US 97 Bend North Corridor Project

Final Environmental Impact Statement and Final Section 4(f) Evaluation

July 2014

U.S. Department of Transportation
Federal Highway Administration

Oregon Department of Transportation

Federal-Aid Number: S004(112) • **ODOT Key Number:** 14020 • FHWA-OR-EIS-14-01-F

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US 97 Bend North Corridor Project
Deschutes County, Oregon
ODOT Key Number: 14020
Federal Aid Number: S004(112)
Final Environmental Impact Statement
and Final Section 4(f) Evaluation

Submitted Pursuant to 42 USC 4332 (2)(c) and where applicable, 49 USC 303
by US Department of Transportation, Federal Highway Administration (FHWA)
and Oregon Department of Transportation (ODOT)

Robert Bryant, ODOT Region 4 Manager

July 24, 2014
Date of Approval

Phillip A. Ditzler, FHWA Division Administrator

July 24, 2014
Date of Approval

The following persons may be contacted for additional information concerning this document:

Amy Pfeiffer
ODOT Region 4
63055 N Highway 97, Bldg M
Bend, OR 97701
(541) 388-6052

Anthony Boesen
FHWA
530 Center Street NE, Suite 420
Salem, Oregon 97301
(503) 399-5749

The Oregon Department of Transportation (ODOT) and Federal Highway Administration (FHWA) plan to improve a segment of US 97 in Deschutes County, Oregon between the Deschutes Market Road/Tumalo Junction interchange and the Empire Avenue interchange. A Draft Environmental Impact Statement (EIS) for the US 97 Bend North Corridor Project was published in July 2011. The Preferred Alternative for the project is an approximately two-mile, access-controlled, four-lane bypass, expressway on a new alignment.

The Preferred Alternative will reroute US 97, from Empire Avenue to just north of Grandview Drive, east of its current alignment, adjacent to the existing railroad tracks. For this segment, the current US 97 roadway would become an extension of 3rd Street and local arterial. A new signalized intersection with US 97 and 3rd Street will be constructed at the northern end of the bypass. The project will reduce traffic congestion, improve traffic flow, and enhance public safety on US 97 between the Deschutes Market Road/Tumalo Junction interchange and the Empire Avenue interchange. Adverse impacts from the project will include the conversion of 82 acres of land to highway use; displacement of 44 businesses and 6 residences; relocation or removal of 1 historic resource; creation of 39 acres of new impervious surfaces while 95 acres of contributing impervious area will be treated; noise impacts to 55 residences and outdoor areas at 4 businesses that will not be abated; while noise abatement will be considered in final design for 12 residences that are noise impacted.

Total project construction cost for the Preferred Alternative is approximately $174 million in 2016 dollars, of which estimated right of way costs are approximately $74 million. The project will be constructed in phases. Specific phases have not yet been identified. Construction is planned to begin in 2016.

TO THOSE WHO HAVE EXPRESSED INTEREST IN THE:

US 97 Bend North Corridor Project
Final Environmental Impact Statement and
Final Section 4(f) Evaluation
Deschutes County, Oregon
ODOT Key Number: 14020
Federal Aid Number: S004(112)

Thank you for your interest in the proposed US 97 Bend North Corridor Project.

The Federal Highway Administration (FHWA) and Oregon Department of Transportation (ODOT) have completed the **Final Environmental Impact Statement (EIS) and Final Section 4(f) Evaluation** for the project.

If you have questions or need additional information concerning the proposed project, please contact Amy Pfeiffer, ODOT Environmental Project Manager at: (541) 388-6052.

Thank you for your participation,

Robert Bryant
ODOT Region 4 Manager

This Executive Summary provides an overview of the project and its potential impacts. The US 97 North Bend Corridor Project Final EIS provides the information in greater detail.

ES.1 Proposed Action

ES.1.1 Project Identification and Description

US 97 is a strategic north-south highway that runs through the central portion of the state and complements the I-5 corridor, as shown in Exhibit ES1. It is designated as a statewide facility and freight route on the National Highway System, and as an expressway from the south end of the City of Redmond through Bend. US 97 is a critical link in moving goods and people through Central Oregon. In the Bend area, US 97 is used as a route for local residents to travel to and from home and work, and it is a connection to area shopping, dining, businesses, schools and recreation. Bend and Central Oregon have experienced significant population growth over the past decade. Between April 2000 and July 2006, Bend was the fourth-fastest growing metropolitan area in the United States (US Census Bureau 2007), although the recent economic downturn has slowed development in Bend over the last five years. Bend's population growth, in combination with US 97 also serving as a regional facility that moves freight and traffic through the region, has led to an increase in traffic congestion and delay, disruptions in traffic flow, and an increase in the severity of vehicular crashes along US 97.

The Oregon Department of Transportation (ODOT) and Federal Highway Administration (FHWA) propose to improve an approximate 6-mile corridor on US 97 in Deschutes County, Oregon between the Deschutes Market Road/Tumalo Junction interchange and the Empire Avenue interchange to address congestion, traffic flow, and safety on this highway corridor. Exhibit ES-2 summarizes the proposed action's location, funding, length, and project type.

This Draft Environmental Impact Statement (EIS) was prepared to analyze the environmental impacts of the proposed action.

This Final EIS documents all of the alternatives considered during the development and narrowing of alternatives. The Preferred Alternative includes modifications to the East DS2 Alternative, in response to comments received on the Draft EIS. The Draft EIS was published in July 2011 and circulated for public comment, including a public hearing. This Final EIS discloses the beneficial and adverse impacts resulting from the Preferred Alternative, identifies the Preferred Alternative, and responds to public and agency comments submitted on the Draft EIS.

Definition

Practical Design

Practical design is a strategy to deliver focused benefits for the State's transportation system while working with the realities of a fiscally constrained funding environment.

Definitions

Area of Potential Impact

The area of potential impact (API) is the area within which potential direct impacts from the proposed action may occur.

Public Approach Road

Public approach road is an existing or planned city street or county road connection that provides vehicular access to and from a highway.

Private Driveway

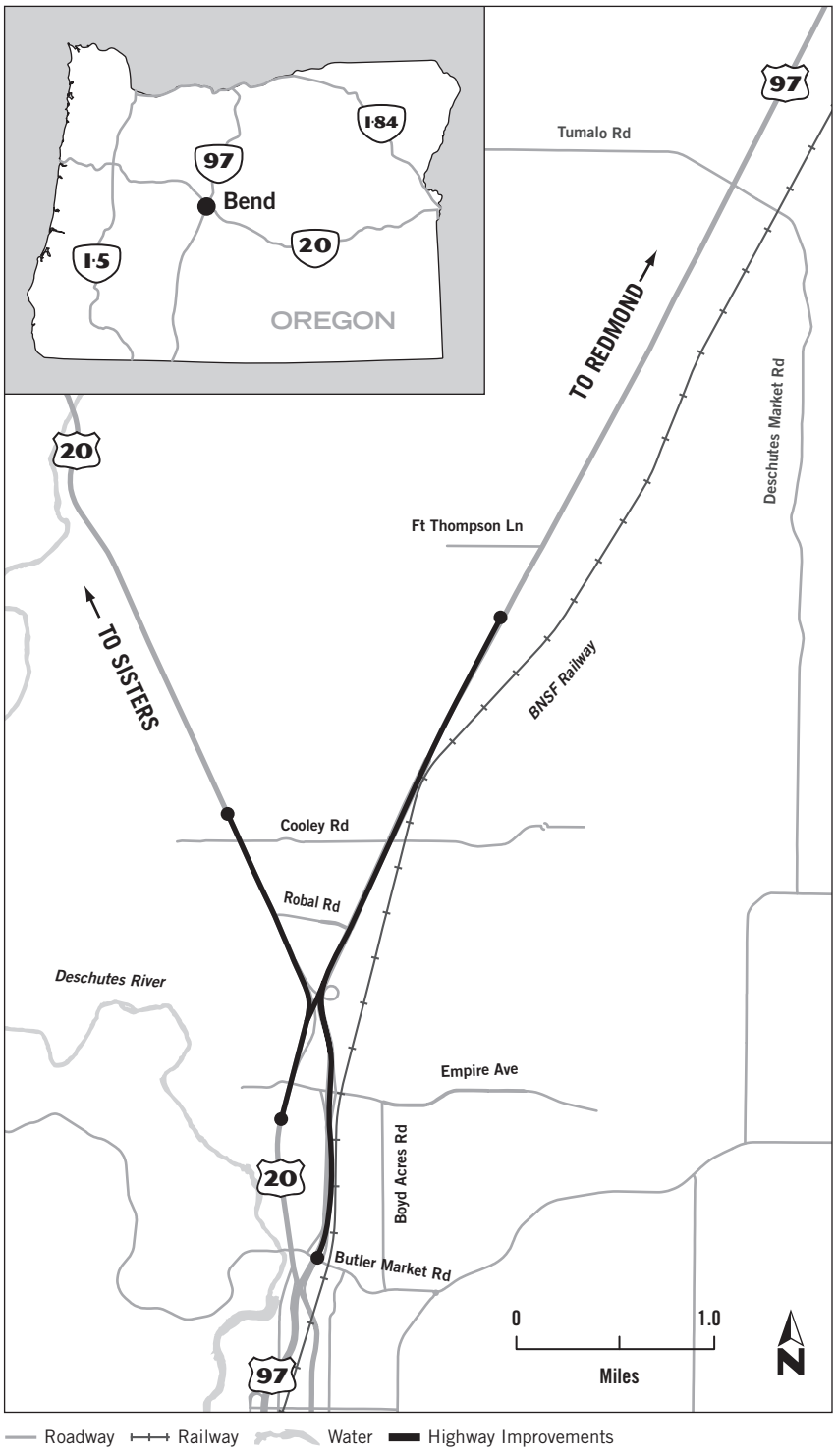
Private driveway is an approach that serves vehicular access to a roadway from one or more properties and that is not a public approach road.

Peak Hour

A peak hour (or rush hour) is a part of the day with the highest traffic volume during which traffic congestion on roads is worst. Normally, the two peak hour periods (morning and evening) occur when people are traveling to or from work or school.

The 2007 evening peak hour in the API is 4:00 to 5:00 pm. By 2035, the peak period will likely spread across multiple hours.

Exhibit ES-1: *Proposed Action Corridor*



ES.1.2 Purpose of and Need for the Proposed Action

Purpose of the Project

The purpose of the proposed action is to improve safety and mobility for trucks and automobiles on US 97 by implementing a practical design solution that is affordable within the potential 20-year funding opportunities and that meets the following performance objectives for

the medium-term (5-10 years) and long-term (over 10 years) planning periods as defined by the Bend Metropolitan Planning Organization's *2007–2030 Metropolitan Transportation Plan.* Performance objectives for the proposed action include:

- Makes incremental improvements to reduce delay, congestion, and the number and severity of crashes at the US 97/Cooley Road and US 97/Robal Road intersections within the medium-term planning period
- Reduces delay and congestion, and improves safety and operations on US 97 as an expressway between the Deschutes Market Road/ Tumalo Junction interchange and Empire Avenue interchange
- Supports economic development consistent with local agency plans; minimizes impacts to existing and planned local economic base; and provides for existing and planned local connectivity within the long-term planning period.

Exhibit ES-2: *Summary of the Proposed Action*

Project Name: US 97 Bend North Corridor Project	
State: Oregon	Southern Milepost: 136.33
County: Deschutes	Northern Milepost: 130.18
City: Bend	Project Length: 6 miles
ODOT Region: 4	Improvement Type: Highway realignment (modernization)
Highway/Roadway: US 97	Number of Proposed Travel Lanes on US 97: 4

Funding Source: FHWA and ODOT

Need for the Project

The proposed action is needed to address:

- **Congestion at Approaches**—Peak hour traffic volumes on US 97 within the area of potential impact (API) are at or exceed capacity of the current highway facility. If nothing is done by 2035, US 97 and the surrounding roadway systems, would experience severe congestion at public road approaches and private driveways during peak travel hours.

Since the publication of the Draft EIS, the ***2011 Amended Oregon Highway Plan*** was published in January 2012. For the urban expressway portion of US 97 located within the Bend Metropolitan Planning Organization boundary the ***2011 Amended Oregon Highway Plan*** revised the mobility standard from a v/c ratio of 0.80 to a mobility target of 0.85. On April 17, 2013 the Oregon Transportation Commission reviewed the expressway designation of this section of US 97 and decided to retain the expressway designation.

In the Final EIS the years of analysis for the No Build Alternative and the Preferred Alternative have been updated from 2007 to 2011 for the existing conditions, 2016 for the estimated year of opening, and

2036 for the future design year. Based on a trend analysis of traffic count data between 2007 and 2011, ODOT and the Bend Metropolitan Planning Organization determined that applying a 10 percent reduction to the 2007 existing traffic volumes would more accurately represent the future conditions (2036). This reduction in traffic volumes is reflective of the reduced population change in the Bend area between 2007 and 2011. This updated traffic analysis for the No Build Alternative demonstrates that if the longterm needs are not addressed, by 2036 US 97 and other roadway systems in the project's area of potential impact (API) would experience severe congestion during peak hours of travel.

Traffic Flow within the Corridor—Traffic flow on US 97 in the API is interrupted and slowed, especially during peak hours. By 2035, average daily traffic in the API is estimated to grow by over 40 percent. If no improvements are made, by 2035 travel times would increase substantially, average travel speeds would be reduced to less than 2 miles per hour (mph) in some areas, and longer traffic queues would further reduce traffic flow.

The result of the traffic analysis for the No Build Alternative in the Final EIS was similar to that for the No Build Alternative in the Draft EIS. If no improvements are made to US 97, the future (2036) traffic flow on US 97 would experience extensive delay and queuing; travel time would increase substantially; and average travel speeds would be reduced to 5 mph.

Safety—The number of severe injury or fatal crashes has increased in the API over the past six years. Specifically, the intersections of US 97 with Cooley Road and with Robal Road are listed in the top 5 percent of ODOT's 2010 Safety Priority Index System, which represents the locations with the highest collision history and ODOT's highest priorities for safety improvements. Also, the existing public road approaches and private driveways along US 97 are spaced substantially closer than current applicable design standards would recommend, further contributing to the increased risk of crashes as drivers encounter unanticipated congestion upon entering the API.

In October 2011, the Oregon Transportation Commission approved the ***Transportation Safety Action Plan***, an element of the ***Oregon Transportation Plan***. This document also serves as the State of Oregon's ***Strategic Highway Safety Plan***, a document required by federal law. The ***Transportation Safety Action Pla***n envisions a future where Oregon's transportation-related death and injury rate continues to decline.

The ***Updated Traffic Analysis Report*** prepared for the Final EIS includes an updated crash analysis and a new predictive analysis that identifies crash frequencies expected for the No Build and Preferred

Alternatives. The updated traffic analysis shows that number of severe injury or fatal crashes in the API has remained relatively constant, with a spike in 2008. The US 97 at Robal Road intersection has consistently been in the top 5 percent of crash locations in the state, while the US 97 at Cooley Road intersection alternates between the top 10 percent and top 5 percent. The predictive crash analysis prepared for the Final EIS also identified safety issues on the current facility, particularly at the US 97 and Cooley Road and US 97 and Robal Road intersections.

ES.1.3 Background

Project stakeholders have consistently requested the transportation infrastructure improvements associated with the proposed action should be economically feasible and support economic development.

Ability to Implement the Proposed Action within the Medium-term and Long-term Planning Periods—Based on past experience and forecasts for Central Oregon, it is conceivable that the proposed action could receive up to $250 million over a 20 to 30 year timeframe. It is not reasonable to assume that such a significant amount of funding could be raised within the first 10 years. Therefore, the ability to make fundable improvements by 2020 is critical in order to begin to provide some congestion relief and improve traffic flow and safety.

Current and Future Economic Lands—The City of Bend has identified the economic lands between US 97 and US 20 as an important component to its current and future economic base. In this vicinity, land can be generally described as being inside the current urban growth boundary (UGB) or being inside a proposed expansion of the UGB that was approved by the Bend City Council on January 5, 2009. Minimizing impacts to these economic lands, such as avoiding the bisection of parcels greater than 5 acres in size, is a key factor in understanding economic impacts associated with the proposed action.

More Information

The traffic analysis for the No Build Alternative assumes construction of approximately 30 publicly-funded and privately-funded road improvement projects. These include widening, realignment or extensions of existing roads, new roads, and new signals or roundabouts.

For additional detail on the publicly-funded and privately-funded roadway improvements assumed for the No Build Alternative see the ***Updated Traffic Analysis Report*** (ODOT 2014o), listed in Appendix K and available in the document library of the project's website (www.us97solutions.org).

ES.2 Alternatives Considered

FHWA and ODOT are considering three alternatives for the proposed action including two build alternatives and the No Build Alternative as required by the National Environmental Policy Act.

Based on the Draft EIS and comments received from agencies and the public, the East DS2 Alternative was modified to minimize impacts to neighborhoods east of US 97, and substantially minimize impacts to rural residential properties north of Cooley Road and west of US 97 by containing all improvements within the adopted UGB, except for the extension of Britta Street west of US 20 and the intersection improvements at Cooley Road and O.B. Riley Road. The East DS2 Modified Alternative is identified as the Preferred Alternative in the Final EIS.

ES.2.1 No Build Alternative

The No Build Alternative would maintain the current US 97 facility as it presently exists (Exhibit ES-3). The No Build Alternative consists of assigning design year 2036 travel forecasts to the financially constrained Bend Metropolitan Transportation Plan scenario. The transportation analysis for the No Build Alternative assumes construction of both publicly-funded and privately-funded roadway improvements and traffic signal projects, which include projects funded through the Oregon Statewide Transportation Improvement Program or the City of Bend's Capital Improvement Plan, and roadway improvements in approved private developments.

ES.2.2 Build Alternatives

Two build alternatives are being considered for the proposed action: the East DS1 Alternative and the East DS2 Alternative. Both alternatives would reroute US 97 east of its current alignment, adjacent to the existing railroad tracks. Where US 97 is realigned, the current US 97 roadway would be used as a portion of the extension of 3rd Street. Within the City of Bend UGB, jurisdiction over this converted segment of US 97 is proposed to be transferred to the City of Bend under either the East DS1 or East DS2 Alternatives. ODOT would retain jurisdiction of the newly realigned portion of US 97.

The Preferred Alternative will also involve transferring the jurisdiction of the current US 97 facility to the City of Bend; this facility will become an extension of 3rd Street as a result of the Preferred Alternative. ODOT will retain jurisdiction of the newly realigned portion of US 97.

Most of the common design features of the East DS1 and East DS2 Alternatives are located south of Cooley Road. These alternatives differ in the location and type of northern interchange. The commonalities and unique features of each build alternative are described below. The East DS1 and East DS2 Alternatives are shown in Exhibit ES-4 and Exhibit ES-5.

The Preferred Alternative does not include a northern interchange as contained in either the East DS1 or East DS2 Alternatives. As a result of the Preferred Alternative, US 97 connects to 3rd Street at a signalized intersection. Other design elements of the Preferred Alternative include enhanced pedestrian and bicycle improvements, design improvements for Empire Avenue, and a signalized intersection at 3rd Street and Mervin Sampels Road (Exhibit ES-5 FEIS).

Common Design Features of the Build Alternatives

Between Butler Market Road and Cooley Road, the East DS1 and East DS2 Alternatives have a similar design. Design features that are

Chapter 1 Purpose of and Need For Proposed Action
Chapter 2 Alternatives
Chapter 3 Affected Environment, Environmental Consequences and Mitigation
Chapter 4 Cumulative Impacts
Chapter 5 Local Short-term Uses and Long-term Productivity
Chapter 6 Irreversible and Irretrievable Commitment of Resources
Chapter 7 Comments and Coordination

Exhibit ES-3: *No Build Alternative*

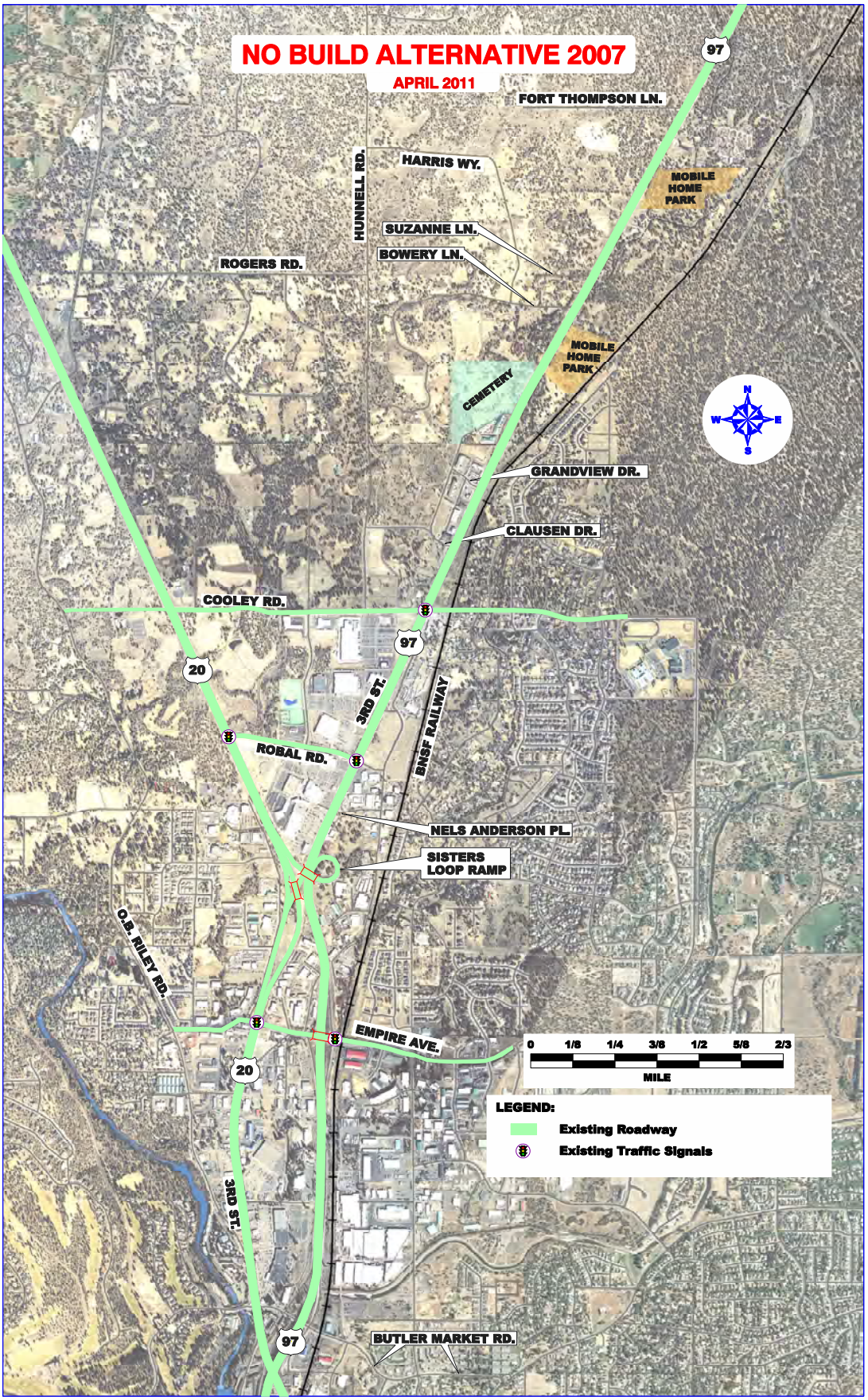


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Exhibit ES-4: *East DS1 Alternative*

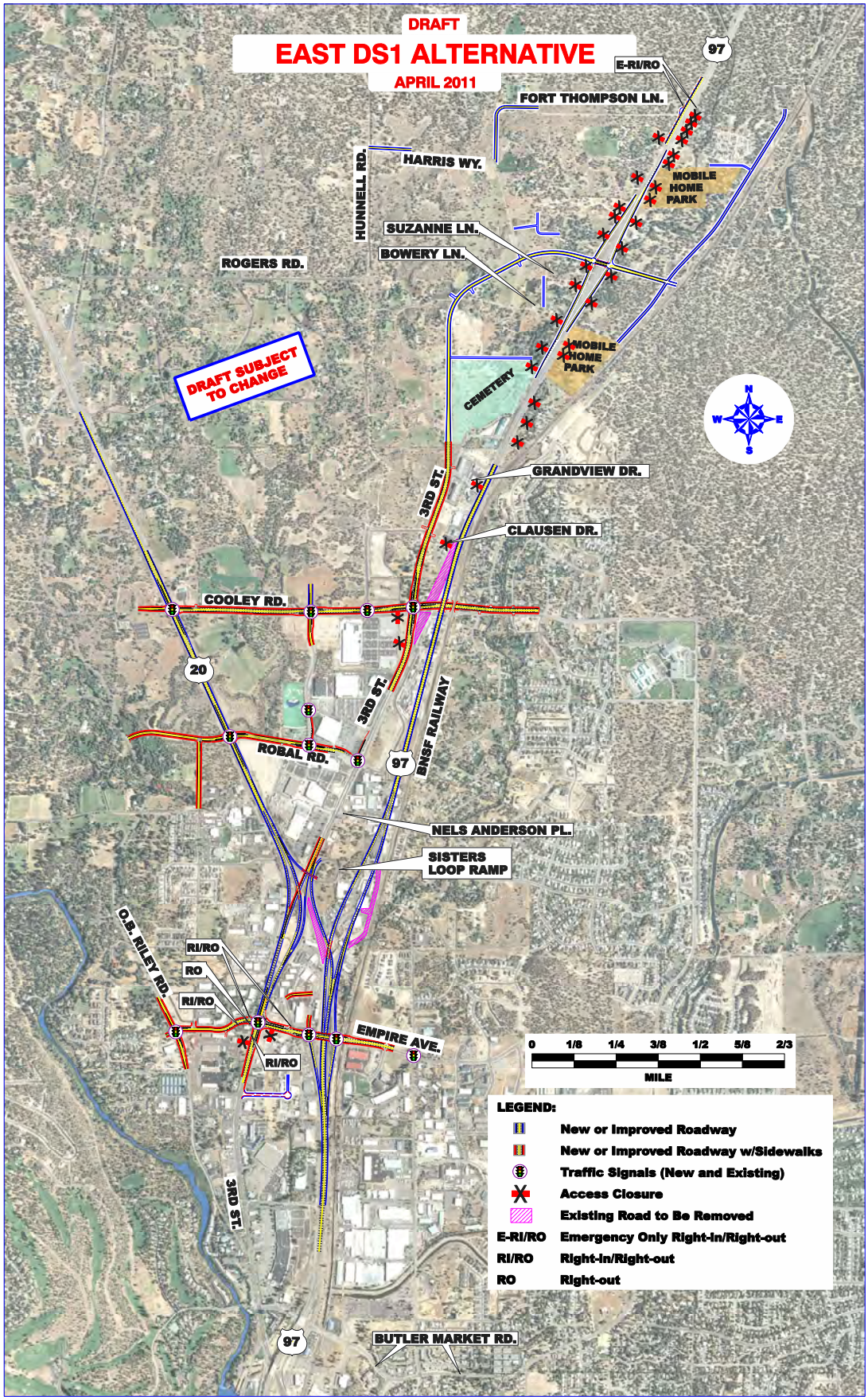


Exhibit ES-5: *East DS2 Alternative*

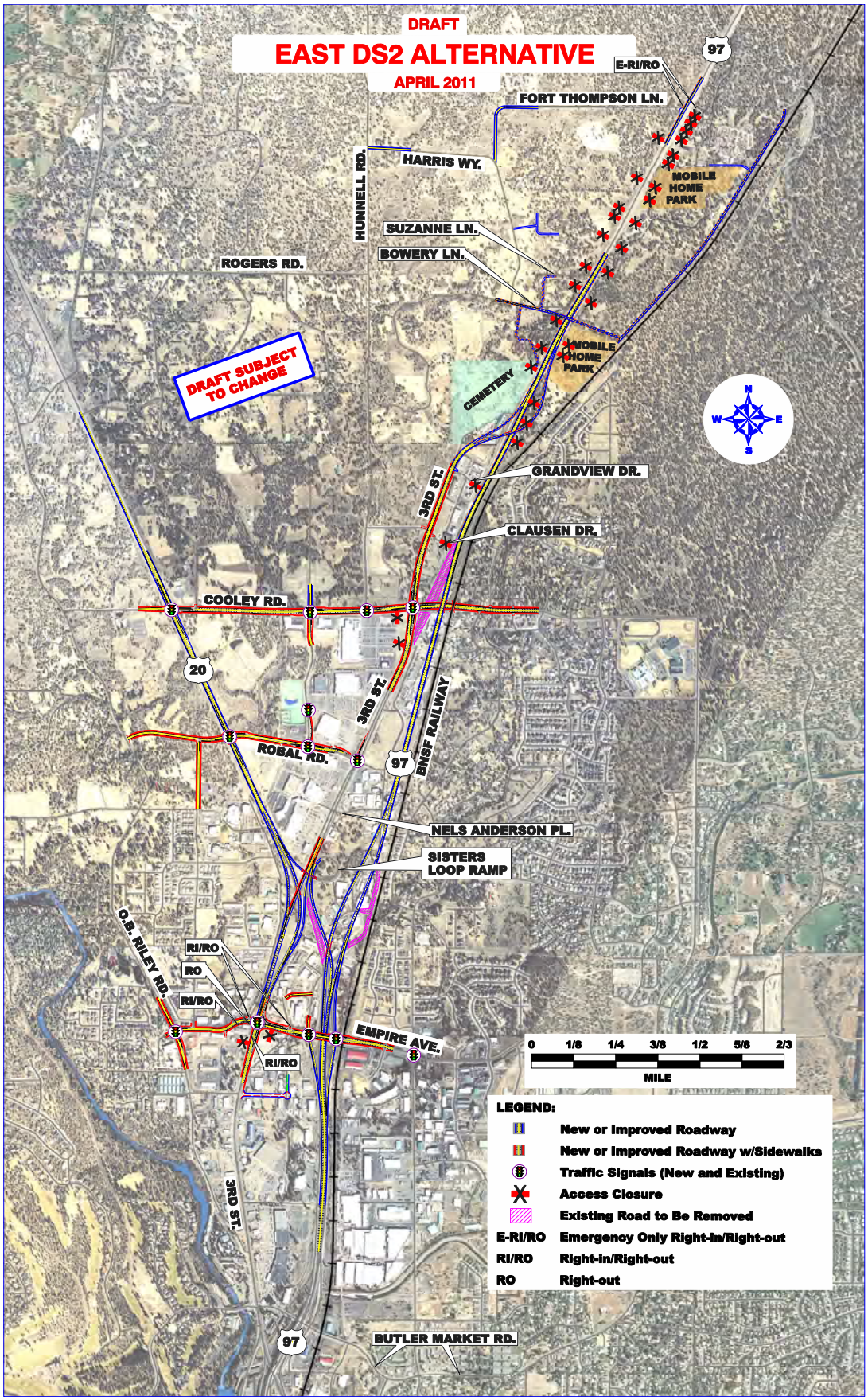
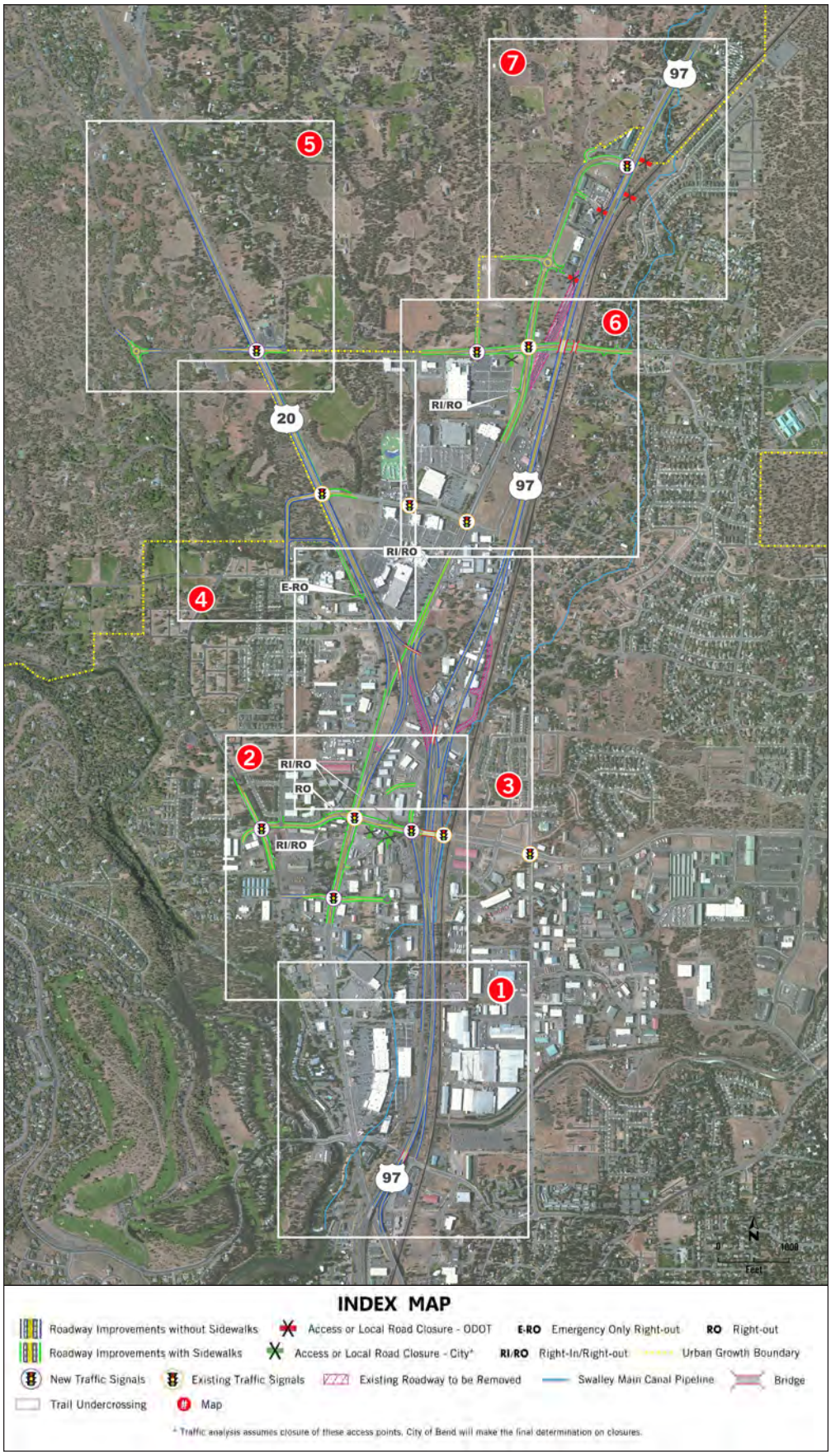
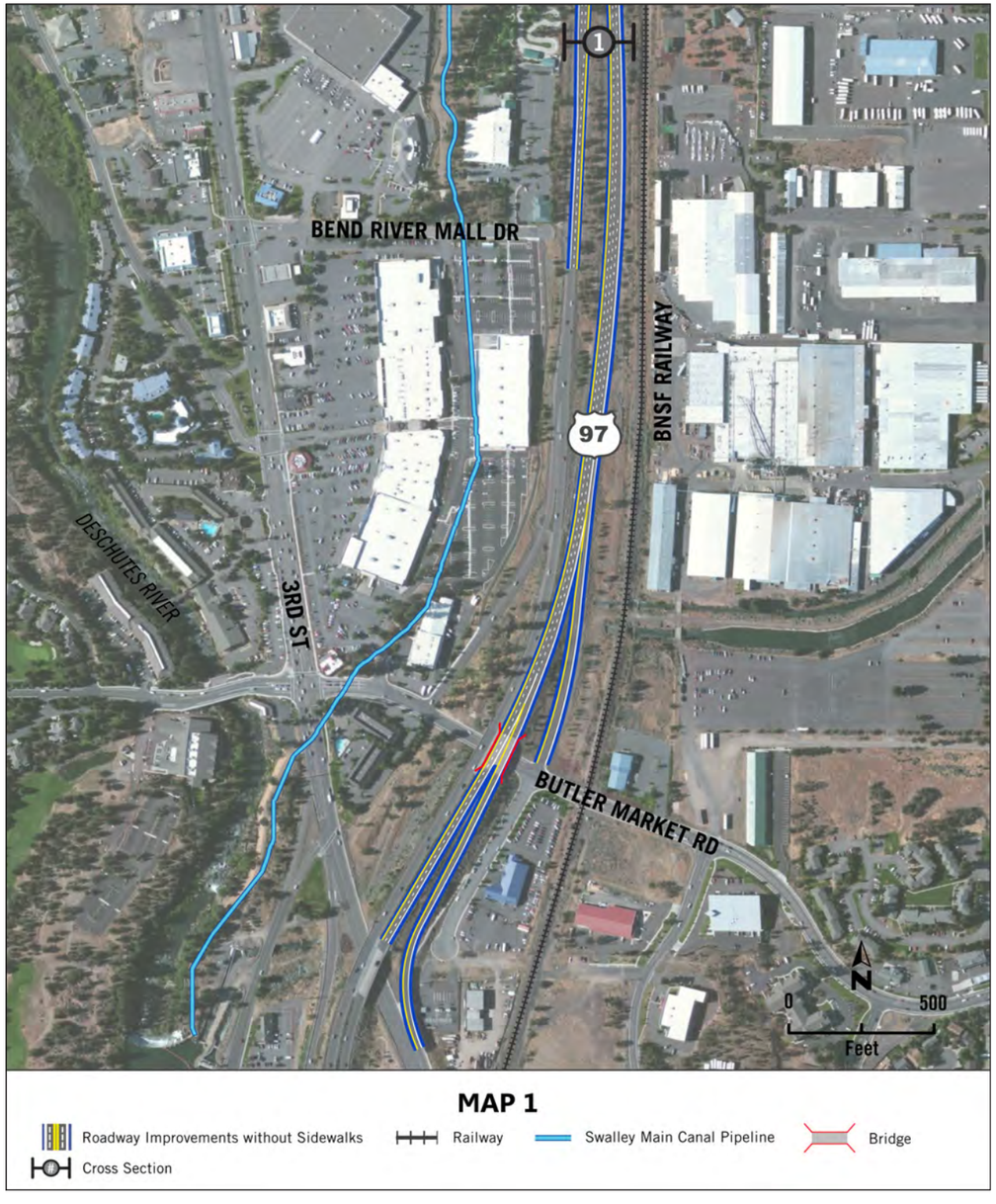


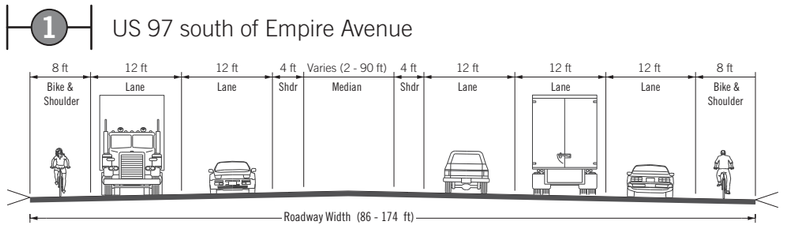
Exhibit ES-5 FEIS: *Preferred Alternative Mapset Index*



Note: This new exhibit was added to the Final EIS to show the design of the Preferred Alternative.

Exhibit ES-5 FEIS: *Preferred Alternative (Map 1)*





Note: The design shown in this exhibit is conceptual in nature. Further refinements may be made during the final design process. Where roadway improvements shown in this exhibit end, the improvements will transition to the existing roadway cross section.

Exhibit ES-5 FEIS: *Preferred Alternative (Map 2)*

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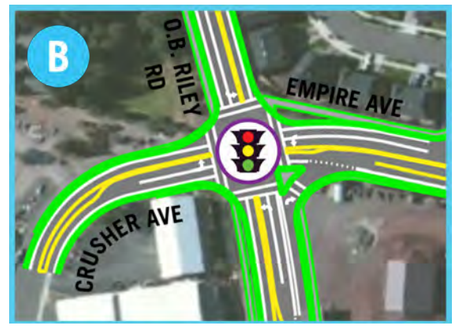
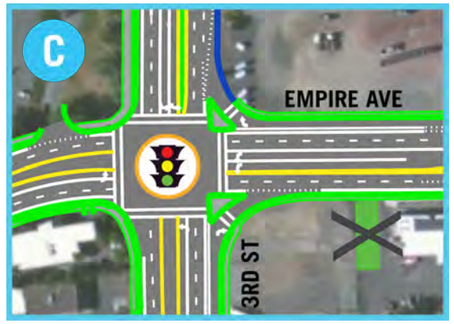
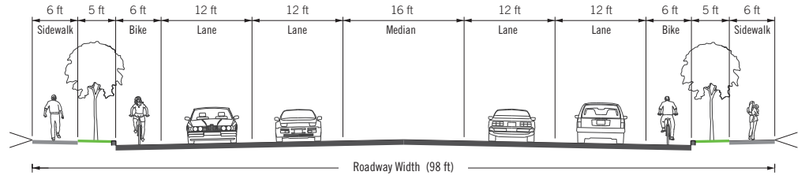
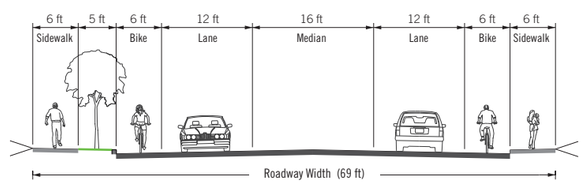




2 3rd Street south of Loco Road



3 Empire Avenue between O.B. Riley Road and 3rd Street



4 Empire Avenue east of 3rd Street

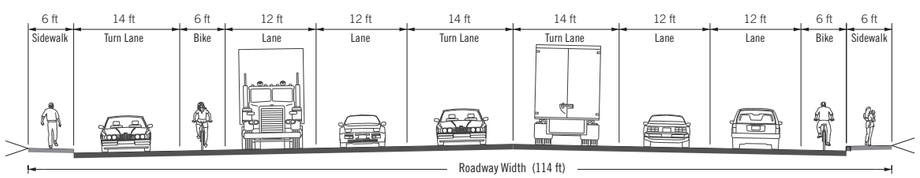
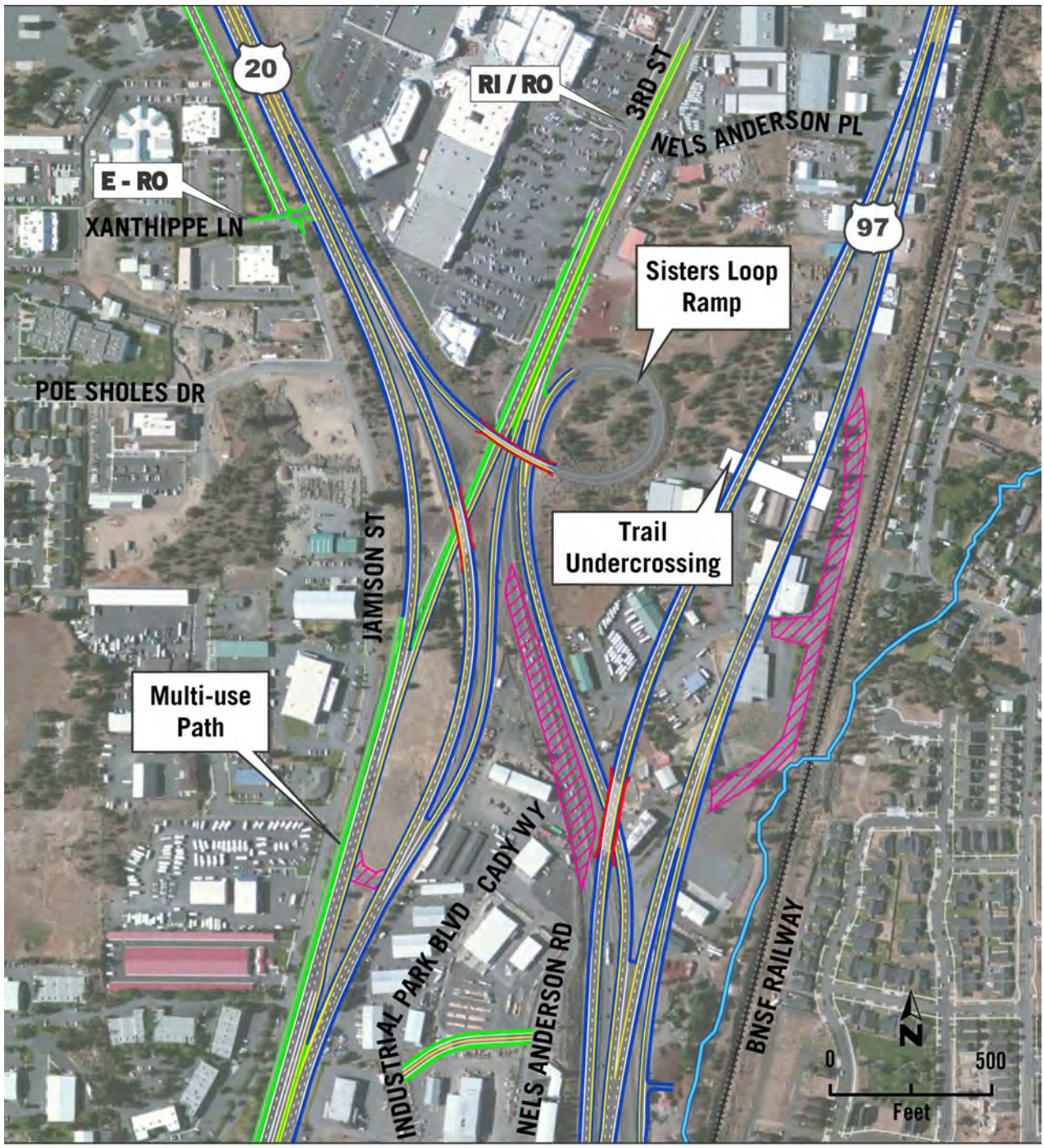


Exhibit ES-5 FEIS: *Preferred Alternative (Map 3)*

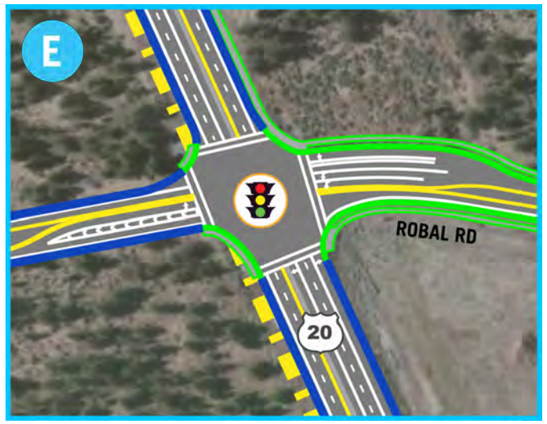


MAP 3

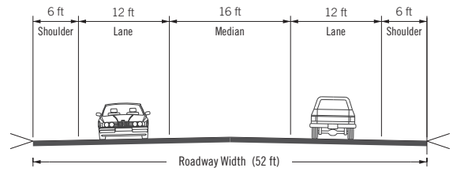
Roadway Improvements without Sidewalks
Roadway Improvements with Sidewalks
RI/RO Right-In/Right-out
Existing Roadway to be Removed
Railway
Bridge
E-RO Emergency Only Right-out

Note: The design shown in this exhibit is conceptual in nature. Further refinements may be made during the final design process. Where roadway improvements shown in this exhibit end, the improvements will transition to the existing roadway cross section.

Exhibit ES-5 FEIS: *Preferred Alternative (Map 4)*



5 Britta Street



6 US 20 between Cooley Road and Robal Road

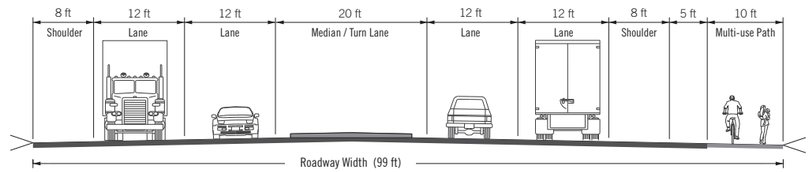


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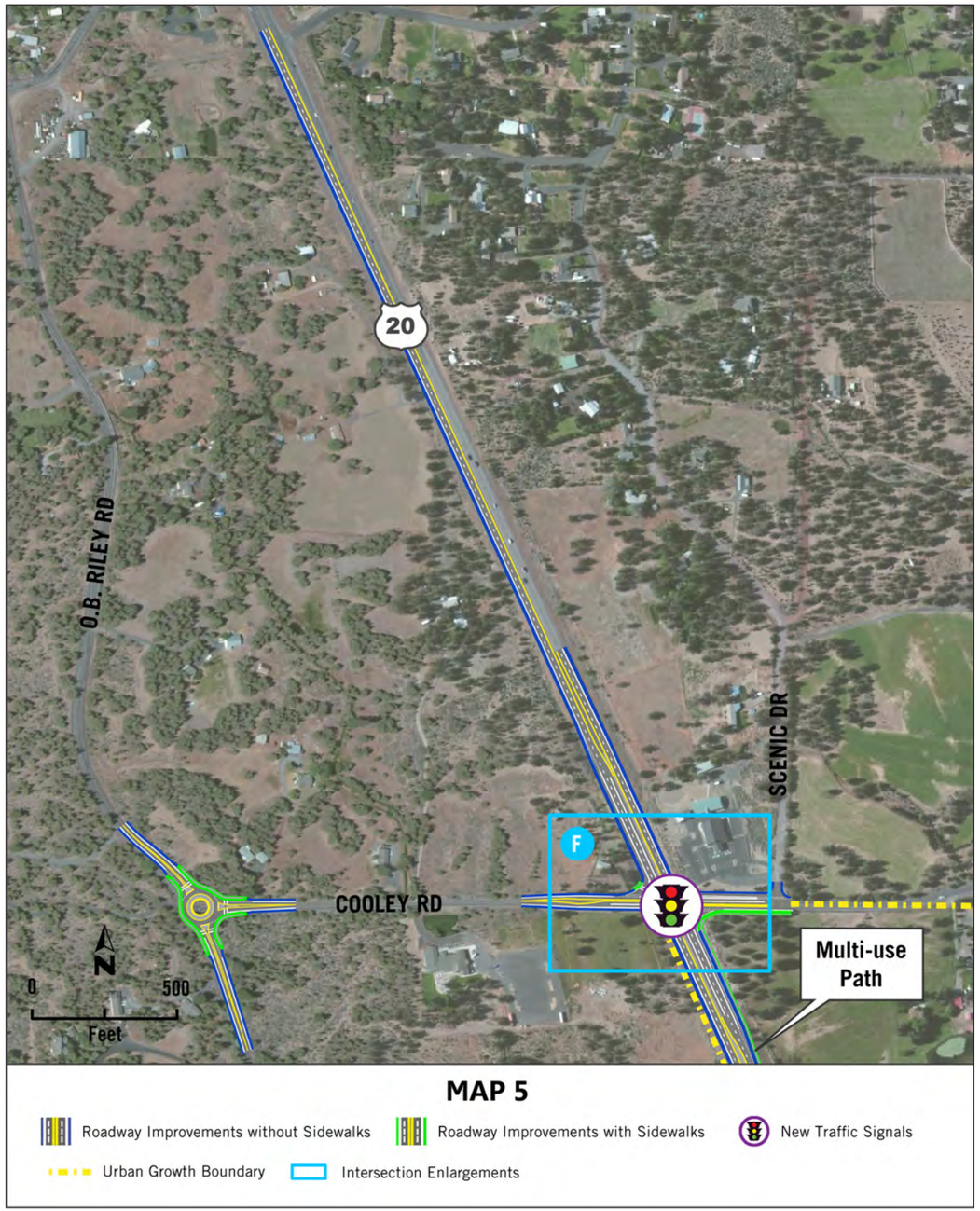
Exhibit ES-5 FEIS: *Preferred Alternative (Map 5)*



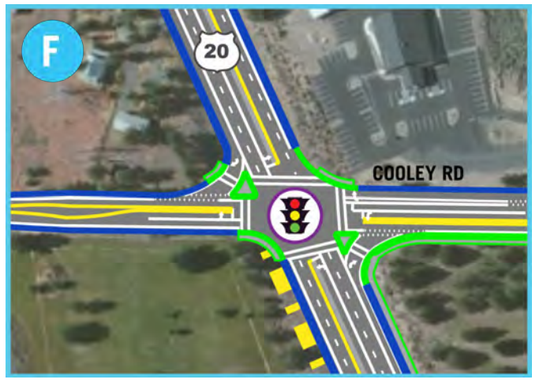


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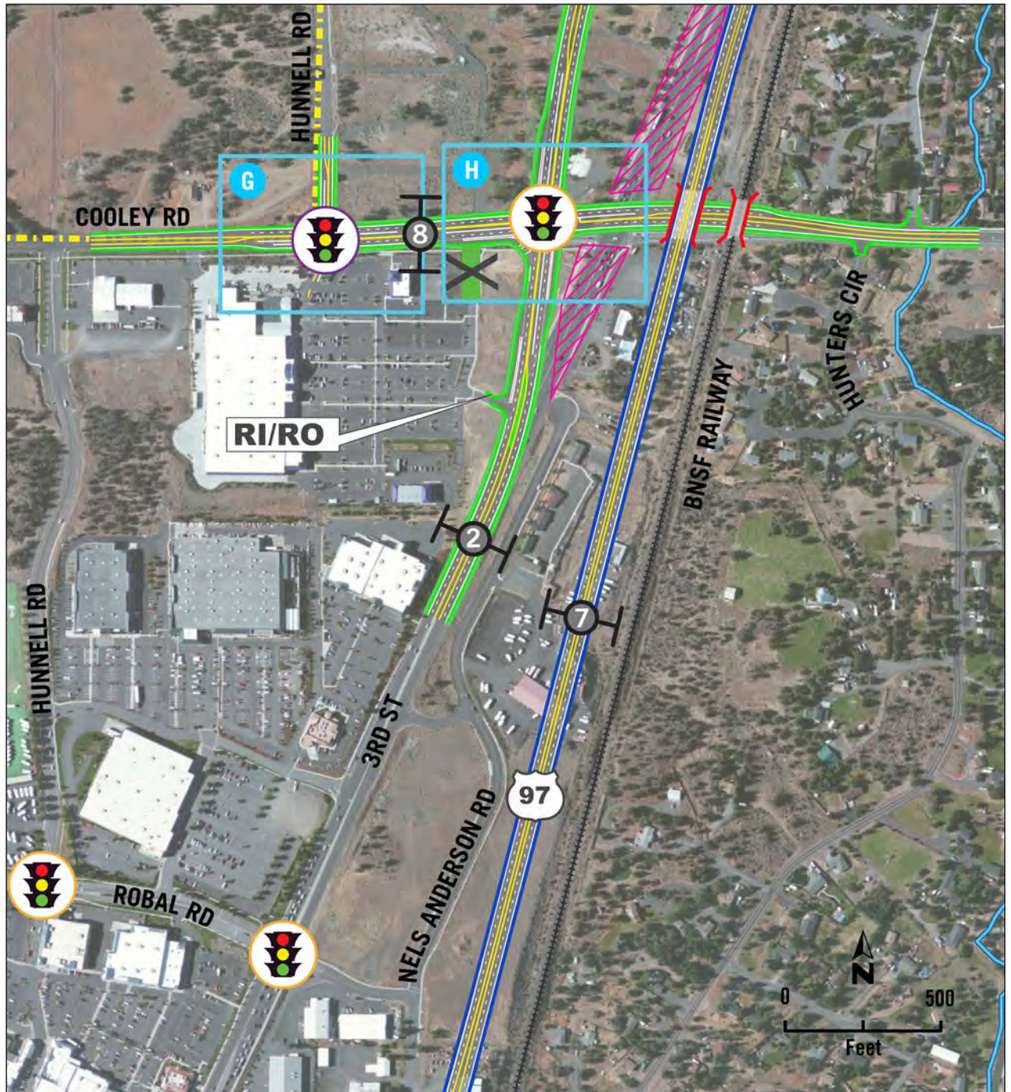
Exhibit ES-5 FEIS: *Preferred Alternative (Map 6)*



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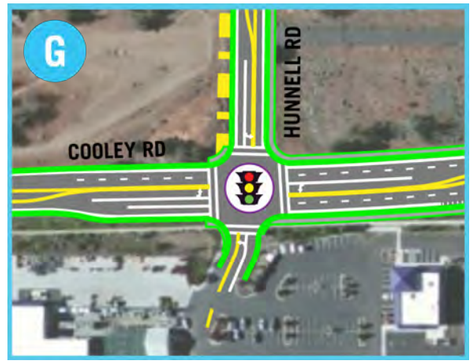
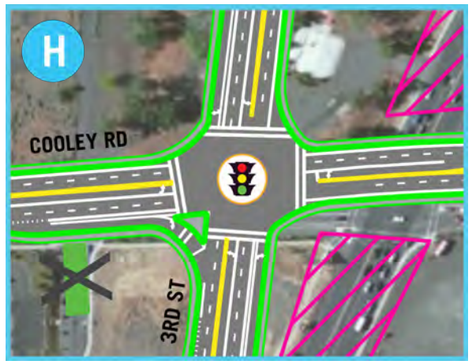
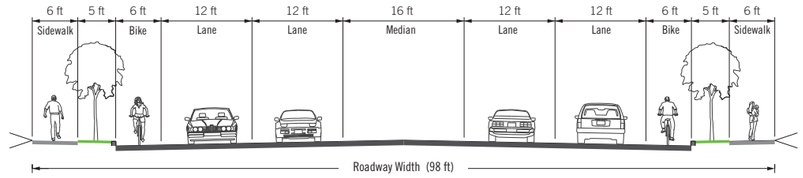
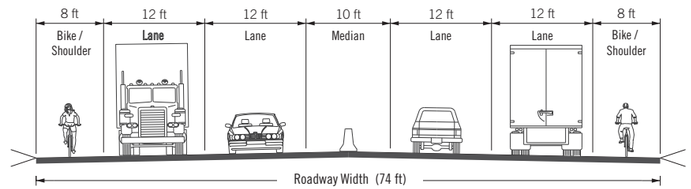




2 3rd Street south of Loco Road



7 US 97 between Empire Avenue and 3rd Street



8 Cooley Road east of Hunnell Road

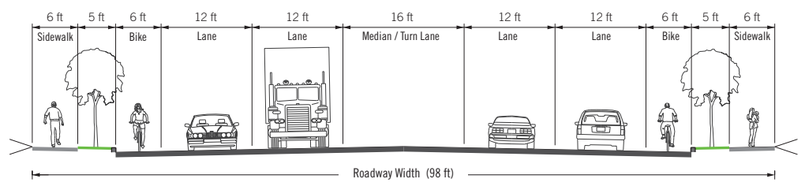
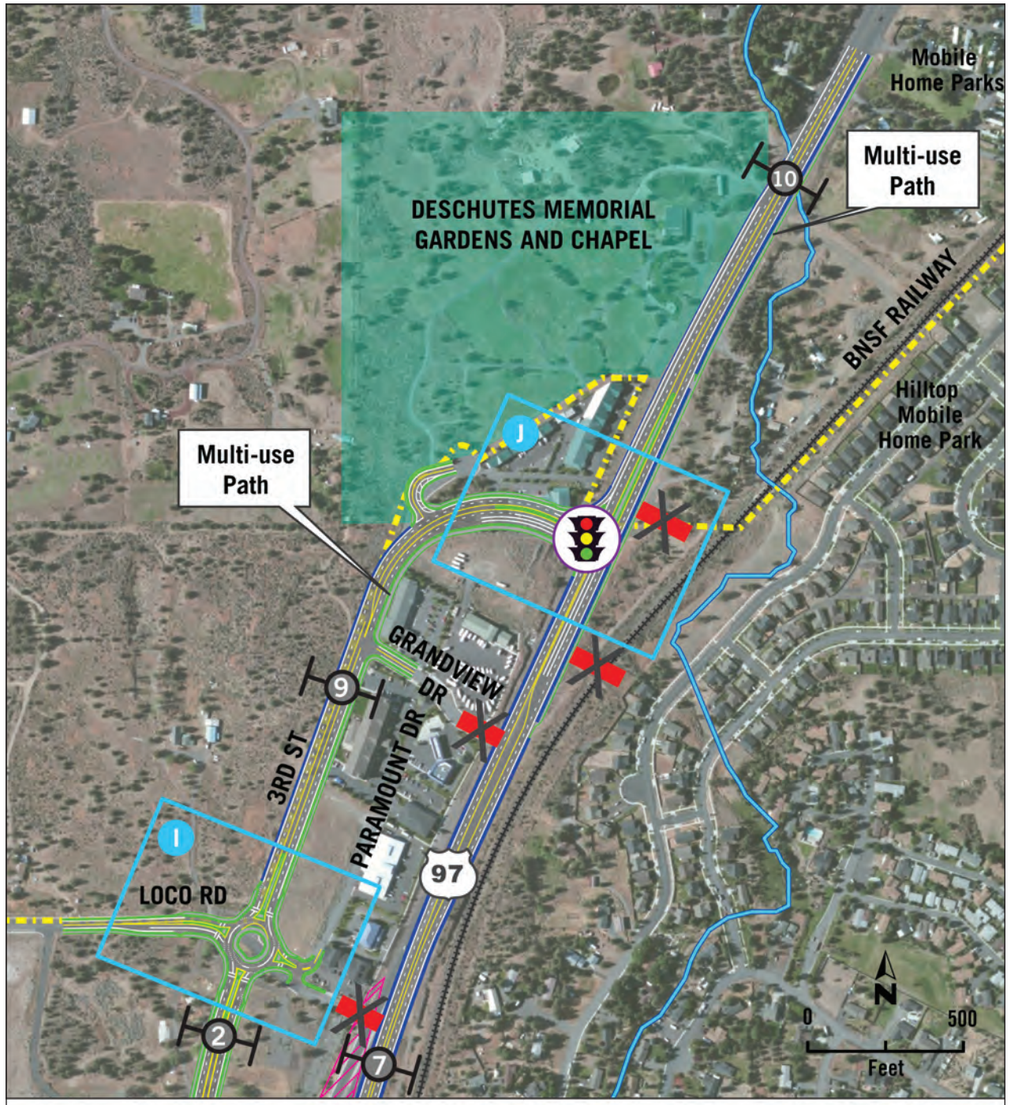
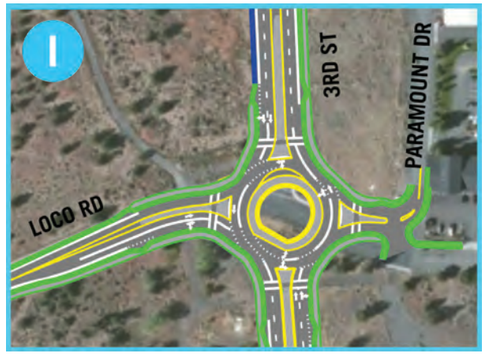
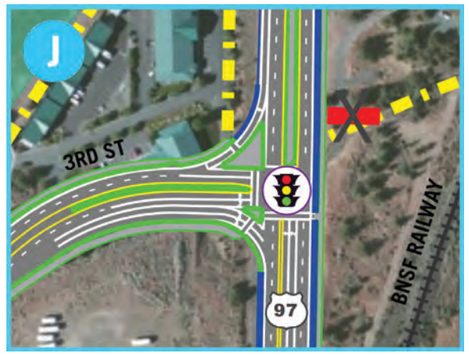


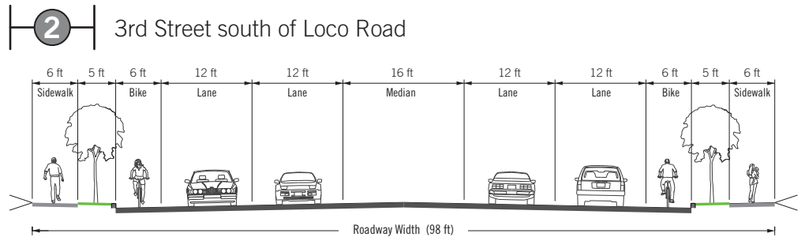
Exhibit ES-5 FEIS: *Preferred Alternative (Map 7)*

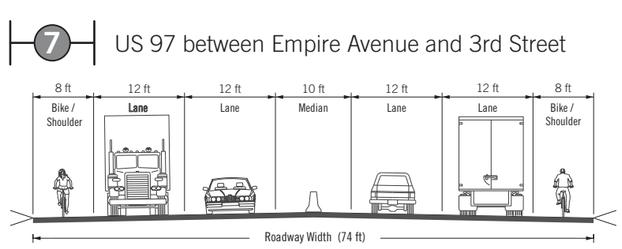


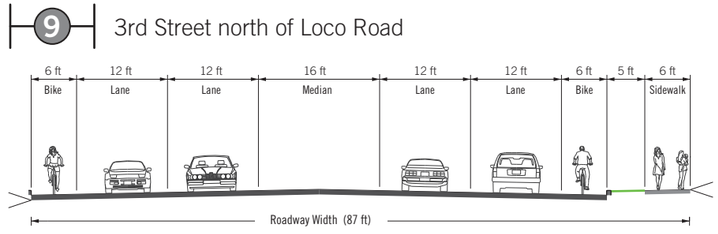
Note: The design shown in this exhibit is conceptual in nature. Further refinements may be made during the final design process. Where roadway improvements shown in this exhibit end, the improvements will transition to the existing roadway cross section.

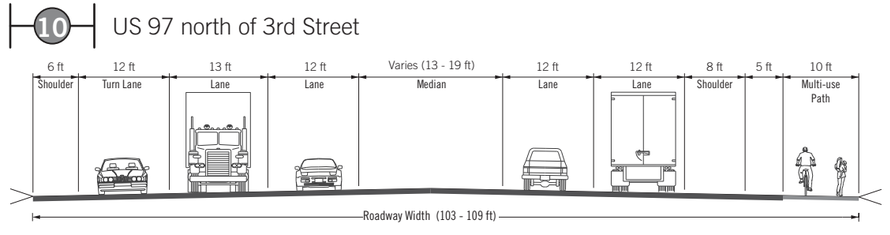












common include some intersection configurations, ramps, auxiliary lanes, grade-separations, and pedestrian and bicycle facilities.

Between Butler Market Road and Empire Avenue, US 97 would be a free flow highway facility with access to and from the highway provided at the Butler Market Road and Empire Avenue interchanges. The Empire Avenue interchange would retain its configuration as a partial diamond interchange, with a widened Empire Avenue crossing over US 97 in the East DS1 and East DS2 Alternatives. An off-ramp would allow vehicles on northbound US 97 to exit the highway at Empire Avenue; there would be no off-ramp from southbound US 97 to Empire Avenue. On-ramps would allow eastbound and westbound vehicles on Empire Avenue to enter northbound or southbound US 97.

About half way between Empire Avenue and the Sisters loop ramp, the US 97 northbound travel lanes would split; the two right lanes would continue on northbound US 97, and the left lane would cross under the southbound travel lanes on US 97 to access US 20 and 3rd Street. Southbound US 97 would cross over the left lane exiting from northbound US 97 to northbound 3rd Street/westbound US 20 on an elevated structure.

Between Nels Anderson Place and Cooley Road, US 97 would shift east to be immediately adjacent to the railroad tracks; the northbound and southbound travel lanes would be separated by a median barrier. An undercrossing would be constructed for Cooley Road to pass under US 97 and the railroad tracks. There would be no connection to US 97 at Cooley Road.

North of Grandview Drive, a number of new local road connections or new local roads would be constructed under the East DS1 and East DS2 Alternatives.

An emergency service turnaround on US 97 would be provided at Fort Thompson Lane. There would be a break in the median barrier for emergency vehicles only. Expanded shoulders in this area would accommodate emergency vehicles turning around to change direction.

The build alternatives would also have access management, stormwater management, and aesthetic treatments.

The Preferred Alternative will not include the following design elements that were common to the East DS1 and East DS2 Alternatives:

- A widened Empire Avenue crossing
- New local road connections or new local roads north of Grandview Drive

- An emergency service turnaround on US 97 at Fort Thompson Lane.

Key Point

Unique features of the East DS1 Alternative would include:

- Diamond interchange north of Bowery Lane allowing movements in all directions
- 3rd Street routed around the west side of Deschutes Memorial Gardens and Chapel
- 3rd Street extension east across US 97.

Design Features Unique to the East DS1 Alternative

Under the East DS1 Alternative, between Cooley Road and the City of Bend's UGB, 3rd Street would extend north with two travel lanes in each direction. North of the UGB, 3rd Street would have one northbound and one southbound travel lane and would be routed around the west side of the Deschutes Memorial Gardens and Chapel. Just north of Bowery Lane, US 97 would have a full diamond interchange with the new extension of 3rd Street. The interchange would allow all northbound and southbound movements on to and off of US 97. At the interchange, 3rd Street would be elevated to cross over US 97 and would terminate just west of the BNSF Railway.

New local road connections and new local roads that would be constructed between Grandview Drive and Fort Thompson Lane include:

- A new road would extend east of 3rd Street to access existing properties north of the Deschutes Memorial Gardens and Chapel
- A new road would connect Bowery Lane to Suzanne Lane
- A new road would extend east of Harris Way to access existing properties between Harris Way and US 97
- An upgraded connection would be provided between Fort Thompson Lane and Harris Way, and between Harris Way and Hunnell Road
- A new road would extend north and south of 3rd Street to access existing properties east of US 97.

New county roads and private driveways have been designed to meet the appropriate standards within this urban area. Existing substandard county roads would not be upgraded by this project, but would be prioritized and developed as standalone projects in the Deschutes County Transportation System Plan and Statewide Transportation Improvement Program projects.

Design Features Unique to the East DS2 Alternative

Under the East DS2 Alternative, 3rd Street would extend north with two travel lanes in each direction with a median that would also serve as a turn lane. The new extension of 3rd Street would connect with US 97 through a directional interchange on the southeast side of the Deschutes Memorial Gardens and Chapel, where 3rd Street would terminate. The directional interchange would allow southbound US 97 traffic to flow freely via an off-ramp to southbound 3rd Street.

Northbound 3rd Street traffic would cross over US 97 and flow freely onto northbound US 97 via an on-ramp.

New local road connections and new local roads that would be constructed between Grandview Drive and Fort Thompson Lane include:

- Bowery Lane would be upgraded and extended to the east, across US 97
- A new road would extend north and south of Bowery Lane to access existing properties east of US 97
- A new road would extend south of Bowery Lane to access existing properties north of Deschutes Memorial Gardens and Chapel
- A new road would extend north of Bowery Lane to access existing properties northwest of the Bowery Lane overcrossing of US 97
- A new road would extend east of Harris Way to access existing properties between Harris Way and US 97
- An upgraded connection would be provided between Fort Thompson Lane and Harris Way, and between Harris Way and Hunnell Road.

Key Point

Unique features of the East DS2 Alternative would include:

- Directional interchange south of Bowery Lane allowing free flow movements between 3rd Street and US 97
- Termination of 3rd Street southeast of Deschutes Memorial Gardens and Chapel
- Bowery Lane extension east across US 97.

New county roads and private driveways have been designed to meet the appropriate standards within this urban area. Existing substandard county roads would not be upgraded by this project, but would be prioritized and developed as standalone projects in the Deschutes County Transportation System Plan and Statewide Transportation Improvement Program projects.

Design Features Unique to the Preferred Alternative—East DS2 Modified Alternative

As a result of the Preferred Alternative, 3rd Street will extend north with two travel lanes in each direction with a two-way left turn lane. Approximately 0.6 mile north of Cooley Road, the new extension of 3rd Street will connect with US 97 through a signalized intersection on the south side of the Deschutes Memorial Gardens and Chapel, where 3rd Street will terminate.

Empire Avenue improvements will include utilizing the existing bridges and containing widening work between US 97 and 3rd Street. In addition a new signal will be added at 3rd Street and Mervin Sampels Road to provide access into the Empire Avenue/Sherman Road business area.

The Preferred Alternative will extend Britta Street to US 20 at Robal Road, whereas the East DS1 and East DS2 Alternatives would extend Robal Road to O.B. Riley Road. The Preferred Alternative will also add

Key Point

Unique features of the Preferred Alternative include:

- Signalized intersection at 3rd Street and US 97
- Termination of 3rd Street south of Deschutes Memorial Gardens and Chapel.

intersection improvements at O.B. Riley Road and Cooley Road. The Preferred Alternative will provide new facilities for serving bicycles and pedestrians.

ES.2.3 Other Alternatives Considered

The alternatives development phase gathered input from technical staff, project committees, participating agencies, and the public to identify alternatives that would address the purpose and need for the proposed action. Initially, a preliminary range of alternatives was developed that comprised 21 build alternatives located along three project corridors:

- **West corridor**—Reroute US 97 west of its existing alignment and closer to US 20
- **Existing corridor**—Retain US 97 on its existing alignment
- **East corridor**—Reroute US 97 east of its existing alignment and closer to the BNSF Railway.

A No Build Alternative was also considered and was automatically forwarded into the Draft EIS for evaluation per requirements under the National Environmental Policy Act.

This preliminary range of 21 build alternatives was assessed in terms of engineering feasibility, significant environmental impacts, and economic feasibility. From this initial assessment, the range of alternatives was revised based on how the alternatives compared to one another, and the best performing alternative(s) in each corridor were carried forward. The result yielded a combined preliminary range of 11 alternatives. Nine of the 11 build alternatives that were screened against the purpose and need and other criteria were eliminated from further consideration (Exhibit ES-6). Only the East DS1 and East DS2 Alternatives passed the screening and were carried forward for further analysis in the Draft EIS.

The Preferred Alternative was evaluated against the same screening criteria and demonstrated it addressed the purpose and need for the proposed action.

Exhibit ES-6: *Build Alternatives Considered but Eliminated from Further Study*

West Corridor	Existing Corridor	East Corridor
WS West Modified	GM2	WS East A Modified
WS West E (Modified)	Existing A	
West 1	Existing DS1	
West DS1	TSM/TDM	

ES.3 Other Actions

There are a number of current and reasonably foreseeable major development actions that are scheduled to take place in the project vicinity and may also influence future traffic conditions within the API. These projects include:

- **Juniper Ridge**—Juniper Ridge is a 1,500 acre site owned by the City of Bend east of the API, of which approximately 500 acres are located within the current City of Bend limits and UGB. The master plan for the project includes area for employment, educational and research opportunities, a town center, and residential neighborhoods.
- **Roadway**—Many streets and roadways under City of Bend and Deschutes County jurisdiction are scheduled for widening and/or extension, as planned in the City's and County's Transportation System Plans and the Bend Metropolitan Planning Organization's *2007–2030 Metropolitan Transportation Plan.* Other roadway projects include the installation of traffic signals and/or roundabouts on local streets throughout the API and greater Bend area.
- **Transit**—A new park and ride facility is planned within the API by the Bend Metropolitan Planning Organization.

  The Central Oregon Intergovernmental Council identified a priority need for a park and ride lot in the Cascade Village shopping center area. The Bend Metropolitan Planning Organization also identified the near-term need for a Redmond – Bend Community Connector (Route #24) stop serving Cascade Village and a future transit hub at the same location.
- **Utility**—Various stormwater and wastewater facility improvements are scheduled for construction throughout the City of Bend and Deschutes County
- **Parks and Trails—**Several smaller community parks and one larger regional park are scheduled for development by the Bend Park and Recreation District outside the API. As described in Section 3.6 Parks and Recreational Facilities, Bend Park and Recreation District's *Parks, Recreation, and Green Spaces Comprehensive Plan* and the *Bend Area General Plan Bicycle and Pedestrian System Map* include pedestrian and bicycle trails planned throughout the API and beyond to connect to local and regional destinations.

Chapter 1 Purpose of and Need For Proposed Action
Chapter 2 Alternatives
Chapter 3 Affected Environment, Environmental Consequences and Mitigation
Chapter 4 Cumulative Impacts
Chapter 5 Local Short-term Uses and Long-term Productivity
Chapter 6 Irreversible and Irretrievable Commitment of Resources
Chapter 7 Comments and Coordination

More Information

Learn more about the proposed action and view the Draft EIS by visiting the project website at: www.us97solutions.org

The Final EIS is also available on the project website.

ES.4 Summary of Adverse and Beneficial Impacts of the Alternatives

The No Build, East DS1, and East DS2 Alternatives were studied and analyzed to identify their long-term and temporary impacts to the local environment. Adverse and beneficial impacts of the alternatives are summarized in Exhibit ES-7 FEIS. Adverse impacts would be mitigated to the extent practicable and as required by applicable regulations.

This Final EIS has been updated to disclose the beneficial and adverse impacts associated with the updated 2036 No Build Alternative and the Preferred Alternative. The adverse and beneficial impacts of the Preferred Alternative are summarized in Exhibit ES-7 FEIS.

Exhibit ES-7 FEIS: *Summary of Adverse and Beneficial Impacts of the Proposed Action*

Resource Element	No Build Alternative	East DS1 Alternative	East DS2 Alternative	Preferred Alternative
Transportation				
Long-term impacts	■ Severe congestion during peak periods in much of the southern part of the API due to substantial increase in traffic volumes ■ Significant queuing on westbound Empire Avenue due to bottleneck at 3rd Street/Empire Avenue intersection ■ US 97 over capacity during peak periods from south of Butler Market Road through the US 20/3rd Street interchange due to increase in traffic volumes, affecting merge/diverge areas for the ramps to and from Empire Avenue ■ Freight trips delayed up to 15 minutes during peak periods due to congestion along the US 97/3rd Street corridor ■ Increased risk of vehicle/train collisions at Cooley Road atgrade crossing due to increasing traffic and current rail volumes ■ Substantial delays to buses traveling on US 97, US 20, and Robal Road during peak periods, with corresponding decrease in ontime performance due to extreme traffic congestion in the API ■ No improvements to the existing bicycle and pedestrian facilities	■ Alleviation of most of the arterial system queuing noted in the No Build Alternative as a result of realignment and access management improvements that shift traffic from the local arterial system onto limited access and access controlled facilities ■ Freight delays reduced to less than 5 minutes, resulting from separate facility for through trips ■ Improved ontime bus performance due to decreased congestion levels in the API ■ Improved motorist safety resulting from grade separating Cooley Road under the BNSF Railway ■ Improved pedestrian and bicycle facilities ■ Queuing reduced on westbound Empire Avenue, but more congestion at Empire Avenue/O.B. Riley Road intersection results from relief of 3rd Street/Empire Avenue bottleneck.		
	■ 9 intersections below operational standards (2—US 97, 4—US 20, 3—local road system) [1] ■ 4 US 97 mainline and merge/diverge/weave segments over standards[1] ■ 7 intersections blocked by queues[1] ■ 25 mph overall average network speed ■ 30,400 overall network stops ■ 800 hours overall network delay ■ 1,800 hours overall network travel time. [1]Because lower existing conditions traffic volumes were assumed for the updated No Build Alternative and Preferred Alternative traffic analysis, these particular measures are not directly comparable to the No Build Alternative and Preferred Alternative.	■ 8 intersections below operational standards (1—US 97, 4—US 20, 3—local road system) [1] ■ 4 US 97 mainline and merge/diverge/weave segments over standards[1] ■ 19 intersections blocked by queues[1] ■ 22 mph overall average network speed ■ 45,100 overall network stops ■ 1,000 hours overall network delay ■ 2,000 hours overall network travel time. [1]Because lower existing conditions traffic volumes were assumed for the updated No Build Alternative and Preferred Alternative traffic analysis, these particular measures are not directly comparable to the No Build Alternative and Preferred Alternative.	■ 5 intersections below operational standards (1—US 97, 3—US 20, 1—local road system) ■ 2 US 97 mainline and merge/diverge/weave segments over standards ■ 0 intersections blocked by queues ■ 19 mph overall average network speed ■ 35,500 overall network stops ■ 1,100 hours overall network delay ■ 1,900 hours overall network travel time.

Note: This revised exhibit reflects corrections to the impacts that would result from the East DS1 and East DS2 Alternatives, includes updated information for the 2036 No Build Alternative where applicable, and includes the impacts and benefits of the Preferred Alternative.

Exhibit ES-7 FEIS: *Summary of Adverse and Beneficial Impacts of the Proposed Action*

Resource Element	No Build Alternative	East DS1 Alternative	East DS2 Alternative	Preferred Alternative
Long-term impacts	■ 12 intersections below operational standards (2—US 97, 4—US 20, 6—local road system) due to increased congestion during peak periods ■ 15 intersections blocked by queues ■ 5 mph overall average network speed ■ 66,100 overall network stops ■ 4,700 hours overall network delay ■ 5,300 hours overall network travel time.			
Temporary construction impacts	None.	Congestion resulting in delay, reduced travel speeds, and increased travel time during construction (23 years) of improvements to intersections and existing roadways Delays and other impacts to transit service along Robal Road and into and out of Cascade Village Shopping Center during construction Temporary changes to private driveways for businesses on Nels Anderson Road, Cooley Road, and Robal Road during construction.		

Note: This revised exhibit reflects corrections to the impacts that would result from the East DS1 and East DS2 Alternatives, includes updated information for the 2036 No Build Alternative where applicable, and includes the impacts and benefits of the Preferred Alternative.

Exhibit ES-7 FEIS: *Summary of Adverse and Beneficial Impacts of the Proposed Action*

Resource Element	No Build Alternative	East DS1 Alternative	East DS2 Alternative	Preferred Alternative
Land Use				
Long-term impacts	■ Inconsistent with state, county, regional, and city transportation plans, *US Highway 97 Corridor Strategy, Oregon Highway Plan, Bend Area General Plan,* and *Northeast Bend Transportation Study* ■ No exceptions to statewide planning goals, but inconsistent with Goal 12 ■ No existing land uses converted ■ No prime farmland converted.	■ Generally consistent with state, county, regional, and city land use plans. ■ Inconsistent with county, regional, and city transportation plans. Amendments to *2007-2030 Metropolitan Transportation Plan*, *Deschutes County Transportation System Plan*, and *Bend Urban Area Transportation System Plan* required. ■ Inconsistent with statewide planning goals. 2 exceptions to Statewide Planning Goals 11 and 14 from Deschutes County required for construction of a new road and new interchange outside of the UGB.		■ Consistent with state, county, regional, and city land use and transportation plans ■ No exceptions to the statewide planning goals required.
		■ 180 acres of land converted to right of way ■ 10 acres of prime farmland and 124 acres of farmland of statewide importance converted to right of way.	■ 131 acres of land converted to right of way ■ 2 acres of prime farmland and 90 acres of farmland of statewide importance converted to right of way.	■ Approximately 82 acres of land converted to right of way ■ Approximately 0.07 acre of prime farmland and approximately 59 acres of farmland of statewide importance converted to right of way.
Temporary construction impacts	■ None.			

Note: This revised exhibit reflects corrections to the impacts that would result from the East DS1 and East DS2 Alternatives, includes updated information for the 2036 No Build Alternative where applicable, and includes the impacts and benefits of the Preferred Alternative.

Exhibit ES-7 FEIS: *Summary of Adverse and Beneficial Impacts of the Proposed Action*

Resource Element	No Build Alternative	East DS1 Alternative	East DS2 Alternative	Preferred Alternative
Right of Way and Utilities				
Long-term impacts	■ No right of way acquisition ■ No utility relocations.	■ Acquisition of 162 parcels totaling approximately 180 acres of right of way.	■ Acquisition of 142 parcels totaling approximately 131 acres of right of way.	■ Acquisition of an estimated 103 parcels totaling approximately 82 acres of right of way.
		■ Relocation of utility facilities.		
Temporary construction impacts	■ None.	■ Short interruptions to utility services.		

Note: This revised exhibit reflects corrections to the impacts that would result from the East DS1 and East DS2 Alternatives, includes updated information for the 2036 No Build Alternative where applicable, and includes the impacts and benefits of the Preferred Alternative.

Exhibit ES-7 FEIS: *Summary of Adverse and Beneficial Impacts of the Proposed Action*

Resource Element	No Build Alternative	East DS1 Alternative	East DS2 Alternative	Preferred Alternative
Environmental Justice				
Long-term impacts	■ No disproportionately high and adverse effects on minority or low-income populations.	■ No disproportionately high and adverse effects on minority or low-income populations ■ Environmental justice populations and others would access US 97 through the northern interchange, a full diamond interchange, with access to northbound and southbound US 97.	■ No disproportionately high and adverse effects on minority or low-income populations ■ Environmental justice populations and others would travel farther on local streets, including Bowery Lane and Hunnell Road, to access US 97. Segments of Bowery Lane and Hunnell Road would be unpaved. Access to southbound US 97 would occur at Empire Avenue. Access to northbound US 97 would occur at Empire Avenue or via 3rd Street north of Cooley Road.	■ No disproportionately high and adverse effects on minority or low-income populations ■ Environmental justice populations and others will maintain existing access to northbound and southbound US 97. The new signalized intersection at US 97 and 3rd Street will provide a connection to locations within the API and greater Bend. ■ A multi-use path will connect the mobile home parks to the signalized intersection, allowing safer travel for pedestrians and bicyclists along US 97 and a safer crossing of US 97.
Temporary construction impacts	■ No disproportionately high and adverse effects on minority or low-income populations.	■ No disproportionately high and adverse effects on minority or low-income populations ■ Persons with limited English proficiency could be more affected if they are unable to understand notifications about construction activities; however, notifications would be provided in English and Spanish, the predominant languages of the API ■ Temporary street crossings in construction zones could become obstacles for disabled and elderly individuals.		

Note: This revised exhibit reflects corrections to the impacts that would result from the East DS1 and East DS2 Alternatives, includes updated information for the 2036 No Build Alternative where applicable, and includes the impacts and benefits of the Preferred Alternative.

Exhibit ES-7 FEIS: *Summary of Adverse and Beneficial Impacts of the Proposed Action*

Resource Element	No Build Alternative	East DS1 Alternative	East DS2 Alternative	Preferred Alternative
Socioeconomic Analysis				
Long-term impacts	■ Residents' quality of life impacted by failure to address vehicular safety concerns within the API ■ No change to community cohesion ■ Impedance of travel routes to and from destination businesses, deterrence of new development, difficulty attracting and retaining businesses, and decreased efficiency of local and regional freight movement as congestion worsens and traffic flow slows ■ No residences, businesses, or rental storage units displaced ■ PM peak traffic volumes Bowery Lane between Hunnell Road and 3rd Street: 7 vehicles/hour. ■ Hunnell Road: 270-920 vehicles/hour. ■ Emergency service provider response times would increase as compared with the existing conditions.	■ Increased air, noise, and visual impacts of new and expanded local roads, elevated structures, and the realignment of US 97 closer to residential neighborhoods could impact quality of life for residents in the API ■ Connectivity and safety for vehicles, pedestrians, and bicyclists generally improved particularly associated with the local street network (including travel to and from area businesses). However, in the vicinity of 3rd Street north of Cooley Road, the Hunnell Neighborhood would be bisected by 3rd Street, decreasing community cohesion in this localized area ■ Increased efficiency of local and regional freight movement, creating opportunities to enhance local and regional economies.	■ Increased air, noise, and visual impacts of new and expanded local roads, elevated structures, and the realignment of US 97 closer to residential neighborhoods could impact quality of life for residents in the API ■ Connectivity and safety for vehicles, pedestrians, and bicyclists generally improved particularly associated with the local street network (including travel to and from area businesses). However, community cohesion would decrease in the vicinity of Bowery Lane between Hunnell Road and 3rd Street because of the increased presence of cut-through traffic. ■ Increased efficiency of local and regional freight movement, creating opportunities to enhance local and regional economies. ■ Displacement of 13 residences, 51 businesses, 3 billboards, and ~~200~~ 250 rental storage units ■ PM Peak Traffic ◆ Bowery Lane between Hunnell Road and 3rd Street: 60—90 vehicles/hour. ◆ Hunnell Road: 180—260 vehicles/hour.	■ Increased air, noise, and visual impacts of new and expanded local roads, primarily located within the Bend UGB, and the realignment of US 97 closer to the Boyd Acres Neighborhood could impact quality of life for residents in the API ■ Community cohesion enhanced with improved connectivity for vehicles, pedestrians and bicyclists. Community cohesion adversely affected by property acquisitions and residential displacements; the magnitude of this impact is less than under the East DS1 and East DS2 Alternatives. ■ Increased efficiency of local and regional freight movement, creating opportunities to enhance local and regional economies.

Note: This revised exhibit reflects corrections to the impacts that would result from the East DS1 and East DS2 Alternatives, includes updated information for the 2036 No Build Alternative where applicable, and includes the impacts and benefits of the Preferred Alternative.

Exhibit ES-7 FEIS: *Summary of Adverse and Beneficial Impacts of the Proposed Action*

Resource Element	No Build Alternative	East DS1 Alternative	East DS2 Alternative	Preferred Alternative
Long-term impacts		■ Displacement of 19 residences, 43 businesses, 4 billboards, and ~~200~~ 250 rental storage units ■ PM peak traffic volumes ◆ Bowery Lane between Hunnell Road and 3rd Street: 20—50 vehicles/hour. ◆ Hunnell Road: 80—140 vehicles/hour.Emergency service provider response times would decrease when compared to the No Build Alternative for 2 out of 6 sampled routes and would increase for 4 out of 6 routes. Response times would increase compared to existing conditions due to increased traffic volumes and out-of-direction travel. ■ Access to US 97 would require longer routes on local streets, including Bowery Lane and Hunnell Road. Segments of Bowery Lane and Hunnell Road would be unpaved. Access to southbound US 97 would occur at Empire Avenue. Access to northbound US 97 would occur at Empire Avenue or via 3rd Street at the northern interchange.	■ Emergency service provider response times would decrease when compared to the No Build Alternative for 2 out of 6 sampled routes and would increase for 4 out of 6 routes. Response times would increase compared to existing conditions due to increased traffic volumes and out-of-direction travel. ■ Access to US 97 would require longer routes on local streets, including Bowery Lane and Hunnell Road. Segments of Bowery Lane and Hunnell Road would be unpaved. Access to southbound US 97 would occur at Empire Avenue. Access to northbound US 97 would occur at Empire Avenue or via 3rd Street at the northern interchange.	■ Displacement of 6 residences, 44 businesses, 2 billboards, and 250 rental storage units ■ PM peak traffic volumes ◆ Hunnell Road: 100-595 vehicles/hour ■ Emergency service provider response times will decrease when compared to the No Build Alternative for 5 out of 6 sampled routes and will increase for 1 out of 6 routes. Response times will increase compared to existing conditions due to increased traffic volumes. ■ Access to northbound and southbound US 97 will occur at Empire Avenue and the northern signalized intersection of US 97 and 3rd Street.
Temporary construction impacts	■ None.	■ Residences affected by temporary road closures, detours, delay and congestion, modified travel routes, approach changes ■ Businesses affected by temporary road closures, detours, delay and congestion, modified travel routes, approach changes.		

Note: This revised exhibit reflects corrections to the impacts that would result from the East DS1 and East DS2 Alternatives, includes updated information for the 2036 No Build Alternative where applicable, and includes the impacts and benefits of the Preferred Alternative.

Exhibit ES-7 FEIS: *Summary of Adverse and Beneficial Impacts of the Proposed Action*

Resource Element	No Build Alternative	East DS1 Alternative	East DS2 Alternative	Preferred Alternative
Parks and Recreational Facilities				
Long-term impacts	■ None.	■ ~~None~~ No conversion of existing park or recreational facilities or alteration of existing trails ■ Connectivity and function of planned trails retained ■ Requires refinement of the conceptual alignment of the Rails with Trails Corridor at crossing with Cooley Road ■ No impacts to Section 4(f) or Section 6(f) resources.		
		■ Requires refinement of conceptual alignment of the extension of the North Parkway Trail between Empire Avenue and Robal Road.		■ Requires refinement of conceptual alignment of the extension of the North Parkway Trail between Empire Avenue and Robal Road; trail undercrossing included in design of Preferred Alternative will accommodate realignment of this future trail
Temporary construction impacts	■ None.	■ Trail users exposed to construction noise, vehicle, and work light illumination, and air and dust emissions.		
Historic Resources				
Long-term impacts	■ None.	■ Finding: Adverse effect to one historically significant property, resulting in a "use" under Section 4(f) ■ Finding: No adverse effect to ~~four~~ five historically significant properties, resulting in a *"de minimis* impact" under Section 4(f).		■ Section 106 finding of adverse effect and Section 4(f) individual evaluation for the Nels and Lillian Andersen House impacted by relocation or removal. ■ Section 4(f) ***de minimis*** findings for: Oregon Trunk Railway and Swalley Riley Lateral.
Temporary construction impacts	■ None.	■ Temporarily affect historic resources with dust, noise and vibration.		

Note: This revised exhibit reflects corrections to the impacts that would result from the East DS1 and East DS2 Alternatives, includes updated information for the 2036 No Build Alternative where applicable, and includes the impacts and benefits of the Preferred Alternative.

Exhibit ES-7 FEIS: *Summary of Adverse and Beneficial Impacts of the Proposed Action*

Resource Element	No Build Alternative	East DS1 Alternative	East DS2 Alternative	Preferred Alternative
Visual Resources				
Long-term impacts	■ None.	■ Decrease the visual quality in the area between Cooley Road and Fort Thompson Lane, including the Hunnell neighborhood.		■ Minimal decrease in visual quality within the API.
Temporary construction impacts	■ None.	■ Temporary visual impacts due to construction equipment, materials, and work activities ■ Glare from construction lights.		
Water Quality, Stormwater Runoff, and Hydrology				
Long-term impacts	■ 44 acres of impervious surfaces ■ 50% stormwater treatment (incidental treatment only) ■ 0 stormwater ponds and 0 stormwater swales ■ No change to roadway pollutant loads per year ■ No drywells and drainwells removed or stormwater treatment installed.	■ 49 acres of net new impervious surfaces ■ 99 acres of impervious surfaces treated ■ 100% stormwater treatment (56% formal treatment, 44% incidental treatment) ■ 6 stormwater ponds and 3 stormwater swales (2.3 acres) ■ Increased roadway pollutant loads per year.	■ 40 acres of net new impervious surfaces ■ 90 acres of impervious surfaces treated ■ 100% stormwater treatment (63% formal treatment, 37% incidental treatment) ■ 6 stormwater ponds and 4 stormwater swales (2.4 acres) ■ Increased roadway pollutant loads per year.	■ 39 acres of net new impervious surfaces ■ 95 acres of impervious surfaces treated ■ 100% stormwater treatment (59% formally treated, 41% incidentally treated) ■ 15 stormwater ponds and 6 stormwater swales (2.7 acres) ■ Increased roadway pollutant loads per year.
		■ Existing drywells and drainwells removed and stormwater treatment facilities installed to benefit groundwater by removing a route for contaminants to reach groundwater and drinking water		
Temporary construction impacts	■ None.	■ Potential soil erosion, increasing sediment and suspended solids from clearing and grading of 115–140 acres ■ Potential concrete spills or contaminant movement from stormwater runoff.		

Note: This revised exhibit reflects corrections to the impacts that would result from the East DS1 and East DS2 Alternatives, includes updated information for the 2036 No Build Alternative where applicable, and includes the impacts and benefits of the Preferred Alternative.

Exhibit ES-7 FEIS: *Summary of Adverse and Beneficial Impacts of the Proposed Action*

Resource Element	No Build Alternative	East DS1 Alternative	East DS2 Alternative	Preferred Alternative
Natural Systems and Communities				
Long-term impacts	■ No removal of strategy habitat ■ No loss of habitat linkage feature	■ Removal of 66 acres of western juniper woodlands habitat and sagebrush shrublands/shrub-steppe strategy habitat ■ ~~Loss of approximately 950 linear feet of habitat linkage feature through piping of the Swalley Canal.~~ ■ Loss of approximately 70 linear feet of habitat linkage feature through piping of the Swalley Riley Lateral.	■ Removal of 62 acres of western juniper woodlands habitat and sagebrush shrublands/shrub-steppe strategy habitat ■ ~~Loss of approximately 2,300 linear feet of habitat linkage feature through piping of the Swalley Canal.~~ ■ Loss of approximately 70 linear feet of habitat linkage feature through piping of the Swalley Riley Lateral.	■ Removal of 16 acres of western juniper woodlands habitat and sagebrush shrublands/shrub-steppe strategy habitat ■ Loss of approximately 70 linear feet of habitat linkage feature through piping of the Swalley Riley Lateral.
Temporary construction impacts	■ None.	■ Strategy habitats temporarily exposed to increased noise, dust, and human activity during construction.		
Wetlands and Other Waters				
Long-term impacts	■ No new canal piping as a result of the proposed action.	■ ~~Pipe approximately 950 feet of the Swalley Canal.~~ ■ New piping of lateral lines connecting to Swalley Main Canal Pipeline: 515 feet.	■ ~~Pipe approximately 2,300 feet of the Swalley Canal.~~ ■ New piping of lateral lines connecting to Swalley Main Canal Pipeline: 515 feet.	■ New piping of lateral lines connecting to Swalley Main Canal Pipeline: 380 feet.
Temporary construction impacts	■ None.	■ No impacts to wetlands and other waters because construction of canal crossings would occur during dry conditions.		

Note: This revised exhibit reflects corrections to the impacts that would result from the East DS1 and East DS2 Alternatives, includes updated information for the 2036 No Build Alternative where applicable, and includes the impacts and benefits of the Preferred Alternative.

Exhibit ES-7 FEIS: *Summary of Adverse and Beneficial Impacts of the Proposed Action*

Resource Element	No Build Alternative	East DS1 Alternative	East DS2 Alternative	Preferred Alternative
Threatened and Endangered Species				
Long-term impacts	■ No habitat removal for threatened and endangered species.	■ Removal of 1 acre of marginal habitat for a state threatened plant.		
Temporary construction impacts	■ None.	■ None.		
Non-Threatened and Endangered Species				
Long-term impacts	■ No loss of habitat for strategy species ■ No loss of urban habitat.	■ Loss of 66 acres of habitat for non-threatened and endangered, strategy species associated with the western juniper woodlands habitat and sagebrush shrublands/shrub-steppe strategy habitat.	■ Loss of 62 acres of habitat for non-threatened and endangered, strategy species associated with the western juniper woodlands habitat and sagebrush shrublands/shrub-steppe strategy habitat.	■ Loss of 16 acres of habitat for non-threatened and endangered, strategy species associated with the western juniper woodlands habitat and sagebrush shrublands/shrub-steppe strategy habitat.
		■ Loss of 34 acres of urban habitat.		■ Loss of 24 acres of urban habitat.
Temporary construction impacts	■ None.	■ Non-threatened and endangered species temporarily exposed to increased noise, dust, and human activity.		

Note: This revised exhibit reflects corrections to the impacts that would result from the East DS1 and East DS2 Alternatives, includes updated information for the 2036 No Build Alternative where applicable, and includes the impacts and benefits of the Preferred Alternative.

Exhibit ES-7 FEIS: *Summary of Adverse and Beneficial Impacts of the Proposed Action*

Resource Element	No Build Alternative	East DS1 Alternative	East DS2 Alternative	Preferred Alternative
Invasive Species				
Long-term impacts	■ No improvements to roadways near priority invasive species.	■ Increased roadway activity along Cooley Road and Clausen Drive resulting from roadway improvements, potentially spreading priority invasive species.		
Temporary construction impacts	■ None.	■ Approximately ~~152~~ 140 acres of ground disturbed during construction, resulting in the potential spread of invasive species.	■ Approximately 132 acres of ground disturbed during construction, resulting in the potential spread of invasive species.	■ Approximately 115 acres of ground disturbed during construction, resulting in the potential spread of invasive species.
Air Quality				
Long-term impacts	■ Reduction of regional and local level mobile source air toxic emissions due to national emissions control programs regardless of any local increase in vehicle-miles traveled on US 97 ■ Since no alternative is predicted to affect regional VMT, background pollutant concentrations are not expected to increase and localized pollutant concentrations are not expected to exceed the National Ambient Air Quality Standards (NAAQS).			
Temporary construction impacts	■ None.	■ Temporary degradation of air quality resulting from excavation, grading, hauling and various other activities ■ Short-term emissions from construction equipment, including carbon monoxide, nitrogen oxides, volatile organic compounds, directly-emitted respirable and fine particulate matter, and toxic air contaminants such as diesel exhaust particulate matter.		

Note: This revised exhibit reflects corrections to the impacts that would result from the East DS1 and East DS2 Alternatives, includes updated information for the 2036 No Build Alternative where applicable, and includes the impacts and benefits of the Preferred Alternative.

Exhibit ES-7 FEIS: *Summary of Adverse and Beneficial Impacts of the Proposed Action*

Resource Element	No Build Alternative	East DS1 Alternative	East DS2 Alternative	Preferred Alternative
Noise				
Long-term impacts	■ Noise impacts at 18 sites, including 46 residences and 5 businesses.	■ Noise impacts at 23 sites, including 59 residences and 5 businesses.	■ Noise impacts at 26 sites, including 63 residences and 5 businesses.	■ Noise impacts at 21 sites, including 67 residences and outdoor areas at 8 businesses.
Temporary construction impacts	■ None.	■ Noise temporarily generated by construction activities, equipment, and delivery vehicles.		
Energy				
Long-term impacts	■ Vehicle-miles traveled in the API: 411,284 miles/day ■ Fuel consumption: 15,663 gallons/day ■ Energy consumption: 2,022 million British Thermal Units (Btu)/day.	■ Vehicle-miles traveled in the API: 670,449 miles/day ■ Fuel consumption: 25,487 gallons/day ■ Energy consumption: 3,293 million Btu/day.	■ Vehicle-miles traveled in the API: 634,144 miles/day ■ Fuel consumption: 24,220 gallons/day ■ Energy consumption: 3,128 million Btu/day.	■ Vehicle-miles traveled in the API: 436,457 miles/day ■ Fuel consumption: 16,442 gallons/day ■ Energy consumption: 2,119 million Btu/day.
Temporary construction impacts	■ None.	■ Fuel consumption: 7.5 million gallons ■ Energy consumption: 932,170 million Btu.	■ Fuel consumption: 7.6 million gallons ■ Energy consumption: 953,114 million Btu.	■ Fuel consumption: 7.0 million gallons ■ Energy consumption: 880,245 million Btu.

Note: This revised exhibit reflects corrections to the impacts that would result from the East DS1 and East DS2 Alternatives, includes updated information for the 2036 No Build Alternative where applicable, and includes the impacts and benefits of the Preferred Alternative.

Exhibit ES-7 FEIS: *Summary of Adverse and Beneficial Impacts of the Proposed Action*

Resource Element	No Build Alternative	East DS1 Alternative	East DS2 Alternative	Preferred Alternative
Geology				
Long-term impacts	■ No ground disturbance.	■ ~~152~~ 140 acres of ground disturbance.	■ 132 acres of ground disturbance.	■ 115 acres of ground disturbance.
Temporary construction impacts	■ None.	■ Erosion of exposed soils.		
Hazardous Materials				
Long-term impacts	■ No disturbance or remediation of known contaminated sites.	■ Potential disturbance and remediation of 1 individual and 3 multi-property known contaminated sites.		
Temporary construction impacts	■ None.	■ Potential exposure or mobilization of contaminants from grading ■ Potential contamination of water discharge areas from dewatering ■ Potential disturbance of unknown contamination (undocumented storage tanks, asbestos-containing materials and lead-based paint) from excavation, earthwork, grading, and utility work ■ Potential mercury groundwater contamination and worker exposure to mercury from high intensity discharge mercury vapor lamps.		

Note: This revised exhibit reflects corrections to the impacts that would result from the East DS1 and East DS2 Alternatives, includes updated information for the 2036 No Build Alternative where applicable, and includes the impacts and benefits of the Preferred Alternative.

ES.5 Unresolved Issues

There are several outstanding issues that will need to be resolved prior to publishing the Final EIS. These issues were identified by the project team earlyon and are expected to be successfully resolved.

All of the unresolved issues identified in the Draft EIS have been resolved for the Preferred Alternative, as demonstrated in the following sections.

Goal Exceptions

Construction of roadways outside of the UGB would require exceptions to Oregon Statewide Planning Goals 11 (public facilities and services) and 14 (urbanization). Two goal exceptions are anticipated for the East DS1 and East DS2 Alternatives: one for the new US 97/3rd Street interchange and one for the Robal Road extension west of US 20 to OB Riley Road. Through the goal exception process, the proposed action would need to demonstrate that it meets the applicable standards for exceptions for transportation improvements, which are listed in OAR 660-012-0070. They require the applicant to:

- Identify the transportation need
- Demonstrate that the need cannot "reasonably be accommodated" through alternatives not requiring goal exceptions, such as through improvements to existing facilities or in locations not requiring new exceptions (such as on lands inside the UGB)
- Compare the economic, social, environmental and energy consequences of the recommended alternative with other alternatives, and select the recommended alternative only if the net economic, social, environmental and energy consequences of that alternative, with mitigation, are not significantly more adverse than the net consequences of the other alternatives
- Provide measures to minimize development pressures on rural lands and protect such lands for rural uses.

Definition

Oregon Statewide Planning Goals

The Oregon Statewide Planning Goals were established in 1973 and constitute the framework for the statewide land use planning program.

The Preferred Alternative will not require any exceptions to the statewide planning goals. All of the improvements will be contained within the City of Bend's UGB except for the extension of Britta Street and the modification of the Cooley Road/O.B. Riley Road intersection to construct a roundabout, which will be constructed to County standards.

Interchange Area Management Plans

Interchange area management plans would be developed to protect the function of the existing interchange at Empire Avenue and a future interchange in the northern portion of the API. The interchange area management plan for the Empire Avenue interchange would

help ensure that this facility continues to provide safe and efficient connections between US 97, US 20, and the local roadways within the vicinity of the interchange. The interchange area management plan for the new northern interchange under the East DS1 and East DS2 Alternatives would serve a similar function; to ensure that the US 97 facility would operate as intended over a long-range planning horizon. Both interchange area management plans would identify land use management strategies, short-term and long-term transportation improvements, access management goals, and strategies to fund identified improvements. The City of Bend and Deschutes County would adopt policies and ordinances necessary to implement the interchange area management plans prior to the publication of the Final EIS. The interchange area management plans would be adopted by the Oregon Transportation Commission prior to the beginning of construction.

Definition

Interchange Area Management Plan

An interchange area management plan is a joint ODOT and local government long term (20+ years) transportation and land use plan to balance and manage transportation and land use decisions in interchange areas, and is an important tool in protecting the function of state highway interchanges and the supporting local street network (ODOT 2006b).

Since the publication of the Draft EIS, ODOT determined that no changes to land use along Empire Avenue would occur, so an interchange area management plan would not be required for the US 97/Empire Avenue interchange. The Preferred Alternative does not include a northern interchange and no changes to land use along Empire Avenue will occur; thus an interchange area management plan is not required.

Highway Designations

US 97 is currently classified as a highway of statewide significance and is designated as an expressway and as a freight route on the National Highway System. The proposed new alignments associated with the build alternatives would be constructed and operated as an access controlled expressway consistent with the bypass policies in the Oregon Highway Plan and Bypass Policy. The remaining portion of US 97 would be reclassified by the Oregon Transportation Commission or transferred to the local jurisdiction.

Definition

Bypass

Bypasses are highways designed to maintain or increase mobility for through traffic. Generally they relocate the highway alignment around a downtown, an urban or metropolitan area or an existing highway to provide an alternative route for through traffic using that highway.

ODOT will coordinate with the Oregon Transportation Commission to apply the bypass, expressway, and freight route designations to the portions of US 97 that will be realigned under the Preferred Alternative.

Local Plan Amendments and Land Use Permits

The Preferred Alternative to be identified in the Final EIS would need to be adopted and amended into the Bend Metropolitan Planning Organization's *2007–2030 Metropolitan Transportation Plan.* The *2007–2030 Metropolitan Transportation Plan* is a 20-year long-range transportation plan that addresses all modes of transportation, establishes transportation policy and project priorities, and includes a financially constrained project list. Part of the long-range planning process is development of a long-range revenue forecast. Only projects

that fit within or can be funded with forecasted revenues are included in the *2007–2030 Metropolitan Transportation Plan.* ODOT is coordinating with the Bend Metropolitan Planning Organization for adoption of the Preferred Alternative into the next update of the plan (FHWA 2011).

The Preferred Alternative would also need to be adopted and amended into the *Bend Area General Plan, Bend Urban Area Transportation System Plan, Deschutes County Comprehensive Plan,* and *Deschutes County Transportation System Plan.* Any new local roads outside of existing right of way could require land use permits from the City and County.

Portions of the Preferred Alternative have identified funding and are included in the financially-constrained list in the ***2007-2030 Metropolitan Transportation Plan.*** On August 15, 2013, the Bend Metropolitan Planning Organization voted to amend the ***2007-2030 Metropolitan Transportation Plan*** to include the remaining portions of Preferred Alternative in the Plan's illustrative list, thereby making the Preferred Alternative consistent with this plan.

As determined by Deschutes County in June 2013, the Britta Street extension in unincorporated Deschutes County, which is part of the Preferred Alternative, is already included in the ***Deschutes County Transportation System Plan*** (see Appendix M). The roundabout at Cooley Road and O.B. Riley Road has been designed in coordination with Deschutes County. On June 14, 2013, ODOT and Deschutes County agreed that this improvement will be added to the ***Deschutes County Transportation System Plan*** when the project is funded for construction. Therefore, the Preferred Alternative is consistent with the ***Deschutes County Transportation System Plan*** and the ***Deschutes County Comprehensive Plan.***

The City of Bend's ***Bend Urban Area Transportation System Plan*** has been amended to include the Preferred Alternative (March 5, 2014).

Areas Remaining to be Surveyed

Some areas within the area of potential effect (APE) have not yet been surveyed for archaeological resources due to land owners not granting permission for surveys and design changes to the alternatives that occurred since the surveys were conducted. Upon gaining right of entry ODOT would survey all remaining areas and comply with Section 106 of the National Historic Preservation Act prior to construction.

All areas within the design footprint of the Preferred Alternative have been surveyed for archaeological resources, with the exception of small areas adjacent to the existing right of way on eight parcels that

Definition

Area of Potential Effect (APE)

The APE is the area within which an undertaking may cause direct or indirect effects to the character or use of historic properties.

total approximately 1.8 acres. The Final EIS includes a commitment by ODOT to survey these remaining areas for archaeological resources prior to construction as ODOT purchases right of way and takes ownership.

ES.6 Identified Areas of Concern

Throughout the alternatives development process a number of issues were raised by the public, participating agencies, and the ODOT-sponsored committees. Generally, the primary areas of concern were:

- **Changes to Approaches and Travel Routes**—Visibility of businesses from the realigned US 97, travel routes to businesses from US 97, and changes to businesses' private driveways, public street connections, and public approach roads are concerns that have been raised repeatedly
- **Emergency Service Providers**—Impacts to emergency response time as a result of altered travel routes and loss of emergency response vehicle maneuvering (U-turn) on US 97 between Empire Avenue and Cooley Road have been raised as an area of concern by emergency service providers
- **Business and Residential Displacements**—Representatives from individual businesses, established business areas, and the residential areas in and around the API have expressed concern about displacements resulting from right of way acquisition and availability of commercial, industrial and residential properties that would be suitable for relocation
- **Quality of Life**—Concerns regarding potential impacts to quality of life have been raised by residents and business representatives throughout the API. These impacts could include:
  - Increased air, noise, and visual impacts of new and expanded local roads, elevated structures, and the realignment of US 97 closer to residential neighborhoods
  - Availability of affordable housing for relocated residents
  - Roadway connectivity and travel routes to existing and future destinations, including out-of-direction travel once access is modified and private driveways on US 97 are eliminated.

The Preferred Alternative was specifically developed to address many of these concerns either through avoidance, such as replacing the northern interchange with a signalized intersection that is wholly contained within the City of Bend UGB, or minimization, such as decreasing impacts to rural residential lands.

More Information

Three ODOT sponsored committees conducted formal meetings throughout development of the proposed action, including:

- Citizen Advisory Committee
- Agency Coordination Committee
- Steering Team

ES.7 Permits and Approvals Needed

Federal, state, and local actions, permits, plan amendments, and approvals would be required for the proposed action, as listed in Exhibit ES-8 FEIS.

ODOT will obtain these permits, approvals, plan amendments, and licenses for the Preferred Alternative prior to initiating construction.

ES.8 Avoidance, Minimization, and/or Mitigation Commitments Incorporated into the Preferred Alternative

Avoidance, minimization, and mitigation commitments incorporated into the Preferred Alternative may be found in each subsection of Chapter 3.

***Exhibit ES-8** FEIS: Permits and Approvals Required*

Agency	Permit/Approval/License	Updated Final EIS Status
Federal Highway Administration	Section 106 determination with Memorandum of Agreement	Completed
Federal Highway Administration	Section 4(f) Evaluation Approval	Completed
Oregon Department of Environmental Quality	National Pollution Discharge Elimination System General Construction Permits (including 1200-CA)	To Be Obtained During Final Design
Oregon Department of Environmental Quality	Oversight of hazardous materials issues	To Be Obtained During Final Design
Oregon Department of Environmental Quality	Site preparation permits for grading, erosion, blasting, and air and noise emissions	To Be Obtained During Final Design
Oregon Department of Transportation	Permit for relocation of utility lines in a state road right of way	To Be Obtained During Final Design
Oregon Department of Transportation	Compliance with Oregon Senate Bill 408	To Be Obtained During Final Design
Oregon Department of Water Resources	Water Rights	To Be Obtained During Final Design
State Historic Preservation Office	Section 106 Historic Resource Concurrence	Completed
Bend Metropolitan Planning Organization	Amendment of *2007-2030 Metropolitan Transportation Plan*	Completed
Deschutes County	Amendment of Deschutes County Comprehensive Plan	Not Required for the Preferred Alternative
Deschutes County	Amendment of Deschutes County Transportation System Plan	Not Required for the Preferred Alternative
Deschutes County	Compliance with Deschutes County Code	To Be Obtained During Final Design
Deschutes County	Goal Exception Application for Statewide Planning Goals 11 (Public Facilities and Services) and 14 (Urbanization)	Not Required for the Preferred Alternative
Deschutes County	Grading Permit	To Be Obtained During Final Design

***Exhibit ES-8** FEIS: Permits and Approvals Required*

Agency	Permit/Approval/License	Updated Final EIS Status
Deschutes County	Land Use Permit	To Be Obtained During Final Design
Deschutes County	Noise variance	To Be Obtained During Final Design
Deschutes County	Utility Permit	To Be Obtained During Final Design
City of Bend	Amendment of Bend Area General Plan	Completed
City of Bend	Amendment of Bend Urban Area Transportation System Plan	Completed
City of Bend	Approval of a Special Planned Areas application (Lava Ridge Refinement Plan Area)	To Be Obtained During Final Design
City of Bend	Land Use Permit	To Be Obtained During Final Design
City of Bend	Landmarks Commission Approval for relocating or removing the Nels and Lillian Andersen House	To Be Obtained During Final Design
City of Bend	Demolition Permit	To Be Obtained During Final Design
City of Bend	Noise variance	To Be Obtained During Final Design
City of Bend	Compliance with Bend Development Code	To Be Obtained During Final Design
BNSF Railway	Encroachment/Crossing Permit	To Be Obtained During Final Design
Swalley Irrigation District	Encroachment/Crossing Easements	To Be Obtained During Final Design

Note: This exhibit was updated to identify the status of each permit or approval at the time of publication of the Final EIS. Additional permits and approvals identified during the development of the Final EIS are shown in the colored text.