Technical Memorandum #4: Preferred Trail Option

Dean to Dunes Trail Plan
City of Reedsport/ODOT



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SCJ ALLIANCE
CONSULTING SERVICES

Draft Technical Memorandum #4: Preferred Trail Option

Project Information

Project:	**Dean to Dunes Trail Plan**
Prepared for:	**City of Reedsport** 451 Winchester Avenue Reedsport, OR 97467

Reviewing Agency

Jurisdiction:	City of Reedsport Oregon Department of Transportation

Project Representative

Prepared by:	**SCJ Alliance** 315 West Mill Plain Blvd, Suite 208 Vancouver, WA 98660 503.341.6248 scjalliance.com
Contact:	Eric Johnston, PE, Principal (360) 352-1465

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SIGNATURE

The technical material and data contained in this document were prepared under the supervision and direction of the undersigned, whose seal, as a professional engineer licensed to practice as such, is affixed below.

Prepared by: Anne Sylvester, PTE, Elisabeth Wooton, Laura Barker

Approved by: Eric Johnston, PE

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1. INTRODUCTION

1.1 PROJECT OVERVIEW

The Dean to Dunes Trail Plan (DDTP) is intended to provide guidance for developing a recreational trail that will connect the City of Reedsport (City) to surrounding natural resources and activity centers, including linking several federal land holdings. These land holdings include:

- Suislaw National Forest, the Oregon Dunes National Recreation Area, and beach parking on US Army Corps of Engineers (USACE) property south of Douglas County's Halfmoon Bay Campground located off US 101 near Winchester Bay on the Pacific Coast, and
- The Dean Creek Elk Viewing Area which is owned and operated by the Bureau of Land Management and is located to the east of Reedsport on Oregon Highway 38.

The DDTP builds on other trail-related planning efforts within the City, including the *Waterfront and Downtown Plan*, the *Levee Loop Trail Plan (LLTP)*, and the *Pedestrian Safety Study*.

Once constructed, the Dean to Dunes Trail (DDT) will provide a safe, convenient, and continuous non-automobile 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 and the Oregon Coast Trail which traverse 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 #4 is to identify a preferred trail alignment alternative, incorporate appropriate amenities and features, develop cost estimates, and highlight potential funding sources. This report builds on the information provided in the documents referenced above and in three prior technical reports prepared for the DDTP – Technical Memoranda #1, #2 and #3.

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 inventoried and summarized existing conditions of the DDT study area that are relevant to the development of the DDTP. The report documented and described:

- 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 also evaluated potential opportunities and constraints associated with these factors that could influence trail siting and development.

Technical Memorandum #3 identified and evaluated a range of trail development options along the approximate ten-mile highway corridor. The primary emphasis in developing and assessing trail options was on the west end of the study area along US 101 between the federal land holdings on the Oregon Coast and Reedsport, and on the east end of the study area between Reedsport and Dean Creek. Several alignment alternatives were evaluated to serve a variety of purposes ranging from local recreational and utilitarian trips to long-distance travel by bicyclists and hikers. The information in this technical memorandum formed the basis for agency stakeholder and public engagement efforts that included a Planning Advisory Committee meeting, a City Council briefing and a public open house.

1.3 Report Organization and Context

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

Chapter 2 presents a summary of trail types proposed to be implemented within the DDT corridor, along with a menu of potential trail amenities. Amenities include but are not limited to illumination and fencing; wayfinding, informational and/or hazard signing; benches or other furniture; viewpoints or rest areas; and community.

Chapter 3 describes the preferred DDT trail alignment, trail types and key features and amenities, along with a broader discussion of transportation system impacts related to the improvements and potential environmental issues.

Chapter 4 discusses trail development cost estimates with an emphasis on the West Segment between the Oregon Dunes and Reedsport for which a potential funding opportunity has been identified. This chapter also includes a broader discussion of trail funding opportunities.

The information contained in Technical Memorandum #4 will next be taken to the project's Planning Advisory Committee, the Reedsport City Council and a public Open House.

2. TRAIL TYPES AND AMENITIES

Technical Memorandum #3 presents a detailed discussion of the types of trails that could be implemented in the DDT corridor including physical descriptions of trail design options and trail features and amenities. That discussion is briefly summarized below for reference to provide a better understanding of the types of trail concepts and potential amenities that are proposed for various portions of the DDT.

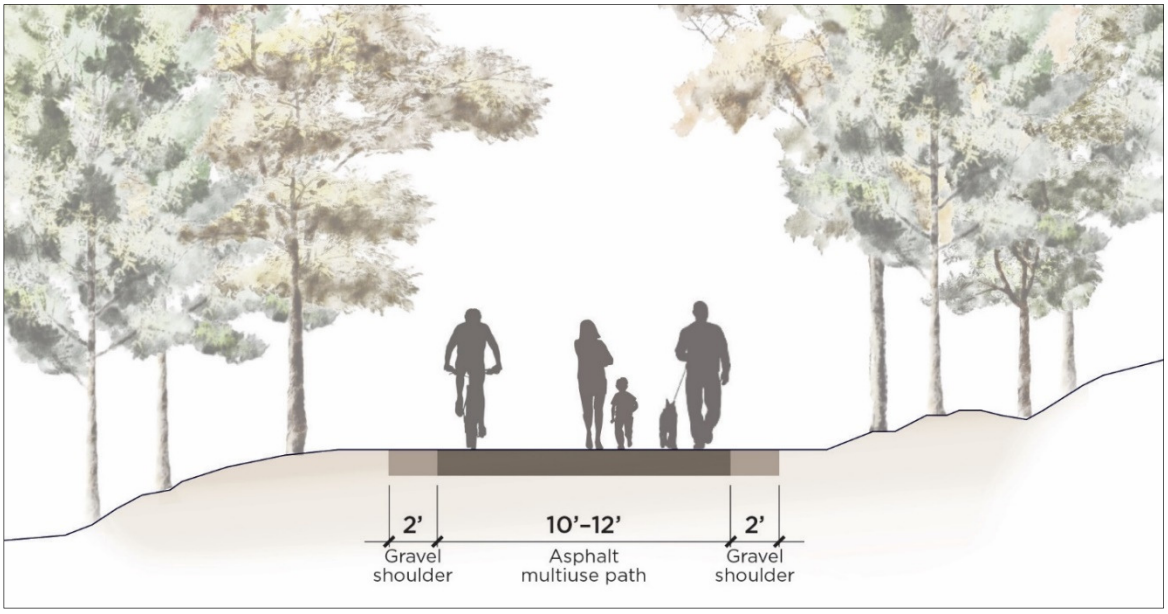
2.1 TRAIL TYPES

2.1.1 Preferred Trail Type

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 earlier technical memoranda, the ***preferred DDTP trail type*** is a multiuse path 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). This path type is shown in **Figure 2-1** and could follow the highway alignment within ODOT right-of-way or use another right-of-way such as a city street but would be physically separated by distance or barrier, providing a completely off-highway experience. To the maximum extent possible, the preferred multiuse path would be:

- 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 Multiuse Trail Type



For trail segments where the preferred trail type is not feasible, other trail solutions may be used. For the DDT these include:

- Street-adjacent multiuse path with at least five feet of separation from the roadway. Separation would be greater or have a higher degree of crash protection near a higher speed road.
- Cantilevered or pile-supported path with separation from the roadway where physical space along the highway is constrained.
- Local access trail for short connections to key destinations or other active transportation facilities.
- On-Street solutions.

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

2.1.2 Street Adjacent Multiuse Path

A street adjacent multiuse path 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. A landscaped buffer would be appropriate along a trail adjacent to low-speed roadways, or where constraints (such as prior development or narrow right of way) prevent complete separation from the highway. A street adjacent path next to a higher speed road would have greater separation and/or a crash attenuating barrier such as a guard rail or concrete separator. **Figure 2-2** illustrates a street adjacent trail next to a lower speed street, while **Figure 2-3** shows a trail next to a higher speed street or highway.

Figure 2-2. Street Adjacent Trail on a Lower Speed Road

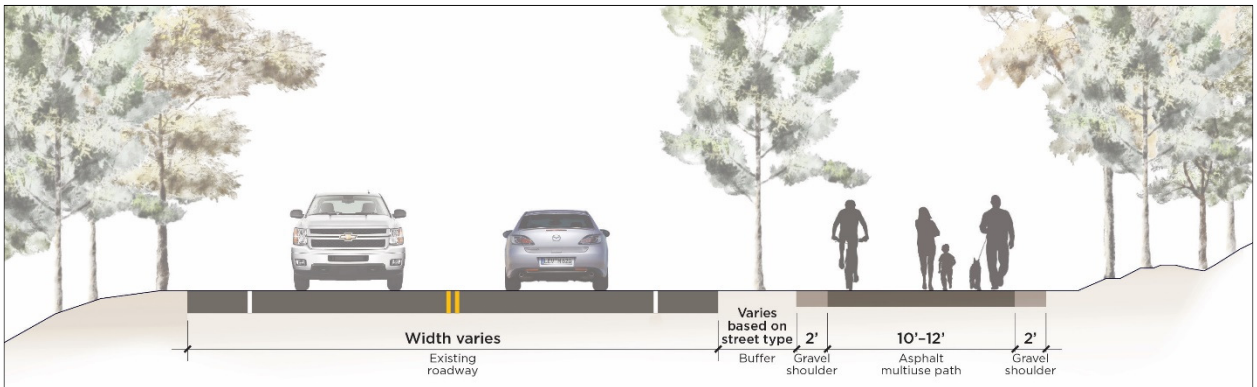
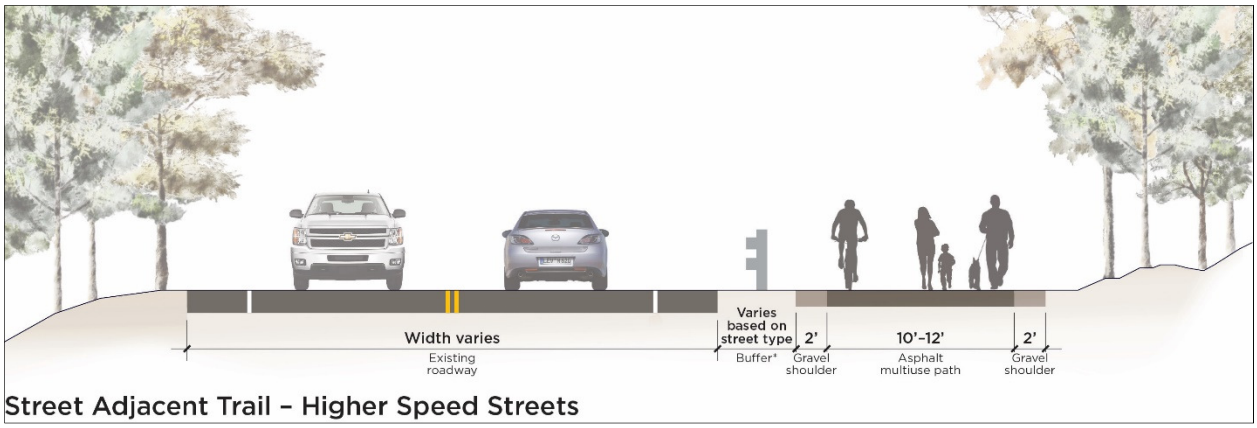


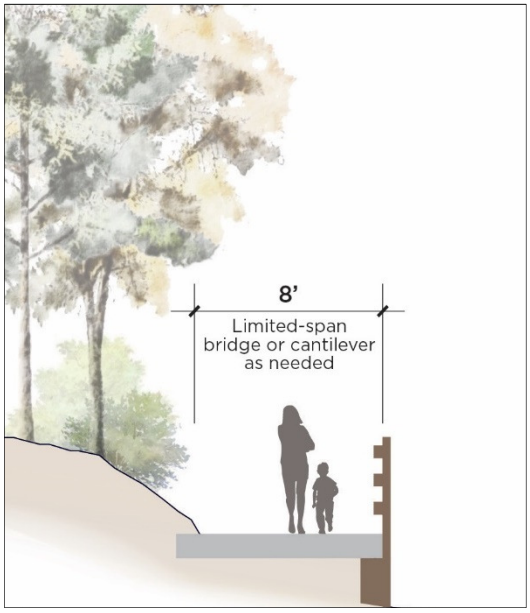
Figure 2-3. Street Adjacent Trail next to Higher Speed Road



2.1.3 Multiuse Cantilevered, Pile or Retaining Wall-Supported Path

This type of path 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 closer to the highway. Path materials may include wood, steel, concrete, or some combination of these materials. An illustration of a cantilevered path is presented in **Figure 2-4**. This trail type could also be supported by piers, particularly in areas with sensitive natural resources.

Figure 2-4. Cantilevered or Pile-Supported Path



2.1.4 Local Trail

This facility could have either a paved or soft surface with a minimum width of 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.

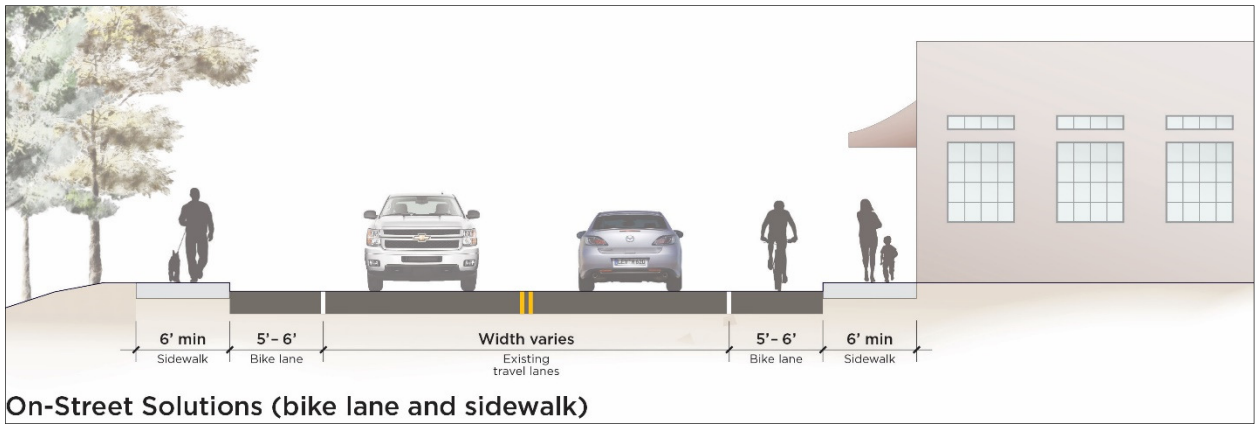
2.1.5 On-street Solutions

On-street solutions would be appropriate where opportunities to provide a trail separated from the roadway are limited. On-street solutions within the road right-of-way include:

- Bike lanes, designated by signing and road surface striping, with parallel pedestrian sidewalks (see **Figure 2-5**).

- Shared roadway solutions or widened roadway shoulders allowing trail users to use vehicle roadways, with signing and surface striping to ensure safety. This solution is only practical and safe on low-speed, low-traffic roadways.

Figure 2-5. On-Street Pedestrian/Bicycle Solutions

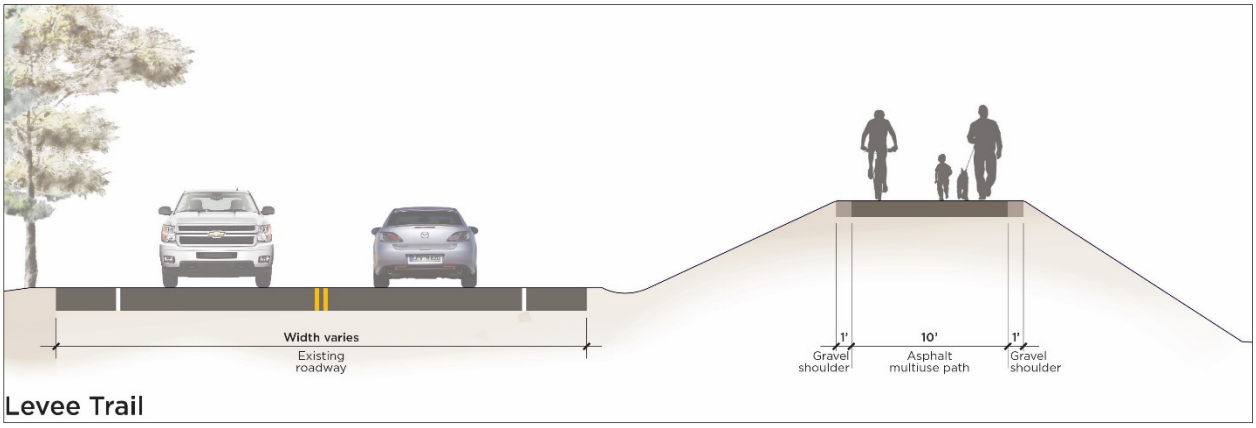


2.1.6 Preferred Trail on Levee

This path type is shown in **Figure 2-6** and would generally follow the highway alignment but use right-of-way under the jurisdiction of the USACE. Because of its elevation and existing separation from the highway, this trail type would provide a completely off-highway experience. To the maximum extent possible, the preferred multiuse path would be:

- 10 feet wide, with 1-foot-wide graveled shoulders.
- Paved with an asphalt surface.
- At or below ADA-compliant maximum grade (e.g., 5 percent) and designed with structures (ramps, landings, etc.) that satisfy ADA requirements.

Figure 2-6. Levee Trail



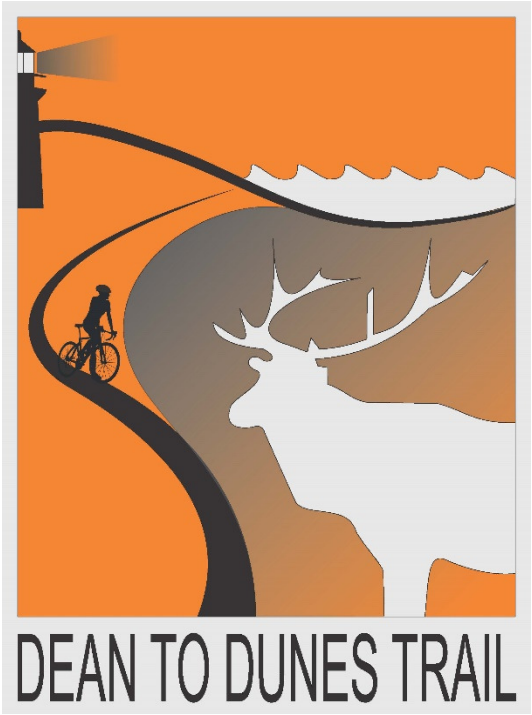
The application of each of these trail types in the Dean to Dunes corridor is discussed in Chapter 3. At time of design and engineering, the trail and required trail structures (bridges, boardwalks, ramps, retaining walls, signage, etc.) should comply with current AASHTO, MUTCD, and ODOT design standards.

2.2 TRAIL AMENITIES AND FEATURES

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, and typical materials, benefits and constraints. Conceptual locations for amenities in each corridor segment are presented in Chapter 3. Trail amenities proposed for the DDT include, but are not limited to:

- **Trailheads** – provides access to the DDT via a connection to the existing active transportation system or a public parking location. Trailheads should provide safe roadway access for vehicular and trail users, can be either paved or unpaved, may have bicycle parking, benches or shelters, have interpretive facilities and/or wayfinding signage, along with any necessary regulatory signage. Security lighting may also be provided.
- **Trail Crossings** – At-grade trail crossings by vehicular traffic may occur either at intersections or mid-block locations. Trail crossings may also be grade-separated. Technical Memoranda #2 and #3 provide more design input on how trail crossings should be treated and identify various state and national publications that provide specific trail crossing design guidance.
- **Structures, Retaining Walls and/or Fencing/Railing** – These elements would be incorporated into design of the trail project as needed for safety, protection from vehicular traffic and/or to minimize grades along sections of the trail.
- **Signage** – Trail signage can be informational or interpretive, offer direction or wayfinding guidance (including mileage to key destinations), identify hazards or provide regulatory control. Development of a DDT trail logo should also be considered for installation along various segments of the facility to help develop a unique brand or unified identify for the entire corridor. One idea for such a sign is illustrated in **Figure 2-7**.

Figure 2-7. Trail Logo Sign



- **Kiosks or Interpretive Materials** – These can be combined with rest areas or viewpoints to offer the user insight into the key natural or cultural features of the area.
- **Rest Areas or Viewpoints** – Provide an opportunity for the travel to rest in a safe and comfortable location. At a minimum, rest areas should provide for seating and bicycle parking.
- **Lighting/Illumination** – Adequate illumination is most important at locations where the trail crosses a public street or highway. Additional lighting can be considered during development of rest or interpretive areas.

- **Gateway Treatment** - Community gateways are usually landscaped sign installations that announce 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. Gateways can be accompanied by speed reduction signage. Gateways also offer an opportunity for a community to communicate its identify to the traveling public.

2.3 ADA COMPLIANCE

The Americans with Disabilities Act (ADA) prohibits state and local governments from discriminating against people with disabilities in all programs, services, and activities. Under the ADA, the US Access Board has developed and continues to maintain design guidelines for accessible buildings and facilities known as the ADA Accessibility Guidelines (ADAAG). These guidelines were adopted by United States Department of Transportation (USDOT) and are published as the ADA Standards for Accessible Design for transportation facilities. These guidelines are enforceable under the ADA.

Relevant to the development of pedestrian and bicycle facilities on US 101 or OR 38 is the requirement that public and private entities use available guidance from the ADAAG to design and construct sidewalks and trails to make them accessible to and usable by people with disabilities. Relevant sections include:

- Walking Surfaces (ADAAG Section 403)
- Ramps (ADAAG Section 405)
- Curb Ramps (ADAAG Section 406)[1]

USDOT Guidance

The US Department of Transportation published *ADA Standards for Transportation Facilities* in 2006. These standards were based on the 2004 US Access Board *Accessibility Guidelines*. Together with the 2010 US Department of Justice *ADA Standards for Accessible Design*, these documents form the basis for compliance with the ADA and the associated Architectural Barriers Act.

AASHTO Guidance

ODOT suggests consulting AASHTO's *Designing Sidewalks and Trails for Access*. AASHTO recommends a maximum grade of 5 percent for bicyclists, with steeper grades allowable for up to 500 feet, provided there is good horizontal alignment and sight distance. The recommended standard cross-slope grade is 2 percent.

ADA Flexibility

Variations to ADA standards are possible. For instance, the US Forest Service has standards for steeper areas where outright compliance with the 5 percent grade maximum proves environmentally damaging. Flexibility is also possible if local jurisdictions have ADA compliance review processes. As an additional reference, the City of Portland has well-developed variance procedures that could be consulted. If local

[1] US Department of Justice, 2010 ADA Standards for Accessible Design, September 15, 2010.

jurisdictions use their own funds for trail construction, the degree of ADA compliance is a matter of local policy.

There are a number of areas along the DDT where ADA considerations could impact trail design, including:

- Sections of the trail that encounter steep slopes, such as the area just north of Reedsport West Road and south of Ranch Road along US 101.
- Areas where the hillside drops away from the road quickly, such as along OR 38 as it follows the Umpqua River.
- Portions of the trail that may use a base other than concrete or asphalt, such as pedestrian bridges or cantilevered sections over environmentally sensitive areas.

2.4 DESIGN GUIDANCE

Source of guidance for design of the DDT have been referenced throughout the various technical memorandums. For convenience, some of the most pertinent resources are listed below.

- *ADA Standards for Accessible Design*, US Department of Justice
- *ADA Standards for Transportation Facilities,* US Department of Transportation
- *Small Town and Rural Multimodal Networks*, US Department of Transportation
- *Implementing Context Sensitive Design on Multimodal Thoroughfares*, Institute of Transportation Engineers
- *Designing Sidewalks and Trails for Access*, American Association of State Highway Transportation Officials

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3. PREFERRED TRAIL ALIGNMENT AND FEATURES

This chapter presents a discussion of the preferred alignment for the Dean to Dunes Trail between the Oregon Dunes National Recreation Area on the west end and the Dean Creek Elk Viewing Area on the east end. This corridor runs through a variety of terrain along differing roadway types within areas of changing land use character. Additionally, there are numerous topographic and natural resource challenges in the corridor which require a creative approach to creating a safe, comfortable and pleasant trail environment.

Technical Memorandum #3 discusses these challenges in some depth and describes the planning context and trail development opportunities in each portion of the corridor. In that memorandum, the trail was broken down into seven segments that were generally homogenous in character. This allowed a discussion of trail alignment options to focus on the key issues and opportunities in each specific geographic area where reasonable comparisons could be made between the options.

In Technical Memorandum #4, these seven homogeneous areas have been grouped into three major corridor segments which are illustrated in **Figure 3-1**:

- **West Segment** – which includes US 101 from the southern end of Reedsport to the Oregon Dunes National Recreation Area/Suislaw National Forest on the Pacific Coast.
- **Central Segment** – which largely includes US 101 and OR 38 through the City of Reedsport. Since this area has previously been studied as part of the *Levee Loop Trail Plan* and the *Pedestrian Safety Study* and has already identified recommended improvements, the primary focus in Technical Memorandum #4 will be on integrating the DDT with these recommendations.
- **East Segment** – which includes OR 38 from the east side of Reedsport to the Dean Creek Elk Viewing Area.

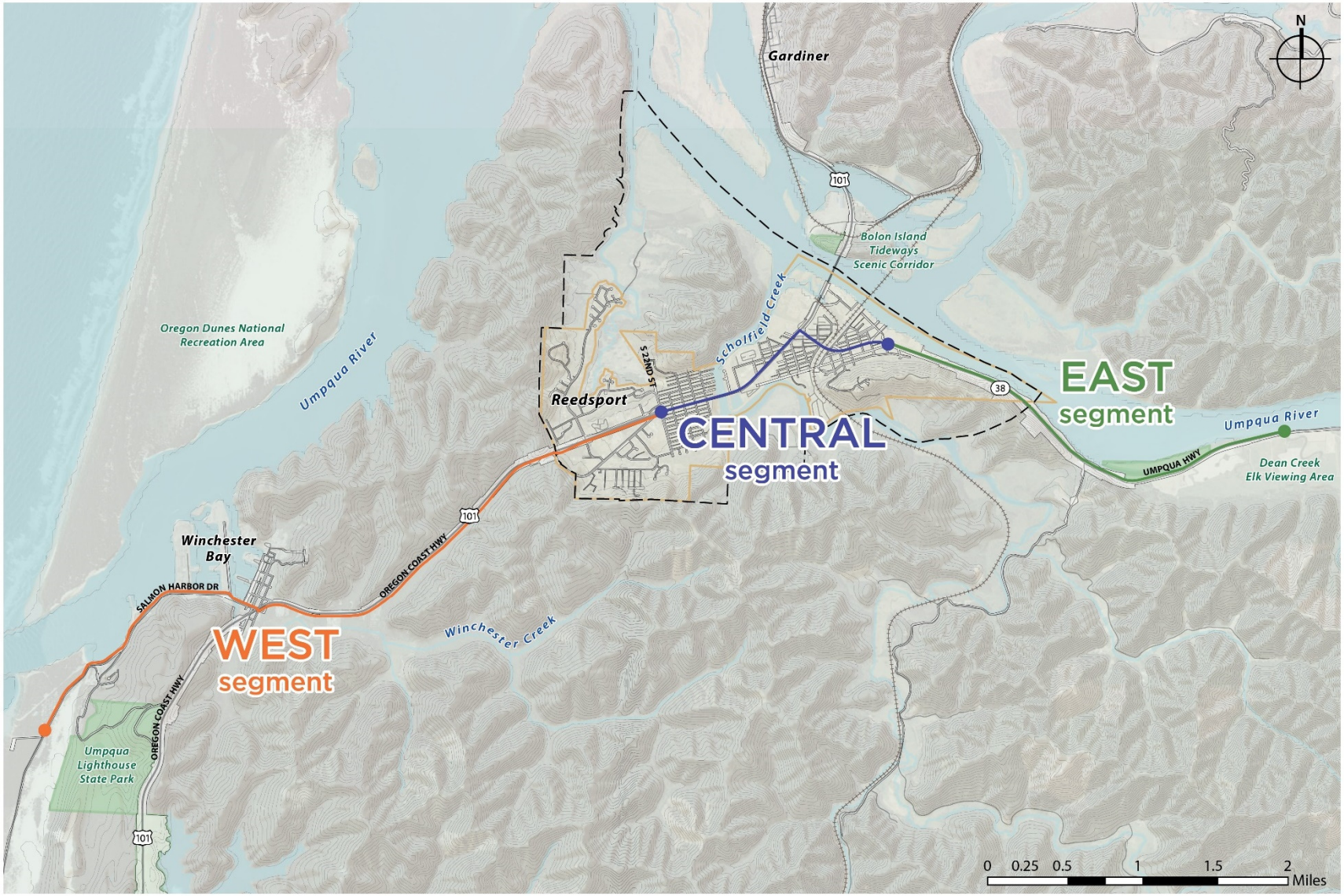
The recommended trail alignment and type, trail features and/or amenities, effects on the existing transportation system, and potential environmental issues for each of these three segments are discussed in this chapter. All graphics in this chapter are presented for illustrative purposes only. Engineering and other considerations that are discovered during the project design phase may require changes from the concepts or details shown in this report. Final alignments and details related to trail amenities will be determined during project design.

3.1 PREFERRED WEST SEGMENT ALIGNMENT – REEDSPORT TO OREGON DUNES

This section discusses key features of the DDT through the West Segment including trail type or types by location, trail cross-section and pavement, the need for any retaining walls, fences or other structures, and potential trail amenities or other facilities. Trail types and amenities are discussed in greater detail in Technical Memorandum #3 with salient information presented in Chapter 2.

The west segment of the preferred Dean to Dunes Trail alignment runs along the east side of US 101 from the south side of Reedsport to the town of Winchester Bay. At Winchester Bay, the trail crosses the state highway and turns west along Salmon Harbor Drive, following this alignment west and then south to ultimately end in the Oregon Dunes National Recreation Area.

Figure 3-1. Dean to Dunes Trail Segments



In this segment, US 101 is a two-lane highway with speeds ranging from 40 mph in Reedsport to 55 mph between Reedsport and Winchester Bay, where the speed then drops to 45 mph. The adjacent land use character is urban as it approaches the city including the Reedsport Junior and Senior High Schools near 22nd Street, Highland Elementary School and Highland Park all on the east side of the highway. South of Reedsport, the highway is located within unincorporated Douglas County and generally has one travel lane in each direction with a southbound left turn at the Oregon Coast RV Resort and a northbound passing lane that begins to the north of the RV Resort access road and extending to just south of Longwood Drive. There is an estuarine wetland on the east side of the highway for approximately 3,500 feet in this area. The highway's 55 mph speeds generally make for a challenging and uncomfortable bicycle riding or walking environment along existing shoulders. Descriptive information about the US 101 portion of the West Segment is presented in earlier memoranda under Segments D and E.

Salmon Harbor Drive is a two-lane county road with a 25 mph speed limit. The road passes through the town of Winchester and provides access to the harbor and a variety of visitor destinations. Portions of the existing shoulder along the north and west side of this road are signed at 15 mph for ATV use which represent a potential conflict with bicycle and pedestrian users. Further south, the road provides direct access to ATV trails and other Dune visitor facilities including several campgrounds. The road is narrow with minimal space for pedestrians and bicyclists. Descriptive information about the Salmon Harbor Drive portion of the West Segment is presented in earlier memoranda under Segments F and G.

3.1.1 Overview of Trail Alignment

From north to south the West Segment of the preferred DDT concept follows the general alignment described below and illustrated in **Figure 3-2**.

- **Beginning of West Segment** - The trail alignment starts at the southeast corner of the intersection of US 101 with 22nd Street in the southern portion of the City of Reedsport. Immediately to the north, ODOT will shortly initiate a land reconfiguration improvement project on US 101 to upgrade the pedestrian and bicycling environment. As part of this project, the existing four-lane highway between 16th and 22nd Street will be converted to three-lanes including one lane of travel in each direction, a center turn lane, two bicycle lanes and space for on-street parking. The traffic signal on US 101 at 22nd Street will be improved to match the three-lane conversion and illumination will be enhanced. Further north, at approximately 16th Street, the City's Levee Loop Trail project would develop a trail system serving the heart of the community. The DDT would be coordinated with facilities recommended in that plan. A map of the recommended Levee Loop Trail is included in **Appendix A**.
- **22nd Street to Ranch Road** - Heading south from the intersection, the trail is located on the east side of US 101 and closely follows the highway alignment (see **Figure 3-3**). It crosses Longwood Drive at grade and then moves slightly away from the highway into a vegetated area within the ODOT highway right-of-way. The trail continues to parallel US 101, getting increasingly distant from the highway, ultimately running adjacent to Highland Elementary School and Highland Park. The trail crosses Ranch Road at-grade in an area that provides on-street parking for park visitors. As shown in **Figure 3-4**, the topography is relative flat is this area with grades being 3 percent or less.

Figure 3-2. Dean to Dunes Trail - West Segment

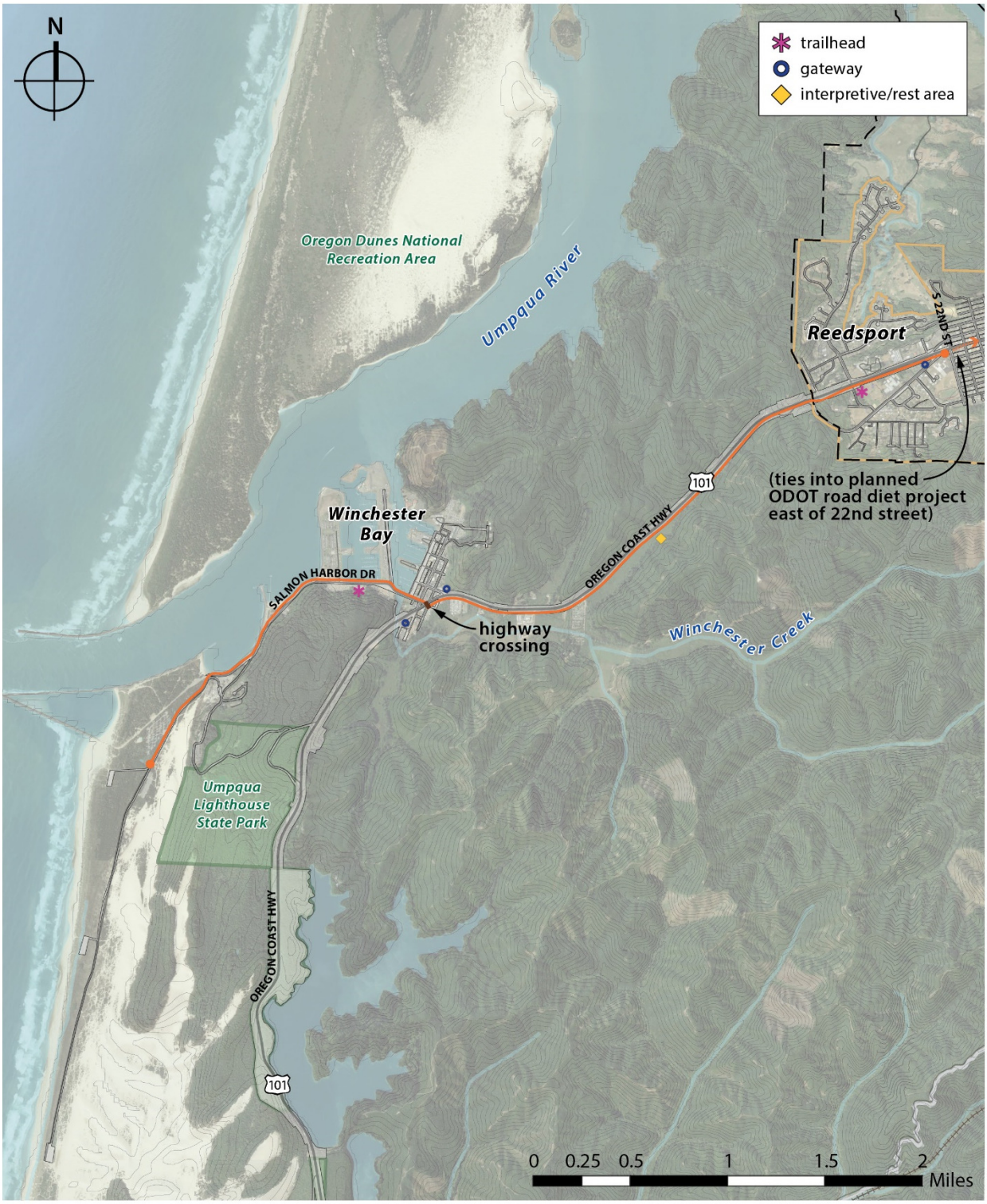
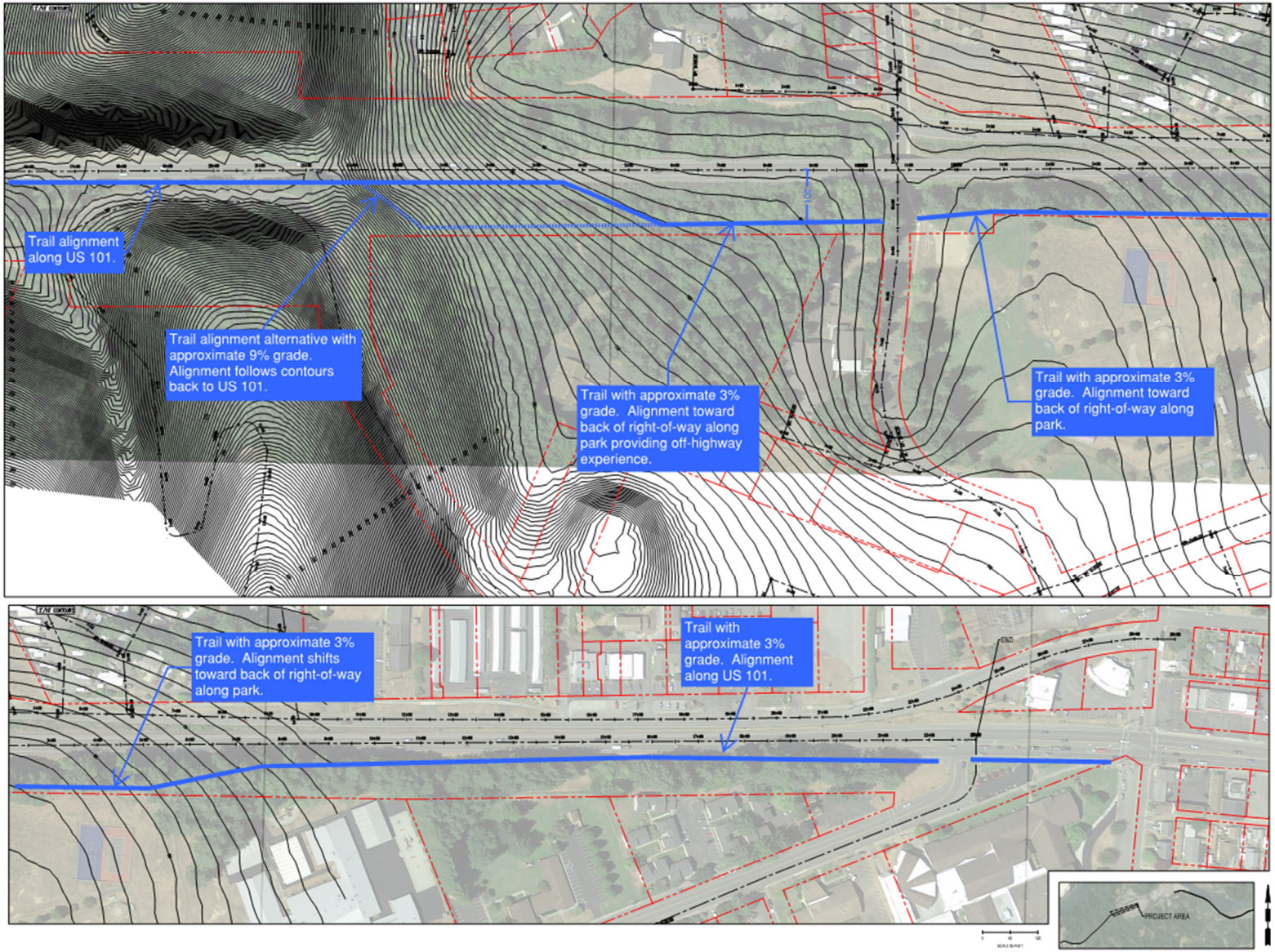


Figure 3-3. DDT West Segment, 2nd Street to Reedsport West Road

Figure 3-4. DDT Trail Alignment, 22nd Street to Reedsport West Road



Ranch Road to Reedsport West Road – South of Ranch Road, the trail alignment begins to climb from an initial 3 percent grade to a 9 percent grade, even with a transverse trail alignment across the face of the slope (made possible by keeping the trail against the back of ODOT right of way approaching the slope). Preliminary analysis suggests an alignment against US 101 through the steeper section could facilitate ADA compliance, which is the design alternative shown in **Figure 3-4**. A segregated, barrier-separated path would be provided to the intersection with Reedsport West Road where an at grade crossing would be provided. Trail design will determine whether one of two design options is most feasible:

1) Maintaining the current highway alignment and removing rock and stabilizing the hillside along the east side of the highway, or
2) Shifting the highway alignment to the west to accommodate the trail on the east side.

At the pinch point, the highway travel lanes are approximately 13.75 feet wide with 5-foot paved shoulders and 5 feet of gravel beyond that (on both sides). Preliminary engineering analysis indicates shifting of the highway centerline to the west about 5.25 feet would allow room for a 10-foot trail with shoulders and protective barrier. The rock walls outside the road bed may require some form of stabilization.

Reedsport West Road to Winchester Bay – As illustrated in **Figure 3-5**, south of Reedsport West Road, the trail would continue on the east side of US 101 along a barrier-separated pathway. At the northern end of this section, the trail would be located within existing highway right-of-way outside of the existing northbound shoulder. In the middle portion of this section (see **Figure 3-6**), the trail would be located between the highway and an estuarine wetland, a portion of which is zoned for Conservation Shorelands. Further south, there is existing development along both sides of the highway, but predominately on the south and east side. Development includes the Oregon Coast RV Resort, the Salmon Harbor RV Park, a mini-storage facility and other light industrial uses, and several commercial establishments on both sides of the highway in the Winchester Bay area. As shown in **Figure 3-7**, the trail would follow the east side of the highway through the developed area on a separated and buffered path. Access management would be implemented to safely accommodate this trail (which would also improve safety in this area for all modes of travel). The trail would cross US 101 at the intersection with Salmon Harbor Drive as shown in **Figure 3-8 and Figure 3-9**.

Winchester Bay to Oregon Dunes National Recreation Area – Two trail alignment options in this segment would be carried forward into preliminary design. One option would follow Salmon Harbor Drive and end near a beach parking lot on USACE property just south of the County's Half Moon Bay campground. The other would follow Salmon Harbor Drive to Lighthouse Road, pass through the Umpqua Lighthouse State Park, and rejoin US 101 south of Winchester Bay. These options are described below:

- *Terminus at Parking Lot on USACE Property* - Heading west from US 101 on Salmon Harbor Drive, the trail would be located on the north side of the road and would use the existing pedestrian bridge over Winchester Creek. The trail would continue along the north and west side of Salmon Harbor Drive to provide separation from ATV traffic that is planned to use the south and east side of this street. For purposes of this planning effort, it was assumed that ATVs would be either trailered in to a place west of Winchester Creek from the rental businesses on the east side of US 101 or would access the ATV trail directly from local campgrounds. A key

Figure 3-5. DDT West Segment, Ranch Road to Estuarine Wetlands

Figure 3-6. DDT West Segment, Near Estuarine Wetlands

Figure 3-7. DDT West Segment, North of Winchester Bay

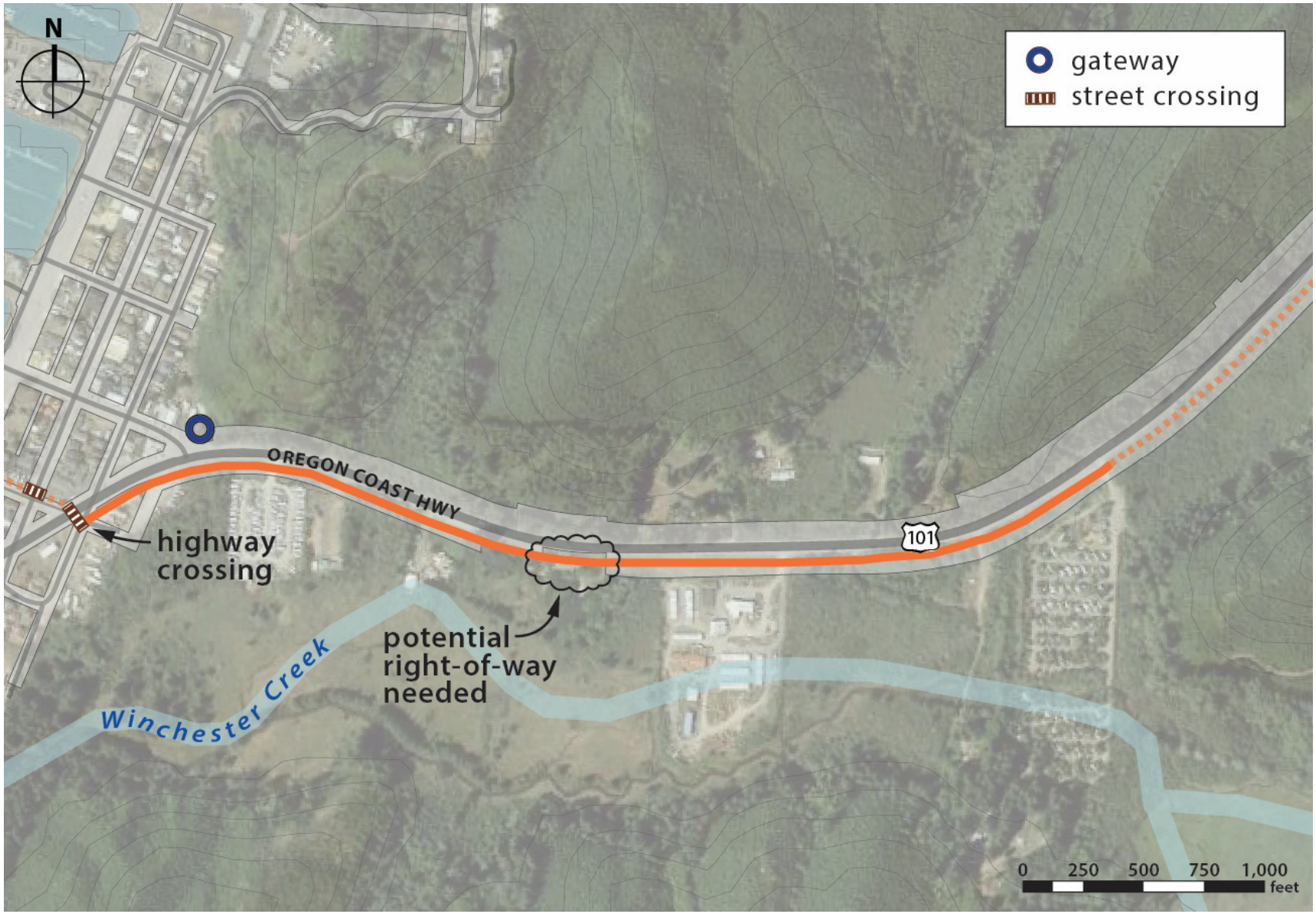


Figure 3-8. DDT Access Management in Winchester Bay

Figure 3-9. DDT Alignment in Winchester Bay

element in the design of the DDT would be to ensure maximum separation of these motorized and non-motorized modes to enhance the safety and the comfort of bicycle and pedestrian trail users. The trail would run along the west side of Salmon Harbor Drive to its southern terminus at the entrance to the beach parking lot on Army Corps property. The alignment of the DDT in this area is shown in **Figure 3-10 and Figure 3-11.** There are numerous destinations served by the trail in this area including:

- Oak Rock County Park
- Salmon Harbor Marina
- Windy Cove RV Park and Campground
- Marina Activity Center
- Winchester Bay RV Resort
- Discovery Point Resort and RV Park
- Ziolkouski Beach Park
- Umpqua River Lighthouse and Museum (off the road and up the hill)
- Umpqua Day Use Beach Area
- Umpqua Sand Campground

- *Loop Through Umpqua Lighthouse State Park* – The path would follow Salmon Harbor Drive west from US 101 to Lighthouse Road, then follow Lighthouse Road to the Oregon Dunes National Recreation Area and ultimately rejoin US 101 south of Winchester Bay. This trail alignment option is shown in **Figure 3-12**.

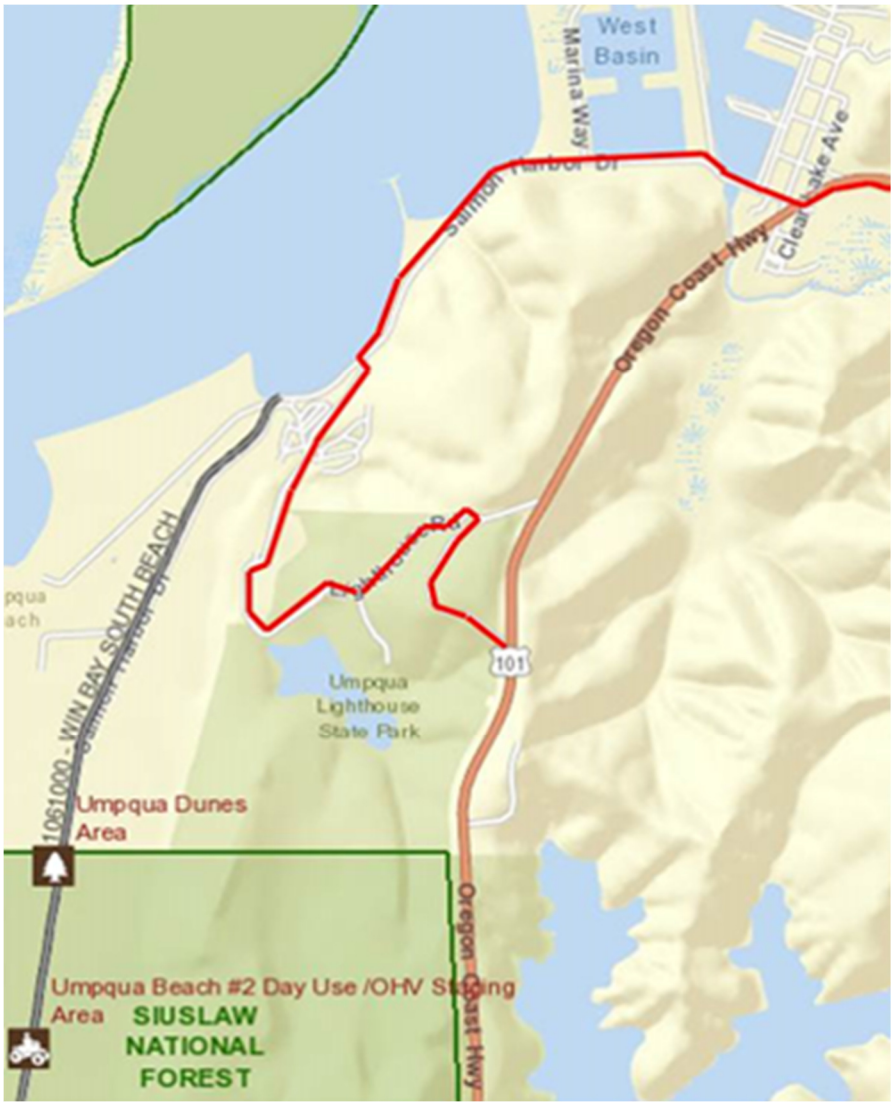
For purposes of the remaining discussion in this Technical Memorandum, the West Segment Trail Alignment has been broken down into various sections. This allows for a more orderly and comprehensive examination of specific trail type recommendations, trail features and amenities, and ADA compliance issues. Chapter 4 follows a similar pattern of trail section disaggregation for a discussion of estimated costs. West Segment Trail sections include:

- W-1 – known as Segment D in earlier Technical Memoranda, this section would run from 22nd Avenue to Reedsport West Road.
- W-2 – known previously as a part of Segment E, this section would run from Reedsport West Road to the beginning of the estuarine wetlands at approximately station 180+00 is the CAD drawings developed to support the analysis in this report.
- W-3 – also known previously as a part of Segment E, this section would run along the estuarine wetlands.
- W-4 – continuing in former Segment E, this section would run from south of the estuarine wetlands to Salmon Harbor Drive in Winchester Bay.
- W-5 – known as Segment F in earlier Technical Memoranda, this section would run from US 101 to Discovery Point Lane.
- W-6 – previously known as Segment G, this section would run from Discovery Point Lane to the USACE beach parking lot. An alternative to this alignment would create a loop route from US 101 at Salmon Harbor Drive through the Umpqua Lighthouse State Park to rejoin US 101 at Lighthouse Road.

Figure 3-10. DDT West Segment, Winchester Bay to Discovery Point Lane

Figure 3-11. DDT West Segment, Discovery Point Lane to Southern Terminus

Figure 3-12. DDT West Segment - Light House Road Trail



Source: ODOT, Federal Land Access Program Grant Application, April 2018.

3.1.2 Section W-1: 22nd Street to Reedsport West Road

The alignment of Section W-1 is described above and illustrated in **Figure 3-3** and **Figure 3-4**. This section presents a discussion of the preferred trail type in the section, design challenges and trail development issues, trail features and amenities, and an approach for ADA compliance.

Trail Type

This trail section would include three trail types as described and generally located in the areas indicated below:

Street Adjacent to Higher Speed Road Concept *(sta 263+50 to 267+50)* - For a one block distance between 22nd Street and Longwood Drive the proposed trail type would be "Street Adjacent with Higher Speeds". Initially south of 22nd Street, the trail would be separated from US 101 with a physical barrier

(speeds at this location are 40 mph). The trail would be paved with asphalt concrete. A marked cross-walk would be provided at the intersection of US 101 with Longwood Drive and signage installed to indicate shared bicycle and pedestrian use. The addition of illumination should be considered at Longwood Drive. Illumination currently exists at the intersection of US 101 with 22nd Street. An illustration of this trail type is found in **Figure 2-3**.

Preferred 10-foot Trail Concept *(sta 229+00 to 263+50)* - South of Longwood Drive separation between the trail and the highway would increase with the trail approximately 100 feet from the highway centerline and a 10-foot wide multiuse path would be provided with a landscaped buffer. This trail would be constructed with asphalt concrete. Care should be taken in design and construction to minimize tree removal in this area. A marked cross-walk would be provided at the intersection with Ranch Road and signage installed to indicate shared bicycle and pedestrian use. As the trail moves south, the grade would gradually increase as the highway grade also increases in this area, but physical separation from the highway would be maintained to a point where a transverse of the slope back toward US 101 is necessary to be able to follow the highway fill profile as the trail continues south. An illustration of this type of trail is presented in **Figure 2-1**.

Preliminary design analysis of this portion of the trail considered alignments along Reedsport West Road, transverse of the steep slope and at-grade and bridge crossings of Ranch Road near US 101 with particular attention paid to ADA compliance. Preliminary design concepts in AutoCAD are available in electronic format as the design effort is advanced. They are not provided with this report as there is limited value at a small scale.

Street Adjacent to Higher Speed Road Concept *(sta 217+50 to 229+00)* – Where the trail and highway grades meet, the trail type would return to the "Street Adjacent with Higher Speeds" concept and continue south to Reedsport West Road. The highway is posted for 55 mph speeds in this area. A concrete barrier with appropriate shy distance would be provided between the 10-foot trail and the highway. A marked trail crossing would be provided at the intersection of US 101 with Reedsport West Road and signage installed to indicate shared bicycle and pedestrian use. Illumination of the intersection may also be installed.

Design Challenges and Trail Development Issues

- A key design challenge in this trail section will be to achieve ADA compliance along the trail where grades increase sharply above 5 percent.
- The narrow roadway between the rock walls on US 101 north of Reedsport West Road is another design challenge.

Trail Amenities and Features

Key amenities and trail features to be installed in this section include:

- **Trailhead** at Ranch Road intersection. A trailhead should include safe access to the trail that separates vehicular and trail users (i.e., installation of bollards and signage to prevent vehicles using the trail), and provides bicycle storage/parking, and wayfinding, directional and trail logo signage. The location already has on-street parking and is adjacent to Highland Park.
- **Trail Crossings** at the following locations:

- US 101 at 22nd Street – signalized intersection with illumination. Trail directional and wayfinding signage along with regulatory signage to restrict trail access would be installed at the southeast corner of this intersection at the beginning of the trail. ADA compliance of existing curb ramps would be determined, and ramps replaced or adjusted as necessary.
- US 101 at Longwood Drive - Trail markings and signage at the Longwood Drive intersection including bollards to restrict vehicular access to the trail. This crossing should be illuminated. A visual simulation of this crossing is presented in **Figure 3-13**.

Figure 3-13. Illustration of DDT Crossing at Longwood Drive

- US 101 at Ranch Road - Trail markings and signage at the Longwood Drive intersection including bollards to restrict vehicular access to the trail. This crossing should be illuminated.
- US 101 at Reedsport West Road - Trail markings and signage at the Longwood Drive intersection including bollards to restrict vehicular access to the trail. This crossing should be illuminated.

- **Trail Signage** – recommended trail signage in this section should include:
  - DDT logo signage
  - Oregon Coast Trail signage
  - Wayfinding signage at decision points including mileage to a variety of destinations or activity centers
  - Directional signage, particularly to get distance riders off US 101 to eliminate shoulder use through the narrow rock-faced section. This is particularly important if the design solution removes the paved shoulder in the southbound direction to provide more width on the northbound side of the highway.
  - Regulatory and/or hazard signage.
- **Trail Furniture -** Include a bench or rocks/downed timber for resting at appropriate locations along the steepest portion of the trail in this section.
- **Gateway Treatment** – Install gateway in the northbound direction south of Longwood Drive between the trail and the highway. The gateway should be visible from both facilities. There are already a number of utilities and signs at this location, so care should be exercised to avoid sign clutter.

ADA Compliance

This section of the trail may have a grade of 9 percent for approximately 500 feet unless the trail returns to an alignment directly adjacent to US 101 prior to the steeper slope. A design solution will need to be developed that meets ADA requirements, as discussed previously.

3.1.3 Section W-2: Reedsport West Road to North End of Estuarine Wetlands

Trail Type

This trail section would include only one trail type:

Street Adjacent to Higher Speed Road Concept *(sta 180+00 to 217+50)* – This trail concept would continue south from Reedsport West Road through the entire section where the posted highway speed is 55 mph. A concrete barrier with appropriate shy distance would be provided between the 10-foot trail and the highway. The trail would be paved with asphalt concrete. See **Figure 2-3** for an illustration of this concept, while a visual simulation of this path is shown in **Figure 3-14**.

Design Challenges and Trail Development Issues

No significant design challenges have been identified for this section of the DDT.

Trail Amenities and Features

Key amenities and trail features to be installed in this section include:

- **Trail Signage** – recommended trail signage in this section should include:
  - DDT logo signage
  - Oregon Coast Trail signage
  - Wayfinding signage south of Reedsport West Road including mileage to a variety of destinations or activity centers
  - Regulatory and/or hazard signage.

Figure 3-14. Illustration of DDT South of Reedsport West Road

Looking South

ADA Compliance

Through this section the trail follows the roadway grade, thus it is expected that ADA compliance can be achieved.

3.1.4 Section W-3: Estuarine Wetlands

Trail Type

This trail section would include only one trail type:

Multiuse Cantilevered or Pile-Supported Path *(sta 144+50 to 180+00)* – This type of trail would provide a low, elevated 10-foot wide or across the wetlands through this section. A trail supported by pin piles or piers may be preferable to the extensive earthwork and environmental permitting that would otherwise be needed to provide sufficient trail width closer to the highway in an area with sensitive natural resources. Path materials may include wood, steel, concrete, or some combination of these materials. An illustration of a cantilevered path is presented in **Figure 2-4**, while a visual simulation of this path is shown in **Figure 3-15**. An alternative to the use of pin piles or piers would involve trail construction using retaining walls.

Figure 3-15. Illustration of Trail Along Estuarine Wetland

Design Challenges and Trail Development Issues

A key challenge in this section will be to design and construct a trail that minimizes adverse impacts to the natural environment adjacent to the highway.

Trail Amenities and Features

Key amenities and trail features to be installed in this section include:

- **Trail Signage** – recommended trail signage in this section should include:
  - DDT logo signage
  - Oregon Coast Trail signage
  - Wayfinding signage including mileage to potential rest/interpretive area and further destinations.
- **Interpretive Information/Rest Areas** – consider developing an interpretive facility and/or rest stop where there is a good view of the estuarine wetland. Include interpretive signage.
- **Trail Furniture** – if a rest area is developed, include a bench.

ADA Compliance

Through this section the trail follows the roadway grade, thus it is expected that ADA compliance can be achieved.

3.1.5 Section W-4: Estuarine Wetland to Salmon Harbor Drive

Trail Type

This trail section would include two trail types the general location of which are indicated in the paragraphs below:

Preferred 10-foot Trail Concept *(sta 105+00 to 144+50)* - South of the wetlands and approaching Winchester Bay on the east side of US 101, the 10-foot Preferred Trail Concept would be used wherever there is sufficient existing right-of-way to accommodate this facility and a desirable setback. Care should be taken in design and construction to minimize any tree removal in this area. Marked cross-walk may be provided across the driveways to existing development including the mini-storage/light industrial park and the RV parks located along the south and east side the US 101. Signage should be installed to indicate shared bicycle and pedestrian use at these locations and bollards installed to prevent access to the trail by motorized vehicles. The trail would be paved with asphalt concrete. An illustration of this type of trail is presented in **Figure 2-1**. Railing or fencing may be required along the east side of the trail in areas where the native grade slopes away steeply to the east.

Street Adjacent to Higher Speed Road Concept *(sta 100+00 to 105+00)* – This trail concept would be used in locations where there is insufficient ROW and/or where potential land use conflicts exist that would preclude implementation of the Preferred Trail Concept, and where speeds are 40 mph or greater. A concrete barrier with appropriate shy distance would be provided between the 10-foot trail and the highway. The trail would be paved with asphalt concrete. See **Figure 2-3** for an illustration of this concept.

Design Challenges and Trail Development Issues

One of the key design challenges in this area will be the implementation of an access management strategy along US 101 through Winchester Bay.

Trail Amenities and Features

Key amenities and trail features to be installed in this section include:

- **Trailhead** in Winchester Bay. A trailhead location should be identified during the design process in consultant with stakeholders in the community. This trailhead should include safe access to the trail that separates vehicular and trail users (i.e., installation of bollards and signage to prevent vehicles using the trail), and provides bicycle storage/parking, and wayfinding, directional and trail logo signage.
- **Trail Crossings** at the following locations:
    - US 101 at Salmon Harbor Drive – May include stop signs on the trail as it approaches the US 101 highway crossing coupled with pedestrian activity ahead signage on the highway in advance of the trail crossing location. Bollards with 6-foot separation may be installed where the trail crosses vehicular travel paths restricting trail access to pedestrians and bicyclists only. This crossing may also require improvements to existing illumination. An illustration of this crossing is presented in **Figure 3-16**.

- Trail crossings of existing driveways along US 101 that may include pavement marking, restricted trail use signage and/or bollards where necessary.

Figure 3-16. Illustration of US 101 Crossing at Winchester Bay

- **Trail Signage** – recommended trail signage in this section should include:
  - DDT logo signage
  - Oregon Coast Trail signage
  - Wayfinding signage including mileage to the wide variety of activity centers located in Winchester. Wayfinding signage should also indicate distance to various destinations outside of the community.
  - Regulatory and/or hazard signage.
- **Gateway Treatment** – Install gateway in both north- and southbound directions approaching Winchester Bay that is visible from both the highway and the trail. This treatment could also include active speed reduction signage to reinforce the posted 45 mph speed.
- **Access Management Strategy** – As illustrated in **Figure 3-8** development of the DDT along the east side of US 101 through Winchester Bay provides the opportunity to implement an access management strategy in an area with limited existing access control. This strategy would offer driveway consolidation which would enhance safety along the highway, in addition to providing a clearly defined and protected facility for pedestrians and bicyclists. Landscaping would be provided along both sides of the highway and adjacent to the trail.

ADA Compliance

Through this section the trail follows the roadway grade, thus it is expected that ADA compliance can be achieved. Care must be taken to ensure that any curb ramps associated with the trail through Winchester Bay meet ADA requirements.

3.1.6 Section W-5: US 101 to Discovery Point Lane

Trail Type

This trail section could include two trail types:

On-street Solutions - **Bicycle Lanes and Pathway** *(sta 91+50 to 100+00)* – Given the limited right-of-way through this area and the competing need for establishing an OHV pathway, development of on-street bicycle lanes is recommended in the area from US 101 to west of the Winchester Creek Bridge. Pedestrians would be accommodated on an 8-foot pathway along the north side of Salmon Harbor

Drive. Speeds are posted for 25 mph and traffic volumes are relatively low, making the use of bicycle lanes in this appropriate. See **Figure 3-9** for a map of this concept and **Figure 3-17** for an illustration. It should be noted that based on further engineering analysis, this concept could change to installation of a street adjacent multi-use path.

Figure 3-17. Illustration of DDT Approaching Winchester Creek Pedestrian Bridge

Street Adjacent to Lower Speed Road Concept *(sta 29+00 to 91+50)* – Salmon Harbor Drive is posted for 25 mph speeds and has limited right-of-way, making this trail concept the appropriate choice is this section west of the Winchester Creek Bridge. This pathway would run along the north side of Salmon Harbor Drive and would be separated from vehicular traffic by a landscaped buffer with a minimum 5-foot width. The trail would be paved with asphalt concrete. See **Figure 2-2** for an illustration of this concept and **Figure 3-18** for a visual simulation of the trail in the area opposite Douglas County's Windy Cove A RV Park and the proposed OHV trail facility.

Figure 3-18. Illustration of DDT on Salmon Harbor Drive near Windy Cove A RV Park

Design Challenges and Trail Development Issues

Maintaining separation and orderly traffic movement for vehicles, OHVs, bicycles and pedestrians through a corridor of limited width.

Trail Amenities

Key amenities and trail features to be installed in this section include:

- **Trail Crossings** at the following locations:
    - Trail crossings of existing driveways and local streets along Salmon Harbor Drive that may include pavement marking, restricted trail use signage and/or bollards where necessary.
- **Trail Signage** – recommended trail signage in this section should include:
    - DDT logo signage
    - Oregon Coast Trail signage to direct users to the beach
    - Wayfinding signage including mileage to the wide variety of activity centers located in Winchester.
    - Regulatory and/or hazard signage.

ADA Compliance

Through this section the trail follows the roadway grade, thus it is expected that ADA compliance can be achieved. Care must be taken to ensure that any curb ramps associated with the trail through Winchester Bay meet ADA requirements.

3.1.7 Section W-6: Discovery Point Lane to Oregon Dunes National Recreation Area

Two alignment options were recommended for further engineering evaluation in Section W-6. These include:

- *Option #1*- An alignment along Salmon Harbor Drive between US 101 and the USACE beach parking lot south of the County's Half Moon Bay Campground.
- *Option #2*- An alignment along Salmon Harbor Drive to Lighthouse Road and then Lighthouse Road until it rejoins US 101 south of Winchester Bay.

Features of these two options are described in the following paragraphs.

Option #1 -Winchester to Beach Parking

Trail Type

This trail section would include only one trail type:

Street Adjacent to Lower Speed Road Concept *(sta 0+00 to 29+00)* – Salmon Harbor Drive is posted for 25 mph speeds and has limited right-of-way, making this trail concept the appropriate choice is this section. This pathway would run along the west side of Salmon Harbor Drive (see **Figure 3-19** for an illustration of this concept**).** This pathway would be separated from vehicular traffic by a landscaped buffer with a minimum 5-foot width. The trail would be paved with asphalt concrete. See **Figure 2-2** for a cross section of this concept.

Design Challenges and Trail Development Issues

Segregation of the DDT from the OHV trail.

Trail Amenities

Key amenities and trail features to be installed in this section include:

- **Trail Signage** – recommended trail signage in this section should include:
  - DDT logo signage
  - Oregon Coast Trail signage to direct users to the beach
  - Wayfinding signage including mileage to the wide variety of activity centers located in Winchester.
  - Regulatory and/or hazard signage.

Figure 3-19. Illustration of DDT on Salmon Harbor Drive Approaching Beach Parking

ADA Compliance

Through this section the trail follows the roadway grade, thus it is expected that ADA compliance can be achieved.

Option #2 - Winchester to US 101 via Lighthouse Road

Trail Type

This trail alignment is illustrated in Figure 3-12 and would potentially include two trail types:

Street Adjacent to Lower Speed Road Concept – Salmon Harbor Drive is posted for 25 mph speeds and has limited right-of-way, making this trail concept the appropriate choice is this section. This pathway would run along the north and west sides of Salmon Harbor Drive to the intersection with Lighthouse Road, cross Salmon Harbor Drive and continue along Lighthouse Road to the entrance to the Oregon Dunes National Recreation Area at the Umpqua Lighthouse. The trail would be separated from vehicular traffic by a landscaped buffer with a minimum 5-foot width and would be paved with asphalt concrete. See **Figure 2-2** for an illustration of this concept and **Figure 3-18 and Figure 3-19** for visual simulations of this trail.

Shared Use Road and Trail – Between the Umpqua Lighthouse and the US 101/Lighthouse Road intersection the trail would use the existing Lighthouse Road which lies entirely within the Umpqua Lighthouse State Park. Due to the very low traffic volumes and relatively low speeds on this road, active transportation uses would share the roadway with vehicular traffic. Sharrow pavement markings would be installed.

3.1.8 Transportation System Impacts and Benefits

The development of the Dean to Dunes trail in the West Segment has a variety of transportation impacts and benefits. The trail represents a new addition to the Reedsport and Douglas County multimodal transportation system and is intended to provide for a safe and comfortable journey by local residents and visitors alike. Integration of this trail into the existing transportation system offers positive benefits to community health by providing a walking and bicycling opportunity that serves both local destinations and is a part of a longer-distance trail that connects Reedsport, Winchester Bay and other communities along the Oregon Coast. The trail also offers a non-motorized travel opportunity for community residents who are low income or otherwise transportation disadvantaged and can augment and support the existing public transit service offered by Pacific Crest Bus Lines. A partner with Amtrak, Pacific Crest Bus Lines provides daily bus service from Winchester Avenue and N 20th Street in Reedsport to Eugene and other coastal communities.

The Dean to Dunes Trail is expected to become a key element in Reedsport's efforts to support a variety of outdoor recreational opportunities that provide alternatives for visitors to the Oregon Dunes, potentially extending a visit or attracting visitors to more local destinations and services. Both downtown Reedsport and the Winchester Bay marina and nearby campground are expected to benefit.

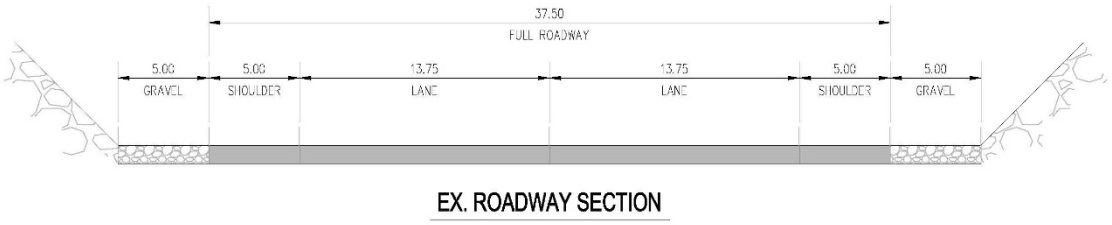
Development of the trail will require careful integration with the existing transportation system both in terms of how it affects existing streets and highways, and how the trail connects to existing or pending future active transportation facilities and services. Some of the key issues that must be addressed as the project moves forward include:

- **Define Jurisdictional Responsibilities** – Jurisdictional responsibilities for trail implementation would focus largely on ODOT and Douglas County as the West Segment of the project largely lies within existing ODOT or County road rights-of-way. US 101 is under the jurisdiction of ODOT whose highway improvement, management and maintenance requirements will govern the development and use of the trail over the long-term. Salmon Harbor Drive is under the jurisdiction of Douglas County who will be responsible for trail development, management and maintenance over the long-term.
- **Acquire Right-of-Way** - These exists a potential need to acquire right-of-way along the east side of US 101 in the area north of Ranch Road and south of Reedsport West Road to develop a trail that meets the requirements of ADA. The trail must traverse an overall 9 percent slope in this area and may require a series of switchbacks to meet the ADA requirement of no more than a 5 percent grade (with limited exceptions). Additionally, initial work indicates that there may be a need to acquire right-of-way along the south side of US 101 as it approaches Winchester Bay for a limited distance between the mini-storage/light industrial park and the Salmon Harbor RV park.
- **Establish Design Parameters** – These are discussed for each section of the West Segment in the foregoing pages and include: trail width, protection from adjacent highway/roadway traffic, roadway crossings, directional, informational and regulatory signage.
- **Integrate with the Existing/Pending Active Transportation System in Reedsport** - As noted earlier in this report, the DDT West Segment ends at the intersection of US 101 with 22nd Street in Reedsport. At this point northbound pedestrians and cyclists can continue along the east side

of the highway using the new bike lanes and existing sidewalk that will be available after completion of ODOT's pending lane reconfiguration improvement between 16th and 22nd Streets. Southbound travelers would need to transition at this signalized intersection from the west side of the highway to the point where the trail starts on the east side of US 101.

- **Integrate Western Trail Terminus with Federal Lands Destination** – The western terminus of the DDT is proposed at the entrance to the Army Corps' beach parking lot immediately south of Douglas County's Half Moon Bay Campground. This is a safe destination for active transportation users which provides direct access to the Pacific Ocean. Access from the trail to the parking lot would be via a shared auto/non-motorized paved roadway.
- **Develop Trail Crossing of US 101** – These may be limited to the Winchester Bay area where highway speeds drop to a posted 45 mph. One crossing is proposed in this location which must meet ODOT requirements. Advance signage warning of pedestrian activity may be provided along with Stop Signs on the trail at the highway crossing.
- **Establish Highway Cross-section** – The existing cross-section of US 101 between Winchester Bay and Reedsport is not proposed to change with development of the DDT, with the single possible exception of the area just north of Reedsport West Road. In this area US 101 (and the proposed trail) are constrained by vertical rock faces on either side of the highway. Stakeholder input has suggested that a long-term solution may be needed to stabilize the rock faces in this area. If that work proceeds, it is possible to widen the roadbed enough to also accommodate the DDT. If this work does not proceed on a timeline that is consistent with the development of the DDT, it would be possible to narrow the travel lanes on US 101 (approximately 13.5 ft. currently at the relevant point) and narrow the gravel shoulders, enabling a trail and concrete barrier to be added in the existing roadbed width. An illustration of this potential cross-section is shown in **Figure 3-20**.

Figure 3-20. US 101 Roadway Cross-section in "Pinch Pont"



- **Consider Alternative Alignment Between Ranch Road and Reedsport West Road –** An alternative to the trail alignment along the east side of US 101 would involve traveling up the slope south of Ranch Road, running along the top of the slope between US 101 and Reedsport West Road, and then dropping back down to grade at the intersection of Reedsport West Road with US 101.

3.1.9 Environmental Issues

As part of the preparation for a Federal Lands Access Program (FLAP) grant funding application for the Western Segment (underway as of March 2018), an environmental baseline analysis was conducted by ODOT staff. This baseline report is included in **Appendix B**. Analysis identified the following specific issues that may need to be addressed as any improvement project in the West Segment proceeds:

- *Cultural Resources* – Undisturbed portions of the proposed path may contain cultural resource deposits. An archaeological survey would be required throughout the project area. A few archaeological sites are in the vicinity of the proposed project. However, the exact locations are unknown.
- *Threatened and Endangered Species* – Endangered Species Act (ESA) listed plants may occur within the project footprint. A rare plant survey would be required. In addition, ESA- listed Coho Salmon are in Solver Creek. Impacts to Silver Creek would need to be avoided to the extent possible. Coordination with the National Marine Fisheries Service (NMFS) would be necessary for this project.
- *Other Fish and Wildlife Habitat* – Extending the culverts that cross US 101 at mileposts 214.0, 214.38, 215.32 and 215.6 will trigger fish passage regulations and require that each of the culverts be replaced with culverts that meet state and federal fish passage requirements.
- *Floodplain/Floodway* – a small portion of the trail may be located in the 100-year floodplain which will require appropriate permitting.
- *Section 4(f) and Section 6(f) Parklands* – the trail alignment will need to avoid potential impacts to these resources in the vicinity of the High School and near existing campgrounds. Windy Cove Campground is located along the south side of Salmon Harbor Drive in the vicinity of the proposed path, and Umpqua Lighthouse State Park is located at the south end of a proposed trail option. Impacts to those areas will need to be avoided.
- *Water Quality/Stormwater Management* – will require stormwater management and/or treatment if water flow on new impervious surfaces is redirected.
- *Wetlands* – an area of vast wetlands is located along US 101 between mileposts 214.5 and 215.7. A wetland determination would be required and impacts to wetlands minimized. Any unavoidable impact will need to be permitted and mitigated. Mitigation rates are approximately $100,000 per acre. However, physical mitigation will be required for any impacts over 0.1 acres and there are currently no mitigation banks on the south coast.
- *Waterways/Other Waters of US and State* – Silver Creek runs parallel to US 101 (on the east side) for approximately one mile. Impacts to Silver Creek will have to be minimized to the extent possible. This will likely cause geographical limitations when trying to fit a multiuse path through portions of this section. Any impacts to waterways or “other” waters will require appropriate permitting.

3.2 REEDSPORT SEGMENT – US 101 AND OR 38

The middle segment of the DDT corridor runs through the City of Reedsport between 22nd Street on US 101 and Winchester Avenue on OR 38. This alignment has lower speeds, varying widths, presence or absence of existing sidewalks and on-street bicycle lanes, and other issues which give this section a strongly urban character. Significant planning has already occurred for multimodal and trail-related improvements in this area as part of both the *Levee Loop Trail Plan*, and the City's *Pedestrian Safety Study.* It is not the intent of the DDT Plan to duplicate the effort already made for trail planning in the Reedsport Segment. Instead, the DDT Plan identifies how integration would be achieved between the trail and existing bicycle and pedestrian facilities in Reedsport Segment. Additionally, signage needs would be identified including: directional to make trail connections, informational and wayfinding to identify amenities that will be attractive to trail users.

3.2.1 Overview of Trail Alignment

The DDT would follow US 101 through Reedsport using existing or pending bicycle and pedestrian enhancements along the highway between 22nd Street and OR 38 (Umpqua Avenue). The trail would then turn east along OR 38 crossing the CORP railroad tracks and transitioning from a wide shoulder into an urban type facility with sidewalks and bicycle lanes at 5th Street. These improvements continue to 3rd Street at which point the East Segment of the DDT would begin. The alignment of the Central Trail Segment is illustrated in **Figure 3-21.**

3.2.2 Section C-1: 22nd Street on US 101 to 3rd Street on OR 38

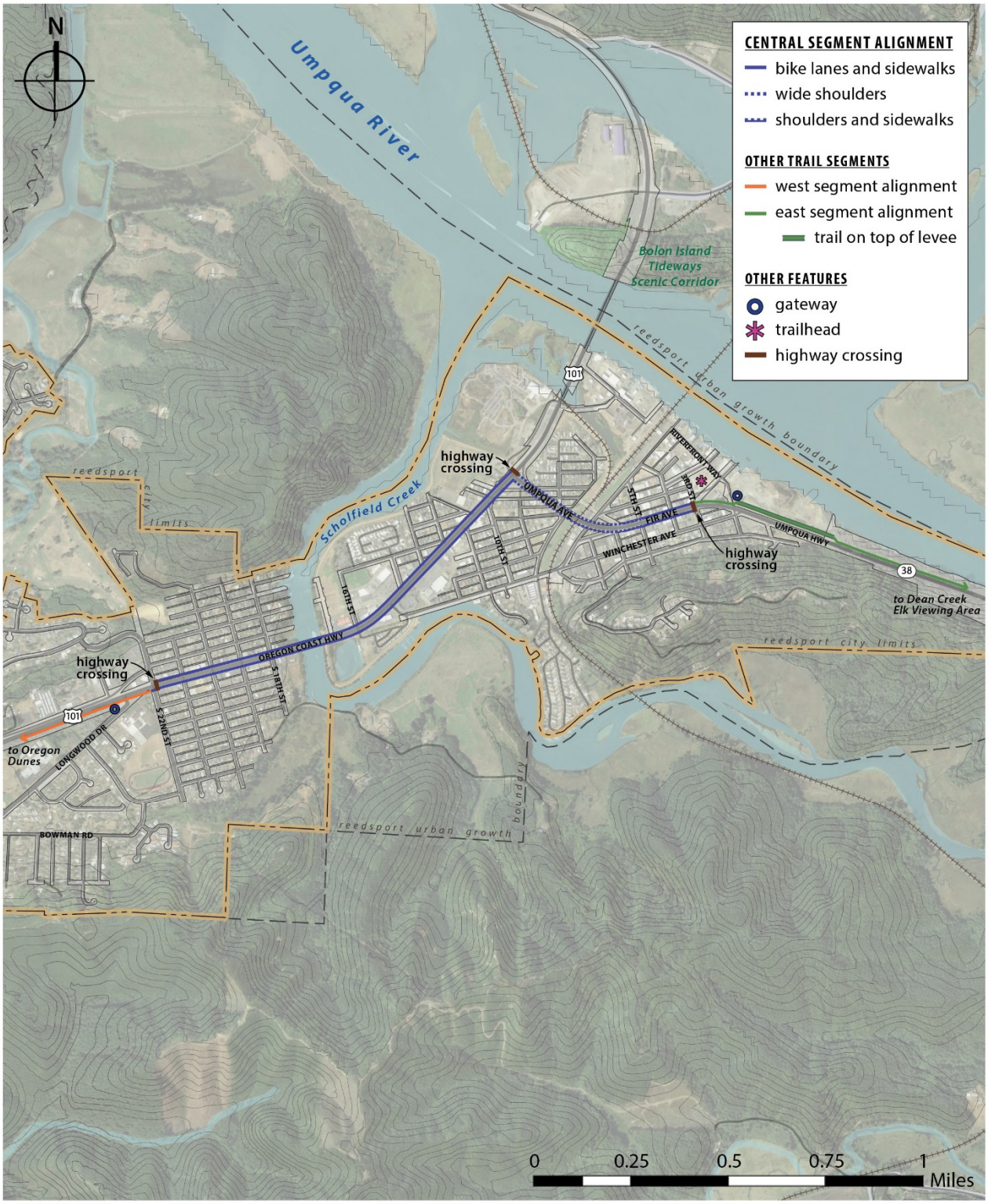
Trail Type

This trail section would include two trail types:

On-street Solutions:

- **Bicycle Lanes and Sidewalks** - These facilities currently existing or will shortly exist along US 101 between 22nd Street and OR 38 (Umpqua Avenue), and along OR 38 (Fir Avenue) between 3rd Street and 5th Street. See **Figure 2-5** for an illustration of this concept.
- **Roadway Shoulders** – no long-term improvements to accommodate bicycle and pedestrian traffic was identified in the *LLTP* or the City's *Pedestrian Safety Plan* for OR 38 between US 101 and 3rd Street. This section also includes an at-grade crossing of the Central Oregon and Pacific Railroad (CORP). Options for providing a trail separated from the roadway are limited in this area, but a variety of options within the road right-of-way are possible. An interim solution is proposed to connect sections of the DDT that would involve bicycling or walking along the existing roadway shoulders with appropriate signage and pavement marking to maximize safety. This solution builds on the recently enhanced bicycle and pedestrian crossing of the CORP tracks and is practical as an interim strategy due to the low-speed and relatively low-traffic volumes along this highway segment. Over the longer-term, it is proposed that improvements be developed to tie the active transportation facilities along this section of the highway to existing improvements on OR 38 through development of sidewalks and bike lanes. A protected pedestrian/bicycle crossing should be developed at the CORP tracks.

Figure 3-21. Dean to Dunes Trail - Central Segment



Design Challenges and Trail Development Issues

- Provide clear bicycle and pedestrian crossings at the intersection of US 101 and OR 38.

Trail Amenities and Features

Key amenities and trail features to be installed in this section include:

- **Trailhead** in the eastern portion of Reedsport. A trailhead location should be identified during the design process in consultant with stakeholders in the community. Existing on-street parking in the vicinity of Rainbow Plaza could be considered for this purpose. This trailhead should include safe access to the trail that separates vehicular and trail users (i.e., installation of bollards and signage to prevent vehicles using the trail), and provide bicycle storage/parking, as well as wayfinding, directional and trail logo signage. Additionally, restrooms are proposed in the LLTP close to a recommended levee trailhead near US 101 and the Scholfield Creek Bridge and these could also be used by persons using the DDT.
- **Trail Crossings** at the following locations:
    - Trail crossing of OR 38 at the intersection of Fir Avenue with 3rd Street using the existing crosswalk on the west side of this intersection.
- **Trail Signage** – recommended trail signage in this section should include:
    - DDT logo signage
    - Wayfinding signage including mileage to the wide variety of activity centers located in Reedsport such as the cycle stop or bike station for minor repairs, restrooms, food and other supplies, visitor and interpretive facilities and others.
    - Regulatory and/or hazard signage.

Reedsport Cycle Stop and Public Art

- **Gateway Treatment** – Install a gateway feature in the westbound direction approaching Reedsport identifying that a traveler is entering a built-up area. This treatment could also include additional active signage that reinforces the 25 mph speed reduction sign that currently exists on westbound OR 38 east of the city. This gateway location could also be coupled with an overall map of trail facilities in the Reedsport Area that includes both DDT information as well as the LLT system. The map could indicate trail lengths and accessibility information.

ADA Compliance

Through this section the trail follows the roadway grade, thus it is expected that ADA compliance can be achieved.

3.3 PREFERRED EAST SEGMENT ALIGNMENT – REEDSPORT TO DEAN CREEK

The preferred Dean to Dunes Trail alignment in this segment runs along the north side of OR 38 east of 3rd Street from where the highway approaches the Reedsport city limits to the Dean Creek Elk Viewing Area visitor facility. As noted previously, the corridor passes through a variety of terrain with differing roadway types. The west end of the East Segment is a two-lane urban highway with 25 mph speeds from east of 3rd Street to east of Winchester Avenue. Upon leaving the developed area, speeds increase to 40 mph along the levee that separates the highway from the Umpqua River, and then to 55 mph from near the end of the levee to Dean Creek. There are varying rights-of-way and pavement widths and differing physical opportunities and constraints along the highway – all of which affect trail development.

It should be noted that development of a multiuse trail along OR 38 to the east of Reedsport involves more complex challenges than can be addressed in a planning level study such as the DDTP. Consequently, the information presented in the remainder of this section is not intended to identify a specific alignment with an associated cost estimate. Rather, it is intended to identify promising opportunities and key issues that must be addressed during a subsequent design level effort.

3.3.1 Overview of Trail Alignment

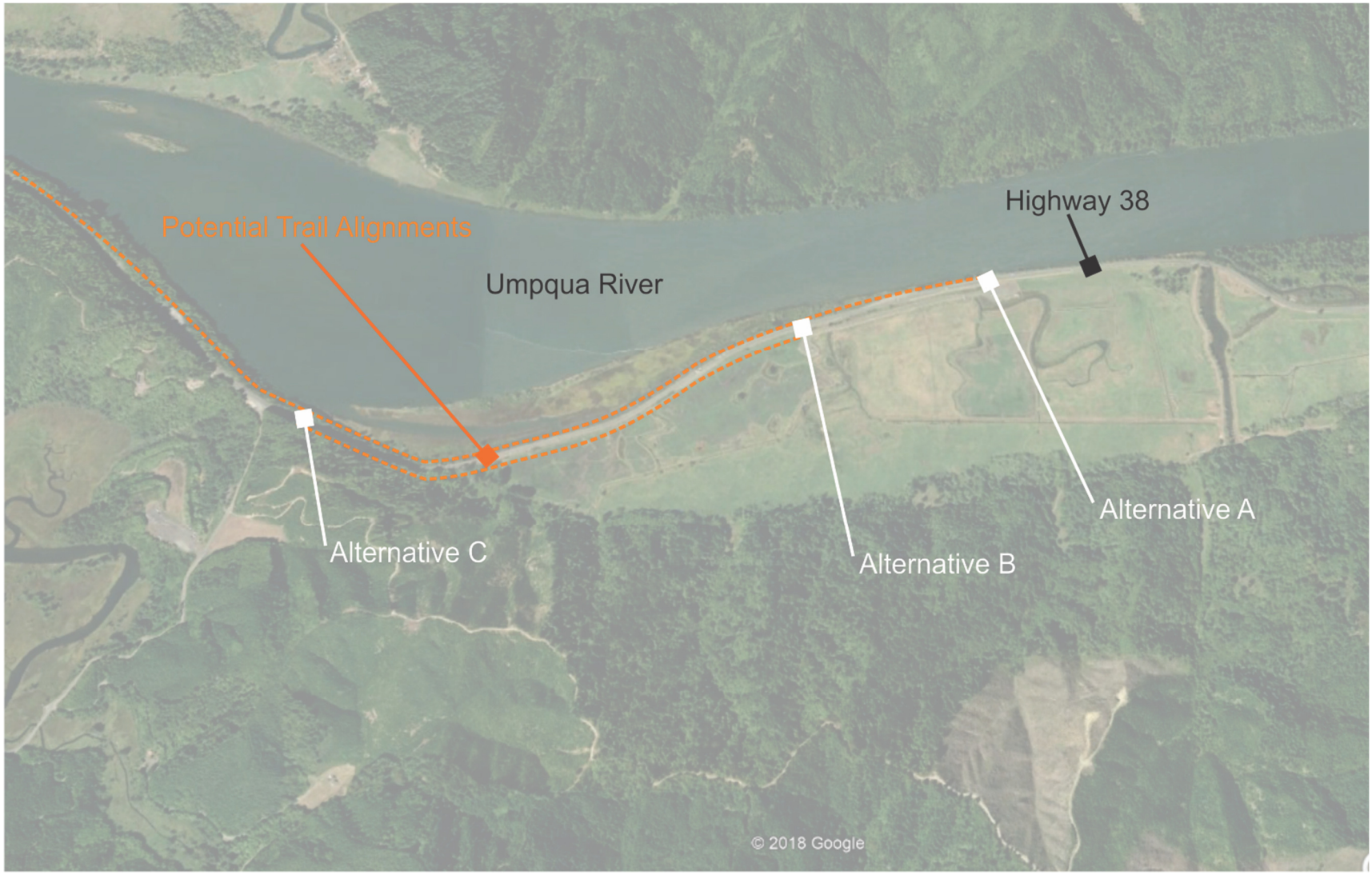
From west to east the East Segment of the preferred DDT concept follows the general alignment described below. The eastern portion of this segment is illustrated in **Figure 3-22** where various highway crossing alternatives are under consideration.

- **Beginning of East Segment** – The trail alignment starts on the northeast corner of the intersection of OR 38 with 3rd Street in the eastern portion of the City of Reedsport. It would continue east along the highway frontage and cross at-grade both Riverfront Way and the entrance to future developable property on Umpqua River frontage. This trail could connect to the Umpqua Discovery Center and the Levee Loop Trail system by using the existing Riverfront Way. A map of the recommended LLT is included in **Appendix A**.
- **Umpqua River Levee** - After crossing the property entrance road the trail would be ramped up onto the existing levee that parallels the north side of OR 38 for approximately 1,450 feet. This area is entirely within the existing Reedsport city limits. The levee is owned and maintained by the USACE and any trail facility would require coordination with and permitting by this agency. By being located off the highway, this alignment provides a more pleasant user experience along with a good view of the river.
- **OR 38 from Levee to Dean Creek** - East of the end of the levee, the trail would follow the north side of OR 38 to a location where it would cross the highway and the continue along the south side of the road to the Dean Creek Elk Viewing Area.

3.3.2 Section E-1: 3rd Street on OR 38 to Dean Creek Elk Viewing Area

The discussion of the trail improvements in the East Segment is more generalized than in the West Segment as this area is a lower priority for implementation than the West. Until further design engineering can be conducted, the appropriate location and type of highway crossing cannot be determined. Additionally, more detailed survey information will be needed to determine where there is sufficient existing width along the highway to add a buffered trail and where some other approach to

Figure 3-22. DDT East Segment Highway Crossings



trail design such as a cantilevered facility. Accordingly, while the overview discussion of the trail in the East Segment identifies specific sections which would have unique treatment, the entire East Segment is treated as a single section for the remainder of this report.

Trail Type

This trail section would include five trail types:

Street Adjacent to Lower Speed Road Concept – Fir Avenue is posted for 25 mph speeds and has limited right-of-way, making this trail concept the appropriate choice is this section. This 10-foot asphalt pathway would run along the north side of Fir Avenue from east of 3rd Street to the point at which the existing Umpqua River levee begins. It would be separated from the roadway by at least a 5-foot wide buffer. This buffer 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. The trail would make an at-grade crossing of Riverfront Way and the existing entrance road to future developable riverfront property. See **Figure 2-2** for an illustration of this concept.

Trail on Levee – East of the future riverfront development entrance road, the trail would access the existing Umpqua River levee via a new ramp that will require approval by the USACE and must meet ADA standards. The trail would follow the levee alignment for approximately 700 feet where a gated opening in the levee currently exists. At this point, the trail would need to drop back down to highway grade, cross the opening and then go back up onto the levee via another ramp. For a short distance the trail would be closer to the highway but would be buffered to preserve a sense of comfort for trail users. The gated crossing is currently unused but is expected to be used in the future as the riverfront property develops. When a full access road is developed at this location, trail crossing enhancements would be necessary including appropriate signage and pavement marking. The trail would continue along the levee for another 700 feet at which point it would ramp back down to highway grade. The trail would be paved with asphalt concrete and would be narrower than the Preferred Trail Concept due to the limited width of the levee itself. An illustration of this type of trail is presented in **Figure 2-6**.

East of the levee the highway follows an alignment that is narrower and has frequent steep topography on either side (both up and down). Generally, the highway alignment through this area to a point just west of Dean Creek would preclude development of the Preferred Trail Concept. Trail recommendations in this area include the "Street Adjacent to Higher Speed Road Concept" and the "Multiuse Cantilevered or Pile-Supported Path" both of which are described below. Stationing of these trail types cannot be accomplished at this time due to insufficient survey information. Generally, the trail would stay on the north (river) side of OR 38 but would ultimately need to cross the highway to reach the Dean Creek Elk Viewing Area. As shown in **Figure 3-22** there are several potential highway crossing alternatives that require further investigation.

Street Adjacent to Higher Speed Road Concept – This trail concept would be used in locations where there is sufficient ROW to provide a barrier-separated facility and where speeds are 40 mph or greater. A concrete barrier with appropriate shy distance would be provided between the 10-foot trail and the highway. This pathway would also be separated from vehicular traffic by the highway shoulder. The trail would be paved with asphalt concrete. See **Figure 2-3** for an illustration of this concept.

Multiuse Cantilevered or Pile-Supported Path – This type of trail would provide a separated 10-foot wide multiuse structure set on fill or piers between the highway shoulder and the existing slope in areas

where there is insufficient right-of-way to provide a full barrier-separated trail on the same grade as the highway. A trail supported by pin piles or piers may be preferable to the extensive earthwork and environmental permitting that would otherwise be needed to provide sufficient trail width closer to the highway in an area with steep slopes and/or sensitive natural resources. Path materials may include wood, steel, concrete, or some combination of these materials. An illustration of a cantilevered path is presented in **Figure 2-4**. An alternative to the use of pin piles or piers would involve trail construction using retaining walls.

Preferred 10-foot Trail Concept – East of the narrow highway sections where sufficient right-of-way becomes available, the 10-foot Preferred Trail Concept would be used. Care should be taken in design and construction to minimize any wetland or river-related impacts in this area. Depending on which highway crossing alternative is selected for implementation, the trail may be either on the north or south side of OR 38. The various highway crossing alternatives are illustrated in **Figure 23** through **Figure 25**. An illustration of the Preferred Trail Concept is presented in **Figure 2-1**. The trail would be paved with asphalt concrete.

Trail Amenities and Features

Key amenities and trail features to be installed in this section include:

- **Trailhead** in the eastern portion of Reedsport. A trailhead location should be identified during the design process in consultant with stakeholders in the community. Existing on-street parking in the vicinity of Rainbow Plaza could be considered for this purpose. This trailhead should include safe access to the trail that separates vehicular and trail users (i.e., installation of bollards and signage to prevent vehicles using the trail), and provide bicycle storage/parking, as well as wayfinding, directional and trail logo signage. Additionally, restrooms are proposed in the *LLTP* close to a recommended levee trailhead near US 101 and the Scholfield Creek Bridge and these could also be used by persons using the DDT.
- **Trail Crossings** at the following locations:
    - Trail crossing of Riverfront Way and the entrance to the area north of the levee and east of Riverfront Way where these streets intersect Fir Avenue (OR 38). Trail markings and signage should be installed at these intersections including bollards to restrict vehicular access to the trail. Existing illumination in this area may need to be enhanced.
    - A crossing of OR 38 at a location and of a type to be determined during further preliminary concept engineering and development. Examples of potential highway crossing locations and types are shown in **Figure 3-22** through **Figure 3-25**.
- **Trail Signage** – recommended trail signage in this section should include:
    - DDT logo signage
    - Wayfinding signage including mileage to the wide variety of activity centers located in Reedsport or other destinations.
    - Directional signage to clearly identify the alignment of the DDT, particularly up onto and off of the levee.
    - Regulatory and/or hazard signage.

Figure 3-23. OR 38 Trail Crossing Alternative A

Figure 3-24. OR 38 Trail Crossing Alternative B

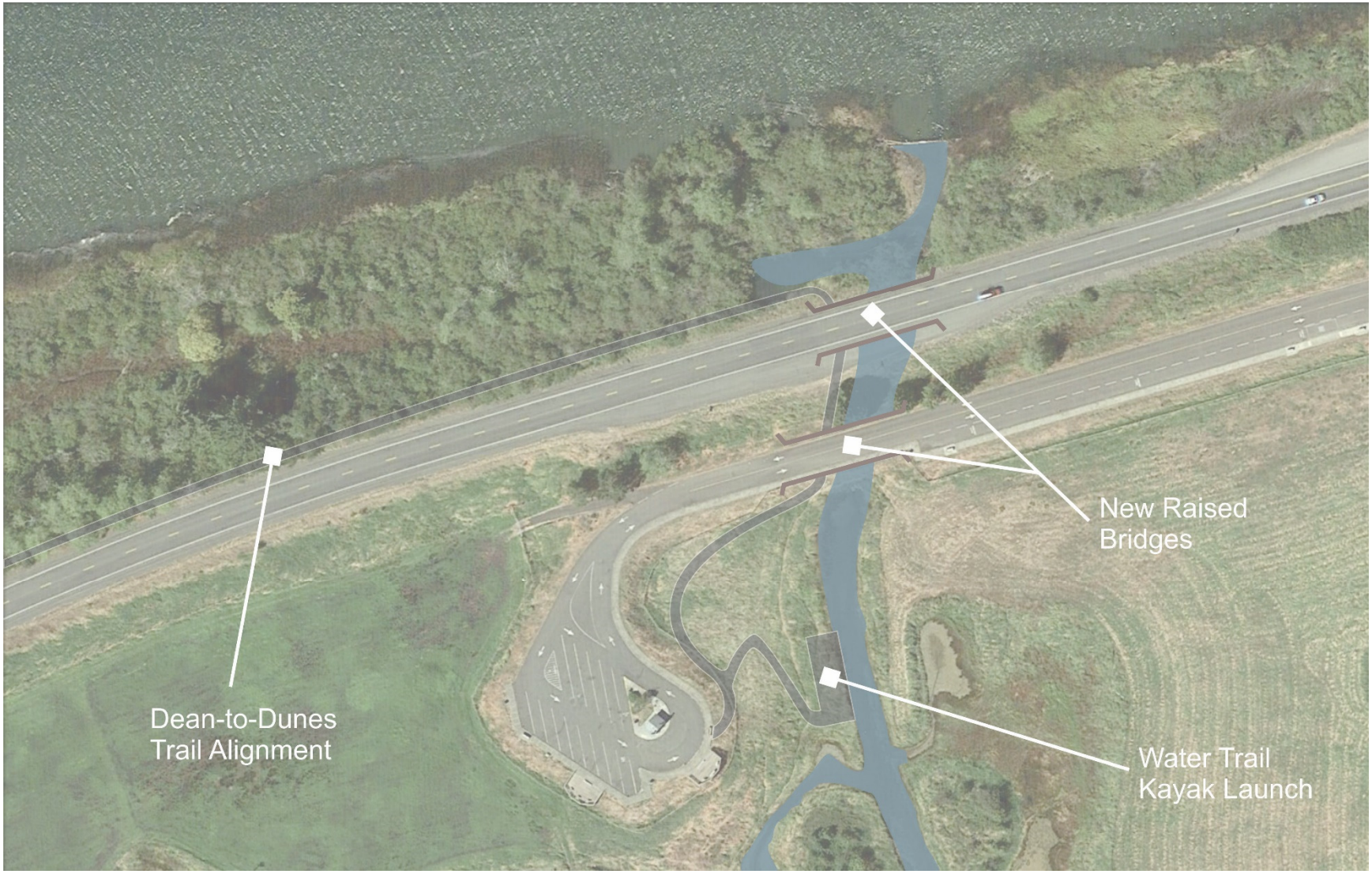


Figure 3-25. OR 38 Trail Crossing Alternative C

As noted in the LLTP because USACE standards preclude footings dug into the levee, any signage would need to be located off of the levee berm, most probably at the toe of the levee ramp.

Design Challenges and Trail Development Issues

The levee trail and 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 of 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. The City and/or ODOT will need to consult closely with USACE to find amenity solutions that satisfy regulations.
- There is the need for levee ramps not only at the beginning and end of this facility but also at the existing gate near the mid-point along the length of the levee to provide a continuous trail connection.

ADA Compliance

Through this section the trail follows the roadway grade in some areas, thus it is expected that ADA compliance can be achieved in those areas.

Where the trail is on the levee, the slope of the levee berm may require railings or other safety amenities. As discussed above, this may dictate an alignment off the levee. If the trail can be constructed on the levee, it will need to descend for at-grade crossings at levee breaks. Trail grade at these locations would need to meet ADA requirements.

In the area where the trail uses a cantilevered section or there are retaining walls due to the steep slope down to the Umpqua River, railings would likely be necessary. If the trail moves away from the roadway, ADA compliant grades must be maintained by the trail as well. This may require landings in steeper sections if the trail rises and falls with the topography.

Should a pedestrian bridge be used to cross the highway, or an undercrossing, similar ADA design requirements will need to be met in these areas.

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4. COST ESTIMATES AND FUNDING OPPORTUNITIES

This chapter includes planning level cost estimates for trail improvements, focusing primarily on the West Segment which is the priority for implementation. The chapter also presents a summary of key funding sources of active transportation and trail-related improvements.

4.1 COST ESTIMATES

4.1.1 Cost Estimating Methods, Assumptions and Resources

Cost estimates have been prepared by ODOT in support of two pending grant applications through the Federal Lands Access Program (FLAP) for development of the DDT. In the West Segment, the grant application is for design refinement/engineering and construction. In the east segment, an overall capital budget has been identified but the initial grant application would support a design and preliminary engineering study to refine the trail alignment identified in the DDTP. These cost estimates are presented below.

4.1.2 Preferred West Segment Alignment – Reedsport to Oregon Dunes

As part of an application for Federal Lands Access Program (FLAP) funding, ODOT prepared a planning level cost estimate for this portion of the DDT. A total project cost of $16,374,000 was identified as described in **Table 4-1**.

Table 4-1. Cost Estimate for West Segment Trail

Item		Total Cost
Total Estimated Construction Cost		$12,811,000
Right-of-way Acquisition		$1,000,000
Construction Engineering		$1,281,000
	Total Cost	$16,374,000

4.1.3 Preferred East Segment Alignment – Reedsport to Dean Creek

A planning level cost estimate for the East Segment of the DDTP trail could not be developed due to the lack of sufficient information about existing highway corridor topography and design constraints. ODOT has indicated an intent to submit a FLAP grant application in an upcoming cycle to conduct more detailed design analysis in the corridor. A final trail alignment will be identified at that time.

4.2 FUNDING OPTIONS

Funding for bicycle and pedestrian facilities comes from a variety of local, state and federal sources. This section discusses a variety of funding sources that could be used to design and construct the Dean to Dunes Trail.

4.2.1 State Funds

State funding for bicycle and pedestrian improvements include the following key programs.

Statewide Transportation Improvement Program (STIP)

The STIP documents Oregon's planned investments in transportation throughout the state over a four-year period. It includes multimodal projects on state, city and county transportation systems that are funded by state and federal sources. The allocation of funds in the STIP falls into several categories from which bicycle and pedestrian funding can be secured. These include:

- Enhance (which expands or improves the system)
- Fix It (which involves taking care of the existing system)
- Non-Highway Program
- Local Government Programs

The **Enhance program** provides funding for bicycle and pedestrian improvements through a combination of state and federal dollars. Funding is competitive with decisions made by the Oregon Transportation Commission in consultation with regional and local governments, public agencies and the public through a process that relies on recommendations from Area Commissions on Transportation (ACTs). Enhancement funds have a 10.27 percent match requirement.

The **Fix-It program** also provides the opportunity for funding through a set aside for specific types of bicycle and pedestrian improvement project such as:

- Sidewalk Improvement Program (SWIP) that is used to add pedestrian and bicycle facilities onto other projects or as stand-alone investments (like pedestrian crossings, pedestrian signals, sidewalk infill, shoulder widening or bicycle lane striping.
- Quick Fix funds are used on a discretionary basis for bicycle and pedestrian improvements on the state highway system for things such as sidewalk infill, pedestrian crossings and bicycle lane striping.

Non-Highway programs competitively fund bicycle and pedestrian projects along with public transportation. Projects are approved by the Oregon Transportation Commission with input from Area Commissions on Transportation.

Connect Oregon

Bicycle and pedestrian projects are not eligible to use the State Highway Fund are eligible for funding under this grant program on a competitive basis. The program is funded biennially by the Oregon legislature, and includes a new $15 bicycle excise tax in addition to lottery-backed bonds. The bicycle excise tax will be used only on bicycle and pedestrian projects. Connect Oregon funds have a 30 percent matching requirement.

Recreational Trail Program

Recreational Trail Program Grants (RTP) are federally-funded and administered by the Oregon Department of Parks and Recreation (OPRD). RTP grants can be used to develop, construct, maintain and rehabilitate trails and trail facilities for hiking, bicycling and all-terrain vehicle riding. Yearly grants are awarded based on the level of funding approved by the U.S. Congress. Eligible applicants include cities, counties, state and federal agencies. The program requires a 20 percent match.

4.2.2 Federal Funds

A Federal funding program that could be used to develop the DDT includes:

Federal Lands Access Program (FLAP)

Federal Lands Access Program (FLAP) funds are intended to connect county roads and state highways to Federal high-use recreational areas or Federal economic generators located on Federal lands. Within the DDT corridor, these federal lands include the Suislaw National Forest, the Army Corps of Engineers beach parking west of Winchester Bay, and the Oregon Dunes National Recreation Area at the west end of the corridor, and the Bureau of Land Management's Dean Creek Elk Viewing Area at the east end. Eligible projects include research, planning, engineering, construction, or maintenance activities related to road, bicycle and pedestrian improvements. Eligible agencies include all Federal Land Management Agencies in Oregon, the State of Oregon, local governments and tribes. Applications must be submitted jointly from a federal and local agency.

Money for this program is available from the Highway Trust Fund and is subject to annual appropriation by the U.S. Congress. For the current fiscal year, nearly $33 million is available in the State of Oregon for projects. These projects are selected through a competitive application process and require a 10.27 percent match.

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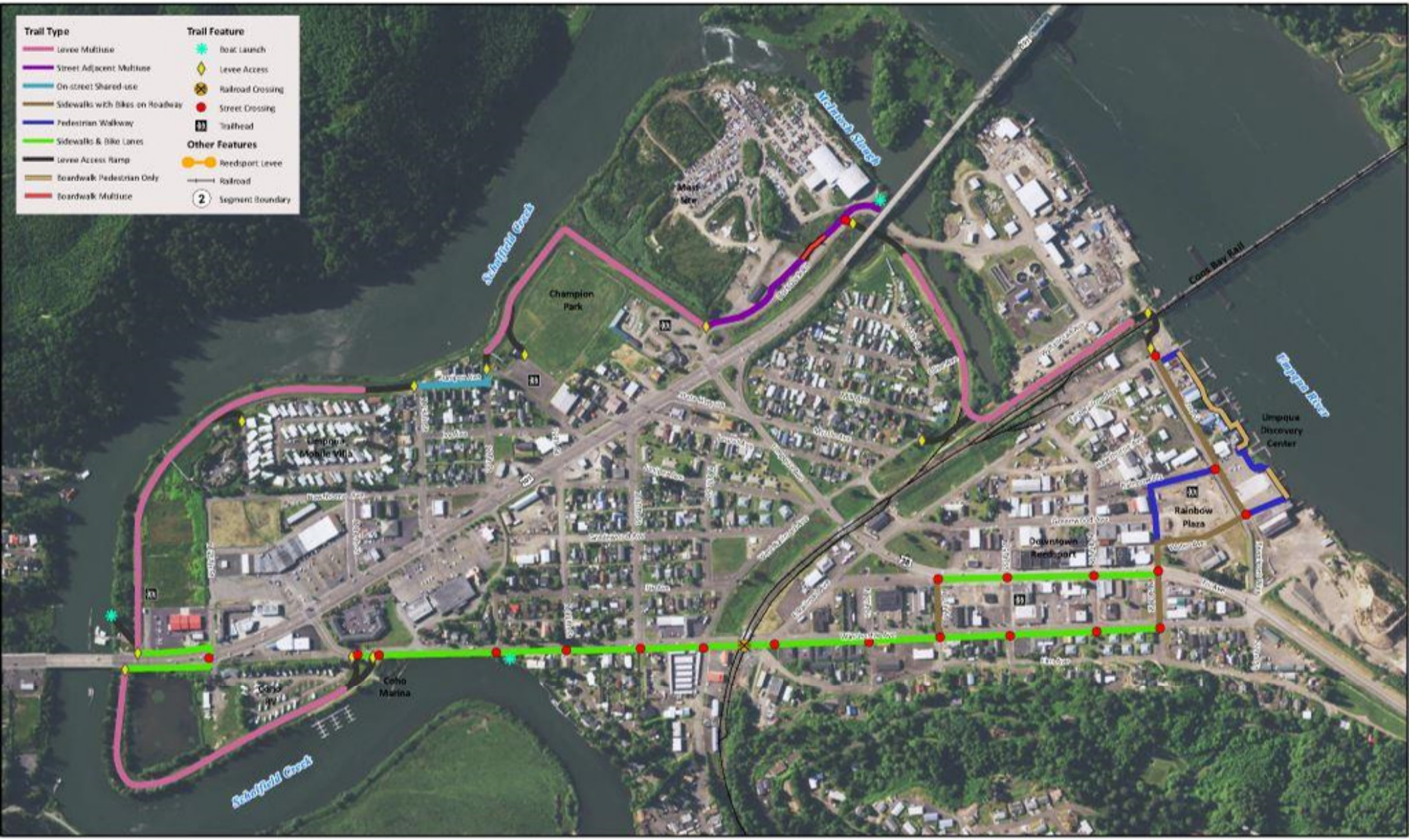
APPENDIX A

LEVEE LOOP TRAIL PLAN PREFERRED OPTIONS


Trail Type
Levee Multiuse
Street Adjacent Multiuse
On-street Shared-use
Sidewalks with Bikes on Roadway
Pedestrian Walkway
Sidewalks & Bike Lanes
Levee Access Ramp
Boardwalk Pedestrian Only
Boardwalk Multiuse
Trail Feature
Boat Launch
Levee Access
Railroad Crossing
Street Crossing
Trailhead
Other Features
Reedsport Levee
Railroad
2
Segment Boundary
Schofield Creek
Champion Park
Coos Bay Rail
Umpqua River
Umpqua Discovery Center
Rainbow Plaza
Downtown Reedsport
Coho Marina
Schofield Creek

APPENDIX B

WEST SEGMENT ENVIRONMENTAL BASELINE REPORT

Region 3
Reedsport – Dunes Multi-Use Path
Environmental Baseline Report
(Scoping Level)

Douglas County, OR

T22S, R12W, Sections 4, 5, 7, 8
T22S, R13W, Sections 12 & 13

USGS Reedsport and Winchester Bay Quads

This Environmental Baseline Report shows a "scoping level" summary of the notable environmental permits, surveys, and clearances for the proposed Reedsport-Dunes Multi-Use Path.

Prepared by: Sam Dunnavant Date: March 9, 2018

Sam Dunnavant
ODOT Regional Environmental Coordinator, Region 3, District 7

A review of project impacts to environmental and cultural resources revealed the clearances that will be needed for this project: The notable clearances are summarized in the table below.

Table 1.0

Environmental Area	Requires Further Study		
	Yes	No	Why (Brief Summary)
Archaeology	X		• Undisturbed portions of the proposed pedestrian path may contain cultural resource deposits. A pedestrian survey (and possible subsurface probing) will be required. A 19th century shipwreck and an archaeological shell midden site have been reported in the vicinity of the proposed path. However, the exact location of the midden site is unknown.
Biology	X		• Extending the culverts that cross US101 at M.P. 214.0, 214.38, 215.32, and 215.60 would trigger fish passage law and require each of those culverts to be replaced with culverts that met State and Federal Fish Passage requirements. A Fish Passage Plan would be required at each location. • Silver Creek runs parallel to US101 for approximately one mile. This will likely cause geographical limitations when trying to fit a multi-use path though portions of this section. • A plant survey will be needed throughout the entire Area of Potential Impact. Based on the results of that survey, subsequent ESA clearance for rare plants will be required. • This project will result in an increase in impervious surface. That new impervious surface will be for non-pollutant generating purposes (i.e. the multi-use path). However, if curbing or something similar is added that redirects the current runoff patterns, then adequate water quality treatment will be necessary (expanded ditches, swales, etc.).
Floodplain/Floodway	X		It appears that a small portion of this project is within the 100-year floodplain. Thus, a "No Rise" Floodplain Certification and possible HEC-RAS analysis will be required by the Douglas County Planning Department.
Hazardous Materials	X		Based on DEQ's Facility Profiler database, it does not appear that there would be major HazMat-related issues as a result of this project. However, a standard HazMat clearance will be required once this project reaches the Project Delivery phase.

Environmental Area	Requires Further Study		
	Yes	No	Why (Brief Summary)
Parks- Section 4(f)/6(f)	X		A portion of the school property just east of US101 at M.P. 213.2 is considered Section 6(f). The Project Development Team will want to stay on ODOT Right of Way in order to avoid a Section 6(f) Conversion. In addition, for the portion of the proposed path along Salmon Harbor Drive, Windy Cove Campground is located on the south side of Salmon Harbor Drive and Lighthouse State Park is located at the extreme south end of the proposed path. Impacts to those areas will want to be avoided.
Water Quality/Storm Water Mgmt.	X		This project will result in an increase in impervious surface. That new impervious surface will be for non-pollutant generating purposes (i.e. the multi-use path). However, if curbing or something similar is added that redirects the current runoff patterns, then adequate water quality treatment will be necessary (expanded ditches, swales, etc.).
Wetlands	X		This project has a large Area of Potential Impact (API). A Wetland Determination will be required throughout the entire API. There is an area of vast wetlands located along US101 between M.P. 214.5 and 215.7. Impacts to these wetlands will need to be minimized as much as possible. Any unavoidable wetland impacts will need to be mitigated and permitted. Mitigation rates are approximately $100,000 per acre. However, physical mitigation will be required for any impacts over 0.1 acre, and there are currently no mitigation banks on the South Coast.
Waterways and other waters of U.S. and State	X		• Extending the culverts that cross US101 at M.P. 214.0, 214.38, 215.32, and 215.60 would trigger fish passage law and require each of those culverts to be replaced with culverts that met State and Federal Fish Passage requirements. A Fish Passage Plan would be required at each location. • Silver Creek runs parallel to US101 for approximately one mile. Impacts to Silver Creek would have to be minimized to the extent possible. This will likely cause geographical limitations when trying to fit a multi-use path though portions of this section. • Any impacts to any "waters" will need to be permitted by the Oregon Department of State Lands and the US Army Corps of Engineers.