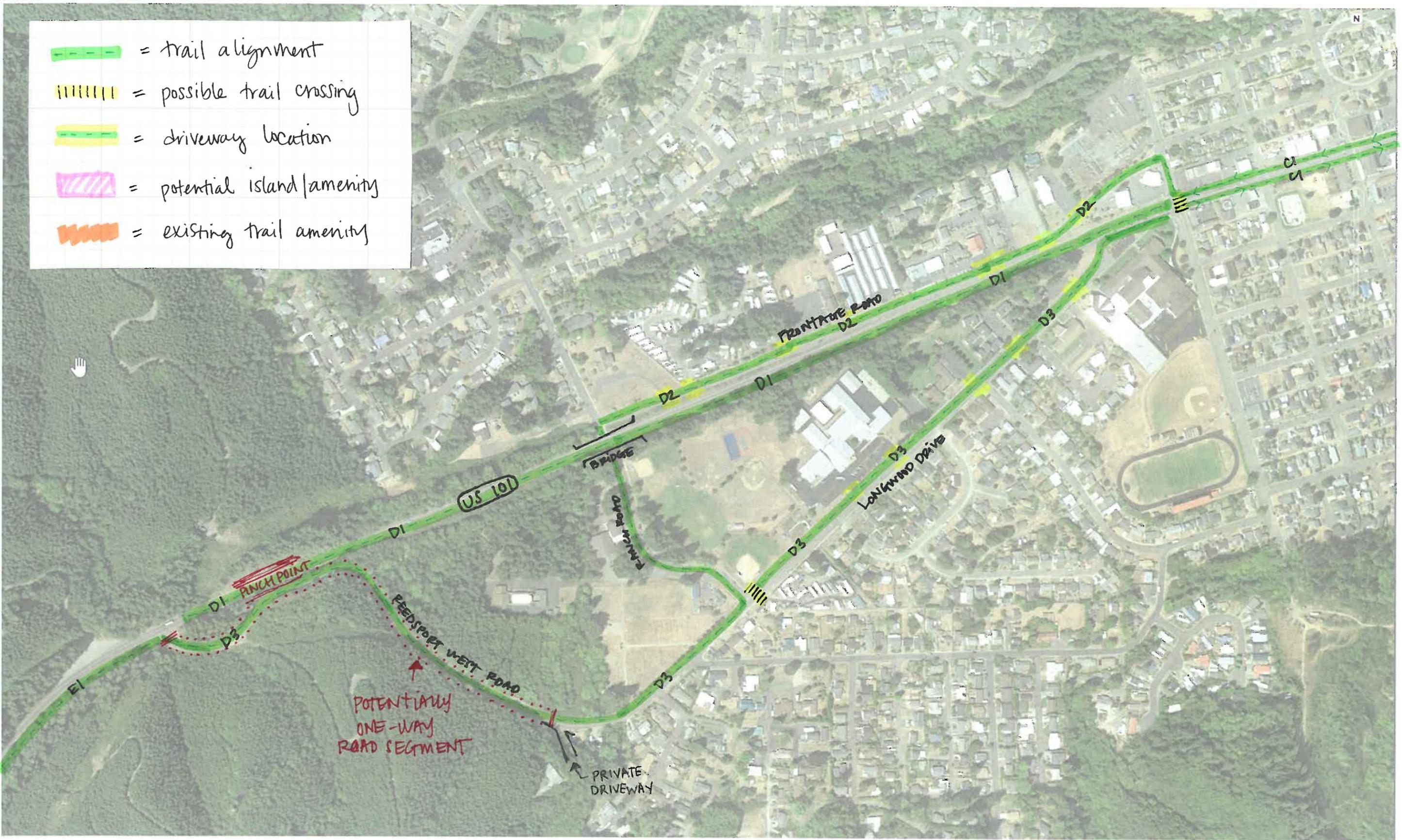
East Reedsport
(OR 38 and Winchester Ave)



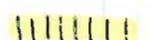
-  = trail alignment
-  = possible trail crossing
-  = driveway location
-  = potential island/amenity
-  = existing trail amenity

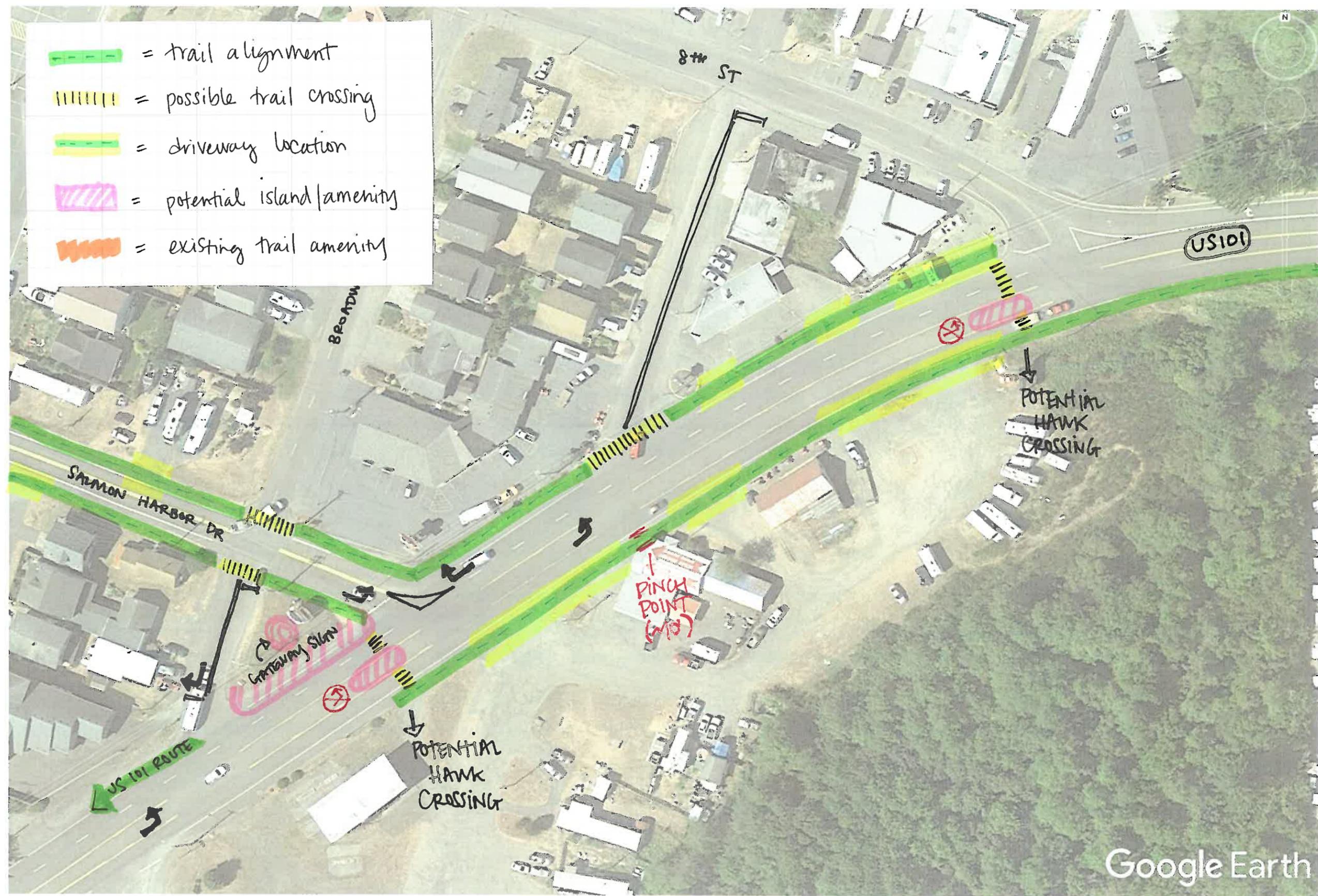
West Reedsport (US 101, Longwood Drive, and Frontage Road)

-  = trail alignment
-  = possible trail crossing
-  = driveway location
-  = potential island/amenity
-  = existing trail amenity



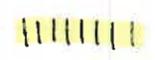
East Winchester Bay
(US 101 and Salmon Harbor Drive)

-  = trail alignment
-  = possible trail crossing
-  = driveway location
-  = potential island/amenity
-  = existing trail amenity



Discovery Point (Salmon Harbor Drive)



-  = trail alignment
-  = possible trail crossing
-  = driveway location
-  = potential island/amenity
-  = existing trail amenity

ZIOLKOWSKI BEACH PARK ACCESS ROAD

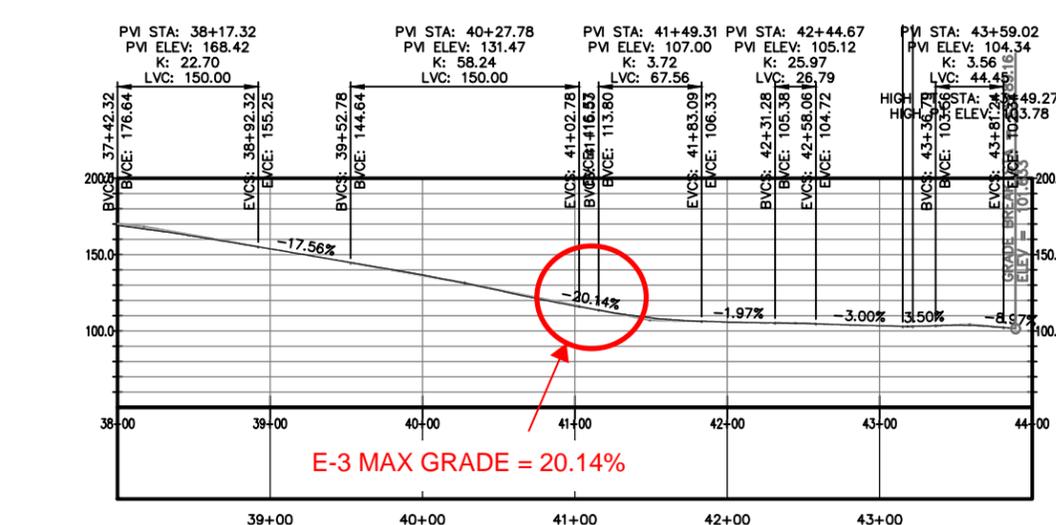
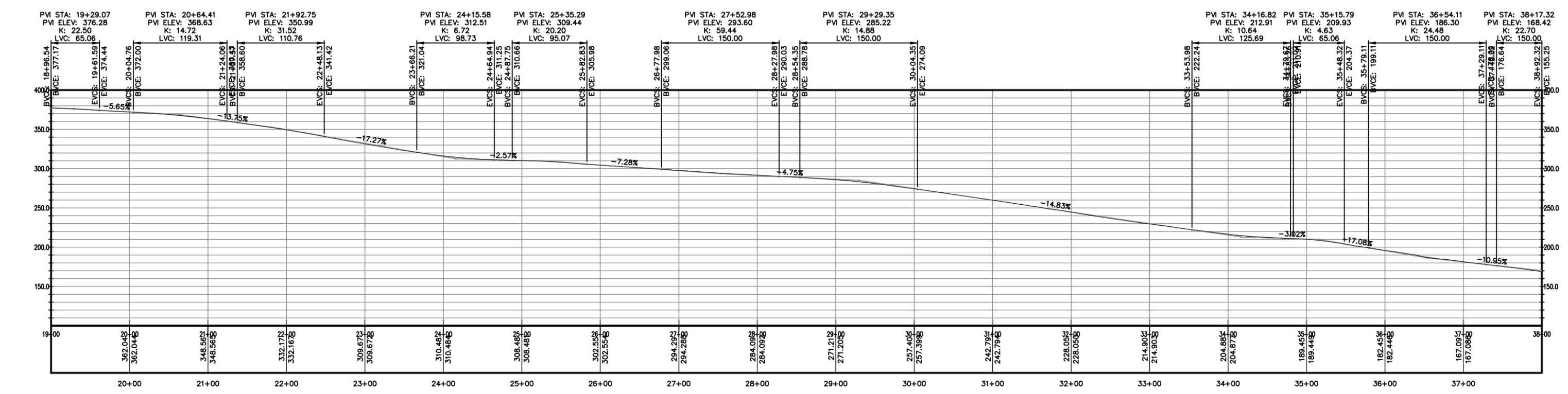
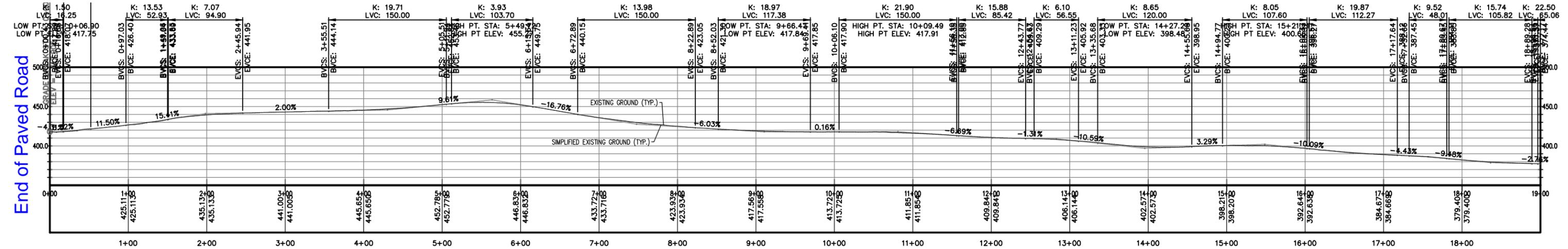
SALMON HARBOR DR
ATV AREA ACCESS

DISCOVERY POINT LANE

Google Earth

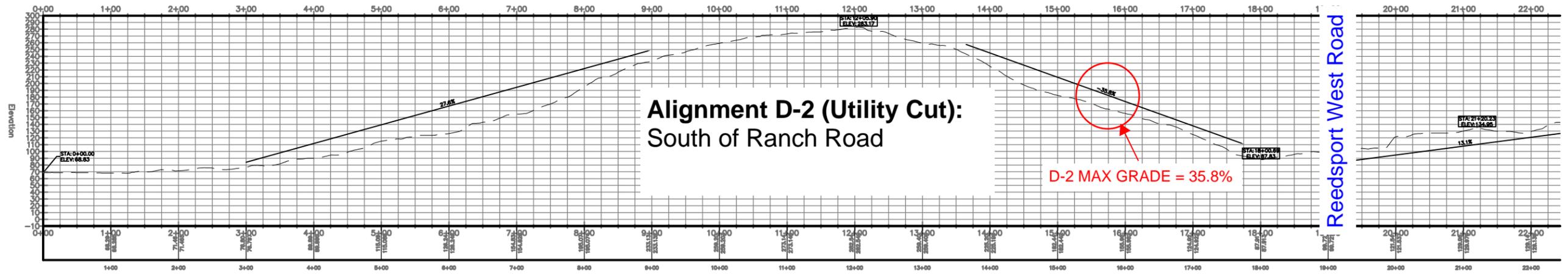
APPENDIX B
EVALUATION OF GRADES

End of Paved Road



Alignment E-3 (Private Logging Road):
US 101 to end of paved road

Ranch Road



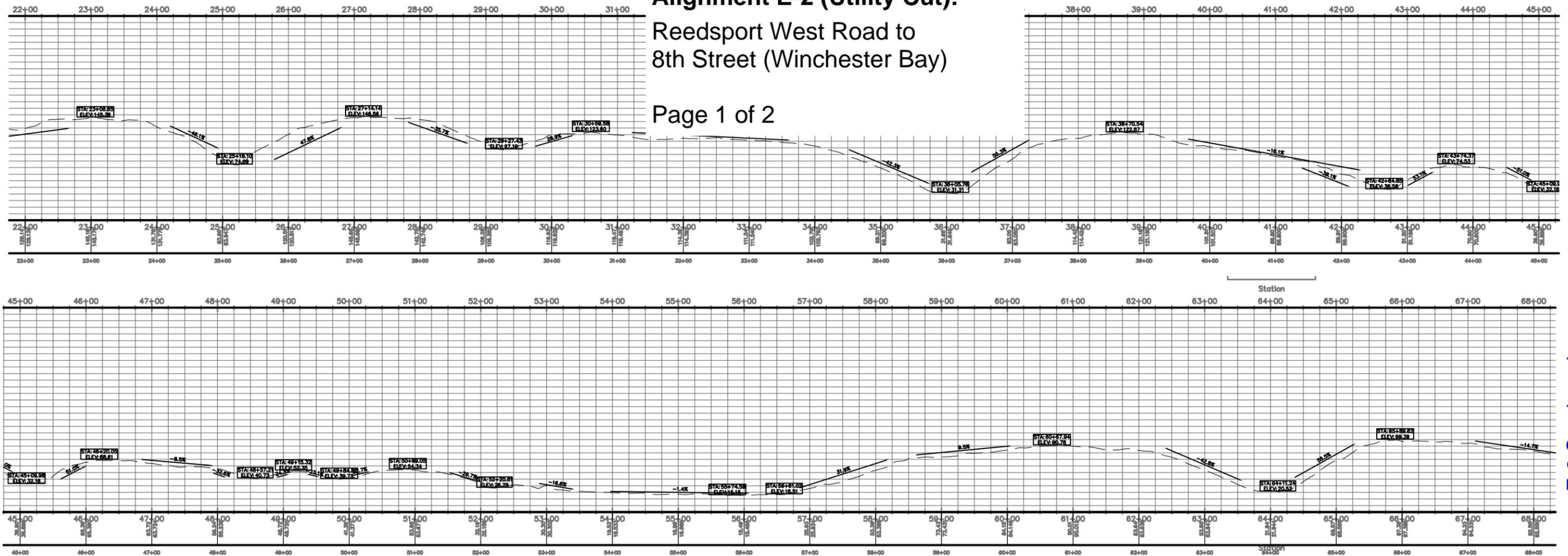
**Alignment D-2 (Utility Cut):
South of Ranch Road**

D-2 MAX GRADE = 35.8%

Reedsport West Road

**Alignment E-2 (Utility Cut):
Reedsport West Road to
8th Street (Winchester Bay)**

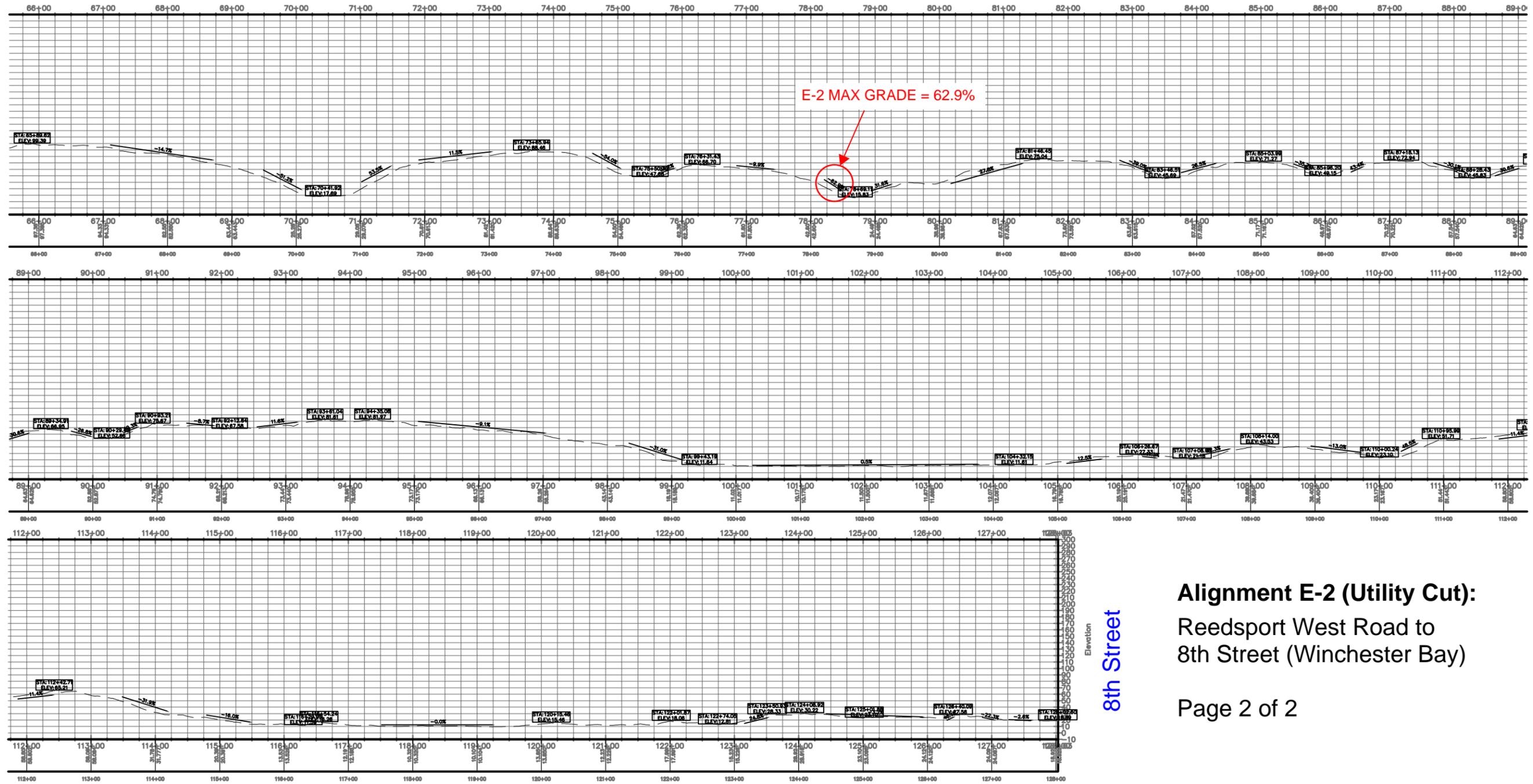
Page 1 of 2



E-2 Continued



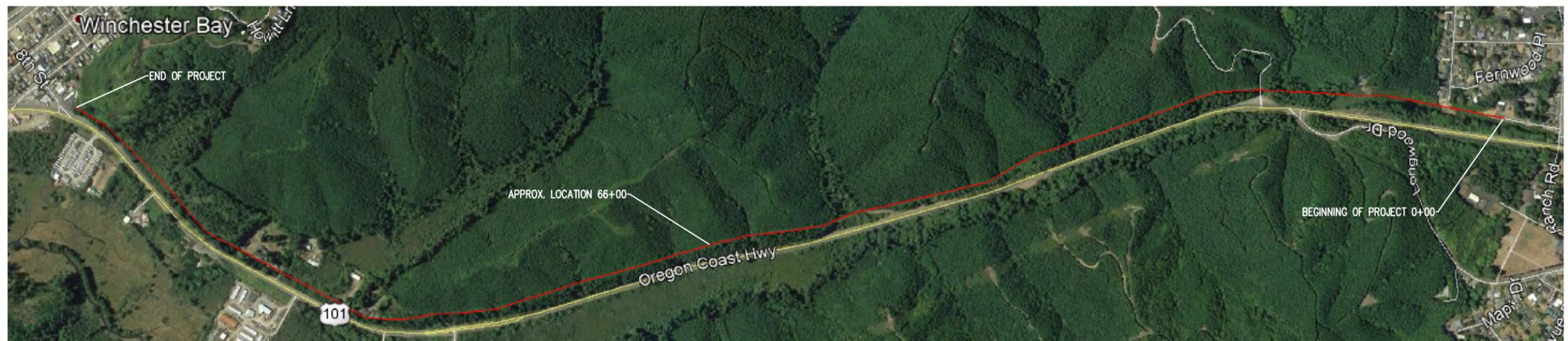
E-2 Continued



8th Street

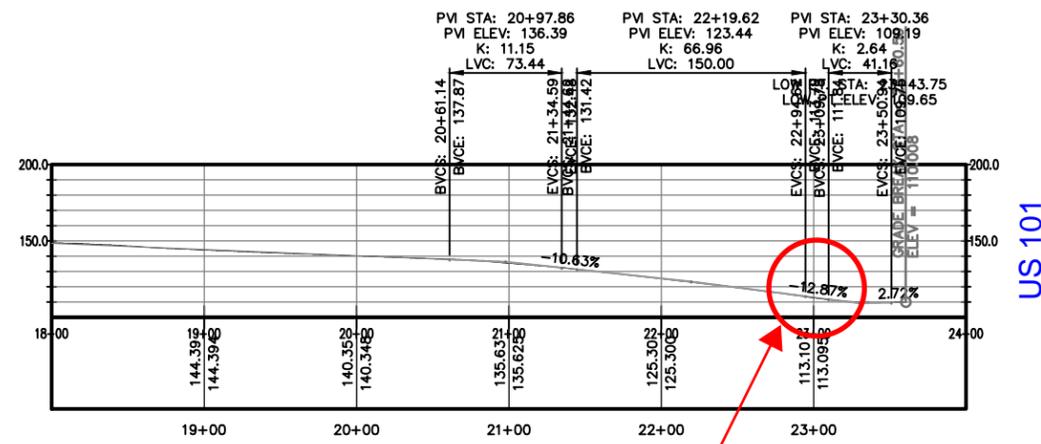
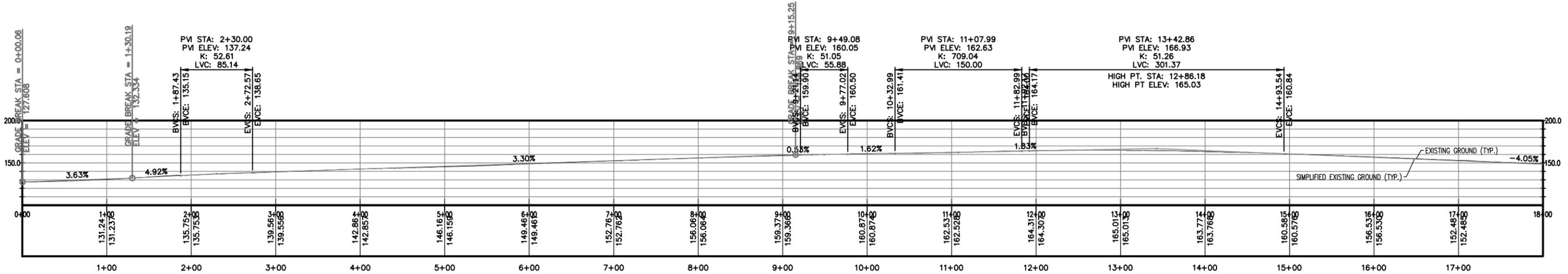
Alignment E-2 (Utility Cut):
Reedsport West Road to
8th Street (Winchester Bay)

Page 2 of 2



Alignment D-3 (Reedsport West Road): Longwood Drive to US 101

Longwood Drive



D-3 MAX GRADE = 12.87%

US 101



LONGWOOD DR

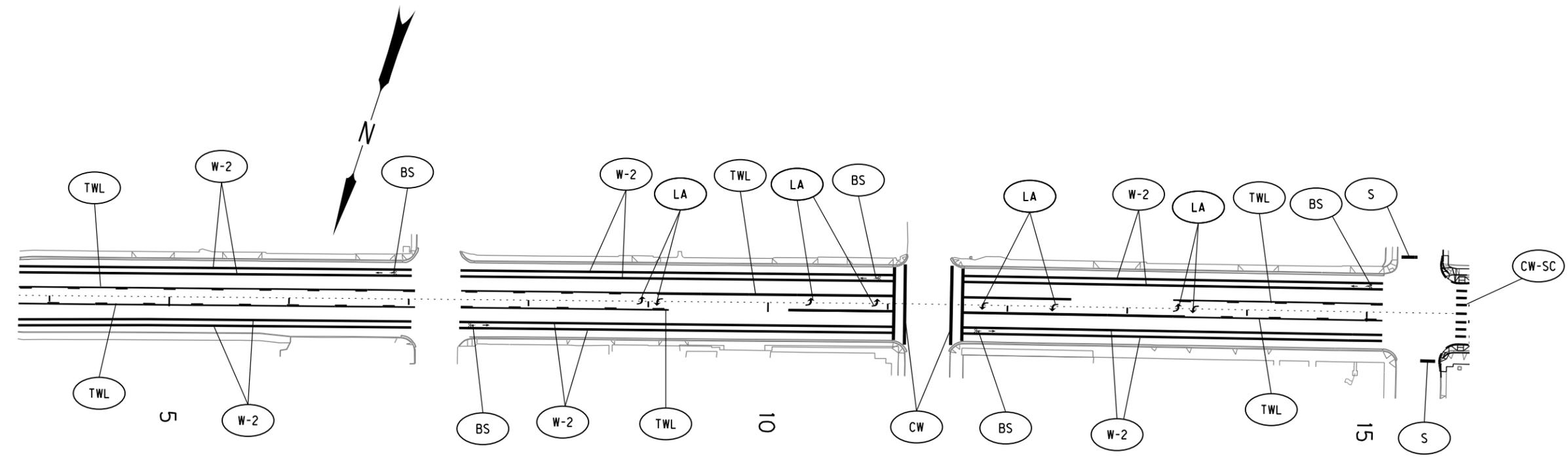
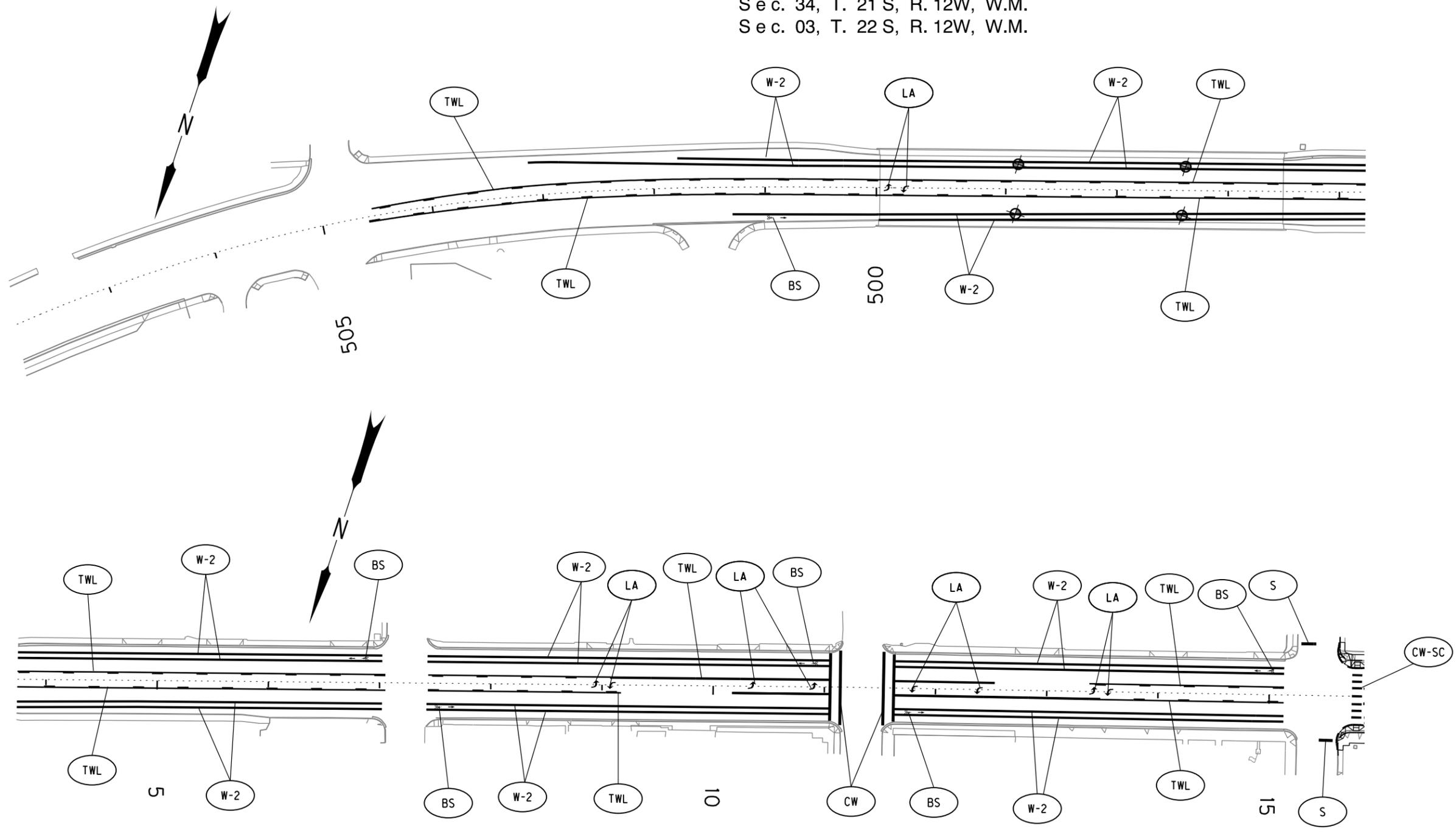
APPENDIX C
ODOT US 101 PRELIMINARY ROAD DIET IMPROVEMENT PLANS

Sec. 34, T. 21 S, R. 12W, W.M.
 Sec. 03, T. 22 S, R. 12W, W.M.

ADVANCE COPY
 SUBJECT TO CHANGE

L E G E N D

- (W-2) Inst. 8" white line
- (CW-SC) Inst. staggered continental crosswalk
- (CW) Inst. standard crosswalk
- (TWL) Inst. two-way left turn
- (S) Inst. 12" white stop bar
- (LA) Inst. left turn arrow (white)
- (BS) Inst. bike marking (white)

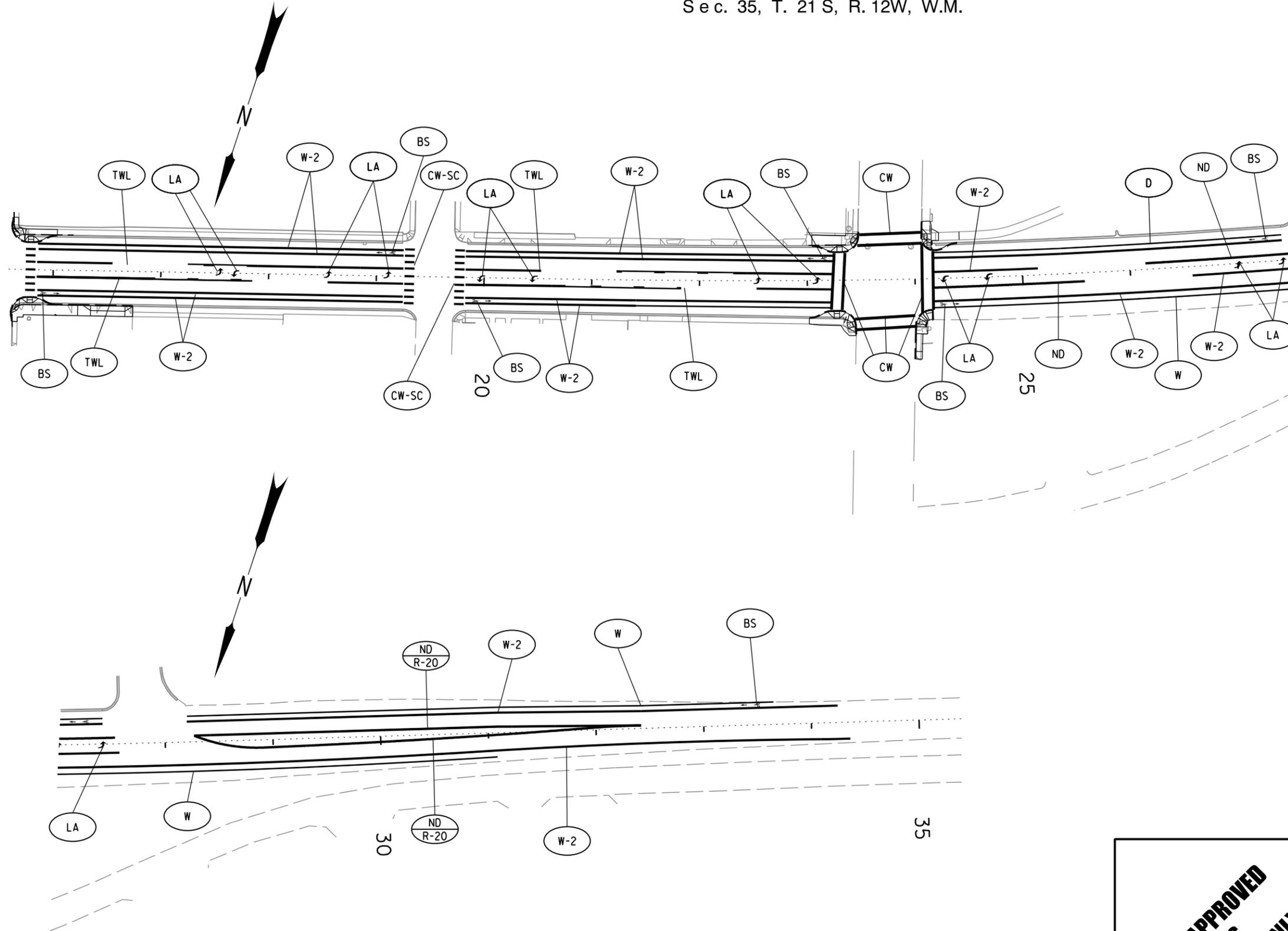


**DESIGN APPROVED
 PLANS
 FOR REVIEW ONLY**

OREGON DEPARTMENT OF TRANSPORTATION		
OR38: US101 DEAN CREEK PAVING & PED IMPROVEMENTS PROJ. UMPQUA & OREGON COAST HIGHWAYS DOUGLAS COUNTY		
Designer: Richard Coffel	Reviewer: Chris Zelmer	
Drafter: Heather Neavoll	Checker: N/A	
STRIPING PLAN		SHEET NO. QA04

L E G E N D

-  Inst. 8" white line
-  Inst. standard crosswalk
-  Inst. two-way left turn
-  Inst. right turn arrow (white)
-  Inst. left turn arrow (white)
-  Inst. "ONLY" (white)
-  Inst. 4" white dotted line
-  Inst. narrow double no-pass
-  Inst. double no-pass
-  Inst. 4" white line
-  Inst. staggered continental crosswalk
-  Inst. narrow double yellow positioning guide



NOTE: From L32+00 to EOP, Replace striping in kind.

DESIGN APPROVED PLANS FOR REVIEW ONLY	OREGON DEPARTMENT OF TRANSPORTATION 	
	OR38: US101 DEAN CREEK PAVING & PED IMPROVEMENTS PROJ. UMPQUA & OREGON COAST HIGHWAYS DOUGLAS COUNTY	
	Designer: Richard Coffel Drafter: Heather Neavoll	Reviewer: Chris Zelmer Checker: N/A
	STRIPING PLAN	
		SHEET NO. QA05