

DRAFT Interchange Area Management Plan

VOLUME 1



I-5 Exit 127 (North Roseburg)

May 2014

Prepared for



Prepared by



I-5 Exit 127 (North Roseburg)

Roseburg, Oregon

DRAFT Interchange Area Management Plan

Prepared for

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- Technical Memorandum #3: Future Baseline Traffic Conditions
- Technical Memorandum #4: Concept Development and Evaluation
- Technical Memorandum #5: Preferred Alternative
- Technical Memorandum #6: Access Management Plan
- Technical Memorandum #7: Potential Management Actions
- Technical Memorandum #8: Public Involvement Summary
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1. INTRODUCTION

The Oregon Department of Transportation (ODOT) encourages the development of Interchange Area Management Plans (IAMPs) to maintain and improve freeway performance and safety by improving system efficiency and management before adding capacity. The development of this IAMP is intended to protect the function of the interchange for the foreseeable future.

1.1. Interchange Function

I-5 Exit 127 is an urban interchange that serves north Roseburg in Douglas County. The interchange ramps connect with Edenbower Boulevard, which is one of four east-west local arterial routes that provide access over I-5 in Roseburg. Edenbower Boulevard connects with Stephens Street (Old Highway 99) east of the interchange and Stewart Parkway southwest of the interchange. Stephens Street is a north-south arterial that runs the entire length of Roseburg parallel to the freeway. Stewart Parkway is another Roseburg arterial that, with Edenbower Boulevard, provides a north-south arterial serving areas of Roseburg west of the freeway.

Edenbower Boulevard provides access to the Roseburg Regional Airport and Mercy Medical Center from I-5. It also connects to the community of Winchester and a Costco to the north via Stephens Street (Old Highway 99), and provides access to residential and commercial developments.

Land uses around the interchange vary. Properties on the west side of the interchange are primarily commercial, including several supermarkets and other big box retail, with some low and medium density residential neighborhoods. Properties on the east side of the interchange are zoned primarily mixed use and industrial, but parts have been developed as residential neighborhoods, bounded by commercial uses (large home improvement centers) and the airport.

The greatest areas of undeveloped land lie north of the interchange, within the Roseburg urban growth boundary (UGB), but mostly outside of the city limits. These areas are primarily zoned for industrial development with some residential designations. Access to these undeveloped lands is limited to Aviation Drive and Hooker Road, which crosses the railroad tracks to connect with Stephens Street.

1.2. Problem Statement

Two primary issues affect the long-term operations of Interchange 127. The existing geometric design does not meet some of the current design guidelines, which raises potential safety concerns at the interchange as summarized by ODOT in the *I-5 State of the Interstate Report*. At the same time, development has placed increased demand on the interchange and supporting arterial street system. Area growth will continue to exacerbate these issues.

A detailed geometric deficiency assessment, conducted in 2000 for the I-5 State of the Interstate Report, reached the following conclusions:

- The curve on Edenbower Boulevard west of the interchange is sharp for the posted speed.
- The deceleration lane length is too short on both the northbound and southbound exit ramps.
- Adjacent public road intersections are too close to the ramp terminals.

The interchange was originally constructed as a standard diamond layout but a northbound looping on ramp was added in 2007. While the southbound ramp terminal is controlled with a traffic signal, also added in 2007, the northbound ramp terminal remains STOP-controlled. Both northbound and southbound ramp terminals have multi-lane approaches to Edenbower Boulevard. The deceleration length of the exit ramps was reassessed in 2007 and found acceptable. The bridge over I-5 is three lanes wide with sidewalks and bike lanes on both sides.

According to the City of Roseburg Transportation System Plan (TSP) dated June 2006, both the northbound and southbound off ramps experience long delays during weekday peak hours; however, the traffic signal installed at the southbound ramp terminal has alleviated the congestion. The traffic signals along Edenbower Boulevard at Aviation Drive and the southbound ramp terminal are currently coordinated to provide gaps in traffic flow so that the STOP-controlled northbound ramp terminal is not congested during peak hours.

Although congestion is not currently an issue at the interchange itself, access to the interchange is affected by traffic delays on the supporting arterial network that are anticipated to worsen over the next 20 years. The intersection of Edenbower Boulevard and Stewart Parkway is currently congested with queues for some traffic movements that exceed the length of the turn bays. Traffic in these turn lanes sometimes has to wait through several green cycles in order to travel through the intersection; this condition is particularly true for the eastbound left turn on Stewart Parkway.

The spacing of the ramp terminals and other access points along Edenbower Boulevard does not meet current access standards. The northbound and southbound ramp terminals are spaced approximately 550 feet apart with nearby intersections only 400 feet to either side of the ramps. The Oregon Highway Plan (OHP) recommends a minimum spacing of 1,320 feet. As traffic volumes continue to grow, the proximity of these intersections could affect the safe and efficient function of the interchange area.

1.3. IAMP Study Area

The interchange management study area (IMSA) delineates the vicinity in which transportation facilities, land uses, and approaches may affect operations at the interchange. For interchanges on the interstate system, the IMSA should extend a minimum of ½ mile¹ in all directions and

¹ Interchange Access Management Plan Guidelines, ODOT, April 2013.

should be large enough to “address both direct and indirect transportation and land uses.” As shown in Figure 1, the IMSA generally extends at least ½ mile along the existing roadway system in all directions.

The IMSA extends east of the interchange to include the intersection of Edenbower Boulevard and Stephens Street over 1,500 feet from the northbound ramp terminal. It also extends approximately ½ mile to the west and south of the interchange to the intersection of Edenbower Boulevard and Stewart Parkway. Most of the local traffic using I-5 Exit 127 passes through one of these two intersections. Understanding how these intersections operate and their relationship to the interchange traffic flow is a key part of the IAMP planning process.

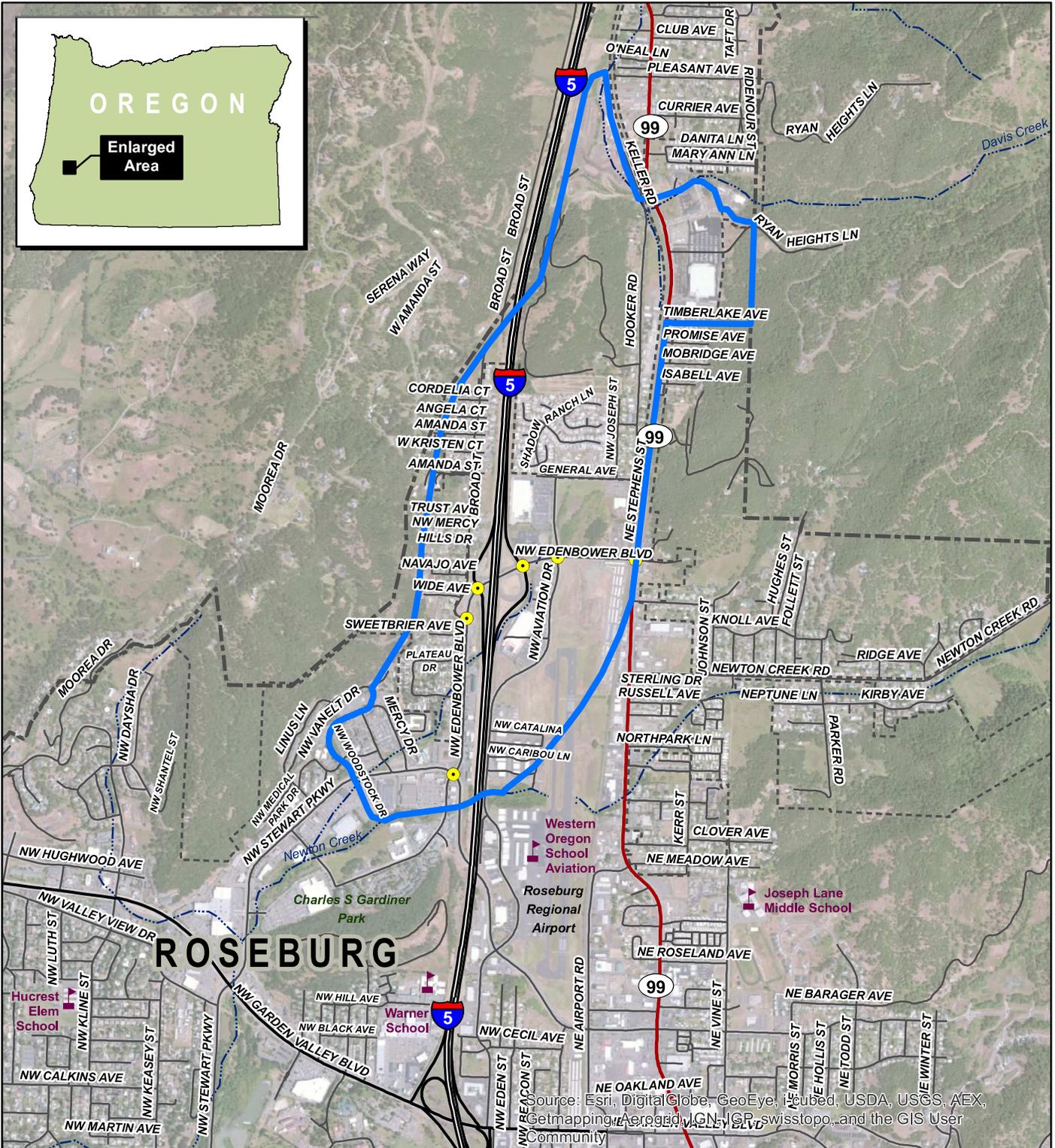
Although the boundaries of the IMSA concentrate around the interchange, the potential growth of Roseburg and the surrounding rural areas both within and outside of the UGB are accounted for in analyzing future conditions. Land uses and population forecasts are based on the adopted Comprehensive Plans and Zoning for the City of Roseburg and Douglas County.

1.4. IAMP Goals and Objectives

The goals of this IAMP are to develop a plan for improvements for Interchange 127 that can be implemented over time to maximize the function of the existing interchange and address the long-term needs of Roseburg and other nearby Douglas County communities.

The objectives of the IAMP are to:

- Protect the function of the interchange and Edenbower Boulevard as specified in the Oregon Highway Plan (OHP) and City of Roseburg Transportation System Plan.
- Develop concepts to improve safety and maximize operational efficiency of the freeway and existing interchange facility.
- Evaluate the need for capacity improvements to address future needs based on the adopted comprehensive land use plans of Roseburg and Douglas County.
- Identify potential local system enhancements that maintain connectivity and complement the interchange function.
- Incorporate bicycle and pedestrian elements, such as sidewalks, bike lanes, and pathways, as well as corresponding roadway crossings.
- Develop an access management plan that provides for safe and acceptable operations on the transportation network, and moves towards achieving the applicable access spacing standards in Oregon Administrative Rule (OAR) 734-051.
- Coordinate planning efforts with other plans and projects in the study area.
- Prioritize IAMP improvements with consideration for potential funding mechanisms.



Source: Esri, DigitalGlobe, GeoEye, iSat, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

I-5 Exit 127 (North Roseburg) IAMP

Legend

-  Interchange Management Study Area (IMSA)
-  Urban Growth Boundary (UGB)
-  City Limits
-  School
-  Intersections to be Studied
-  Interstate
-  Highway
-  Arterial Road
-  Local Road
-  Rivers



Figure 1
Interchange Management Study Area



1.5. Planning Process

The IAMP for I-5 Exit 127 was developed through a series of technical analyses.

Key elements of the process include:

- Evaluation of baseline conditions, such as existing and future traffic operations, environmental constraints, land use designations, and community facilities (Evaluation of Baseline Conditions)
- Alternatives development and evaluation (IAMP Improvements)
- Creation of the IAMP, including access management and local system improvements (Management Strategies)
- Implementation measures (Implementation)

This document provides a summary of each of these elements. A second volume provides the detailed analysis and supporting documentation that led to the development of the plan.

Four technical advisory committee (TAC) meetings were held for I-5 Exit 127 that included technical and City staff. ODOT and the City of Roseburg provided technical representation. The meetings included graphic presentations and facilitated discussion to solicit input. In addition to technical review and input, a citizen advisory committee (CAC), including area citizens, provided input. The meetings for these two committees occurred on:

- April 1, 2013 (CAC) and April 2, 2013 (TAC)
- August 1, 2013 (CAC) and August 2, 2013 (TAC)
- January 9, 2014 (Combined CAC and TAC)
- June 11, 2014 (Combined CAC and TAC)

In addition to the committee review, two public open houses were held during the process to allow the community input into the development of the plan. These meetings occurred on:

- April 1, 2013
- August 12, 2013

2. EVALUATION OF BASELINE CONDITIONS

This section summarizes baseline conditions in the IAMP study area including an overview of the regulatory framework that guides the process. Land use within the study area is presented and potential land use or environmental constraints are identified. Existing transportation system and traffic conditions in the study area are evaluated to identify deficiencies. Future traffic operations and safety are then assessed to determine how conditions may worsen.

2.1. Overview of the Regulatory Framework

State and local regulations, policies, and transportation and land use plans provided the legal framework for preparing the IAMP. (For a complete list of the guiding framework, refer to the summary description of all relevant plans and policies included in *Technical Memorandum #1: Definition and Background* in Volume 2 of this IAMP.) The language contained within these documents provides guidance to the state and local jurisdictions on how to manage transportation facilities and land uses in the study area to protect the interchange function, provide for safe and efficient operations, and minimize the need and expense for making major improvements to the interchange through the 2035 planning horizon.

Discussed below are the operational and access management standards. Operational standards and access management standards for study area roadway facilities are designated by ODOT and the City of Roseburg.

2.1.1. Operational Standards

The Oregon Highway Plan (OHP)² has established several policies that enforce general objectives and approaches for maintaining highway mobility. Of these policies, the Highway Mobility Standards (Policy 1F) establish maximum volume-to-capacity (v/c) ratio targets (or standards) for peak hour operating conditions for all highways in Oregon based on the location and classification of the highway segment being examined. The OHP policy also specifies that the v/c ratio standards be maintained for ODOT facilities through a 20-year horizon. For the concept evaluation, the mobility standards in the 2012 Highway Design Manual (HDM)³ were applied.

A v/c ratio of less than 1.00 indicates that the volume is less than capacity. When it is closer to 0.00, traffic conditions are generally good with little congestion and low delays for most intersection movements. As the v/c ratio approaches 1.00, traffic becomes more congested and unstable with longer delays.

² Table 6, Volume-to-Capacity Ratio Targets for Peak Hour Operating Conditions, Oregon Highway Plan Policy 1F Revisions: Adopted December 21, 2011, Oregon Department of Transportation.

³ Table 10-2: 20 Year Design-Mobility Standards (Volume/Capacity [V/C] Ratio), 2012 ODOT Highway Design Manual, Oregon Department of Transportation.

Another standard for measuring traffic capacity and quality of service of roadways at intersections is level of service (LOS). Six standards have been established ranging from LOS A where there is little or no delay, to LOS F, where there is delay of more than 50 seconds at unsignalized intersections, or more than 80 seconds at signalized intersections.

The City of Roseburg also has established performance standards. The City of Roseburg identifies a dual performance measure in the city's TSP. The dual performance measure specifies a v/c ratio based on roadway functional classification and a LOS performance standard based on traffic control (i.e., signalized or unsignalized).

The freeway and ramps falls under state jurisdiction but jurisdictional responsibility along the other roadways lies with the City of Roseburg. The resulting operational standards applicable to the freeway and the management area intersections are shown in Table 1.

Table 1. Management Area Performance Measures

Location	Applicable Jurisdictional Performance Measures		
	ODOT ¹	Roseburg ²	
I-5 Mainline	V/C ≤ 0.80	-	-
I-5 SB Ramps at Edenbower Blvd.	V/C ≤ 0.85	-	-
I-5 NB Ramps at Edenbower Blvd.	V/C ≤ 0.85	-	-
Edenbower Blvd. at Stewart Pkwy. (Signalized)	-	LOS D or better	V/C ≤ 0.85
Edenbower Blvd. at Broad St.	-	LOS E or better	V/C ≤ 0.85
Edenbower Blvd. at Aviation Dr. (Signalized)	-	LOS D or better	V/C ≤ 0.85
Edenbower Blvd. at Stephens St. (Signalized)	-	LOS D or better	V/C ≤ 0.85

Notes:

1. OHP, Policy 1F, Action 1F.1, sixth bullet establishes a "maximum volume to capacity ratio for the ramp terminals of interchange ramps that is the more restrictive volume to capacity ratio for the crossroad, or 0.85" and Table 6, Volume-to-Capacity Ratio Targets for Peak Hour Operating Conditions.
2. City of Roseburg Transportation System Plan, 2006, p.7-44.

2.1.2. Applicable Access Management Standards

The OHP also addresses access management with the most recent revisions adopted in March 2012⁴. More detailed requirements, action definitions, and the access spacing standards for state highways are specified in Oregon Administrative Rule (OAR) 734-051 (Division 51): Highway Approaches, Access Control, Spacing Standards, and Medians⁵.

Elevated above I-5 at Interchange 127, Edenbower Boulevard is not a state facility. However, ODOT does have jurisdiction of the section of roadway between Broad Street and just west of

⁴ 1999 Oregon Highway Plan Revisions to Address Senate Bill 264 (2011) Policy 3A, website:

http://www.oregon.gov/ODOT/TD/TP/docs/ohp_am/accesssm.pdf

⁵ Oregon Administrative Rules Chapter 734, Division 51, Highway Approaches, Access Control, Spacing Standards, and Medians, Temporary Rules Effective January 1, 2012, Amended May 3, 2012, website:

<http://www.oregon.gov/ODOT/HWY/ACCESSMGT/docs/pdf/734-051.pdf>

Aviation Drive. The City of Roseburg has jurisdiction of the roadway in the remainder of the study area.

The access management standards applicable to this project are summarized in Table 2.

Table 2. Access Spacing Standards

Segment Characteristic	Access Spacing Standard
ODOT – Interchange Ramp Terminals - Fully Developed Urban¹	
Distance from off-ramp to first approach on the right, right-turn movements only	750 feet ²
Distance from off-ramp to first intersection where left turns are allowed	1320 feet ²
Distance from last approach road to the start of the taper for the on-ramp	1320 feet ²
Distance from last right in/right out approach road to the start of the taper for the on-ramp	990 feet ²
Other Public/Private Access Points	
Roseburg - Arterial (Edenbower Blvd.)	500 feet ³

Notes:

1. Fully Developed Urban Interchange Management Area: Occurs when 85% or more of the parcels along the developable frontage area are developed at urban densities and many have driveways connecting to the crossroad. See definition in the Oregon Highway Plan.
2. Table 18 in the revised OHP-Effective January 1, 2012 Amended May 3, 2012 : Access Management Spacing Standards for Freeway Interchanges with Multi-Lane Crossroads
3. City of Roseburg Land Use and Development Ordinance.

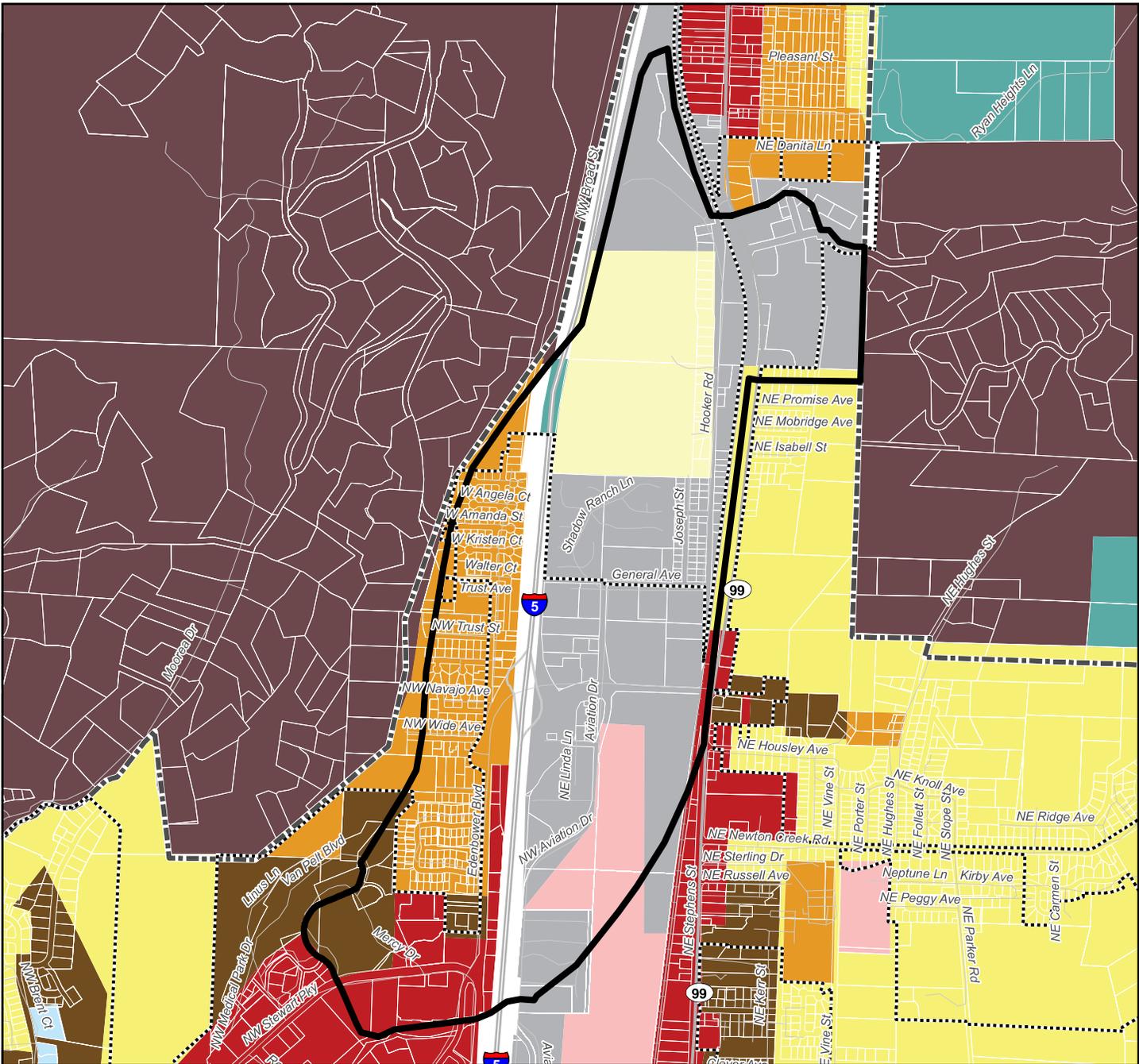
Ideally, a project includes provisions by which access can be made fully compliant with the spacing standards in Table 2. In many instances, access needed for existing development will not allow these standards to be met. When the requirements and standards cannot be met, progress toward meeting the applicable standards must be demonstrated or a deviation must be justified and approved by the Region Access Management Engineer.

2.2. Existing Land Use Designations and Zoning

This section summarizes existing land use within the IMSA. Figure 2 shows the Comprehensive Plan designations for the IMSA, and Figure 3 shows the zoning designations. The information in this section is taken primarily from published documents, maps, and GIS data.

The IMSA is within the City of Roseburg UGB, although only the southern portion is within the City of Roseburg city limits. East of the interchange, Comprehensive Plan designations are Industrial with some Public/Semi-Public lands and an area designated as Residential Open Space. West of the interchange, designations are primarily Residential (medium and high density) or Commercial.

For the most part, the zoning designations are consistent with the general Comprehensive Plan designations. Some Mixed Use zoning immediately east of the interchange has allowed development of some big box retail (Lowes and Home Depot). Other land uses of note in the IMSA include the Roseburg Regional Airport zoned as Airport District and Mercy Medical Center in the Public Reserve zoning along Edenbower Boulevard.



I-5 Exit 127 (North Roseburg) IAMP

Legend

- Urban Growth Boundary (UGB)
- City Limits
- Interchange Management Study Area (IMSA)

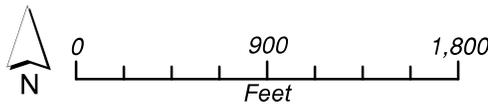
Douglas County Comprehensive Plan Designations

- Agriculture
- Rural Residential

City of Roseburg Comprehensive Plan Designations

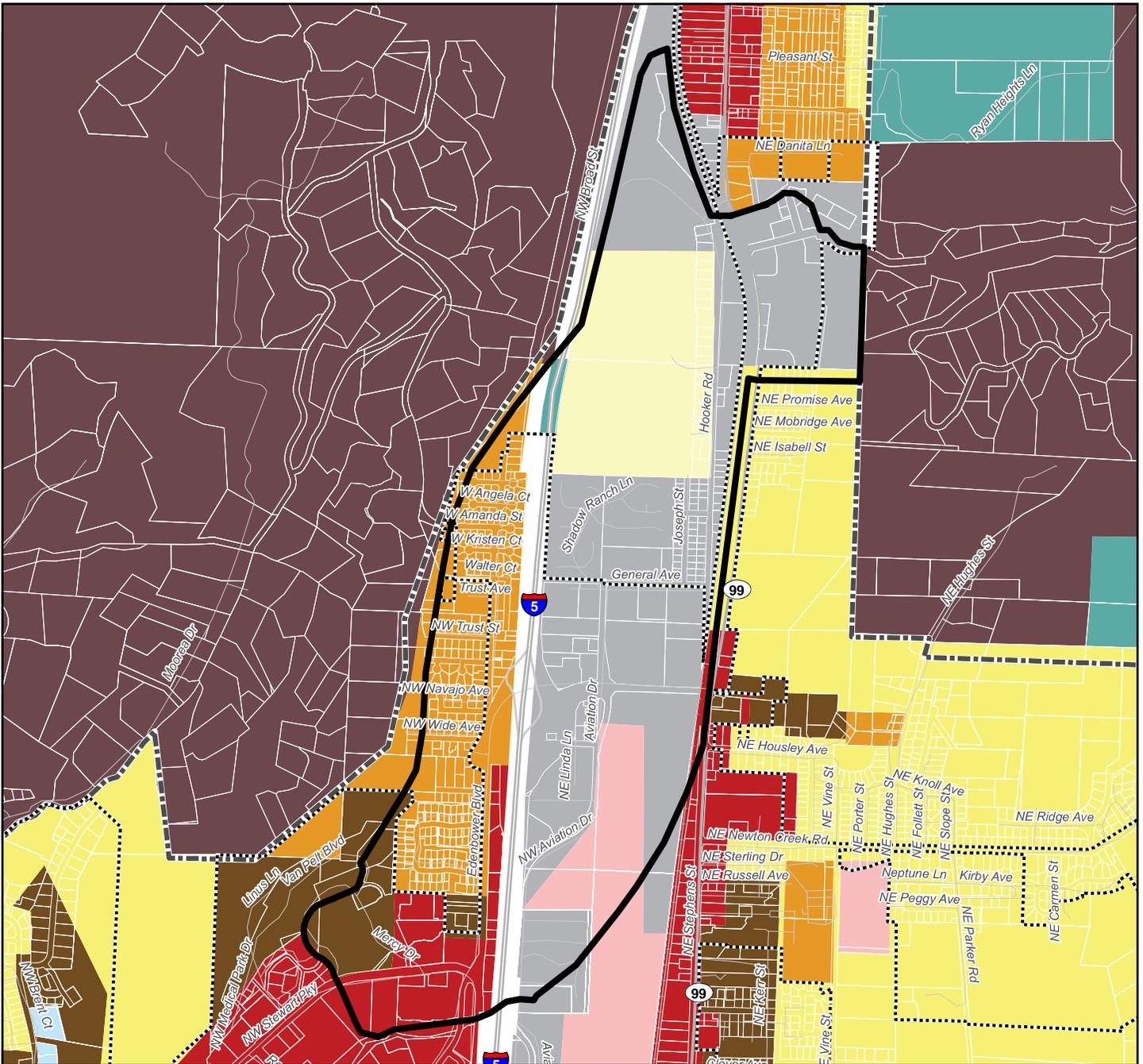
- Low-Density Residential (LDR)
- Medium-Density Residential (MDR)
- High-Density Residential (HDR)
- Residential Open Space (ROS)
- Commercial (COM)
- Industrial (IND)
- Professional Office (PO)
- Public Open Space (POS)
- Public/Semi-Public (PSP)

Figure 2
Comprehensive Plan
Designations



Source Info:
City of Roseburg, Oregon, 2010-2012
Douglas County, Oregon, 2010-2012





I-5 Exit 127 (North Roseburg) IAMP

Legend

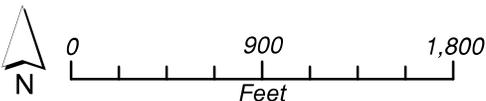
- Urban Growth Boundary (UGB)
- City Limits
- Interchange Management Study Area (IMSA)

City of Roseburg Zoning Designations

- Airport District (AP)
- Limited Commercial (C-1)
- General Commercial (C-3)
- Light Industrial (M-1)
- Medium Industrial (M-2)
- Medium Density Multi-Family Residential (M-18)
- Multi-Family Residential (M-29)
- High Density Multi-Family Residential (M-40)
- Mixed Use (MU)
- Public Reserve (PR)
- Single Family Residential > 7,500 SF (R-1-7.5)
- Single Family Residential (R-1-10)

Douglas County Zoning Designations

- Rural Residential (1R)
- Rural Residential (5R)
- Agriculture and Woodlot (AW)
- Community Commercial (C-2)
- General Commercial (C-3)
- Farm Forest (FF)
- Light Industrial (M-1)
- Medium Industrial (M-2)
- Heavy Industrial (M-3)
- Public Reserve (PR)
- Single-Family Residential (R-1)
- Multiple-Family Residential (R-2)
- Rural Residential (RR)
- Suburban Residential (RS)
- Floodplain Overlay (FP)



Source Info:
 City of Roseburg, Oregon, 2010-2012
 Douglas County, Oregon, 2010-2012

Figure 3
 Zoning Designations



2.3. Environmental, Community, and Cultural Resources

Research and mapping of environmental features and community resources in the I-5 Exit 127 IMSA was used to identify known issues and those that may pose potential challenges or barriers to transportation improvements. The information gathered was taken primarily from published documents and maps, GIS data, and conversations with appropriate professional contacts. The analysis is limited to “visual windshield validation.” Further resources may exist in the study area that are not yet documented or are not visually apparent. For more detailed information regarding this research, refer to *Technical Memorandum #2: Existing Conditions Analysis* in Volume 2 of this IAMP.

Environmental features researched in the IMSA include:

- Wildlife Habitat and Wetlands
- Threatened and Endangered Species
- FEMA Floodplain/Floodway

Community and cultural resources identified in the IMSA include:

- Historic and Archaeological Resources
- Sections 4(f) Resources

Socioeconomic data was also mapped to incorporate environmental justice considerations into the IAMP development.

2.3.1. Potential Design Constraints

Depending on the location of the preferred project, final design and construction details, there will be specific permits, regulatory requirements, or authorizations required prior to construction of the project.

Special attention should be given to avoiding or minimizing impacts to Davis, Newton, and Sweetbriar creeks and the Umpqua River, as impacts to these may affect:

- Habitat and riparian corridors
- Wetlands
- T&E species habitat

In addition, impacts to environmental justice or transportation disadvantaged populations should be avoided or minimized.

2.4. Transportation System Inventory

The transportation system inventory examines the roadways, access points, and bicycle and pedestrian facilities in the study area. (For more detailed system inventory information, refer to *Technical Memorandum #2: Existing Conditions Analysis* in Volume 2.)

2.4.1. Roadway Inventory

I-5 Exit 127 is an urban interchange that serves North Roseburg in Douglas County. The interchange ramps connect with Edenbower Boulevard, which is one of four east-west local arterial routes that provide access over I-5. Edenbower Boulevard provides access to the Roseburg Regional Airport and Mercy Medical Center from I-5. It also connects to the community of Winchester to the north via Stephens Street (Old Highway 99), and provides access to residential and commercial developments. Table 3 presents an inventory of study area roadways and their general characteristics.

Table 3. IAMP 127 Study Area Roadway Inventory

Roadway/ Highway Name	Jurisdiction	ODOT/Federal Functional Classification	City/County Functional Classification	Posted Speed (mph)	No. of Lanes
Interstate 5					
Mainline	ODOT	Interstate, NHS, FR, TR ¹	-	65	4
I-5 Exit 127 Ramps	ODOT	Interstate, NHS, FR, TR ¹	-	-	1
City					
Edenbower Boulevard	City of Roseburg	Minor Arterial	Arterial ²	40 ³	2
Stewart Parkway	City of Roseburg	Minor Arterial	Arterial	40	2
Broad Street	City of Roseburg	Urban Collector	Minor Collector	25	2
Aviation Drive	City of Roseburg	Urban Collector	Collector	40	2
Stephens Street	City of Roseburg	Principal Arterial	Arterial	20-45 ⁴	4, 2 ⁵

Acronyms: NHS: National Highway System; FR: State Freight Route; TR: Federally Designated Truck Route

Notes:

- Oregon Highway Plan (OHP) District Highway mobility standard is shown as NHS: National Highway System; FR: Freight Route; TR: Truck Route
- The City of Roseburg Transportation System Plan (TSP) classifies Edenbower Blvd. as a minor collector south of Stewart Pkwy, and an arterial from Stewart Pkwy to Stephens St.
- Edenbower Blvd. is posted at 25mph south of Stewart Pkwy
- The speed of Stephens St. (Old Hwy 99) varies between 20-45 mph within Roseburg city limits.
- Stephens St. reduces to 2 travel lanes north of the intersection with Edenbower Blvd.

The non-freeway facilities within the I-5 Exit 127 IMSA consist mainly of City arterial and collector streets leading directly to the interchange. I-5 is classified as a component of the National Highway System, a freight route, and a truck route.

The interchange itself has a standard diamond layout with a northbound looping on ramp. While the southbound ramp terminal is controlled with a traffic signal, the northbound ramp

terminal remains STOP-controlled. Both the northbound and southbound ramp terminals have multi-lane approaches to Edenbower Boulevard. The bridge over I-5 is three lanes wide with sidewalks and bike lanes on both sides. According to the City of Roseburg TSP dated June 2006, both the northbound and southbound off ramps experienced long delays during weekday peak hours; however, the traffic signal subsequently installed at the southbound ramp terminal has alleviated some of the congestion.

The existing geometric design does not meet some of the current design guidelines, which raises potential safety concerns at the interchange as summarized by ODOT in the *I-5 State of the Interstate Report*. The geometric deficiency assessment, conducted in 2000, reached the following conclusions:

- The curve on Edenbower Boulevard west of the interchange is sharp for the posted speed.
- The deceleration lane length is too short on both the northbound and southbound exit ramps.
- Adjacent public road intersections are too close to the ramp terminals

The deceleration length of the exit ramps was reassessed in 2007 with construction of the northbound looping on ramp and found to be acceptable.

2.4.2. Existing Access Inventory

Access inventory data was obtained from aerial photography, the OPAL database, and site visits for Edenbower Boulevard from Stewart Parkway to Stephens Street. This data includes public street intersections and public/private approaches to Edenbower Boulevard. Aerial mapping depicting access locations is shown in Figure 4.

Edenbower Boulevard has 16 access points that intersect on the left side (west and north) and 18 that intersect on the right side (east and south). When compared to the applicable spacing standards, few of the driveway accesses meet current spacing standards based on existing average annual daily traffic (AADT) volumes, roadway jurisdiction, and speeds. There are eight access points within a quarter mile of the northbound and southbound ramp terminals. None of these access points meet the 1,320 feet (¼ mile) spacing standard set forth by ODOT.

Outside the ¼ mile influence area of the ramp terminals the west side of the study area uses the 500-foot spacing standards identified in the City of Roseburg Land Use and Development Ordinance for arterial streets. None of the accesses within this segment meet the City standards currently. On the east side of the interchange (outside the ¼ mile influence area) the City spacing standard of 500 feet applies. None of the accesses within this segment currently meet the City standards.

While ODOT requires approach permits for approaches to highways under its jurisdiction, many counties and cities do not. Edenbower Boulevard is not a highway and does not have specific approach permit requirements.

2.4.3. Bicycle and Pedestrian Facilities Inventory

The non-freeway facilities within the IMSA have sidewalks and marked bike lanes without the presence of on-street parking. All of the striped bike lanes in the IMSA are in good condition. The sidewalk conditions throughout the IMSA are also good. The sidewalks are generally six-foot wide and include ramps on the corners at study area intersections.

Along Edenbower Boulevard, sidewalks are located on both sides through all of the study area and along side streets.

Crosswalks are striped at most of the IMSA intersections, although not always across all of the intersection approaches. The crosswalk inventory for the Edenbower Boulevard intersections includes:

- Stewart Parkway: All Approaches (Signalized)
- Broad Street: None
- I-5 Southbound Ramp Terminal: All Approaches (Signalized)
- I-5 Northbound Ramp Terminal: South
- Aviation Drive: All Approaches (Signalized)
- Stephens Street (OR 99): All Approaches (Signalized)

2.5. Existing Operations and Safety

The assessment of existing traffic conditions includes development of existing traffic volumes, traffic operations evaluation, and a review of historical crash patterns. For more detailed data and evaluation results, refer to *Technical Memorandum #2: Existing Conditions Analysis* in Volume 2 of this IAMP.

2.5.1. Volume Development

Traffic counts were collected in 2012 and seasonally adjusted to correspond to traffic volumes that are seen in the peak month of the year (July), also known as the Design Hourly Volume (DHV). The ODOT Transportation Planning Analysis Unit (TPAU) procedures were followed. After peak hour count data was seasonally adjusted, volumes were balanced to achieve a uniform dataset for analysis.

These peak hour traffic volumes are illustrated in Figure 5.

2.5.2. Existing Intersection Operations

Table 4 summarizes the analysis results for all study area intersections.

Table 4. Existing (2012) PM Peak Hour Traffic Operations Analysis Results

Intersection	Critical Movement ¹	V/C Ratio ²	LOS ²	Operational Standards	
				OHP ³	City ⁴
Edenbower Blvd. at Stewart Pkwy. (Signalized)	Overall	0.83	C	-	LOS D/0.85
Edenbower Blvd. at Broad St.	EB L/R	0.15	C	-	LOS E/0.85
Edenbower Blvd. at SB Ramp Terminal (Signalized)	Overall	0.57	B	0.85	-
Edenbower Blvd. at NB Ramp Terminal	NB L/T	0.37	C	0.85	-
Edenbower Blvd. at Aviation Dr. (Signalized)	Overall	0.54	B	-	LOS D/0.85
Edenbower Blvd. at Stephens St. (Signalized)	Overall	0.66	C	-	LOS D/0.85

Acronyms: NB = northbound, SB = southbound, EB = eastbound, WB = westbound, L = left-turn movement, T = through movement, R = right-turn movement. Two or more travel movements permitted in one lane group are indicated with a slash.

Notes:

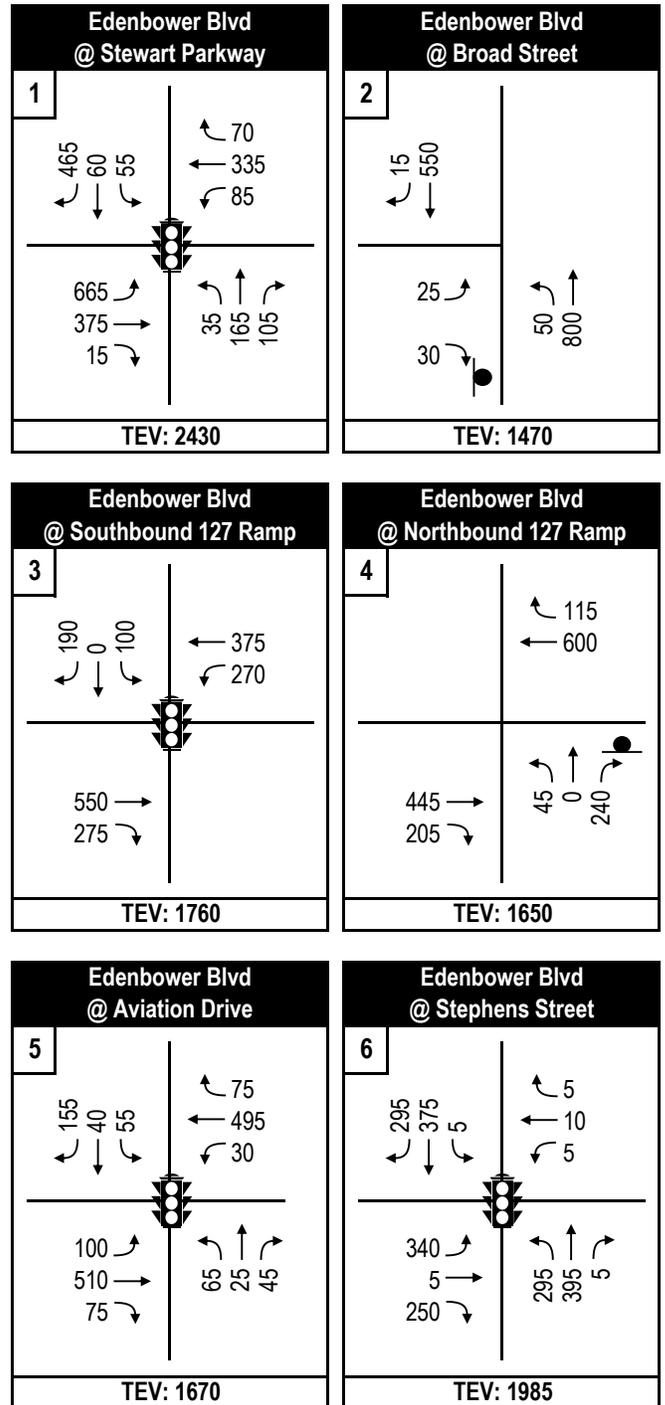
1. At signalized intersections, the overall results are reported along with all individual movements, while at unsignalized intersections the results are reported for all movements that must stop or yield the right of travel to other traffic flows.
2. The v/c ratios and LOS are based on the results of the macrosimulation analysis using Synchro, which cannot account for the influence of adjacent intersection operations.
3. 1999 Oregon Highway Plan (OHP), Policy 1F applies to existing and no-build conditions through the planning horizon.
4. The Roseburg Transportation System Plan (TSP) designates the traffic operations standard on City facilities and defers to ODOT standards for intersections with state highways within the City.

Source: Synchro HCM Intersection Analysis Report and SimTraffic microsimulation

Analysis for the PM peak period shows that all of the management area intersections currently meet applicable mobility thresholds.

At the signalized intersection of Edenbower Boulevard and Stewart Parkway, the City standard of LOS D and the County standard of a v/c of 0.85 are both met; however, all approaches are expected to have lanes with queuing that exceed available storage lengths. The signalized intersection of Edenbower Boulevard at Stephens Street experiences queuing that exceeds the available storage for the eastbound left-turn, and the eastbound thru/right queue blocks access to the storage facility on the southeast corner of the intersection. The remaining study intersections appear to have adequate capacity and storage for the current demand.

Field observations suggest that queuing in the westbound direction at the intersection of Aviation Drive and Edenbower Boulevard may be a concern. Recent improvements done at that intersection have alleviated most of the operational issues at the intersection. The analysis shows the westbound queue regularly extending back halfway between Aviation Drive and Stephens Street. If the queue grows closer to the railroad tracks near Stephens Street, additional action may be necessary to improve the queue, such as timing adjustments to the signalized intersections.



I-5 Exit 127 (North Roseburg) IAMP

Legend

→ Allowable Movement

TEV: Total Entering Volume

PM Peak Hour Turning Movement Volume



Signalized Intersection



STOP Controlled Approach

Figure 5
Existing (2012) PM Peak Hour
Traffic Volumes



2.5.3. Merge and Diverge Operations

It is also important to evaluate how the interchange ramps interact with the mainline highway traffic on I-5 through an analysis of the points where traffic enters or merges onto the highway and where it exits or diverges from the highway. These analyses were conducted in accordance with ODOT procedures to determine v/c ratio performance. The results of the analysis are summarized in Table 5.

The merge and diverge analyses show that the freeway and the merge and diverge points associated with the I-5 Exit 127 ramps are currently operating well below the mobility standard of 0.80 during both the AM and PM peak hours.

Table 5. Existing (2012) Freeway Operations

Direction/Location	V/C Ratio ¹	
	Design Hour ²	Alternate Hour ³
I-5 Northbound		
Mainline South of Exit 127	0.30	0.19
Diverge: Exit 127 Northbound Off Ramp	0.14	0.12
Mainline between Off and On Ramps	0.24	0.14
Merge: Exit 127 Eastbound to Northbound On Ramp	0.29	0.15
Mainline between On Ramps	0.29	0.15
Merge: Exit 127 Westbound to Northbound On Ramp	0.32	0.17
Mainline North of Exit 127	0.31	0.17
I-5 Southbound		
Mainline North of Exit 127	0.26	0.24
Diverge: Exit 127 Southbound Off-Ramp	0.14	0.14
Mainline between Off and On-Ramps	0.20	0.18
Merge: Exit 127 Southbound On-Ramp	0.30	0.22
Mainline South of Exit 127	0.29	0.22

Notes:

1. The v/c ratios for the merge/diverge analysis are calculated based on the methodologies outlined in ODOT's Analysis Procedures Manual.
2. The design hour is the hour between 4:30 and 5:30 PM, which coincides with system peaking.
3. The alternate hour is AM peak hour, which occurs between 7:30 and 8:30 AM.

2.5.4. Crash History Analysis

A crash history analysis was conducted to determine whether any significant, documented safety issues exist within the study area. The ODOT database (years 2006 through 2010) has 122 crashes in the management area including 27 crashes on I-5 mainline and ramps. Two of the reported crashes resulted in a serious injury, and 51 resulted in a minor injury(s). Very few of the reported crashes were attributed to speed or alcohol.

The intersection of Stewart Parkway and Edenbower Boulevard had 37 reported crashes and the highest crash rate within the management area, 0.83 crashes per million entering vehicles (mvm). This crash rate exceeds the critical crash rate for this intersection (described further in the following section), and had one serious injury reported, as well as 20 minor injury crashes. Approximately 65% of the reported crashes at this location involved a rear-end collision, with the next prevalent crash types being sideswipe (14%) and turning (11%).

There were no segments in the study area identified in the top 10 percent of the State's 2012 Safety Priority Index System (SPIS)⁶ database.

Critical Crash Rates

The Highway Safety Manual Part B describes the critical crash rate method as a means of identifying locations that warrant further investigation. The critical crash rate is based upon average crash rates at comparable sites, traffic volume, and a confidence interval.

Critical crash rates were calculated for signalized and unsignalized study intersections and compared with observed crash rates. Observed crash rates only exceeded the critical crash rate at one intersection, which is the intersection of Edenbower Boulevard and Stewart Parkway. The observed crash rate at the northbound ramp terminal is equal to the corresponding critical crash rate.

2.6. Future Baseline Conditions

The analysis of future baseline conditions examines long-term operational and safety concerns of the transportation system for a future baseline scenario. (Detailed discussions of existing conditions can be found in *Technical Memorandum #3: Future Baseline Traffic Conditions* in Volume 2 of this IAMP.) The future baseline analysis examines conditions where the transportation system has been improved by projects with programmed funding sources and where traffic volumes continue to grow based on population and employment forecasts in the City of Roseburg and nearby communities.

2.6.1. Land Use Scenario

The long-range traffic forecasts are based on the current Roseburg Comprehensive Plan and Zoning Map and recently adopted population growth forecasts for the city and its environs. The population growth forecasts assume an annual growth rate of 1.2 percent within the city and 1.0 percent outside the city.

⁶ The SPIS is a method used in Oregon to identify safety problem areas along state highways. Highways are evaluated in approximately one-tenth mile increments (often grouped into larger segments). Each year these segments are ranked by assigning a SPIS score based on the frequency and severity crashes observed, while taking traffic volume into account. When a segment is ranked in the top 10% of the index, a crash analysis is typically warranted and corrective actions are considered.

The population growth was converted into estimates of households and employment using data derived from existing available census and employment data, aerial surveys of development, assessments of vacant and buildable lands, and discussions with the City of Roseburg and Douglas County planning staff.

Within the IMSA, the forecasted population growth occurs primarily along Edenbower Boulevard, where properties are designated Medium-Density Residential. The forecasted employment growth is highest at the southern end of the IMSA in properties designated Commercial along Stewart Parkway.

2.6.2. Future Baseline Peak Hour Traffic Volumes

Future Baseline traffic volume forecasts were developed using the Roseburg travel demand forecasting model, which is based on the above long-range land use assumptions. Future traffic forecasts are shown in Figure 6.

2.6.3. Future Intersection Operations

The future baseline traffic analysis results are summarized in Table 6 for all major study area intersections.

Table 6. Future (2035) PM Peak Hour Traffic Operations Analysis Results

Intersection	Critical Movement ¹	V/C Ratio ²	LOS ²	Operational Standards	
				OHP ³	City ⁴
Edenbower Blvd. at Stewart Pkwy. (Signalized)	Overall	1.02	E	--	LOS D/0.85
Edenbower Blvd. at Broad St.	EB L/R	0.26	C	--	LOS E/0.85
Edenbower Blvd. at SB Ramp Terminal (Signalized)	Overall	0.69	B	0.85	--
Edenbower Blvd. at NB Ramp Terminal	NB R	0.48	D	0.85	--
Edenbower Blvd. at Aviation Dr. (Signalized)	Overall	0.61	B	--	LOS D/0.85
Edenbower Blvd. at Stephens St. (Signalized)	Overall	0.71	C	--	LOS D/0.85

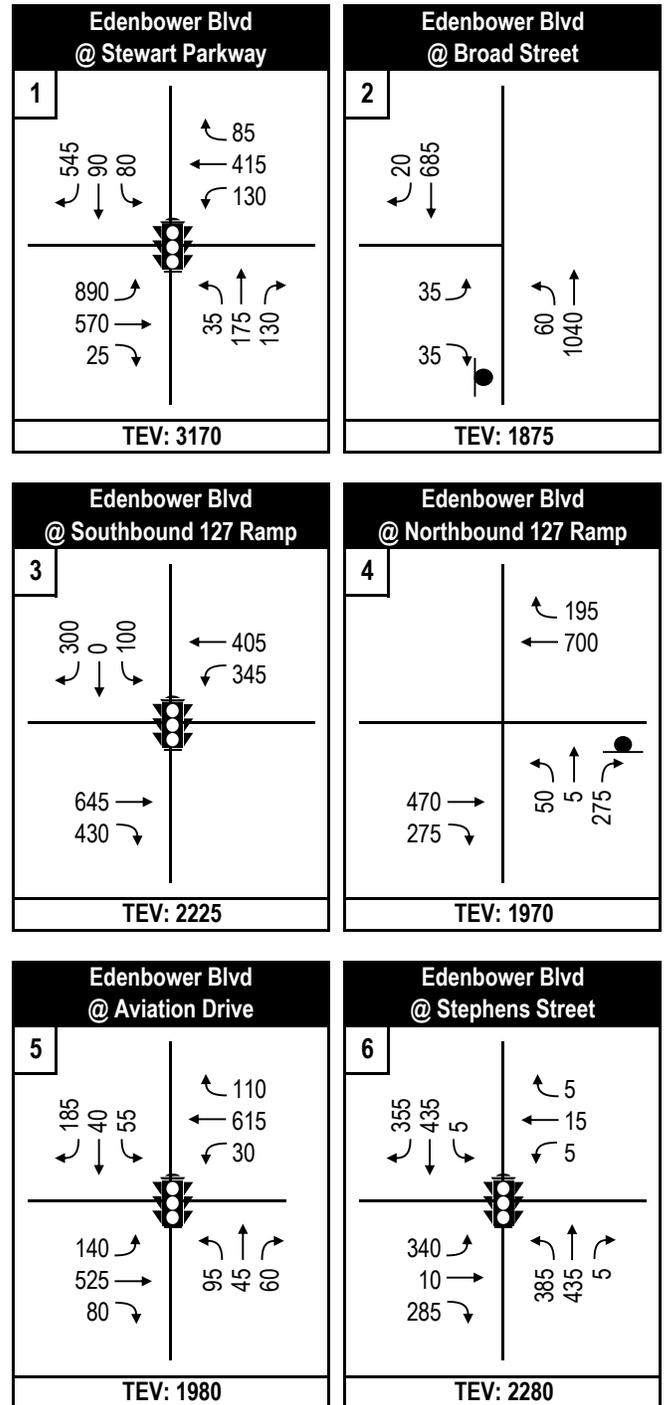
Acronyms: NB = northbound, SB = southbound, EB = eastbound, WB = westbound, L = left-turn movement, T = through movement, R = right-turn movement. Two or more travel movements permitted in one lane group are indicated with a slash.

Notes:

1. At signalized intersections, the overall results are reported along with all individual movements, while at unsignalized intersections the results are reported for all movements that must stop or yield the right of travel to other traffic flows.
2. The v/c ratios and LOS are based on the results of the macrosimulation analysis using Synchro, which cannot account for the influence of adjacent intersection operations.
3. 1999 Oregon Highway Plan (OHP), Policy 1F applies to existing and no-build conditions through the planning horizon.
4. The Roseburg Transportation System Plan (TSP) designates the traffic operations standard on City facilities and defers to ODOT standards for intersections with state highways within the City.

Shaded results indicate where mobility standards are not met.

Source: Synchro HCM Intersection Analysis Report and SimTraffic microsimulation



I-5 Exit 127 (North Roseburg) IAMP

Legend

→ Allowable Movement

TEV: Total Entering Volume

PM Peak Hour Turning Movement Volume



Signalized Intersection



STOP Controlled Approach

Figure 6
Future (2025) PM Peak Hour
Traffic Volumes



The analysis results show that, under 2035 future baseline conditions, one of the study area intersections would not meet operational standards during the PM peak period. The signalized intersection of Edenbower Boulevard at Stewart Parkway would not meet the City standards. Furthermore, this intersection is forecast to have demand that would exceed available capacity.

While queuing issues would be present at several of the study area intersections, it is a particular concern at the intersection of Edenbower Boulevard at Stewart Parkway. The eastbound left-turn from Stewart Parkway would have queues that continue into the two-way left-turn lane and spill out into through traffic more than half of the peak hour. The westbound movements Stewart Parkway would all experience queuing problems with the turn lanes spilling out into the through movement, and the through movement blocking the nearest access point or entrance into the turn lanes.

2.6.4. Merge/Diverge Analysis

The future baseline operations of the interchange ramp interaction with the mainline highway traffic were also evaluated. The results of the analyses are summarized in Table 7.

Table 7. Future (2035) Freeway Operations

Direction/Location	V/C Ratio ¹	
	Design Hour ²	Alternate Hour ³
I-5 Northbound		
Mainline South of Exit 127	0.43	0.28
Diverge: Exit 127 Northbound Off Ramp	0.16	0.19
Mainline between Off and On Ramps	0.36	0.20
Merge: Exit 127 Eastbound to Northbound On Ramp	0.42	0.22
Mainline between On Ramps	0.41	0.22
Merge: Exit 127 Westbound to Northbound On Ramp	0.47	0.24
Mainline North of Exit 127	0.46	0.24
I-5 Southbound		
Mainline North of Exit 127	0.37	0.36
Diverge: Exit 127 Southbound Off-Ramp	0.19	0.20
Mainline between Off and On-Ramps	0.28	0.27
Merge: Exit 127 Southbound On-Ramp	0.46	0.32
Mainline South of Exit 127	0.45	0.31

Notes:

1. The v/c ratios for the merge/diverge analysis are calculated based on the methodologies outlined in ODOT's Analysis Procedures Manual.
2. The design hour is the hour between 4:30 and 5:30 PM, which coincides with system peaking.
3. The alternate hour is AM peak hour, which occurs between 7:30 and 8:30 AM.

The merge and diverge analyses for both the future design hour (PM peak hour) and the alternate hour (AM peak period) show that the freeway and the merge and diverge points associated with the I-5 Exit 127 ramps would operate below the mobility standard of 0.80 for the future 2035 baseline scenario.

3. IAMP IMPROVEMENTS

This section discusses the conceptual development of improvements to address deficiencies within the I-5 Exit 127 IMSA as identified through existing and future baseline analysis and recommendations for the preferred alternative. The improvements were developed to meet the identified goals and objectives of this plan. (Detailed discussions of concept development can be found in *Technical Memorandum #4: Concept Development and Evaluation* and *Technical Memorandum #5: Preferred Alternative* in Volume 2 of this IAMP.)

3.1. Preliminary Concepts to Address Operational Deficiencies

After evaluating existing and future baseline conditions, a list of potential solutions was created to address operational deficiencies. These concepts were developed to provide an understanding of the diverse range of actions that could be implemented. Concepts initially targeted improvements unique to individual intersections knowing that different combinations of improvements could be paired together.

The concept analysis focused on four areas for consideration within the I-5 Exit 127 IMSA:

- **Intersection Improvements** – These concepts identify potential improvements to improve traffic flow, provide additional capacity, and/or address safety concerns at individual intersections within the IMSA.
- **Interchange Ramp Improvements** – These concepts address concerns raised about driver expectation and safety on interchange ramps.
- **Multimodal Improvements** – These concepts identify potential improvements to enhance safety, desirability, and continuity of facilities for non-auto users in the IMSA.
- **Additional Improvements** – These concepts focus on managing the transportation system for safety and long-term operations and complement the other concepts.

Operational analyses were performed at key intersections for some of the concepts to help determine how well each would address deficiencies. In addition, right-of-way needs, concept resource impacts, and preliminary-level cost opinions were prepared to compare the concepts to each other.

The results of the concept evaluation were presented in a variety of forums and recommendations were made based on feedback from the Technical Advisory and Citizen Advisory Committees, comments received at the Public Open House, and input from ODOT and City staff. The resulting recommendations for implementation are summarized in Table 8.

Table 8. Summary of IAMP 127 Concepts

Concept	Recommendation
Intersection Improvements	
Concept 1 – Edenbower Boulevard/Stewart Parkway: Add Second Eastbound Left-Turn Lane A - Add a second left-turn lane on the eastbound approach of Stewart Parkway by widening the roadway to the north B - Add a second left-turn on the eastbound approach of Stewart Parkway by converting a through travel lane to a shared left-through lane C - Add a second left-turn lane on the eastbound approach by converting the existing center through lane to a dedicated left-turn lane	Medium Priority <i>Could be constructed in phases with lane striping changes on Stewart Parkway (Option B or C) built initially and widening for the second left-turn lane (Option A) constructed at a later time</i>
Concept 2 – Edenbower Boulevard/Stewart Parkway: Install Multi-Lane Roundabout	Not Recommended
Concept 3 – Edenbower Boulevard/Stewart Parkway: Realign Intersection for Major Traffic Flow and Close South Approach	Not Recommended
Concept 4 – Edenbower Boulevard/Stewart Parkway: Create “T” Intersection and Close South Approach	Not Recommended
Concept 5 – Edenbower Boulevard/Aviation Drive: Extend Westbound Right-Turn Bay	Low Priority
Concept 6 – Edenbower Boulevard/Stephens Street: Extend Left-Turn Bays	Medium Priority
Interchange Ramp Improvements	
Concept 7 – Westbound to Northbound On-Ramp: Gore Area Delineation	Low Priority
Concept 8 – Westbound to Northbound On-Ramp: Install Visual Barrier	Low Priority
Multi-Modal Improvements	
Concept 9 – Northbound Ramp Terminal: Improve North Side Pedestrian Crossing	High to Medium Priority
Concept 10– Edenbower Boulevard from Broad Street to Stewart Parkway: Enhance Pedestrian Crossings	Not Recommended
Transportation System Management Improvements	
Concept A-1 –Northbound Ramp Terminal: Signalize Intersection	Low Priority
Concept A-2 – Edenbower Blvd: Maintain Signal Coordination	High To Medium Priority
Concept A-3 – Edenbower Blvd: Speed Study	Medium Priority
Concept A-4 – Edenbower Boulevard/Stewart Parkway: Provide Adequate Sight Distance	Medium Priority

Notes: Concepts in **bold** are recommended.

3.2. Preferred Alternative

The preferred alternative consists of a combination of transportation system management (TSM) measures and infrastructure improvements at the interchange ramps or other IMSA intersections, totaling 10 projects.

Figure 7 illustrates the locations of the recommended improvement projects and Table 9 provides descriptions, along with benefits and considerations, as well as recommendations for general timing and triggers for implementation.

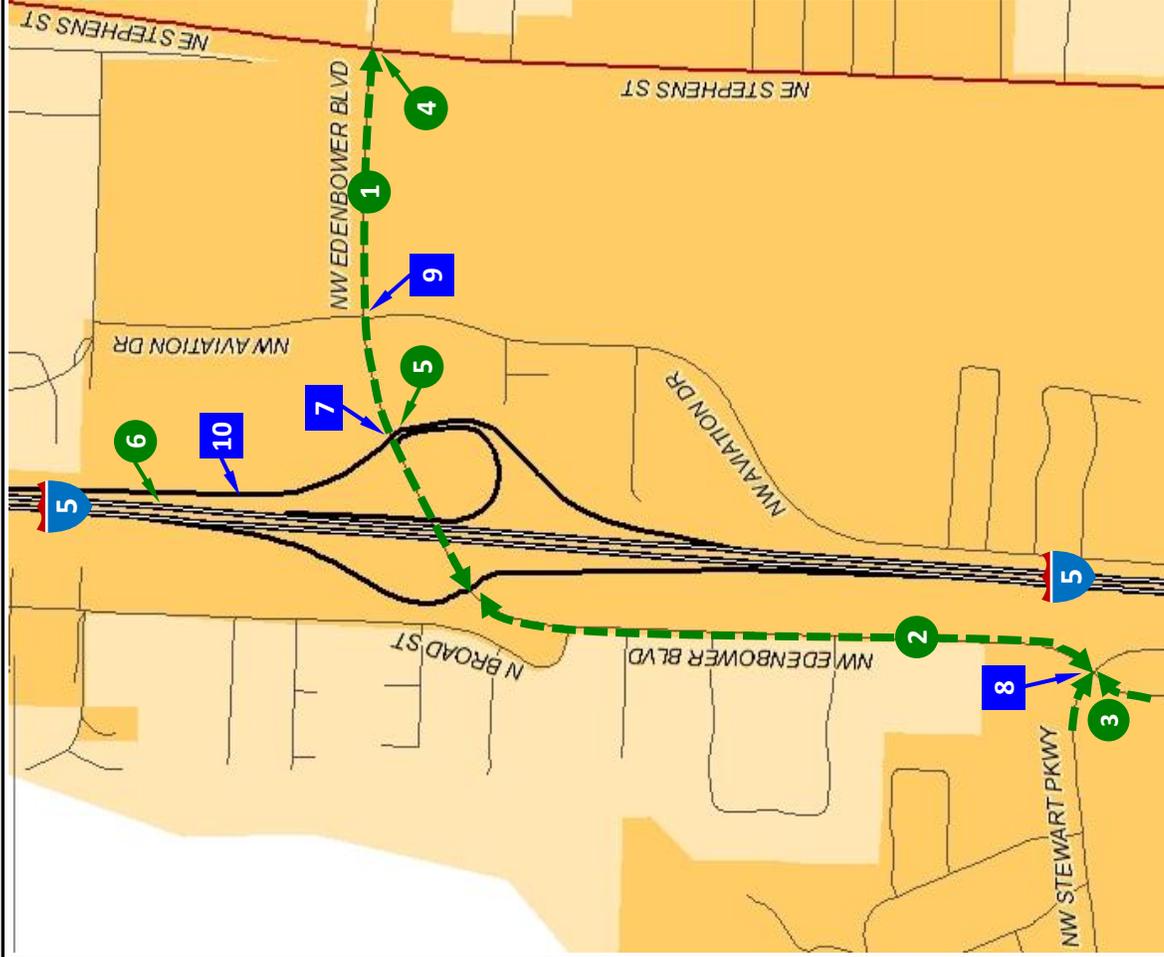
Table 9. Summary of Recommended IAMP Improvements

Project	Mobility	Safety	Multimodal	Implementation		Related Projects	Estimated Cost ¹	Potential STIP ² Funding Category		Other Funding ²
				Priority	Trigger			Enhance	Fix It	
Transportation System Management Improvements										
1. Edenbower Blvd: Maintain Signal Coordination	✓	✓		High to Medium	<ul style="list-style-type: none"> Queuing between intersections Northbound Ramp Signalization 	5: NB Ramp Terminal Signal	< \$10,000		◆	
2. Edenbower Blvd: Speed Study		✓		Medium	<ul style="list-style-type: none"> Crash pattern related to speed Crash pattern related to merge (with Project 8) 	8: Edenbower Blvd/ Stewart Pkwy: Second EB Left-Turn Lane	< \$10,000		◆	◆
3. Edenbower Blvd/Stewart Pkwy: Provide Adequate Sight Distance		✓		Medium	<ul style="list-style-type: none"> Crash pattern of EB rear-end collisions Crash pattern of angle collisions between EB and NB 	8: Edenbower Blvd/ Stewart Pkwy: Second EB Left-Turn Lane	< \$10,000			◆
4. Edenbower Blvd/Stephens St: Extend Left-Turn Bays	✓	✓		Medium	<ul style="list-style-type: none"> Queues interfering with through lane Crash pattern related to queues 	1: Edenbower Blvd Signal Coordination	\$15,000			◆
5. NB Ramp Terminal: Signalize Intersection	✓	✓	✓	Low	<ul style="list-style-type: none"> Signal warrants met 	1: Edenbower Blvd Signal Coordination	\$500,000		◆	
6. WB to NB On Ramp: Gore Area Delineation		✓		Low	<ul style="list-style-type: none"> Crash pattern related to merging Crash pattern of rear-end collisions 	10: WB to NB On Ramp Visual Barrier	\$20,000		◆	
Infrastructure Improvements										
7. NB Ramp Terminal: Improve North Side Pedestrian Crossing		✓	✓	High to Medium	<ul style="list-style-type: none"> Existing deficiency 	5: NB Ramp Terminal Signal	\$20,000	◆		
8. Edenbower Blvd/Stewart Pkwy: Add Second EB Left-Turn Lane	✓	✓		Medium	<ul style="list-style-type: none"> Persistent congestion (v/c ratio > 0.85) Crash pattern related to queuing 	3: Edenbower Blvd/Stewart Pkwy Sight Distance	\$1,600,000			◆
9. Edenbower Blvd/Aviation Dr: Extend WB Right-Turn Bay	✓	✓	✓	Low	<ul style="list-style-type: none"> Queues interfering with through lane or bike lane Crash pattern related to queues 	1: Edenbower Blvd Signal Coordination	\$75,000			◆
10. WB to NB On Ramp: Install Visual Barrier		✓		Low	<ul style="list-style-type: none"> Crash pattern related to merging Crash pattern of rear-end collisions 	6: WB to NB On Ramp Gore Delineations	\$100,000		◆	

Acronyms: NB = northbound, SB = southbound, EB = eastbound, WB = westbound

Notes:

- Estimated costs exclude right of way acquisition, hazardous materials mitigation, natural resource mitigation, and utilities relocation.
- Assumes projects that involve both state and local agency participation will have costs split at 70% from state/federal sources and 30% from local match. Assumes ODOT will fund 100% of state highway projects. Assumes local agencies will fund projects that are not within state jurisdiction.



- 1** **Edenbower Boulevard Signal Timing Improvements:** Coordinate signals from the I-5 southbound ramp terminal through Stephens Str (High to Medium Priority)
- 2** **Edenbower Boulevard Speed Reduction:** Reduce posted speed between Stewart Pkwy and I-5 Southbound Ramp Terminal (Medium Priority)
- 3** **Edenbower Boulevard/Stewart Parkway Sight Distance Improvements:** Mitigate the existing sight distance limitations that restrict visibility for drivers traveling through the intersection on the eastbound (Stewart Pkwy) and northbound (Edenbower Blvd) approaches (Medium Priority)
- 4** **Edenbower Boulevard/Stephens Street Intersection Improvements:** Extend eastbound and northbound left-turn bays (Medium Priority)
- 5** **Edenbower Boulevard/I-5 Northbound Ramp Terminal Intersection Improvement:** Install traffic signal (Low Priority)
- 6** **I-5 Westbound to Northbound On-Ramp Gore Delineation:** Install additional delineation in the gore area by painting a chevron pattern (Low Priority)
- 7** **Edenbower Boulevard/I-5 Northbound Ramp Terminal Pedestrian Improvement:** Improve pedestrian crossing on north side (High to Medium Priority)
- 8** **Edenbower Boulevard/Stewart Parkway Intersection Improvements:** Add a second left-turn lane on the eastbound approach of Stewart Pkwy and a by widening the roadway to the north and add a second northbound receiving lane by widening Edenbower Blvd (Medium Priority). This project could be constructed in phases.
- 9** **Edenbower Boulevard/Aviation Drive Intersection Improvements:** Modify the northeast corner of the intersection to extend the existing westbound right-turn bay from 100 to 175 feet (Low Priority)
- 10** **I-5 Westbound to Northbound On-Ramp Visual Barrier:** Install a concrete barrier with glare shields on the west side of the on ramp (Low Priority)

I-5 Exit 127 (North Roseburg) IAMP

Legend
 ● Transportation System Management Improvements
 ■ Infrastructure Improvements



Figure 7
 Locations of Recommended
 IAMP Improvements

3.2.1. Operations with Recommended Improvements

Operations at relevant intersections for the preferred alternative network were evaluated for both the 2035 LU 1.2 travel demand model with results summarized in Table 10. All improved intersections would meet mobility standards with the 2035 forecasts.

Table 10. Operations with Recommended Improvements

Intersection	Critical Movement ¹	V/C Ratio ²	LOS ²	Operational Standards	
				OHP ⁴	City ⁵
Edenbower Blvd. at Stewart Pkwy. (Signalized)	Overall	0.82 ⁴	C	--	LOS D/0.85
Edenbower Blvd. at Broad St.	EB L/R	0.26	C	--	LOS E/0.85
Edenbower Blvd. at SB Ramp Terminal (Signalized)	Overall	0.69	B	0.85	--
Edenbower Blvd. at NB Ramp Terminal	NB R	0.48	D	0.85	--
Edenbower Blvd. at Aviation Dr. (Signalized)	Overall	0.61	B	--	LOS D/0.85
Edenbower Blvd. at Stephens St. (Signalized)	Overall	0.71	C	--	LOS D/0.85

Acronyms: NB = northbound, SB = southbound, EB = eastbound, WB = westbound, L = left-turn movement, T = through movement, R = right-turn movement. Two or more travel movements permitted in one lane group are indicated with a slash.

Notes:

1. At signalized intersections, the overall results are reported along with all individual movements, while at unsignalized intersections the results are reported for all movements that must stop or yield the right of travel to other traffic flows. Signalized intersection results are based on HCM 2000 methodology, while unsignalized intersection results are based on HCM 2010 methodology.
2. The v/c ratios and LOS are based on the results of the macrosimulation analysis using Synchro, which cannot account for the influence of adjacent intersection operations.
3. The Roseburg Transportation System Plan (TSP) designates the traffic operations standard on City facilities and defers to ODOT standards for intersections with state highways within the City.
4. Operations reflect an assumption that 65 percent of the eastbound left-turning traffic will use the far left-turn lane while 35 percent will use

Source: Synchro HCM Intersection Analysis Report and SimTraffic microsimulation

3.2.2. Cost Estimates

Cost estimates for the interchange and intersection improvements associated with the preferred alternative are summarized in Table 11. The estimates for the ten recommended projects were developed as part of this IAMP. These estimates are preliminary and include engineering and construction (with a contingency factor) for infrastructure, but do not include right-of-way costs, and may change as the design is refined. In addition, the estimates do not account for utility costs or the potential costs of environmental analyses or mitigation.

Table 11. Preferred Alternative Preliminary Cost Estimates

Concept	Estimated Cost ¹
Transportation System Management Improvements	
1. Edenbower Boulevard : Signal Coordination	< \$10,000
2. Edenbower Boulevard: Speed Reduction	< \$10,000
3. Edenbower Boulevard/ Stewart Parkway: Maintain Adequate Sight Distance	< \$10,000
4. Edenbower Boulevard/ Stephens Street: Extend Left-Turn Bays	\$15,000
5. Northbound Ramp Terminal: Signalize Intersection	\$500,000
6. Westbound to Northbound On-Ramp: Gore Area Delineation	\$20,000
Subtotal	\$565,000
Infrastructure Improvements	
7. Northbound Ramp Terminal: Improve North Side Pedestrian Crossing	\$20,000
8. Edenbower Boulevard/ Stewart Parkway: Add Second Eastbound Left-Turn Lane	\$1,600,000
9. Edenbower Boulevard/ Aviation Drive: Extend Westbound Right-Turn Bay	\$75,000
10. Northbound Ramp Terminal: Improve North Side Pedestrian Crossing	\$100,000
Subtotal	\$1,795,000
TOTAL	\$2,400,000

Notes:

1. Cost estimates were prepared in year 2013 using present day dollars and are consistent with standard estimating methods.

4. MANAGEMENT STRATEGIES

An integral part of the IAMP process is providing an action plan to protect the function of the interchange and its influence area. This plan explores a set of measures under the heading “management actions” that could be employed at or near I-5 Exit 127. Management actions can extend the life of the interchange and provide for incremental implementation of I-5 Exit 127 area improvements, allowing individual components to be funded and built when needed. Given the funding constraints and statewide demand for interchange improvements, it will likely require several years for ODOT, Douglas County, and the City of Roseburg to develop a funding package and construct all the improvements recommended in the IAMP.

4.1. Access Management Plan

Access management is an essential tool for protecting the function of an interchange and included in the Interchange Area Management Plan (IAMP) process. In the vicinity of the interchange it includes consideration of access to and from the interchange, maintaining capacity for traffic flow and operations, and safety.

Implementation of access management measures has the effect of protecting the public investment in an interchange and enabling it to accommodate traffic volumes safely and efficiently into the future while ensuring circulation necessary for good access to the freeway. This IAMP acknowledges the vital need of adjacent property owners to maintain roadway access to their businesses and residences. However, a proliferation of driveways and minor street intersections near an interchange multiplies the number of conflicts along a roadway segment, thus reducing the capacity of intersections, increasing the probability of crashes, and generally degrading service for all system users. Hence, the access management plan must balance the competing needs of compatible land uses, private access, and the function of the transportation system.

Access management actions proposed in this plan involves some restrictions and a reduction of access for properties along Edenbower Boulevard; however, these access management actions would not prevent the properties from being used and developed in a manner consistent with their adopted comprehensive planning designations. Rather, access management will help to ensure that property owners continue to be able to utilize site advantages of the properties by improving traffic circulation, safety, and mobility.

The access management measures identified in this plan represent medium- and long-term actions that may be triggered as land use changes occur (new development or redevelopment), future improvement projects are implemented, or as safety and operational issues arise.

4.1.1. Access Management and Implementation

The access management plan for Edenbower Boulevard includes a variety of techniques that can be applied as appropriate to the roadways and adjacent land use characteristics. Access management techniques shall be applied with a desire to move towards achieving applicable access spacing standards over time.

Access management techniques would be implemented when one or more of the following triggers occur:

- Applications for land use changes or development are submitted
- Future roadway improvements move into design and construction
- Safety and/or operational problems arise

However, approval or delay of implementation may be determined by the Region Access Management Engineer and/or the City of Roseburg, as appropriate.

4.1.2. Access Management Actions

Access management is a set of techniques that the state can use to control access to a highway that extend the operational life of the facility by reducing congestion, improving traffic flow, reducing crashes, and reducing conflicting vehicle movements. Access management techniques applicable to Edenbower Boulevard are listed in the following section. Figure 8 illustrates the recommended access management actions.

Stewart Parkway west of Edenbower Boulevard

Recommended access management actions are illustrated in Figure 8 and summarized below:

1. Consolidate/close driveways in an effort to move towards achieving applicable access spacing standards.
 - *Consolidation or closure of driveways should be considered when properties develop or redevelop and when reasonable access can be provided with a single access point or via a local street.*
 - *Consolidation or closure of driveways should be considered when Edenbower Boulevard/Stewart Parkway improvements are constructed to reduce turning and merging conflicts along the east side of the roadway, extending 500 feet north of Stewart Parkway.*
 - *Consolidation or closure of driveways should be considered when the annual crash rate is greater than the statewide annual average accident rate for similar roadways, or when an increase in turning-related crashes is identified.*

2. Evaluate potential turn limitations along Stewart Parkway.
 - *Analysis should be completed when planning and design begins for the Edenbower Boulevard/Stewart Parkway improvements.*
 - *Turn limitations should be considered when the annual crash rate is greater than the statewide annual average accident rate for similar roadways, or when an increase in turning-related crashes is identified.*

Edenbower Boulevard from Stewart Parkway to Plateau Drive (south)

Recommended access management actions are illustrated in Figure 8 and summarized below:

3. Consolidate/close driveways in an effort to move towards achieving applicable access spacing standards.
 - *Consolidation or closure of driveways should be considered when properties develop or redevelop and when reasonable access can be provided with a single access point or via a local street.*
 - *Consolidation or closure of driveways should be considered when Edenbower Boulevard/Stewart Parkway improvements are constructed to reduce turning and merging conflicts along the east side of the roadway, extending 500 feet north of Stewart Parkway.*
 - *Consolidation or closure of driveways should be considered when the annual crash rate is greater than the statewide annual average accident rate for similar roadways, or when an increase in turning-related crashes is identified.*
4. Evaluate potential turn limitations along Edenbower Boulevard.
 - *Analysis should be completed when planning and design begins for the Edenbower Boulevard/Stewart Parkway improvements.*
 - *Turn limitations should be considered when the annual crash rate is greater than the statewide annual average accident rate for similar roadways, or when an increase in turning -related crashes is identified.*

Edenbower Boulevard from Plateau Drive (south) to I-5 Southbound Ramp Terminal

Recommended access management actions are illustrated in Figure 8 and summarized below:

5. Consolidate/close driveways in an effort to move towards achieving applicable access spacing standards.
 - *Consolidation or closure of driveways should be considered when properties develop or redevelop and when reasonable access can be provided with a single access point or via a local street.*

- *Consolidation or closure of driveways should be considered when the annual crash rate is greater than the statewide annual average accident rate for similar roadways, or when an increase in turning-related crashes is identified.*

Edenbower Boulevard from I-5 Northbound Ramp Terminal to Stephens Street

Recommended access management actions are illustrated in Figure 8 and summarized below:

6. Evaluate potential turn limitations along Edenbower Boulevard.
 - *Turn limitations should be considered when the annual crash rate is greater than the statewide annual average accident rate for similar roadways, or when an increase in turning -related crashes is identified.*

4.2. Transportation Demand Management Measures

Transportation Demand Management (TDM) measures are designed to reduce vehicle demand, especially for commuter trips in the peak periods. Goals and policies of the State of Oregon, and the City of Roseburg contain provisions that embrace TDM measures.

TDM measures include strategies that shift modes away from the single-occupancy vehicle like carpooling, vanpooling, transit, bicycling, and walking programs; strategies that shift trips to non-peak periods, such as flexible work schedules and off peak shifts; and telecommuting, which eliminates trips. TDM strategies are most effective in areas with high concentrations of employment and where a robust transit system exists. Generally, the strategies are easiest to implement where there are large employers or where a transportation management association (TMA) has been established to pool the efforts of many smaller employers.

4.3. Transportation System Management Measures

Transportation System Management (TSM) measures are designed to make maximum use of existing transportation facilities. A number of TSM measures have been included in the preferred alternative including signal optimization and coordination, changes in traffic control, right-turn-on-red restrictions, restriping, pedestrian connections, and extensions of turn lanes needed to address future operational deficiencies. Traffic signal optimization and coordination between signals were assumed for the future analysis of the interchange study area.

Facility management measures, such as ramp meters, preferential lanes, and signal priority, will not likely be considered at I-5 Exit 127 in the short term since freeway congestion is not expected to be a concern in 2035. If I-5 should become congested in the future, metering of interchange ramp terminals throughout the Roseburg region may become necessary.

4.4. Land Use Management Measures

Transportation modeling draws guidance from comprehensive plans, but requires making assumptions about the type, intensity and location of development that can occur within each zone. Changes to the current land use zoning could dramatically affect the number of trips generated, trip patterns, and traffic volumes at intersections and the interchange. As a result, traffic operations at the interchange may approach capacity more rapidly than anticipated, shortening the life of the updated interchange and hastening the need for costly investments for additional interchange improvements.

Vehicle trip generation associated with potential future growth in the region could cause traffic operations at I-5 Exit 127 to exceed ODOT mobility standards within the 20-year planning horizon. The intensity, timing and location of actual development may result in more congestion than is estimated by the model.

ODOT is relying on the currently adopted plans, policies, designations and codes to ensure that the land uses remain supportive of the function of the interchange. This management strategy is essentially a reaffirmation by the City of Roseburg that their Comprehensive Plan and TSP remains valid or, if changes are needed, the TPR requirements will be met and the City will notify ODOT and jointly undertake an evaluation of impacts to the interchange. The Transportation Planning Rule (TPR) provides specifications on what must be addressed by agencies when seeking a comprehensive plan amendment or rezoning. *Technical Memorandum #1: Definition and Background, Appendix A – Review of Plans and Policies* and *Technical Memorandum #2: Existing Conditions Analysis* cite the standards that the IAMP relies on for consistency and implementation and associates them with the applicable IAMP sections. Specifically, these are:

- City of Roseburg Comprehensive Plan: Comprehensive Plan Map (March 1, 2011)
- City of Roseburg Transportation System Plan, Goal 3. Transportation and Land Use (December 2006)
- City of Roseburg Land Use and Development Ordinance (March 11, 2013) and Zoning Map (April 28, 2014)

5. IMPLEMENTATION

Implementation of the I-5 Exit 127 (North Roseburg) IAMP will need to occur at the local and state level. The plan will be adopted as an amendment to the Oregon Highway Plan by the Oregon Transportation Commission. It will also be adopted as part of the City of Central Point Transportation System Plan.

The elements recommended for formal adoption as part of this IAMP are specified below. Some actions are to be adopted by the OTC as a “facility plan” that implements the OHP. Other actions are adopted by the City of Roseburg.

5.1. OHP Policy Statement

Adoption of the OHP is a state responsibility. Adopting a new policy statement describing the priorities associated with potential interchange improvements is a state responsibility. The following policy statements are added to the Investment Policies and Scenarios section of the OHP:

- Future investments by the State to increase capacity within the I-5 Exit 127 IAMP management area shall require the City of Roseburg to adopt the I-5 Exit 127 IAMP.

5.2. Recommended Local Agency Development Code and Plan Amendments

Under development

APPENDIX – PROJECT SHEETS

Project sheets have been prepared for each IAMP improvements identifying:

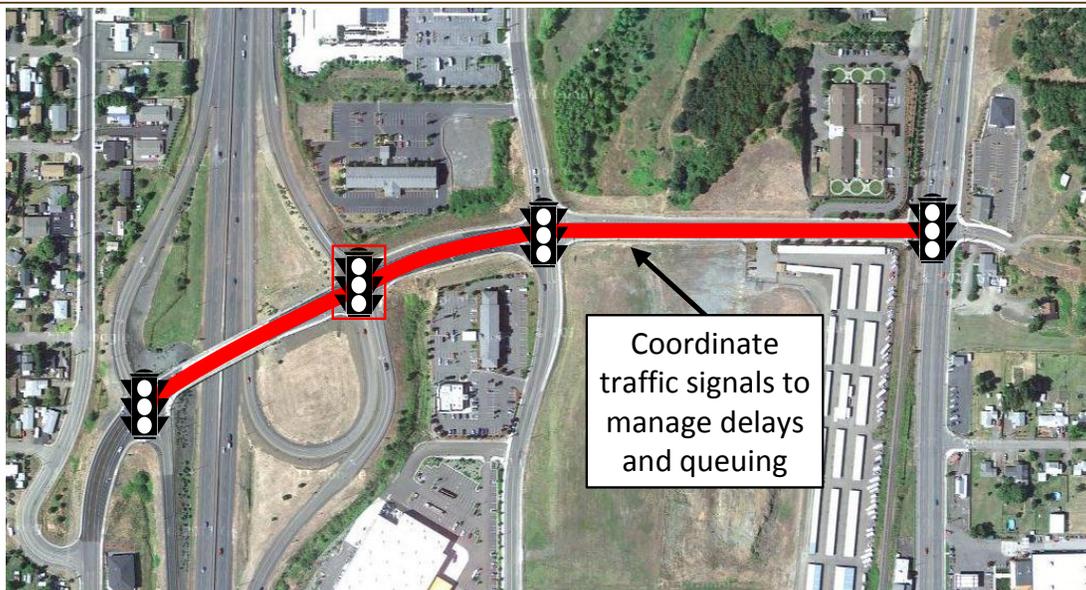
- Name
- Location
- Description of recommended improvement
- Project purpose
- Existing/future deficiencies without project
- Result of improvements (i.e., how it addresses deficiencies)
- Considerations/potential impacts
- Cost opinion
- Implementation considerations (priority, phasing, triggers)
- Illustration (as appropriate)

Project 1. Edenbower Blvd: Maintain Signal Coordination

**I-5 Exit 127 (North Roseburg):
Interchange Area Management Plan**

Description	Manage delays and queuing for safety and operations	
Purpose	<ul style="list-style-type: none"> Manage delays and queuing for safety and operations 	
Roadway Characteristics	<ul style="list-style-type: none"> Posted speed is 40 mph Current (2012) ADT = 16,500 vehicles per day Forecast (2035) ADT = 19,700 vehicles per day 13 crashes during a 5-year study period (majority of crashes occurred before or during reconstruction of northbound loop-ramp). 	
How Improvement Addresses Deficiencies	<p style="text-align: center;">Existing/Future Deficiency</p> <ul style="list-style-type: none"> Signals at Southbound Ramp Terminal and Aviation Dr. are currently coordinated to maintain gaps for traffic stopped at the Northbound Off Ramp Cycle lengths for signals along Edenbower Blvd differ from cycle lengths for signals along Stephens St Queuing between intersections does not currently interfere with operations but could change over time 	
	<p style="text-align: center;">With Improvement</p> <ul style="list-style-type: none"> Common cycle length may eventually be necessary to manage queuing on Edenbower between Aviation Dr and Stephens St Traffic signal coordination could be maintained manually with consistent cycle lengths and phasing plans Ultimately interconnected signal system may be desirable 	
Additional Considerations	<ul style="list-style-type: none"> Ongoing process that needs to respond to changing conditions over time Infrastructure is in place for interconnected system Potential additional signal at Northbound Off Ramp will need to be connected with rest of system 	
Cost Opinion	<ul style="list-style-type: none"> Less than \$10,000 assuming infrastructure is ready 	
Implementation	<ul style="list-style-type: none"> High priority Based on ongoing needs Queuing between intersections Related to Project 5. NB Ramp Terminal: Signalize Intersection 	

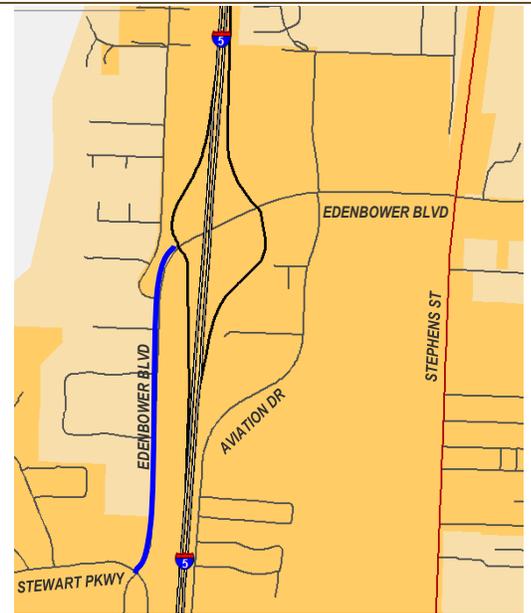
Preliminary Alignment Concept



Project 2. Edenbower Blvd: Speed Study

**I-5 Exit 127 (North Roseburg):
Interchange Area Management Plan**

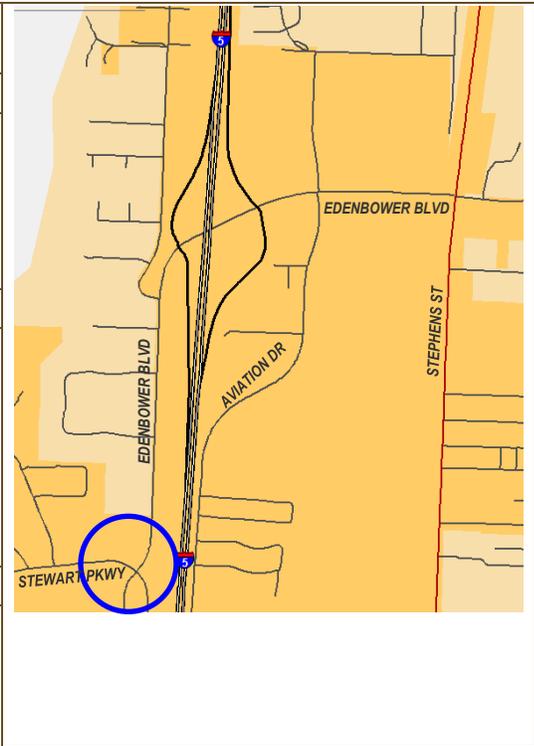
Description	Conduct speed study and reduce posted speed if appropriate
Purpose	<ul style="list-style-type: none"> Reassess travel speeds and posted speeds based on geometric modifications and safety
Roadway Characteristics	<ul style="list-style-type: none"> Posted speed is 40 mph Current (2012) ADT = 15,000 vehicles per day Forecast (2035) ADT = 19,000 vehicles per day No segment crashes during 5-year analysis period 2 crashes at intersection with Broad St
How Improvement Addresses Deficiencies	Existing/Future Deficiency
	<ul style="list-style-type: none"> Edenbower Boulevard curve between Broad Street and I-5 SB ramp terminal is sharp for 40 mph posted speed New merge point for dual left north of Stewart Parkway could benefit from lower travel speeds
	With Improvement
	<ul style="list-style-type: none"> Posted speed would be appropriate for roadway geometry and would be consistent driver behavior
Additional Considerations	<ul style="list-style-type: none"> Speed study would be needed to determine if speed reduction is ultimately appropriate Speed study should follow improvements at Edenbower/Stewart intersection (Project 8)
Cost Opinion	<ul style="list-style-type: none"> Less than \$5,000
Implementation	<ul style="list-style-type: none"> Medium priority Crash pattern related to speed Related to Project 8. Edenbower Blvd/Stewart Pkwy: Add Second EB Left-Turn Lane



Preliminary Alignment Concept

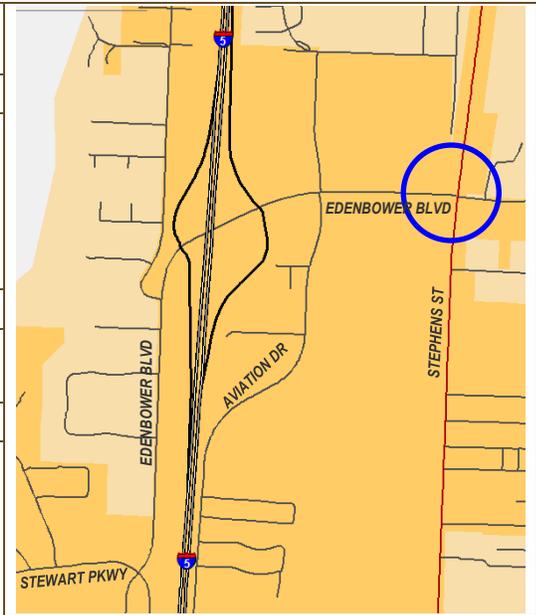


Project 3. Edenbower Blvd/Stewart Pkwy: Provide Adequate Sight Distance

<p>Description</p>	<p>Provide adequate sight distance to maintain safe intersection operations</p>	
<p>Purpose</p>	<ul style="list-style-type: none"> Address sight distance concerns and improve safety 	
<p>Roadway Characteristics</p>	<ul style="list-style-type: none"> Posted speed is 40 mph Current (2012) ADT = 24,300 vehicles per day Forecast (2035) ADT = 31,700 vehicles per day 37 crashes during a 5-year study period (mostly rear-end or turning collisions) 	
<p>How Improvement Addresses Deficiencies</p>	<p style="text-align: center;">Existing/Future Deficiency</p> <ul style="list-style-type: none"> Obstructions in southwest quadrant limit eastbound sight distance Eastbound Stewart Parkway has supplemental signal head to offset limitations Drivers on northbound Edenbower Boulevard making a right turn on red have limited sight distance but no crash pattern present at this time <p style="text-align: center;">With Improvement</p> <ul style="list-style-type: none"> Improved sight distance Potentially fewer eastbound rear-end collisions Potentially fewer angle collisions between eastbound and northbound vehicles 	
<p>Additional Considerations</p>	<ul style="list-style-type: none"> “No turn on red” could be implemented on northbound Edenbower Blvd Removal of roadside obstructions may be necessary 	<p style="text-align: center;">Preliminary Alignment Concept</p>  <p style="text-align: center;">Stewart Parkway looking eastward to Edenbower Boulevard</p>  <p style="text-align: center;">Edenbower Boulevard looking westward along Stewart Parkway</p>
<p>Cost Opinion</p>	<ul style="list-style-type: none"> Less than \$10,000 	
<p>Implementation</p>	<ul style="list-style-type: none"> Medium priority Crash pattern of rear-end collisions Crash pattern of angle collisions between eastbound and northbound movements Related to Project 10. WB to NB On Ramp: Install Visual Barrier 	

Project 4. Edenbower Blvd/Stephens St: Extend Left-Turn Bays

Description	Extend striped eastbound left-turn bay on Edenbower Boulevard and northbound left-turn bay on Stephens Street.
Purpose	<ul style="list-style-type: none"> Address queuing concerns
Roadway Characteristics	<ul style="list-style-type: none"> Posted speed is 40 mph Current (2012) ADT = 19,850 vehicles per day Forecast (2035) ADT = 22,800 vehicles per day 12 intersection related crashes during a 5-year study period, the majority being rear end and turning.
How Improvement Addresses Deficiencies	Existing/Future Deficiency
	<ul style="list-style-type: none"> Queuing sometimes interferes with adjacent travel lane Conditions will worsen in future as traffic volumes grow
	With Improvement
	<ul style="list-style-type: none"> Prevents queues building up and spilling into through travel lane which can give rise to safety concerns Reduces conflicts between through movements and excessive queuing from left-turn lanes which improves safety May reduce delay for other travel movements



Additional Considerations	<ul style="list-style-type: none"> Project completed within the existing paved roadway Could be paired with turn restrictions at some accesses within influence of left-turn bays
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Cost Opinion	<ul style="list-style-type: none"> \$15,000
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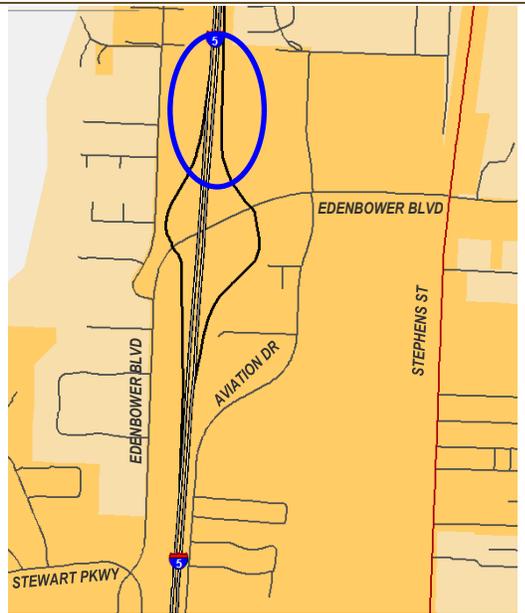
Implementation	<ul style="list-style-type: none"> Medium priority Queues interfering with adjacent travel lanes Crash patterns related to queue buildup Related to Project 1. Edenbower Blvd: Maintain Signal Coordination
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Project 5. NB Ramp Terminal: Signalize Intersection

**I-5 Exit 127 (North Roseburg):
Interchange Area Management Plan**

Description	Install a traffic signal at the northbound off-ramp
Purpose	Addresses long-term traffic operations and safety
Roadway Characteristics	<ul style="list-style-type: none"> Current (2012) ADT = 1,150 vehicles per day Forecast (2035) ADT = 1,950 vehicles per day 8 crashes during a 5-year study period.
How Improvement Addresses Deficiencies	Existing/Future Deficiency
	<ul style="list-style-type: none"> Preliminary traffic signal warrants not met within next five years and forecasts do not show long-term need
	With Improvement
	<ul style="list-style-type: none"> A signal may be warranted if land use changes direct more traffic to the interchange or the frequency of turning or angle collision increases



Additional Considerations	<ul style="list-style-type: none"> Project completed within the existing paved roadway Traffic signals have trade offs in both vehicular delay and crash patterns and should not be installed without meeting warrants Signal interconnection and coordination along Edenbower Blvd necessary to maintain traffic flow
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Cost Opinion	<ul style="list-style-type: none"> \$500,000
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Implementation	<ul style="list-style-type: none"> Low priority Signal warrants met Related to Project 1. Edenbower Blvd: Maintain Signal Coordination
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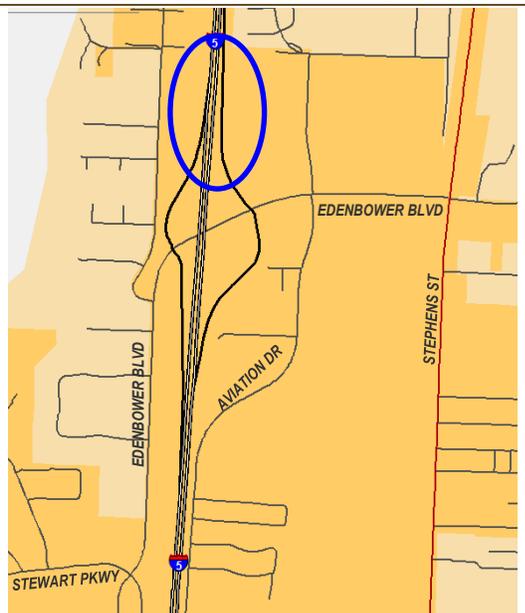
Preliminary Alignment Concept



Project 6. WB to NB On Ramp: Gore Area Delineation

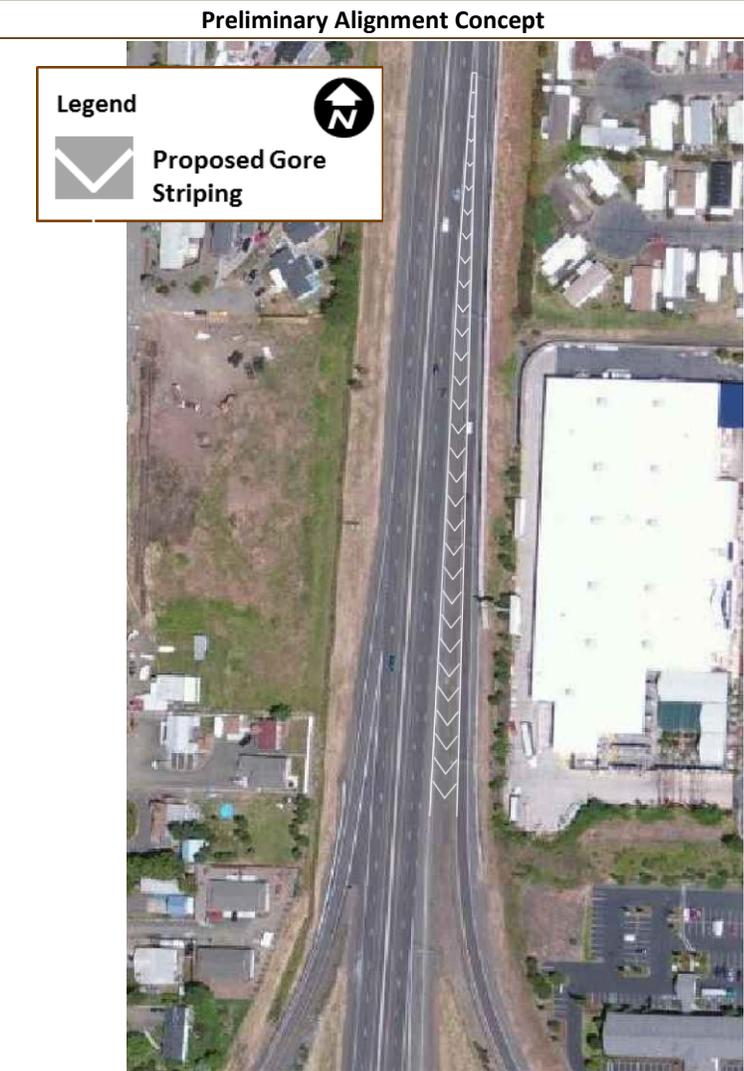
**I-5 Exit 127 (North Roseburg):
Interchange Area Management Plan**

Description	Install a visual barrier on the westbound to northbound on-ramp
Purpose	<ul style="list-style-type: none"> Address driver expectation concerns
Roadway Characteristics	<ul style="list-style-type: none"> Current (2012) ADT = 1,150 vehicles per day Forecast (2035) ADT = 1,950 vehicles per day 8 crashes during a 5-year study period.
How Improvement Addresses Deficiencies	Existing/Future Deficiency
	<ul style="list-style-type: none"> The long northbound on-ramp may cause drivers to begin looking over their shoulders well before necessary to make the merging movement to the mainline
	With Improvement
	<ul style="list-style-type: none"> Provides visual cue to drivers of the appropriate time to merge No impact on capacity



Additional Considerations	<ul style="list-style-type: none"> Project completed within the existing paved roadway Assumes 8" striping
Cost Opinion	<ul style="list-style-type: none"> \$20,000

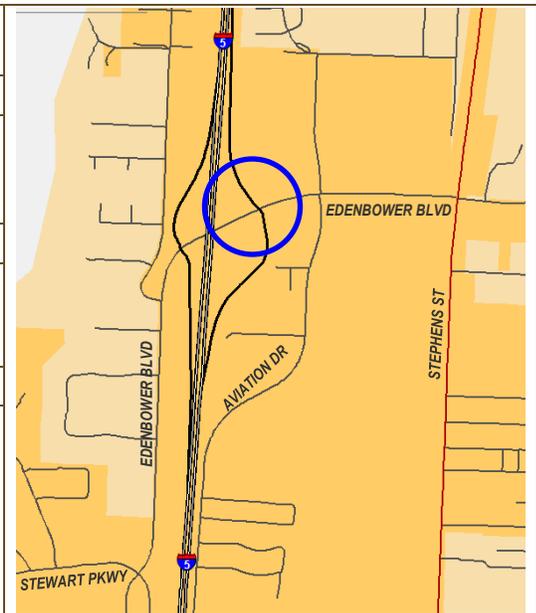
Implementation	<ul style="list-style-type: none"> Low priority Crash pattern related to merging Crash pattern of rear-end collisions Related to Project 10. WB to NB On Ramp: Install Visual Barrier
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Project 7. NB Ramp Terminal: Improve North Side Pedestrian Crossing

I-5 Exit 127 (North Roseburg): Interchange Area Management Plan

Description	Install a visual barrier on the westbound to northbound on-ramp
Purpose	<ul style="list-style-type: none"> Address driver expectation concerns
Roadway Characteristics	<ul style="list-style-type: none"> Current (2012) ADT = 1,150 vehicles per day Forecast (2035) ADT = 1,950 vehicles per day 8 crashes during a 5-year study period.
How Improvement Addresses Deficiencies	Existing/Future Deficiency
	<ul style="list-style-type: none"> The long northbound on-ramp may cause drivers to begin looking over their shoulders well before necessary to make the merging movement to the mainline
	With Improvement
	<ul style="list-style-type: none"> Prohibits drivers from looking at I-5 traffic before it is time to start merging No impact to vehicle carrying capacity since guardrail on west side currently defines unobstructed roadway width

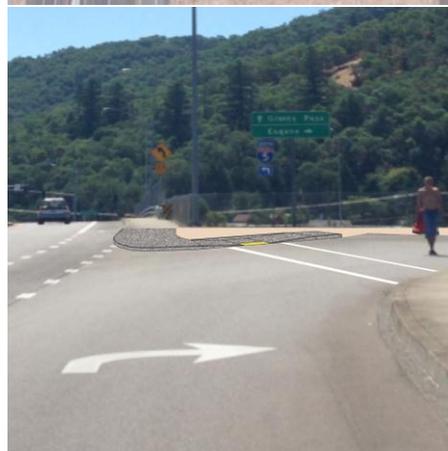
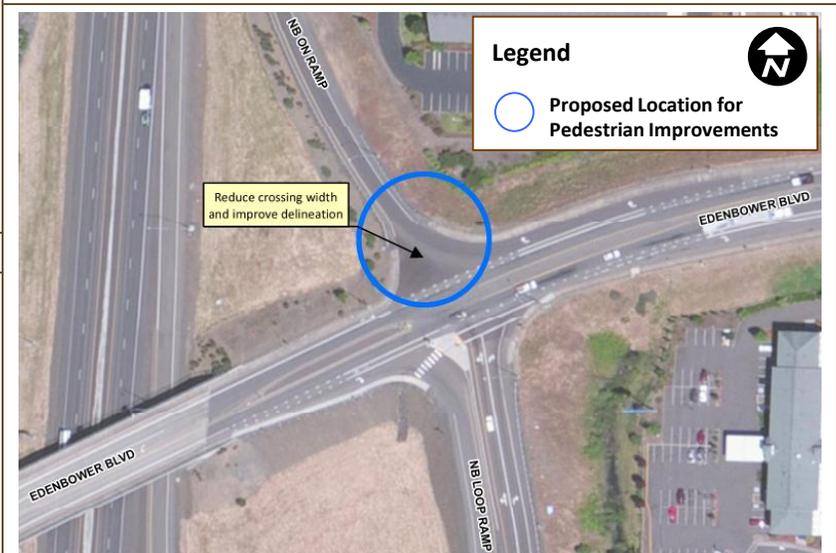


Additional Considerations	<ul style="list-style-type: none"> Project completed within the existing paved roadway Construction of raised island or curb extension needs to meet geometric requirements for westbound right turn and northbound through movement from off-ramp
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Cost Opinion	<ul style="list-style-type: none"> \$100,000
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Implementation	<ul style="list-style-type: none"> Medium priority Existing deficiency Related to Project 5. NB Ramp Terminal: Signalize Intersection
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Preliminary Alignment Concept



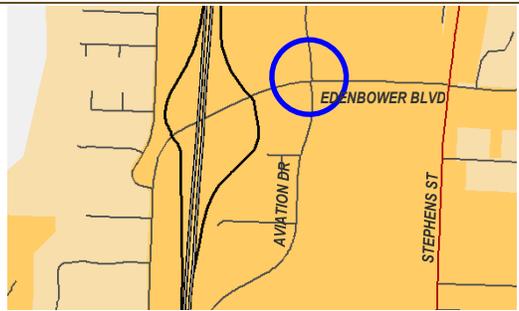
Project 8. Edenbower Blvd/Stewart Pkwy: Add Second EB Left-Turn Lane

<p>Description</p>	<p>Widen the eastbound approach of Stewart Parkway north to add a second left-turn lane and widen Edenbower Blvd to add second northbound receiving lane</p>	
<p>Purpose</p>	<ul style="list-style-type: none"> Plan for long-term capacity needs Address safety concerns associated with queuing on the eastbound approach 	
<p>Roadway Characteristics</p>	<ul style="list-style-type: none"> Posted speed is 40 mph Current (2012) ADT = 24,300 vehicles per day Forecast (2035) ADT = 31,700 vehicles per day Forecast PM peak eastbound left-turns = 890 vehicles 37 crashes during a 5-year study period (mostly rear-end or turning collisions) 	
<p>How Improvement Addresses Deficiencies</p>	<p>Existing/Future Deficiency</p>	<p>Preliminary Alignment Concept</p>
	<p>With Improvement</p> <ul style="list-style-type: none"> Forecast PM peak v/c ratio = 1.02 and LOS E Excessive queuing, especially eastbound Forecast v/c ratio = 0.77 with LOS C Reduces conflicts between through movements and excessive queuing from left-turn lanes Provides protected left turns for all approaches, potentially reducing turning movement and angle crashes associated with left turns 	
<p>Additional Considerations</p>	<ul style="list-style-type: none"> Access control may be needed on Stewart Pkwy and Edenbower Blvd Does not address sight distance on Stewart Pkwy Roadway widening on both Stewart Pkwy and Edenbower Blvd impacts several parking lots Widening Stewart Pkwy northward would bring roadway closer to Sweetbrier Creek corridor Widening on Stewart Pkwy east of intersection could extend to Newton Creek corridor Project may have to demonstrate it will be consistent with applicable FEMA and local floodplain standards Additional ROW needed 	
<p>Cost Opinion</p>	<ul style="list-style-type: none"> \$1.6 million (excluding ROW, utility relocation, or costs to address potential hazardous waste) 	
<p>Implementation</p>	<ul style="list-style-type: none"> Medium priority Persistent congestion (v/c ratio > 0.85) Queues interfering with through travel lanes Could be constructed in phases with Edenbower Blvd widening and lane striping changes on Stewart Pkwy (two options possible) constructed initially and widening for the second left-turn lane constructed at a later time Related to Project 2. Edenbower Blvd: Speed Study 	

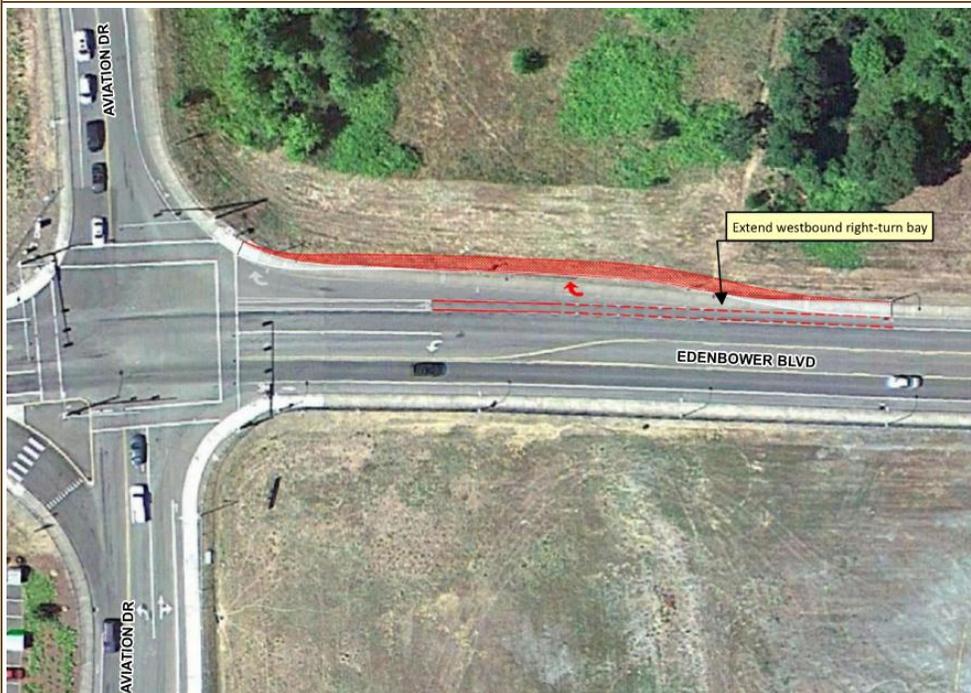
Project 9. Edenbower Blvd/Aviation Dr: Extend WB Right-Turn Bay

**I-5 Exit 127 (North Roseburg):
Interchange Area Management Plan**

Description	Extend westbound right-turn bay on Edenbower Blvd	
Purpose	<ul style="list-style-type: none"> ▪ Address queuing concerns 	
Roadway Characteristics	<ul style="list-style-type: none"> ▪ Posted speed is 40 mph ▪ Current (2012) ADT = 16,700 vehicles per day ▪ Forecast (2035) ADT = 19,800 vehicles per day ▪ 10 crashes during a 5-year study period (mostly rear end collisions) 	
How Improvement Addresses Deficiencies	Existing/Future Deficiency	With Improvement
	<ul style="list-style-type: none"> ▪ Long-term queuing expected to block bike lane and interfere with through travel lane 	<ul style="list-style-type: none"> ▪ Extending turn bay improves safety by allowing the right-turn traffic to get out of the way of through traffic ▪ Increased storage length reduces the number of vehicles blocking the bike lane during queuing
Additional Considerations	<ul style="list-style-type: none"> ▪ Requires additional ROW on north side of roadway ▪ Requires cutting into and stabilizing hillside next to Edenbower Blvd ▪ Lighting and sidewalks need to be relocated 	
Cost Opinion	<ul style="list-style-type: none"> ▪ \$75,000 (excluding ROW acquisition costs or environmental mitigation) 	
Implementation	<ul style="list-style-type: none"> ▪ Low priority ▪ Queues interfering with through lane or bike lane ▪ Crash pattern related to queues ▪ Prior to implementation, traffic signal timing may be used to manage queues 	



Preliminary Alignment Concept



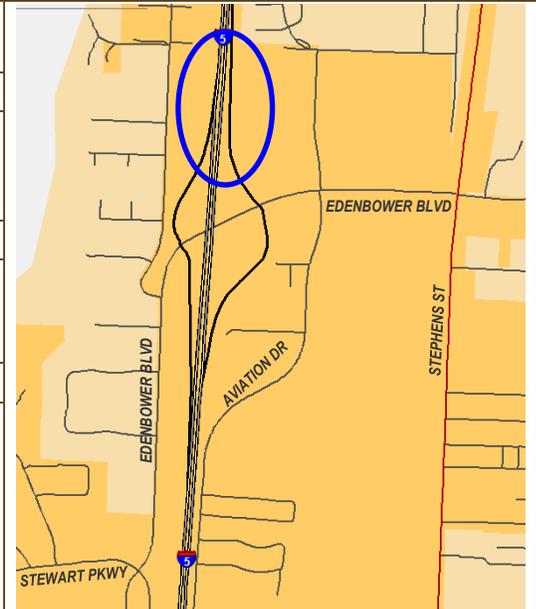
Legend

- Proposed Lane Configuration
- Existing Lane Configuration
- Approximate Boundary of Impacts
- Proposed Striping
- Proposed Extension

Project 10. WB to NB On Ramp: Install Visual Barrier

**I-5 Exit 127 (North Roseburg):
Interchange Area Management Plan**

Description	Install a visual barrier on the westbound to northbound on-ramp
Purpose	<ul style="list-style-type: none"> Address driver expectation concerns
Roadway Characteristics	<ul style="list-style-type: none"> Current (2012) ADT = 1,150 vehicles per day Forecast (2035) ADT = 1,950 vehicles per day 8 crashes during a 5-year study period.
How Improvement Addresses Deficiencies	Existing/Future Deficiency
	<ul style="list-style-type: none"> The long northbound on-ramp may cause drivers to begin looking over their shoulders well before necessary to make the merging movement to the mainline
	With Improvement
	<ul style="list-style-type: none"> Prohibits drivers from looking at I-5 traffic before it is time to start merging No impact to vehicle carrying capacity since guardrail on west side currently defines unobstructed roadway width



Additional Considerations	<ul style="list-style-type: none"> Project completed within the existing paved roadway Assumed concrete barrier with glare shields
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Cost Opinion	<ul style="list-style-type: none"> \$100,000
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Implementation	<ul style="list-style-type: none"> Low priority Crash pattern related to merging Crash pattern of rear-end collisions Only implemented if Project 6. WB to NB On Ramp: Gore Area Delineation is not effective at addressing concerns on the ramp.
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