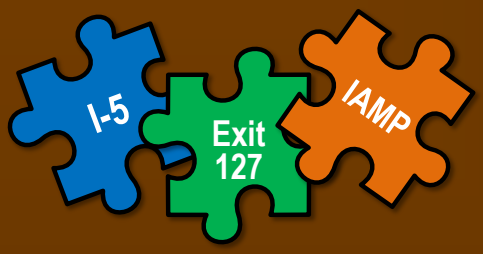
Interchange Area Management Plan

VOLUME 2
REFERENCE MATERIAL



I-5 Exit 127 (North Roseburg)

December 2014

Oregon Department of Transportation

ACKNOWLEDGMENTS

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This companion document to the I-5 Exit 127 (North Roseburg) Interchange Area Management Plan contains the technical memorandums and analysis that was prepared during the development of the plan. It also documents the public involvement that was conducted throughout the planning process. Lastly, it summarizes how Title VI and Environmental Justice as addressed during plan development.

VOLUME 2: REFERENCE MATERIAL

Technical Memorandum #1: Definition and Background

Technical Memorandum #2: Existing Conditions Analysis

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: Recommended Code and Plan Amendments

Technical Memorandum #9: Public Involvement Summary

Technical Memorandum #10: Title VI and Environmental Justice

List of Acronyms

ADT	Average Daily Traffic
CIP	Capital Improvement Program
CORP	Central Oregon and Pacific (Railroad)
DHV	Design Hourly Volume
HCM	Highway Capacity Manual
HDM	Highway Design Manual
LOS	Level of Service
mvm	million vehicle miles
OAR	Oregon Administrative Rules
ODOT	Oregon Department of Transportation
OHP	Oregon Highway Plan
OPAL	Official Project Access List
OR	Oregon Route
OTC	Oregon Transportation Commission
ROW	Right of Way
SPIS	Safety Priority Index System
STIP	Statewide Transportation Improvement Program
T&E	Threatened and Endangered
TDM	Transportation Demand Management
TIS	Traffic Impact Study
TSM	Transportation System Management
TSP	Transportation System Plan
UGB	Urban Growth Boundary
v/c	volume-to-capacity
vpd	vehicles per day

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

Technical Memorandum #1
Definition and Background

Prepared for

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December 2014

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Figure 1-1. Interchange Management Study Area

1. DEFINITION AND BACKGROUND

The Oregon Department of Transportation (ODOT) encourages the development of Interchange Area Management Plans (IAMP) to maintain and improve highway performance and safety by improving system efficiency and management before adding capacity. Public investments for major interchange improvements are very costly, and it is in the interest of the State, local governments, citizens of Oregon, and the traveling public to ensure that the interchange functions as it is designed for as long as possible.

1.1. Purpose

As described in ODOT's Interchange Area Management Plan Guidelines, the objectives of an IAMP are:

- Protect the state and local investment in major facilities
- Establish the desired function of interchanges
- Protect the function of interchanges by maximizing the capacity of the interchanges for safe movement from the mainline highway facility
- Balance the need for efficient interstate and state travel with local use
- Preserve and improve safety of existing interchanges
- Provide safe and efficient operation between connecting roadways
- Adequately protect interchanges from unintended and unexpected development while accommodating planned community development
- Manage the existing interchange capacity and new capacity provided through interchange improvements
- Establish how future land use and transportation decisions will be coordinated in interchange areas between ODOT and the local governments

The IAMP planning process examines land use and transportation conditions and identifies long-range concepts to accommodate anticipated growth. Outcomes of the process include:

- Improvements to address safety issues
- Capacity enhancements to address operational deficiencies
- Modifications to the local street network in the vicinity of the interchange
- Land use actions and/or management measures to be applied in the management area

State and local regulations, policies, and transportation and land use plans provided the framework for preparing the IAMP. The language contained within these documents provides guidance to the state and local jurisdictions on how to:

- Manage transportation and land uses in the interchange influence area to protect the interchange function,
- Provide for safe and efficient operations

- Minimize the need and expense for making major improvement to the interchange through the planning horizon.

Hence, the IAMP documents relevant plans and policies, and identifies how they influence planning for the Interchange 127 area. The purpose of the review is to ensure the necessary compatibility, consistency, and compliance required by state law and ODOT policy. A summary description of the reviewed plans and policies is attached at the end of this technical memorandum as Appendix A.

1.2. Interchange Function

I 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 a 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 lands.

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

1.3. Problem Statement

Two primary issues affect the long-term operations of I-5 Exit 127:

1. Existing access spacing does not meet state standards; nearby public road intersections are too close to the ramp terminals. 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.

Measures to manage operations of the closely spaced network and future access are identified in this IAMP.

2. Growth and development will place increased demand on the interchange and supporting arterial street system. Evaluation conducted as part of this IAMP preparation indicates that the interchange ramp terminal intersections should have enough capacity to meet future demand based on adopted City of Roseburg and Douglas County population growth rates. Some of the local intersections are anticipated to have operational issues but would not impact the interchange.

A review of plans and policies related to the interchange identified two documents that listed geometric and operational concerns at the interchange. The issues raised and findings from the IAMP preparation are presented below:

I-5 State of the Interstate Report (2000)

- The curve on Edenbower Boulevard west of the interchange is sharp for the posted speed. *A review of crash patterns on Edenbower Boulevard did not reveal any crashes associated with the sharp curve in the roadway.*
- The deceleration lane length is too short on both the northbound and southbound exit ramps. *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.*
- Adjacent public road intersections are too close to the ramp terminals. The current intersection spacing does not meet ODOT standards. *A review of crash patterns did not reveal any crashes related to the proximity of these intersections; however, signal coordination to manage congestion and queuing must be maintained to avoid future issues near the interchange.*

City of Roseburg Transportation System Plan (dated June 2006, adopted December 2006)

- According to the Transportation System Plan (TSP), both the northbound and southbound ramp terminals experience long delays during weekday peak hours. *The traffic signal installed at the southbound ramp terminal has alleviated congestion. Signal coordination along Edenbower Boulevard at Aviation Drive and the southbound ramp terminal currently provides gaps in traffic flow so that the STOP-controlled northbound ramp terminal is not congested during peak hours. The interchange is expected to operate well in the future too based on analysis of traffic forecasts using the currently adopted population growth rates for the City of Roseburg and Douglas County.*

Although congestion is not an issue at the interchange itself under either existing or forecast conditions, access to the interchange is affected by traffic delays on the City of Roseburg's

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.

1.4. IAMP Planning 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 mile[1] in all directions and should be large enough to "address both direct and indirect transportation and land uses." As shown in Figure 1-1, 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.

1.5. IAMP Goal 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.

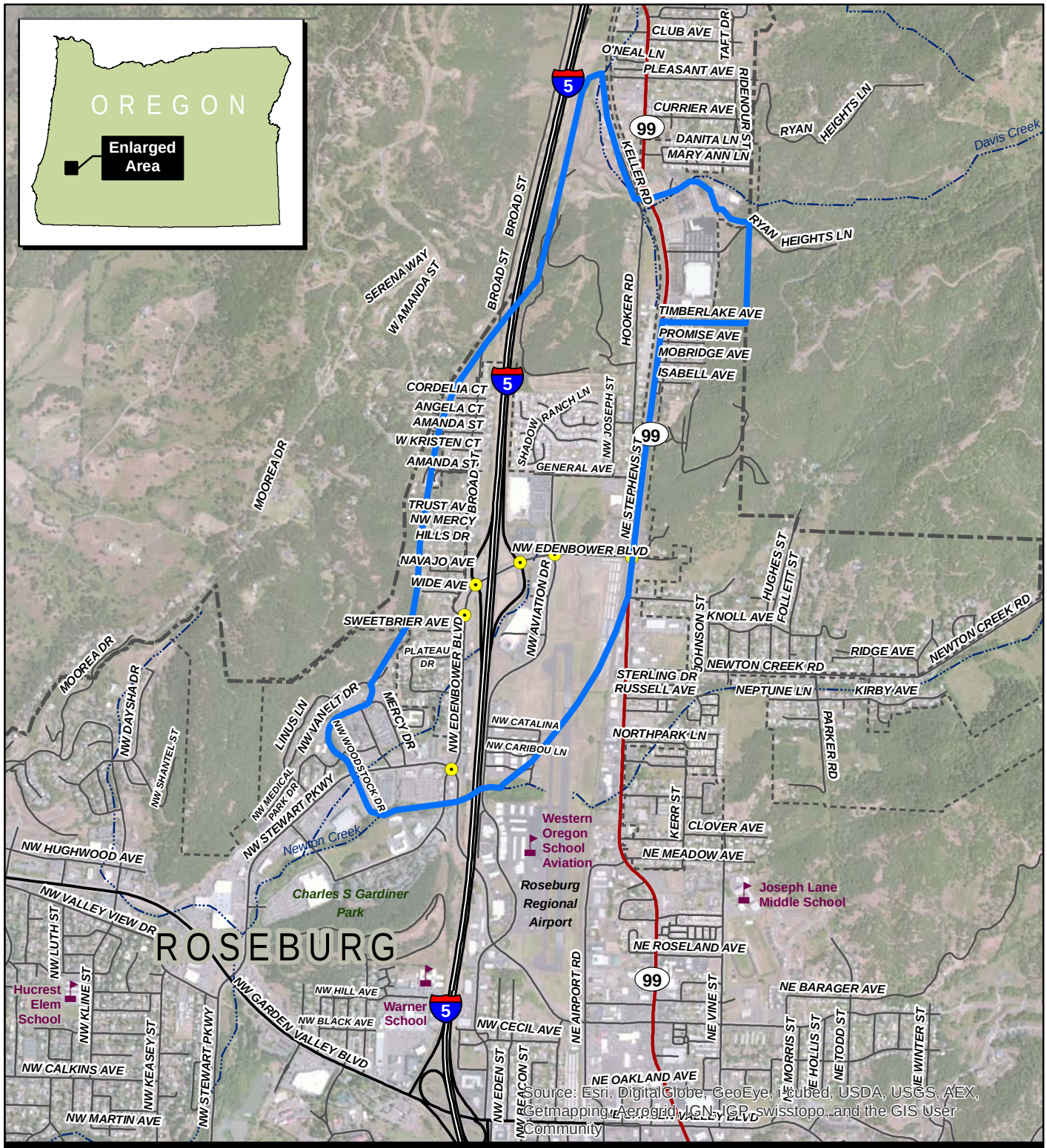
The objectives of the IAMP are to:

- 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.

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

- 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

Attachments:
Figure 1-1. Interchange Management Study Area
Appendix A. Review of Plans and Policies



Legend

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

N

0 2,000 4,000 Feet

Figure 1-1
Interchange Management Study Area

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

Technical Memorandum #1
Appendix A
Review of Plans and Policies

Prepared for

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December 2014

Appendix A Contents

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A. REVIEW OF PLANS AND POLICIES

The purpose of this review is to provide the IAMP's regulatory framework by identifying the required state and local plans with which the IAMP must be compatible or consistent as required by state law and ODOT policy. This review will be used to guide development of the IAMP's goals and objectives and decisions regarding selection of preferred alternatives and management measures.

After the IAMP draft is completed, this review will be used to make findings of compatibility and compliance with state and local policies and regulations. It will be used to identify where policy changes and plan amendments and/or local development code changes are needed to implement the IAMP. According to OAR 734-051-7010, IAMPS must be adopted by the Oregon Transportation Commission (OTC) as a transportation facility plan consistent with the provisions of OAR 731-015-0065. Prior to adoption by the OTC, Douglas County and the City of Roseburg may need to amend their comprehensive plans, transportation system plans and/or local land use and subdivision codes to ensure consistency. The OTC adoption package includes findings of consistency.

Each state and local policy, plan, and regulation is summarized and the relevance and requirement for the IAMP identified. Although each document reviewed contains many policies, only the pertinent policies are included. The standards and polices that most directly affect the planning or design of the interchange are highlighted in **bold**.

A.1. Review of Adopted State Plans

The following statewide planning documents are included:

- Statewide Planning Goals 1, 2, 3, 4, 5, 6, 7, 9, 11, 12, & 14
- Oregon Transportation Plan (2006)
- Oregon Highway Plan (Updated 2012)
- Oregon Bicycle and Pedestrian Plan (updated 2011)
- Oregon Freight Plan (2011)
- OAR Chapter 731 Division 15
- OAR Chapter 734 Division 051 (Division 51)
- OAR 660 Division 12 (TPR—including recent amendments)
- 2001 Oregon Rail Plan
- ODOT Right of Way Section
- ODOT Title VI
- Interchange Area Management Plan Guidelines (2011)
- Highway Design Manual (HDM 2011)

A.1.1. Statewide Planning Goals

Since 1973, Oregon has maintained a strong statewide program for land use planning. The foundation of that program is a set of 19 statewide planning goals. Most of the goals are accompanied by guidelines, which are suggestions about how a goal may be applied. The goals express the state's policies on land use and related topics, such as citizen involvement, housing, and natural resources. Oregon's statewide goals are achieved through local comprehensive planning. State law requires each city and county to adopt a comprehensive plan, of which transportation system plans are a part, and the zoning and land-division ordinances needed to put the plan into effect. The local comprehensive plans must be consistent with the Statewide Planning Goals. When the state's Land Conservation and Development Commission (LCDC) officially approves a local government's plan, the plan is said to be acknowledged. It then becomes the controlling document for land use in the area covered by that plan. Oregon's planning laws strongly emphasize coordination—keeping plans and programs consistent with each other, with the statewide planning goals, and with acknowledged local plans. The goals that are most pertinent to transportation system planning, and therefore the Interchange 127 IAMP, are described below.

Statewide Planning Goal 1 (Citizen Involvement)

Goal 1, Citizen Involvement, ensures the opportunity for all citizens to be involved in all phases of the planning process. The citizen involvement program must be appropriate to the scale of the planning effort. The program must provide for continuity of citizen participation and of information that enables citizens to identify and understand the issues.

The citizen involvement program needs to incorporate the following components:

1. Citizen Involvement -- To provide for widespread citizen involvement.
2. Communication -- To assure effective two-way communication with citizens.
3. Citizen Influence -- To provide the opportunity for citizens to be involved in all phases of the planning process.
4. Technical Information -- To assure that technical information is available in an understandable form.
5. Feedback Mechanisms -- To assure that citizens will receive a response from policy-makers.
6. Financial Support -- To insure funding for the citizen involvement program.

Project Relevance

Goal 1 requires state, local, and special district agencies to coordinate their planning efforts, which in this case are ODOT, the City of Roseburg, and Douglas County. The scale of the public involvement program developed for the IAMP is appropriate for the project. It includes four Technical Advisory Committee (TAC) meetings, four Citizen Advisory Committee (CAC) meetings and two public meetings. The TAC provides technical and policy guidance to the project team during preparation of the IAMP. The CAC provides interested parties, the public, and

stakeholders an opportunity to give input to ODOT and the project team during preparation of the IAMP. The public meetings allow the general public at large to learn about and offer their comments and feedback on the development of IAMP. Additional components of the public involvement plan include preparing displays to clearly convey project information during public involvement meetings and comment forms for meeting attendees. Outreach efforts through the development of the IAMP are documented in an appendix of the IAMP.

Statewide Planning Goal 2 (Land Use Planning)

Goal 2 outlines the basic procedures of Oregon's statewide planning program. A land use planning process and policy framework must be established as a basis for all decisions and actions relating to the use of land. All local governments and state agencies involved in the land use action must coordinate with each other. City, county, and state agency and special district plans and actions related to land use shall be consistent with the comprehensive plans of cities and counties and regional plans adopted under ORS Chapter 268. Additionally, land use decisions and actions must be supported by an "adequate factual base." Evidence must be provided that a reasonable person would find sufficient to support a finding of fact that a land use action complies with the applicable review standards. Goal 2 also contains standards for taking exceptions to statewide goals. An exception may be taken when a statewide goal cannot or should not be applied to a particular area or situation.

Project Relevance

This memorandum serves as a policy framework for the development of the IAMP. The project's TAC will provide technical and policy guidance throughout the development of the IAMP. Although the IAMP will not amend land use designations, it may require county and/or city comprehensive plan, TSP or development code amendments in order to incorporate facility improvements or other management actions into the plans to protect the interchange and to make the IAMP and plans consistent. The technical memoranda prepared for the project will document the adequate factual base for any recommended plan changes.

Statewide Planning Goal 3 (Agricultural Lands)

Goal 3's intent is to preserve and maintain agricultural lands. Agricultural lands must be preserved and maintained for farm use, consistent with existing and future needs for agricultural products, forest, and open space and with the state's agricultural land use policy expressed in ORS 215.243. Zoning applied to agricultural land limits uses which can have significant adverse effects on agricultural and forest land, farm and forest uses or accepted farming or forest practices.

Project Relevance

Portions of the northeast quadrant of the IAMP study area are zoned as farmed forest. A major task of the IAMP is to complete an existing conditions analysis that summarizes the comprehensive plan and zoning designations, including any overlays, and the land uses allowed within each zoning district within the study area. OAR 660-012-0065 identifies transportation

improvements permitted on rural lands consistent with Statewide Planning Goals 3, 4, 11 and 14 without the requirement of a goal exception. IAMP implementation measures will address consistency with designated agricultural lands and the allowed uses as described in ORS 215.243.

Statewide Planning Goal 4 (Forest Lands)

This goal defines forest lands and requires counties to inventory them and adopt policies and ordinances that will "conserve forest lands for forest uses."

Project Relevance

Portions of the northeast quadrant of the IAMP study area are zoned as farmed forest. Improvements proposed in the corridor must comply with city and county policies, programs, and permitting that implement this goal. In general, the IAMP will be developed in respect of this goal. OAR 660-012-0065 identifies transportation improvements permitted on rural lands consistent with Statewide Planning Goals 3, 4, 11 and 14 without the requirement of a goal exception. IAMP implementation measures will address consistency with designated forest lands and the allowed uses as described in ORS 215.243.

Statewide Planning Goal 5 (Natural Resources)

The purpose of Goal 5, Natural Resources, Scenic and Historic Areas, and Open Spaces, is to “protect natural resources and conserve scenic and historic areas and open spaces.” This goal requires local governments to inventory natural and cultural resources in their jurisdictions and to develop and adopt programs to conserve and protect them. Among the resources to be inventoried are: riparian corridors, wetlands, federal Wild and Scenic Rivers, state Scenic Waterways, groundwater resources, wildlife habitat, natural areas, wilderness areas, open spaces, scenic views and sites, mineral and aggregate resource areas, energy sources, and historic and cultural areas. If a resource or site is found to be significant, a local government has three policy choices: preserve the resource, allow proposed uses that conflict with it, or strike some sort of a balance between the resource and the uses that would conflict with it.

Project Relevance

Goal 5 resources on land in the study area will be inventoried Technical Memorandum #2: Existing Conditions Analysis. Improvements proposed in the study area must comply with city and county policies, programs, and permitting that implement this goal. In general, the IAMP must be developed in respect of this goal.

Statewide Planning Goal 6 (Resources Quality)

This goal requires local comprehensive plans and implementing measures to be consistent with state and federal regulations on matters such as groundwater pollution.

Project Relevance

The IAMP will be developed consistently with this goal. Improvements proposed in the study area must comply with federal, state, city and county policies, programs, and permitting that implement this goal.

Statewide Planning Goal 7 (Natural Hazardous)

Goal 7 deals with development in places subject to natural hazards such as floods or landslides. It requires that jurisdictions apply "appropriate safeguards" (floodplain zoning, for example) when planning for development in areas of natural hazards.

Project Relevance

The IAMP will be developed consistently with this goal. Goal 7 resources on land in the study area will be identified in Technical Memorandum #2: Existing Conditions Analysis. Improvements proposed as part of the IAMP must comply with city and county policies, programs, and permitting that implement this goal.

Statewide Planning Goal 9 (Economic Development)

The intent of Goal 9, Economic Development, is to “provide adequate opportunities throughout the state for a variety of economic activities vital to the health, welfare, and prosperity of Oregon’s citizens.” Local comprehensive plans and policies must support this goal and include policies addressing economic development and development opportunities. Plans must also identify an adequate supply of land with characteristics suitable for a variety of employment and economic development. Development should be limited around identified industrial sites to that which is compatible with uses allowed on the sites.

Project Relevance

The IAMP will be developed consistently with this goal. The existing, intended, and allowed uses of land will be reviewed in Technical Memorandums #2: Existing Conditions Analysis and #3: Future Baseline Conditions Report and considered during the development of the IAMP.

Statewide Planning Goal 11 (Public Facilities and Services)

Goal 11 calls for efficient planning of public services such as sewers, water, law enforcement, and fire protection. The goal’s central concept is that local governments should plan public services in accordance with its community’s needs and capacities rather than being forced to respond to development as it occurs. The goal requires that urban and rural development be “guided and supported by types and levels of urban and rural public facilities and services appropriate for, but limited to, the needs and requirements of the urban, urbanizable and rural areas to be served.”

Project Relevance

The IAMP will be developed consistently with this goal.

Statewide Planning Goal 12 (Transportation)

The goal requires cities, counties, metropolitan planning organizations (MPOs), and ODOT to provide and encourage a safe, convenient, and economic transportation system. This is partially accomplished through development of Transportation System Plans (TSPs) based on inventories of local, regional, and state transportation needs.

The implementation portion of the Goal states that:

1. The number and location of major transportation facilities should conform to applicable state or local land use plans and policies designed to direct urban expansion to areas identified as necessary and suitable for urban development. The planning and development of transportation facilities in rural areas should discourage urban growth while providing transportation service necessary to sustain rural and recreational uses in those areas so designated in the comprehensive plan.
2. Plans for new or for the improvement of major transportation facilities should identify the positive and negative impacts on: (1) local land use patterns, (2) environmental quality, (3) energy use and resources, (4) existing transportation systems and (5) fiscal resources in a manner sufficient to enable local governments to rationally consider the issues posed by the construction and operation of such facilities.
3. Lands adjacent to major mass transit stations, freeway interchanges, and other major air, land and water terminals should be managed and controlled so as to be consistent with and supportive of the land use and development patterns identified in the comprehensive plan of the jurisdiction within which the facilities are located.
4. **Plans should provide for a detailed management program to assign respective implementation roles and responsibilities to those governmental bodies operating in the planning area and having interests in carrying out the goal.**

Project Relevance

The IAMP will recommend interchange improvements, transportation system network improvements and management measures to support 20-year traffic growth and future development of planned land uses within Roseburg's city limits and Urban Growth Boundary (UGB) and outside the UGB within Douglas County jurisdiction. Therefore, it meets the intent of Goal 12. The IAMP's Implementation section will assign measures and responsibilities.

Statewide Planning Goal 14 (Urbanization)

This goal requires cities to estimate future growth and needs for land and then plan and zone enough land to meet those needs. It calls for each city to establish a UGB to identify and separate urbanizable land from rural land. Land uses permitted within the urban areas are more urban in nature and higher intensity than in rural areas, which primarily include farm and forest uses. It specifies seven factors that must be considered in establishing a UGB. It also lists four criteria to be applied when undeveloped land within a UGB is to be converted to urban uses. Compact development helps contain the costs of public facilities such as transportation and helps jurisdictions better anticipate where growth will occur.

Project Relevance

The location, type, and intensity of development within the study area could affect future use and operation of the interchange. The interchange study area is within the northern edge of City of Roseburg UGB. The IAMP will be developed consistently with Goal 14 and in respect of local land use zoning designations and projected future development patterns.

A.1.2. Oregon Transportation Plan (2006)

The Oregon Transportation Plan (OTP) is the state's long-range multimodal transportation plan. The OTP considers all modes of Oregon's transportation system as a single system. The current OTP assesses state, regional, and local public and private transportation facilities through 2030. The OTP establishes goals, policies, strategies, and initiatives that address the core challenges and opportunities facing Oregon. It also provides the framework for prioritizing transportation improvements based on varied future revenue conditions.

Relevant goals and policies are:

Goal 1 – Mobility and Accessibility

Policy 1.1 – Development of an Integrated Multimodal System: It is the policy of the State of Oregon to plan and develop a balanced, integrated transportation system with modal choices for the movement of people and goods.

Policy 1.2 – Equity, Efficiency and Travel Choices: It is the policy of the State of Oregon to promote a transportation system with multiple travel choices that are easy to use, reliable, cost-effective and accessible to all potential users, including the transportation disadvantaged.

Policy 1.3 – Relationship of Interurban and Urban Mobility: It is the policy of the State of Oregon to provide intercity mobility through and near urban areas in a manner that minimizes adverse effects on urban land use and travel patterns and provides for efficient long distance travel.

Goal 2 – Management of the System

Policy 2.1 - Capacity and Operational Efficiency: It is the policy of the State of Oregon to manage the transportation system to improve its capacity and operational efficiency for the long-term benefit of people and goods movement.

Policy 2.2 - Management of Assets: It is the policy of the State of Oregon to manage transportation assets to extend their life and reduce maintenance costs.

Goal 3 – Economic Vitality

Policy 3.1 – An Integrated and Efficient Freight System: It is the policy of the State of Oregon to promote an integrated, efficient, and reliable freight system involving air, barges, pipelines, rail, ships, and trucks to provide Oregon a competitive advantage by moving goods faster and more reliably to regional, national, and international markets.

Policy 3.2 – Moving People to Support Economic Vitality: It is the policy of the State of Oregon to develop an integrated system of transportation facilities, services, and information so that intrastate, interstate, and international travelers can travel easily for business and recreation.

Policy 3.3 – Downtowns and Economic Development: It is the policy of the State of Oregon to provide transportation improvements to support downtowns and to coordinate transportation and economic development strategies.

Goal 4 – Sustainability

Policy 4.1 – Environmentally Responsible Transportation System: It is the policy of the State of Oregon to provide a transportation system that is environmentally responsible and encourages conservation and protection of natural resources.

Policy 4.3 – Creating Communities: It is the policy of the State of Oregon to increase access to goods and services and promote health by encouraging the development of compact communities and neighborhoods that integrate residential, commercial, and employment land uses to help make shorter trips, transit, walking, and bicycling feasible, and that integrate features that support the use of transportation choices.

Goal 5 – Safety and Security

Policy 5.1 – Safety and Security: It is the policy of the State of Oregon to continually improve the safety and security of all modes and transportation facilities for system users including operators, passengers, pedestrians, recipients of goods and services, and property owners.

Policy 5.2 – Security: It is the policy of the State of Oregon to provide transportation security consistent with the leadership of federal, state, and local homeland security entities.

Goal 7 – Coordination, Communication and Cooperation

Policy 7.1 - A Coordinated Transportation System: It is the policy of the State of Oregon to work collaboratively with other jurisdictions and agencies with the objective of removing barriers so the transportation system can function as one system.

Policy 7.3 – Public Involvement and Consultation: It is the policy of the State of Oregon to involve Oregonians to the fullest practical extent in transportation planning and implementation in order to deliver a transportation system that meets the diverse needs of the state.

Policy 7.4 – Environmental Justice: It is the policy of the State of Oregon to provide all Oregonians, regardless of race, culture or income, equal access to transportation decision-making so all Oregonians may fairly share in benefits and burdens and enjoy the same degree of protection from disproportionate adverse impacts.

Project Relevance

The development of this IAMP is integral to maintaining the highway facility and optimizing system performance. Transportation improvements identified in the IAMP will be developed consistent with and to implement the goals of the OTP.

A.1.3. Oregon Highway Plan (Updated 2012)

The Oregon Highway Plan (OHP) establishes policies and investment strategies for Oregon's state highway system over a 20-year period and refines the goals and policies found in the OTP. Policies in the OHP emphasize the efficient management of the highway system to increase safety and to extend highway capacity, partnerships with other agencies and local governments, and the use of new techniques to improve road safety and capacity. These policies also link land use and transportation, set standards for highway performance and access management, and emphasize the relationship between state highways and local road, bicycle, pedestrian, transit, rail, and air systems.

I-5 is an interstate highway and part of the National Highway System (NHS). The OHP describes this designation as:

- Interstate Highways (NHS) provide connections to major cities, regions of the state, and 8 other states. A secondary function in urban areas is to provide connections for regional trips within the metropolitan area. The Interstate Highways are major freight routes and their objective is to provide mobility. The management objective is to provide for safe and efficient high-speed continuous-flow operation in urban and rural areas.

The OHP policies applicable to IAMPs include:

Goal 1 – System Definition

<u>Policy 1A: State Highway Classification System</u>: It is the policy of the State of Oregon to develop and apply the state highway classification system to guide ODOT priorities for system investment and management.

<u>Policy 1B: Land Use and Transportation</u>: This policy recognizes the role of both State and local governments related to the state highway system:

- State and local government must work together to provide safe and efficient roads for livability and economic viability for all citizens.
- State and local government must share responsibility for the road system.
- State and local government must work collaboratively in planning and decision-making relating to transportation system management.

It is the policy of the State of Oregon to coordinate land use and transportation decisions to efficiently use public infrastructure investments to:

- Maintain the mobility and safety of the highway system;
- Foster compact development patterns in communities;

- Encourage the availability and use of transportation alternatives;
- Enhance livability and economic competitiveness; and
- Support acknowledged regional, city and county transportation system plans that are consistent with this Highway Plan.

Policy 1C: State Highway Freight System: It is the policy of the State of Oregon to balance the need for movement of goods with other uses of the highway system, and to recognize the importance of maintaining efficient through movement on major truck freight routes.

Policy 1E: Lifeline Routes: It is the policy of the State of Oregon to provide a secure lifeline network of streets, highways, and bridges to facilitate emergency services response and to support rapid economic recovery after a disaster.

Policy 1F: Highway Mobility Policy[1]: It is the policy of the State of Oregon to maintain acceptable and reliable levels of mobility on the state highway system, consistent with the expectations for each facility type, location and functional objectives. Highway mobility targets will be the initial tool to identify deficiencies and consider solutions for vehicular mobility on the state system. Specifically, mobility targets shall be used for:

- Identifying state highway mobility performance expectations for planning and plan implementation;
- Evaluating the impacts on state highways of amendments to transportation plans, acknowledged comprehensive plans and land use regulations pursuant to the Transportation Planning Rule (OAR 660-12-0060); and
- Guiding operational decisions such as managing access and traffic control systems to maintain acceptable highway performance.

Policy 1G: Major Improvements: It is the policy of the State of Oregon to maintain highway performance and improve safety by improving system efficiency and management before adding capacity. ODOT will work in partnership with regional and local governments to address highway performance and safety needs.

Goal 2 – System Management

Policy 2A: Partnerships: It is the policy of the State of Oregon to establish cooperative partnerships to make more efficient and effective use of limited resources to develop, operate, and maintain the highway and road system. These partnerships are relationships among ODOT and state and federal agencies, regional governments, cities, counties, tribal governments, and the private sector.

Policy 2B: Off-System Improvements: It is the policy of the State of Oregon to provide state financial assistance to local jurisdictions to develop, enhance, and maintain

[1] This excerpt is abbreviated.

improvements on local transportation systems when they are a cost-effective way to improve the operation of the state highway system if:

- The off-system costs are less than or equal to on-system costs, and/ or the benefits to the state system are equal to or greater than those achieved by investing in on-system improvements;
- **Local jurisdictions adopt land use, access management and other policies and ordinances to assure the continued benefit of the off-system improvement to the state highway system;**
- **Local jurisdictions agree to provide advance notice to ODOT of any land use decisions that may impact the off-system improvement in such a way as to adversely impact the state highway system; and**
- **Local jurisdictions agree to a minimum maintenance level for the off-system improvement that will assure the continued benefit of the off-system improvement to the state highway system.**

Policy 2F: Traffic Safety: It is the policy of the State of Oregon to continually improve safety for all users of the highway system using solutions involving engineering, education, enforcement, and emergency medical services.

Policy 2G: Rail and Highway Compatibility: It is the policy of the State of Oregon to increase safety and transportation efficiency through the reduction and prevention of conflicts between railroad and highway users.

Goal 3 - Access Management

Policy 3A: Classification and Spacing Standards: It is the policy of the State of Oregon to manage the location, spacing and type of road and street intersections and approach roads on state highways to assure the safe and efficient operation of state highways consistent with the classification of the highways.

Action 3A.2: Establish spacing standards on state highways based on highway classification, type of area and speed. The tables in Appendix C show the access spacing standards which consider urban and rural highway classification, traffic volumes, speed, safety, and operational needs.

Policy 3C: Interchange Access Management Areas: It is the policy of the State of Oregon to plan for and manage grade-separated interchange areas to ensure safe and efficient operation between connecting roadways.

Action 3C.1: Develop interchange area management plans to protect the function of interchanges to provide safe and efficient operations between connecting roadways and to minimize the need for major improvements of existing interchanges.

Action 3C.2: To improve an existing interchange or construct a new interchange:

- **The interchange access management spacing standards are shown in Appendix C;**

- **The standards do not apply retroactively to interchanges existing prior to adoption of this Oregon Highway Plan, except or until any redevelopment, change of use, or highway construction, reconstruction or modernization project affecting these existing interchanges occurs. It is the goal at that time to meet the appropriate spacing standards, if possible, but, at the very least, to improve the current conditions by moving in the direction of the spacing standards;**
- **Necessary supporting improvements, such as road networks, channelization, medians and access control in the interchange management area must be identified in the local comprehensive plan and committed with an identified funding source, or must be in place;**
- **Access to cross streets shall be consistent with established standards for a distance on either side of the ramp connections so as to reduce conflicts and manage ramp operations. The Interchange Access Management Spacing Standards supersede the Access Management Classification and Spacing Standards (Policy 3A), unless the latter distance standards are greater (see Appendix C);**
- **Where possible, interchanges on Freeways and Expressways shall connect to state highways, or major or minor arterials;**
- **Interchanges on Statewide, Regional or District Highways may connect to state highways, major or minor arterials, other county or city roads, or private roads, as appropriate;**
- **The design of urban interchanges must consider the need for transit and park-and-ride facilities, along with the interchange's effect on pedestrian and bicycle traffic; and**
- **When possible, access control shall be purchased on crossroads for a minimum distance of 1320 feet (400 meters) from a ramp intersection or the end of a free flow ramp terminal merge lane taper.**

<u>Action 3C.3</u>: Establish criteria for when deviations to the interchange access management spacing standards may be considered. The kinds of considerations likely to be included are:

- **Location of existing parallel roadways (e.g., Highways 99W or 99E which parallel Interstate 5);**
- **Use of traffic controls;**
- **Potential queuing, increased delays and safety impacts; and**
- **Possible use of non-traversable medians for right-in/right-out movements.**

<u>Action 3C.4</u>: When new approach roads or intersections are planned or constructed near existing interchanges, property is redeveloped or there is a change of use, wherever possible, the access spacing and operation standards in the Access Management Rule should be applied within the influence area of the interchange

(measurements are from ramp intersection or the end of a free flow ramp terminal merge lane taper).

Action 3C.5: As opportunities arise, rights of access shall be purchased on crossroads around existing interchanges. Whenever possible, this protective buying should be for a distance of 1320 feet (400 meters) on the crossroads.

Action 3C.6: Plan for and operate traffic controls within the influence area of an interchange with the priority of moving traffic off the main highway, Freeway or Expressway and away from the interchange area. Within the Interchange Access Management Area, priority shall be given to operating signals for the safe and efficient operation of the interchange.

Action 3C.7: Use grade-separated crossings without connecting ramps to provide crossing corridors that relieve traffic crossing demands through interchanges.

Goal 4 – Travel Alternatives

Policy 4A: Efficiency of Freight Movement: It is the policy of the State of Oregon to maintain and improve the efficiency of freight movement on the state highway system and access to intermodal connections. The State shall seek to balance the needs of long distance and through freight movements with local transportation needs on highway facilities in both urban areas and rural communities.

Policy 4D: Transportation Demand Management: It is the policy of the State of Oregon to support the efficient use of the state transportation system through investment in transportation demand management strategies.

While development of an IAMP must be consistent with the entirety of the OHP, Goal 3 and its polices provide direct guidance and requirements for development of an IAMP such as access spacing standards. Access spacing standards for interchanges are listed in Tables 16-19 of OHP Appendix C. Most applicable to this IAMP is Table 17, Minimum Spacing Standards Applicable to Freeway Interchanges with Two-Lane Crossroads for urban area:

- Distance between the start and end of tapers of adjacent interchanges = 1 mile
- Distance to the first approach on the right, right in/right out only = 1320 feet
- Distance to first intersections where left turns are allowed = 1320 feet
- Distance between the last right in/right out approach road and the start of the taper for the on-ramp = 990 feet

Project Relevance

The OHP establishes the state highway classification system to guide ODOT priorities for system investment and management. In addition, the OHP provides interchange spacing requirements, investment priorities, access management policy, and mobility standards. A TAC will provide technical and policy guidance during preparation of the IAMP. The TAC will include representatives from Douglas County, the City of Roseburg, ODOT, and other agencies.

Additionally, Policy 2B: Off-System Improvements provides the policy requirements local jurisdictions must comply with if they are going to use state money for off-system, or off state-system improvements. If these policies currently are not included in adopted local jurisdiction plans and policies, they may be included in an IAMP as necessary amendments to implement an IAMP.

A.1.4. Oregon Bicycle and Pedestrian Plan (updated 2011)

The Oregon Bicycle and Pedestrian Plan (OBPP) was originally prepared in 1995 to implement the Actions recommended by the OTP; guide ODOT and local governments in developing bikeway and walkway systems; explain the laws pertaining to the establishment of bikeways and walkways; fulfill the requirements of the TPR; and provide standards for planning, designing, and maintaining bikeways and walkways.

The OBPP policies applicable to IAMPs include:

Goal: To provide safe, accessible and convenient bicycling and walking facilities and to support and encourage increased level of bicycling and walking.

Action 1: Provide bikeway and walkway systems that are integrated with other transportation systems.

Strategy 1A: Integrate bicycle and pedestrian facility needs into all planning, design, construction and maintenance activities of the Oregon Department of Transportation, local governments and other transportation providers.

The 2011 updated design portion of the OBPP focuses on the importance of good design and understanding the context of facilities. The document includes chapters addressing on-road bikeways, restriping, bicycle parking, walkways, street crossings, intersections, shared-use paths. Both standards and minimums are recommended in the manual along with innovative designs that have been implemented successfully in Oregon or other parts of the county.

Project Relevance

Pedestrian and bicycle facility needs will be assessed and designed in respect of the standards of the OBPP and integrated into the IAMP as required.

A.1.5. Oregon Freight Plan (2011)

The purpose of the Oregon Freight Plan, which is an Element of the Oregon Transportation Plan, is to “improve freight connections to local, state, tribal, regional, national and international markets with the goal of increasing trade-related jobs and income for Oregon workers and businesses”. The plan documents the economic importance of freight movement in Oregon, identifies transportation networks important to freight-dependent industries and recommends multimodal strategies to increase strategic freight system efficiency. The plan identifies sixteen freight issues and strategies with action steps to address the issues.

The study area is in the Western Freight Corridor of the state. According to the Freight Plan, the Western Freight Corridor contains some of the major intermodal facilities in the state, which move both heavy and valuable goods to markets around the world. Transportation facilities area also identified as necessary to support resource based industries as those found in the study area and the area surrounding the study area. Additionally, the plan states that agriculture, forestry and fishing related shipments are expected to grow at a high rate of around 2.1 percent annually through 2035.

Interstate 5 carries the majority of north/south freight traffic in Oregon and connects the Oregon freight system with national and international destinations. In the eastern portion of the study area, Class 1 Central Oregon & Pacific (CORP) rail lines run north to south. There is one rail crossing in the study area on Edenbower Boulevard just west of NE Stephens Street. Additionally, the Roseburg Regional Airport is southeast of the interchange. As a Category III airport (a regional general aviation airport), measurable air cargo shipment volumes are expected (measurable volumes are expected only at category I, II and III airports).

Project Relevance

Maintaining and enhancing freight system efficiency will be integrated into the IAMP in consideration of the motor vehicle, aviation and rail freight networks in the study area.

A.1.6. OAR Chapter 731 Division 15

OAR 731 Division 15 establishes the procedures used by ODOT to implement the provisions of its State Agency Coordination Program which assure that ODOT programs are carried out in compliance with the statewide planning goals and in a manner compatible with acknowledged comprehensive plans, as required by ORS 197.180 and OAR 660, Divisions 30 and 31.

The section applicable to IAMPs is section 731-015-0065 Coordination Procedures for Adopting Final Facility Plans:

(1) Except in the case of minor amendments, the Department shall involve DLCD and affected metropolitan planning organizations, cities, counties, state and federal agencies, special districts and other interested parties in the development or amendment of a facility plan. This involvement may take the form of mailings, meetings or other means that the Department determines are appropriate for the circumstances. The Department shall hold at least one public meeting on the plan prior to adoption.

(2) The Department shall provide a draft of the proposed facility plan to planning representatives of all affected cities, counties and metropolitan planning organization and shall request that they identify any specific plan requirements which apply, any general plan requirements which apply and whether the draft facility plan is compatible with the acknowledged comprehensive plan. If no reply is received from an affected city, county or metropolitan planning organization within 30 days of the Department's request for a compatibility determination, the Department shall deem that the draft plan is compatible with that jurisdiction's acknowledged comprehensive plan. The

Department may extend the reply time if requested to do so by an affected city, county or metropolitan planning organization.

(3) If any statewide goal or comprehensive plan conflicts are identified, the Department shall meet with the local government planning representatives to discuss ways to resolve the conflicts. These may include:
   (a) Changing the draft facility plan to eliminate the conflicts;
   (b) Working with the local governments to amend the local comprehensive plans to eliminate the conflicts; or
   (c) Identifying the conflicts in the draft facility plan and including policies that commit the Department to resolving the conflicts prior to the conclusion of the transportation planning program for the affected portions of the transportation facility.

(4) The Department shall evaluate and write draft findings of compatibility with acknowledged comprehensive plans of affected cities and counties, findings of compliance with any statewide planning goals which specifically apply as determined by OAR 660-030-0065(3)(d), and findings of compliance with all provisions of other statewide planning goals that can be clearly defined if the comprehensive plan of an affected city or county contains no conditions specifically applicable or any general provisions, purposes or objectives that would be substantially affected by the facility plan.

(5) The Department shall present to the Transportation Commission the draft plan, findings of compatibility with the acknowledged comprehensive plans of affecting cities and counties and findings of compliance with applicable statewide planning goals.

(6) The Transportation Commission shall adopt findings of compatibility with the acknowledged comprehensive plans of affected cities and counties and findings of compliance with applicable statewide planning goals when it adopts the final facility plan.

(7) The Department shall provide copies of the adopted final facility plan and findings to DLCD, to affected metropolitan planning organizations, cities, counties, state and federal agencies, special districts and to others who request to receive a copy.

Project Relevance

The IAMP Findings will document compliance with the above procedures 1 through 4. ODOT will follow procedures 5 through7 during the facility plan adoption process.

A.1.7. OAR Chapter 734 Division 051 (Division 51)

The purpose of Division 51 is to balance development needs with transportation safety and access management objectives of state highways in a manner consistent with local transportation system plans and the land uses permitted in applicable local comprehensive plan(s). Division 51 provides standards to govern highway approaches, access control, spacing standards, medians, and restriction of turning movements, in compliance with statewide

planning goals and in a manner compatible with acknowledged comprehensive plans and consistent with Oregon Revised Statutes (ORS), Oregon Administrative Rules (OAR), and the Oregon Highway Plan (OHP). The Oregon Highway Plan serves as the policy basis for implementing division 51, and guides the administration of access management rules, including mitigation and public involvement.

Section 734-051-7010 Access Management Plans and Interchange Area Management Plans provides a framework of criteria that need to be addressed in an IAMP:

(7) Interchange Area Management Plan Criteria. An interchange area management plan must comply with the following criteria, unless the plan documents why compliance with a criterion is not applicable:

(a) Be developed no later than the time an interchange is designed or is being redesigned.

(b**) Identify opportunities to improve operations and safety in conjunction with roadway projects and property development or redevelopment and adopt policies, provisions, and development standards to capture those opportunities.**

(c) Include short, medium, and long-range actions to improve operations and safety within the designated study area.

(d) Consider current and future traffic volumes and flows, roadway geometry, traffic control devices, current and planned land uses and zoning, and the location of all current and planned approaches.

(e) Provide adequate assurance of the safe operation of the facility through the design traffic forecast period, typically twenty (20) years.

(f) Consider existing and proposed uses of all the property within the designated study area consistent with its comprehensive plan designations and zoning.

(g) Be consistent with any applicable access management plan, corridor plan or other facility plan adopted by the commission.

(h) Include polices, provisions and standards from local comprehensive plans, transportation system plans, and land use and subdivision codes that are relied upon for consistency and that are relied upon to implement the interchange area management plan.

Project Relevance

The IAMP will evaluate access control, spacing standards and other applicable standards and will be developed in respect of the applicable criteria of Division 51 including Section 734-051-7010(7).

A.1.8. OAR 660 Division 12 (TPR—including recent amendments)

Goal 12 is implemented through OAR 660, Division 12, the Transportation Planning Rule (TPR). The TPR contains numerous requirements governing transportation planning and project development. The TPR requires local governments to adopt land use regulations consistent

with state and federal requirements "to protect transportation facilities, corridors and sites for their identified functions OAR 660-012-0045(2)." This policy is achieved through a variety of measures, including:

- Access control measures which are consistent with the functional classification of roads and consistent with limiting development on rural lands to rural uses and densities
- Standards to protect future operations of roads
- A process for coordinated review of future land use decisions affecting transportation facilities, corridors or sites
- A process to apply conditions to development proposals in order to minimize impacts and protect transportation facilities, corridors or sites
- Regulations to provide notice to ODOT of land use applications that require public hearings, involve land divisions, or affect private access to roads.

OAR 660-012-0065 identifies transportation improvements on rural lands which may be permitted on rural lands consistent with Goals 3, 4, 11 and 14 without requiring a goal exception. OAR 660-012-0070, exceptions for transportation improvements on rural lands, applies if improvements do not meet OAR 660-012-0065 requirements.

The TPR was amended in 2011 in response to the Department of Land Conservation and Development and ODOT recognizing that the TPR and OHP were having unintended consequences on planning and development objectives including economic goals. Therefore, amendments to the TPR were made to:

- Streamline the regulatory process to allow local governments to rezone land without analyzing traffic if the rezoning is consistent with the comprehensive plan map designation and the transportation system plan.
- Allow for local decisions to be made without traffic analysis if the action includes conditions to prevent any increase in traffic generated at the site.
- Adjust the balance between multiple objectives for economic development projects to reduce the burden of mitigating traffic impacts.
- Allow local governments to designate areas where compact urban development is desirable and thus traffic congestion will not be a factor in zoning decisions.

Project Relevance

The IAMP will be developed in consideration of OAR 660 and its governing principles.

A.1.9. 2001 Oregon Rail Plan

The Oregon Rail Plan is a modal element of the OTP. It is intended to implement the OTP's long-range vision of a viable freight and passenger rail system in Oregon. The Oregon Rail Plan is a comprehensive assessment of the state's rail planning, freight rail, and passenger rail systems. The Oregon Rail Plan identifies specific policies and planning processes concerning rail in the state, including minimum level of service standards for statewide freight and passenger rail

systems. The freight element describes existing conditions in the different regions of the state and improvements that are needed. It also identifies issues that should be considered in rail planning during local land use planning like preparation of a TSP and comprehensive plan policies to support the TSP.

To meet the goals of the OTP, service standards for minimum levels of service are specified for each freight service. These minimum levels of service pertain to intermodal freight and ports, highway freight, and rail freight.

- Connections to deep draft ports should be available under open access terms to all major railroads and trucking lines in the nearby vicinity of maritime port terminals where feasible (e.g. Astoria, Portland, Coos Bay and Newport).
- To the extent possible, major intermodal rail/truck facilities should exist on rail main lines with a service area radius of 150 miles (e.g. Portland, Eugene, Klamath Falls, Umatilla/Boardman, and Ontario). Intermodal reload facilities are to be encouraged at other locations, as the market demands (e.g. Medford, Bend/Redmond, Salem, Baker City, and La Grande, and coastal ports)
- Ports and port systems handling substantial quantities of international and national freight (more than 3 million tons) should have multimodal connections, be able to operate in the international marketplace and have access to rail freight service (e.g. the lower Columbia River and Coos Bay).
- Highway freight accessing intermodal truck/rail terminals or moving within Oregon should experience level of service C or better on Oregon highways during off-peak periods (e.g. Portland, Eugene, Medford, Klamath Falls, and Umatilla/Boardman).
- Branch rail lines within Oregon should be maintained to allow a minimum speed of operation of 25 miles per hour whenever upgrading can be achieved with a favorable cost-benefit ratio.
- Rail main lines within Oregon should provide convenient ramp, terminal and reload facilities for transfers from truck to rail for long haul movement of freight. High quality highway access should be provided to these sites. Priority right-of-way should be preserved for potential public use or ownership when abandonment proceedings are initiated (e.g. corridors where there are future alternative uses, especially near expanding urban area).
- Reload facilities should be encouraged and, if warranted, supported where they provide the most cost efficient and environmentally effective response to branch line abandonment.

Applicable policies and actions include:

<u>Policy 1</u>: Increase economic opportunities for the State by having a viable and competitive rail system.

<u>Policy 4</u>: Integrate rail freight considerations into the State's land use planning process.

Action 3: Work with communities to minimize conflicts between railroad operations and other urban activities.

CORP is Oregon's second largest short line railroad. It operates on 391 route miles and 8 miles of trackage rights in Oregon. Its route miles comprise 16 percent of all route miles statewide. CORP operates in the southwestern quadrant of the state serving the southern Willamette Valley to the California border and the central Oregon coast. The main north-south line provides connections from Eugene-Springfield to Cottage Grove, Roseburg, Glendale, Grants Pass, Medford, Ashland and into California. CORP's Coos Bay Branch provides connections between Eugene and coastal communities such as Reedsport, Coos Bay and Coquille.

Additionally, extension of service to Roseburg is identified as a second stage for higher speed rail: Upgrade Willamette Valley to higher maximum speeds (90-110 mph with elimination of speed restrictions in selected locations); extension of service to Roseburg; increased service frequencies; added feeder buses.

Project Relevance

The IAMP will consider the needs of the rail freight system in developing recommended projects. The TAC includes members from ODOT Rail and ODOT Freight and the CAC includes members representing local freight needs.

A.1.10. ODOT Right of Way Section

The ODOT Right of Way Section provides expertise in real estate and other right of way matters for ODOT and implements Public Law 91-646, the Uniform Relocation Assistance, and Real Property Policies of 1970, as amended. In general, the Right of Way section provides guidance regarding Federal, State, and local laws that govern public project and program activities as they pertain the process of acquiring private property for public purposes.

Project Relevance

The project team will consider the federal, state and local laws governing right of way acquisition as the IAMP is developed and potential right of way needs are generally identified. Specific right-of-way locations and needs are identified during project design and delivery.

A.1.11. ODOT Title VI

The Title VI Program was established to carry out the Oregon Department of Transportation's commitment to ensure that the most fundamental principles of equality of opportunity and human dignity are upheld in all decisions and in any activity or process as ODOT conducts its business, sets it policy, delivers its projects, and provides its services to any member of the public that it serves.

In order to receive federal financial assistance, ODOT instituted a Title VI Program to address nondiscrimination laws that impact transportation investment decision making. Title VI of the Civil Rights Act of 1964 and related statutes and policies prohibit discrimination on the basis of

race, color, national origin, gender, age, and disability in ODOT's programs, activities and services. The purpose of the Title VI and related statutes and policies is to ensure that public funds are not spent in a way that encourages, subsidizes or results in discrimination.

Planning, design, construction, and operations and maintenance projects across all travel modes have well defined Title VI and Environmental Justice compliance components. ODOT and its transportation partners are committed to developing and refining its technical capability to assess the benefits and adverse effects of all of its transportation activities, among different population groups, and use that capability to develop appropriate procedures, goals, and performance measures in all aspects of its mission.

To address Environmental Justice, Executive Order 12898 and the USDOT and FHWA orders, ODOT is committed to:

1. Avoid, minimize or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations.
2. Ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.
3. Prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and/or low-income populations.

Project Relevance

The development of the IAMP includes consideration of Title VI and Environmental Justice requirements throughout the process. Public outreach targeted at these protected populations will be performed by ODOT and a memorandum documenting the steps taken for identification of, outreach to, and inclusion of Title VI and Environmental Justice populations will be included in the IAMP. In the inventory phases of developing the IAMP, protected populations for the study area will be mapped and summarized based on US Census Data. Existing transportation barriers (motorized and non-motorized) for Title VI and Environmental Justice populations will be identified. When evaluating improvement concepts, the mapping and land use data to identify land use and transportation impacts and benefits of alternatives to Title VI and Environmental Justice populations.

A.1.12. Interchange Area Management Plan Guidelines (2011)

The Interchange Area Management Plan Guidelines provide a guiding resource for preparation of IAMPs. The Guidelines provide a background to why IAMPS are prepared, what they are, what their regulatory significance is, and their purpose. Additionally, the Guidelines identify the general process to develop an IAMP. The Guidelines describe the elements of an IAMP, what an IAMP should accomplish, and how to meet expectations and objectives.

Project Relevance

The project team will use the Guidelines as a tool during development of the IAMP

A.1.13. Highway Design Manual (HDM 2011)

The HDM provides design standards for state highways and associated highway elements. These standards are dependent on the highway's functional classification and project type (e.g., Modernization, Preservation, Safety, Operations, or Maintenance). The purpose of the HDM is to establish mobility standards when evaluating potential design configurations.

Project Relevance

The IAMP alternatives will be developed to be consistent with the applicable HDM Standards for an Interstate.

A.2. Local Plans and Ordinances

The following local planning documents were reviewed:

- City of Roseburg Urban Area Comprehensive Plan (1984)
- City of Roseburg Transportation System Plan (2006)
- City of Roseburg Urban Area Land Use and Development Ordinance (2013)
- Draft City of Roseburg Capital Improvement Plan Update (CIP) 2012-2017
- Roseburg Regional Airport Layout Plan Report (2006)
- Douglas County Comprehensive Plan (2010)
- Douglas County Transportation System Plan (1998) and Amendments (2001)
- Douglas County Land Use and Development Ordinance (2010)

A.2.1. City of Roseburg Urban Area Comprehensive Plan

The Roseburg Urban Area Comprehensive Plan is a long-range general policy guide in which the City of Roseburg and Douglas County jointly set forth major policies concerning desirable future growth for the Roseburg area. The Plan establishes land-use categories throughout the urban area and provides a unified set of policies for the physical, social and economic development of the community.

Goals and objectives applicable to planning for the IAMP are excerpted below:

Economics Element

Objective 8. Continue to develop the urban area as a regional distribution, trade and service center.

Objective 10. Ensure compatibility between industrial lands and adjacent areas.

Objective 12. Provide the necessary public facilities and services to allow economic development.

Public Facilities and Services Element

Goal: To provide a timely, orderly and efficient arrangement of public facilities and services to serve as a framework for community development.

Objective 1. Provide a level of public facilities and services adequate to meet the needs of existing and planned development.

Objective 2. Direct the location and timing of urban development by means of capital improvement planning which is closely coordinated with the Comprehensive Plan.

Objective 3. Optimize the utilization of existing facilities.

Objective 5. Strive for continued and improved cooperation and coordination between other units of government as well as other public and private organizations which provide services to the urban area's citizens.

Policy 1. Facility and service planning in the Roseburg urban area shall use the Comprehensive Plan as the basis for decisions to ensure that needs of the urban area are met in a timely, orderly and efficient manner.

Land Use and Urbanization

Objective 11. Relate land use actions to housing, open space, recreation, transportation, utilities, shopping facilities, jobs, police and fire protection and other special needs.

Urbanization. Land Use, and Growth Management

Urban Growth

Policy 6. The extension of sewer, water, storm drainage, and transportation facilities within the urban growth boundary shall be in conformity with and adopted growth management program.

Residential Development

Goal: To promote and encourage residential densities and designs that conserve land and energy, minimize unnecessary and costly public service extensions and maintain the unique geographic character of the urban area; to enhance and protect the quality of existing neighborhoods; and to ensure varied living areas and housing types for residents of all income levels and an adequate supply of serviced, developable land to support such housing.

Objective 2. Residential areas shall be protected by zoning ordinance, subdivision ordinance, and other regulations from any land use activity involving an excessive level of noise, pollution, traffic volume, nuisances, and hazards to residents.

Commercial Development

Goal: To encourage and promote the health and vitality of the central City core as a focus of civic and business life and to encourage the following variety of commercial activities in selected outlying areas:

1. Community shopping and service facilities.
2. Neighborhood shopping and service facilities.
3. Convenience stores.

4. Commercial office structure.
5. Specialized shopping areas.

Industrial Development

Goal: To encourage and promote industrial development which strengthens the economic base of the community and minimize air, noise, water, and visual pollution.

Public and Semi-Public Buildings and Lands Development

Goal: To provide for an arrangement of public and semi-public facilities and services which complement private development and meet the needs of Roseburg area residents.

Transportation Development

Goal: To insure the provision and coordination of transportation facilities and services that reflect desired development pattern and are timed to coincide with community needs and to minimize the adverse impacts of traffic on residential areas.

Policy 1. When practical, the circulation system shall utilize existing facilities and rights-of-way, and on-street parking shall be removed in preference to widening streets for additional travel lanes.

Policy 3. Transportation facilities shall be designed and constructed to minimize noise energy consumption, neighborhood disruption, cost, and social, environmental and institutional disruptions, and to encourage the use of public transit, bikeway, and walkways.

Policy 4. Traffic movement on arterial streets should be facilitated by limiting or controlling access wherever possible.

Project Relevance

The IAMP may rely on some or all existing policies for consistency with the IAMP and to implement the IAMP. Particularly, the IAMP may rely on polices related to:

- *Current land use designations with current uses and densities;*
- *Plan and code amendment processes;*
- *Requirements for traffic impact studies; and*
- *Processes for notification to ODOT regarding land use actions that may affect state transportation facilities.*

Amendments may be proposed to the Comprehensive Plan to ensure the Plan has sufficient policies intact to protect the function of the interchange and surrounding street network. Therefore, the IAMP and Comprehensive Plan must be consistent or amended to be made consistent. Upon completion of the IAMP, the City may need to adopt the IAMP as a policy and implementation document before ODOT can present the IAMP to the OTC for adoption.

A.2.2. City of Roseburg Transportation System Plan

This Transportation System Plan (TSP) provides guidance and regulatory tools so that the City can develop its transportation system through coordinated policies and planned improvements over the next 20 years. It also identifies planned transportation facilities and services needed to support planned land uses identified in the Comprehensive Plan in a manner consistent with the Transportation Planning Rule (OAR 660-012) and the Oregon Transportation Plan.

More generally, the TSP helps to accomplish the following goals:

- Assure adequate planned transportation facilities to support planned uses over the next 20 years;
- Provide certainty and predictability for locating new public streets, roads, highway improvements, and other planned transportation improvements;
- Provide predictability for land development; and
- Help reduce the costs and maximize the efficiency of public spending on transportation facilities and services by coordinating land use and transportation decisions.

Relevant goals and objectives to IAMP planning include:

Goal 1. Overall Transportation System: Provide a transportation system for the Roseburg planning area that is safe, efficient, and accessible.

Objective A. Manage projected travel demand consistent with community, land use, environmental, economic, and livability goals.

Objective B. Use the Transportation System Plan as the legal basis and policy foundation for decisions involving transportation issues.

Objective H. Maintain access management standards for streets consistent with city, county, and state requirements to reduce conflicts among vehicles, trucks, bicycles, and pedestrians.

Goal 3. Transportation and Land Use: Maximize the efficiency of Roseburg's transportation system through effective land use planning.

Objective D. Integrate transportation and land use into development ordinances.

Goal 5. Balanced Transportation System: Facilitate the development of bus stops, bike lanes, sidewalks, and multi-use paths in the Roseburg UGB to provide more transportation options for Roseburg residents and visitors.

Objective L. City plans and the Land Use and Development Ordinance need to address the need to maximize the comfort level of driving (such as fewer distractions and driveways, increase sight distances, etc.) consistent with the needs for access.

Goal 6. Transportation that Supports Economic Development: Facilitate the provision of a multimodal transport system for the efficient, safe, and competitive movement of goods and services to, from, and within the Roseburg UGB.

Objective D. Designate arterial routes and freeway access are essential for efficient movement of goods. Design these facilities and adjacent land uses to reflect the needs of goods movement.

Objective E. Encourage and support the operation, maintenance, and expansion of facilities and services provided at or near the Roseburg Regional Airport that accommodate passenger air travel, air cargo, and charter services.

Goal 7. Funding Transportation System Improvements: Implement the transportation plan by working cooperatively with federal, state, regional, and local governments, the private sector, and residents. Create a stable, flexible financial system for funding transportation improvements.

Objective C. Coordinate transportation projects, policy issues, and development actions with all affected governmental units in the area. Key agencies for coordination include Douglas County, Oregon Department of Transportation, URCOG[2], and Umpqua Transit.

Objective G. Working in partnership with Oregon Department of Transportation, Douglas County, and other jurisdictions and agencies, develop a long-range financial strategy to make needed improvements to the transportation system and support operational and maintenance requirements.

The roadway classifications in the study area identified in the TSP as follows:

- Arterials: Edenbower Boulevard between Stephens Street and Stewart Parkway, Stephens Street, Stewart Parkway
- Collector: Aviation Drive
- Minor collector: Edenbower Boulevard (between Renann Street and Stewart Parkway), Airport Road

The typical cross section for arterials and collectors includes a 6- to 8-foot sidewalk, a 7- to 8-foot landscape strip, and a 6-foot (or 5-foot on Industrial collectors) bike lane.

The following improvements are identified in the TSP in or near the study area:

- Edenbower Boulevard between the I-5 ramps: add two through lanes in each direction through the I-5 ramp terminal intersections.
- Edenbower Boulevard and I-5 northbound off-ramp: widen off-ramp to two lanes and add northbound double lefts and a channelized westbound right-turn lane. A new northbound on-ramp in partial cloverleaf configuration is recommended as identified in the Environmental Impact Statement (EIS). Edenbower Boulevard and I-5 southbound off-ramp: widen off-ramp to two lanes.
- Stephens Street at Edenbower Boulevard: add northbound double left-turn lanes and an eastbound right-turn lane.

[2] The Umpqua Regional Council of Governments is no longer active.

- Stewart Parkway at Edenbower Boulevard: add eastbound double left-turn lanes, westbound double left-turn lanes, add an exclusive northbound right-turn lane, and add two exclusive southbound right-turn lanes.
- Stewart Parkway Improvements (0-5 years): This project is proposed to widen Stewart Parkway to four lanes between Harvey Avenue and Garden Valley Parkway, straighten the S-curves, and build a new bridge over the South Umpqua River. In addition, new bike lanes and sidewalk are proposed with this project to promote other modes of transportation. Also, an access management plan is proposed to be included as part of this project. The safety improvement at the intersection of Harvard Avenue at Stewart Parkway includes adding turn lanes (as recommended in the intersection improvements). By adding turn lanes, the vehicles stopped to make turns are taken out of the through traffic stream to reduce rear-end type crashes (predominant crash type). This project is part of the Roseburg CIP.
- Broad Street to Edenbower Boulevard (16-20 years): To improve safety and mobility, this project proposes reconstruct Broad Street to collector street design standards, construct drainage facilities, and construct pedestrian facilities. This project is part of the Roseburg CIP.
- The Stephens Street / Pine Street Safety Improvement Project (0-5 years) (from Mosher Avenue to Edenbower Blvd) proposes the project to include traffic signal coordination along the corridor (as recommended per roadway improvement projects), intersection turn lanes (as recommended under intersection improvements), and multimodal considerations.

Sidewalks gaps include:

- Aviation Drive south of Edenbower Boulevard (short-term)
- I-5 Westside Path adjacent to I-5 between Edenbower Boulevard to Dogwood Street or Hill Avenue (long-term)
- Broad Street: Bike lanes on Broad Street from the Edenbower Interchange to the new road connection and Sidewalk infill (long-term)

Project Relevance

Upon completion of the IAMP, the city may need to adopt the IAMP before ODOT can present the IAMP to the Oregon Transportation Commission (OTC) for adoption. After adoption of the IAMP, subsequent amendments to the city's TSP will need to be compatible with the adopted IAMP.

A.2.3. City of Roseburg Urban Area Land Use and Development Ordinance

The Ordinance guides the development and use of lands in the Roseburg Urban Area. Additionally, it is designed to implement the Roseburg Urban Area Comprehensive Plan and the goals and policies of the Plan. Standards from ordinance that guide IAMP development and which may be relied upon to protect the function of the interchange are cited below:

Chapter 2: Zoning Regulations

Lands directly adjacent to the interchange are predominantly industrial to the east and commercial to the southwest, with areas of mixed use. There are hillside areas within the western portion of the IAMP study area. The purposes of the zoning designations near the IAMP, as outlined in Chapter 2 of the Code, are:

- **Public Reserve (PR)*:*** The Public Reserve classification is intended to establish districts within which a variety of public service activities may be conducted without interference from inappropriate levels of residential, commercial, or industrial activities. It is intended to be applied primarily, though not exclusively, to publicly owned lands. (Article 2: Public Reserve and Residential Open Space Districts describes the purpose, allowed uses, and standards.)
- **Medium Density Multiple Family Residential (MR18)** The Medium Density Multiple Family Residential District is intended to provide for a variety of housing types at varying densities. Because of the mix of housing types, care is needed in determining the location of the MR18 District to ensure that both the physical and aesthetic carrying capacity of the area is not exceeded. (Article 3: Residential Districts describes the purpose, allowed uses, and standards.)
- **High Density Multiple Family Residential (MR40)**: The High Density Multiple Family Residential District is intended to provide opportunities for multifamily housing with densities ranging up to forty (40) dwelling units per acre. Placement of the MR40 District needs to be made with great care, as public facilities may be easily outstripped by the permitted density. Certain limited commercial uses are allowed conditionally in the MR40 District to serve the needs of the denser population. (Article 3: Residential Districts describes the purpose, allowed uses, and standards.)
- **General Commercial (C-3):** The General Commercial classification is intended to provide areas within which a variety of retail and wholesale business occurs. These areas serve general community-wide and regional commercial needs. (Article 4: Business and Commercial Districts describes the purpose, allowed uses, and standards.)
- **Airport District (AP)**: The Airport District classification is intended to protect airport facilities and operations from incompatible uses; to provide for future airport expansion; and to preserve airport lands for future commercial and industrial uses, which will be directly dependent on air transportation. (Article 6: Airport District describes the purpose, allowed uses, and standards.)
- **Mixed Use (MU)**: The Mixed Use classification is intended to provide areas within which a variety of activity occurs. These areas serve communitywide and regional needs. Because of the potential for high density uses, care is needed to insure that adjacent uses are compatible and do not adversely affect other uses or the carrying capacity of public facilities. The proximity of other uses shall not be a reason for permitted uses to deviate from the standards established in other zones. (Article 7: Industrial Districts describes the purpose, allowed uses, and standards.)

- **Light Industrial (M1)**: The Light Industrial classification is intended to create, preserve and enhance areas containing secondary manufacturing and related establishments and intense commercial uses with limited external impact. (Article 7: Industrial Districts describes the purpose, allowed uses, and standards.)
- **Medium Industrial (M2)**:The Medium Industrial classification is intended to create, preserve, and enhance areas containing a wide range of manufacturing and related establishments, and is typically appropriate to areas providing a wide variety of sites with good rail or highway access. (Article 7: Industrial Districts describes the purpose, allowed uses, and standards.)

Additional standards from Chapter 2 which may be relied upon to protect the function of the interchange include:

Section 2.1.070 Overlay Districts

1. Airport Impact Overlay (AI). The Airport Impact Overlay District is intended to protect the public health, safety, and welfare by assuring that development within areas impacted by airport operations is appropriately planned to mitigate the impact of such operations, and to prevent the establishment of air space obstructions in air approaches through height restrictions and other land use controls as specified in Article 8 of Chapter 2.
2. Floodplain Districts (FP). A district shall be given a floodplain overlay designation when such district has been identified as subject to periodic inundations by the Federal Emergency Management Agency (FEMA). Since such inundation adversely affects the public health, safety, and general welfare, development in said district shall be in conformance to the provisions of Article 9 of Chapter 2 of this Ordinance, in addition to the requirements of the underlying zone.
3. Hillside Development/Geologic Hazards Overlay (HD). A Hillside Development/ Geologic Review Area is particularly applicable to areas of active or potential mass movement (landslide areas) and to all areas identified on the City of Roseburg Slope Map adopted by reference herein and/or greater than 12% slope. Prior to development approval, assurance shall be made that the public health, safety and welfare is not jeopardized by land use or development being proposed. Such approval shall be pursuant to Article 10 of Chapter 2 of this Ordinance.

Article 8, Airport Impact Overlay, Section 2.8.010 Purpose

The purpose of the Airport Impact Overlay District is to protect the public health, safety, and welfare by assuring the development within areas impacted by airport operations is appropriately planned to mitigate the impact of such operations. Furthermore, this overlay district is intended to prevent the establishment of air space obstructions in air approaches through height restrictions and other land use controls, as deemed essential to protect the public health, safety, and welfare consistent with Federal Aviation Regulations (FAR) Part 77. The Airport Approach and Runway Protection Zones are shown on Sheets 2 thru 5 of the Airport Layout Plan in Chapter 5.

Article 9, Floodplain Overlay, Section 2.9.030 Statement of Purpose

It is the purpose of this statute to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed:

1) To protect human life and health;
2) To minimize expenditure of public money and costly flood control projects;
3) To minimize the need for rescue and relief efforts associated with flooding generally undertaken at the expense of the general public;
4) To minimize prolonged business interruptions;
5) To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone, and sewer lines, streets, and bridges located in areas of special flood hazard;
6) To help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future flood blight areas;
7) To ensure that potential buyers are notified that property is in an area of special flood hazard; and
8) To ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.

Article 10: Hillside Development / Geologic Review Overlay, Section 2.10.010 Purpose and Intent

The intent of this Article is to provide regulations for development in hillsides that relates to topography, geology, hydrology, and fire risks. These regulations relate to the steepness of slopes and geologic conditions. The specific purpose of this Article is to ensure that Hillside Development occurs in a manner that:

1) Ensures public health, safety, and general welfare.
2) Provides for appropriate Hillside Development consistent with the allowed density provided by the zoning classifications.
3) Addresses potential risks that can result from steeply sloped sites and geologic hazard areas.
4) Minimizes potential hazards from fire, water, and unstable soils.
5) Helps ensure stability of steep slopes and protection of environmental resources.
6) Reduces potential risks associated with hillside erosion, sedimentation on lower slopes, and damage from landslides while providing flexible development standards.

Chapter 3: Site Development

Standards from Chapter 3 that guide IAMP development and which may be relied upon to protect the function of the interchange are cited below:

Article 1, Site Plan Review, Section 3.1.020 Site Plan Review Required

No lot or parcel in any District established under the provisions of this Ordinance shall hereafter be developed or physically altered, and no building or structure hereafter shall be erected, enlarged, or structurally altered until site development plans have been approved in accordance with the provisions of this Chapter. Without limiting the foregoing or any other provision of this Ordinance, no installation of 3,000 square feet or more of asphalt or other impervious surfaces shall be made until site development plans have been approved in accordance with the provisions of this Chapter.

To the extent possible, site plan review shall be coordinated with any other plan review required by this Ordinance. Where other provisions of this Ordinance require plan review, such other review shall serve to meet the requirements of this Chapter; provided, however, that when the standards of this Chapter are more restrictive than comparable standards imposed by other provisions of this Ordinance, the standards of this Chapter shall govern.

Article 1, Site Plan Review, Section 3.1.040 Criteria and Standards (Ord. No. 3279, 3/2008)

In addition to the other specific requirements of this Ordinance and other applicable ordinances, development plans submitted to the Director shall comply with the following standards and criteria:

b) Access, Parking and Loading. Site access and parking lots shall be reviewed for conformance with standards contained within this Ordinance (e.g., vehicular/bicycle parking facilities, ingress/egress, circulation, walkways, maneuvering aisles, loading areas, etc.). Arrangement of parking, loading, internal circulation and driveways shall be reviewed for safety, convenience, and mitigation of potential adverse impacts on neighboring properties, the operation of public facilities, and on the traffic flows of adjacent and nearby streets.

    i) Driveway access shall be from adjacent streets of the lowest classification. Driveway access to arterial and collector streets may be permitted if no reasonable alternative street access exists or where heavy use of local streets is inappropriate due to traffic impacts in residential areas.

    ii) Where a proposed development abuts an existing or proposed Arterial or Collector Street, the development design and off-street improvements shall minimize the traffic conflicts.

    iii) To reduce traffic conflicts, bus turn out lanes may be required consistent with an adopted transit plan.

    iv) Additional improvements or design modifications necessary to resolve identified transportation conflicts may be required on a case by case basis.

    v) Driveways shall be designed to allow safe and efficient vehicular ingress and egress in accordance City of Roseburg Public Works Standards.

vi) Except where specified in an adopted access management plan, minimum separation between a standard driveway (measured from the end of the curb radius at the driveway or the top of the transition) and the nearest intersection curb return (measured at the end of the curb radius at an intersection or the top of the transition) or between two driveways (except driveways for single-family residential and duplex on local street) on the same side of the street shall be as shown in Table 3-1:Minimum Driveway Spacing.

TABLE 3-1: MINIMUM DRIVEWAY SPACING

LAND USE	STREET TYPE		
	ARTERIAL	COLLECTOR	LOCAL
Industrial	500’	200'	150'
Commercial/ Public Land	500’	200’	75’
Multi-family Residential	500’	200’	75’
Single-family Residential and Duplexes	500’	200’	30'

c) Access Permission. The following shall apply to all public and private streets within the City and to all properties that abut these streets:

a) Permission to access City streets shall be subject to review and approval by the Public Works Director based on the standards contained in this Chapter, Public Works Standards, any access management plans, and any access management agreements between ODOT and the City. Access will be evaluated and determined as a component of the land use decision process. Construction shall be as detailed in the review and decision of the land use.

b) Permits for access to State highways shall be subject to review and approval by the Oregon Department of Transportation (ODOT), except when ODOT has delegated this responsibility to the City. In that case, the City shall determine whether access is granted based on ODOT and City adopted standards.

d) Traffic Impact Study

i) A Traffic Impact Study (TIS) shall be required based on anticipated negative significant traffic and safety impacts projected to be caused by the proposed development as determined by the Community Development Director after a recommendation from the Public Works Director.

Negative significant traffic and safety impacts may include, but not be limited to:

i) An anticipated increase of at least 5% of the current traffic volume during the peak hour and at least 100 trips per day.

ii) Additional traffic and turn movement projected to result from the proposed development is projected to exceed the applicable volume to capacity ratio and/or level of service:

Volume to Capacity Ratio:

Arterial: 0.85

Collector: 0.90

Local: 0.95

Level of Service Standard:

Signalized intersection: LOS D

Unsignalized intersection: LOS E

Downtown Intersection: 0.95 and LOS E

iii) A significant capacity and/or safety problem is likely to be caused by, or increased by the development.

ii) When required, the TIS shall, at a minimum:

a) Utilize a Scope of Work and an Analysis Methodology approved or accepted by the Community Development Director.

b) Consider cumulative impacts of existing and proposed development in the study area.

c) Include long-term impact (20 year) of the development in the context of the projected traffic environment at 5-year increments.

c) Consider circulation and safety needs for pedestrians, bicyclists, and transit in addition to motor vehicles.

e) Extend the analysis coverage of the street system until the peak traffic impact becomes less than 5%.

e) Intersections. Intersections shall be designed and constructed in accordance with the following requirements.

a) In order to minimize traffic conflicts and provide for efficient traffic signalization, intersections involving curb return driveways and streets, whether public or private, shall be directly opposed, unless a Traffic Impact Study indicates that an offset intersection benefits public safety to a greater degree.

b) Streets shall intersect one another at an angle as near to a right angle as is practicable, considering topography of the area and previous adjacent layout, but in no case at an angle less than sixty (60) degrees. The right of way and street paving within the acute angle shall have a minimum of thirty (30) feet centerline radius. At intersections, each collector or arterial street shall be straight or shall have a radius greater than 600 feet for a distance of 100 feet from each intersection.

c) Intersections shall be so designed that no offset dangerous to the traveling public is created as a result of staggering intersections. The minimum offset between two local streets that do not have left turn storage needs shall be 200 feet. The minimum offset between two streets other than local streets shall be determined by the Community Development Director after a recommendation from the Public Works Director. In all cases, the minimum distances shall be the offset of the centerlines of

side streets or driveways. These minimums may be increased based on traffic safety considerations.

Chapter 4: Supplemental Regulations

Standards from Chapter 4 that guide IAMP development and which may be relied upon to protect the function of the interchange are cited below:

Article 4, Supplementary Provisions, Section 4.4.060 Clear Vision Area

A clear vision triangle area shall be maintained at the corner of all properties at the intersections of two (2) streets, or at a street and a railroad. Within the clear vision triangle area nothing shall be erected including plantings, fences, walls, signs, structures, vehicles, or temporary or permanent obstructions between three (3) feet and twelve (12) feet in height above the finished grade, except as provided in items 1 through 5 below.

a. A single public utility pole;
b. A single tree trimmed (to the trunk) to a line at least eight (8) feet above the level of the intersection;
c. An official street sign, warning sign or signal;
d. Two (2) sign poles other than above the clear vision height, with a maximum cross section of any sign pole not exceeding twelve (12) inches;
e. A place where the natural contour of the ground is such that there can be no cross visibility at the intersection.

Chapter 5: Procedures

Standards from Chapter 5 that guide IAMP development and which may be relied upon to protect the function of the interchange are cited below:

Article 1, Development Approval Procedures, Section 5.1.030 Coordination of Development Approval

1) The Director shall be responsible for the coordination of a development application and decision making procedures, and shall approve or recommend that the approving authority approve developments when proper application is made and the proposed development is in compliance with the provisions of this Ordinance and the Roseburg Urban Area Comprehensive Plan. Before approving or recommending approval of any development, the Director shall be provided with information by the applicant sufficient to establish full compliance with the requirements of this Ordinance and the Plan. Before approving any development, the Director shall consider comments received from other public agencies during the comment and public hearing period.

Article 1, Development Approval Procedures, Section 5.1.070 General Provisions Regarding Notice

c) Public agencies providing transportation facilities and services shall be notified of the following:
   1) Land use applications that require a public hearing
   2) Subdivision and partition applications
   3) Applications that involve major private access to public streets and roads, such as private streets, and large commercial and multifamily developments
   4) Applications within the Airport Impact Overlay (3.35.600) (Ord. No. 3279,3/2008)

Article 1, Development Approval Procedures, Section 5.1.150 Decision of the Director

1) In making a decision on an administrative action under Section 5.1.090 or 5.1.120, the Director shall consider the following:
   a) The burden of proof is placed upon the applicant seeking an action pursuant to the provisions of this Chapter. Unless otherwise provided for in this Article, such burden shall be to prove:
      1) The proposed action fully complies with the applicable land use map element of the Comprehensive Plan, and also the written policies of the Comprehensive Plan.
      2) The proposed action is in accordance with the applicable criteria of this Ordinance.
   b) Written comments from parties.

Article 4, Zone Change, Section 5.4.040 Conditions of Approval

Reasonable conditions may be imposed, as are necessary to ensure the compatibility of a zone change to surrounding uses and as are necessary to fulfill the general and specific purposes of this Ordinance. Such conditions may include, but are not limited to, the following:

d) Street dedication and improvements or traffic control devices or facilities or bonds or other monetary contributions in lieu of improvements. (Ord. No. 3279, 3/2008)
e) Control of points of vehicular ingress and egress.

Article 8, Conditional Use Permits, Section 5.8.060 Criteria

A Conditional Use Permit shall be granted only if the approval authority finds that the proposal conforms to all five of the following criteria, the conditions set forth in Article 1 of Chapter 3, Site Plan Review, and any additional criteria made applicable by other Sections of this Ordinance:

c) That the site for the proposed development is served by streets and highways which are adequate in width, construction, and placement to safely carry the quantity and kind of traffic generated by the proposed use;

Article 8, Conditional Use Permits, Section 5.8.060 Conditions

In addition to the requirements of Site Plan Review detailed in Article 1 of Chapter 3, the approval authority may designate conditions in granting a Conditional Use Permit as it deems necessary to secure the purpose of this Article and may require guarantees and evidence that such conditions shall be met. Such conditions may include

d) Street right-of-way dedications and street improvements.

e) Regulation of points of vehicular ingress and egress.

Chapter 6: Land Divisions

Standards from Chapter 6 that guide IAMP development and which may be relied upon to protect the function of the interchange are cited below:

Article 1, Partitions and Subdivisions, Section 6.1.050 Requirements and Standards for Preliminary Plans

The following are the requirements and standards to which the preliminary plan and improvement plan of a subdivision or partition or common boundary line adjustment must conform.

1) Conformity with the Comprehensive Plan. All divisions of land and common boundary line adjustments shall conform with the Roseburg Urban Area Comprehensive Plan with respect to the type and intensity of use, population densities, locations, and sizes of public areas, rights-of-way and improvements of streets, and any other aspects governed by comprehensive plan goals, policies or maps.

1) Relation to Adjoining Street System and Bicycle System. A subdivision or partition shall provide for the continuation of major and secondary streets existing in adjoining subdivisions or partitions, or for their proper projection when adjoining property is not subdivided or partitioned, and such streets shall be of a width not less than the minimum requirements for streets set forth in these regulations. The connecting street network shall have capacity to support the proposed land uses. Connections shall also be made for pedestrian, bicycle, and vehicle access to schools, parks, employment, and recreation areas. Where the approving authority finds that topographic conditions make such continuation or conformity impractical, appropriate exceptions to this requirement shall be made. (Ord. No. 3279, 3/2008)

3) Access

a) Every lot or parcel created by partition or subdivision or common boundary adjustment shall have direct access to a public street or road except as provided in this Section.

a) A lot or parcel shall be considered to have direct access to a public street or road if:

b) The lot or parcel abuts a public street or road; and

c) The Public Street or road abutting the lot or parcel provides actual, practical and usable physical access to the lot or parcel.

b) Access to a lot or parcel created by partition or subdivision or common boundary line adjustment may be accomplished by a private easement of way established by deed, if:

i)The approving authority finds that such private easement is the only reasonable method of providing sufficient access to the rear portion of an unusually narrow and deep lot, otherwise large enough to warrant partitioning.

ii) There is an express grant or reservation of an easement in a document recorded in the office of the County Clerk.

iii) No more than one (1) lot or parcel will be provided access via the easement.

iv) Residential use of a lot or parcel provided access via an easement will be limited to a single-family dwelling.

v) Commercial uses establish common access points in order to reduce the number of access points to streets. Construction of common access points must be preceded by recording of joint access and maintenance easements.

Project Relevance

The IAMP may rely on some or all existing standards to protect the function of the interchange. Particularly, the IAMP may rely on polices related to:

- *Current land use designations with current uses and densities;*
- *Plan and code amendment processes;*
- *Requirements for traffic impact studies; and*
- *Processes for notification to ODOT regarding land use actions that may affect state transportation facilities.*

The IAMP and Ordinance must be consistent or amended to be made consistent. Amendments may be proposed to the Ordinance to ensure it has sufficient provisions to protect the function of the interchange and surrounding street network. Tech Memo #8 will identify any amendments needed and include proposed changes. Upon completion of the IAMP, the county may need to adopt the IAMP as a policy and implementation document before ODOT can present the IAMP to the OTC for adoption.

A.2.4. Draft City of Roseburg Capital Improvement Plan Update (CIP) 2012-2017

The City of Roseburg CIP is a five year plan (years 2012 through 2017) for financing and constructing projects that require significant capital investment. The CIP lists the City's capital improvement projects, places the projects in a priority order, and schedules the projects for funding and construction.

Projects in the CIP that are in the IAMP study area include:

- **Aviation/Edenbower Phase 2 (2012-13)**: This project will modify the intersection of Aviation Drive and Edenbower Boulevard with two primary components. The first is the addition of a right turn lane from southbound Aviation Drive onto westbound Edenbower Boulevard. The second is the reconstruction of the north leg of the intersection to improve sight distance at the intersection. The vertical curve on the north leg of the intersection will be flattened in order to increase sight distance entering the intersection. This improvement will facilitate changes to the timing of the traffic signal that will allow the northbound and southbound movements to occur simultaneously. This will add capacity to the intersection and reduce delays to the travelling public.
- **Edenbower/Stewart Parkway Intersection (2012-13)**: The intent of this project is to construct an additional lane southbound to provide a right turn lane for the westbound movement. The right turn movement from Edenbower will be phased to occur at the same time as the left turns from Stewart Parkway. These are the two heaviest movements at this intersection. By reconfiguring the intersection and changing the signal timing, the project will increase the capacity at this intersection.

Project Relevance

The IAMP will assume construction of these funded projects in the future conditions analysis.

A.2.5. Roseburg Regional Airport Layout Plan Report (2006)

The Roseburg Regional Airport is southeast of the interchange. The Airport Layout Plan Report identifies the current, short-term, and long-term needs of the airport. It updates the airport layout plan, airspace plan and land-use plan for the airport and its surrounding areas.

Some of the key information from the report includes:

- Scheduled commercial air service by FAR Part 121 operators such as Horizon Air is not anticipated during the current twenty-year planning period.
- Based on current airline industry market conditions, it is believed that scheduled commercial air service may now be feasible for Roseburg by carriers operating under FAR Part 135 (commuter).

The City of Roseburg and Douglas County should ensure through their comprehensive planning that development of lands in the vicinity of the airport is compatible with airport activities. Maintaining Manufacturing zoning in the areas surrounding the airport provides effective land use compatibility with airport operations. Development of new residential areas, or increasing the densities of existing rural residential areas within the boundaries of the protected airspace surfaces of the airport should be discouraged to ensure the long-term viability of the airport as an important transportation facility within the region. The City of Roseburg should prepare necessary documentation for FAA review to support proposed non-aviation use and potential

sale of airport property located near the north end of the airport (beyond the future runway protection zone), on the north side of Edenbower Road, consistent with current planning.

Project Relevance

The IAMP will take into consideration the current and future airport configuration and operating plans.

A.2.6. Douglas County Comprehensive Plan (2010)

The Douglas County Comprehensive Plan officially establishes the findings, goals, objectives, policies, and policy implementation statements addressing 17 elements including Agriculture, Energy, Transportation and Land Use.

Objectives and Policies applicable to planning for the IAMP are excerpted below:

Citizen Involvement Process

Objective: To involve a cross section of affected citizens in a program which ensures effective communication between citizens and decision making bodies.

Policy 7. During review and revisions of the Comprehensive Plan and Land Use and Development Ordinance, Douglas County recognizes and encourages participation by affected governmental units in accordance with the requirements of ORS 215.060 and 215.223, and pursuant to 2.065 and 6.600 of the Douglas County Land Use and Development Ordinance.

Forest Resource Policies

Objective A: To encourage that the forest lands base in Douglas County is maintained for the continuous growing and harvesting of forest tree species as the leading land use consistent with sound management of soil, air, water, and fish and wildlife resources and to provide for recreational opportunities and agriculture.

Policy 1.d. The Timberlands and Farm/Forest Transitional designations in this Plan, as implemented by the Land Use and Development Ordinance, substantially limits alternatives for the use of such lands. However, the necessity of preserving such lands for the economic base of Douglas County justifies such restrictions.

Agricultural Resource Management

Objective B: To minimize conflicts between agricultural and nonagricultural uses.

Policy 3. Roads through designated agricultural areas shall be encouraged to locate where they have minimum effects on agricultural management and the area's established land use pattern.

Water Resources

Objective G: To utilize the water resources of Douglas County in an efficient manner.

Policy 2. Consider, in land development and road construction, actions which minimize the degradation of water quality.

Air Quality

Objective C: To initiate specific measures to minimize or eliminate air pollution from the following sources: open burning, dust, smoke stacks, automotive exhaust, industrial and commercial operation.

Policy 2. Encourage pathways for non-motorized travel to be provided within urban areas.

Energy

Objective A: Reduce the need for energy through sound planning and economic principles.

Policy 16. Encourage the placement of bike and pedestrian equipment (e.g., bike racks and covers) along routes of heavy traffic and at termini (e.g. shopping centers government buildings and schools).

Population

Objective A: Develop a land use plan that provides for orderly growth which reduces the cost of essential services while preserving the basic elements of our environment.

Policy 6. Coordinate planning efforts of local governments and special districts to maximize efficiency of public facilities, and have land use actions reflect goals of the plan.

Public Facilities and Services

Objective E. To provide for facilities, utilizes and services that ensure a strong foundation for the County economy.

Applicable polices for transportation are the same as what is in the Douglas County TSP excerpted under that section.

Project Relevance

The IAMP may rely on some or all existing policies to protect the function of the interchange. Particularly, the IAMP may rely on polices related to:

- *Current land use designations with current uses and densities;*
- *Plan and code amendment processes;*
- *Requirements for traffic impact studies; and*
- *Processes for notification to ODOT regarding land use actions that may affect state transportation facilities.*

Amendments may be proposed to the TSP to ensure it has sufficient provisions to protect the function of the interchange and surrounding street network. Therefore, the IAMP and Comprehensive Plan must be consistent or amended to be made consistent. Upon completion of the IAMP, the county may need to adopt the IAMP as a policy and implementation document before ODOT can present the IAMP to the OTC for adoption.

A.2.7. Douglas County Transportation System Plan (1998) and Amendments (2001)

The TSP was compiled from the acknowledged Douglas County Comprehensive Plan Transportation Element and support documents. The Transportation Element contains findings concerning: the background and existing conditions that affect Douglas County's transportation system; a description of Douglas County's transportation facilities; a County roadway network plan; a Bikeway Master Plan; transportation goals and policies; and bikeway policies. The support documents contain discussions of road, rail, air, waterways, pipeline, pedestrian and bicycle modes, and the transportation for the disadvantaged.

Transportation objectives and policies applicable to planning for the IAMP are excerpted below:

Objective: To be consistent with the state transportation plan.

Policies:

- The preparation and revisions of the County Transportation System Plan shall be coordinated with the Oregon Department of Transportation.
- The County Transportation System Plan relies upon the Oregon Transportation System Plan and its modal and multi-modal plans for analysis and policy direction on state facilities and relies upon the Oregon Department of Transportation to apply plan policies and programs on state facilities.
- Douglas County acknowledges the portions of the Oregon Transportation System Plan and its modal and multi-modal plans are applicable to the County Transportation System Plan.

Objective A: To accommodate existing and projected transportation demands in Douglas County.

Policy 2. The evaluation of all proposed Comprehensive Plan and Land Use Regulation amendments should specifically address the Transportation Planning Rule requirements that an amendment to land use designations, densities, and design standards are consistent with the functions, capacities and performance standards of facilities identified in the Transportation System Plan.

Policy 3. Existing and planned transportation facilities and corridors shall be protected from conflicting land uses.

Policy 4. All transportation facilities should be periodically evaluated for their adequacy to accommodate existing demand.

Policy Implementation: The evaluation of all proposed Comprehensive Plan and Land Use Regulation amendments shall address the transportation criteria found in the Land Use and Development Ordinance, Quasi-judicial Plan Amendment Chapter, Amendment Standards, of the Application Form and Content section.

Objective B: To develop and utilize design standards for road construction which promote vehicular safety and economy of construction.

Policy 1. The following classification system will be used for the planning and maintenance of all roads within the County maintenance system: a Principal Highway, b. Arterial, c. Major Collector, d. Minor Collector, e. Local

Policy 3. Pursuant to the Oregon Highway Plan, direct access points to state managed interstate highway and interchanges shall be prohibited. Direct access to remaining principal highways and arterial roadways should be discouraged to avoid conflicts with through traffic.

Policy 4. Direct access to non-interstate Principal Highways should be provided within unincorporated communities at levels which are consistent with land use classifications and facility operations.

Policy 5. Access to state roads is the jurisdiction of the Oregon Department of Transportation.

Objective F: To encourage, coordinate and assist in the development of transportation modes other than private vehicle.

Policy 1. The installation of spur lines in industrial areas as means of facilitating the use of rail transportation shall be encouraged.

Bicycle transportation objectives and policies applicable to planning for the IAMP are excerpted below:

Objective E: To develop a set of standards for bikeway development and establish a prioritization of bikeway construction.

Policy 4. The State of Oregon Department of Transportation is encouraged to install appropriate bikeway improvements on highways and roads under their jurisdiction (and within their maintenance system) as improvement projects are conducted on designated County bikeways.

Proposed urban and rural preferred alternatives that are considered conceptual in nature with no funding identified that are incorporated in the TSP include:

- Extend Vine Street north from Roseburg City Limits to NE Stephens near the new east-west facility that connects to the north Roseburg Interchange. This project should be completed as the area develops and may address two needs. The route will serve as a frontage road to local street networks and should reduce the local traffic usage of North Stephens.

Project Relevance

Upon completion of the IAMP, the county may need to adopt the IAMP before ODOT can present the IAMP to the Oregon Transportation Commission (OTC) for adoption. After adoption of the IAMP, subsequent amendments to the County's TSP will need to be compatible with the IAMP.

A.2.8. Douglas County Land Use and Development Ordinance (2010)

The Douglas County Land Use and Development Ordinance (LUDO) governs the development and use of lands and to implements the Douglas County Comprehensive Plan. The County maintains the LUDO online[3]. The most recent amendments were completed in December 2010.

Lands directly adjacent to the interchange are predominantly industrial to the east and residential to the west. Commercial uses are south of the interchange. The purposes of the zoning designations near the IAMP are:

- **(M-2) Medium Industrial**: The Medium Industrial classification is intended to create, preserve and enhance areas containing a wide range of manufacturing and related establishments, and is typically appropriate to areas providing a wide variety of sites with good rail or highway access.
- **(M-3) Heavy Industrial**: The Heavy Industrial classification is intended to provide, protect and recognize areas well suited for medium and heavy industrial development and uses free from conflict with commercial, residential and other incompatible land uses. This district is intended to be applied generally only to those areas which have available excellent highway, rail or other transportation.
- **(C-3) General Commercial**: The General Commercial classification is intended to provide areas within which a variety of retail and wholesale business will occur. These areas would serve general community needs with types of activities which need not be conducted wholly within an enclosed building.
- **(R-1) Single-Family Residential**: The Single-Family Residential classification is intended to provide for a medium density urban residential use plus related compatible uses such as schools and parks. The classification is designed for those areas adjacent or close to existing cities or areas with an urban character in which urban services such as public water and sewer is available.
- **(R-2) Multiple Family Residential**: The Multiple-Family Residential classification is intended to provide a wide range of housing density and type while preserving the residential character of an area. This zone applies to properties with minimal topographic limitations; locations which are readily accessible by and to major streets; and adjacent to public open space or commercial services.
- **(R-5) Rural Residential-5:** classification is intended to provide for low density rural homesites in an open space environment in order to encourage the continued existence of rural family life. The 5R zone is also intended to provide a transition from more intense residential development to the agriculture, timber, and open space areas of the County. The zone may be applied to areas committed to nonresource use or reserved for rural residential expansion at this density, as specifically provided in the Douglas County Comprehensive Plan.

[3] http://www.co.douglas.or.us/planning/tbl_cont.asp

- **(FG) Exclusive Farm Use-Grazing:** The purpose and intent of the Exclusive Farm Use-Grazing zone is to provide areas for the continued practice of agriculture and permit the establishment of only those new uses which are compatible with agricultural activities. It is the purpose of this zone classification to provide the automatic farm use valuation for farms which automatically qualify under the provisions of ORS 308. Therefore, the Exclusive Farm Use Zone is to be applied to all lands designated "Agriculture" in the Comprehensive Plan in accordance with LCDC Goal No. 3 and the Douglas County Agricultural Element. The Exclusive Farm Use Zone is intended to guarantee the preservation and maintenance of the areas so classified for farm use free from conflicting nonfarm uses and influences.
- **(PR) Public Reserve:** This classification is intended to establish districts within which a variety of public service activities may be conducted without interference from inappropriate levels of residential, commercial or industrial activities. It is intended to be applied primarily, though not exclusively, to publicly owned lands.
- **(ME) Rural Industrial:** This classification is intended to maintain pre-existing rural area industrial uses and to create and enhance opportunities for small scale low impact and resource related industrial uses. It is also intended to provide for new uses that will not exceed the capacity of the area to provide water and absorb sewage. While uses located within this zone may provide employment opportunities, it is the intent of this zone to support resource related industries and rural levels of industrial development which have a limited impact on surrounding uses and communities and cities and which do not require public sewage disposal.

Additional standards applicable to the project may include:

Article 30: (FP) Floodplain Overlay

The flood hazard areas of Douglas County are subject to periodic inundation, resulting in loss of life and property, health and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief, impairment of the tax base, and adverse effects on the public health, safety and general welfare.

Article 32 Supplementary Provisions for Natural Resource Areas

This article is designed to provide protection for a number of natural resource areas throughout Douglas County. The article consists of several overlay districts that provide additional development standards or special processes for development in protected areas. The overlay districts are designed to minimize uses which conflict with the resource values being protected and manage the resource areas so as to preserve their original character.

Section 3.35.400 Cultural, Historic and Archaeological Resources Overlay (CHA)

The purpose of this overlay district is to reasonably assure that resources classified as "significant" in Douglas County's Historic Resource Register are conserved and

protected, while providing an expedient process for reviewing land use actions that may affect identified sites.

Section 3.35.500 Geologic Hazards Overlay (GH)

The purpose of the Geologic Hazards overlay district is to protect the public health, safety and welfare by assuring that development in hazardous or potentially hazardous areas is appropriately planned to mitigate the threat to man's life and property.

Section 3.35.800 Airport Impact Overlay (AIO)

The purpose of the Airport Impact Overlay District is to protect the public health, safety and welfare by assuring that development within areas impacted by airport operations is appropriately planned to mitigate such operations. This overlay district is also intended to prevent the establishment of air space obstructions in air approaches through height restrictions and other land use controls, as deemed essential to protect the public health, safety and welfare.

Section 3.35.050 Access onto County Roads

Standards of access for new lots and parcels or development onto County roads are regulated by the Douglas County Public Works Department and are initiated with an access permit application. These standards of access shall be maintained in accordance with the provisions of Chapter 4 of this ordinance; except standards of access for multi-family and condominium development, development which will generate more than 300 trips per day on County facilities; and, other identified development shall be as follows….

Section 3.35.060 Coordination of Development Review

To maintain a process for coordinated review of future land use decisions affecting transportation facilities, corridors and sites and to provide information to ODOT, City of Roseburg, City of Myrtle Creek, Ports of Umpqua and Coos Bay and affected school districts in Douglas County of applications made under Sections 2.060 (3) & (4), land divisions, developments generating more than 300 trips per day and development within Airport Impact Zones, Douglas County will:

1. Provide written information to the affected jurisdiction describing the proposed action prior to making a final land use decision; and
2. Provide an opportunity to the affected jurisdiction to qualify as a party to the proceeding.

Section 3.35.065 Access onto State Roads

ODOT has responsibility and authority in managing access to State Highways. This section outlines the County coordination process with ODOT when an ODOT access permit, for direct access to a state highway, is required. Douglas County will:

1. Provide applicants with information related to the need for a State access permit;

2. Refer land use permits, including those which result from actions listed in Section 3.35.060, with direct access to State Highways to ODOT, and
3. Require applicant(s) to provide either authorization of an approved State access permit, or a State access permit, prior to a land use application or permit being considered complete.
    a. If the applicant and ODOT cannot agree on an access permit, the permit or application will not be accepted as complete.
    b. If the applicant agrees to specific conditions for the access permit, the agreement may be referenced in the County's land use decision.

Section 3.35.940 Right-of-Way Protection Overlay (RW)

The Right-of-Way Protection Overlay (RW) classification is intended to protect future streets identified in the Circulation Plans and Land Use Element of the Comprehensive Plan from significant conflicting uses. Requiring development to be in accordance with the requirements of the overlay zone and preventing preemptory uses along identified routes ensures that sufficient and appropriate streets can be provided for future community development.

The RW Overlay shall be applied to designated principal highways, arterials, major and minor collectors, and necessary local streets shown on the Circulation Plans for Green, Glide, and Tri City which require future right-of-way.

Chapter 2 Development Approval Procedures, Section 2.065 Notice

1. At least twenty (20) days prior to the date of a quasi-judicial public hearing under §2.060.3.a., b., c. and e., and §2.060.4.a., b., c., e. and f., notice shall be sent by mail to:
    a. The applicant and all owners or contract purchasers of record of the property which is the subject of the application;
    b. All owners of property within:
        i. 100 feet of the property which is the subject of the notice if such property is wholly or partially within an urban unincorporated area or an urban growth boundary;
        ii. 250 feet of the property which is the subject of the notice if such property is outside an urban growth boundary and not within a farm or forest zone;
        iii. 500 feet of the property which is the subject of the notice if such property is within a farm or forest zone and outside of an urban unincorporated area or an urban growth boundary.
    c. The appropriate Planning Advisory Committee; and
    d. Any public school district, and any other affected governmental agency which has entered into an agreement with Douglas County to coordinate planning efforts and to receive notices of such hearings.

Section 3.38.200 Development Review Following a Zone Change

Reasonable conditions may be imposed on the development review process, and building permits, as are necessary to insure the compatibility of a zone change to surrounding uses, and as are necessary to fulfill the general and specific purposes of this ordinance by application.

4. Street dedication and improvements or bonds in lieu of improvements.
5. Control of points of vehicular ingress and egress.

Article 39 Conditional Use Review, Section 3.39.100 Conditions

Reasonable conditions necessary to ensure the compatibility of a conditional use to adjacent permitted uses and as are necessary to fulfill the purpose stated in §3.39.000, pursuant to §2.120.3. Such conditions may include but are not limited to the following:

4. Street dedication and improvements or bonds in lieu of improvements.
5. Control of points of vehicular ingress and egress.

Chapter 4 Land Divisions, Section 4.100 General Requirements and Standards of Design and Development for Preliminary Plans

The following are the requirements and standards to which the preliminary plan of a subdivision or partition must conform. All divisions of land shall conform with the Comprehensive Plan of Douglas County with respect to the type and intensity of use, population densities, locations and sizes of public areas, rights-of-way and improvements of streets, and any other aspects governed by Comprehensive Plan goals, policies or maps.

5. Access for New Development
   b. Each unit of land proposed to be created shall have access by way of a County road except as provided below:
      (7) Douglas County may, upon the recommendation of the Director of the Public Works Department, require a Traffic Impact Study (TIS) for
         (a) subdivisions or partitions when the new development will exceed 15 lots or parcels with access to a state highway or county road;
         (b) any new subdivision creating 15 or more lots either initially or through phased development with access onto a state highway or county road; or
         (c) as provided for in §3.35.050.6, “Access onto County Roads.”

      The TIS shall be prepared by a licensed traffic engineer and shall address the impacts of traffic, generated directly or indirectly by the proposed development, on the surrounding transportation system. The TIS shall also address traffic projections and transportation plans adopted by city, county, or state agencies if applicable to the proposed development.

8. Streets Adjacent to Railroads, Freeways and Parkways

   When the proposed subdivision contains or is adjacent to a railroad, freeway or parkway, a street parallel to the railroad, freeway or parkway shall be provided. In the case of a railroad, a land strip of not less than twenty-five (25) feet in width shall be provided along such railroad right-of-way for screen planting between the railroad and residential lots. When such parallel streets are less than eighty (80) feet from a freeway or parkway, the intervening property between the freeway or parkway and the parallel streets shall be held for and developed only for park or thoroughfare purposes. Where such parallel streets intersect streets that cross a railroad, the intersections shall be located at sufficient distance from the railroad to make full provision for any possible grade separations on the cross streets.

Project Relevance

The IAMP may rely on some or all existing standards for consistency with the IAMP and to implement the interchange area management plan. Particularly, the IAMP may rely on polices related to:

- *Current land use designations with current uses and densities;*
- *Plan and code amendment processes;*
- *Requirements for traffic impact studies; and*
- *Processes for notification to ODOT regarding land use actions that may affect state transportation facilities.*

Amendments may be proposed to the LUDO to ensure it has sufficient provisions to protect the function of the interchange and surrounding street network. Therefore, the IAMP and Ordinance must be consistent or amended to be made consistent. Upon completion of the IAMP, the county may need to adopt the IAMP as a policy and implementation document before ODOT can present the IAMP to the OTC for adoption.

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

Technical Memorandum #2
Existing Conditions Analysis

Prepared for

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December 2014

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2. EXISTING CONDITIONS ANALYSIS

This memorandum provides a summary of the existing transportation, land use, and environmental conditions related to Interchange 127. It also identifies potential constraints found within the interchange management study area (IMSA). The study area, shown in Figure 2-1, generally encompasses the existing interchange and the surrounding areas served by the interchange.

2.1. Existing Transportation System Inventory

Interchange 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 Interstate 5 (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.

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. Table 2-1 presents an inventory of management area roadways, jurisdiction, classifications, posted speed, and number of lanes.

Table 2-1. Management Area Roadway Inventory

Roadway/ Highway Name	Jurisdiction	ODOT Functional Classification	City Functional Classification	Posted Speed (mph)	No. of Lanes
I-5 (Pacific Highway No. 1)	ODOT	Interstate Hwy, NHS, FR, TR[1]	-	65	4
I-5 Northbound & Southbound Ramps	ODOT	Interstate Hwy, NHS, FR, TR[1]	-	-	1
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]

Notes:
1. Oregon Highway Plan (OHP) District Highway mobility standard is shown as NHS: National Highway System; FR: Freight Route; TR: Truck Route
2. 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.
3. Edenbower Blvd. is posted at 25mph south of Stewart
4. The speed of Stephens (Old Hwy 99) varies between 20-45 mph within Roseburg city limits.
5. Stephens reduces to 2 travel lanes north of the intersection with Edenbower Blvd.

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 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 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.

2.1.1. Access Inventory

Access inventory data was obtained from aerial photography, the OPAL database, and site visits. This data collected includes public street intersections, as well as both public and private access points to businesses and residences. Thirty-four access points were identified (18 on the east/south side, and 16 on the west/north side along Edenbower Boulevard).

Figure 2-2 provides an aerial map depicting existing access locations. Table 2-2 corresponds to the figure and provides details for all approaches in the study area including: type of use, width, side of the road, stationing, tax lot information, and distance to next access point. Access spacing is measured along one side of the roadway without regard for connections on the opposite side. Table 2-2 considers spacing on the “west/north” and “east/south” sides of Edenbower Boulevard.

Both ODOT and the City require approach permits for approaches under their jurisdiction. Edenbower Boulevard is a City facility, and the City of Roseburg would require permits for approaches taken from their roadway.

The spacing of the ramp terminals and other access points along Edenbower Boulevard does not meet the ODOT spacing standard. 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 (¼ mile). As traffic volumes continue to grow, the proximity of these intersections could affect the safe and efficient function of the interchange area.

Edenbower Boulevard has 18 access points which intersect the east/south side and 16 access points that intersect the west/north side. There are 9 access points within ¼ mile of the northbound and southbound ramp terminals; these do not meet ODOT's ¼-mile spacing standard.

Outside the ¼-mile influence area of the ramp terminals, the City of Roseburg uses a 500-foot spacing standard, as identified in their TSP. Many of the accesses within this segment do not currently meet the City standards. The City TSP calls for an access management plan for Edenbower Boulevard.

Table 2-2. Edenbower Boulevard Access Inventory

ID	Public vs. Private / Type	Site Use	Distance to Next Point (ft)	Access Road Width (ft)	Tax Lot Number
Access Points on the East/South Side of Edenbower Blvd.					
1	Public / Street	Stewart Pkwy	233	80	-
3	Private / Commercial	Real Estate & Convenience Store	89	32	400
4	Private / Commercial	Veterinarian Business	82	24	500
5	Private / Commercial	Veterinarian Business	76	30	500
7	Private / Commercial	Furniture Store	79	24	600/700
9	Private / Commercial	Furniture Store	228	28	600/700
11	Private / Commercial	Applebee's	136	24	2900
13	Private / Commercial	Applebee's	241	28	2900
16	Private / Commercial	Sleep Inn Suites Hotel	312	28	3800
17	Private / Commercial	Sleep Inn Suites Hotel	187	28	3800
19	Private / Commercial	Real Estate Office	237	28	3802 / 3500
21	Private / Commercial	Real Estate and Eye Doctor	577	30	4600 / 3500
23	Public / Street	I-5 SB On Ramp	654	76	-
25	Public / Street	I-5 NB On/Off Ramp	532	76	-
27	Public / Street	Aviation Dr.	611	40	-
29	Private / Commercial	Tom Thumb Mini Storage	461	35	400
31	Public / Street	Stephens St.	98	78	-
33	Private / Commercial	Business	n/a	20	700
Access Points on the West/North Side of Edenbower Blvd.					
2	Public / Street	Stewart Pkwy	352	70	-
6	Private / Commercial	Forest Service Offices	101	32	3100
8	Private / Residential	Garden Hills Apartment	174	28	2800 / 2900/ 3000
10	Private / Residential	Garden Hills Apartment	116	20	2800 / 2900 / 3000
12	Private / Residential	Garden Hills Apartment	318	28	2800 / 2900 / 3000
14	Public / Street	Plateau Dr.	27	40	-
15	Private / Residential	Private Residence off Plateau Dr.	210	12	-
18	Public / Street	Plateau Dr.	353	40	-
20	Public / Street	Sweetbrier Ave.	247	40	-
22	Public / Street	Broad St.	498	40	-
24	Public / Street	I-5 SB Off Ramp	662	46	-
26	Public / Street	I-5 NB On Ramp	585	36	-
38	Public / Street	Aviation Dr.	764	40	-

30	Private / Commercial	Alzheimer Care Facility	329	30	301
32	Public / Street	Stephens St.	170	84	-
34	Private / Commercial	Douglas Co. Association of Realtors	n/a	22	302

2.1.2. Bicycle and Pedestrian 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. Table 2-3 provides a summary of these facilities.

Table 2-3. Management Area Bicycle and Pedestrian Inventory

Location	Jurisdiction	Bicycle Facilities		Pedestrian Facilities		On-Street Parking	Rail Crossings
		Type	Width	Type	Width		
Edenbower Blvd.	City of Roseburg	Bike Lanes: both directions	6’	Sidewalks: both sides	6-8’	No	At-grade west of Stephens
Stewart Pkwy	City of Roseburg	Bike Lanes: both directions	5-6’	Sidewalks: both sides Crosswalks: at Edenbower	6-7’	No	No
Broad St.	Douglas County	Bike Lanes: both directions	8’	Sidewalks: both sides Crosswalks: none	5-6’	No	No
Aviation Dr.	City of Roseburg	Bike Lanes: both directions	5-6’	Sidewalks: both sides Crosswalks: at Edenbower	6-7’	No	No
Stephens St.	City of Roseburg	Bike Lanes: both directions	6’	Sidewalks: both sides south of Edenbower, east only north of Edenbower Crosswalks: at Edenbower	5-6’	No	No

2.1.3. Transit Inventory

Umpqua Transit serves the study area with Paratransit (U-Trans Direct), fixed route, and commuter bus service on weekdays. Bus routes near Interchange 127 include the Orangeline, the Redline, and Greenline routes. The Redline and Greenline travel along Stewart Parkway and Stevens Street along the same path. They travel through the southern portion and eastern portions of the IMSA. They have stops on Stewart Parkway west of Edenbower Boulevard and on Stephens Street/OR99 two blocks south of Edenbower Boulevard. Buses stop every hour between 6:50 am and 6:40 pm. The Orangeline runs north-south along Stephens Street/OR99 and has a stop two blocks south of Edenbower Boulevard. Buses stop 8 times daily between 7:00 am and 7:00 pm, mainly directed at morning and evening commuters. There is no bus service along Edenbower Boulevard within the IMSA.

Paratransit, or dial-a-ride, service is provided five days per week between 6:50 am and 6:30 pm for people with qualifying disabilities who cannot use the fixed route service. The Paratransit

route provides public transportation for people with disabilities within a three-quarter mile radius of the existing bus routes.

Greyhound Bus Lines has a terminal in downtown Roseburg, approximately four miles from Interchange 127. Currently, nine buses per day operate between Portland and California (six southbound and three northbound) from the terminal in Roseburg.

2.1.4. Rail Inventory

One railroad line passes through the study area. The Central Oregon and Pacific (CORP) Railroad is a short line railroad owned by RailAmerica, Inc., which is based in Jacksonville, Florida. Currently, the railroad line is exclusively for freight, with 90 percent of their delivery consisting of forest products.

CORP, headquartered in Roseburg, Oregon, has 389 miles of track between Eugene, Oregon and Black Butte, California. CORP tracks are maintained to Federal Railroad Administration (FRA) Class 1 (47 miles) and Class 2 (200 miles) conditions, which limits maximum speeds to 10 mph for Class 1 or 25 mph for Class 2. Current service includes one northbound and one southbound train five days a week on eight routes:

- Eugene and Roseburg
- Glendale and Medford
- Roseburg and Dillard
- Dillard and Riddle
- Dillard and Glendale
- Springfield and Cottage Grove
- Sutherlin and Roseburg
- White City and Medford

No passenger rail service is available in the study area; the closest available is AMTRAK located in Eugene, Oregon.

IAMP Considerations: Potential projects near Edenbower Boulevard and Stevens Street may be impacted by the close proximity of the at-grade rail crossing.

2.1.5. Airport

Roseburg Regional Airport is adjacent to Interchange 127, with the aviation frontage road connecting to Edenbower Boulevard at Bower Street, just east of the interchange. Owned and operated by the City of Roseburg, the Roseburg Regional Airport does not have commercial flights. The nearest airports for commercial flight are North Bend, Eugene, or Medford. A transit parking fee is charged per day at the airport, and can be paid on site for airplanes of any size.

Ameriflight LLC and Empire Airlines have regular freight flights into and out of Roseburg Regional Airport. Generally, three departing flights leave Roseburg, one for Medford in the morning, and two for Portland scheduled during the evening. Approximately seven flights arrive from Portland in a typical morning.

Classified by the Oregon Aviation Plan (OAP 2007) as a Category III airport, Roseburg is a “Regional General Aviation Airport” and supports most twin and single engine aircraft. It may

accommodate occasional business jets, and supports regional transportation needs. As a Category III, the site is designed to handle less than 30,000 yearly operations, and is more than 90 minutes from a commercial airfield. Especially during the summer months, Roseburg Regional Airport accommodates seasonal fire response activity for surrounding areas.

Western Oregon Aviation is based at the Roseburg Regional Airport and offers flight lessons to pilots of all ages and experience levels.

IAMP Considerations: Potential projects are unlikely to impact airport facilities or operations.

2.1.6. Existing Bridge Inventory

The 2011 bridge inventory data within the IMSA was obtained from ODOT's Bridge Maintenance Section and reviewed. One element used to evaluate bridge conditions is the sufficiency rating, which is a complex formula that takes into account four separate factors to obtain a numeric value rating the ability of a bridge to service demand. The result of this method is a percentage in which 100 percent would represent an entirely sufficient bridge and zero percent would represent an entirely insufficient or deficient bridge. Those bridges with a sufficiency rating of 80 or less are eligible for rehabilitation. Those bridges with a sufficiency of 50 or less are eligible for replacement. Bridges lose their eligibility status for a period of ten years after a (Highway Bridge Program) project is completed.

Two additional elements are used to rate bridge conditions: structural deficiency and functional obsolescence. Structural deficiency is determined based on the condition rating for the deck, superstructure, substructure, or culvert and retaining walls. It may also be based on the appraisal rating of the structural condition or waterway adequacy. Functional obsolescence is determined based on the appraisal rating for the bridge deck geometry, underclearances, and approach roadway alignment. It may also be based on the appraisal rating of the structural condition or waterway adequacy.

There are two bridges located within the IMSA, as listed in Table 2-4. Both of these have no deficiencies identified, and have relatively high sufficiency ratings.

Table 2-4. Management Area Bridge Inventory

M.P.	Br. #	Name	Year built	Length (ft)	Sufficiency Rating	Structural Condition	Deficiencies
125.72	18990	Stewart Pkwy (Airport Rd) over Interstate 5	2002	228	87.8	Good	Not Distressed / Not Deficient
126.52	17235	Edenbower Blvd over Interstate 5	1996	265	94	Fair	Not Distressed / Not Deficient

Source: ODOT, 2011 Bridge Condition Report (http://www.oregon.gov/ODOT/HWY/BRIDGE/docs/brlog.pdf)

2.1.7. Assumed Improvements

The City of Roseburg had two projects in their Capital Improvement Program within the IMSA scheduled for FY 2012/2013 construction:

- Edenbower/Stewart Parkway Intersection – SB right-turn lane on Edenbower with signal timing changes
- Aviation/Edenbower Phase 2 – SB right-turn on Aviation and sight distance improvements to allow for more efficient signal phasing

These projects have been completed and are assumed within this analysis of existing conditions.

2.2. Traffic Conditions

The assessment of traffic conditions includes development of existing traffic volumes, assessment of traffic operations, and a review of historical crash patterns.

2.2.1. Average Daily Traffic Volumes

The average annual daily traffic (AADT) volumes for I-5 and the Interchange 127 ramps are currently available for the year 2011. The volumes are summarized in Table 2-5.

Table 2-5. Average Annual Daily Traffic Volumes (2011)

Location Description	Volume
Interstate 5	
North of Interchange 127	33,500 vpd
South of Interchange 127	33,600 vpd
Interchange 127	
Northbound Off-Ramp	3,860 vpd
Eastbound to Northbound On-Ramp	2,540 vpd
Westbound to Northbound On-Ramp	1,670 vpd
Southbound Off-Ramp	4,680 vpd
Southbound On-Ramp	5,200 vpd

vpd = vehicles per day

Source: 2011 Transportation Volume Tables, Oregon Department of Transportation

Historic Automatic Traffic Recorder (ATR) data shows negligible growth near the management area in recent years. Between the years of 2006 and 2011, volumes on I-5 through the study area reached a high in 2007 and dropped to their lowest in 2008. The 2010 volumes show negligible growth from 2008.

2.2.2. Turning Movement Counts

Traffic counts, conducted on June 11 and June 12, 2012, consisted of 16-hour turning movement counts at five of the six management area intersections, a 3-hour peak period turning-movement count at the remaining intersection, and a 16-hour count on the I-5 mainline just north of Exit 127. The counts included full Federal Highway Administration (FHWA) 13-class vehicle classifications. Table 2-6 below provides a list of all intersection count locations and includes the type of count.

Table 2-6. Vehicle Count Locations and Types

Location	Type of Count	Count Date
I-5 Mainline North of Interchange 127	16-hour, directional straightaway, classification	6/12/2012
Edenbower Blvd. & I-5 NB Ramps	16-hour (06:00 - 22:00), turning movement, classification	6/11/2012
Edenbower Blvd. & I-5 SB Ramps	16-hour (06:00 - 22:00), turning movement, classification	6/11/2012
Edenbower Blvd. & Stephens St.	16-hour (06:00 - 22:00), turning movement, classification	6/11/2012
Edenbower Blvd. & Stewart Pkwy	16-hour (06:00 - 22:00), turning movement, classification	6/12/2012
Edenbower Blvd. & Aviation Dr.	16-hour (06:00 - 22:00), turning movement, classification	6/11/2012
Edenbower Blvd. & Broad St.	3-hour peak period (06:00 - 09:00 & 15:00 - 18:00)	6/11/2012

The traffic volume data was examined to determine a common peak hour for each of the intersections, which is the one-hour period when the sum of volumes entering at all management area intersections is highest. The common peak hour for the intersections was found to occur between 4:30 and 5:30 pm. The peak hour at each intersection may or may not correspond to the common peak hour.

2.2.3. Design Hourly Volumes

ODOT generally requires that transportation facilities be analyzed under design hourly volumes (DHVs), known as 30th highest hour volumes. The 30th highest hour volumes are used in traffic operations analysis so that results are valid for all but a few hours of the year. The procedure for determining 30th highest hour volumes is specified in ODOT's Analysis Procedures Manual (APM)[1] and briefly described below.

The 30th highest hour traffic volumes are calculated by multiplying the peak hour volumes by a seasonal factor. The seasonal factor is determined from automatic traffic recorders (ATR), which are electronic counting sites on roadways that count vehicles continuously. It is desirable to obtain data from ATRs that either (1) are within the management area or (2) are on similar roadway types or within similar area types. The seasonal factors for the freeway-related movements use a combination of an ATR to the north of the IMSA and one on a comparable

[1] Analysis Procedures Manual, Oregon Department of Transportation, Transportation Development Division Planning Section, Transportation Planning and Analysis Unit, Salem, Oregon, April, 2006, Section 4.3.

facility. For non-freeway locations, a commuter trend adjustment was applied. The data used in calculating the seasonal factors is included in Appendix A (available upon request).

Peak hour count data was seasonally adjusted and volumes were balanced to achieve a uniform dataset for analysis. Because the counts were conducted in 2012 (the baseline analysis year), an annual growth adjustment was not applied. Figure 2-3 shows the existing balanced PM peak hour volumes developed for this project.

2.2.4. Operational Criteria

Transportation engineers have established various methods for measuring traffic operations of roadways and intersections. Most jurisdictions use either volume-to-capacity (v/c) ratio or level of service (LOS) to establish performance criteria. Both the LOS and v/c ratio concepts require consideration of factors that include traffic demand, capacity of the intersection or roadway, delay, frequency of interruptions in traffic flow, relative freedom for traffic maneuvers, driving comfort, convenience, and operating cost.

Volume-to-Capacity (V/C) Ratio

A comparison of traffic volume demand to intersection capacity is one method of evaluating how well an intersection is operating. This comparison is presented as a v/c ratio. A v/c ratio of less than 1.00 indicates that the volume is less than capacity. When it is closer to 0, 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.

Level of Service (LOS)

Level of service is also a widely recognized and accepted measure and descriptor of traffic operations. At both stop-controlled and signalized intersections, LOS is a function of control delay, which includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. 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.

It should be noted that, although delays can sometimes be long for some movements at a STOP-controlled intersection, the v/c ratio may indicate that there is adequate capacity to process the demand for that movement. Similarly at signalized intersections, some movements, particularly side street approaches or left turns onto side streets, may experience longer delays because they receive only a small portion of the green time during a signal cycle, but their v/c ratio may be relatively low. For these reasons, it is important to examine both v/c ratio and LOS when evaluating overall intersection operations. Both are reported in the following section.

95th Percentile Queues

In addition to the operational criteria that measure intersection performance, it is also important to examine queuing and where demand may exceed available storage. Queues that

spill out of storage bays and into adjacent travel lanes impair intersection performance by reducing capacity and creating potential safety concerns. Queues may also extend from one intersection through another upstream intersection which also impairs performance. The 95th percentile queue length (meaning 95 percent of all queues will be shorter) is used for this analysis.

2.2.5. Operational Standards

The OHP 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 v/c ratio 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.

Although the OHP Highway Mobility Standards are the overriding operations standards for Oregon highways, Douglas County and the City of Roseburg have performance measures in-place to evaluate transportation deficiencies. Douglas County's performance standards utilize volume-to-capacity ratios that vary according to the county's roadway classifications. The City of Roseburg identifies a dual performance measure in the city's TSP. The dual performance measure refers to the v/c ratio standards established by Douglas County and specifies a LOS performance standard of D or better.

Table 2-7. Management Area Performance Measures

	Applicable Jurisdictional Performance Measures		
Location	**ODOT[1]**	**Roseburg[2]**	**Douglas County[3]**
I-5 Mainline	V/C <= 0.80	-	-
I-5 NB Ramp Terminal	V/C <= 0.85	-	-
I-5 SB Ramp Terminal	V/C <= 0.85	-	-
Edenbower Blvd.	-	LOS D or better	V/C <= 0.85
Stewart Pkwy	-	LOS D or better	V/C <= 0.85
Broad St.	-	LOS D or better	V/C <= 0.95
Aviation Dr.	-	LOS D or better	V/C <= 0.90
Stephens St.	V/C <= 0.85	LOS D or better	V/C <= 0.85

Notes:

1. Table 6: Volume to Capacity Ratio Targets for Peak Hour Operating Conditions, 1999 Oregon Highway Plan, Mobility Policy Revisions, 2011.
2. City of Roseburg Transportation System Plan, 2004, p. 4-17.
3. Douglas County Transportation System Plan.
4. Operations at these locations will be compared with multiple agency performance standards since these intersections involve roadways under one or more jurisdictions.

2.2.6. Traffic Operations Analysis Procedures

All operations were evaluated using the methodology outlined in the *2010 Highway Capacity Manual* (HCM) along with the procedures outlined in ODOT's Analysis Procedures Manual (APM). The Synchro/SimTraffic analysis software was selected to perform the intersection analysis since it can provide the v/c ratio and LOS output of an HCM analysis and consider the systematic interaction of the intersections with regard to queuing and delays.

Synchro is a macroscopic model similar to the Highway Capacity Software (HCS), and like the HCS, is based on the 2010 HCM. The Synchro model explicitly evaluates traffic operations under coordinated and uncoordinated systems of signalized and unsignalized intersections. The v/c ratios and LOS presented in this report are based on the Synchro model output.

SimTraffic animates traffic flow based on input volumes and signal timing and allows viewing of traffic flow under saturated traffic conditions where traffic may spill over from one intersection to another. It is particularly effective at evaluating closely spaced intersections. The SimTraffic model was run multiple times using different arrival patterns to determine how sensitive traffic operations are to subtle variations in traffic flows. The delays and the 95th percentile queues from the SimTraffic model are also presented in this report.

As noted above, the results from both Synchro and SimTraffic are reported in this document. Because these programs evaluate operations using different methodologies, the analysis results sometimes vary; however, the differences are generally minor unless saturated or congested conditions are present. Under saturated conditions, SimTraffic queuing and delays present results that reflect how congested intersections impact each other, while Synchro represents intersection performance in isolation and may reflect better performance results.

2.2.7. Existing PM Peak Traffic Operations

Existing (2012) PM peak hour traffic operations were evaluated at the six management area intersections and in both the AM and PM peak hour for the freeway segments where ramp traffic is entering (i.e., merging) or exiting (i.e., diverging) the mainline traffic stream. These findings reflect the current signal timing plans. Operations are described in the following sections and the detailed analysis worksheets are presented in Appendix B (available upon request).

Intersection Operations

Table 2-8 summarizes the results of the traffic operations analysis and Figure 2-4 presents the v/c ratios and LOS performance by lane group for the area intersections. At the signalized intersections within the management area, the overall operational results are summarized in Table 2-8 and the individual movements are reported in Figure 2-4. For unsignalized intersections, Table 2-8 reports the operational results the critical movement (worst movement that must stop or yield the right of travel to other traffic flows) with all individual movements reported in Figure 2-4. Critical movements at unsignalized intersections are typically the minor-street left turns or, in the case of single-lane approaches, the minor street approaches. These

movements are required to yield to all other movements at the intersection and thus are subject to the longest delays and have the least capacity. Left turns from the major street are also subject to delays, since motorists making these maneuvers must also yield to oncoming major-street traffic.

Table 2-8. Existing (Year 2012) PM Peak Hour Traffic Operations Analysis Results

Intersection	Critical Movement[1]	V/C Ratio[2]	LOS[2]	Operational Standards	
				OHP[4]	City/County[5]
1. Edenbower Blvd. at Stewart Pkwy. (Signalized)	Overall	0.83	C	--	LOS D/0.85
2. Edenbower Blvd. at Broad St.	EB L/R	0.15	C	--	LOS D/0.85
3. Edenbower Blvd. at SB Ramp Terminal (Signalized)	Overall	0.57	B	0.85	LOS D/0.85
4. Edenbower Blvd. at NB Ramp Terminal	NB L/T	0.37	C	0.85	LOS D/0.85
5. Edenbower Blvd. at Aviation Dr. (Signalized)	Overall	0.54	B	--	LOS D/0.85
6. Edenbower Blvd. at Stephens St. (Signalized)	Overall	0.66	C	--	LOS D/0.85

Acronyms: EB = eastbound; WB = westbound; NB = northbound; and SB = southbound. L = left; T = through; and R = right.

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. The delays and 95th percentile queues are based on the results of the microsimulation modeling use SimTraffic.
4. 1999 Oregon Highway Plan (OHP), Policy 1F applies to existing and no-build conditions through the planning horizon.
5. 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, while the Douglas County TSP identifies standards for County facilities.

Source: David Evans and Associates, Inc.

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

Table 2-9 summarizes intersection movements where the 95th percentile queues either exceed available storage or extend beyond the nearest upstream intersection. 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.

Table 2-9. Existing (Year 2012) 95th Percentile Queues Exceeding Available Storage

Intersection	Approach & Movement	95th Percentile Queue (ft.)	Available Storage	Percent Time Blocked[1]
1. Edenbower Blvd. at Stewart Pkwy. (Signalized)	EB L	350	325[4]	67%
	WB L	125	100[3]	5%
	WB T	175	125[2]	21%
	WB R	100	75[3]	--
	NB T/R	275	225[2]	15%
	SB R	175	150[3]	--
5. Edenbower Blvd. at Aviation Dr. (Signalized)	EB L	150	125[3]	--
	WB R	150	100[3]	--
6. Edenbower Blvd. at Stephens St. (Signalized)	EB L	275	125[4]	--
	NB L	200	150[4]	23%
	SB R	175	150[3]	--

Notes:
1. Percent time block reflects the percentage of time when the queue either extends out of a storage bay and interferes with the adjacent through travel lane or extends past the next upstream intersection.
2. Storage distance reflects spacing to the next public access point.
3. Storage distance reflects length of travel lane or turn bay.
4. Storage distance reflects length of turn bay but TWLTL allows additional storage space.

Source: David Evans and Associates, Inc.

Freeway 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 the methodology prescribed in ODOT's APM to determine v/c ratio performance. The results of the analysis are summarized in Table 2-10**.**

The merge and diverge analyses for the design hour between 4:30 and 5:30 PM show that the freeway and the merge and diverge points associated with the Interchange 127 ramps are currently operating well below the mobility standard of 0.80. During this period, the northbound direction has the higher directional flow on the freeway.

An alternate hour (7:30 to 8:30) was also analyzed to evaluate conditions when the southbound direction has the higher directional flow. The alternate hour analysis also shows that freeway operations meet the state's mobility standard.

Table 2-10. Existing (Year 2012) Freeway Operations

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

Acronyms: IC = Interchange, NA = Not Applicable

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.

Source: David Evans and Associates, Inc.

2.2.8. Safety Analysis

A safety analysis was conducted to determine whether any significant, documented safety issues exist within the management area and to inform future measures or general strategies for improving overall safety. This analysis includes a review of crash records, critical crash rates, and ODOT Safety Priority Index System (SPIS) data.

Crash History

The crash analysis included a review of crash history data supplied by the ODOT Crash Analysis and Reporting Unit for the period between January 1, 2006, and December 31, 2010, which were the five most recent full years for which crash data were available at the time of the analysis. Table 2-11 summarizes this data. The reports are contained in Appendix C (available upon request).

There were 122 crashes reported within in the IMSA within the 5-year analysis period. 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.

Along Interstate 5 within the IMSA, there was a relatively low frequency of crashes, without a pronounced trend of any one crash type. In the 5-year analysis period, there were 28 freeway crashes, 17 in the northbound direction, and 10 in the southbound. This translates to fewer than 6 freeway crashes per year, both directions combined. The 5-year crash rate for the northbound freeway segment is 0.40 crashes per million vehicle miles traveled (crashes/mvmt), and the southbound segment is 0.28 crashes/mvmt. These crash rates are comparable with the statewide average crash rates for interstate freeways of 0.40 crashes/mvmt; however, higher rates are typically expected adjacent to interchange ramp connections when compared to mainline segments. The most common crash type reported was rear-end collisions (49%). One serious injury crash occurred near the southbound on ramp, which was alcohol-related, rear-end collision.

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. 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%).

At the southbound ramp terminal, there were a moderate number of reported crashes (15), but a high frequency of turning-related collisions (9 crashes, 60%). The crash rate at this southbound terminal is below the corresponding critical crash rate.

The northbound ramp terminal had 13 reported crashes, and a crash rate of 0.43, which is equal to the critical crash rate for this intersection. There were two minor-injury crashes reported at this location, and no serious/fatal injuries. There is not a pronounced trend observed in crash types.

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.

Safety Priority Index System (SPIS)

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. There are no segments of Interstate 5 within the IMSA that are identified in the top 10% of the most recent (2011) SPIS rankings.

Table 2-11. Management Area Crash Summary (2006-2010)

Intersection	Total	% of Total	Severity			Crash Type										5-Year Crash Rate	Critical Crash Rate[1]
			Property Damage Only	Minor Injury	Fatal & Serious Injury	Rear End	Fixed Object	Angle	Other	Backing	Turning	Sideswipe - Overtaking	Sideswipe - Meeting	Non-Collision	Bicycle		
Edenbower Blvd.																	
Stewart Pkwy (Signalized)	**37**	30%	16	20	1[2]	24	0	3	0	0	4	5	1	0	0	**0.83**	**0.61**
Broad St	**2**	2%	0	2	0	0	0	0	0	0	2	0	0	0	0	**0.07**	**0.45**
I-5 SB Ramps (Signalized)	**15**	12%	15	0	0	5	0	1	0	0	9	0	0	0	0	**0.47**	**0.64**
I-5 NB Ramps	**13**	11%	11	2	0	7	1	0	0	1	4	0	0	0	0	**0.43**	**0.43**
Aviation Dr. (Signalized)	**10**	8%	5	5	0	6	0	2	1	0	1	0	0	0	0	**0.33**	**0.65**
Stephens St. (Signalized)	**12**	10%	7	5	0	6	0	0	0	2	4	0	0	0	0	**0.33**	**0.62**
Non-Intersection	**6**	5%	4	2	0	1	1	0	0	0	3	0	0	0	1	-	-
Subtotal	***96***	***78%***	***59***	***36***	***1***	***49***	***2***	***6***	***1***	***3***	***27***	***5***	***1***	***0***	***1***		
I-5 Mainline: Northbound																	N.A.
South of Off Ramp	**1**	1%	0	1	0	0	1	0	0	0	0	0	0	0	0	**0.14**	
NB Off Ramp	**0**	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	**0.00**	
Between Off & On Ramp	***0***	*0%*	0	0	0	0	0	0	0	0	0	0	0	0	0	***0.00***	
EB to NB On Ramp	**3**	2%	1	2	0	2	0	0	0	0	1	0	0	0	0	**0.12**	
Between On Ramps	***0***	*0%*	0	0	0	0	0	0	0	0	0	0	0	0	0	***0.00***	
WB to NB On Ramp	**8**	7%	0	8	0	3	2	0	0	0	0	3	0	0	0	**0.30**	
North of On Ramp	***5***	*4%*	3	2	0	3	1	0	1	0	0	0	0	0	0	***0.65***	
Subtotal	***17***	***14%***	***4***	***13***	***0***	***8***	***4***	***0***	***1***	***0***	***1***	***3***	***0***	***0***	***0***	**0.40**	
I-5 Mainline: Southbound																	
North of Off Ramp	***3***	*2%*	1	2	0	1	1	0	1	0	0	0	0	0	0	***0.48***	
SB Off Ramp	**4**	3%	4	0	0	1	1	0	2	0	0	0	0	0	0	**0.24**	
Between Off & On Ramp	***0***	*0%*	0	0	0	0	0	0	0	0	0	0	0	0	0	***0.00***	
I-5 SB On Ramp	**3**	2%	2	0	1[2]	1	0	0	0	0	0	1	0	1	0	**0.12**	
South of I-5 SB On Ramp	**0**	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	**0.00**	
Subtotal	***10***	***8%***	***7***	***2***	***1***	***3***	***2***	***0***	***3***	***0***	***0***	***1***	***0***	***1***	***0***	**0.28**	
Totals	**122**	**100%**	**69**	**51**	**2**	**60**	**8**	**6**	**5**	**3**	**28**	**9**	**1**	**1**	**1**		
Percent of Total Crashes			56%	42%	2%	49%	7%	5%	4%	2%	23%	7%	1%	1%	1%		

Notes:

1. Highway Safety Manual Part B methodology was used to calculate critical crash rates for signalized and unsignalized intersections. Where the observed rate exceeds the critical crash rate, the observed rate is shaded.
2. A serious injury crash occurred and is combined with fatal crashes due to the severity.

Source: ODOT Transportation Development Division, Transportation Data Section, Crash Analysis and Reporting Unit

2.3. Multimodal Conditions

A multimodal analysis provides a comprehensive assessment of all modes, taking into account the impact of adjacent modes of travel. The multimodal analysis conducted as part of this IAMP uses available data from bicycle, pedestrian, transit, and auto analyses previously discussed. Table 2-12 provides a summary of performance for each mode, using a ranking system with five categories, from very poor to excellent. These rankings take into account available facilities and their widths, vehicular travel speeds, volumes, operations, access, transit routes and frequencies, general conditions, and other factors that influence level of service for each mode. While bicycle, pedestrian, and transit conditions are largely influenced by adjacent modes, vehicular performance is primarily rated based on vehicular-oriented variables.

Table 2-12. Existing Multimodal Conditions

Location	Bicycle	Pedestrian	Transit	Auto
Along Edenbower Boulevard				
Stewart Pkwy	Fair	Fair	Good	Fair
Between Stewart Pkwy and Broad St	Good	Good	Poor	Good
Broad St	Good	Fair	Very Poor	Very Good
Between Broad St and I-5 SB Ramps	Fair	Good	Very Poor	Very Good
I-5 SB Ramps	Fair	Fair	Very Poor	Very Good
Between I-5 SB Ramps and I-5 NB Ramps	Fair	Good	Very Poor	Very Good
I-5 NB Ramps	Fair	Fair	Very Poor	Very Good
Between I-5 NB Ramps and Aviation Dr	Fair	Good	Very Poor	Very Good
Aviation Dr.	Fair	Fair	Very Poor	Very Good
Between Aviation Dr and Stephens St	Fair	Good	Poor	Good
Stephens St.	Fair	Fair	Fair	Fair
Overall IMSA Performance	**Fair**	**Good**	**Poor**	**Good**

Note: Multimodal analysis uses available data from existing conditions analysis for all modes.

2.4. Existing Environmental and Land Use Summary

To help inform the conceptual alternatives development process in subsequent phases of planning for improvements in the IMSA, this section identifies and reviews the existing environmental and land use conditions in the IMSA. The information gathered was taken primarily from published documents, websites, and GIS data. It identifies areas where existing conditions may constrain transportation improvement projects. This section considers federal regulations and standards because potential projects identified in the IAMP may be partially federally funded or require federal permits, and therefore would need to comply with federal regulations and standards.

2.4.1. Environmental Resources

A summary of research that includes the mapped known environmental resources is provided in Figure 2-5.

Wildlife Habitat and Wetlands

The IMSA is within the South Umpqua Watershed. Three creeks run through the IMSA. Davis Creek in the northern edge of the IMSA, Newton Creek in the southern edge, and Sweetbriar Creek runs southwest through the IMSA from Edenbower Boulevard east of the interchange to NW Stewart Parkway. These water resources provide limited linear wildlife corridor connectivity because they are interrupted by urban uses such as the airport and I-5. However, Newton Creek supports Coho salmon and winter steelhead habitat. The South Umpqua, which the three creeks drain into, provides existing habitat for Coho salmon, fall Chinook salmon, spring Chinook salmon, and winter steelhead.

Wildlife need the ability to move to access food, water, shelter, mates, and wintering habitat and to disperse to maintain healthy populations. Loss of habitat connectivity due to manmade barriers is a major contributor to loss of species and degradation of ecosystems. The Oregon Department of Fish and Wildlife, under the Oregon Wildlife Movement Strategy and in partnership with other government agencies, produces data for wildlife linkages, which are key movement areas for wildlife, specifically across roads. Most of the IMSA, except for the area south of Home Depot and Sweetbriar Avenue, has a high wildlife movement threat value based on roadkill data (ODOT's Wildlife Collision Hotspots dataset), areas identified during the workshops by ODFW and other agency staff, areas important for multiple species, and areas connected to public lands.[2]

The land adjacent to the interchange has largely been developed or disturbed for urban uses. Therefore, much of the historical vegetation has been lost due to development and wildlife habitat has been degraded. There is an area of Freshwater Emergent wetland along and adjacent to the northbound interchange on-ramp (See Figure 2-5). However, due to the proximity of the Super 8 Hotel and Lowe's Home Improvement Store developments and the disturbed pervious and impervious areas associated with the on-ramp, the wetland quality and functions are likely highly degraded. Further from the interchange, there are wetlands associated with Sweetbriar Creek which runs southwest from Edenbower Boulevard east of the interchange to NW Stewart Parkway. The Freshwater Forested/Shrub wetlands are east of Aviation Drive just north of Edenbower Boulevard. There are two wetlands north of Stewart Parkway east and west of Mercy Drive. Additional areas of Freshwater Emergent wetland are east of Aviation Drive and east of Sweetbriar Creek just north of Stewart parkway. There are likely additional wetland areas in the IMSA in addition than those mapped due to the topography of the area, which is a valley floor interspersed with creeks.

IAMP Considerations: To preserve wildlife habitat, disturbances to undeveloped areas should be avoided or minimized if possible. If potential projects include new areas of impervious surface, fill, or structures, impacts to riparian vegetation should be minimized and native vegetation should be restored where possible. Project design should take into account wildlife connectivity

[2] A more detailed qualitative explanation of ranking process https://nrimp.dfw.state.or.us/web%20stores/data%20libraries/files/ODFW/ODFW_806_2_Linkages_Report_Final_2009.pdf).

and existing documented wildlife movement corridors and linkages in the IMSA. Water quality measures should be incorporated into project design and construction to protect aquatic habitat. Wetlands permits will be required if impacts to wetlands are unavoidable. Wetland impacts and other habitat impacts could be minimized or avoided through adequate erosion control Best Management Practices (BMPs) and other protective measures integrated into project design and construction.

Threatened and Endangered Species

The Oregon Natural Heritage Information Center (ONHIC) database documents the federally listed and state listed threatened or endangered species. The State of Oregon and the federal government maintain separate lists of threatened and endangered (T & E) species. These are species that they are at some degree of risk of becoming extinct. The ONHIC information, based on reported historic sightings within two miles of the IMSA is summarized in Table 2-13. There is only one federally listed threatened species, the Coho salmon, and no state listed threatened and endangered species. Newton Creek in the IMSA is identified by ODFW as having Coho salmon and winter steelhead habitat (see Figure 2-5). Areas of suitable habitat are those that are believed to be used currently or historically by wild, natural, and/or hatchery fish populations. The term "currently" is defined as within the past five reproductive cycles. Historical habitat includes suitable habitat that fish no longer access and will not access in the foreseeable future without human intervention. However, there are both federal and state species listed as ‘sensitive’ or ‘species of concern’. Additionally, according to the ORHIC search, the Pacific pond turtle, a Federal species of concern (SOC), was spotted in or near Newton Creek although the exact location was not given.

Under federal law, the U.S. Fish and Wildlife Service (USFWS) and National Oceanic and Atmospheric Administration (NOAA) share responsibility for implementing the federal Endangered Species Act (ESA) of 1973 (Public Law 93-205, 16 United States Code (USC) § 1531), as amended. In general, USFWS has oversight for land and freshwater species and NOAA for marine and anadromous species. In addition to information about species already listed, the USFWS Oregon Field Office maintains a list of Species of Concern.

Once it is listed as threatened or endangered, a species is afforded the full range of protections available under the ESA, including prohibitions on killing, harming or otherwise “taking” a species. In some instances, the listing of a species can be avoided by the development of Candidate Conservation Agreements that may remove threats facing the candidate species.

A species is listed as one of two categories, endangered or threatened, depending on its status and the degree of threat it faces. An “endangered species” is one that is in danger of extinction throughout all or a significant portion of its range. A “threatened species” is one that is likely to become endangered in the foreseeable future throughout all or a significant portion of its range. “Species of Concern” is an informal term under the federal listing that is not specifically defined in the federal ESA. The term commonly refers to species that are declining or appear to be in need of conservation.

Table 2-13. ONHIC-Identified Listed Threatened or Endangered Species within the IMSA

Common Name	Scientific Name	Status	
		Federal[1]	State[2]
Vertebrate Animal			
Pacific lamprey	Lampetra tridentata	SOC	SV
Common kingsnake	Lampropeltis getula	SOC	SV
Pacific pond turtle	Actinemys marmorata	SOC	SC
Coho salmon (Oregon Coast ESU)	Oncorhynchus kisutch pop. 3	LT	SV
Chinook salmon (Oregon Coast ESU, spring run)	Oncorhynchus tshawytscha pop. 27	-	SC
Steelhead (Oregon Coast ESU, winter run)	Oncorhynchus mykiss pop. 31	SOC	SV
Umpqua chub	Oregonichthys kalawatseti	SOC	SC
Invertebrate Animal			
Franklin's bumblebee	Bombus franklini	SOC	-
Vascular Plant			
Slender meadow-foam	Limnanthes gracilis ssp. gracilis	-	C
Red-root yampah	Perideridia erythrorhiza	SOC	C
Koehler's rockcress	Arabis koehleri var. koehleri	SOC	C
Hitchcock's blue-eyed grass	Sisyrinchium hitchcockii	SOC	-

Notes:
1. SOC (Species of Concern); LT (Listed Threatened)
2. SV (Sensitive-Vulnerable); SC (Sensitive-Critical); C (Candidate for Listing as Threatened or Endangered)

Source: Oregon Natural Heritage Information Center (ONHIC) database,2011

Under state law (Oregon Revised Statute 496.171-496.192) the Fish and Wildlife Commission, through the Oregon Department of Fish and Wildlife (ODFW), maintains the list of native wildlife species in Oregon that have been determined to be either “threatened” or “endangered” according to criteria set forth by rule (Oregon Administrative Rule [OAR] 635-100-0105). Plant listings are handled through the Oregon Department of Agriculture, while most invertebrate listings are conducted through the Oregon Natural Heritage Program.

Under Oregon’s Sensitive Species Rule (OAR 635-100-040), a “sensitive” species classification was created to focus fish and wildlife management and research activities on species that need conservation attention. “Sensitive” refers to naturally reproducing fish and wildlife species, subspecies, or populations that are facing one or more threats to their populations and/or habitats. Implementation of appropriate conservation measures to address threats may prevent the species from declining to the point of qualifying for threatened or endangered status.

Sensitive species are assigned one of two subcategories. “Critical” sensitive species are imperiled with extirpation from a specific geographical area of the state because of small population sizes, habitat loss or degradation, and/or immediate threats. Critical sensitive species may decline to the point of qualifying for threatened or endangered status if conservation actions are not taken. “Vulnerable” sensitive species are facing one or more threats to their populations and/or habitats. Although not currently imperiled with extirpation

from a specific geographical area of the state, vulnerable species could, however, become so with continued or increased threats to populations and/or habitats. For plants, there are no sensitive species but candidate species instead - candidate for listing as threatened or endangered.

IAMP Considerations: Measures must be incorporated into project development, design, and construction specifications to protect water quality for listed aquatic species. To preserve wildlife habitat, disturbances to undeveloped areas should be avoided or minimized if possible, and where avoidance is not possible, mitigation measures must be implemented.

Floodplains and Floodways

Acting through the local planning agencies, the Federal Emergency Management Agency (FEMA) regulates development within Regulated Floodways and Special Flood Hazard Areas (SFHA). A "Regulatory Floodway" means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height. SFHA are defined as the areas that will be inundated by the flood event having a one-percent chance of being equaled or exceeded in any given year. The one-percent annual chance flood is also referred to as the base flood or 100-year flood. Development in the regulated floodway typically requires a project to demonstrate no net rise and could require an amendment to the FEMA regulated floodway boundaries.

FEMA-designated regulated floodways and SFHA in IMSA are displayed in Figure 2-5. Only one floodplain and floodway associated with Newton Creek is in the IMSA (FEMA Map Panel: 41019C1726F, February 17, 2010) in the southern edge of the IMSA between I-5 and NW Aviation Drive.

IAMP Considerations: Potential projects are unlikely to impact the floodplain or floodway because of their location in the southern edge of the IMSA. However, project development and design should consider the potential for impacts to floodplains especially if projects are identified for Edenbower Boulevard or NW Stewart Parkway west of I-5 which intersect creeks in the IMSA. Impacts to floodplains or floodways may have to demonstrate no net rise in the base flood elevation. Project development encroaching on floodplains should pay close attention to the floodplain and floodway requirements.

2.4.2. Socioeconomic and Environmental Justice

Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations of February 11, 1994, requires agencies undertaking federal projects to identify low-income and minority populations; assess whether high and adverse human health or environmental impacts would result from the alternatives; and ensure participation of low-income and minority populations in the transportation decision making process. The Federal Highway Administration (FHWA) defines a disproportionately high and adverse impact on minority and low-income populations as one that:

- Is predominantly borne by a minority population and/or a low-income population; or
- Will be suffered by the minority population and/or low-income population and is appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the non-minority population and/or non-low-income population.

EO 12898 states that agencies must consider whether human health effects, in terms of risks and rates, are significant or above accepted norms.

Additional underserved populations are the "transportation disadvantaged." These are those persons who, because of physical or mental disability, income status, or age, are unable to transport themselves or to purchase transportation and are, therefore, dependent upon others to obtain access to health care, employment, education, shopping, social activities, or other life-sustaining activities. Projects receiving federal assistance must also evaluate impacts to these populations to comply with the Age Discrimination Act of 1975, Federal-Aid Highways Act, Rehabilitation Act of 1973 and Americans with Disabilities Act of 1990.

Socioeconomic Data

Socioeconomic data for the IMSA was drawn primarily from the U.S. Census Bureau. The census tracts reviewed for this memorandum represent the following geographical areas:

- Census tract 800 represents the portion of the IMSA west of I-5
- Census tract 900 represents the eastern section
- Census tract 1200 represents the area south and east of the IMSA

Based on the data from the American Community Survey (ACS) and 2010 Census, the IMSA is less diverse than the state. Census tract 800 (92.3%) and 900 (92.7%) have similar race and ethnicity composition to Douglas County with most people identifying themselves as white only. However, Census tract 1200 is more diverse than the census tracts with a higher percentage of people identifying themselves with being two or more races (3.9 percent). Table 2-14 provides a summary of race and ethnicity survey data.

Table 2-14. Race and Ethnicity, Percentage of Total Population (2010 Decennial Cenus)

Geography		Race									
		% White	% Non-white	% Black or African American	% American Indian & Alaska Native	% Asian	% Native Hawaiian & Other Pacific Islander	% Some Other Race	% Two or More Races	% Not Hispanic	% Hispanic
Oregon		83.6	16.4	1.8	1.4	3.7	0.3	5.3	3.8	88.3	11.7
Douglas County		92.4	7.6	0.3	1.8	1	0.1	1.2	3.2	95.3	4.7
Census Tract	800	92.3	7.7	0.3	0.9	2.4	0.2	1.0	2.9	96.2	3.8
	900	92.7	7.3	0.4	1.5	1.3	0	1.5	2.6	95.1	4.9
	1200	90.6	9.4	0.4	1.9	1.1	0.2	1.8	3.9	93.6	6.4

Source: DEC_10_SF1_QTP3

Douglas County tends to have an older population than the state which is confounded in Census tracts 800. However, Census tracts 900 and 1200, have a younger median population than the state, county or census tracts 800.

Table 2-15. Age by Census Tracts (2010 Decennial Cenus)

Geography		Median Age; Total (Estimate)	% Under 18	% 65 and older
Oregon		38.4	22.6	23.4
Douglas County		46.1	20.5	28.1
Census Tract	800	51.9	18.4	29.4
	900	48.5	19.3	28.2
	1200	35.8	24.5	21.4

Source: DEC_10_SF1_P13 and DEC_10_SF1_P12

Persons are considered to be in poverty status when income earned is less than the income threshold. The poverty threshold is a measure of annual pretax cash income which falls below a federal measure of poverty that is recalculated each year. The percent of population in poverty for the IMSA is shown in Table 2-16. As shown in the table, and in Figure 2-6, the census tracts in the IMSA have a lower percentage of individuals living in poverty than Douglas County or the state. However, census tract 1200 has a substantially higher amount (34 percent). Additionally, census tract 1200 has a higher percentage of persons with disability and female head of households with children. Figure 2-7 shows the disabled populations broken down by census tracts within the IMSA, while Figure 2-8 shows percentages of female head of households with children.

Table 2-16. Percent of Individuals Below Poverty Level (2010 American Community Survey 5-Year Estimates)

Geography		Percent Population for Whom Poverty Status is Determined	% Persons with Disability	% Female Head of Household w/Children
Oregon		14%	19	6
Douglas County		16%	23	6
Census Tract	800	11%	20	4
	900	11%	22	6
	1200	34%	24	13

Source: ACS B17001. Poverty Status in the Past 12 Months by Sex by Age - Universe: Population for Whom Poverty Status Is Determined

Tax Lots

Figure 2-9 shows the tax lots and estimated right-of-way in the IMSA. To the west of I-5 are mostly larger lots, except for along Hooker Road, indicative of the commercial and industrial uses in the area. However, the west side of I-5 has smaller lots for the residential neighborhoods which abut I-5 and the interchange.

Community Resources

There are no public schools, police or fire stations in the IMSA. Resources and activity centers that are key destinations for the local community in and near the IMSA include (and shown on Figure 2-10):

- Mercy Medical Center which includes hospital and doctor offices (2700 Stewart Parkway).
- Shopping area across the street from NW Stewart Parkway which includes KMART, Express Employment and Albertsons.
- Salvation Army (3030 Northeast Stephens Street),
- Charles A Gardiner Park between NW Stewart Parkway and Edenbower Boulevard
- Cow Creek Band of Umpqua Tribe of Indians (2371 NE Stephens Street)
- Costco (4141 NE Stephens St)
- Umpqua Community Health Clinic (150 NE Kenneth Ford Dr)
- Army National Guard (111 General Avenue)
- Douglas County Farmer's Co-op (3171 NE Stephens ST)
- Sunrise Shop and Save (2658 Ne Stephens St)
- US Foresty Department (2900 NW Stewart Pkwy)
- Roseburg Airport (2251 Aviation Drive)
- Oregon Department of Transportation (3500 NW Stewart Parkway)
- United Community Action Network (280 Kenneth Ford Drive)

Transportation Barriers

Potential transportation barriers in the IMSA include a lack of public transit service on weekends. Additionally, the residential area west of the interchange is not served by transit nor is the mobile home park northeast of the interchange. Bus lines only run along OR 99 and other major roads in the IMSA making it difficult for rural residents to utilize. For disabled or elderly populations who have limited income, the existing paratransit fare ($4.00) may be unaffordable. Other potential transportation barriers could include access to services particularly health services for environmental justice populations in rural areas, language barriers especially in the southeast of the IMSA (census block 1200), and barriers to public transit information access.

IAMP Considerations: Potentially affected populations, businesses, and impacts to public resources should be determined through more thorough site analysis, interviews, and other public outreach efforts, as appropriate. Disproportionate impacts to environmental justice populations by potential projects should be avoided, but. Displacements and potential business impacts should be avoided or minimized. Displacements of gas stations, motels, restaurants, and parking facilities would potentially have an adverse impact to the immediate local economy.

2.4.3. Land Use and Zoning

The IMSA is within the City of Roseburg UGB, although only the southern portion is within the City of Roseburg city limits. Except for an undeveloped area between Keller Road and Oak Tree Road, the IMSA is a largely flat, urbanized area of valley floor surrounded by undeveloped hills. Adjacent to the interchange to the east is residential development. Adjacent to the interchange to the west, is big box retail (Lowes and Home Depot) and motels. North of the interchange are primarily rural residential uses except for some light industrial uses between Hooker Road and the railroad tracks. There is a mobile home park north of the Lowes's and an area used for agricultural uses north of the mobile home park. The Army National Guard is south of General Avenue on Hooker Road adjacent to an undeveloped lot which fronts NW Edenbower Boulevard. There is a Costco and health clinic on the east side of NE Stephens Road along Ryan Heights Lane. In the northern tip of the IMSA, is a lumber mill. Southwest of the interchange is the Roseburg Regional Airport. The Central Oregon and Pacific Railroad (CORP) tracks run north and south through the IMSA west of NE Stephens Street. East of the interchange is primarily residential except for in between I-5 and NW Edenbower Boulevard which has commercial uses. Mercy Medical Center is north of NW Stewart Parkway west of NW Edenbower Boulevard.

Major property owners in the IMSA include: The City of Roseburg, Costco, Douglas County, Home Depot, Lowes, Keller Lumber, and Mercy Medical Center. Appendix D includes a list of vacant and redevelopable lots in the IMSA with ownership.

Figure 2-11 shows Comprehensive Plan designations within the IMSA, while Figure 2-12 shows zoning designations for the IMSA. The Technical Memorandum 1, Appendix identifies the purpose of each zone. Adjacent to the interchange to the east are lots zoned Mixed Use, Airport District to the southeast, and Medium Industrial designations to the northeast. North of the industrial uses, at the northern tip of the IMSA, is an area zoned Farm Forest, Rural Residential, and Medium Industrial. There are industrial and suburban residential uses between Hooker Road and NE Stephens Street. South of Ryan Heights Road is an area zoned Mixed Use. East of the interchange, there are residential designations to the north and to the south, general commercial designations. There is an area designated Public Reserve where Mercy Medical Center is located.

IAMP Considerations: Potential future development of industrial or mixed use designated lots which could generate truck or other traffic along NW Edenbower Boulevard.

2.4.4. Historic and Archaeological Resources

Under Section 106 of the National Historic Preservation Act of 1966 (Public Law 89-665), 16 USC 470-470m, and under federal regulations governing the protection of historic and cultural resources (36 Code of Federal Regulations [CFR] 800), federal agencies, and the state and local agencies to which the federal agency has delegated responsibility, are directed to avoid undertakings that adversely affect properties that are included in or are eligible for inclusion in the National Register of Historic Places (NRHP). The NRHP identifies and documents (in partnership with state, federal, and tribal preservation programs) districts, sites, buildings,

structures, and objects that are significant in American history, architecture, archaeology, engineering, and culture. This section summarizes NRHP resources in the IMSA as well as other historic, prehistoric, and cultural resources.

For the IMSA, the State Historic Preservation Office (SHPO) database shows one potential historical resource listed in the IMSA (see Figure 2-10) on the west side of OR 99: Kennedy's Dutch Mill. However, this structure has since been torn down.

Additional historical resources may exist in the IMSA that have not yet been surveyed, although given that much of the land in the IMSA is either used for airport related use, commercial uses, and newer residential development, there are no obvious potential resources. However, the entire IMSA has not been surveyed for historical resources. There are areas in the IMSA that although likely to have been disturbed at some point, are undeveloped. There may be existing documented or undocumented archeological or cultural resource sites that often are found in areas with similar topographical characteristics to those in the IMSA, particularly creeksides.

IAMP Considerations: It is unlikely that the IMSA has been completely surveyed for historical an archaeological resources. Before any ground disturbing actions, ODOT must conduct an archaeological field investigation. Additionally, if right-of-way acquisition is necessary for any proposed projects, ODOT must conduct a cultural resource surveys determining the eligibility of buildings or structures more than 50 years of age.

2.4.5. Section 4(f) Resources

Section 4(f) refers to a part of federal law that protects public parks, recreation lands, wildlife and waterfowl refuges, and public or private historic sites. Section 4(f) applies only to Departments of Transportation (DOTs) and their agencies. Highway projects that "use" public parks or other protected land must fulfill the requirements of Title 23, USC, Section 138, Section 4(f) of the Department of Transportation Act of 1966, as amended.

A "use" that is subject to the provisions of Section 4(f) occurs:

- When land is permanently incorporated into a transportation facility
- When there is a temporary occupancy of land that is adverse in terms of the statute's preservationist purpose
- When there is constructive use of the land

DOTs must demonstrate that a proposed project will not "use" the publicly owned parks and recreation land, where "use" can mean both actual conversion of recreation lands into a transportation use, or a "constructive use," where off-site impacts of the transportation project substantially impair the site's vital functions. Findings of "no feasible and prudent alternatives" and "all possible planning to minimize harm" must be well-documented and supported. A feasible alternative is an alternative that is possible to engineer, design, and build. To find that an alternative that avoids a Section 4(f) resource is not "prudent," one must document that there are unique problems or unusual factors involved with the use of such an alternative. This

means that the cost, the social, economic, and environmental impacts, and/or community disruption resulting from such alternatives reach extraordinary magnitudes.

Potential Section 4(f) resource lands within the IMSA consist of Charles S. Gardiner Park in the southeastern edge of the IMSA and any other identified historic resources.

IAMP Considerations: In general, transportation improvements should try to avoid park areas. Additional cultural resources surveys should be completed to ensure there is no disturbance to any protected resource. A Section 4(f) evaluation will require ODOT to assess all reasonable alternatives that adversely affect protected lands. If every potential alternative that can meet the project objective would impact some Section 4(f) property, then the alternative with the least impact must be selected unless it is not feasible and prudent.

2.4.6. Section 6(f) Resources

The Land and Water Conservation Fund (LWCF) Act of 1965 established grants-in-aid funding to assist states in the planning, acquisition, and development of outdoor recreational land and water areas and facilities. Section 6(f) of the LWCF Act prohibits the conversion of property acquired or developed with the assistance of the LWCF to anything other than public outdoor recreation use without the approval of the Secretary of the U.S. Department of the Interior. No LWCF resource lands were identified in the IMSA.

IAMP Considerations: None.

2.4.7. Potential Design Constraints

While this review did not identify any “red flags,” the baseline data identifies several land use and environmental conditions that could potentially be affected by transportation improvements. Table 2-17 summarizes resource issues that may present potential design constraints.

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.

Table 2-17. Environmental and Land Use Summary

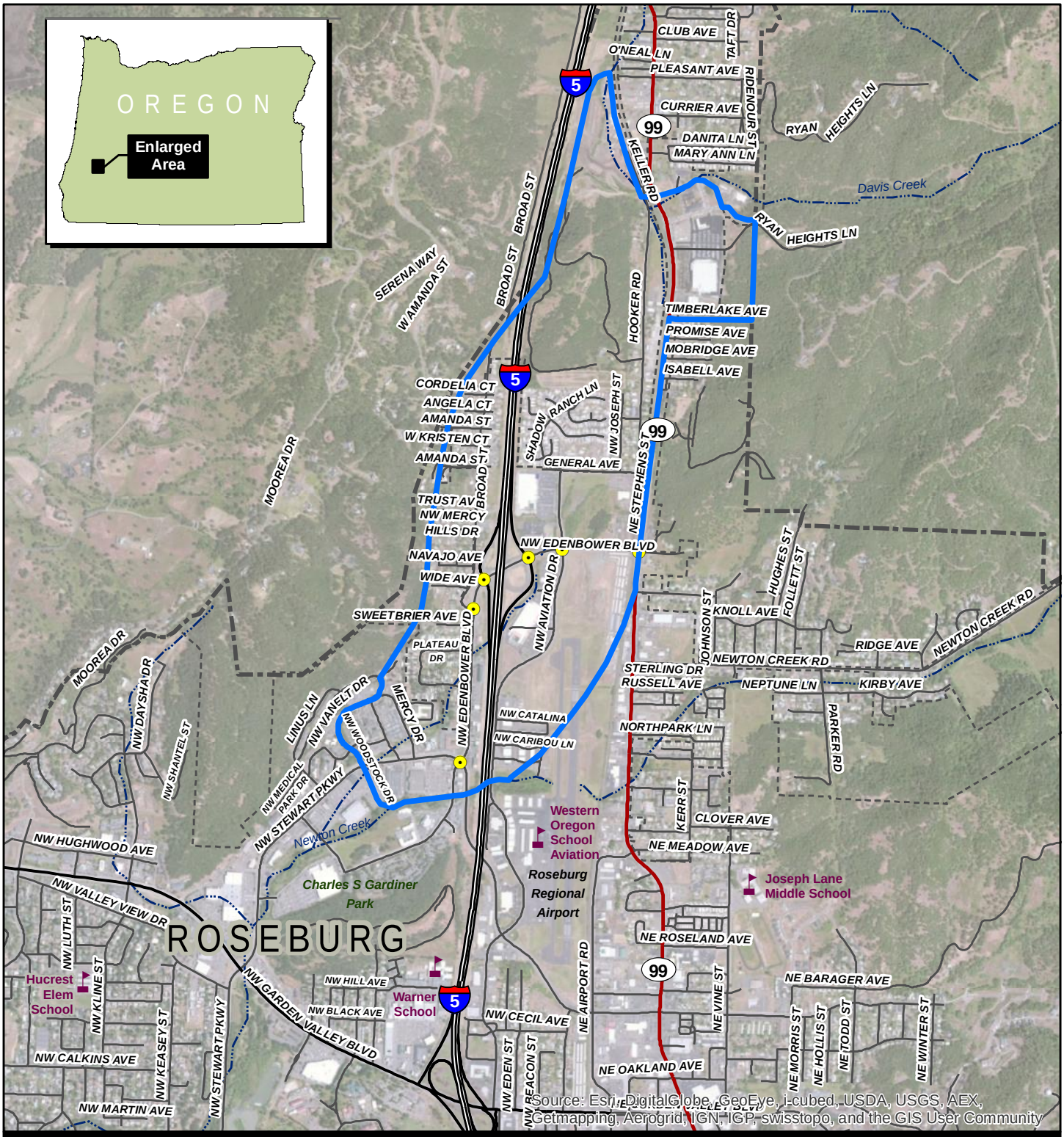
Feature	Summary of Key Resources and Concept Guidance	Key Potential Conflict Location(s)	Potential Approval/Permit If Resource Impacted
Wildlife Habitat & Wetlands	Disturbance to undeveloped areas should be avoided if possible. Wetland delineations should be conducted once concept footprints are identified. Impacts to wetlands should be avoided; mitigation and permitting will be necessary if impacts cannot be avoided. BMPs incorporated into project design and construction can help minimize impacts.	Adjacent and north of interchange.	▪ U.S. Army Corps of Engineers ▪ Oregon Department of State Lands ▪ Oregon Department of Fish and Wildlife ▪ Local land use approvals
Threatened and Endangered Species	Concepts should avoid disturbance of areas where the species habitat is present. Water quality impacts and physical impediments in T&E species contributing waterways should be avoided.	Newton Creek	▪ National Marine Fisheries Service ▪ U.S. Fish and Wildlife Service ▪ Oregon Department of Agriculture ▪ Oregon Department of Fish and Wildlife
Floodplains and Floodways	Fill in floodways and floodplains should be avoided. No net rise will have to be demonstrated if improvements involve any sort of fill in floodways. Cut and fill requirements will need to be adhered to in floodplains.	Newton Creek	FEMA regulations administered through local land use approvals
Socioeconomic and Environmental Justice	Displacements of businesses and communities should be avoided or minimized.	Businesses and affected communities throughout the IMSA	The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act) Title VI Compliance
Land Use and Zoning	Improvements may be limited in Farm and Forest resource lands and will need to comply with Floodplain, Natural Resource, and Airport overlay standards	Eastern and western ends of IMSA	Local land use approvals
Historical and Archaeological Resources	Historical and cultural resources - Further surveys will need to be completed, especially if improvements will include ground-disturbing activities and or right-of-way acquisition of property with potential historical resources.	Throughout IMSA	▪ National Historic Preservation Act ▪ FHWA – 4(f) ▪ State Historic Preservation Office Local land use approvals
Parks and Recreation and Section 4(f) Resources	Avoid resources if possible. Any "use" of Section 4(f) lands will need to demonstrate that it is either a "de minimis" impact or that there was no alternative for the impact.	4(f) potential throughout IMSA	▪ Federal Highway Administration 4(f) ▪ National Park Service ▪ Oregon Parks and Recreation ▪ Local land use approvals
Section 6(f) Resources	None identified	N/A	N/A

Other design constraints, which were not reviewed in this memorandum, may include hazardous material sites, fish passage requirements at stream or culvert crossings, and stormwater treatment requirements.

This memo identifies baseline resource information in the IMSA from a "visual windshield validation" perspective. ODOT will need to undertake detailed studies of specific areas to determine design limitations for specific proposed projects. Potential projects identified in the IAMP may require permits, regulatory requirements, or authorizations.

Attachments:
Figure 2-1. Interchange Management Study Area
Figure 2-2. Interchange Management Access Inventory
Figure 2-3. Existing Conditions (2012) PM Peak Hour Volumes
Figure 2-4. Existing Conditions (2012) Traffic Operations and Lane Configurations
Figure 2-5. Natural Features
Figure 2-6. Poverty
Figure 2-7. Disability
Figure 2-8. Female Head of Household
Figure 2-9. Tax Lots
Figure 2-10. Socioeconomic Community Features
Figure 2-11. Comprehensive Plan
Figure 2-12. Zoning

Appendix A. Traffic Seasonal Factor
Appendix B. Traffic Operations Worksheets
Appendix C. ODOT Crash Analysis Reports
Appendix D. Vacant and Redevelopable Lots



I-5 Exit 127 (North Roseburg) IAMP

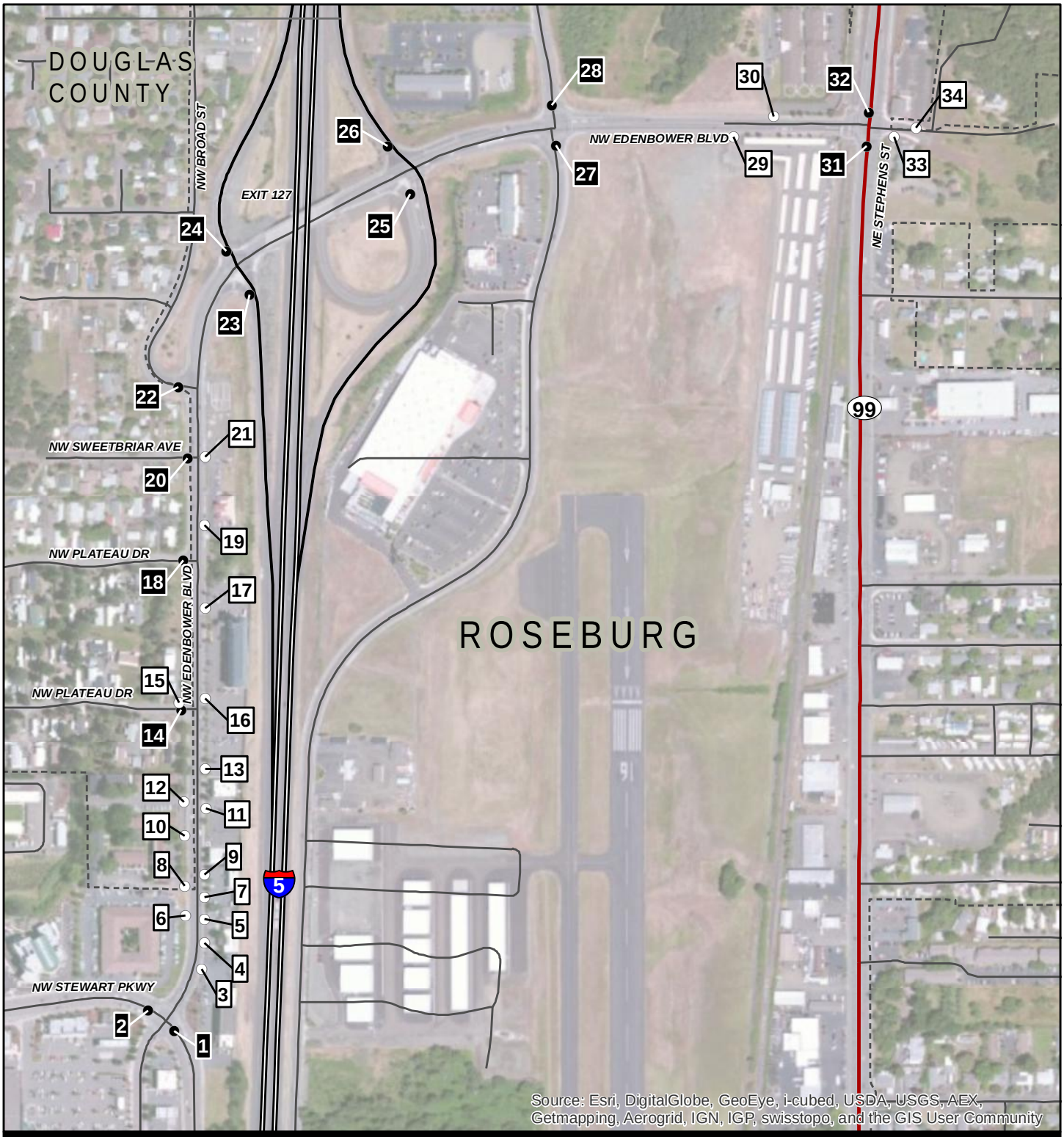
Legend

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

N

0 2,000 4,000 Feet

Figure 2-1
Interchange Management Study Area



I-5 Exit 127 (North Roseburg) IAMP

Legend

- City Limits
- Interstate
- Highway
- Arterial Road
- Local Road

Access Location by Type

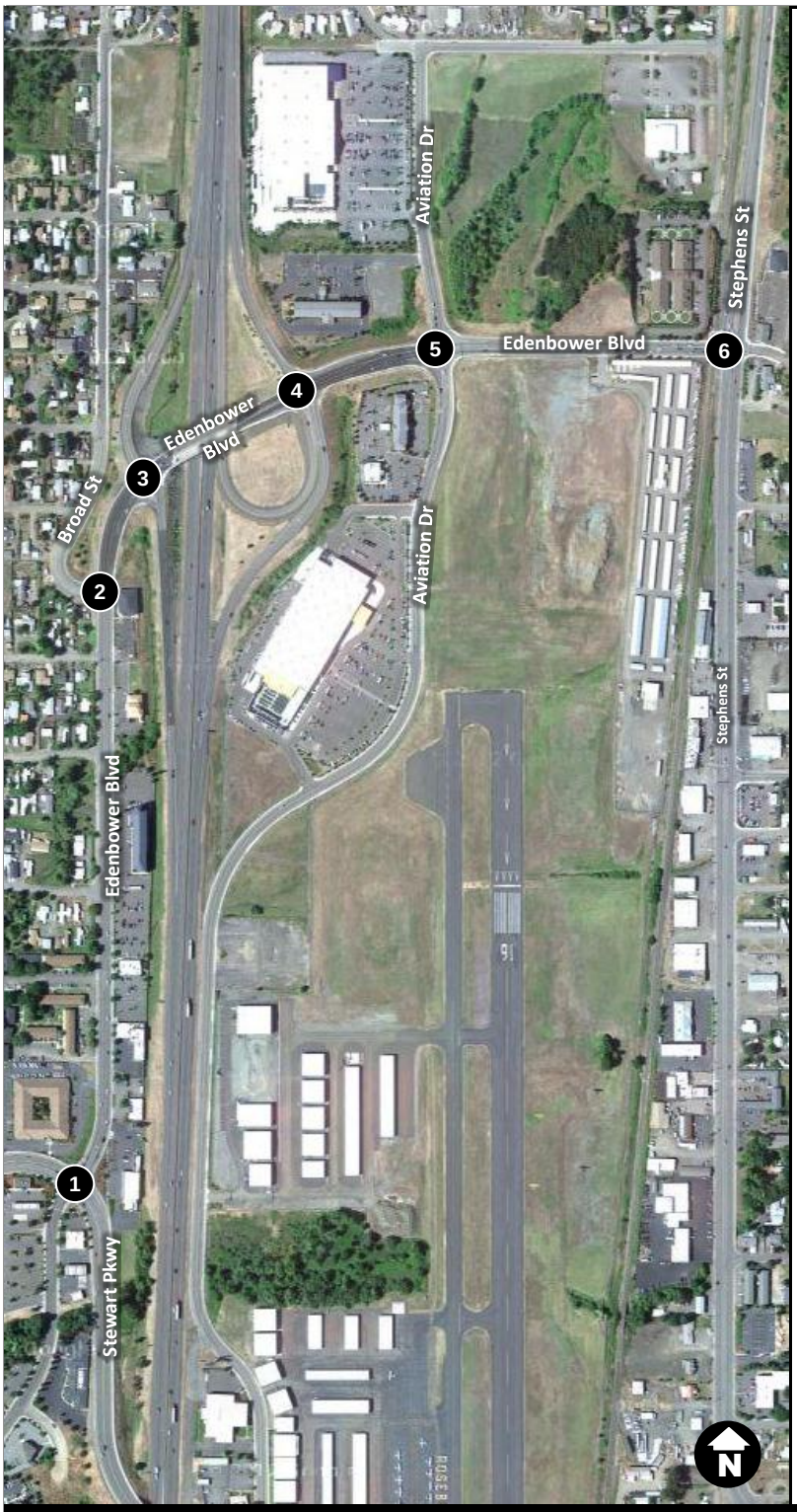
- Private
- Public

Note: Number call outs match the access inventory table.

N

0 600 1,200 Feet

Figure 2-2
Interchange Management Access Inventory



Edenbower Blvd @ Stewart Parkway

1

465 60 55

70 335 85

665 375 15

35 165 105

TEV: 2430

Edenbower Blvd @ Broad Street

2

15 550

25 30

50 800

TEV: 1470

Edenbower Blvd @ Southbound 127 Ramp

3

190 0 100

375 270

550 275

TEV: 1760

Edenbower Blvd @ Northbound 127 Ramp

4

115 600

445 205

45 0 240

TEV: 1650

Edenbower Blvd @ Aviation Drive

5

155 40 55

75 495 30

100 510 75

65 25 45

TEV: 1670

Edenbower Blvd @ Stephens Street

6

295 375 5

5 10 5

340 5 250

295 395 5

TEV: 1985

I-5 Exit 127 (North Roseburg) IAMP

Legend

Allowable Movement

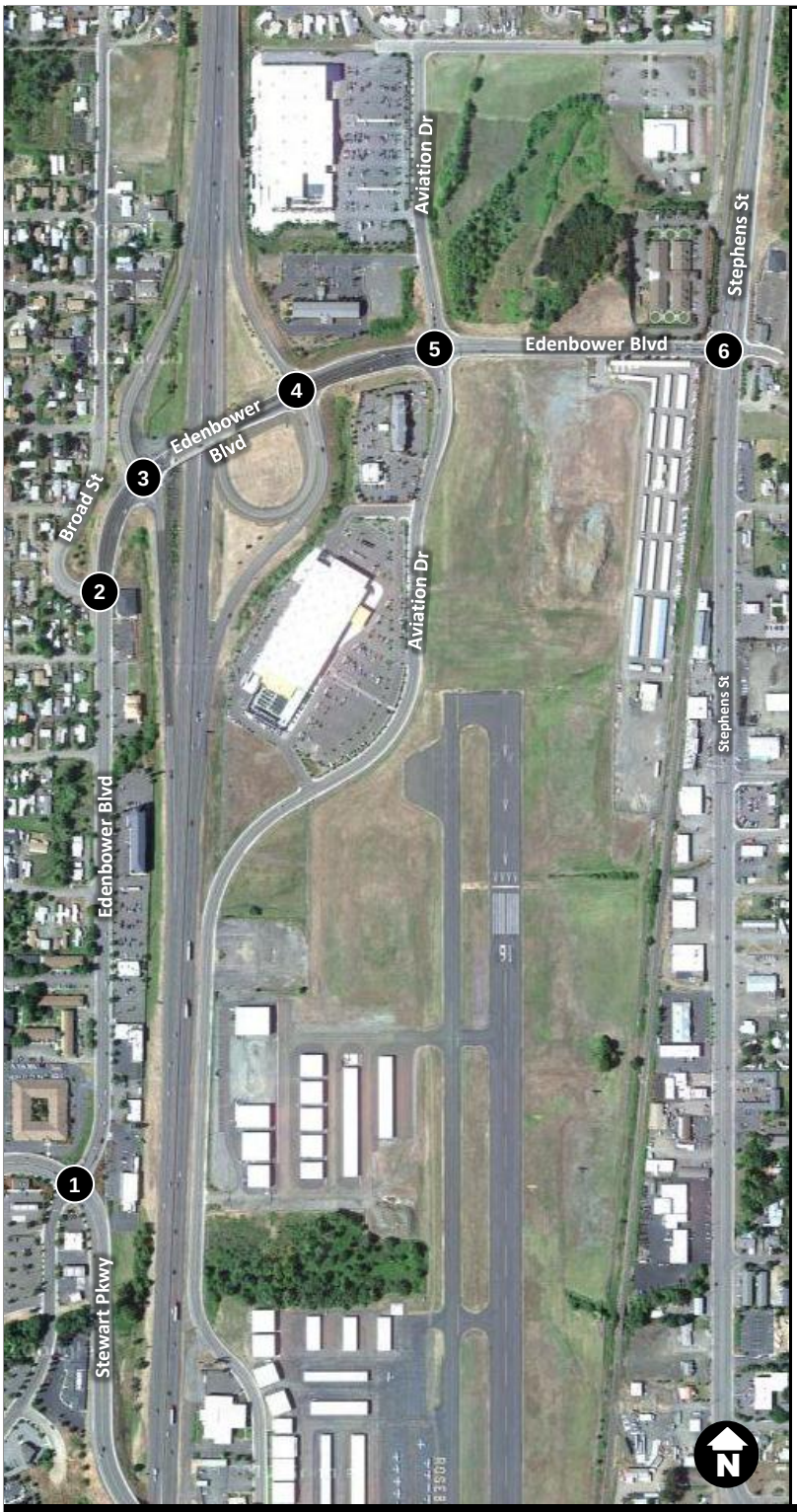
TEV: Total Entering Volume

PM Peak Hour Turning Movement Volume

Signalized Intersection

STOP Controlled Approach

Figure 2-3
2012 Baseline
PM Peak Hour Volumes



Edenbower Blvd @ Stewart Parkway*

1

0.50 (A)
0.18 (C)
0.56 (C)

0.05 (C)
0.46 (C)
0.58 (D)

1.07 (F)
0.23 (B)

0.14 (C)
0.75 (D)

Overall: 0.83 (D)

Edenbower Blvd @ Broad Street

2

0.00 (--)

0.15 (C)

0.05 (A)
0.00 (--)

Overall: 0.15 (C)

Edenbower Blvd @ Southbound 127 Ramp*

3

0.14 (C)
0.44 (C)

0.31 (A)
0.55 (B)

0.61 (B)
0.19 (A)

Overall: 0.57 (B)

Edenbower Blvd @ Northbound 127 Ramp

4

0.00 (--)
0.00 (--)

0.00 (--)
0.00 (--)

0.37 (C)
0.30 (B)

Overall: 0.37 (C)

Edenbower Blvd @ Aviation Drive*

5

0.12 (C)
0.26 (C)
0.24 (C)

0.06 (B)
0.68 (B)
0.09 (A)

0.28 (B)
0.63 (B)
0.06 (C)

0.26 (C)
0.20 (C)

Overall: 0.54 (B)

Edenbower Blvd @ Stephens Street*

6

0.22 (C)
0.40 (C)
0.28 (D)

0.02 (C)
0.02 (C)

0.82 (D)
0.56 (C)

0.76 (D)
0.24 (B)

Overall: 0.66 (C)

I-5 Exit 127 (North Roseburg) IAMP

Legend

Lane Configuration

0.01 (A) Lane Group V/C (LOS)
Volume-to-Capacity Ratio (Level of Service)

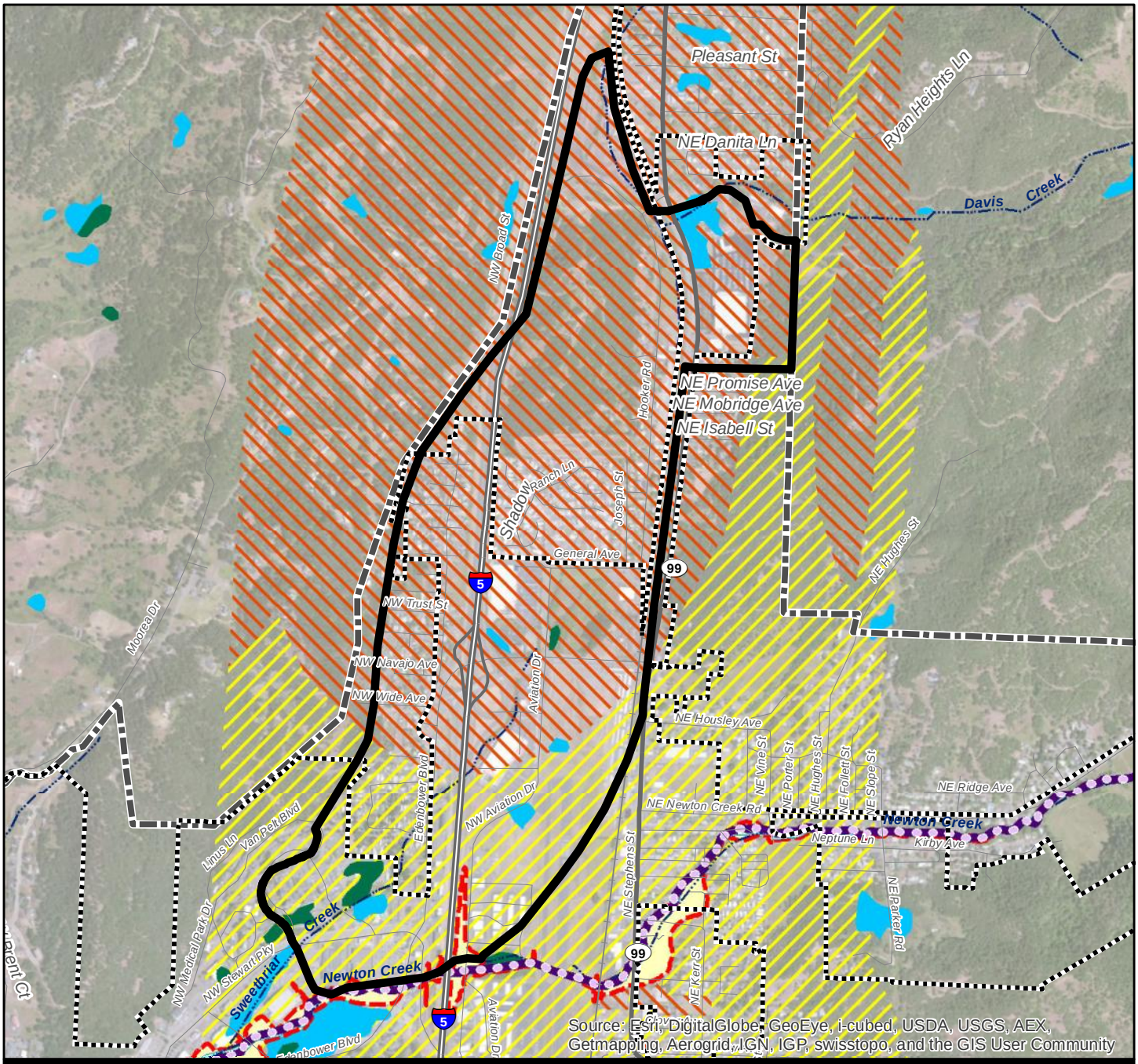
(--) LOS only reported for stopped or yielding movement

Signalized Intersection

STOP Controlled Approach

**Intersection operations based on HCM 2000 Methodology*

Figure 2-4
2012 Baseline
PM Peak Hour Operations



I-5 Exit 127 (North Roseburg) IAMP

Legend

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

Transportation

- Interstate
- Highway
- Arterials
- Other Roads
- Railroad

Natural Features

- Rivers
- Floodway
- 100-Year Floodplain

Wetland Classifications

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland

Wildlife Priority Rank

- 5-6
- 7-8

ODFW Habitat Distribution

- Coho Salmon
- Winter Steelhead

N

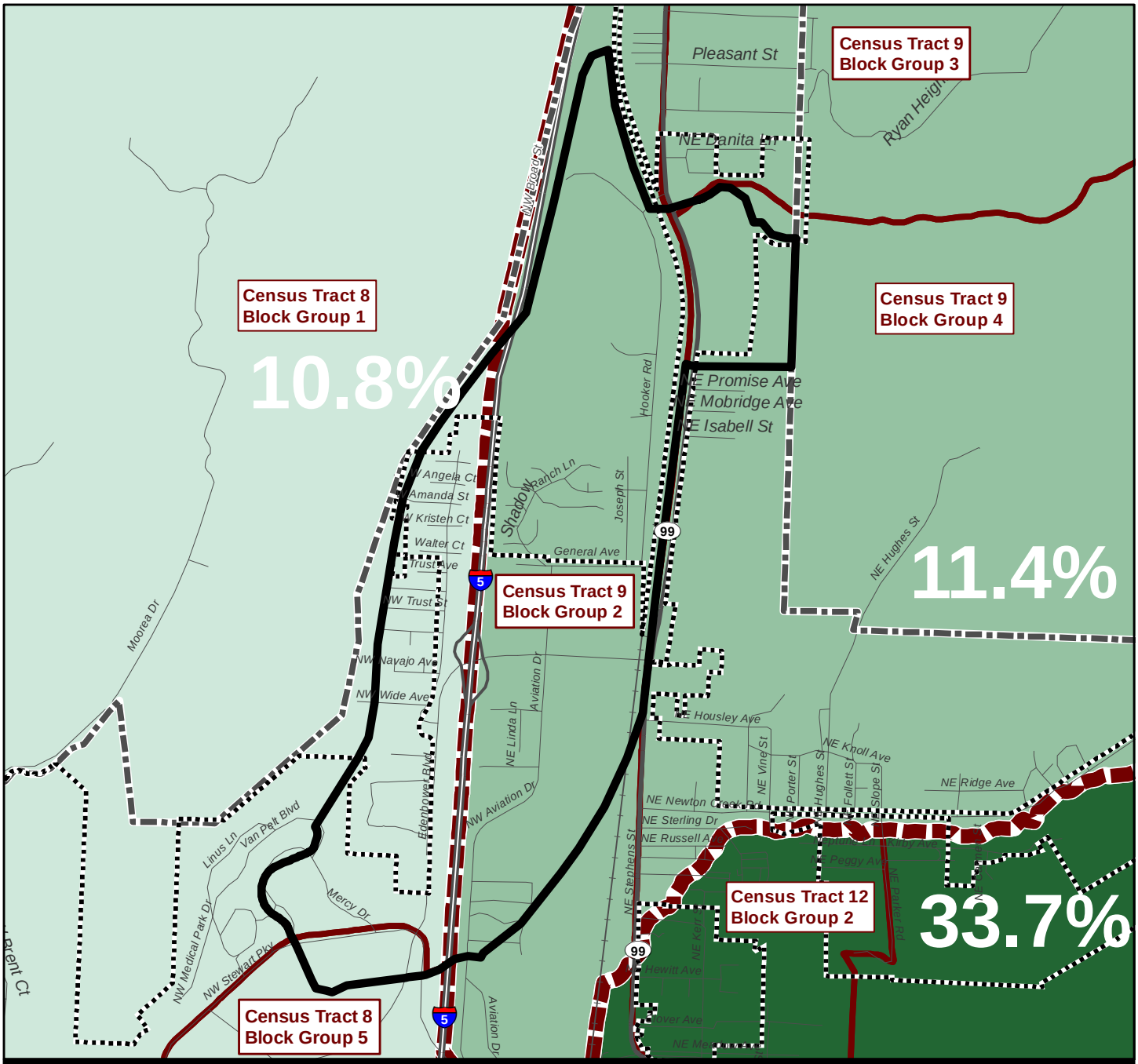
0 1,200 2,400

Feet

Source Info:

City of Roseburg, Oregon, 2010-2012
ESRI, 2009
Federal Emergency Management Agency (FEMA), 2010
Oregon Department of Fish and Wildlife (ODFW), 2012
U.S. Fish and Wildlife Service (USFWS), 2010

Figure 2-5
Natural Features



I-5 Exit 127 (North Roseburg) IAMP

Legend

- Urban Growth Boundary (UGB)
- City Limits
- Interchange Management Study Area (IMSA)
- Census Tract
- Block Group

Transportation

- Interstate
- Highway
- Arterials
- Other Roads
- Railroad

2010 Percent Poverty

- < 10%
- 10% to 20%
- 20% to 30%
- > 30%

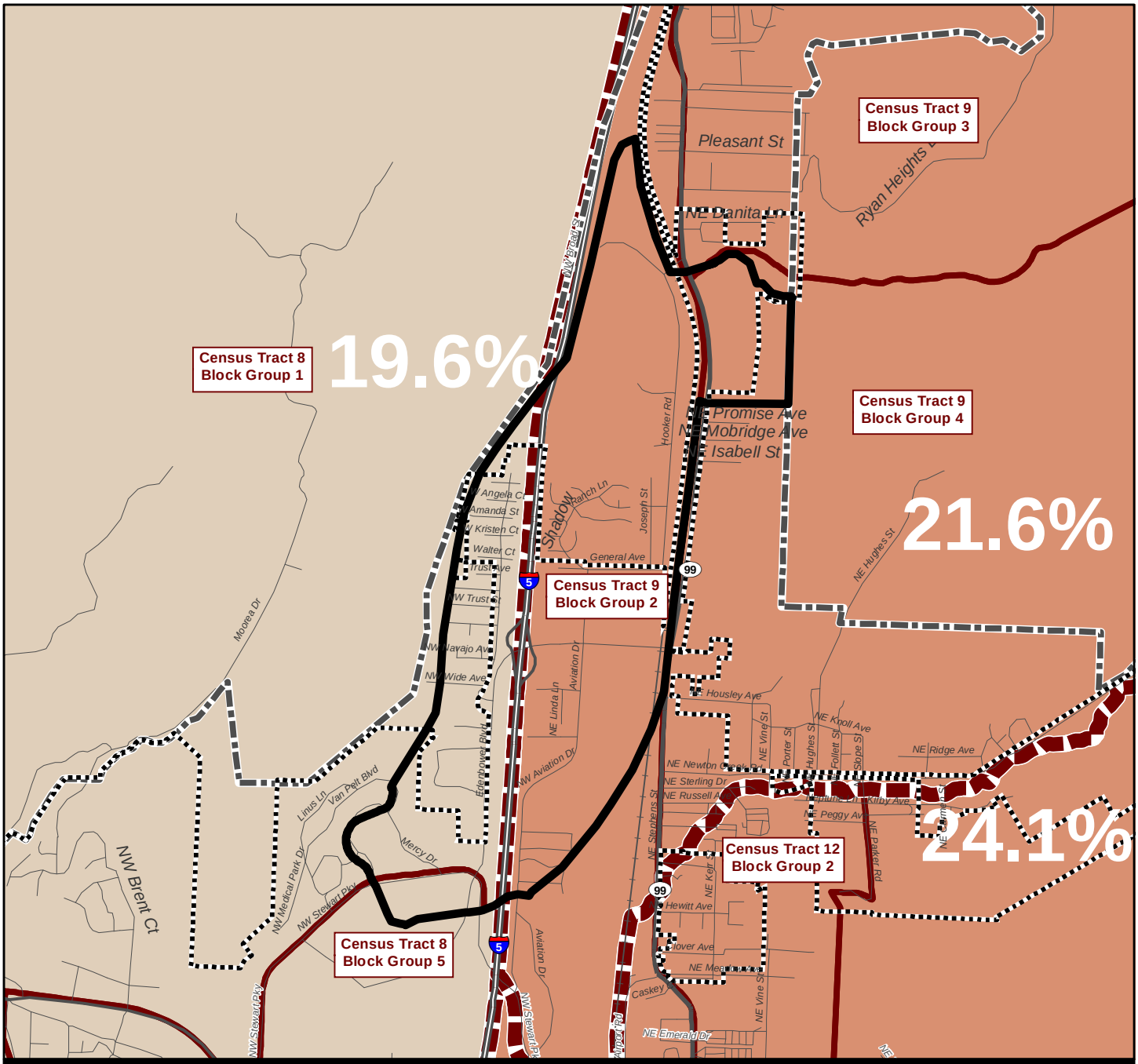
N

0 1,200 2,400

Feet

Source Info:
ACS 5-Year, 2010
City of Roseburg, Oregon, 2010-2012
Douglas County, Oregon, 2010-2012

Figure 2-6
Poverty



I-5 Exit 127 (North Roseburg) IAMP

Legend

- Urban Growth Boundary (UGB)
- City Limits
- Interchange Management Study Area (IMSA)
- Census Tract
- Block Group

Transportation

- Interstate
- Highway
- Arterials
- Other Roads
- Railroad

2010 Percent Disability

- < 20%
- 20% to 30%
- > 30%

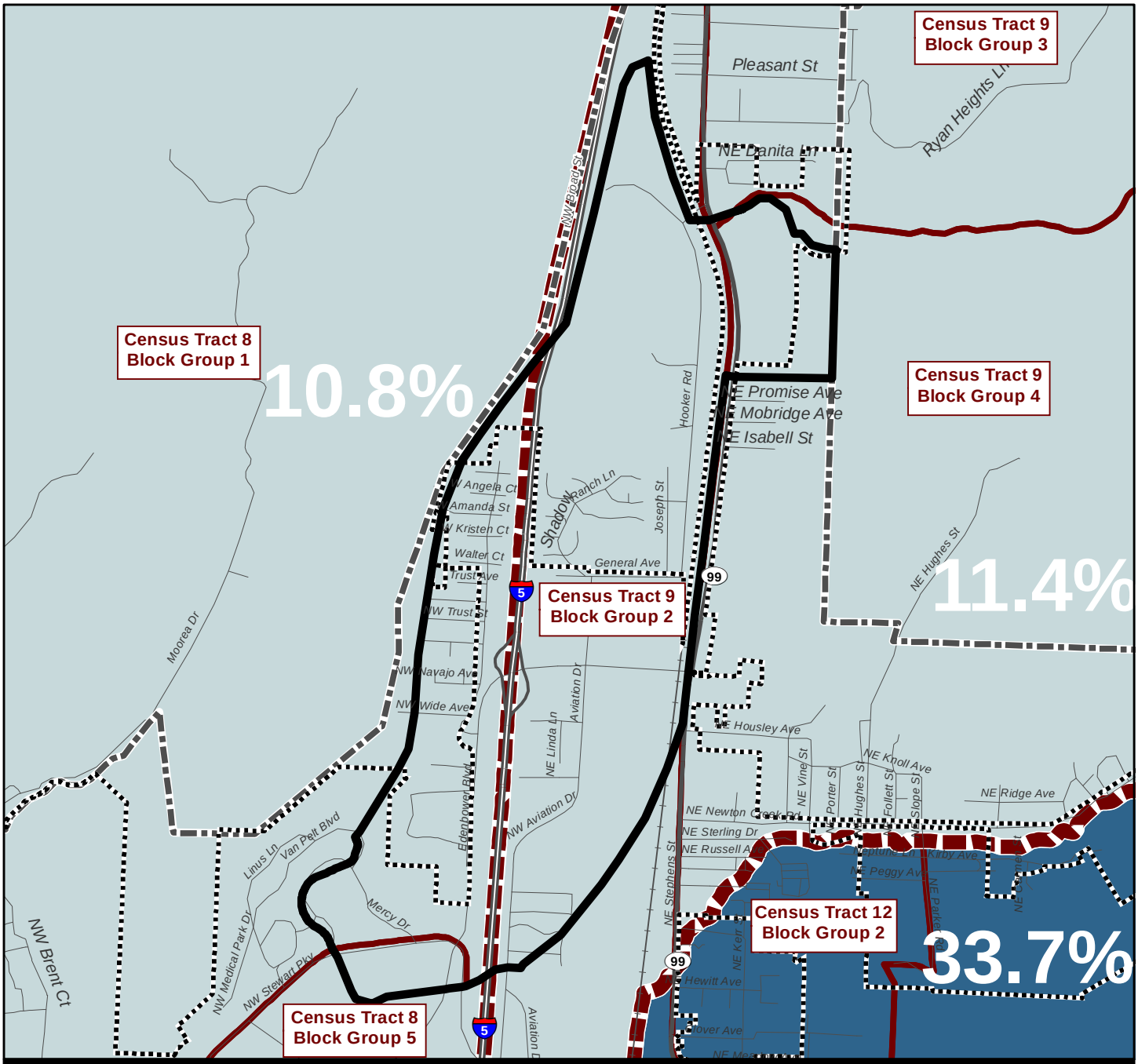
N

0 1,200 2,400

Feet

Source Info:
Census, 2000
City of Roseburg, Oregon, 2010-2012
Douglas County, Oregon, 2010-2012

Figure 2-7
Disability



I-5 Exit 127 (North Roseburg) IAMP

Figure 2-8
Female Head of Household

Legend

- Urban Growth Boundary (UGB)
- City Limits
- Interchange Management Study Area (IMSA)
- Census Tract
- Block Group

Transportation

- Interstate
- Highway
- Arterials
- Other Roads
- Railroad

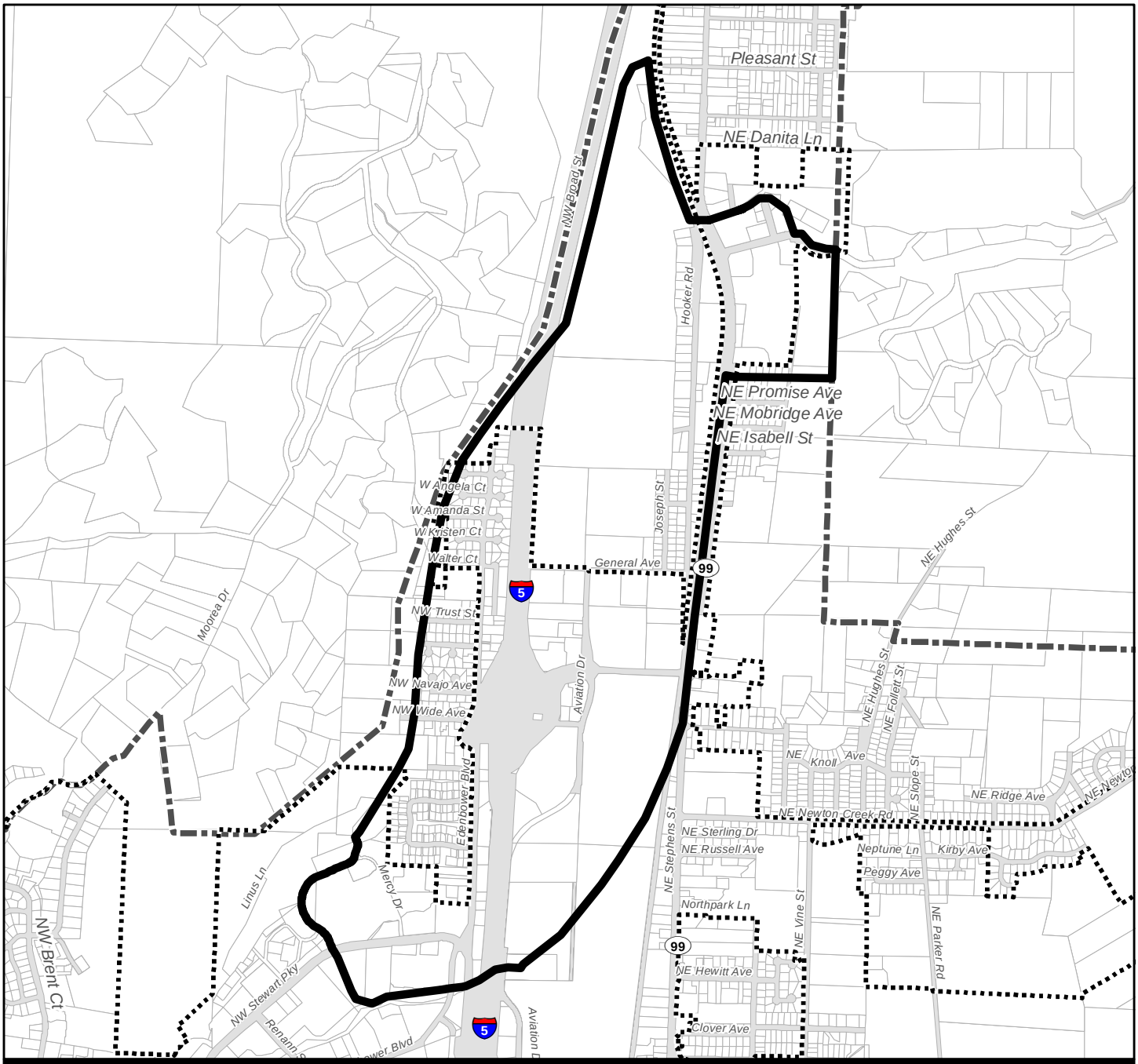
2010 Percent Female Head of Household

- 10% to 20%
- 20% to 30%
- 30% to 40%

N

0 1,200 2,400
Feet

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



I-5 Exit 127 (North Roseburg) IAMP

Legend

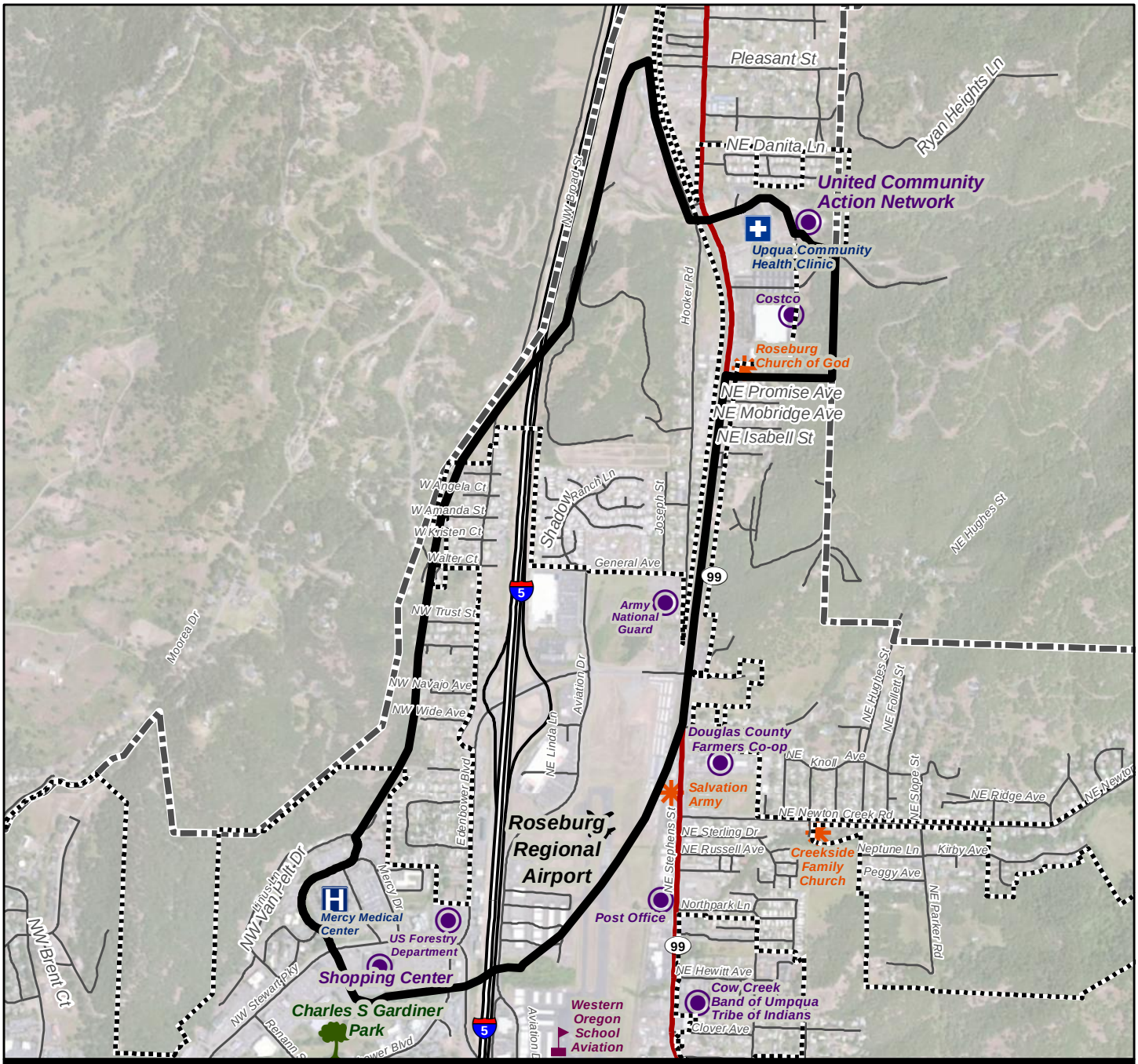
- Urban Growth Boundary (UGB)
- City Limits
- Interchange Management Study Area (IMSA)
- Tax Lots

Figure 2-9
Tax Lots

N

0 1,200 2,400
Feet

Source Info:
City of Roseburg, Oregon, 2010-2012
ESRI, 2009



I-5 Exit 127 (North Roseburg) IAMP

Legend

- Urban Growth Boundary (UGB)
- City Limits
- Interchange Management Study Area (IMSA)
- Interstate
- Highway
- Arterial Road
- Local Road

Community Features

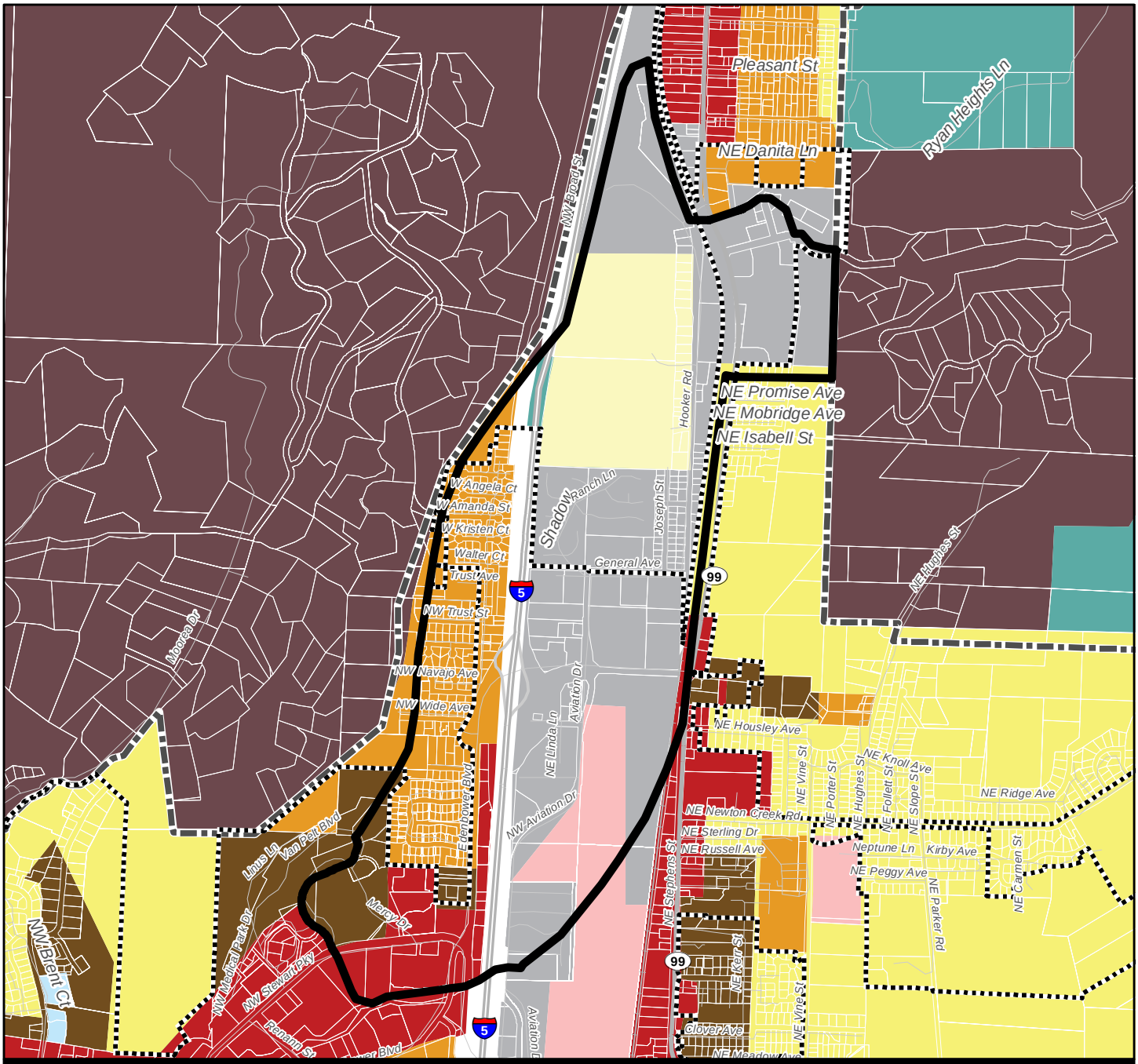
- Airport
- Church
- Hospital
- Park
- Medical Facility
- School
- Other Points of Interest

Figure 2-10
Community Features

N

0 1,200 2,400
Feet

Source Info:
City of Roseburg, Oregon, 2010-2012
ESRI, 2009



I-5 Exit 127 (North Roseburg) IAMP

Legend

- Urban Growth Boundary (UGB)
- City Limits
- Interchange Management Study Area (IMSA)
- Intersections to be Studied

Transportation

- Interstate
- Highway
- Arterials
- Other Roads
- Railroad

CompPlan

City of Roseburg Comprehensive Plan Designations

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

Douglas County Comprehensive Plan Designations

- Agriculture
- Rural Residential

N

0 1,200 2,400

Feet

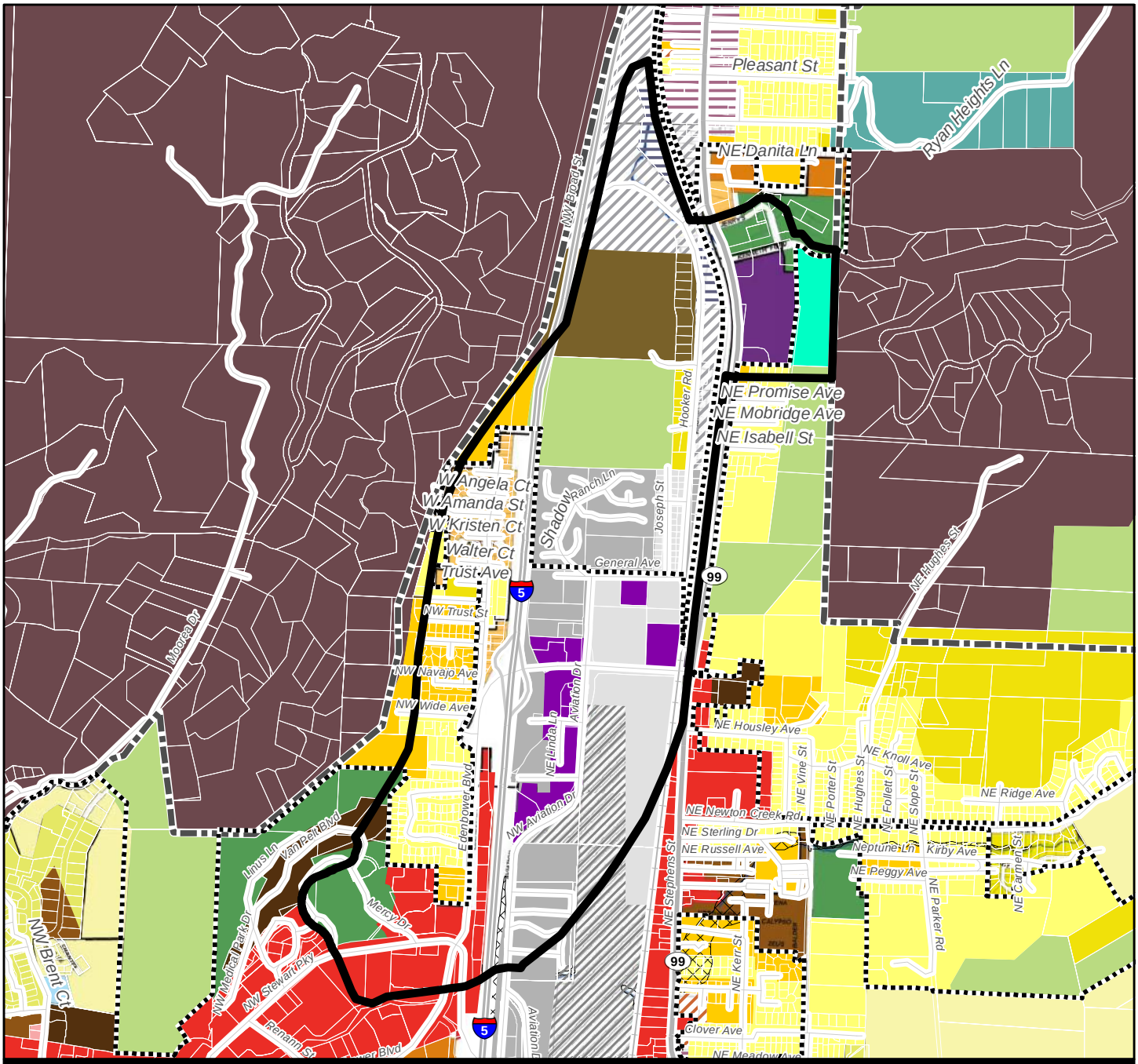
Source Info:

City of Roseburg, Oregon, 2010-2012

Douglas County, Oregon, 2010-2012

Figure 2-11

Comprehensive Plan Designations



I-5 Exit 127 (North Roseburg) IAMP

Legend

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

Transportation

- Interstate
- Highway
- Arterials
- Other Roads
- Railroad

N

0 1,200 2,400

Feet

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)
- Residential Open Space (RO)

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 2-12
Zoning Designations

Appendix A. Traffic Seasonal Factor

IAMP 127 Seasonal Adjustment Factors

Interstate Seasonal Adjustment

ATR 09-020

Year	ADT	AWT JUN	%ADT	AWT JUL	%ADT	
2010	*27361*	*31503*	*115*	*32482*	*119*	High
2009	27242	31316	115	32393	119	
2008	*28041*	*32267*	*115*	*33097*	*118*	Low
2007	31492	36100	115	36052	114	
2006	31315	36048	115	35254	113	
Avg % ADT		115%	115	115%	115.33	
Seasonal Factor		**1.02**		**1.01**		

ATR 10-005

Year	ADT	AWT JUN	%ADT	AWT JUL	%ADT	
2010	*30099*	*33500*	*111*	*35592*	*118*	High
2009	29874	33194	111	35214	118	
2008	29112	31574	108	33422	115	
2007	31958	35309	110	36871	115	
2006	*31519*	*33586*	*107*	*35338*	*112*	Low
Avg % ADT		110%	110	116%	116	
Seasonal Factor		**1.07**		**1.01**		

	June
ATR 09-020	1.02
ATR 10-005	1.07
Average	1.04

Local Network Factor: 1.02

Local Network Seasonal Adjustment

Commuter

Seasonal Peak Period Factor = 0.90

Count Date Seasonal Factor (June 1) = 0.92

Seasonal Adjustment Factor:

1.02

Ramp Factor: 1.04

Appendix B. Traffic Operations Worksheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	665	375	15	85	335	70	35	165	105	55	60	465
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	175.0	175.0	175.0	175.0	175.0	182.0	175.0	175.0	175.0	175.0	175.0	175.0
Lanes	1	2	0	1	2	1	1	1	0	1	1	1
Cap, veh/h	678	1638	65	134	585	272	300	282	180	222	493	1033
Arrive On Green	0.41	0.50	0.49	0.08	0.18	0.18	0.28	0.28	0.27	0.28	0.28	0.29
Sat Flow, veh/h	1667	3261	129	1667	3325	1547	859	999	638	1106	1750	1487
Grp Volume(v), veh/h	715	205	214	91	360	75	38	0	290	59	65	500
Grp Sat Flow(s),veh/h/ln	1667	1663	1727	1667	1663	1547	859	0	1637	1106	1750	1487
Q Serve(g_s), s	36.0	6.2	6.2	4.7	8.9	3.7	3.1	0.0	13.7	4.4	2.5	13.7
Cycle Q Clear(g_c), s	36.0	6.2	6.2	4.7	8.9	3.7	5.5	0.0	13.7	18.1	2.5	13.7
Prop In Lane	1.00		0.07	1.00		1.00	1.00		0.39	1.00		1.00
Lane Grp Cap(c), veh/h	678	835	868	134	585	272	300	0	462	222	493	1033
V/C Ratio(X)	1.06	0.25	0.25	0.68	0.62	0.28	0.13	0.00	0.63	0.27	0.13	0.48
Avail Cap(c_a), veh/h	678	835	868	489	789	367	455	0	758	422	810	1302
HCM Platoon Ratio	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.3	12.5	12.6	39.6	33.7	31.6	25.8	0.0	27.9	35.6	23.7	6.2
Incr Delay (d2), s/veh	50.0	0.4	0.3	2.3	2.5	1.3	0.1	0.0	0.5	0.2	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	23.3	2.4	2.5	2.0	3.8	1.5	0.6	0.0	5.4	1.2	1.0	3.8
Lane Grp Delay (d), s/veh	76.3	12.9	12.9	41.9	36.2	32.9	25.8	0.0	28.5	35.9	23.8	6.4
Lane Grp LOS	F	B	B	D	D	C	C		C	D	C	A
Approach Vol, veh/h		1134			526			328			624	
Approach Delay, s/veh		52.9			36.7			28.2			11.0	
Approach LOS		D			D			C			B	

Timer												
Assigned Phs	5	2		1	6			8			4	
Phs Duration (G+Y+Rc), s	40.0	48.5		11.1	19.6			29.0			29.0	
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0			4.5			4.5	
Max Green Setting (Gmax), s	35.0	30.0		25.0	20.0			40.5			40.5	
Max Q Clear Time (g_c+I1), s	38.0	8.2		6.7	10.9			15.7			20.1	
Green Ext Time (p_c), s	0.0	15.6		0.1	3.7			4.6			4.4	

Intersection Summary	
HCM 2010 Ctrl Delay	36.5
HCM 2010 LOS	D

Notes

Intersection	
Intersection Delay, s/veh	0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	25	30	50	800	550	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	None	None	None	None	None	None
Storage Length	0	0	175			0
Median Width	12			12	12	
Grade, %	0%			0%	0%	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles, %	0	0	0	0	1	0
Mvmt Flow	25	30	51	808	556	15
Number of Lanes	1	0	1	1	1	0

Major/Minor				Major 1	Major 2	
Conflicting Flow All	1472	563	571	0	-	0
Stage 1	563	-	-	-	-	-
Stage 2	909	-	-	-	-	-
Follow-up Headway	3.5	3.3	2.2	-	-	-
Pot Capacity-1 Maneuver	141	530	1012	-	-	-
Stage 1	574	-	-	-	-	-
Stage 2	396	-	-	-	-	-
Time blocked-Platoon, %	0	0	0	-	-	-
Mov Capacity-1 Maneuver	134	530	1012	-	-	-
Mov Capacity-2 Maneuver	265	-	-	-	-	-
Stage 1	574	-	-	-	-	-
Stage 2	376	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.7	0.5	0
HCM LOS	C	-	-

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Cap, veh/h	1012	-	364	-	-
HCM Control Delay, s	8.744	-	16.7	-	-
HCM Lane V/C Ratio	0.05	-	0.15	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th-tile Q, veh	0.2	-	0.5	-	-

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	550	275	270	375	0	0	0	0	100	0	190
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	175.0	180.2	182.0	175.0	0.0				170.1	163.6	175.0
Lanes	0	1	1	1	1	0				0	1	1
Cap, veh/h	0	868	759	522	1187	0				297	0	284
Arrive On Green	0.00	0.50	0.00	0.23	1.00	0.00				0.18	0.00	0.19
Sat Flow, veh/h	0	1750	1532	1733	1750	0				1558	0	1487
Grp Volume(v), veh/h	0	591	0	290	403	0				108	0	204
Grp Sat Flow(s),veh/h/ln	0	1750	1532	1733	1750	0				1558	0	1487
Q Serve(g_s), s	0.0	15.7	0.0	4.8	0.0	0.0				3.7	0.0	7.9
Cycle Q Clear(g_c), s	0.0	15.7	0.0	4.8	0.0	0.0				3.7	0.0	7.9
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	868	759	522	1187	0				297	0	284
V/C Ratio(X)	0.00	0.68	0.00	0.56	0.34	0.00				0.36	0.00	0.72
Avail Cap(c_a), veh/h	0	929	814	616	1344	0				509	0	486
HCM Platoon Ratio	0.00	0.00	0.00	0.00	0.00	0.00				0.00	0.00	0.00
Upstream Filter(I)	0.00	1.00	0.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	11.7	0.0	7.4	0.0	0.0				21.7	0.0	23.2
Incr Delay (d2), s/veh	0.0	4.3	0.0	0.7	0.8	0.0				0.9	0.0	4.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	0.0	6.5	0.0	1.2	0.3	0.0				1.5	0.0	3.1
Lane Grp Delay (d), s/veh	0.0	16.0	0.0	8.1	0.8	0.0				22.6	0.0	27.3
Lane Grp LOS		B		A	A					C		C
Approach Vol, veh/h		591			693						312	
Approach Delay, s/veh		16.0			3.8						25.7	
Approach LOS		B			A						C	

Timer												
Assigned Phs		2		1	6						4	
Phs Duration (G+Y+Rc), s		34.3		11.2	45.5						15.7	
Change Period (Y+Rc), s		4.5		4.0	4.5						4.0	
Max Green Setting (Gmax), s		32.0		10.5	46.5						20.0	
Max Q Clear Time (g_c+I1), s		17.7		6.8	2.0						9.9	
Green Ext Time (p_c), s		12.1		0.4	31.3						1.9	

Intersection Summary		
HCM 2010 Ctrl Delay		12.6
HCM 2010 LOS		B

Notes

Intersection	
Intersection Delay, s/veh	2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	445	205	0	600	115	45	0	240	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	Free	Free	Free	None	None	None	None	None	None	None	None	None
Storage Length	0		90	0		175	0		0	0		0
Median Width		14			14			0			0	
Grade, %		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles, %	0	1	1	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	489	225	0	659	126	49	0	264	0	0	0
Number of Lanes	0	1	1	0	1	1	0	1	1	0	0	0

Major/Minor	Major 1			Major 2			Minor 1		
Conflicting Flow All	659	0	0	489	0	0	1148	1148	489
Stage 1	-	-	-	-	-	-	489	489	-
Stage 2	-	-	-	-	-	-	659	659	-
Follow-up Headway	2.2	-	-	2.2	-	-	3.5	4	3.3
Pot Capacity-1 Maneuver	939	-	-	1085	-	-	222	200	583
Stage 1	-	-	-	-	-	-	621	553	-
Stage 2	-	-	-	-	-	-	518	464	-
Time blocked-Platoon, %	0	-	-	0	-	-	0	0	0
Mov Capacity-1 Maneuver	939	-	-	1085	-	-	222	0	583
Mov Capacity-2 Maneuver	-	-	-	-	-	-	222	0	-
Stage 1	-	-	-	-	-	-	621	0	-
Stage 2	-	-	-	-	-	-	518	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	16.7
HCM LOS	-	-	C

Minor Lane / Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR
Cap, veh/h	368	583	939	-	-	1085	-	-
HCM Control Delay, s	20.5	13.8	0	-	-	0	-	-
HCM Lane V/C Ratio	0.37	0.30	-	-	-	-	-	-
HCM Lane LOS	C	B	A	-	-	A	-	-
HCM 95th-tile Q, veh	1.7	1.3	0.0	-	-	0.0	-	-

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	100	510	75	30	495	75	65	25	45	55	40	155
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	182.0	173.3	169.9	182.0	175.0	182.0	175.0	175.0	175.0	175.0	175.0	175.0
Lanes	1	1	1	1	1	1	1	1	0	1	1	1
Cap, veh/h	363	827	689	535	770	681	381	93	167	370	274	309
Arrive On Green	0.14	0.95	0.00	0.03	0.44	0.44	0.06	0.17	0.15	0.05	0.16	0.15
Sat Flow, veh/h	1733	1733	1444	1733	1750	1547	1667	563	1009	1667	1750	1487
Grp Volume(v), veh/h	116	593	0	35	576	87	76	0	81	64	47	180
Grp Sat Flow(s),veh/h/ln	1733	1733	1444	1733	1750	1547	1667	0	1572	1667	1750	1487
Q Serve(g_s), s	2.0	2.9	0.0	0.7	16.0	1.9	2.2	0.0	2.7	1.8	1.4	6.4
Cycle Q Clear(g_c), s	2.0	2.9	0.0	0.7	16.0	1.9	2.2	0.0	2.7	1.8	1.4	6.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.64	1.00		1.00
Lane Grp Cap(c), veh/h	363	827	689	535	770	681	381	0	259	370	274	309
V/C Ratio(X)	0.32	0.72	0.00	0.07	0.75	0.13	0.20	0.00	0.31	0.17	0.17	0.58
Avail Cap(c_a), veh/h	542	862	719	690	781	690	623	0	297	626	330	357
HCM Platoon Ratio	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Upstream Filter(I)	1.00	1.00	0.00	0.76	0.76	0.76	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.4	0.8	0.0	8.9	13.6	9.7	18.3	0.0	21.7	19.0	21.3	20.8
Incr Delay (d2), s/veh	0.4	5.3	0.0	0.0	5.0	0.3	0.2	0.0	0.5	0.2	0.2	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	0.6	1.5	0.0	0.2	6.7	0.7	0.8	0.0	1.0	0.7	0.6	2.3
Lane Grp Delay (d), s/veh	9.8	6.0	0.0	8.9	18.7	10.0	18.5	0.0	22.2	19.2	21.5	22.2
Lane Grp LOS	A	A		A	B	A	B		C	B	C	C
Approach Vol, veh/h		709			698			157			291	
Approach Delay, s/veh		6.7			17.1			20.4			21.4	
Approach LOS		A			B			C			C	

Timer												
Assigned Phs	5	2		1	6		3	8		7	4	
Phs Duration (G+Y+Rc), s	8.0	31.8		5.8	29.6		7.5	13.6		7.0	13.1	
Change Period (Y+Rc), s	4.5	5.5		4.5	5.5		4.5	4.5		4.5	4.5	
Max Green Setting (Gmax), s	9.5	27.5		6.5	24.5		11.5	10.5		11.5	10.5	
Max Q Clear Time (g_c+I1), s	4.0	4.9		2.7	18.0		4.2	4.7		3.8	8.4	
Green Ext Time (p_c), s	0.1	20.2		0.0	6.1		0.1	0.7		0.1	0.3	

Intersection Summary	
HCM 2010 Ctrl Delay	14.1
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	340	5	250	5	10	5	295	395	5	5	375	295
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	182.0	171.6	171.6	175.0	175.0	175.0	180.2	175.0	175.0	182.0	173.3	175.0
Lanes	1	1	0	1	1	0	1	2	0	1	2	1
Cap, veh/h	516	8	431	241	343	156	359	1880	22	7	1163	526
Arrive On Green	0.30	0.30	0.29	0.30	0.30	0.29	0.21	0.56	0.55	0.00	0.35	0.35
Sat Flow, veh/h	1476	27	1436	1126	1140	518	1716	3365	40	1733	3292	1487
Grp Volume(v), veh/h	362	0	271	5	0	16	314	207	218	5	399	314
Grp Sat Flow(s),veh/h/ln	1476	0	1463	1126	0	1659	1716	1663	1743	1733	1646	1487
Q Serve(g_s), s	20.1	0.0	14.0	0.3	0.0	0.6	15.5	5.5	5.5	0.3	7.8	15.1
Cycle Q Clear(g_c), s	20.7	0.0	14.0	14.3	0.0	0.6	15.5	5.5	5.5	0.3	7.8	15.1
Prop In Lane	1.00		0.98	1.00		0.31	1.00		0.02	1.00		1.00
Lane Grp Cap(c), veh/h	516	0	440	241	0	498	359	929	973	7	1163	526
V/C Ratio(X)	0.70	0.00	0.62	0.02	0.00	0.03	0.88	0.22	0.22	0.74	0.34	0.60
Avail Cap(c_a), veh/h	848	0	769	494	0	871	510	968	1015	218	1354	612
HCM Platoon Ratio	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.9	0.0	26.5	32.5	0.0	21.7	33.5	9.7	9.8	43.6	20.8	23.2
Incr Delay (d2), s/veh	1.8	0.0	1.4	0.0	0.0	0.0	10.5	0.2	0.2	73.1	0.3	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	7.3	0.0	5.1	0.1	0.0	0.2	7.5	2.0	2.1	0.2	3.0	5.5
Lane Grp Delay (d), s/veh	30.7	0.0	27.9	32.5	0.0	21.7	44.0	10.0	10.0	116.6	21.1	25.2
Lane Grp LOS	C		C	C		C	D	A	A	F	C	C
Approach Vol, veh/h		633			21			739			718	
Approach Delay, s/veh		29.5			24.3			24.4			23.6	
Approach LOS		C			C			C			C	

Timer								
Assigned Phs		8			4		1	6		5	2	
Phs Duration (G+Y+Rc), s		30.3			30.3		22.3	52.9		4.3	34.9	
Change Period (Y+Rc), s		4.0			4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s		46.0			46.0		26.0	51.0		11.0	36.0	
Max Q Clear Time (g_c+I1), s		22.7			16.3		17.5	7.5		2.3	17.1	
Green Ext Time (p_c), s		3.6			3.8		0.8	24.9		0.0	13.8	

Intersection Summary	
HCM 2010 Ctrl Delay	25.7
HCM 2010 LOS	C

Notes

Merge and Diverge Analysis

	Volumes		Merge		Diverge		
	Mainline Volume	Ramp Volume	Primary	Secondary	Downstream Primary	Ramp Flow Primary	Upstream Secondary
Northbound Diverge	1420	285			0.24	0.14	0.30
Eastbound to Northbound Merge	1135	205	0.29	0.29			
Westbound to Northbound Merge	1345	130	0.32	0.31			
Southbound Diverge	1210	285			0.20	0.14	0.26
Southbound Merge	925	460	0.30	0.29			

Equations for V/C Analysis in Merge/Diverge Sections

Merge

Merge influence area (primary)

$$\frac{V_{MAINLINE} + V_{RAMP}}{4600}$$

Downstream basic freeway segment (secondary) [1]

$$\frac{V_{MAINLINE} + V_{RAMP}}{4700}$$

Diverge

Downstream freeway leg (primary) [2]

$$\frac{V_{MAINLINE} - V_{RAMP}}{4700}$$

Ramp flow (primary)

Standard Diamond [3,5,6]

$$\frac{V_{RAMP}}{2200} ; \frac{V_{RAMP}}{2100} ; \frac{V_{RAMP}}{2000}$$

Folded Diamond [4]

$$\frac{V_{RAMP}}{1900}$$

Freeway flow upstream of the diverge (secondary) [2]

$$\frac{V_{MAINLINE}}{4700}$$

Flow rate entering lanes 1 and 2 immediately upstream of he deceleration lane (secondary)

$$\frac{V_{MAINLINE}}{4400}$$

See TPAU pg. 6-5

1. Exhibit 25-7, 65 mph, 2-lane facility
2. Exhibit 25-14, 2-lane facility 65 mph
3. Exhibit 25-3, 1-lane 50 mph exit speed
4. Exhibit 25-3, 1-lane 25mph
5. Exhibit 25-3. 1-lane 45 mph exit speed
6. Exhibit 25-3. 1-lane 30 mph exit speed

Merge and Diverge Analysis

Direction/Location	V/C Ratio PM Peak Hour
I-5 Northbound	
Mainline South of IC 127	0.30
Diverge: IC 127 Northbound Off Ramp	0.14
Mainline between Off and On Ramps	0.24
Merge: IC 127 Eastbound to Northbound On Ramp	0.29
Mainline between On Ramps	0.29
Merge: IC 127 Westbound to Northbound On Ramp	0.32
Mainline North of IC 33	0.31
I-5 Southbound	
Mainline North of IC 127	0.26
Diverge: IC 127 Southbound Off Ramp	0.20
Mainline between Off and On Ramps	0.14
Merge: IC 127 Southbound On Ramp	0.30
Mainline South of IC 127	0.29

PM Peak Hour

NB	Main S	1420
	NB Off	285
	Through	1135
	EB to NB On	205
	Through	1345
	WB to NB On	130
	Main N	1475
SB	Main N	1210
	SB Off	285
	Through	925
	SB On	460
	Main S	1385

Appendix C. ODOT Crash Analysis Reports

(January 1, 2005 through December 31, 2007)

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CITY STREET LOCATIONS BY COUNTY - DRIVER BEHAVIOR FORMAT

Aviation Drive @ Edenbower Boulevard

January 1, 2006 through December 31, 2010

DOUGLAS COUNTY

SERIAL NO	DATE	TIME	DAY	*COUNTY OR CITY NAME	CRASH LOCATION	COLL TYPE	EVENT	CAUSE	ERROR	SURF	TOTVEH	VEHICLE TYP/OWN #1	#2	PEOPLE KILL	INJ	ALC	SPED
00930	08/21/2007	4P	TU	Roseburg	AVIATION DR AT EDENBOWER BLVD	OTH	028,080	24,10	085	DRY	2	011	011	0	0	N	N
00778	06/25/2006	6P	SU	Roseburg	AVIATION DR AT EDENBOWER BLVD	ANGL		02	028	DRY	2	011	011	0	0	N	N
01249	12/16/2009	12P	WE	Roseburg	AVIATION DR AT EDENBOWER BLVD	ANGL		04	020	DRY	2	011	011	0	0	N	N
01165	10/01/2007	2P	MO	Roseburg	AVIATION DR AT EDENBOWER BLVD	REAR		07	026	DRY	2	041	011	0	0	N	N
00814	08/31/2008	4P	SU	Roseburg	AVIATION DR AT EDENBOWER BLVD	REAR		07	042	DRY	2	011	011	0	5	N	N
00739	08/17/2009	5P	MO	Roseburg	AVIATION DR AT EDENBOWER BLVD	REAR		07	026	DRY	2	011	011	0	0	N	N
00830	09/12/2009	1P	SA	Roseburg	AVIATION DR AT EDENBOWER BLVD	REAR		07	026	DRY	2	011	011	0	1	N	N
00782	08/04/2010	3P	WE	Roseburg	AVIATION DR AT EDENBOWER BLVD	REAR	013	07	043	DRY	3	011	011	0	1	N	N
01016	09/18/2007	10A	TU	Roseburg	AVIATION DR AT EDENBOWER BLVD	TURN		02	004,028	DRY	2	011	011	0	1	N	N

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
STATE HIGHWAY SYSTEM CRASH LOCATIONS - DRIVER BEHAVIOR FORMAT

Edenbower Boulevard from Stephens Street to Stewart Parkway
January 1, 2006 through December 31, 2010

SERIAL NO	DATE	TIME	DAY	*COUNTY OR CITY NAME	COMPNT	MLGTYP	CRASH LOCATION	COLL TYPE	EVENT	CAUSE	ERROR	SUR F	TOTVEH	VEHICLE TYP/OWN #1	VEHICLE TYP/OWN #2	--PEOPLE-- KILL	INJ	ALC	SPED
00926	10/06/2008	5P	MO	Roseburg	CN	R	HY 001, PACIFIC AT MP 126.61	TURN		02	028	DRY	2	011	011	0	0	N	N

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CITY STREET LOCATIONS BY COUNTY - DRIVER BEHAVIOR FORMAT

Edenbower Boulevard from Stephens Street to Stewart Parkway
January 1, 2006 through December 31, 2010

DOUGLAS COUNTY

SERIAL NO	DATE	TIME	DAY	*COUNTY OR CITY NAME	CRASH LOCATION	COLL TYPE	EVENT	CAUSE	ERROR	SURF	TOTVEH	VEHICLE TYP/OWN #1	#2	PEOPLE KILL	INJ	ALC	SPED
00778	06/25/2006	6P	SU	Roseburg	AVIATION DR AT EDENBOWER BLVD	ANGL		02	028	DRY	2	011	011	0	0	N	N
01249	12/16/2009	12P	WE	Roseburg	AVIATION DR AT EDENBOWER BLVD	ANGL		04	020	DRY	2	011	011	0	0	N	N
01016	09/18/2007	10A	TU	Roseburg	AVIATION DR AT EDENBOWER BLVD	TURN		02	004,028	DRY	2	011	011	0	1	N	N
00023	01/03/2008	4P	TH	Roseburg	EDENBOWER BLVD UNK FT UN OF AVIATION DR	FIX	079	10	081	DRY	1	011		0	0	N	N
00087	01/08/2008	4P	TU	Roseburg	EDENBOWER BLVD 50 FT E OF AVIATION DR	REAR		07	026	WET	2	011	011	0	3	N	N
00642	07/22/2009	2P	WE	Roseburg	EDENBOWER BLVD AT STEPHENS ST	BACK		10	011	DRY	2	011	011	0	0	N	N
00355	04/09/2010	9A	FR	Roseburg	EDENBOWER BLVD AT STEPHENS ST	BACK		10	011	DRY	2	041	011	0	0	N	N
00006	01/17/2008	4P	TH	Roseburg	EDENBOWER BLVD AT STEPHENS ST	REAR		10	026	ICE	2	011	011	0	0	N	N
00723	08/14/2008	4P	TH	Roseburg	EDENBOWER BLVD AT STEPHENS ST	REAR	093	07	014	DRY	2	011	011	0	1	N	N
00818	09/09/2008	2P	TU	Roseburg	EDENBOWER BLVD AT STEPHENS ST	REAR		07	043	DRY	2	011	011	0	1	N	N
00956	10/04/2010	7P	MO	Roseburg	EDENBOWER BLVD AT STEPHENS ST	REAR		07	026	DRY	2	011	011	0	0	N	N
01522	11/29/2006	2P	WE	Roseburg	EDENBOWER BLVD AT STEPHENS ST	TURN		27	014	DRY	2	011	011	0	0	N	N
00418	05/07/2008	3P	WE	Roseburg	EDENBOWER BLVD AT STEPHENS ST	TURN		04	020	DRY	2	011	011	0	1	N	N
00859	09/23/2009	4P	WE	Roseburg	EDENBOWER BLVD AT STEPHENS ST	TURN		04	004,020	DRY	2	011	011	0	1	N	N
00991	10/12/2010	7P	TU	Roseburg	EDENBOWER BLVD AT STEPHENS ST	TURN		04	020	DRY	2	011	011	0	0	N	N
00569	06/01/2008	1P	SU	Roseburg	EDENBOWER BLVD 250 FT W OF STEPHENS ST	REAR	093	07,27	016,026	DRY	2	011	011	0	2	N	N
00195	02/15/2008	6P	FR	Roseburg	EDENBOWER BLVD 300 FT W OF STEPHENS ST	REAR		07	026	DRY	2	011	011	0	0	N	N
00472	06/02/2009	3P	TU	Roseburg	EDENBOWER BLVD 2000 FT UN OF STEPHENS ST	TURN		02	028	DRY	2	011	011	0	1	N	N
00158	01/01/2006	6P	SU	Roseburg	EDENBOWER BLVD AT STEWART PKY	ANGL		04	020	WET	2	011	011	0	1	N	N
01124	10/11/2007	2P	TH	Roseburg	EDENBOWER BLVD AT STEWART PKY	ANGL		04,27	016,020	DRY	2	011	011	0	3	N	N
00821	09/08/2009	1P	TU	Roseburg	EDENBOWER BLVD AT STEWART PKY	ANGL		04	097,097	DRY	2	011	011	0	0	N	N
00118	01/25/2006	3P	WE	Roseburg	EDENBOWER BLVD AT STEWART PKY	REAR		07	014	WET	2	011	011	0	2	N	N
01477	12/18/2007	10A	TU	Roseburg	EDENBOWER BLVD AT STEWART PKY	REAR	010,001	07,27	043	WET	2	011	093	0	1	N	N
00088	01/28/2009	5P	WE	Roseburg	EDENBOWER BLVD AT STEWART PKY	REAR		07	026	WET	2	011	011	0	1	N	N
00845	09/11/2009	3P	FR	Roseburg	EDENBOWER BLVD AT STEWART PKY	REAR		07	026	DRY	2	011	011	0	2	N	N
01032	10/29/2009	7P	TH	Roseburg	EDENBOWER BLVD AT STEWART PKY	REAR		07	026	WET	2	011	011	0	2	N	N
01198	11/02/2009	12P	MO	Roseburg	EDENBOWER BLVD AT STEWART PKY	REAR		07	026	DRY	2	011	011	0	0	N	N
00151	02/20/2010	3P	SA	Roseburg	EDENBOWER BLVD AT STEWART PKY	REAR		07	014	DRY	2	011	011	0	1	N	N
00483	05/26/2010	1P	WE	Roseburg	EDENBOWER BLVD AT STEWART PKY	REAR		07	026	WET	2	011	011	0	1	N	N
01079	11/20/2008	3P	TH	Roseburg	EDENBOWER BLVD AT STEWART PKY	SS-M	013	05	039	WET	3	011	011	0	0	N	N
01283	10/04/2006	2P	WE	Roseburg	EDENBOWER BLVD AT STEWART PKY	SS-O		13	003	DRY	2	011	011	0	0	N	N
00659	06/15/2007	11A	FR	Roseburg	EDENBOWER BLVD AT STEWART PKY	SS-O		13	045	DRY	2	011	011	0	0	N	N
00109	02/03/2009	3P	TU	Roseburg	EDENBOWER BLVD AT STEWART PKY	SS-O		13	045	DRY	2	011	011	0	1	N	N
00098	02/02/2010	10P	TU	Roseburg	EDENBOWER BLVD AT STEWART PKY	SS-O		13	045	WET	2	011	011	0	0	N	N
00545	06/23/2010	5P	WE	Roseburg	EDENBOWER BLVD AT STEWART PKY	SS-O		13	045	DRY	2	011	011	0	0	N	N
00570	05/11/2006	9A	TH	Roseburg	EDENBOWER BLVD AT STEWART PKY	TURN		02	004,028	DRY	2	011	011	0	0	N	N
00356	03/19/2007	9P	MO	Roseburg	EDENBOWER BLVD AT STEWART PKY	TURN		02	004,028	DRY	2	011	011	0	1	N	N
00747	08/18/2008	8A	MO	Roseburg	EDENBOWER BLVD AT STEWART PKY	TURN		01,08	047,007	WET	3	011	051	0	0	N	Y
01080	10/21/2009	11A	WE	Roseburg	EDENBOWER BLVD AT STEWART PKY	TURN		01	047,080	WET	2	011	011	0	1	N	Y
01082	11/03/2010	2P	WE	Roseburg	EDENBOWER BLVD 40 FT SW OF STEWART PKY	REAR		07	026	DRY	2	011	011	0	1	N	N
00263	02/09/2007	12P	FR	Roseburg	EDENBOWER BLVD 50 FT NE OF STEWART PKY	REAR	013	07	026	WET	3	011	011	0	0	N	N
01282	11/29/2007	1P	TH	Roseburg	EDENBOWER BLVD 50 FT NE OF STEWART PKY	REAR		07	026	DRY	2	011	011	0	0	N	N
00041	01/14/2008	5P	MO	Roseburg	EDENBOWER BLVD 70 FT NE OF STEWART PKY	REAR	013	07	026	WET	3	011	011	0	0	N	N
00774	08/13/2009	4P	TH	Roseburg	EDENBOWER BLVD 80 FT NE OF STEWART PKY	REAR		07	026	DRY	2	011	011	0	0	N	N
00125	01/28/2006	11A	SA	Roseburg	EDENBOWER BLVD 100 FT NE OF STEWART PKY	REAR	013	01	047	WET	3	011	011	0	1	N	Y
00229	02/02/2006	2P	TH	Roseburg	EDENBOWER BLVD 100 FT NE OF STEWART PKY	REAR		10	026	DRY	2	011	011	0	0	N	N
00758	07/02/2007	11A	MO	Roseburg	EDENBOWER BLVD 100 FT NE OF STEWART PKY	REAR	002	07,27	016,026	DRY	2	011	011	0	3	N	N
00811	07/17/2007	12P	TU	Roseburg	EDENBOWER BLVD 100 FT NE OF STEWART PKY	REAR		07,27	014,026	DRY	2	011	011	0	0	N	N
00149	02/21/2008	2P	TH	Roseburg	EDENBOWER BLVD 100 FT NE OF STEWART PKY	REAR		07	014,026	DRY	2	011	011	0	0	N	N
01139	11/13/2009	1P	FR	Roseburg	EDENBOWER BLVD 100 FT NE OF STEWART PKY	REAR		32,07	052,026	WET	2	011	011	0	1	N	N
01016	10/20/2010	5P	WE	Roseburg	EDENBOWER BLVD 100 FT NE OF STEWART PKY	REAR		07	026	DRY	2	011	011	0	1	N	N

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CITY STREET LOCATIONS BY COUNTY - DRIVER BEHAVIOR FORMAT

Edenbower Boulevard from Stephens Street to Stewart Parkway
January 1, 2006 through December 31, 2010

DOUGLAS COUNTY

SERIAL NO	DATE	TIME	DAY	*COUNTY OR CITY NAME	CRASH LOCATION	COLL TYPE	EVENT	CAUSE	ERROR	SURF	TOTVEH	VEHICLE TYP/OWN #1	#2	PEOPLE KILL	INJ	ALC	SPED
01632	12/03/2006	6P	SU	Roseburg	EDENBOWER BLVD 100 FT SW OF STEWART PKY	TURN		08	006	DRY	2	011	011	0	0	N	N
01102	11/19/2010	12P	FR	Roseburg	EDENBOWER BLVD 175 FT NE OF STEWART PKY	REAR		07	014	WET	2	011	011	0	1	N	N
00083	01/11/2006	12P	WE	Roseburg	EDENBOWER BLVD 200 FT NE OF STEWART PKY	REAR		10,22	026	WET	2	011	011	0	2	N	N
00615	07/12/2010	2P	MO	Roseburg	EDENBOWER BLVD 200 FT NE OF STEWART PKY	REAR	013	07	026	DRY	3	011	011	0	1	N	N
00172	03/06/2010	2P	SA	Roseburg	EDENBOWER BLVD 300 FT NE OF STEWART PKY	REAR	003	07	043	DRY	2	011	011	0	2	N	N
00188	02/11/2008	11A	MO	Roseburg	EDENBOWER BLVD 455 FT SW OF STEWART PKY	TURN		02	028	DRY	2	011	011	0	0	N	N
00466	05/25/2010	4P	TU	Roseburg	EDENBOWER BLVD 500 FT SW OF STEWART PKY	REAR	013	07	042	DRY	3	011	011	0	1	N	N
00676	06/20/2007	9P	WE	Roseburg	EDENBOWER BLVD 500 FT NE OF STEWART PKY	TURN		02,32	004,028,052	DRY	2	011	011	0	0	N	N
00565	05/09/2006	12P	TU	Roseburg	EDENBOWER BLVD 700 FT NE OF STEWART PKY	TURN		08	006	DRY	2	011	011	0	0	N	N
00336	04/09/2008	2P	WE	Roseburg	EDENBOWER BLVD 845 FT NE OF STEWART PKY	REAR		07	026	DRY	2	011	011	0	0	N	N
00828	07/21/2007	8P	SA	Roseburg	EDENBOWER BLVD AT SWEETBRIAR AVE	TURN	001	02	027	DRY	1	011		0	1	N	N
01210	12/09/2010	7A	TH	Roseburg	EDENBOWER BLVD AT SWEETBRIAR AVE	TURN		02	028	WET	2	011	011	0	1	N	N

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
STATE HIGHWAY SYSTEM CRASH LOCATIONS - DRIVER BEHAVIOR FORMAT

Northbound I-5 (Hwy 001) ramp terminal @ Edenbower Boulevard
January 1, 2006 through December 31, 2010

SERIAL NO	DATE	TIME	DAY	*COUNTY OR CITY NAME	COMPNT	MLGTYP	CRASH LOCATION	COLL TYPE	EVENT	CAUSE	ERROR	SURF	TOTVEH	VEHICLE TYP/OWN #1	VEHICLE TYP/OWN #2	--PEOPLE-- KILL	INJ	ALC	SPED
00926	10/06/2008	5P	MO	Roseburg	CN	R	HY 001, PACIFIC AT MP 126.61	TURN		02	028	DRY	2	011	011	0	0	N	N

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CITY STREET LOCATIONS BY COUNTY - DRIVER BEHAVIOR FORMAT

Stephens Street @ Edenbower Boulevard

January 1, 2006 through December 31, 2010

DOUGLAS COUNTY

SERIAL NO	DATE	TIME	DAY	*COUNTY OR CITY NAME	CRASH LOCATION	COLL TYPE	EVENT	CAUSE	ERROR	SURF	TOTVEH	VEHICLE TYP/OWN #1	#2	PEOPLE KILL	INJ	ALC	SPED
00642	07/22/2009	2P	WE	Roseburg	EDENBOWER BLVD AT STEPHENS ST	BACK		10	011	DRY	2	011	011	0	0	N	N
00355	04/09/2010	9A	FR	Roseburg	EDENBOWER BLVD AT STEPHENS ST	BACK		10	011	DRY	2	041	011	0	0	N	N
00006	01/17/2008	4P	TH	Roseburg	EDENBOWER BLVD AT STEPHENS ST	REAR		10	026	ICE	2	011	011	0	0	N	N
00723	08/14/2008	4P	TH	Roseburg	EDENBOWER BLVD AT STEPHENS ST	REAR	093	07	014	DRY	2	011	011	0	1	N	N
00818	09/09/2008	2P	TU	Roseburg	EDENBOWER BLVD AT STEPHENS ST	REAR		07	043	DRY	2	011	011	0	1	N	N
00956	10/04/2010	7P	MO	Roseburg	EDENBOWER BLVD AT STEPHENS ST	REAR		07	026	DRY	2	011	011	0	0	N	N
01522	11/29/2006	2P	WE	Roseburg	EDENBOWER BLVD AT STEPHENS ST	TURN		27	014	DRY	2	011	011	0	0	N	N
00418	05/07/2008	3P	WE	Roseburg	EDENBOWER BLVD AT STEPHENS ST	TURN		04	020	DRY	2	011	011	0	1	N	N
00859	09/23/2009	4P	WE	Roseburg	EDENBOWER BLVD AT STEPHENS ST	TURN		04	004,020	DRY	2	011	011	0	1	N	N
00991	10/12/2010	7P	TU	Roseburg	EDENBOWER BLVD AT STEPHENS ST	TURN		04	020	DRY	2	011	011	0	0	N	N

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CITY STREET LOCATIONS BY COUNTY - DRIVER BEHAVIOR FORMAT

Stewart Parkway @ Edenbower Boulevard

January 1, 2006 through December 31, 2010

DOUGLAS COUNTY

SERIAL NO	DATE	TIME	DAY	*COUNTY OR CITY NAME	CRASH LOCATION	COLL TYPE	EVENT	CAUSE	ERROR	SURF	TOTVEH	VEHICLE TYP/OWN #1	#2	PEOPLE KILL	INJ	ALC	SPED
00158	01/01/2006	6P	SU	Roseburg	EDENBOWER BLVD AT STEWART PKY	ANGL		04	020	WET	2	011	011	0	1	N	N
01124	10/11/2007	2P	TH	Roseburg	EDENBOWER BLVD AT STEWART PKY	ANGL		04,27	016,020	DRY	2	011	011	0	3	N	N
00821	09/08/2009	1P	TU	Roseburg	EDENBOWER BLVD AT STEWART PKY	ANGL		04	097,097	DRY	2	011	011	0	0	N	N
00118	01/25/2006	3P	WE	Roseburg	EDENBOWER BLVD AT STEWART PKY	REAR		07	014	WET	2	011	011	0	2	N	N
01477	12/18/2007	10A	TU	Roseburg	EDENBOWER BLVD AT STEWART PKY	REAR	010,001	07,27	043	WET	2	011	093	0	1	N	N
00088	01/28/2009	5P	WE	Roseburg	EDENBOWER BLVD AT STEWART PKY	REAR		07	026	WET	2	011	011	0	1	N	N
00845	09/11/2009	3P	FR	Roseburg	EDENBOWER BLVD AT STEWART PKY	REAR		07	026	DRY	2	011	011	0	2	N	N
01032	10/29/2009	7P	TH	Roseburg	EDENBOWER BLVD AT STEWART PKY	REAR		07	026	WET	2	011	011	0	2	N	N
01198	11/02/2009	12P	MO	Roseburg	EDENBOWER BLVD AT STEWART PKY	REAR		07	026	DRY	2	011	011	0	0	N	N
00151	02/20/2010	3P	SA	Roseburg	EDENBOWER BLVD AT STEWART PKY	REAR		07	014	DRY	2	011	011	0	1	N	N
00483	05/26/2010	1P	WE	Roseburg	EDENBOWER BLVD AT STEWART PKY	REAR		07	026	WET	2	011	011	0	1	N	N
01079	11/20/2008	3P	TH	Roseburg	EDENBOWER BLVD AT STEWART PKY	SS-M	013	05	039	WET	3	011	011	0	0	N	N
01283	10/04/2006	2P	WE	Roseburg	EDENBOWER BLVD AT STEWART PKY	SS-O		13	003	DRY	2	011	011	0	0	N	N
00659	06/15/2007	11A	FR	Roseburg	EDENBOWER BLVD AT STEWART PKY	SS-O		13	045	DRY	2	011	011	0	0	N	N
00109	02/03/2009	3P	TU	Roseburg	EDENBOWER BLVD AT STEWART PKY	SS-O		13	045	DRY	2	011	011	0	1	N	N
00098	02/02/2010	10P	TU	Roseburg	EDENBOWER BLVD AT STEWART PKY	SS-O		13	045	WET	2	011	011	0	0	N	N
00545	06/23/2010	5P	WE	Roseburg	EDENBOWER BLVD AT STEWART PKY	SS-O		13	045	DRY	2	011	011	0	0	N	N
00570	05/11/2006	9A	TH	Roseburg	EDENBOWER BLVD AT STEWART PKY	TURN		02	004,028	DRY	2	011	011	0	0	N	N
00356	03/19/2007	9P	MO	Roseburg	EDENBOWER BLVD AT STEWART PKY	TURN		02	004,028	DRY	2	011	011	0	1	N	N
00747	08/18/2008	8A	MO	Roseburg	EDENBOWER BLVD AT STEWART PKY	TURN		01,08	047,007	WET	3	011	051	0	0	N	Y
01080	10/21/2009	11A	WE	Roseburg	EDENBOWER BLVD AT STEWART PKY	TURN		01	047,080	WET	2	011	011	0	1	N	Y

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CITY STREET LOCATIONS BY COUNTY - DRIVER BEHAVIOR FORMAT

Sweetbrier Avenue @ Edenbower Boulevard

January 1, 2006 through December 31, 2010

DOUGLAS COUNTY

SERIAL NO	DATE	TIME	DAY	*COUNTY OR CITY NAME	CRASH LOCATION	COLL TYPE	EVENT	CAUSE	ERROR	SURF	TOTVEH	VEHICLE TYP/OWN #1	#2	PEOPLE KILL	INJ	ALC	SPED
00828	07/21/2007	8P	SA	Roseburg	EDENBOWER BLVD AT SWEETBRIAR AVE	TURN	001	02	027	DRY	1	011		0	1	N	N
01210	12/09/2010	7A	TH	Roseburg	EDENBOWER BLVD AT SWEETBRIAR AVE	TURN		02	028	WET	2	011	011	0	1	N	N

Appendix D. Vacant and Redevelopable Lots

NAME	ADDRESS	ACREAGE	VACANT	REDEVELOPABLE
3030 Nw Aviation Drive LLC	23580 Johnson Road	0.45	no	no
3030 Nw Aviation Drive LLC	23580 Johnson Road	0.45	yes	
3030 Nw Aviation Drive LLC	23580 Johnson Road	0.37	yes	
Addington, Effie	P.O. Box 1365	0.15	no	yes
Addington, Effie May	P.O. Box 1365	0.15	no	yes
Alford, Pamela R	905 Plateau Dr	0.12	no	yes
Alford, Pamela R	905 Plateau Dr	0.01	yes	
Anaya, Gustavo &	Anaya, Gustavo M	0.28	no	no
Andrews, Brenda J Fair	180 NW Navajo	0.19	no	no
Ashbrook, Joan I & Chester L	170 NW Amanda St	0.17	no	yes
Ashworth, Johnie &	Newell, Abbie Trs	0.27	no	no
Auer, John J	4304 NW Hooker Rd	0.82	no	no
Bailey, Richard J & Kathye	166 W Angela Court	0.17	no	yes
Baldwin, Armond E Jr	1224 NE Walnut #282	0.29	no	no
Ballance, Steve & Rita	288 Taft Dr	0.41	no	yes
Ballance, Steven & Rita	288 Taft	0.2	no	yes
Ballance, Steven & Rita	288 Taft	0.21	no	yes
Banducci, Richard	7888 Green Valley Rd	0.15	no	yes
Barg, Leola Ann Trs of the	Leola Ann Barg Trust	0.18	no	no
Barnaby, Margaret M Trs	Barnaby Trust	0.22	no	yes
Barr, Darrell L & Joann	723 Evergreen Loop Dr	0.24	yes	
Barrick, Roger M & Shirley A	1038 NW Plateau Drive	0.14	no	yes
Barrick, Roger M & Shirley A	1038 NW Plateau Drive	0.02	yes	
Barron, Kelly S &	Lewis, Kristine A	0.15	no	yes
Barrows, Don	c/o Herrera, Rigoberto &	0.2	no	yes
Barter, Judith Ann Dunn	P.O. Box 990	0.15	no	yes
Bayless, Connie A	3653 NW Joseph St	0.15	no	yes
Beaudry, Eugene E &	Beaudry, Brian E &	0.2	no	yes
Beebe, Roger B & Marsha M	3330 NE Hughes St	0.12	no	yes
Beebe, Roger B & Marsha M	3330 NE Hughes St	0.01	yes	
Beier, Lucie Estate	> Beverly Beier	0.99	no	no
Beier, Lucie Estate	> Beverly Beier	0.48	yes	
Bell, Linn R	P.O. Box 220	0.13	no	yes
Bell, Linn R	P.O. Box 220	0.02	yes	
Best, Gloria W	3778 NW Joseph St	0.15	no	yes
Bestow, Ronald L Trs of the	Ronald L Bestow Family Trust	0.23	no	yes
Bestow, Ronald L Trs of the	Ronald L Bestow Family Trust	0.24	yes	
Bingham, Sondra L	510 Wide Avenue	0.17	no	yes
Bishop, Donna K	2562 Golfers Ridge Rd	0.18	no	yes
Black, Edward	200 W Kristen Ct	0.21	no	yes
Blatter, Carolee Charis	P.O. Box 203	0.15	no	no
Blatter, Carolee Charis	P.O. Box 203	0.01	yes	
Blue Office LLC	> Roger C Potter	0.98	no	yes
Booth, H Ray & Treva D Trs	Booth Loving Trust	0.11	no	yes
Booth, H Ray & Treva D Trs	Booth Loving Trust	0.11	no	yes
Booth, H Ray & Treva D Trs	Booth Loving Trust	0.02	yes	
Booth, H Ray & Treva D Trs	Booth Loving Trust	0.02	yes	
Booth, H Ray & Treva D Trs of	Booth Loving Trust	0.15	no	yes

NAME	ADDRESS	ACREAGE	VACANT	REDEVELOPABLE
Booth, H Ray & Treva D Trs of	Booth Loving Trust	0.11	no	yes
Booth, H Ray & Treva D Trs of	Booth Loving Trust	0.01	yes	
Booth, H Ray & Treva D Trs of	Booth Loving Trust	0.02	yes	
Booth, Paul E & Karen J	959 Plateau Drive	0.15	no	yes
Booth, Paul E & Karen J	959 Plateau Drive	0.01	yes	
Boyer, Michael Dee	560 Plateau Drive	0.11	yes	
Bradshaw, Oral T & Jessie E	125 E Kristen Ct	0.18	no	yes
Brookshire, Edna W &	Holbrook, Linda Jean &	0.13	no	yes
Brookshire, Edna W &	Holbrook, Linda Jean &	0.01	yes	
Brown, Duane H & Jessie F Trs	Brown Revocable Trusts	0.13	no	yes
Brown, Duane H & Jessie F Trs	Brown Revocable Trusts	0.02	yes	
Brown, Lawrence Wayne	568 NW Wide Ave	0.27	no	yes
Bryan, Richard A & Bonnie E	115 NW Makah Ct	0.17	no	no
Burge, Geraldine Mae Cobb Trs	Geraldine Mae Cobb Burge Trust	0.15	yes	
Burpee, Adam Lee	3598 NW Joseph Street	0.15	no	yes
Burpee, Adam Lee	3598 NW Joseph Street	0.15	yes	
Byrd, Barbara A	1011 NW Plateau Dr	0.11	no	yes
Byrd, Barbara A	1011 NW Plateau Dr	0.01	yes	
Campman, Joseph N	772 NW Plateau Dr	0.17	no	no
Campos, Tony W & Veronica L	106 E Kristen Ct	0.25	no	yes
Cathcart, Lynn E &	Cathcart, David Allen	0.12	no	yes
Cathcart, Lynn E &	Cathcart, David Allen	0.02	yes	
Cbs Outdoor Inc	> Ryan & Company	0	no	no
Cbs Outdoor Inc	> Ryan & Company	0	no	no
Chamberlain, Glenn L & Hazel L	544 NW Sweetbriar Av	0.5	no	no
Chasteen, Mary	1665 Youngwood Court	0.11	no	yes
Chasteen, Mary	1665 Youngwood Court	0.02	yes	
Chitwood, Maria Guadalupe	538 Plateau Dr	0.11	no	yes
Christel, Albert &	Christel, Rudolph & Kathleen	0.15	no	no
Church of God Of Oregon	P.O. Box 957	0.19	no	no
Church of God Of Oregon	Headquarters, Cleveland,	0.38	no	no
Churchill, Roger C &	Churchill, Vicky L	0.24	no	no
Cirina, Joe Aka Giuseppe Trs &	Cirina Loving Trust	2.6	yes	
Cirina, Joe Aka Giuseppe Trs &	Cirina Loving Trust	2.84	yes	
City of Roseburg	900 SE Douglas Av	0	no	no
City of Roseburg	900 SE Douglas	5.85	no	yes
City of Roseburg	900 SE Douglas Av	0	no	no
City of Roseburg	900 SE Douglas Av	0	no	no
City of Roseburg	900 SE Douglas Ave	14.82	no	yes
City of Roseburg	900 SE Douglas Ave	0	no	no
City of Roseburg	900 SE Douglas Ave	0	no	no
City of Roseburg	900 SE Douglas Av	40.8	no	yes
City of Roseburg	Airport	102.28	no	yes
City of Roseburg	900 SE Douglas	4.25	yes	
City of Roseburg	900 SE Douglas Ave	2.52	yes	
City of Roseburg	900 SE Douglas Ave	2.41	yes	
City of Roseburg	900 SE Douglas Ave	3.09	yes	
City of Roseburg	900 SE Douglas Ave	9.45	yes	

NAME	ADDRESS	ACREAGE	VACANT	REDEVELOPABLE
City of Roseburg	900 SE Douglas Ave	0.04	yes	
City of Roseburg &	North Umpqua Aviation LLC>le	0	no	no
City of Roseburg &	D R Johnson >Le	0	no	no
City of Roseburg &	Johnson, Don R >Le	0	no	no
City of Roseburg &	Lido LLC>le	0	no	no
City of Roseburg &	Mathis, Jack D & Doris >Le	0	no	no
City of Roseburg &	Roseburg Forest Products >Le	0	no	no
City of Roseburg &	Preston, Ronald R >Le	0	no	no
City of Roseburg &	R E Noah & Company Inc >Le	0	no	no
City of Roseburg &	Goodwin, Allen & Kathryn >Le	0	no	no
City of Roseburg &	Ocean Air Aviation >Le	0	no	no
City of Roseburg &	Ocean Air Aviation >Le	0	no	no
City of Roseburg &	Ocean Air Aviation >Le	0	no	no
City of Roseburg &	Douglas Co Avaition LLC>le	0	no	no
City of Roseburg &	Diemert Flying LLC>le	0	no	no
City of Roseburg &	Harvard Park Medical Ltd >Le	0	no	no
City of Roseburg &	Dwt Investments LLC>le	0	no	no
City of Roseburg &	Pacific Housing Management >Le	0	no	no
City of Roseburg &	Pacific Housing	0	no	no
City of Roseburg &	Skenzick, Steven S &	0	no	no
City of Roseburg &	Rush Creek Holdings LLC>le	0	no	no
City of Roseburg &	Randall/pacific Group II Etal	0	no	no
City of Roseburg &	Gordon's Landing LLC>le	0	no	no
City of Roseburg &	Tater Rental LLC>le	0	no	no
City of Roseburg &	Palm Harbor Homes Inc >Le	1.99	no	yes
City of Roseburg &	Tom Thumb Mini-storage LLC>le	0	no	no
Clark, Ralph W &	Clark, Betty &	0.2	no	yes
Cockrell, Charlene Trs	The Preston Cockrell Family Trust	0.11	no	yes
Cockrell, Charlene Trs	The Preston Cockrell Family Trust	0.02	yes	
Coffman, David W & Linda M	3750 Joseph St	0.15	no	yes
Cole, Arnold J &	Barbara A	0.14	no	yes
Cole, Arnold J &	Barbara A	0.04	yes	
Coleman, Elizabeth J &	Thomas A Sr	0.11	no	yes
Collier, Karen Rae	3763 Joseph	0.15	no	yes
Collins, James B	25328 Delmar Ave	0.2	no	yes
Collinsworth, Pauline	159 Kristen Ct	0.17	no	yes
Columbus Properties LLC	> Peninsula Group LLC	0.9	yes	
Columbus Properties LLC	> Peninsula Group LLC	1.19	yes	
Community Cancer Center	2880 NW Stewart Parkway	0.6	no	no
Community Cancer Center	2880 NW Stewart Parkway	0	no	no
Community Cancer Center &	Mercy Medical Center Inc >Le	0.02	no	no
Coon, Olive M &	Coon, James D	0.22	no	yes
Cooper, Chet W & Irene	255 Amanda St	0.21	no	yes
Corn, Violette	622 Plateau Drive	0.13	no	yes
Corn, Violette	622 Plateau Drive	0.01	yes	
Corn, Violette G	646 Plateau	0.13	no	yes
Cornell, Jerry N Trs &	Cornell, Carolyn S Trs of	0.17	no	no
Costco Wholesale Corporation	> Attn: Property Tax Department	0.47	no	no

NAME	ADDRESS	ACREAGE	VACANT	REDEVELOPABLE
Costco Wholesale Corporation	> Attn: Property Tax Department	15.21	yes	
Costco Wholesale Corporation	> Attn: Property Tax Department	0.54	yes	
Couey, Loris G	c/o Williams, David A & Marcia L	0.82	no	yes
Couey, Loris Gene Trustee of the	Loris Gene Couey Living Trust	0.41	no	no
Couey, Loris Gene Trustee of the	Loris Gene Couey Living Trust	0.41	yes	
Couey, Loris Gene Trustee of the	Loris Gene Couey Living Trust	0.41	yes	
Couey, Loris Gene Trustee of the	Loris Gene Couey Living Trust	0.41	yes	
Couey, Robert A & Karen M	3459 Broad Street	0.21	no	no
Croucher, Samual A & Genevieve	801 NW Plateau	0.14	no	yes
Croucher, Samual A & Genevieve	801 NW Plateau Dr	0.02	yes	
Crutchfield, Steven &	Scherler, Susan	0.18	no	yes
Daniels, Albert W & Lorraine M	200 Angela Ct	0.24	no	yes
Darby, Alice	P.O. Box 2809	0.15	no	yes
Davis, Betty Lou	167 Trust Ave	0.18	no	yes
Davis, Myrl & Hazel	3342 NW Broad St	0.21	no	yes
Davison, Larry R & Jewell O Trs &	Walz, Kathy M Trs	0.15	no	yes
Davison, Larry R & Jewell O Trs &	Walz, Kathy M Trs	0.02	yes	
Debolt, Alexander & Maudie Mae	613 NW Sweetbriar	0.56	no	no
Devine, Gregg	P.O. Box 2273	0.46	no	yes
Dewees, Terry P	3531 NW Broad St	0.17	no	yes
Doss, James B	330 Woodpath Ln	0.11	no	yes
Doss, James B	330 Woodpath Ln	0.01	yes	
Doss, James B Trs	James B Doss Family Trust	0.14	no	yes
Doss, James B Trs	James B Doss Family Trust	0.01	yes	
Douglas County	1036 SE Douglas Ave	11.75	yes	
Douglas County	1036 SE Douglas Ave	0.23	yes	
Douglas County	1036 SE Douglas Ave	1.08	yes	
Douglas County	1036 SE Douglas Ave	11.75	yes	
Douglas Resident Training	Facilities Inc	0.28	no	no
Douglas Resident Training	Facilities Inc	0.2	yes	
Doyle, John W Jr & Shirley L Trs	Doyle Loving Trust	0.2	no	no
Doyle, John W Jr & Shirley L Trs	Doyle Loving Trust	0.26	no	yes
Dts Inc	5057 N Umpqua Hy	0.24	yes	
Dyson, Thomas E & Lola I	3394 Broad St	0.26	no	yes
Engle, Margaret	1073 Plateau Dr	0.28	no	yes
Engle, Margaret	1073 Plateau Dr	0.01	yes	
Engle, Rex A; Connie J;clifford	3764 NW Joseph	0.15	no	yes
Escobar, Linda Sue	524 NW Wide Avenue	0.27	no	yes
Evans, Betty	110 Navajo Avenue	0.17	no	no
Eveland, James L	1284 NW Troost	0.31	no	yes
Eveland, James L	1284 NW Troost	0.22	no	no
Fabian, Joseph A	1801 SE 175th Avenue	0.15	no	yes
Fabian, Joseph A	1801 SE 175th Avenue	0.01	yes	
Farman, Cozy E Creech Trs of	Farman Family Trust	0.17	no	yes
Feero, Betty L	116 E Kristen Ct	0.18	no	yes
Fejeran, Victor G	P.O. Box 1164	0.14	no	no
Fejeran, Victor G	P.O. Box 1164	0.02	yes	
Fish of Roseburg	P.O. Box 1162	0.23	no	no

NAME	ADDRESS	ACREAGE	VACANT	REDEVELOPABLE
Fitzgerald, Gerald C & Mary Jane	178 Misty Ln	0.15	yes	
Fleeman, William T	4848 NE Stephens Bmb #102	0.15	no	yes
Florea, Robert D & Betty J	1021 NW Keasey	0.19	no	yes
Fornero, Dorothy J &	Manetta, Evelyn	0.17	no	yes
Forrester, Todd A &	Forrester, Leisa R	0.41	no	yes
Fowler, Dixie B &	Fowler, Stewart L	0.15	no	yes
Fowler, Dixie B &	Fowler, Stewart L	0.15	yes	
Fozo, Ben & Marie	2235 Diamond Lake Blvd	0.14	no	yes
Fozo, Ben & Marie	2235 Diamond Lake Blvd	0.02	yes	
Frack, Stephen R &	Antoinette R	0.17	no	no
Frazier, Sandra	615 NW Wide Avenue	1	no	yes
Frazier, Sandra Kay Watson	P.O. Box 115	0.14	no	yes
Frazier, Sandra Kay Watson	P.O. Box 115	0.02	yes	
Fry, Gail M	515 NW Wide Ave	0.13	no	yes
Fry, James R & Faye M	3580 Broad St	0.17	no	yes
Gage, David A & Mary A	c/o Standley, Richard W	0.21	no	yes
Garden Hills No 2 Owners Assoc	P.O. Box 2314	0.86	yes	
Garden Hills No 2 Owners Assoc	P.O. Box 2314	1.63	yes	
Garden Hills No 2 Owners Assoc	P.O. Box 2314	1.23	yes	
Garl, Allen C	150 Navajo Ave	0.19	no	yes
Gates, James R	P.O. Box 480	0.11	no	yes
Ge Capital Franchise	Finance Corporation	0.86	no	no
Gibbens, Herbert H &	Gibbens, Beulah F	0.17	no	yes
Giddings, Susan Succ Trustee	Grable Family Rev Liv Trust	0.17	no	yes
Gilbuena, Joseph W & Sherry M	361 River Bend Rd	0.83	no	no
Gober, Richard Dan	3995 Hooker Rd	0.22	no	no
Goforth, Faviola	3598 NW Hooker Rd	0.15	no	yes
Gould, Gerald & Patricia	3261 NW Broad Street	0.17	no	no
Gray Medical Office Holdings LLC	286 NW Moorea Drive	0.59	yes	
Green, Dale R & Marie N	1755 San Souci	0.14	no	no
Green, Dale R & Marie N	1755 San Souci	0.01	yes	
Grissom, Dennis &	Grissom, Amy	0.15	no	yes
Grover, Gwen L	220 W Trust Av	0.19	no	yes
Gwaltney, Michael D & Trina C	219 Mercy Hills Drive	0.25	no	no
Hagar, William Lee &	Jacqueline Joyce	0.27	no	yes
Hagar, William Lee &	Jacqueline Joyce	0.17	yes	
Halter, Florence M	105 NW Angela Ct	0.22	no	no
Hampton, Edward C & Evelyn J Trs	Hampton Revocable Living Trust	0.18	no	yes
Hancock, John F & Debra J	117 E Kristen Ct	0.18	no	no
Hanlin, Jerry D	170 Navajo St	0.19	no	yes
Harley Burnett Estates LLC	1224 NE Walnut #258	0.15	no	yes
Harley Burnett Estates LLC	1224 NE Walnut #258	0.15	no	no
Harley Burnett Estates LLC	1224 NE Walnut #258	0.15	no	no
Harley-burnett Estates LLC	c/o Walton, Maude Lf Est	0.11	no	yes
Harris, Danny H & Karla K	3665 Broad	0.27	no	no
Hartman, Robert S	9 Mercury Ave	0.15	no	yes
Harwell, Sally R	16000 Peppertree Ln	0.16	no	yes
Harwell, Sally R	16000 Peppertree Ln	0.12	no	no

NAME	ADDRESS	ACREAGE	VACANT	REDEVELOPABLE
Harwell, Sally R	16000 Peppertree Ln	0.02	yes	
Harwell, Sally R Trs	Harwell Revocable Living Trust	0.17	no	yes
Hawkes, Martha E	P.O. Box 577	0.18	no	yes
Hawkins, Darla	3668 NW Joseph	0.15	no	yes
Hayes, Alice A	540 Plateau Dr	0.14	no	no
Hayes, Alice A	540 Plateau Dr	0.04	yes	
Haymond, Gloria Trs of the	Gloria Haymond Living Trust	0.17	no	yes
Haynes, Grace L	236 W Amanda St	0.19	no	no
Hendy, Scott G	2655 NW Edenbower Blvd	0.39	no	no
Henry, Patricia A	204 W Kristen Ct	0.18	no	yes
Hernandez, Juan L	102 E Amanda Ct	0.22	no	yes
Herrington, Ronald G & Patricia	851 NW Plateau Dr	0.11	no	yes
Herrington, Ronald G & Patricia	851 NW Plateau Dr	0.02	yes	
Hill, Vicky R	198 Trust Ave	0.18	no	no
Hobi, Blake H	P.O. Box 1504	8.44	yes	
Hobi, Blake H	P.O. Box 1504	8.44	yes	
Hodge, Evelyn & Avon	177 W Angela Court	0.17	no	yes
Holloway, Douglas S & Joan F	183 NW Mercy Hills Dr	0.17	no	yes
Holmes, Carl D & Betty	506 NW Wide Avenue	0.15	no	yes
Holznagel, Robert D	3124 Broad St	0.23	no	yes
Home Depot Usa Inc	> Store Support Center	10.45	no	no
Horn, Jeremy C	114 Pawnee Ct	0.17	no	no
Houde, Doris L	563 NW Sweetbriar	0.16	no	no
Houston, Orville Clark &	Patricia Ann Co-Trustees/trust	0.18	no	yes
Howell, Diane L & Susan Y	121 Oak Tree Rd	0.49	no	yes
Howell, Douglas Scott	107 E Kristen Court	0.22	no	yes
Hubbard, Barbara	104 E Cordelia Ct	0.22	no	yes
Hummel, Neil D & Catherine A	2245 NW Stewart Parkway	0.3	no	yes
Hummel, Neil D & Catherine A	2245 NW Stewart Parkway	0.68	no	no
Hummel, Neil D & Catherine A	2245 NW Stewart Parkway	0.79	no	no
Hummel, Neil D & Catherine A	2245 NW Stewart Parkway	0.5	no	no
Hummel, Neil D & Catherine A	2245 NW Stewart Parkway	0.41	no	no
Hummell, Neil D & Catherine A	2245 NW Stewart Parkway	0.72	no	no
Hurst, Richard	679 Plateau Dr	0.15	no	yes
Hurst, Richard	679 Plateau Dr	0.02	yes	
Invest West Alpha &	Pacifica Property Management	5.13	no	yes
Invest West Alpha &	Pacifica Property Management	4.32	no	no
Investors X LLC	2640 E Barnett Rd	2.01	yes	
Ivey, Opal	567 Plateau Dr	0.14	no	yes
Ivey, Opal	567 Plateau Dr	0.04	yes	
Jacobsen, Molly M & Dana L	120 Winston Section Rd	0.17	no	no
Jacque, Martha L	c/o Burpee, Michael L & Cheryl A	0.15	no	yes
James Lee & Joan LLC	2822 W Oriole Dr	0.66	no	yes
James Lee & Joan LLC	2822 W Oriole Dr	0.21	yes	
James Lee & Joan LLC	2822 W Oriole Dr	0.8	yes	
James Lee & Joan LLC	2822 W Oriole Dr	0.46	yes	
Jansen, Willard S & Gloria E	4064 Hooker Rd	0.41	no	no
Jessen, Nis C Jr &	Jessen, Wendy J	0.27	no	yes

NAME	ADDRESS	ACREAGE	VACANT	REDEVELOPABLE
Johnson, Ricky D & Heather N	122 Walter Ct	0.18	no	yes
Jones, Donald P &	Witt, Donitta D	0.26	no	yes
Jones, Donald P &	Witt, Donitta D	0.03	yes	
Jones, Stephanie Katherine	538 Wide Avenue	0.27	no	no
Jones, Theodore L & Celia Lyn	555 Wide Avenue	0.17	no	no
Jones, Theodore L & Celia Lyn	555 Wide Avenue	0.15	no	yes
Jscw Enterprises Ii LLC	10281 Bright Angel Way	0.28	no	yes
Judd, Gary Robert	60867 Windsor Drive	0.15	no	yes
Kaser, E Neil & Carol M	208 W Amanda	0.17	no	no
Kastan, Louis F & Evelyn P	1132 Plateau Dr	0.13	no	yes
Kastan, Louis F & Evelyn P	1132 Plateau Dr	0.04	yes	
Kearney, Ken	3695 Joseph St	0.15	yes	
Kearney, Ken & Sherry	12265 Garden Valley Road	0.11	no	yes
Kearney, Ken & Sherry	12265 Garden Valley Road	0.02	yes	
Kearney, Ken D	P.O. Box 206	0.15	yes	
Kearney, Ken D & Sherry D	P.O. Box 206	0.15	no	yes
Kearney, Robert & Delores Trs	Kearney Family Trust	5.27	no	yes
Kearney, Robert D & Delores Trs	Kearney Family Trust	14.83	no	no
Kearney, Robert D & Delores Trs	Kearney Family Trust	13.18	no	yes
Keller Lumber Co	4418 NE Keller Rd	40.48	no	yes
Keller Lumber Co	4418 NE Keller Rd	72.96	no	yes
Keller Lumber Co	4418 NE Keller Rd	6.54	no	no
Keller, Dan &	Keller, John C &	0.41	yes	
Keller, Dan S &	Keller, John C &	2.1	no	yes
Keller, Dan S &	Keller, John C &	3.93	no	yes
Keller, Dan S &	Keller, John C &	0.05	yes	
Keller, Janet S & Robert J	201 Kristin Ct	0.19	no	yes
Kelley, Amy M &	Ashby, Daniel A	0.2	no	no
Kelsey, Tom L &	Kelsey, Mary A	0.41	no	no
Kimbrough, Lindsey D & Beverly A	246 Trout Loop	0.15	no	yes
King, James L & Norma L	205 Amanda Street	0.17	no	yes
King, Leslie R &	Erwin, Patricia A	0.17	no	no
King, Pamela L	660 NW Plateau Dr	0.12	no	yes
King, Robert Ryan & Jodi L	583 NW Sweetbrier Av	0.17	no	no
Kinney, Clifford W & Alice M	3223 NW Broad St	0.14	no	yes
Kinney, Clifford W & Alice May	3223 NW Broad St	0.36	no	yes
Kinney, Clifford W & Alice May	3223 NW Broad St	0.26	no	no
Kirkendall, Kathryn & Jeremy	188 NW Mercy Hills Drive	0.21	no	no
Kittelman, Thayla L &	Loomas, Theresa L &	0.3	no	yes
Klier, Michael J	178 W Cordelia Court	0.18	no	yes
Kluver, Barbara A	853 NW Plateau Dr	0.14	no	yes
Kluver, Barbara A	853 NW Plateau Dr	0.02	yes	
Knox, David A & Jeanna M	190 Camino Francisco	0.82	no	yes
Krueger, Helen Virginia	3777 NW Joseph	0.15	no	yes
Labeau, Denzle R & Nora A Co-Trs	Labeau Trust	0.02	yes	
Labeau, Denzle R & Nora Ann Trs	Labeau Trust	0.14	yes	
Labranche, Roger A	3805 Joseph St	0.15	no	yes
Laduke, Leroy V Sr	777 Plateau Drive	0.12	no	yes

NAME	ADDRESS	ACREAGE	VACANT	REDEVELOPABLE
Laduke, Leroy V Sr	777 Plateau Drive	0.02	yes	
Lamar Advertising Co	P.O. Box 66338	0	no	no
Lamar Advertising Co	P.O. Box 66338	0	no	no
Landers, Eugene M & Edna L	677 NW Plateau	0.02	yes	
Landers, Eugene M & Edna L Trs	Landers Trust	0.15	no	yes
Lange, Diana Lynn	518 Wide Ave	0.18	yes	
Langvin, Sharon E	541 NW Plateau Dr	0.14	no	yes
Langvin, Sharon E	541 NW Plateau Dr	0.04	yes	
Larecy, Charles L & Joan D Trs	Larecy Loving Trust	0.14	no	yes
Larecy, Charles L & Joan D Trs	Larecy Loving Trust	0.02	yes	
Lauren Young Profit Sharing Trst	Lauren Young, Trustee	0.14	yes	
Leh Properties LLC	11627 Seminole Circle	5.05	yes	
Leh Properties LLC	11627 Seminole Circle	3.88	yes	
Lemings, Leonard A &	Lemings, Velma V	0.12	no	no
Lemings, Leonard A &	Lemings, Velma V	0.01	yes	
Li, Su Mei	206 N Coast Hwy 101	0.18	no	no
Lillard, Flossie Jo &	Rhea, Jimmy C	0.12	no	yes
Lillard, Flossie Jo &	Rhea, Jimmy C	0.01	yes	
Little, Regis C & Dianne L	3868 Hooker Rd	0.48	no	no
Lo, Laurie L	180 W Angela Ct	0.18	no	yes
Los Duartes Inc	1347 NE Stephens	0	no	no
Lostracco, Venus Dee	266 Amanda St	1.44	no	yes
Lostracco, Venus Dee	266 Amanda St	1.44	yes	
Loveless, Frank L &	Loveless, Linda	0.11	no	yes
Lowe's Hiw Inc	Attn Tax Department 1eta	3.17	no	no
Lowe's Hiw Inc	Attn Tax Department 1eta	1.92	no	yes
Lowe's Hiw Inc	Attn Tax Department 1eta	2.56	no	no
Lowe's Hiw Inc	Attn Tax Department 1eta	1.61	no	yes
Lowe's Hiw Inc	Attn Tax Department 1eta	0.69	no	yes
Lowe's Hiw Inc	Attn Tax Department 1eta	0.3	no	yes
Ludwig, Leslie H & Jane L	130 Walter Ct	0.19	no	no
Ludwig, Leslie H & Jane L	130 Walter Ct	0.22	yes	
Luth, Shirley R	3709 Joseph Street	0.15	no	yes
Mackintosh, Karen L	2131 NW Motah St	0.17	no	no
Macpherson, Barbara J	151 Trust Av	0.18	no	yes
Mandera, Joe	7301 Melqua Rd	0.17	no	yes
Manor House Memory Care LLC	P.O. Box 3006	4.72	no	no
McClendon, James E	179 W Cordelia Ct	0.18	no	yes
McDonald, David G	515 Plateau Dr	0.14	no	yes
McDonald, David G	515 Plateau Dr	0.04	yes	
McKim, Paul O & Nancy A	100 E Cordelia Ct	0.18	no	no
McOwen, Teresa	130 NW Pawnee Ct	0.17	no	no
McQueary, Richard L	271 Plat I Rd	0.35	no	yes
Meade, Trista A	543 Sweetbrier Avenue	0.16	no	no
Mercy Medical Center Inc	2700 Stewart Parkwy	0.21	no	yes
Mercy Medical Center Inc	2700 Stewart Parkwy	1.52	no	yes
Mercy Medical Center Inc	2700 Stewart Parkwy	18.77	no	no
Mercy Medical Center Inc	2700 Stewart Parkwy	0.26	no	yes

NAME	ADDRESS	ACREAGE	VACANT	REDEVELOPABLE
Mercy Medical Center Inc	Msc Landscape Services Co >Le	0.5	no	yes
Mercy Medical Center Inc	2700 Stewart Parkwy	0.25	yes	
Mercy Medical Center Inc	2700 Stewart Parkwy	2.12	yes	
Mercy Medical Center Inc	2700 Stewart Parkwy	0.48	yes	
Mercy Medical Center Inc	2700 Stewart Parkwy	6.62	yes	
Mercy Medical Center Inc	2700 Stewart Parkwy	1.61	yes	
Mercy Medical Center Inc	2700 Stewart Parkwy	2.27	yes	
Mercy Medical Center Inc	2700 Stewart Parkwy	0.87	yes	
Mercy Medical Center Inc	2700 NW Stewart Parkway	0.34	yes	
Mercy Medical Center Inc &	Roseburg Surgery Center LLC>le	1.43	no	yes
Mercy Medical Center Inc &	Community Cancer Center >Le	1.45	yes	
Mercy Medical Center Inc &	Roseburg Surgery Center LLC&	0.16	yes	
Mercy Medical Center Inc &	Telecare Mental Health Services	0	yes	
Mercy Medical Center Inc &	Roseburg Surgery Center LLC>le	0.23	yes	
Mexico, James D & Mildred Trs	Mexico Family Trust	0.18	no	yes
Middleton, Dennis W & Wanda Trs	D W & W S Middleton Livg Trust	0.74	no	yes
Mierow, Ardythe Mae	829 Plateau Dr	0.11	no	yes
Mierow, Ardythe Mae	829 Plateau Dr	0.02	yes	
Miller, Betty M Trs of the	Betty Miller Trust	0.14	no	yes
Miller, Betty M Trs of the	Betty Miller Trust	0.04	yes	
Mills, Myron E & Janet	910 NW Plateau	0.14	no	yes
Molero, Andres Javier	3610 NW Broad Street	0.17	no	yes
Monrean, Larry E & Joan A	> June Sumner	0.15	no	yes
Montgomery, Doris Patricia	593 NW Sweetbrier	0.15	no	yes
Montgomery, Foster V & Ellen J	P.O. Box 746	0.36	no	yes
Moore, Jerrell W & Barbara M	3944 Hooker Rd	0.21	no	yes
Morgan, Casey J Trustee	Casey J Morgan Loving Trust	0.68	yes	
Morgan, Casey J Trustee	Casey J Morgan Loving Trust	0.98	yes	
Morgan, Casey J Trustee	Casey J Morgan Loving Trust	0.68	yes	
Morgan, Casey J Trustee	Casey J Morgan Loving Trust	0.11	yes	
Morley, Wallace L & Dorothy L	3480 Broad Street	0.17	no	yes
Morris, Duane W & Madge E	222 NW Mercy Hills Dr	0.26	no	no
Myers, Richard A & Virginia L	2940 Hooker Road	0.21	no	no
Nager, Steven A & Nga Thi	3362 NW Broad St	3.17	no	yes
Neifert, Richard L & Kathy S	893 Plateau	0.15	no	yes
Neifert, Richard L & Kathy S	893 Plateau	0.01	yes	
Nevue, Elaine A	384 W Lilburn Ave	0.17	no	yes
New Albertsons Inc	> Dept 70428 - Corporate Tax	6.02	no	no
Norrington, Ronald E	158 Timberlake Avenue	0.19	no	yes
Olson, Linda D	168 NE Trust	0.18	no	no
Onya Hospitality, LLC&	Jay Ram Investment, LLC&	1.95	no	no
Opp, Ronald L & Carol L	P.O. Box 574	0.24	no	no
Ortiz, Rosa A	202 Amanda Street	0.17	no	yes
Owens, Harold T	P.O. Box 428	0.82	no	yes
Page, Tanya L	620 NW Plateau Dr	0.14	no	yes
Page, Tanya L	620 NW Plateau Dr	0.01	yes	
Parkway Medical Buildings Inc	2700 Stewart Parkwy	2.6	no	no
Pearson, Aleesha &	Pearson, Ryan	0.18	no	yes

NAME	ADDRESS	ACREAGE	VACANT	REDEVELOPABLE
Pedersen, David A	553 Sweetbrier Ave	0.16	no	no
Pierzina, Bruce D & Mary Ellen	6941 Myrtle Ave	0.47	no	yes
Pierzina, Bruce D & Mary Ellen	6941 Myrtle Ave	0.47	yes	
Pieske, Jeremy & Yvette R	139 NW Pawnee Ct	0.2	no	yes
Plouff, Cleo	167 NW Mercy Hills Drive	0.17	no	no
Plummer, Frank & Nancy	2161 Circle Dr	0.11	no	yes
Pollard, Richard W & Diana M	182 Amanda Street	0.17	no	yes
Pope, Dennis B & Gloria J	109 NW Navajo	0.16	no	yes
Pope, Dennis B & Gloria J	109 NW Navajo	0.01	yes	
Potter, Brian L	3184 Broad St	0.17	no	no
Potter, Steven A	4019 Hooker Road	0.75	no	no
Powell, Ethel C &	Porter, Vernice C Powell	0.18	no	no
Powell-roseburg LLC	> Powell Development Company	1.56	no	no
Powell-roseburg LLC	> Powell Development Company	1.63	yes	
Prather, John M	2865 Juniper Ct	0.14	no	yes
Prather, John M	2865 Juniper Ct	0.02	yes	
Preston, Karla L	188 Lupine Lane	0.24	no	no
Price, Greg & Heather	523 NW Sweetbrier Ave	0.16	no	yes
Prohoroff, John Steven &	Vicki Jean Trustees of the	0.17	no	yes
Raine, Alfred B & Carol J Co-Trs	Raine Family Trust	0.2	yes	
Rammage, Dean C & Ione E	109 E Amanda Ct	0.38	no	yes
Rapat Inc	2855 NW Edenbower Blvd	0.63	no	yes
Rapat Inc	2855 NW Edenbower Blvd	1.51	no	no
Rapat Inc &	Rci Realty LLC	0.01	yes	
Rapat Inc &	Rci Realty LLC	0	yes	
Reagles, Robert L & Doris F	1613 NW Kline St	0.16	no	yes
Reagles, Robert L & Doris F	1613 NW Kline St	0.16	no	yes
Reagles, Robert L & Doris F	1613 NW Kline St	0.04	yes	
Reed, David M & Jeanette A	3530 Broad St	0.17	no	yes
Reed, Richard D & Karan B	P.O. Box 1343	0.17	no	yes
Reeves, Randy	556 Sweetbrier Ave	0.32	no	no
Reinhart, Louis B	577 NW Plateau Dr	0.14	no	yes
Reinhart, Louis B	577 NW Plateau Dr	0.04	yes	
Rice, Danial P	130 Navajo Ave	0.19	no	no
Rice, Virginia Lee Trs	Virginia Lee Rice Loving Trust	0.14	no	yes
Rice, Virginia Lee Trs	Virginia Lee Rice Loving Trust	0.01	yes	
Richards, Dorothy G	1081 NW Plateau Dr	0.13	no	yes
Richards, Dorothy G	1081 NW Plateau Dr	0.01	yes	
Robertson, David L	585 NW Wide Ave	0.18	no	yes
Robertson, David L	585 NW Wide Ave	0.26	no	no
Romeril, Allan B & Jeannine D	114 NW Kimberly Ct	0.26	no	yes
Roseburg M6 LLC	982 Moorea Dr	0.71	no	no
Roseburg M6 LLC	982 Moorea Dr	0.42	yes	
Roseburg M6 LLC	982 Moorea Dr	0.42	yes	
Roseburg M6 LLC	982 Moorea Dr	0.68	yes	
Roseburg Surgery Center LLC	> Cpac	0	no	no
Roseburg Surgery Center LLC	Mercy Medical Center Inc > Le	0.78	no	no
Roseburg Surgery Center LLC&	Mercy Medical Center Inc >Le &	0	no	no

NAME	ADDRESS	ACREAGE	VACANT	REDEVELOPABLE
Roseburg Urban Renewal Agency	900 SE Douglas	0.12	yes	
Roseburg Urban Renewal Agency	900 SE Douglas	1.17	yes	
Roush, Frank L & Beverly	487 NE Russell	0.3	no	yes
Roy, Joseph Percy Lorne &	Marie Charleen	0.11	no	yes
Roy, Joseph Percy Lorne &	Marie Charleen	0.02	yes	
Ruchaber, Harry J & Wanda L	523 Troost St	0.11	no	yes
Rutledge, Irene M	P.O. Box 1	0.11	no	yes
Salvation Army, The	30840 Hawthorn Bl	0.63	no	no
Scalone, Howard A Trs	Do Pc/pension & Profit Shar Plan	0.14	no	yes
Scalone, Howard A Trs Ha Scalone	Do Pc/pension & Profit Shar Plan	0.02	yes	
Schaan, Allan I &	Shoults, Ramona L	0.17	no	yes
Schattenkerk, Doug P & Tina R	5057 N Umpqua Hwy	0.26	no	no
Schattenkerk, Doug P & Tina R	5057 N Umpqua Hwy	0.17	no	no
Schattenkerk, Doug P & Tina R	5057 N Umpqua Hwy	0.27	yes	
Schattenkerk, Douglas P &	Bentz, Donald & Carol Trs &	0.62	yes	
Schattenkerk, Kerry J	3277 Broad Street	0.31	yes	
Scherf, Trisha L	170 NW Mercy Hills Dr	0.21	no	no
Schulie, Geraldine Louise &	Schulie, Albert Henry	0.16	no	yes
Schulie, Geraldine Louise &	Schulie, Albert Henry	0.01	yes	
Schwartz, Carol J	697 NW Plateau Dr	0.14	no	no
Schwartz, Carol J	697 NW Plateau Dr	0.02	yes	
Sedar, Joseph & Cathy	539 NW Plateau Dr	0.11	no	yes
Seek Inc	c/o Yost, Philip &	0.14	no	yes
Seek Inc	c/o Yost, Philip &	0.02	yes	
Seek Inc	c/o Brown, Alan D	0.11	yes	
Seek Inc	c/o Brown, Alan D	0.02	yes	
Selgear Development LLC	> Reagles, Daniel E	0.19	no	yes
Senn, Ralph & Jeannine	132 Oak Tree Rd	0.42	no	yes
Shang, Shuangling &	Zhu, Hao	7.74	no	yes
Shang, Shuangling &	Zhu, Hao	7.74	yes	
Shockey, Eugene H &	Shockey, Lola B	0.45	no	no
Shoufler, Raymond R	Pmb 337	0.3	yes	
Smith, Pennie Potter	3667 Joseph St	0.15	no	yes
Smith, Timothy Ray &	Michelle Lynn	0.15	no	yes
Smith, Timothy Ray &	Michelle Lynn	0.29	no	yes
Smith, Timothy Ray &	Michelle Lynn	0.15	no	no
Snider, Gregory R & Julie L	1572 NW Cherry	0.17	no	no
Snyder, Roger S & Nancy Bell	251 W Amanda St	0.26	no	yes
Sorensen, Bernadette M	1609 4th St	0.11	no	yes
Speigel, Leroy	> Robert D Johnson	0.15	no	yes
Speigel, Leroy	3686 Joseph Street	0.15	no	yes
Sperry, Edward D & Sheri R	100 E Kristen Ct	0.18	no	no
Standridge, Randy W & Kathy M	400 Strickland Cyn	0.27	no	yes
Stanton, Merdith J	3468 Broad St	0.17	no	yes
Starcher, Donna Lyn	3682 Hooker Road	0.15	no	yes
State of Oregon	355 Capitol St NE Rm 420	3.48	no	no
State of Oregon	355 Capitol St NE Rm 420	1.52	no	yes
State of Oregon	Dept of Transportation	0.06	yes	

NAME	ADDRESS	ACREAGE	VACANT	REDEVELOPABLE
State of Oregon	Dept of Transportation	0.14	yes	
State of Oregon	Dept of Transportation	0	yes	
State of Oregon	Dept of Transportation	0.01	yes	
State of Oregon	Dept of Transportation	0.02	yes	
State of Oregon	Dept of Transportation	0.15	yes	
Steele, Helen M	1224 NE Walnut #259 St	0.8	no	no
Sterken, Arthur W Sr	342 Lower Garden Valley Rd	1.23	no	no
Sterken, Arthur W Sr	342 Lower Garden Valley Rd	0.13	yes	
Stewart Avenue Property LLC	> Stein, Carl E & Norma J	2.8	no	no
Stewart Parkway LLC&	Elliott, Mark	0.66	no	no
Stewart Parkway LLC&	Elliott, Mark	0.65	no	no
Stewart Parkway Medical	Group LLC	1.36	no	no
Stewart Parkway Medical	Group LLC&	0.45	no	no
Stiles, Robert C	124 Trust Avenue	0.17	no	no
Stock, Bill & Mary	103 E Cordelia Ct	0.24	no	yes
Stocks, Lloyd & Toni	3430 NW Broad St	1.15	no	yes
Strain, Albert H & Birdella	3283 Broad St	0.17	no	no
Stucker, Ronald W & Bernice E	3659 Broad St	0.18	no	yes
Stuermer, Charles W & Neva E	240 Amanda St	0.18	no	yes
Stuermer, Charles W & Neva E	240 Amanda St	0.04	yes	
Summers, Mike J	3479 NW Broad St	0.19	no	yes
Sunderland, Steven L & Joanne M	1072 Plateau Dr	0.25	no	yes
Sunderland, Steven L & Joanne M	1072 Plateau Dr	0.02	yes	
Tang, Minh K & Snow Tiet Nguyen	2057 SE Lois Dr	0.17	no	no
Tarvin, Leslie C	P.O. Box 221	1.19	no	yes
Tarvin, Leslie C	P.O. Box 221	0.73	yes	
Tarvin, Leslie C	P.O. Box 221	0.25	yes	
Tatone, Joseph M Jr	1316 Cedar Ridge	0.65	no	no
Tatone, Joseph M Jr	> Re/max Professional Realty	0.3	yes	
The Old School Offices Inc	P.O. Box 1233	11.25	yes	
Tidrick, Carl A	3731 Hooker Rd	0.33	no	yes
Tolley, Don L & M E Susanna	118 E Cordelia Ct	0.19	no	yes
Tomashek, David E & Irene	594 Sweetbrier Ave	0.74	no	no
Tucci, Joseph J &	Victoria A Trs &	0.25	no	no
Umpqua Community Devlop Corp &	Umpqua Homes For The	0.54	no	no
Umpqua Community Health Center	544 W Umpqua St, Ste 206	0.83	yes	
Ungersma, Steven & Dawn	348 E Magnolia Ave	0.18	no	no
United Community Action Network	280 Kenneth Ford Drive	0.96	no	no
Varga, Peter V & Cristina D	10659 SE 172 Ave	9.75	yes	
Virnig, Jeff	1914 Romie Howard Road	0.13	no	yes
Virnig, Jeff	1914 Romie Howard Road	0.02	yes	
Virnig, Jeff J	1914 Romie Howard Rd	0.14	yes	
Virnig, Jeff J	1914 Romie Howard Rd	0.08	yes	
Walker, James L	2822 W Oriole	0.17	no	yes
Wastling, Shannon L Deedon	3733 Hooker Rd	0.18	no	yes
Watson, Richard &	Watson, Laverne E	0.17	no	yes
Wear, Travis W	554 NW Sweetbriar	0.42	no	no
Weaver, Stanley L & Alayne	100 E Angela Court	0.2	no	no

NAME	ADDRESS	ACREAGE	VACANT	REDEVELOPABLE
Weckerle, Richard S & Ramonda V	200 Timberlake Avenue	0.19	no	yes
Weckerle, Richard S & Ramonda V	1117 SE Kane St	0.17	no	no
Wellington, Donna L	4116 Hooker Road	0.41	no	no
West, Anton & Rhonda	10 N Encino Rd	3.64	yes	
Whalon, Mary K &	Shank, Robert E Jr & Chara-Lea	0.27	no	no
Wheeler, Lorraine	151 Mercy Hills	0.17	no	no
Wheeler, Richard & Deborah J	4044 NW Hooker Rd	0.41	no	no
White, Margaret A	962 NW Plateau Dr	0.14	no	yes
White, Margaret A	962 NW Plateau Dr	0.02	yes	
White, Noel W	3400 Broad St	0.6	no	yes
Wiley, Farrell & Peggy A	172 Kristen Ct	0.17	no	yes
Willamette Graystone Inc	P.O. Box 7816	3.08	no	no
Willamette Graystone Inc	P.O. Box 7816	0.12	yes	
Williams, David M & Joanne A	P.O. Box 536	0.27	no	no
Williams, Joanne	P.O. Box 536	0.23	no	no
Willis, Loren Lee & Maria Luz	741 Oakview Dr	0.18	no	no
Wilson, Donald E & Janis C	138 Mercy Hills	0.19	no	yes
Wingfield, James F	137 Trust Ave	0.17	no	yes
Wolfe, Kenneth T	3612 NW Joseph St	0.15	no	yes
Worsley, Dennis E	877 NW Plateau Dr	0.14	no	no
Worsley, Dennis E	877 NW Plateau Dr	0.02	yes	
Wright, Jason & Halie J	P.O. Box 446	0.41	no	yes
Young, Audrey	4098 Hooker Road	0.41	no	no
Young, W E & M L Trs Young Trust	c/o Nash, Norman H & Shirley R Trs	0.14	no	yes
Young, W E & M L Trs Young Trust	c/o Nash, Norman H & Shirley R Trs	0.04	yes	
Young, Wayne E & Marion L Trs	Young Trust	0.19	no	yes
Young, William P & Barbara A	3626 Broad	0.17	no	yes
Young's Mgt Company	> Lauren & Dena Young	0.11	yes	
Ziebarth, Herman F & Susan L	3315 Broad St	0.58	no	no
Ziglinski, Mark T & Deborah	3432 NW Broad St	0.78	no	no
Ziglinski, Mark T & Deborah	3432 NW Broad St	0.13	yes	

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

Technical Memorandum #3
Future Baseline Traffic Conditions

Prepared for

Oregon Department of Transportation, Region 3
3500 NW Stewart Parkway
Roseburg, Oregon 97470

Prepared by

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2100 SW River Parkway
Portland, Oregon

December 2014

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3. FUTURE BASELINE TRAFFIC CONDITIONS

This technical memorandum presents the future baseline traffic conditions in the I-5 Exit 127 interchange management study area (IMSA) for the Year 2035. The 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. The analysis identifies anticipated operational deficiencies and serves as the basis for later evaluation to compare project alternatives that address deficiencies.

3.1. Future Land Use

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.

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. The resulting housing and employment forecasts for the region are summarized in Table 3-1.

Table 3-1. 2035 LU 1.2 Housing and Employment Growth

Land Use	2009 Baseline	2035 Future Baseline (LU1.2)	Percent Growth	
			Total	Annual
Households	22,203	29,778	33%	1.12%
Employment	24,315	28,243	16%	0.58%

Source: David Evans and Associates, Inc.

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 NW Stewart Parkway.

3.2. Future Traffic Volume Development

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. The travel demand forecasting process and resulting traffic forecasts are briefly described below.

3.2.1. Travel Demand Forecasting Models

The travel demand forecasting model for the Roseburg area is maintained by the Transportation Planning and Analysis Unit (TPAU) at ODOT. The model relies on socioeconomic data (e.g., households and employment) to determine travel demand and system attributes (e.g., roadway capacity, speeds, and distances) to represent the transportation supply. The long-range regional growth forecasts are consistent with current land use zoning.

The travel demand model for the Roseburg area has a base year of 2009 and a future year of 2035. The scenario used in forecasting demand this Interchange Area Management Plan (IAMP) is known as 2035 LU 1.2.

3.2.2. Future Transportation Network

The network used in the forecasts for IAMP 127 is a future network that includes roadway projects that are expected to occur by year 2035. These projects have known funding sources or are programmed to be funded in the next 20 years. Other planned projects that do not have identified funding sources are addressed in the alternatives analysis portion of this project. Only one noteworthy project is currently planned and funded within the IMSA. The widening of Stewart Parkway to two lanes in each direction from Valley View Drive to Harvey Avenue was considered in analysis. This project is not within the IMSA; however it was included in the traffic forecasting model as it could impact network travel patterns.

3.2.3. Traffic Forecasts

Traffic forecasts for the study area intersections were developed from the 2009 and 2035 forecasting models and the 2012 existing traffic data for the future baseline scenario. The process followed the procedures from ODOT's Analysis Procedures Manual (APM)[1]. The forecast year for this corridor study is 2035; thus, model volumes were extrapolated to 2035.

Traffic volumes for the future baseline scenario are presented in Figure 3-1. The detailed volume development worksheets are presented in Appendix A.

3.3. Future Traffic Operations

Traffic analysis for the 2035 future baseline scenario was performed for the six study area intersections and for the merge-diverge sections of the freeway.

3.3.1. Intersection Analysis

Table 3-2 summarizes the results of the traffic operations analysis and compares them to the Oregon Highway Plan (OHP) mobility targets and City and Douglas County standards. Figure 3-2 presents the v/c ratios and LOS performance by lane group for the area intersections. Traffic

[1] Analysis Procedures Manual, Oregon Department of Transportation, Transportation Development Division Planning Section, Transportation Planning and Analysis Unit, Salem, Oregon, April, 2006, Section 4.3.

signal timing at the signalized intersections was modified to optimize traffic flow with future demands. The two unsignalized intersections (Broad Street at Edenbower Boulevard and the northbound ramp terminal at Edenbower Boulevard) would not meet preliminary signal warrants for the future baseline conditions; both were assumed to remain STOP-controlled.

Table 3-2. Future (2035) Baseline Intersection Operations

Intersection	Critical Movement[2]	V/C Ratio[3]	LOS[3]	Operational Standards	
				OHP[4]	City/County[5]
1. Edenbower Blvd. at Stewart Pkwy. (Signalized)	Overall	**1.02**	**E**	--	LOS D/0.85
2. Edenbower Blvd. at Broad St.	EB L/R	0.26	C	--	LOS D/0.85
3. Edenbower Blvd. at SB Ramp Terminal (Signalized)	Overall	0.69	B	0.85	LOS D/0.85
4. Edenbower Blvd. at NB Ramp Terminal	NB R	0.48	D	0.85	LOS D/0.85
5. Edenbower Blvd. at Aviation Dr. (Signalized)	Overall	0.61	B	--	LOS D/0.85
6. Edenbower Blvd. at Stephens St. (Signalized)	Overall	0.71	C	--	LOS D/0.85

Acronyms: EB = eastbound; WB = westbound; NB = northbound; and SB = southbound. L = left; T = through; and R = right.

Notes:
1. **SHADED** Values exceed operational standard
2. 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.
3. 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.
4. 1999 Oregon Highway Plan (OHP), Policy 1F applies to existing and no-build conditions through the planning horizon.
5. 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, while the Douglas County TSP identifies standards for County facilities.

Source: David Evans and Associates, Inc.

The analysis results show that under the 2035 future baseline conditions, only one of the six 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 standard of LOS D. Furthermore, this intersection is forecast to have demand that would exceed available capacity.

The intersection with the next worse operations is Edenbower Boulevard at Stephens Street, though it would meet operational standards with LOS C and a V/C of 0.71.

Table 3-3 presents the 95th percentile queuing estimates. All Synchro and SimTraffic output worksheets are provided in Appendix B. Preliminary signal warrants were evaluated at the two unsignalized IMSA intersections and are not expected to be met with future baseline traffic volumes. The worksheets may be found in Appendix C.

Table 3-3. Future (2035) Baseline 95th Percentile Queues Exceeding Available Storage

Intersection	Approach & Movement	95th Percentile Queue (ft.)	Available Storage	Percent Time Blocked[1]
1. Edenbower Blvd. at Stewart Pkwy. (Signalized)	EB L	375	325[4]	63%
	EB T/R	850	410[3]	--
	WB L	200	100[3]	16%
	WB T	275	125[2]	37%
	WB R	100	75[3]	--
	NB L	150	115[3]	--
	NB T/R	400	215[2]	40%
	SB R	200	150[3]	--
5. Edenbower Blvd. at Aviation Dr. (Signalized)	WB R	175	100[3]	--
6. Edenbower Blvd. at Stephens St. (Signalized)	EB L	275	110[4]	--
	EB T/R	250	360[2]	--
	NB L	200	150[4]	28%
	NB T/R	450	350[2]	--
	SB R	200	165[3]	--

Acronyms: EB = eastbound; WB = westbound; NB = northbound; and SB = southbound. L = left; T = through; and R = right.

Notes:
1. Percent time block reflects the percentage of time when the queue either extends out of a storage bay and interferes with the adjacent through travel lane or extends past the next upstream intersection.
2. Storage distance reflects spacing to the next public access point.
3. Storage distance reflects length of travel lane or turn bay.
4. Storage distance reflects length of turn bay but TWLTL allows additional storage space.

Source: David Evans and Associates, Inc.

Three of the six study intersections experience movements with 95th percentile queues expected to exceed available storage or extend beyond the next upstream intersection. As identified in the existing conditions, the intersection of Edenbower Boulevard at Stewart Parkway has lanes on each approach with queues exceeding available storage. The eastbound left-turn has queuing that continues into the two-way left-turn lane and spills out into through traffic more than half of the peak hour. The westbound movements 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.

The signalized intersection of Edenbower Boulevard at Aviation Drive would experience queues that exceed available storage for the westbound right-turn lane. Westbound traffic is expected to regularly queue back approximately halfway between Aviation Drive and Stephens Street, and depending on the traffic from Stephens Street, may occasionally queue back even further.

At the signalized intersection of Edenbower Boulevard and Stephens Street, the eastbound left-turn lane queue exceeds available storage and the thru/right queue blocks access to the storage facility located on the southwest corner of the intersection. The northbound left-turn and southbound right-turn lane queues are expected to exceed turn lane storage, and the northbound thru/right queue blocks a public access point 350 feet south of the intersection.

3.3.2. Freeway Analysis

The 2035 operations of the interchange ramp interaction with the mainline highway traffic were also evaluated. These analyses were conducted in accordance with the methodology prescribed in ODOT's APM to determine v/c ratio performance. The results of the analyses are summarized in Table 3-4.

Table 3-4. Future (2035) Baseline Freeway Operations

Direction/Location	V/C Ratio[1]	
	PM Peak 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 Northbound Loop On-Ramp	0.42	0.22
Mainline North of Exit 127 between On-Ramps	0.41	0.22
Merge: Exit 127 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.

Source: David Evans and Associates, Inc.

The merge and diverge analyses for both the future design hour (PM peak hour) and the alternate hour (AM peak hour) 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 0.85 for the future baseline scenario.

3.4. Future Traffic Safety Considerations

A safety analysis was conducted using the Highway Safety Manual (HSM) Part C methodology. This analysis includes a comparison of predicted crash frequencies for the existing and future baseline year conditions. Predictions were made using empirically-determined crash characteristics based on the facility type, HSM supported crash modification factors, forecast ADTs, and existing crash data for calibration purposes. The findings from this analysis are summarized in Table 3-5 and more detailed worksheets can be found in Appendix D. .

Table 3-5. Summary of Expected Average Crash Frequency per Year

	Expected Crash Frequency per Year[1]	
Location	**Existing[2]**	**Baseline[3]**
Segments along Edenbower Blvd.		
Stewart Pkwy to Broad St.	1.82	2.09
Broad St. to SB Ramp Terminal	0.18	0.24
SB Ramp Terminal to NB Ramp Terminal	0.17	0.20
NB Ramp Terminal to Aviation Dr.	0.22	0.26
Aviation Dr. to Stephens St.	0.53	0.61
Intersections		
Edenbower Blvd. at Stewart Pkwy.	5.66	6.54
Edenbower Blvd. at Broad St.	0.28	0.37
Edenbower Blvd. at SB Ramp Terminal	1.80	2.31
Edenbower Blvd. at NB Ramp Terminal	1.01	1.22
Edenbower Blvd. at Aviation Dr.	2.00	2.28
Edenbower Blvd. at Stephens St.	2.16	2.36
Total	**15.84**	**18.47**

Notes:
1. The expected crash frequency per year was calculated using the Highway Safety Manual Part C methodology.
2. Existing analysis assumes 2012 ADT volumes.
3. Baseline analysis assumes forecasted 2035 ADT volumes.

A comparison of the Existing and Future Baseline HSM analysis indicates that additional volumes traveling through the network would result in a slightly higher overall crash frequency. Since the Future Baseline scenario does not include any network improvements within the study area, this result is expected. Predicted crash frequencies associated with the Stewart Parkway intersection are significantly higher than other locations within the IMSA due to existing crash history, conflict points and higher traffic volumes. Factors that generally increase predicted segment crash rates include roadside fixed object density (the presence of light poles, power lines, trees, etc.), number of accesses and ADT. Factors that generally decrease the predicted intersection crash rates include the number of turn lanes.

In combination with the HSM findings, future traffic operations highlight a number of safety issues for consideration in the interchange management area. These safety concerns include access spacing, queue spillback into adjacent intersections, two-way left-turn lane overlapping demand, intersection approach geometry and excessive side street delay. Below is a summary by intersection of issues for consideration for future traffic safety.

- Stewart Parkway and Edenbower Boulevard: Safety concerns at this intersection may arise because the queue storage in the two-way left-turn lanes east and west of Edenbower Boulevard would not be adequate to accommodate forecast demand and queues would spill out into the adjacent through lane. This queue spillover could result in an increase in rear end or sideswipe collisions as drivers encounter stopped traffic or change lanes to avoid stopped traffic. Existing conditions have already highlighted queuing problems in both the east and west direction. Opportunities to reduce queuing

should be investigated and access management in the corridor should also be considered. Roadway approach geometry may also be a contributing factor to increased crash rates; the curve at this location limits sight distance.

- Broad Street and Edenbower Boulevard: Safety concerns at this intersection are focused on the limited number of adequate gaps in traffic which might result in an increased crash rate as drivers engage in riskier behaviors to enter the traffic stream. Crash frequency and severity should be monitored in the future as adequate gaps along Edenbower Boulevard decrease and the delays for side street traffic increase. Additionally, this intersection may benefit from separate turn lanes on the side street or signalization when the warrant is met.
- Southbound Ramp Terminal and Edenbower Boulevard: The queue spillback in the eastbound direction on Edenbower Boulevard could develop into a safety and operational concern at this intersection. Rear-end collisions or sideswipe collisions may increase as traffic trying to get onto the freeway maneuvers around the eastbound through queue. Monitoring of crash patterns at this location must focus on both the intersection and its potential effects on the freeway.
- Northbound Ramp Terminal and Edenbower Boulevard: Safety concerns at this intersection are focused on the limited number of adequate gaps in traffic which might result in an increased crash rate as drivers engage in riskier behaviors to enter the traffic stream. Crash frequency and severity should be monitored in the future as adequate gaps along Edenbower Boulevard decrease and the delays for the northbound left turns increase. Additionally, this intersection may benefit from signalization when the warrant is met. Monitoring of crash patterns at this location must focus on both the intersection and its potential effects on the freeway.
- Aviation Drive and Edenbower Boulevard: Operational analysis of future conditions shows that a few of the movements at Aviation Drive would have queues that exceed available storage and traffic at the northbound ramp terminal would affect this intersection. Queue spillover and spillback could result in an increase in rear-end or sideswipe collisions as drivers encounter stopped traffic or change lanes to avoid stopped traffic in the westbound direction. Continue to monitor movement capacity on all approaches. Extra storage should be provided where possible.
- Stephens Street and Edenbower Boulevard: Safety concerns at this intersection may arise because the queue storage in the left-turn lanes eastbound and northbound would not be adequate to accommodate forecast demand and queues would spill out into the adjacent through lanes. This queue spillover could result in an increase in rear end or sideswipe collisions as drivers encounter stopped traffic or change lanes to avoid stopped traffic

3.5. Conclusions

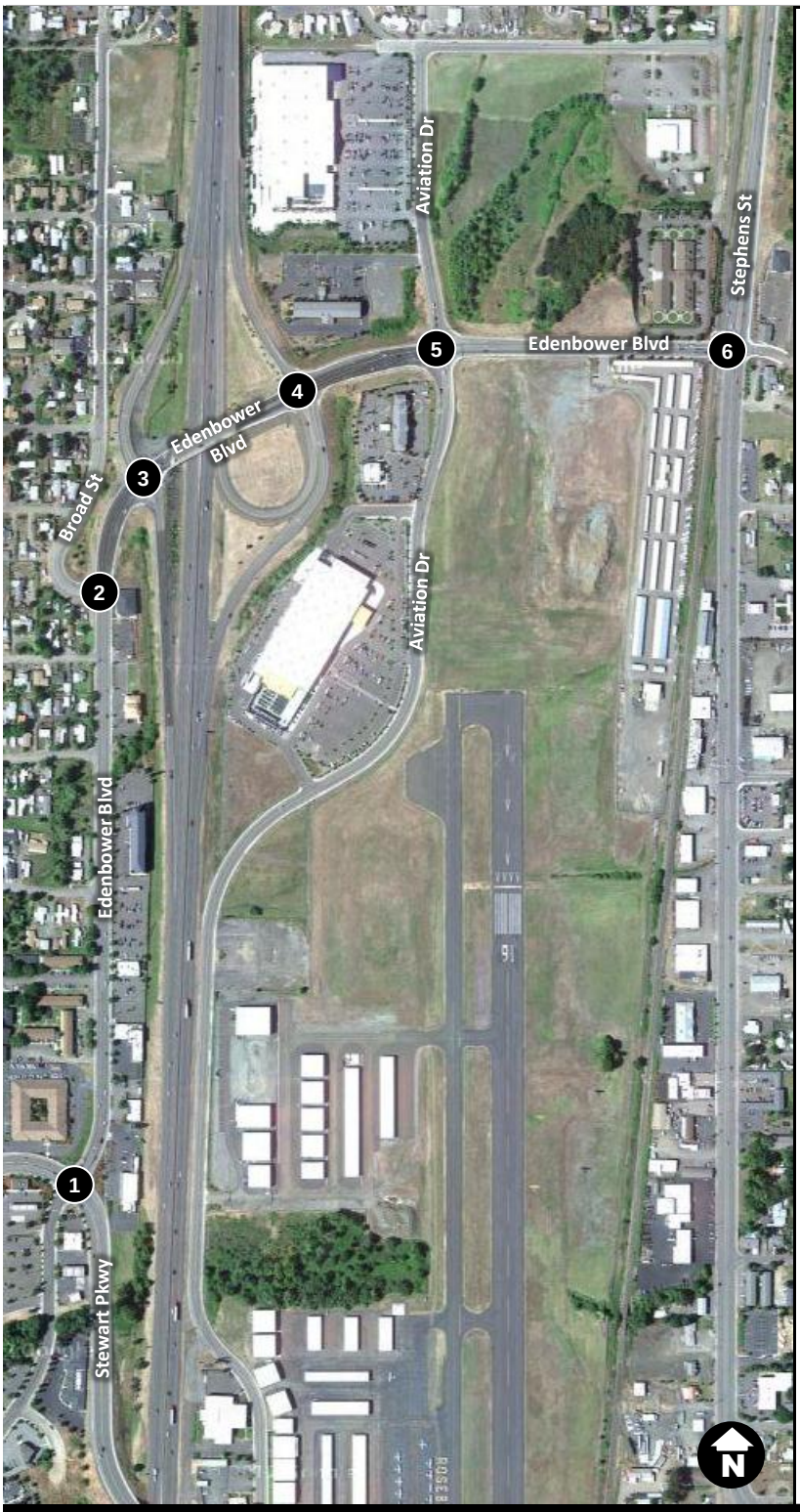
One study area intersection would exceed mobility standards under the future baseline scenario. The rest of the IMSA intersections operate within operational standards and with minimal queues. Future operational issues are summarized below:

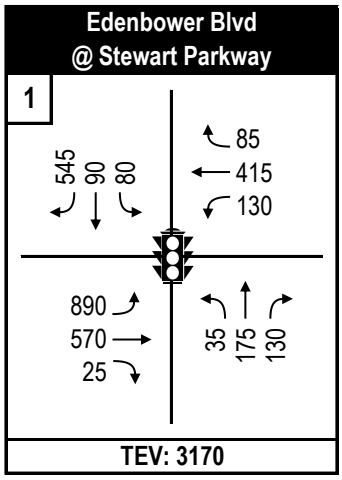
- Stewart Parkway at Edenbower Boulevard would fail to meet operational standards and experience significant queuing for several of the movements. Overall traffic demand is expected to exceed intersection capacity. Extensive queuing would create safety concerns.
- The two unsignalized intersections (Broad Street at Edenbower Boulevard and the northbound ramp terminal at Edenbower Boulevard) do not currently meet signal warrants and would not meet them in the near term. Both intersections operate well below their respective mobility standards.
- The southbound ramp terminal would meet mobility standards in 2035 but queuing in the eastbound direction should be monitored for safe stopping sight distance.
- Aviation Drive at Edenbower Boulevard would meet operational standards, although queuing would start to become a concern in the westbound turn lanes.
- Operations would be acceptable at Stephens Street at Edenbower Boulevard, though queuing in the eastbound direction would impact accesses. The northbound left-turn traffic would exceed the striped storage, though the two-way left-turn lane provides ample storage space.

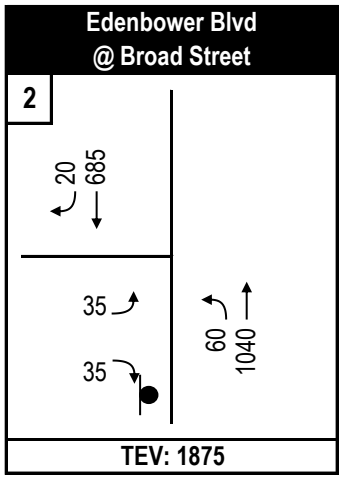
Attachments:

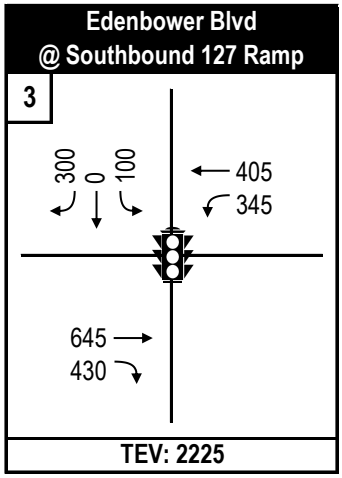
Figure 3-1. Future Baseline (2035) Conditions – Design House Traffic Volumes
Figure 3-2. Future Baseline (2035) Conditions – Lane Configurations & Traffic Operations

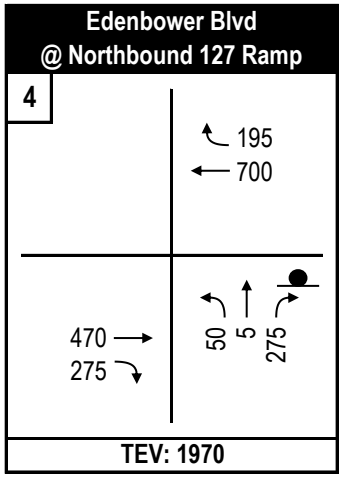
Appendix A. Future Traffic Volume Development
Appendix B. Synchro Output Worksheets
Appendix C. ODOT's Preliminary Traffic Signal Warrants
Appendix D. HCM Part C Worksheets

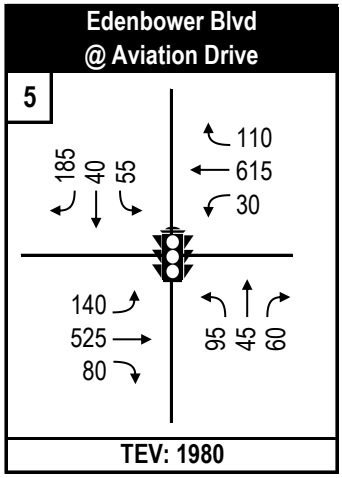


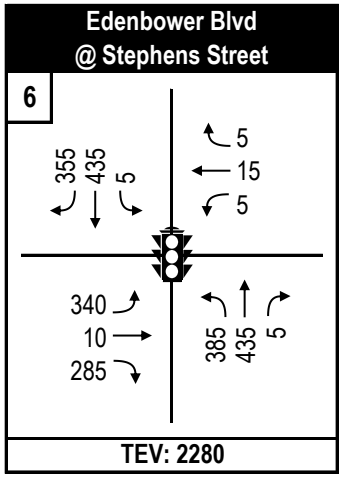










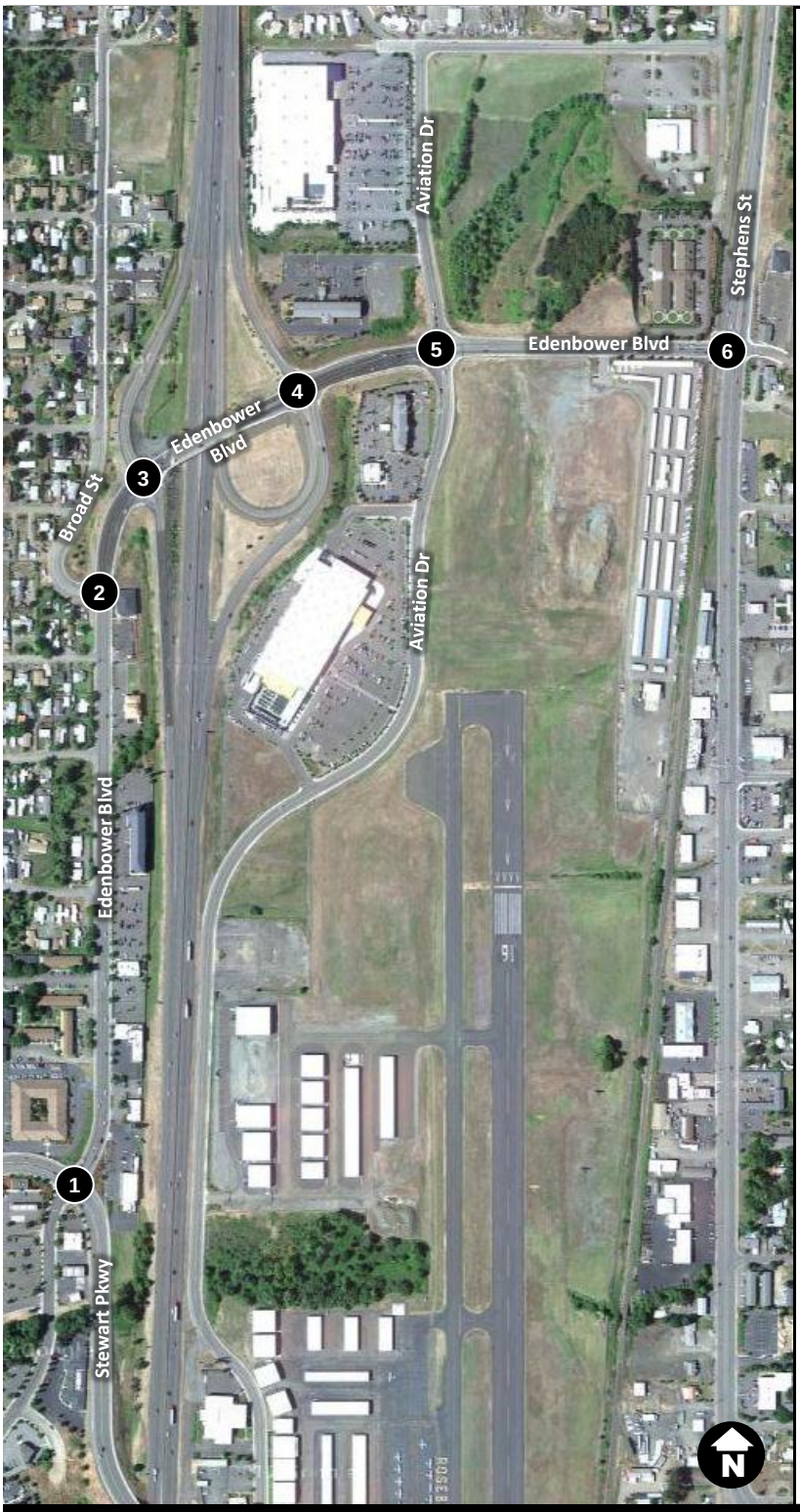


I-5 Exit 137 (North Roseburg) IAMP

Legend

- Allowable Movement
- TEV: Total Entering Volume
- ### PM Peak Hour Turning Movement Volume
- Signalized Intersection
- STOP Controlled Approach

Figure 3-1
2035 Future Baseline
PM Peak Hour Volumes



Edenbower Blvd @ Stewart Parkway*

1

0.53 (A)
0.25 (D)
0.99 (F)

0.06 (C)
0.60 (D)
0.67 (D)

1.25 (F)
0.34 (B)

0.14 (C)
0.82 (D)

Overall: 1.02 (E)

Edenbower Blvd @ Broad Street

2

0.00 (--)

0.26 (C)

0.07 (A)
0.00 (--)

Overall: 0.26 (C)

Edenbower Blvd @ Southbound 127 Ramp*

3

0.21 (C)
0.47 (D)

0.32 (A)
0.70 (B)

0.67 (B)
0.29 (B)

Overall: 0.69 (B)

Edenbower Blvd @ Northbound 127 Ramp

4

0.00 (--)
0.00 (--)

0.00 (--)
0.00 (--)

0.48 (D)
0.35 (B)

Overall: 0.48 (D)

Edenbower Blvd @ Aviation Drive*

5

0.14 (D)
0.21 (D)
0.32 (C)

0.08 (A)
0.69 (B)
0.07 (A)

0.38 (A)
0.54 (A)
0.06 (A)

0.41 (C)
0.25 (C)

Overall: 0.61 (B)

Edenbower Blvd @ Stephens Street*

6

0.25 (C)
0.46 (C)
0.56 (F)

0.03 (C)
0.02 (C)

0.84 (D)
0.67 (C)

0.84 (D)
0.24 (B)

Overall: 0.71 (C)

I-5 Exit 137 (North Roseburg) IAMP

Legend

Lane Configuration

0.01 (A) Lane Group V/C (LOS)
Volume-to-Capacity Ratio (Level of Service)

(--) LOS only reported for stopped or yielding movement

Signalized Intersection

STOP Controlled Approach

**Intersection operations based on HCM 2000 Methodology*

Figure 3-2
2035 Future Baseline
PM Peak Hour Operations

Appendix A. Future Traffic Volume Development

Project: Interchange 127 Area Management Plan

Job #: ODOT0000-0767

Subject: ***PM Turning Movement Volumes***

3/27/2013

N-S ID	Synchro ID	Intersection	Direction	Movement	Int ID	Existing Counts 1-Hr Volume PM Peak	Existing Heavy Vehicle Count	Existing Heavy Vehicle Percentage	Base Year Adjustment Factor	Seasonal Adjustment Factor	30th Highest Hour Adjusted 1-Hr Volume AM Peak	Volume Balancing Adjustments	2012 Balanced Volumes PM Peak	2035 NCHRP 255-Base Unbalanced Future Baseline	2035 NCHRP 255-Base Rounded Future Baseline	2035 NCHRP 255-Base Balanced Future Baseline
1	10	Edenbower Boulevard @ Stewart Parkway		EBL	10	652	0	0%	1.00	1.02	665	0	665	894	895	890
	10	16 hr PM Turning Movement Count	EB	EBT	10	367	0	0%	1.00	1.02	375	0	375	569	570	570
	10	Count Date: 6/12/2012		EBR	10	14	0	0%	1.00	1.02	15	0	15	23	25	25
	10	2012		WBL	10	83	0	0%	1.00	1.02	85	0	85	130	130	130
	10	Signalized	WB	WBT	10	327	0	0%	1.00	1.02	335	0	335	413	415	415
	10			WBR	10	67	0	0%	1.00	1.02	70	0	70	87	85	85
	10	PM Peak Hour: 4:30 PM-5:30 PM		NBL	10	34	0	0%	1.00	1.02	35	0	35	37	35	35
	10	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT	10	161	0	0%	1.00	1.02	165	0	165	181	180	175
	10			NBR	10	102	0	0%	1.00	1.02	105	0	105	130	130	130
	10			SBL	10	56	0	0%	1.00	1.02	55	0	55	78	80	80
	10	PHF:	SB	SBT	10	57	0	0%	1.00	1.02	60	0	60	85	85	90
	10	0.93		SBR	10	456	0	0%	1.00	1.02	465	0	465	547	545	545
			TEV	**TEV**		**2376**	**0**				**2430**	**0**	**2430**	**3174**	**3175**	**3170**
2	20	Edenbower Boulevard @ Broad Street		EBL	20	26	0	0%	1.00	1.02	25	0	25	33	35	35
	20	4 hr PM Turning Movement Count	EB	EBT	20	0	0	0%	1.00	1.02	0	0	0	0	0	0
	20	Count Date: 6/11/2012		EBR	20	27	0	0%	1.00	1.02	30	0	30	34	35	35
	20	2012		WBL	20	0	0	0%	1.00	1.02	0	0	0	0	0	0
	20		WB	WBT	20	0	0	0%	1.00	1.02	0	0	0	0	0	0
	20			WBR	20	0	0	0%	1.00	1.02	0	0	0	0	0	0
	20	PM Peak Hour: 4:30 PM-5:30 PM		NBL	20	49	0	0%	1.00	1.02	50	0	50	61	60	60
	20	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT	20	784	2	0%	1.00	1.02	800	0	800	1,042	1040	1040
	20			NBR	20	0	0	0%	1.00	1.02	0	0	0	0	0	0
	20			SBL	20	0	0	0%	1.00	1.02	0	0	0	0	0	0
	20	PHF:	SB	SBT	20	537	3	1%	1.00	1.02	550	0	550	683	685	685
	20	0.99		SBR	20	17	0	0%	1.00	1.02	15	0	15	20	20	20
			TEV	**TEV**		**1440**	**5**				**1470**	**0**	**1470**	**1873**	**1875**	**1875**
3	30	Edenbower Boulevard @ SB 127 Ramp		EBL	30	0	0	0%	1.00		0	0	0	0	0	0
	30	4 hr PM Turning Movement Count	EB	EBT	30	537	2	0%	1.00	1.02	550	0	550	645	645	645
	30	Count Date: 6/11/2012		EBR	30	179	1	1%	1.00	1.04	185	90	275	427	425	430
	30	2012		WBL	30	264	1	0%	1.00	1.04	275	-5	270	344	345	345
	30	Signalized	WB	WBT	30	366	0	0%	1.00	1.02	375	0	375	404	405	405
	30			WBR	30	0	0	0%	1.00		0	0	0	0	0	0
	30	PM Peak Hour: 4:30 PM-5:30 PM		NBL	30	0	0	0%	1.00		0	0	0	0	0	0
	30	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT	30	0	0	0%	1.00		0	0	0	0	0	0
	30			NBR	30	0	0	0%	1.00		0	0	0	0	0	0
	30			SBL	30	98	7	7%	1.00	1.04	100	0	100	100	100	100
	30	PHF:	SB	SBT	30	1	0	0%	1.00	1.04	0	0	0	2	0	0
	30	0.93		SBR	30	175	0	0%	1.00	1.04	180	10	190	299	300	300
			TEV	**TEV**		**1620**	**11**				**1665**	**95**	**1760**	**2222**	**2220**	**2225**
4	40	Edenbower Boulevard @ NB 127 Ramp		EBL	40	0	0	0%	1.00	1.04	0	0	0	0	0	0
	40	4 hr PM Turning Movement Count	EB	EBT	40	437	6	1%	1.00	1.02	445	0	445	470	470	470
	40	Count Date: 6/11/2012		EBR	40	199	1	1%	1.00	1.04	205	0	205	277	275	275
	40	2012		WBL	40	0	0	0%	1.00		0	0	0	0	0	0
	40		WB	WBT	40	588	2	0%	1.00	1.02	600	0	600	699	700	700
	40			WBR	40	125	0	0%	1.00	1.04	130	-15	115	193	195	195
	40	PM Peak Hour: 3:45 PM-4:45 PM		NBL	40	42	0	0%	1.00	1.04	45	0	45	50	50	50
	40	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT	40	2	0	0%	1.00	1.04	0	0	0	3	5	5
	40			NBR	40	230	1	0%	1.00	1.04	240	0	240	275	275	275
	40			SBL	40	0	0	0%	1.00		0	0	0	0	0	0
	40	PHF:	SB	SBT	40	0	0	0%	1.00		0	0	0	0	0	0
	40	0.91		SBR	40	0	0	0%	1.00		0	0	0	0	0	0

Project: Interchange 127 Area Management Plan

Job #: ODOT0000-0767

Subject: ***PM Turning Movement Volumes***

3/27/2013

N-S ID	Synchro ID	Intersection	Direction	Movement	Int ID	Existing Counts 1-Hr Volume PM Peak	Existing Heavy Vehicle Count	Existing Heavy Vehicle Percentage	Base Year Adjustment Factor	Seasonal Adjustment Factor	30th Highest Hour Adjusted 1-Hr Volume AM Peak	Volume Balancing Adjustments	2012 Balanced Volumes PM Peak	2035 NCHRP 255-Base Unbalanced Future Baseline	2035 NCHRP 255-Base Rounded Future Baseline	2035 NCHRP 255-Base Balanced Future Baseline
			TEV	**TEV**		**1623**	**10**				**1665**	**-15**	**1650**	**1968**	**1970**	**1970**
5	50	Edenbower Boulevard @ Aviation Drive		EBL	50	96	0	0%	1.00	1.02	100	0	100	140	140	140
	50	16 hr PM Turning Movement Count	EB	EBT	50	500	4	1%	1.00	1.02	510	0	510	531	530	525
	50	Count Date: 6/11/2012		EBR	50	71	2	3%	1.00	1.02	70	5	75	80	80	80
	50	2012		WBL	50	28	0	0%	1.00	1.02	30	0	30	31	30	30
	50	Signalized	WB	WBT	50	476	0	0%	1.00	1.02	485	10	495	616	615	615
	50			WBR	50	74	0	0%	1.00	1.02	75	0	75	108	110	110
	50	PM Peak Hour: 5:00 PM-6:00 PM		NBL	50	56	0	0%	1.00	1.02	55	10	65	92	90	95
	50	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT	50	25	0	0%	1.00	1.02	25	0	25	46	45	45
	50			NBR	50	44	0	0%	1.00	1.02	45	0	45	59	60	60
	50			SBL	50	52	0	0%	1.00	1.02	55	0	55	55	55	55
	50	PHF:	SB	SBT	50	37	0	0%	1.00	1.02	40	0	40	41	40	40
	50	0.86		SBR	50	142	0	0%	1.00	1.02	145	10	155	182	180	185
			TEV	**TEV**		**1601**	**6**				**1635**	**35**	**1670**	**1981**	**1975**	**1980**
6	60	Edenbower Boulevard @ Stephens Street		EBL	60	322	0	0%	1.00	1.02	330	10	340	339	340	340
	60	4 hr PM Turning Movement Count	EB	EBT	60	5	0	0%	1.00	1.02	5	0	5	6	5	10
	60	Count Date: 6/11/2012		EBR	60	237	4	2%	1.00	1.02	240	10	250	284	285	285
	60	2012		WBL	60	3	0	0%	1.00	1.02	5	0	5	4	5	5
	60	Signalized	WB	WBT	60	9	0	0%	1.00	1.02	10	0	10	13	15	15
	60			WBR	60	4	0	0%	1.00	1.02	5	0	5	5	5	5
	60	PM Peak Hour: 4:30 PM-5:30 PM		NBL	60	291	2	1%	1.00	1.02	295	0	295	385	385	385
	60	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT	60	388	1	0%	1.00	1.02	395	0	395	437	435	435
	60			NBR	60	5	0	0%	1.00	1.02	5	0	5	6	5	5
	60			SBL	60	4	0	0%	1.00	1.02	5	0	5	5	5	5
	60	PHF:	SB	SBT	60	368	2	1%	1.00	1.02	375	0	375	436	435	435
	60	0.94		SBR	60	287	0	0%	1.00	1.02	295	0	295	351	350	355
			TEV	**TEV**		**1923**	**9**				**1965**	**20**	**1985**	**2270**	**2270**	**2280**
7	70	I-5 PM Merge/Diverge		Main S		1366		0%	1.00	1.04	1420	0	1420	43%	2030	2029
	70	16 Hr Turning Movement Count		NB Off		274		0%	1.00	1.04	285	0	285	15%	325	327
	70	Count Date; 6/12/2012		Through		1092		0%	1.00	1.04	1135	0	1135	47%	1670	1668
	70	2012	NB	EB to NB On		199		0%	1.00	1.04	205	0	205	34%	275	275
	70			Through		1291		0%	1.00	1.04	1345	0	1345	44%	1945	1943
	70	24 Hr Factor: 1.1		WB to NB On		125		0%	1.00	1.04	130	0	130	54%	200	200
	70			Main N		**1416**	**237**	17%	1.00	1.04	1475	0	1475	45%	2140	2138
	70			Main N		**1164**	**227**	20%	1.00	1.04	1210	0	1210	42%	1725	1723
	70			SB Off		274		0%	1.00	1.04	285	0	285	41%	400	402
	70		SB	Through		890		0%	1.00	1.04	925	0	925	44%	1330	1329
	70			SB On		443		0%	1.00	1.04	460	0	460	68%	775	773
	70			Main S		1333		0%	1.00	1.04	1385	0	1385	49%	2060	2059
			TEV	**TEV**		**9867**	**464**				**10260**	**0**	**10260**		**14875**	**14866**
8	80	I-5 AM Merge/Diverge		Main S		849		0%	1.00	1.04	885	0	885	49%	1315	1315
	80	16 Hr Turning Movement Count		NB Off		222		0%	1.00	1.04	230	0	230	68%	388	387
	80	Count Date; 6/12/2012		Through		627		0%	1.00	1.04	650	0	650	43%	930	929
	80	2012	NB	EB to NB On		60		0%	1.00	1.04	60	0	60	41%	85	85
	80			Through		687		0%	1.00	1.04	715	0	715	42%	1015	1014
	80	24 Hr Factor: 1.1		WB to NB On		72		0%	1.00	1.04	75	0	75	41%	105	106
	80			Main N		**759**	**0**	0%	1.00	1.04	790	0	790	42%	1120	1119
	80			Main N		**1094**	**0**	0%	1.00	1.04	1140	0	1140	47%	1670	1670
	80			SB Off		285		0%	1.00	1.04	295	0	295	42%	420	418
	80		SB	Through		809		0%	1.00	1.04	840	0	840	49%	1250	1252

Project: Interchange 127 Area Management Plan

Job #: ODOT0000-0767

Subject: ***PM Turning Movement Volumes***

3/27/2013

N-S ID	Synchro ID	Intersection	Direction	Movement	Int ID	Existing Counts 1-Hr Volume PM Peak	Existing Heavy Vehicle Count	Existing Heavy Vehicle Percentage	Base Year Adjustment Factor	Seasonal Adjustment Factor	30th Highest Hour Adjusted 1-Hr Volume AM Peak	Volume Balancing Adjustments	2012 Balanced Volumes PM Peak	2035 NCHRP 255-Base Unbalanced Future Baseline	2035 NCHRP 255-Base Rounded Future Baseline	2035 NCHRP 255-Base Balanced Future Baseline
	80			SB On		178		0%	1.00	1.04	185	0	185	15%	215	213
	80			Main S		987		0%	1.00	1.04	1025	0	1025	43%	1465	1464
			TEV	**TEV**		**6629**	**0**				**6890**	**0**	**6890**		**9978**	**9972**

Appendix B. Synchro Output Worksheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	890	570	25	130	415	85	35	175	130	80	90	545
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	175.0	175.0	175.0	175.0	175.0	182.0	175.0	175.0	175.0	175.0	175.0	175.0
Lanes	1	2	0	1	2	1	1	1	0	1	1	1
Cap, veh/h	704	1763	78	173	741	328	237	245	182	155	460	1025
Arrive On Green	0.42	0.53	0.52	0.10	0.21	0.21	0.26	0.26	0.25	0.26	0.26	0.27
Sat Flow, veh/h	1667	3327	147	1667	3500	1547	790	933	695	1082	1750	1487
Grp Volume(v), veh/h	918	309	305	134	428	88	36	0	314	82	93	562
Grp Sat Flow(s),veh/h/ln	1667	1750	1724	1667	1750	1547	790	0	1627	1082	1750	1487
Q Serve(g_s), s	49.0	11.7	11.7	9.1	12.7	5.5	4.3	0.0	20.5	8.7	4.8	21.9
Cycle Q Clear(g_c), s	49.0	11.7	11.7	9.1	12.7	5.5	9.1	0.0	20.5	29.2	4.8	21.9
Prop In Lane	1.00		0.09	1.00		1.00	1.00		0.43	1.00		1.00
Lane Grp Cap(c), veh/h	704	928	914	173	741	328	237	0	428	155	460	1025
V/C Ratio(X)	1.30	0.33	0.33	0.77	0.58	0.27	0.15	0.00	0.73	0.53	0.20	0.55
Avail Cap(c_a), veh/h	704	928	914	258	859	380	237	0	428	155	460	1025
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.5	15.6	15.6	50.7	41.1	38.2	36.9	0.0	39.3	52.4	33.3	9.0
Incr Delay (d2), s/veh	147.4	0.5	0.5	3.9	1.7	1.0	0.1	0.0	5.7	1.7	0.1	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	48.7	4.8	4.8	4.1	5.8	2.2	0.9	0.0	9.0	2.5	2.1	6.8
Lane Grp Delay (d), s/veh	180.9	16.1	16.1	54.6	42.8	39.3	37.0	0.0	45.0	54.1	33.4	9.4
Lane Grp LOS	F	B	B	D	D	D	D		D	D	C	A
Approach Vol, veh/h		1532			650			350			737	
Approach Delay, s/veh		114.8			44.7			44.1			17.4	
Approach LOS		F			D			D			B	

Timer												
Assigned Phs	5	2		1	6			8			4	
Phs Duration (G+Y+Rc), s	53.0	65.5		16.1	28.6			34.5			34.5	
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0			4.5			4.5	
Max Green Setting (Gmax), s	48.0	58.5		17.0	27.5			30.0			30.0	
Max Q Clear Time (g_c+I1), s	51.0	13.7		11.1	14.7			22.5			31.2	
Green Ext Time (p_c), s	0.0	33.7		0.1	8.8			3.1			0.0	

Intersection Summary												
HCM 2010 Ctrl Delay			71.4									
HCM 2010 LOS			E									

Notes

Intersection	
Intersection Delay, s/veh	1.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	35	35	60	1040	685	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	175	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	99	99	99	99	99	99
Heavy Vehicles, %	0	0	0	0	1	0
Mvmt Flow	35	35	61	1051	692	20

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1874	702	712	0	-	0
Stage 1	702	-	-	-	-	-
Stage 2	1172	-	-	-	-	-
Follow-up Headway	4	3	2	-	-	-
Pot Capacity-1 Maneuver	80	442	897	-	-	-
Stage 1	495	-	-	-	-	-
Stage 2	297	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	75	442	897	-	-	-
Mov Capacity-2 Maneuver	193	-	-	-	-	-
Stage 1	495	-	-	-	-	-
Stage 2	277	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	23	0	0

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	897	-	269	-	-
HCM Lane V/C Ratio	0.068	-	0.263	-	-
HCM Control Delay (s)	9.304	-	23.1	-	-
HCM Lane LOS	A		C		
HCM 95th %tile Q(veh)	0.217	-	1.027	-	-

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	470	275	0	700	195	50	5	275	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	None	-	-	None	-	-	None
Storage Length	-	-	90	-	-	175	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	1	1	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	511	299	0	761	212	54	5	299	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	761	0	0	511	0	0	1272	1272	511
Stage 1	-	-	-	-	-	-	511	511	-
Stage 2	-	-	-	-	-	-	761	761	-
Follow-up Headway	2	-	-	2	-	-	4	4	3
Pot Capacity-1 Maneuver	860	-	-	1065	-	-	187	169	567
Stage 1	-	-	-	-	-	-	606	540	-
Stage 2	-	-	-	-	-	-	465	417	-
Time blocked-Platoon, %		-	-		-	-			
Mov Capacity-1 Maneuver	860	-	-	1065	-	-	187	# 0	567
Mov Capacity-2 Maneuver	-	-	-	-	-	-	187	# 0	-
Stage 1	-	-	-	-	-	-	606	# 0	-
Stage 2	-	-	-	-	-	-	465	# 0	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	20

Minor Lane / Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR
Capacity (veh/h)	330	567	860	-	-	1065	-	-
HCM Lane V/C Ratio	0.483	0.351	-	-	-	-	-	-
HCM Control Delay (s)	25.7	14.8	0	-	-	0	-	-
HCM Lane LOS	D	B	A			A		
HCM 95th %tile Q(veh)	2.509	1.572	0	-	-	0	-	-

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	140	525	80	30	615	110	95	45	60	55	40	185
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	182.0	173.3	169.9	182.0	175.0	182.0	175.0	175.0	175.0	175.0	175.0	175.0
Lanes	1	1	1	1	1	1	1	1	0	1	1	1
Cap, veh/h	310	893	744	356	830	733	395	140	186	355	312	265
Arrive On Green	0.07	0.52	0.52	0.03	0.47	0.47	0.07	0.20	0.19	0.05	0.18	0.18
Sat Flow, veh/h	1733	1733	1444	1733	1750	1547	1667	683	907	1667	1750	1487
Grp Volume(v), veh/h	152	571	87	33	668	120	103	0	114	60	43	201
Grp Sat Flow(s),veh/h/ln	1733	1733	1444	1733	1750	1547	1667	0	1590	1667	1750	1487
Q Serve(g_s), s	3.1	18.3	2.4	0.8	25.0	3.4	3.7	0.0	4.8	2.2	1.6	9.9
Cycle Q Clear(g_c), s	3.1	18.3	2.4	0.8	25.0	3.4	3.7	0.0	4.8	2.2	1.6	9.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.57	1.00		1.00
Lane Grp Cap(c), veh/h	310	893	744	356	830	733	395	0	326	355	312	265
V/C Ratio(X)	0.49	0.64	0.12	0.09	0.81	0.16	0.26	0.00	0.35	0.17	0.14	0.76
Avail Cap(c_a), veh/h	310	893	744	389	837	740	416	0	589	355	580	493
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.68	0.68	0.68	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.3	13.5	9.6	11.9	17.2	11.5	21.5	0.0	26.5	24.1	26.6	30.0
Incr Delay (d2), s/veh	0.9	3.5	0.3	0.1	5.7	0.3	0.3	0.0	0.5	0.2	0.1	3.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	1.2	7.7	0.8	0.3	10.8	0.1	1.5	0.0	1.9	0.9	0.7	3.8
Lane Grp Delay (d), s/veh	15.2	17.0	9.9	11.9	22.9	11.9	21.8	0.0	26.9	24.3	26.8	33.3
Lane Grp LOS	B	B	A	B	C	B	C		C	C	C	C
Approach Vol, veh/h		810			821			217			304	
Approach Delay, s/veh		15.9			20.9			24.5			30.6	
Approach LOS		B			C			C			C	

Timer												
Assigned Phs	5	2		1	6		3	8		7	4	
Phs Duration (G+Y+Rc), s	9.2	43.6		6.0	40.5		9.5	19.8		7.5	17.7	
Change Period (Y+Rc), s	4.5	5.5		4.5	5.5		4.5	4.5		4.5	4.5	
Max Green Setting (Gmax), s	4.7	37.0		3.0	35.3		6.0	28.0		3.0	25.0	
Max Q Clear Time (g_c+I1), s	5.1	20.3		2.8	27.0		5.7	6.8		4.2	11.9	
Green Ext Time (p_c), s	0.0	15.7		0.0	8.0		0.0	1.6		0.0	1.3	

Intersection Summary	
HCM 2010 Ctrl Delay	20.7
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	340	10	285	5	15	5	385	435	5	5	435	355
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	182.0	171.7	175.0	175.0	175.0	175.0	180.2	175.0	175.0	182.0	173.3	175.0
Lanes	1	1	0	1	1	0	1	2	0	1	2	1
Cap, veh/h	501	14	418	200	371	124	447	1963	22	7	1081	464
Arrive On Green	0.29	0.29	0.29	0.29	0.29	0.29	0.26	0.57	0.56	0.00	0.31	0.31
Sat Flow, veh/h	1471	48	1418	1092	1257	419	1716	3455	39	1733	3465	1487
Grp Volume(v), veh/h	351	0	304	5	0	20	397	227	226	5	448	366
Grp Sat Flow(s),veh/h/ln	1471	0	1467	1092	0	1676	1716	1750	1743	1733	1733	1487
Q Serve(g_s), s	20.2	0.0	16.7	0.4	0.0	0.8	20.1	5.8	5.8	0.3	9.2	20.3
Cycle Q Clear(g_c), s	20.9	0.0	16.7	17.0	0.0	0.8	20.1	5.8	5.8	0.3	9.2	20.3
Prop In Lane	1.00		0.97	1.00		0.25	1.00		0.02	1.00		1.00
Lane Grp Cap(c), veh/h	501	0	432	200	0	494	447	994	991	7	1081	464
V/C Ratio(X)	0.70	0.00	0.70	0.03	0.00	0.04	0.89	0.23	0.23	0.74	0.41	0.79
Avail Cap(c_a), veh/h	768	0	699	399	0	799	685	1203	1198	58	1114	478
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.2	0.0	28.5	35.9	0.0	22.7	32.1	9.7	9.7	44.9	24.5	28.3
Incr Delay (d2), s/veh	1.8	0.0	2.1	0.0	0.0	0.0	8.1	0.2	0.2	73.4	0.5	9.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	7.4	0.0	6.1	0.1	0.0	0.3	9.3	2.2	2.2	0.3	3.9	8.4
Lane Grp Delay (d), s/veh	32.0	0.0	30.6	35.9	0.0	22.8	40.2	9.9	9.9	118.3	25.0	37.7
Lane Grp LOS	C		C	D		C	D	A	A	F	C	D
Approach Vol, veh/h		655			25			850			819	
Approach Delay, s/veh		31.3			25.4			24.1			31.2	
Approach LOS		C			C			C			C	

Timer												
Assigned Phs		8			4		1	6		5	2	
Phs Duration (G+Y+Rc), s		30.6			30.6		27.5	55.3		4.4	32.1	
Change Period (Y+Rc), s		4.0			4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s		43.0			43.0		36.0	62.0		3.0	29.0	
Max Q Clear Time (g_c+I1), s		22.9			19.0		22.1	7.8		2.3	22.3	
Green Ext Time (p_c), s		3.6			3.8		1.4	31.9		0.0	5.9	

Intersection Summary	
HCM 2010 Ctrl Delay	28.6
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	890	570	25	130	415	85	35	175	130	80	90	545
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width	11	12	12	11	12	13	12	12	12	11	11	12
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1607	3304		1607	3325	1537	1662	1638		1607	1692	1488
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.68	1.00		0.23	1.00	1.00
Satd. Flow (perm)	1607	3304		1607	3325	1537	1187	1638		389	1692	1488
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	918	588	26	134	428	88	36	180	134	82	93	562
RTOR Reduction (vph)	0	2	0	0	0	69	0	24	0	0	0	32
Lane Group Flow (vph)	918	612	0	134	428	19	36	290	0	82	93	530
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2		1	6			8			4	5
Permitted Phases						6	8			4		4
Actuated Green, G (s)	48.5	58.3		12.4	22.2	22.2	22.8	22.8		22.8	22.8	71.3
Effective Green, g (s)	49.5	59.3		13.4	23.2	23.2	23.3	23.3		23.3	23.3	73.3
Actuated g/C Ratio	0.46	0.55		0.12	0.21	0.21	0.22	0.22		0.22	0.22	0.68
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0	4.5	4.5		4.5	4.5	5.0
Vehicle Extension (s)	1.5	5.2		1.5	5.2	5.2	2.0	2.0		2.0	2.0	1.5
Lane Grp Cap (vph)	736	1814		199	714	330	256	353		83	365	1009
v/s Ratio Prot	c0.57	0.19		0.08	c0.13			0.18			0.05	0.24
v/s Ratio Perm						0.01	0.03			c0.21		0.12
v/c Ratio	1.25	0.34		0.67	0.60	0.06	0.14	0.82		0.99	0.25	0.53
Uniform Delay, d1	29.2	13.5		45.2	38.2	33.7	34.3	40.4		42.2	35.1	8.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	122.5	0.2		6.9	2.1	0.2	0.1	13.7		93.7	0.1	0.2
Delay (s)	151.7	13.7		52.1	40.4	33.9	34.3	54.1		135.9	35.3	8.9
Level of Service	F	B		D	D	C	C	D		F	D	A
Approach Delay (s)		96.4			41.9			52.0			26.4	
Approach LOS		F			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	65.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	108.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	102.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	35	35	60	1040	685	20
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Hourly flow rate (vph)	35	35	61	1051	692	20
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					439	
pX, platoon unblocked	0.93	0.93	0.93			
vC, conflicting volume	1874	702	712			
vC1, stage 1 conf vol	702					
vC2, stage 2 conf vol	1172					
vCu, unblocked vol	1901	644	655			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	85	92	93			
cM capacity (veh/h)	241	444	878			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	71	61	1051	712
Volume Left	35	61	0	0
Volume Right	35	0	0	20
cSH	313	878	1700	1700
Volume to Capacity	0.23	0.07	0.62	0.42
Queue Length 95th (ft)	21	6	0	0
Control Delay (s)	19.8	9.4	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	19.8	0.5		0.0
Approach LOS	C			

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	645	430	345	405	0	0	0	0	100	0	300
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width	12	12	14	13	12	12	12	12	12	13	12	12
Total Lost time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Lane Util. Factor		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		1750	1571	1718	1750						1554	1488
Flt Permitted		1.00	1.00	0.24	1.00						0.95	1.00
Satd. Flow (perm)		1750	1571	428	1750						1554	1488
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	679	453	363	426	0	0	0	0	105	0	316
RTOR Reduction (vph)	0	0	192	0	0	0	0	0	0	0	0	271
Lane Group Flow (vph)	0	679	261	363	426	0	0	0	0	0	105	45
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	0%	0%	0%	7%	0%	0%
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)		51.3	51.3	68.6	68.6						12.9	12.9
Effective Green, g (s)		51.8	51.8	68.6	69.1						12.9	12.9
Actuated g/C Ratio		0.58	0.58	0.76	0.77						0.14	0.14
Clearance Time (s)		4.5	4.5	4.0	4.5						4.0	4.0
Vehicle Extension (s)		4.8	4.8	2.5	4.8						3.5	3.5
Lane Grp Cap (vph)		1007	904	516	1343						222	213
v/s Ratio Prot		0.39		c0.10	0.24							
v/s Ratio Perm			0.17	c0.43							0.07	0.03
v/c Ratio		0.67	0.29	0.70	0.32						0.47	0.21
Uniform Delay, d1		13.2	9.7	9.1	3.2						35.4	34.1
Progression Factor		1.00	1.00	1.14	1.21						1.00	1.00
Incremental Delay, d2		3.6	0.8	3.4	0.5						1.9	0.6
Delay (s)		16.9	10.5	13.8	4.4						37.3	34.7
Level of Service		B	B	B	A						D	C
Approach Delay (s)		14.3			8.7			0.0			35.3	
Approach LOS		B			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	16.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	73.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	470	275	0	700	195	50	5	275	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	511	299	0	761	212	54	5	299	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage veh)					2							
Upstream signal (ft)		638			555							
pX, platoon unblocked	0.75			0.82			0.84	0.84	0.82	0.84	0.84	0.75
vC, conflicting volume	973			511			1272	1484	511	1573	1272	761
vC1, stage 1 conf vol							511	511		761	761	
vC2, stage 2 conf vol							761	973		812	511	
vCu, unblocked vol	793			292			739	993	292	1100	739	509
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			86	98	51	100	100	100
cM capacity (veh/h)	624			1049			387	289	616	177	381	424

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	511	299	761	212	60	299
Volume Left	0	0	0	0	54	0
Volume Right	0	299	0	212	0	299
cSH	1700	1700	1700	1700	375	616
Volume to Capacity	0.30	0.18	0.45	0.12	0.16	0.49
Queue Length 95th (ft)	0	0	0	0	14	66
Control Delay (s)	0.0	0.0	0.0	0.0	16.4	16.2
Lane LOS					C	C
Approach Delay (s)	0.0		0.0		16.3	
Approach LOS					C	

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	52.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	140	525	80	30	615	110	95	45	60	55	40	185
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width	14	12	12	16	12	13	12	12	12	11	11	12
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.91		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1773	1733	1444	1884	1750	1537	1662	1600		1607	1692	1488
Flt Permitted	0.23	1.00	1.00	0.38	1.00	1.00	0.60	1.00		0.68	1.00	1.00
Satd. Flow (perm)	425	1733	1444	749	1750	1537	1044	1600		1156	1692	1488
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	571	87	33	668	120	103	49	65	60	43	201
RTOR Reduction (vph)	0	0	34	0	0	53	0	55	0	0	0	177
Lane Group Flow (vph)	152	571	53	33	668	67	103	59	0	60	43	24
Heavy Vehicles (%)	0%	1%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	60.4	53.1	53.1	51.3	48.5	48.5	17.5	12.7		12.7	10.3	10.3
Effective Green, g (s)	60.9	54.6	54.6	52.3	50.0	50.0	18.5	13.2		13.7	10.8	10.8
Actuated g/C Ratio	0.68	0.61	0.61	0.58	0.56	0.56	0.21	0.15		0.15	0.12	0.12
Clearance Time (s)	4.5	5.5	5.5	4.5	5.5	5.5	4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	2.5	4.8	4.8	2.5	4.8	4.8	2.5	2.5		2.5	2.5	2.5
Lane Grp Cap (vph)	405	1051	876	476	972	853	250	234		190	203	178
v/s Ratio Prot	c0.03	0.33		0.00	c0.38		c0.02	0.04		0.01	0.03	
v/s Ratio Perm	0.22		0.04	0.04		0.04	c0.06			0.04		0.02
v/c Ratio	0.38	0.54	0.06	0.07	0.69	0.08	0.41	0.25		0.32	0.21	0.14
Uniform Delay, d1	9.0	10.4	7.2	8.4	14.4	9.3	30.3	34.0		33.6	35.8	35.4
Progression Factor	0.47	0.65	0.50	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.4	1.9	0.1	0.0	4.0	0.2	0.8	0.4		0.7	0.4	0.3
Delay (s)	4.6	8.6	3.8	8.4	18.3	9.5	31.1	34.4		34.3	36.1	35.7
Level of Service	A	A	A	A	B	A	C	C		C	D	D
Approach Delay (s)		7.4			16.6			32.9			35.5	
Approach LOS		A			B			C			D	

Intersection Summary			
HCM 2000 Control Delay	17.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	340	10	285	5	15	5	385	435	5	5	435	355
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width	13	12	12	11	10	12	14	12	12	14	12	11
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.85		1.00	0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1718	1468		1607	1572		1756	3319		1773	3292	1438
Flt Permitted	0.74	1.00		0.39	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1346	1468		662	1572		1756	3319		1773	3292	1438
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	351	10	294	5	15	5	397	448	5	5	448	366
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	0	0	0	258
Lane Group Flow (vph)	351	304	0	5	17	0	397	453	0	5	448	108
Heavy Vehicles (%)	0%	0%	2%	0%	0%	0%	1%	0%	0%	0%	1%	0%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4								2
Actuated Green, G (s)	29.9	29.9		29.9	29.9		26.1	54.1		0.5	28.5	28.5
Effective Green, g (s)	29.9	29.9		29.9	29.9		26.1	54.1		0.5	28.5	28.5
Actuated g/C Ratio	0.31	0.31		0.31	0.31		0.27	0.56		0.01	0.30	0.30
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.5	4.6		2.5	4.6	4.6
Lane Grp Cap (vph)	417	454		205	487		474	1860		9	972	424
v/s Ratio Prot		0.21			0.01		c0.23	0.14		0.00	c0.14	
v/s Ratio Perm	c0.26			0.01								0.08
v/c Ratio	0.84	0.67		0.02	0.03		0.84	0.24		0.56	0.46	0.25
Uniform Delay, d1	31.1	29.0		23.2	23.2		33.2	10.8		47.9	27.7	25.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	14.2	3.7		0.0	0.0		12.0	0.1		48.3	0.6	0.6
Delay (s)	45.3	32.7		23.2	23.3		45.2	10.9		96.2	28.4	26.5
Level of Service	D	C		C	C		D	B		F	C	C
Approach Delay (s)		39.5			23.2			26.9			27.9	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	96.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	73.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

10: NW Edenbower Boulevard & NW Stewart Parkway Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	632.8	1.2	0.8	0.0	301.6
Total Del/Veh (s)	79.9	40.7	51.5	17.4	51.2

20: NW Edenbower Boulevard & NW Broad Street Performance by approach

Approach	EB	NB	SB	All
Denied Del/Veh (s)	0.1	0.0	0.0	0.0
Total Del/Veh (s)	23.9	5.2	1.7	4.6

30: NW Edenbower Boulevard/NW Edenbower Boulevard #1 & SB Exit 127 Ramp Performance by approa

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.0	0.0	1.2	0.3
Total Del/Veh (s)	10.6	9.4	16.0	11.2

40: NB Exit 127 Ramp & NW Edenbower Boulevard #1 Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0
Total Del/Veh (s)	3.3	2.5	8.7	3.9

41: NB Exit 127 Ramp Performance by approach

Approach	SB	NW	All
Denied Del/Veh (s)	0.0	3.1	1.9
Total Del/Veh (s)	0.5	1.0	0.8

50: NW Aviation Drive & NW Edenbower Boulevard #1/NW Edenbower Boulevard Performance by approa

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	1.9	3.4	0.7
Total Del/Veh (s)	9.4	15.6	32.4	22.9	16.3

60: NE Stephens Street & NW Edenbower Boulevard Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.1	1.4	1.5	1.1
Total Del/Veh (s)	29.7	21.6	23.6	20.3	24.0

Total Zone Performance

Denied Del/Veh (s)	178.9
Total Del/Veh (s)	1040.2

10: NW Edenbower Boulevard & NW Stewart Parkway Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	635.1	630.0	616.2	3.2	0.3	3.1	3.5	0.5	0.5	0.0	0.0	0.0
Total Del/Veh (s)	118.0	21.0	14.5	54.3	40.5	22.1	52.0	57.7	43.6	51.8	33.2	9.0

10: NW Edenbower Boulevard & NW Stewart Parkway Performance by movement

Movement	All
Denied Del/Veh (s)	301.6
Total Del/Veh (s)	51.2

20: NW Edenbower Boulevard & NW Broad Street Performance by movement

Movement	EBL	EBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	32.9	15.8	9.0	5.1	1.7	1.1	4.6

30: NW Edenbower Boulevard/NW Edenbower Boulevard #1 & SB Exit 127 Ramp Performance by mover

Movement	EBT	EBR	WBL	WBT	SBL	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0	3.3	0.6	0.3
Total Del/Veh (s)	12.8	7.4	13.9	5.6	33.2	10.7	11.2

40: NB Exit 127 Ramp & NW Edenbower Boulevard #1 Performance by movement

Movement	EBT	EBR	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	3.5	2.9	2.7	2.0	15.8	7.1	7.6	3.9

41: NB Exit 127 Ramp Performance by movement

Movement	SBT	NWR	All
Denied Del/Veh (s)	0.0	3.1	1.9
Total Del/Veh (s)	0.5	1.0	0.8

50: NW Aviation Drive & NW Edenbower Boulevard #1/NW Edenbower Boulevard Performance by mover

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.1	0.1	0.0	0.1	0.4	3.1	3.0	3.8	0.8	3.8
Total Del/Veh (s)	19.8	7.7	2.5	16.2	16.9	7.7	38.0	38.7	18.8	33.1	36.6	16.9

50: NW Aviation Drive & NW Edenbower Boulevard #1/NW Edenbower Boulevard Performance by mover

Movement	All
Denied Del/Veh (s)	0.7
Total Del/Veh (s)	16.3

60: NE Stephens Street & NW Edenbower Boulevard Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.1	0.1	2.7	0.3	0.4	2.7	0.3	3.0
Total Del/Veh (s)	33.1	10.5	27.3	28.3	25.3	6.9	38.9	10.3	6.8	44.3	25.4	13.5

60: NE Stephens Street & NW Edenbower Boulevard Performance by movement

Movement	All
Denied Del/Veh (s)	1.1
Total Del/Veh (s)	24.0

Total Network Performance

Denied Del/Veh (s)	178.9
Total Del/Veh (s)	53.2

Intersection: 3:

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 10: NW Edenbower Boulevard & NW Stewart Parkway

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	TR	L	T	R
Maximum Queue (ft)	350	741	719	211	281	237	111	204	431	127	191	226
Average Queue (ft)	350	741	423	103	169	129	50	43	225	65	63	98
95th Queue (ft)	351	741	835	192	252	207	95	127	393	115	134	181
Link Distance (ft)		722	722		758	758			698		1954	
Upstream Blk Time (%)		69	0									
Queuing Penalty (veh)		0	0									
Storage Bay Dist (ft)	325			100			75	115		150		150
Storage Blk Time (%)	63			16	37	21	4		40	1	0	2
Queuing Penalty (veh)	180			33	48	18	9		14	3	2	4

Intersection: 20: NW Edenbower Boulevard & NW Broad Street

Movement	EB	NB	NB
Directions Served	LR	L	T
Maximum Queue (ft)	123	48	20
Average Queue (ft)	46	22	1
95th Queue (ft)	92	49	11
Link Distance (ft)	830		1954
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		175	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 30: NW Edenbower Boulevard/NW Edenbower Boulevard #1 & SB Exit 127 Ramp

Movement	EB	EB	WB	WB	SB	SB
Directions Served	T	R	L	T	LT	R
Maximum Queue (ft)	314	307	200	192	161	183
Average Queue (ft)	142	89	103	64	69	83
95th Queue (ft)	277	215	174	144	127	143
Link Distance (ft)	375			600		986
Upstream Blk Time (%)	0					
Queuing Penalty (veh)	1					
Storage Bay Dist (ft)		200	285		375	
Storage Blk Time (%)	3	1				
Queuing Penalty (veh)	15	7				

Intersection: 40: NB Exit 127 Ramp & NW Edenbower Boulevard #1

Movement	WB	NB	NB
Directions Served	R	LT	R
Maximum Queue (ft)	2	81	129
Average Queue (ft)	0	34	67
95th Queue (ft)	2	66	111
Link Distance (ft)		122	122
Upstream Blk Time (%)			1
Queuing Penalty (veh)			1
Storage Bay Dist (ft)	175		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 41: NB Exit 127 Ramp

Movement	NW
Directions Served	R
Maximum Queue (ft)	24
Average Queue (ft)	2
95th Queue (ft)	19
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	325
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 50: NW Aviation Drive & NW Edenbower Boulevard #1/NW Edenbower Boulevard

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	L	T	R	L	TR	L	T	R
Maximum Queue (ft)	116	206	126	483	255	127	154	107	164	170
Average Queue (ft)	53	80	20	181	47	68	72	40	32	67
95th Queue (ft)	100	168	71	373	174	117	132	82	81	129
Link Distance (ft)		475		982		998			752	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	125		110		100		200	140		140
Storage Blk Time (%)	0	2		17	0		0	0	0	1
Queuing Penalty (veh)	3	5		25	0		0	0	0	1

Intersection: 60: NE Stephens Street & NW Edenbower Boulevard

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	T	R
Maximum Queue (ft)	339	352	39	58	174	470	385	53	241	230	247
Average Queue (ft)	175	141	4	16	163	215	130	6	141	96	107
95th Queue (ft)	276	251	21	46	200	429	311	32	211	190	189
Link Distance (ft)		982	313	313		1187	1187		969	969	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	300				150			115			165
Storage Blk Time (%)	1	0			28	0			16	1	2
Queuing Penalty (veh)	2	1			61	0			1	2	5

Network Summary

Network wide Queuing Penalty: 442

Appendix C. ODOT's Preliminary Traffic Signal Warrants

Oregon Department of Transportation

Transportation Development Branch

Transportation Planning Analysis Unit

Preliminary Traffic Signal Warrant Analysis[1]

Major Street:	Edenbower Boulevard	**Minor Street:**	Broad Street
Project:	IAMP 127	**City/County:**	Roseburg/Douglas County
Year:	2012 PM	**Alternative:**	Baseline

Preliminary Signal Warrant Volumes

Number of Approach lanes		ADT on major street approaching from both directions		ADT on minor street, highest approaching volume	
Major Street	Minor Street	Percent of standard warrants 100	70	Percent of standard warrants 100	70
Case A: Minimum Vehicular Traffic					
1	1	8850	6200	2650	1850
2 or more	1	10600	7400	2650	1850
2 or more	2 or more	10600	7400	3550	2500
1	2 or more	8850	6200	3550	2500
Case B: Interruption of Continuous Traffic					
1	1	13300	9300	1350	950
2 or more	1	15900	11100	1350	950
2 or more	2 or more	15900	11100	1750	1250
1	2 or more	13300	9300	1750	1250
X	100 percent of standard warrants				
	70 percent of standard warrants[2]				

Preliminary Signal Warrant Calculation

	Street	Number of Lanes	Warrant Volumes	Approach Volumes	Warrant Met
Case A	Major	1	8850	14150	N
	Minor	1	2650	250	
Case B	Major	1	13300	14150	N
	Minor	1	1350	250	

Analyst and Date:	Reviewer and Date:

[1] Meeting preliminary signal warrants does **not** guarantee that a signal will be installed. When preliminary signal warrants are met, project analysts need to coordinate with Region Traffic to initiate the traffic signal engineering investigation as outlined in the Traffic Manual. Before a signal can be installed, the engineering investigation must be conducted or reviewed by the Region Traffic Manager who will forward signal recommendations to headquarters. Traffic signal warrants must be met and the State Traffic Engineer's approval obtained before a traffic signal can be installed on a state highway.

[2] Used due to 85th percentile speed in excess of 40 mph or isolated community with population of less than 10,000.

Oregon Department of Transportation

Transportation Development Branch

Transportation Planning Analysis Unit

Preliminary Traffic Signal Warrant Analysis[1]

Major Street:	Edenbower Boulevard	**Minor Street:**	NB Ramp Terminals
Project:	IAMP 127	**City/County:**	Roseburg/Douglas County
Year:	2012 PM	**Alternative:**	Baseline

Preliminary Signal Warrant Volumes

Number of Approach lanes		ADT on major street approaching from both directions		ADT on minor street, highest approaching volume	
Major Street	Minor Street	Percent of standard warrants 100	70	Percent of standard warrants 100	70
Case A: Minimum Vehicular Traffic					
1	1	8850	6200	2650	1850
2 or more	1	10600	7400	2650	1850
2 or more	2 or more	10600	7400	3550	2500
1	2 or more	8850	6200	3550	2500
Case B: Interruption of Continuous Traffic					
1	1	13300	9300	1350	950
2 or more	1	15900	11100	1350	950
2 or more	2 or more	15900	11100	1750	1250
1	2 or more	13300	9300	1750	1250
X	100 percent of standard warrants				
	70 percent of standard warrants[2]				

Preliminary Signal Warrant Calculation

	Street	Number of Lanes	Warrant Volumes	Approach Volumes	Warrant Met
Case A	Major	1	8850	13650	N
	Minor	1	2650	450	
Case B	Major	1	13300	13650	N
	Minor	1	1350	450	

Analyst and Date:	Reviewer and Date:

[1] Meeting preliminary signal warrants does **not** guarantee that a signal will be installed. When preliminary signal warrants are met, project analysts need to coordinate with Region Traffic to initiate the traffic signal engineering investigation as outlined in the Traffic Manual. Before a signal can be installed, the engineering investigation must be conducted or reviewed by the Region Traffic Manager who will forward signal recommendations to headquarters. Traffic signal warrants must be met and the State Traffic Engineer's approval obtained before a traffic signal can be installed on a state highway.

[2] Used due to 85th percentile speed in excess of 40 mph or isolated community with population of less than 10,000.

Oregon Department of Transportation

Transportation Development Branch

Transportation Planning Analysis Unit

Preliminary Traffic Signal Warrant Analysis[1]

Major Street:	Edenbower Boulevard	**Minor Street:**	Broad Street
Project:	IAMP 127	**City/County:**	Roseburg/Douglas County
Year:	2015 PM	**Alternative:**	Baseline

Preliminary Signal Warrant Volumes

Number of Approach lanes		ADT on major street approaching from both directions		ADT on minor street, highest approaching volume	
Major Street	Minor Street	Percent of standard warrants 100	70	Percent of standard warrants 100	70
Case A: Minimum Vehicular Traffic					
1	1	8850	6200	2650	1850
2 or more	1	10600	7400	2650	1850
2 or more	2 or more	10600	7400	3550	2500
1	2 or more	8850	6200	3550	2500
Case B: Interruption of Continuous Traffic					
1	1	13300	9300	1350	950
2 or more	1	15900	11100	1350	950
2 or more	2 or more	15900	11100	1750	1250
1	2 or more	13300	9300	1750	1250
X	100 percent of standard warrants				
	70 percent of standard warrants[2]				

Preliminary Signal Warrant Calculation

	Street	Number of Lanes	Warrant Volumes	Approach Volumes	Warrant Met
Case A	Major	1	8850	14660	N
	Minor	1	2650	260	
Case B	Major	1	13300	14660	N
	Minor	1	1350	260	

Analyst and Date:	Reviewer and Date:

[1] Meeting preliminary signal warrants does **not** guarantee that a signal will be installed. When preliminary signal warrants are met, project analysts need to coordinate with Region Traffic to initiate the traffic signal engineering investigation as outlined in the Traffic Manual. Before a signal can be installed, the engineering investigation must be conducted or reviewed by the Region Traffic Manager who will forward signal recommendations to headquarters. Traffic signal warrants must be met and the State Traffic Engineer's approval obtained before a traffic signal can be installed on a state highway.

[2] Used due to 85th percentile speed in excess of 40 mph or isolated community with population of less than 10,000.

Oregon Department of Transportation

Transportation Development Branch

Transportation Planning Analysis Unit

Preliminary Traffic Signal Warrant Analysis[1]

Major Street:	Edenbower Boulevard	**Minor Street:**	NB Ramp Terminal
Project:	IAMP 127	**City/County:**	Roseburg/Douglas County
Year:	2015 PM	**Alternative:**	Baseline

Preliminary Signal Warrant Volumes

Number of Approach lanes		ADT on major street approaching from both directions		ADT on minor street, highest approaching volume	
Major Street	Minor Street	Percent of standard warrants 100	70	Percent of standard warrants 100	70
Case A: Minimum Vehicular Traffic					
1	1	8850	6200	2650	1850
2 or more	1	10600	7400	2650	1850
2 or more	2 or more	10600	7400	3550	2500
1	2 or more	8850	6200	3550	2500
Case B: Interruption of Continuous Traffic					
1	1	13300	9300	1350	950
2 or more	1	15900	11100	1350	950
2 or more	2 or more	15900	11100	1750	1250
1	2 or more	13300	9300	1750	1250
X	100 percent of standard warrants				
	70 percent of standard warrants[2]				

Preliminary Signal Warrant Calculation

	Street	Number of Lanes	Warrant Volumes	Approach Volumes	Warrant Met
Case A	Major	1	8850	14010	N
	Minor	1	2650	460	
Case B	Major	1	13300	14010	N
	Minor	1	1350	460	

Analyst and Date:	Reviewer and Date:

[1] Meeting preliminary signal warrants does **not** guarantee that a signal will be installed. When preliminary signal warrants are met, project analysts need to coordinate with Region Traffic to initiate the traffic signal engineering investigation as outlined in the Traffic Manual. Before a signal can be installed, the engineering investigation must be conducted or reviewed by the Region Traffic Manager who will forward signal recommendations to headquarters. Traffic signal warrants must be met and the State Traffic Engineer's approval obtained before a traffic signal can be installed on a state highway.

[2] Used due to 85th percentile speed in excess of 40 mph or isolated community with population of less than 10,000.

Appendix D. HCM Part C Worksheets

Worksheet 3A -- Predicted Crashes by Severity and Site Type and Observed Crashes Using the Site-Specific EB Method for Urban and Suburban Arterials

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Collision type / Site type	**Predicted average crash frequency (crashes/year)**			**Observed crashes, $N_{observed}$** (crashes/year)	**Overdispersion Parameter, k**	**Weighted adjustment, w**	**Expected average crash frequency,**
	$N_{predicted}$ (TOTAL)	$N_{predicted}$ (FI)	$N_{predicted}$ (PDO)			Equation A-5 from Part C Appendix	Equation A-4 from Part C Appendix
ROADWAY SEGMENTS - BASELINE 2035							
Multiple-vehicle nondriveway							
Segment 1: Stewart to Broad	1.956	0.542	1.414	0.8	0.660	0.437	1.305
Segment 2: Broad to SB Ramps	0.234	0.064	0.170	0.0	0.660	0.866	0.202
Segment 3: Between Ramps	0.162	0.047	0.115	0.0	0.840	0.880	0.143
Segment 4: NB Ramps to Aviation	0.243	0.065	0.178	0.0	0.660	0.862	0.210
Segment 5: Aviation to Stephens	0.541	0.139	0.402	0.0	0.660	0.737	0.398
				0.0		1.000	0.000
Single-vehicle							
Segment 1: Stewart to Broad	0.294	0.081	0.213	0.2	1.370	0.713	0.267
Segment 2: Broad to SB Ramps	0.037	0.010	0.026	0.0	1.370	0.952	0.035
Segment 3: Between Ramps	0.059	0.012	0.047	0.0	0.810	0.955	0.056
Segment 4: NB Ramps to Aviation	0.041	0.011	0.030	0.2	1.370	0.947	0.049
Segment 5: Aviation to Stephens	0.105	0.029	0.075	0.0	1.370	0.875	0.091
Multiple-vehicle driveway-related							
Segment 1: Stewart to Broad	1.185	0.288	0.897	0.0	1.100	0.434	0.514
Segment 2: Broad to SB Ramps	0.000	0.000	0.000	0.0	1.100	1.000	0.000
Segment 3: Between Ramps	0.000	0.000	0.000	0.0	0.810	1.000	0.000
Segment 4: NB Ramps to Aviation	0.000	0.000	0.000	0.0	1.100	1.000	0.000
Segment 5: Aviation to Stephens	0.135	0.033	0.102	0.0	1.100	0.871	0.117
INTERSECTIONS - BASELINE 2035							
Multiple-vehicle							
Stewart	3.049	1.014	2.035	7.4	0.390	0.457	5.413
Broad	0.349	0.127	0.222	0.2	0.800	0.782	0.316
SB Ramps	1.699	0.571	1.127	3.0	0.330	0.641	2.166
NB Ramps	0.550	0.165	0.385	2.4	0.800	0.694	1.115
Aviation	2.243	0.725	1.518	2.0	0.390	0.533	2.130
Stephens	2.795	0.888	1.906	2.6	0.390	0.479	2.693
Single-vehicle							
Stewart	0.191	0.049	0.142	0.0	0.360	0.936	0.178
Broad	0.045	0.014	0.031	0.2	1.140	0.951	0.053
SB Ramps	0.156	0.048	0.108	0.0	0.360	0.947	0.148
NB Ramps	0.091	0.027	0.064	0.2	1.140	0.906	0.101
Aviation	0.157	0.044	0.114	0.0	0.360	0.946	0.149
Stephens	0.206	0.059	0.147	0.0	0.360	0.931	0.192
COMBINED (sum of column)	16.520	5.053	11.468	19	--	--	18.042

BASELINE 2035	
Segment 1	2.09
Segment 2	0.24
Segment 3	0.20
Segment 4	0.26
Segment 5	0.61

BASELINE 2035	
Stewart	5.59
Broad	0.37
SB Ramps	2.31
NB Ramps	1.22
Aviation	2.28
Stephens	2.88
TOTAL	18.04

Worksheet 3A -- Predicted Crashes by Severity and Site Type and Observed Crashes Using the Site-Specific EB Method for Urban and Suburban Arterials

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Collision type / Site type	**Predicted average crash frequency (crashes/year)**			**Observed crashes, $N_{observed}$** (crashes/year)	**Overdispersion Parameter, k**	**Weighted adjustment, w**	**Expected average crash frequency,**
	$N_{predicted}$ (TOTAL)	$N_{predicted}$ (FI)	$N_{predicted}$ (PDO)			Equation A-5 from Part C Appendix	Equation A-4 from Part C Appendix
ROADWAY SEGMENTS - Existing 2012							
Multiple-vehicle nondriveway							
Segment 1: Stewart to Broad	1.412	0.368	1.044	0.80	0.660	0.518	1.117
Segment 2: Broad to SB Ramps	0.165	0.042	0.123	0.00	0.660	0.902	0.149
Segment 3: Between Ramps	0.127	0.037	0.090	0.00	0.840	0.903	0.115
Segment 4: NB Ramps to Aviation	0.195	0.050	0.145	0.00	0.660	0.886	0.173
Segment 5: Aviation to Stephens	0.442	0.109	0.333	0.00	0.660	0.774	0.342
				0.00		1.000	0.000
Single-vehicle							
Segment 1: Stewart to Broad	0.259	0.073	0.187	0.20	1.370	0.738	0.244
Segment 2: Broad to SB Ramps	0.032	0.009	0.023	0.00	1.370	0.958	0.031
Segment 3: Between Ramps	0.054	0.011	0.043	0.00	0.810	0.958	0.052
Segment 4: NB Ramps to Aviation	0.038	0.011	0.027	0.20	1.370	0.951	0.046
Segment 5: Aviation to Stephens	0.097	0.027	0.069	0.00	1.370	0.883	0.086
Multiple-vehicle driveway-related							
Segment 1: Stewart to Broad	0.940	0.228	0.712	0.00	1.100	0.492	0.462
Segment 2: Broad to SB Ramps	0.000	0.000	0.000	0.00	1.100	1.000	0.000
Segment 3: Between Ramps	0.000	0.000	0.000	0.00	0.810	1.000	0.000
Segment 4: NB Ramps to Aviation	0.000	0.000	0.000	0.00	1.100	1.000	0.000
Segment 5: Aviation to Stephens	0.117	0.028	0.088	0.00	1.100	0.886	0.103
INTERSECTIONS - Existing 2012							
Multiple-vehicle							
Stewart	2.162	0.700	1.461	7.40	0.390	0.543	4.558
Broad	0.243	0.092	0.151	0.20	0.800	0.837	0.236
SB Ramps	1.178	0.416	0.762	3.00	0.330	0.720	1.688
NB Ramps	0.423	0.132	0.291	2.40	0.800	0.747	0.923
Aviation	1.790	0.571	1.220	2.00	0.390	0.589	1.876
Stephens	2.407	0.758	1.649	2.60	0.390	0.516	2.500
Single-vehicle							
Stewart	0.149	0.041	0.108	0.00	0.360	0.949	0.141
Broad	0.039	0.012	0.027	0.20	1.140	0.957	0.046
SB Ramps	0.122	0.037	0.085	0.00	0.360	0.958	0.117
NB Ramps	0.080	0.024	0.055	0.20	1.140	0.917	0.090
Aviation	0.132	0.038	0.094	0.00	0.360	0.955	0.126
Stephens	0.184	0.054	0.130	0.00	0.360	0.938	0.173
COMBINED (sum of column)	12.787	3.869	8.918	19	--	--	15.393

Existing 2012	
Segment 1	1.82
Segment 2	0.18
Segment 3	0.17
Segment 4	0.22
Segment 5	0.53

Existing 2012	
Stewart	4.70
Broad	0.28
SB Ramps	1.80
NB Ramps	1.01
Aviation	2.00
Stephens	2.67
TOTAL	15.39

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

Technical Memorandum #4
Concept Development and Evaluation

Prepared for

Oregon Department of Transportation, Region 3
3500 NW Stewart Parkway
Roseburg, Oregon 97470

Prepared by

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2100 SW River Parkway
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December 2014

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Figure 4-14. Concept 9 – Northbound Ramp Terminal: Improve North Side Pedestrian Crossing

Figure 4-15. Concept 10 –Broad Street to Stewart Parkway – Enhance Pedestrian Crossings

4. CONCEPT DEVELOPMENT AND EVALUATION

This memorandum presents the preliminary improvement concepts developed to address deficiencies in the IAMP 127 Interchange Management Study Area (IMSA). The goal of the identified improvement concepts is to help achieve the goals and objectives set forth for this project, while addressing identified deficiencies for all modes.

Once concepts are selected for further analysis, they will be combined to create a comprehensive improvement strategy. As the overall strategy is developed, concepts will be refined so that the improvements work well together.

4.1. Concept Development

Each improvement concept was developed to address specific deficiencies, safety issues, or access concerns. These concepts were developed based upon available standards, warrants, perceived need, safety data, traffic operations, and community livability. Concepts were not limited to roadway issues, and include bicycle, pedestrian, and transit-related projects.

The concepts were developed keeping in mind the objectives developed for this IAMP:

- 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.

This memorandum considers changes/improvements in three general categories:

- **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.

4.1.1. Intersection Improvements

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. In particular, 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. This congestion affects accessibility to the interchange for the medical center and other users on Stewart Parkway.

The concepts developed for intersection improvements address operational and safety deficiencies at individual intersections within the IMSA. Many of the intersection improvements are targeted at Edenbower Boulevard and Stewart Parkway – the only intersection within the study area that is expected to fail to meet City of Roseburg mobility targets during the IAMP planning period. Other suggested improvements may address queue storage lengths and safety at intersections where overall capacity is not expected to be of concern.

Two significant intersection capacity and timing improvements completed in late 2012 and early 2013 have addressed many of the congestion issues within the IMSA and these have been included in the baseline analysis for the IAMP.

4.1.2. Interchange Ramp Improvements

While the current interchange ramps have some features that may deviate from the desired configuration, a detailed review of crash history data for the period between January 1, 2006, and December 31, 2010 did not show consistent crash patterns associated with ramp geometry. However, several concepts to address citizen concerns raised about driver expectation are included for consideration.

4.1.3. Multimodal Improvements

In alignment with the goals of this plan, the proposed improvements provide enhanced safety, desirability, and continuity of facilities for non-auto users in the IMSA. These improvements primarily serve pedestrians because the existing bike network is complete and there is currently no transit service on most of the IMSA roadways. The concepts focus on improving crossings where pedestrians interact with motorized vehicles.

4.2. Concept Evaluation

Not all of the concepts proposed in this memorandum will be recommended for implementation. Each improvement concept will be evaluated with regard to applicable impacts (e.g. traffic operations, safety, environmental, etc.), feasibility, stakeholder feedback, and ability to meet the goals of the IAMP.

The concept analysis included traffic operations, road geometries and ROW requirements, environmental and land use consequences, and cost opinions.

4.2.1. Traffic Operations and Safety

Traffic operations were evaluated for concepts that were identified to address operational deficiencies. The operational assessment focuses on the volume-to-capacity (v/c) ratio and level of service (LOS) for the 2035 future condition. Operational results for the concepts were compared to the mobility targets set forth in the Oregon Highway Plan (OHP)[1] and Highway Design Manual[2] (HDM), as well as City of Roseburg operational standards.

At intersections where potential changes in traffic control or turn lanes were considered, the procedures in the ODOT Analysis Procedures Manual (APM) were followed in concert with City of Roseburg design standards, based on the governing jurisdiction.

The existing (2012) and future baseline (2035) traffic volumes have been attached to this memo (Figure 4-1 and Figure 4-2) for easy reference.

Some improvements are focused on addressing traffic operation deficiencies or may address operational as well as safety concerns. Crash patterns from the five-year analysis period (2006 through 2010) are discussed for those improvements that address safety.

In addition to traffic and safety, benefits and impacts to bicycle and pedestrian facilities were considered.

4.2.2. Basic Roadway Geometries and Right-of-Way Requirements

Evaluations of basic roadway geometry and ROW needs were conducted for concepts that involve infrastructure improvements. Geometric improvements in the concepts generally follow ODOT design standards and accommodate a WB-67 truck. These items are addressed in the detailed concept discussions.

4.2.3. Environmental, Land Use, and Socioeconomic Assessment

Impacts to resources were qualitatively assessed based on the data assembled for the environmental and land use reconnaissance. The level of analysis of the study area is designed to identify those areas judged to have considerable potential for conflict. Socioeconomic (Title VI) benefits and impacts were also considered in the evaluation.

[1] Table 6: Volume to Capacity Ratio Targets for Peak Hour Operating Conditions, 1999 Oregon Highway Plan, Amended December 2011, online reference: http://www.oregon.gov/ODOT/TD/TP/OHP2011.shtml

[2] Table 10-1: 20 Year Design-Mobility Standards (Volume/Capacity [V/C] Ratio), Highway Design Manual, 2003, online reference: http://egov.oregon.gov/ODOT/HWY/ENGSERVICES/hwy_manuals.shtml

4.2.4. Concepts Cost Opinions

Rough order of magnitude cost opinions were developed using present day dollars and are consistent with standard estimating methods. The estimates include a contingency factor and preliminary engineering but do not include ROW, utility relocation, or hazardous material costs. The cost opinions are intended to help differentiate alternatives by approximating the relative costs of each concept.

4.3. Intersection Improvements

Five potential intersection improvements were identified to improve traffic flow, provide additional capacity, or address safety concerns. A brief summary of the projects is presented in Table 4-1 with more detailed concept layouts identified in Figure 4-3 through Figure 4-11. The following sections discuss in detail potential intersection improvements.

Table 4-1. Intersection Improvement Concepts

ID	Location	General Description	Purpose
1	Edenbower Blvd at Stewart Pkwy	Add second eastbound left-turn lane	Improve operations
2	Edenbower Blvd at Stewart Pkwy	Install a multi-lane roundabout with dual approach lanes on all legs	Improve operations and safety
3	Edenbower Blvd at Stewart Pkwy	Close access to southwest leg and realign intersection to better accommodate major movements	Improve operations and safety
4	Edenbower Blvd at Stewart Pkwy	Close access to southwest leg and realign approaches to form a perpendicular “T” intersection	Improve operations and safety
5	Edenbower Blvd at Aviation Dr	Extend westbound right-turn bay	Address queuing concerns
6	Edenbower Blvd at Stephens St (OR 99)	Extend eastbound left-turn bay and northbound left-turn bay	Address queuing concerns

4.3.1. Concept 1 – Edenbower Boulevard/Stewart Parkway: Add Second Eastbound Left-Turn Lane

The signalized intersection of Edenbower Boulevard/Stewart Parkway is expected to exceed the City’s v/c ratio standard of 0.85 within five years. The forecast demand would exceed available capacity by the year 2035 (v/c ratio = 1.02) and forecast Level of Service (LOS) E would be worse than the City’s standard of LOS D.

As identified in the existing conditions[3], the intersection of Edenbower Boulevard at Stewart Parkway has lanes on each approach with queues currently exceeding available storage. The eastbound left-turn has queuing that continues into the two-way left-turn lane and spills out

[3] Including the recently installed (2012) southbound right-turn lane

into through traffic more than half of the peak hour. The westbound movements all experience queuing issues with the turning vehicles spilling out into the through movement, and the through movement blocking the nearest access point or entrance into the turn lanes.

In addition, obstructions in the southwest quadrant limit the sight distance for drivers traveling through the intersection on the eastbound (Stewart Parkway) and northbound (Edenbower Boulevard) approaches. Vehicles heading eastbound cannot see the main overhead traffic signal until they are between 100 and 150 feet from the intersection. Although a secondary/supplemental pole mounted signal for the eastbound traffic has been installed to address this concern, unfamiliar drivers may not identify it or understand its purpose. Vehicles heading northbound and taking a right-turn-on-red only have 125-150 feet of unobstructed sight distance, when looking west for conflicting eastbound through traffic.

Lastly, this is the only intersection where the critical crash rate (0.61 crashes/million entering vehicles [mev]) is exceeded. This intersection has the highest crash rate (0.83 crashes/mev) and number of reported collisions (37) within the study area in the five-year analysis period. One of these crashes involved a serious injury and 20 involved minor injuries.

Concept 1 would improve the Edenbower Boulevard/Stewart Parkway intersection by adding additional capacity where needed. This concept would install dual left turns on the eastbound approach of Stewart Parkway, add a second northbound receiving lane on Edenbower Boulevard, and modify signal timing to accommodate the new lane configurations. This concept would meet the City's dual v/c and LOS standard.

Three options for creating a second left-turn lane on Stewart Parkway were developed for this concept. All three options include adding the second northbound receiving lane on Edenbower Boulevard north of Stewart Parkway, but the lane striping differs between options. The Concept 1 improvement options include:

- **Option A**: Add a second left-turn lane on the eastbound approach of Stewart Parkway by widening the roadway to the north. Widen Edenbower Boulevard to include two northbound receiving lanes which merge back to a single lane. Modify the traffic signal to provide protected left-turn phasing on all approaches. This concept is consistent with the preferred alternative identified in the recent Traffic Impact Study[4] developed in 2011. Concept 1, Option A is illustrated in Figure 4-3.
- **Option 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. Widen Edenbower Boulevard to include two northbound receiving lanes but try to minimize widening impacts by reducing the number of southbound approach lanes from three (left, through, and right) to two (left-through and right) lanes. Traffic signal changes include split phasing (one approach is stopped while the opposing approach proceeds) on Stewart Parkway. Concept 1, Option B is illustrated in Figure 4-4.

[4] Edenbower Boulevard/Stewart Parkway Intersection Improvements, Kittelson Associates, Inc., 2011.

- **Option C**: Add a second left-turn lane on the eastbound approach by converting the existing center through lane to a dedicated left-turn lane. Widen Edenbower Boulevard to include two northbound receiving lanes but try to minimize widening impacts by reducing the number of southbound approach lanes from three (left, through, and right) to two (left-through and right) lanes. Concept 1, Option C is illustrated in Figure 4-5.

Concept 1 – Traffic Operations and Safety

Current traffic demand along Edenbower Boulevard at this intersection is approximately 14,800 vehicles per day (vpd), with a higher 2035 forecast demand of approximately 18,650 vpd. The total daily volume entering the intersection is approximately 24,300 vpd, with a 2035 forecast demand of 31,700 vpd.

The proposed improvements would provide additional capacity for the eastbound left-turn movement from Stewart Parkway to Edenbower Boulevard; this movement carries almost one third of the total volume entering the intersection during the peak hour. To provide additional left-turn capacity, each improvement reconfigures the intersection to create multiple left-turn lanes in the eastbound direction. With left turns allowed from more than one eastbound lane, unequal distribution of left turning vehicles between the two turn lanes is expected due to vehicles positioning for downstream turning or merging movements. For analysis purposes, a lane utilization split of 55%/45% was assumed for improvements with two exclusive left-turn lanes, with the higher utilization corresponding to the inside left-turn lane (lane closest to the centerline). A lane utilization split of 60%/40% was assumed for the improvement with one exclusive left-turn lane and one shared left-through lane, with the higher utilization assumed for the exclusive turn lane.

Concept 1, Option A would provide a reduction in delay and queuing during peak periods, and the most gains in operational benefits, with a 2035 forecast v/c ratio of 0.77 and LOS C operations. This option would provide protected left-turn signal phasing where movements are currently permitted on the northbound and southbound approaches. This modification would reduce the potential for turning and angle collisions, which are crash types that often result in injuries. The addition of dual receiving lanes on the north leg could lead to an increase in collisions where the northbound traffic merges from two lanes to one.

Option A would involve widening the east and west legs of Stewart Parkway as well as the north leg of Edenbower Boulevard. Widening the roadways would increase the crossing distance for both pedestrians and bicyclists using the intersection. The traffic signal would need to be modified to accommodate the wider pedestrian crossing times and minimum green times would need to be adequate for bicyclists to cross the intersection.

Concept 1, Option B would provide a slightly smaller reduction in delay and queuing during peak periods, compared to Option A, but result in fewer impacts to adjacent lands. With a 2035 forecast v/c ratio of 0.84 and LOS D operations, this option is expected to meet operational standards. Split phasing on Stewart Parkway would be required to accommodate the new eastbound left-through lane configuration. This option changes the dedicated left-turn lanes

on the southbound approaches to a shared left/through and could lead to an increase in turning and angle collisions. As in Option A, the addition of dual receiving lanes on the north leg could lead to an increase in collisions where the northbound traffic merges from two-lanes to one.

Option B would only involve widening the north leg of Edenbower Boulevard with none of the widening on Stewart Parkway associated with Option A. Widening the Edenbower Boulevard would still require increase the crossing distance for both pedestrians and bicyclists using the intersection. The traffic signal would need to be modified to accommodate the wider pedestrian crossing times and minimum green times would need to be adequate for bicyclists to cross the intersection.

Concept 1, Option C has similar operations to Option B with a v/c of 0.83 and LOS C. This option creates a "trap" lane when the inner eastbound through lane becomes a dedicated left-turn lane; trap lanes are not considered desirable as they violate driver expectation. Advanced signing and ample pavement paint can help mitigate last minute lane changes. The same safety concerns on the Edenbower Boulevard approaches for Option B exist for Option C. Bicycle and pedestrians concerns for Option C would also be similar to those discussed for Option B.

None of these options specifically address the identified sight distance concerns on eastbound Stewart Parkway or northbound Edenbower Boulevard.

All three options would require additional access control considerations because of the dual turn lanes and merge points associated with the improvements.

Concept 1 – Basic Roadway Geometries and Right-of-Way Requirements

The geometric layouts for Concept 1 are shown in Figure 4-3, Figure 4-4, and Figure 4-5 for Options A, B, and C, respectively.

Concept 1, Option A would have the most extensive ROW impacts of the three options. To avoid building impacts, Stewart Parkway would be widened on its north side to the west of Edenbower Boulevard to add the second left-turn lane on the eastbound approach (west leg). Stewart Parkway would also be widened to the east of Edenbower Boulevard (southeast leg) to align the westbound through movements with their receiving lanes. Edenbower Boulevard north of Stewart Parkway (north leg) would require an additional northbound receiving lane, which would be accommodated by widening primarily the east side of the roadway. The additional receiving lane would need to extend approximately 700 feet to the north of the intersection before tapering 300 feet back to a single lane, which would impact approximately 1,000 feet of roadway frontage.

Concept 1, Option B would involve less ROW impacts than Option A; the second left-turn lane on the eastbound approach of Stewart Parkway would be accommodated by converting the existing center through lane to a shared left/through lane. Therefore, no roadway widening or additional ROW would be required on the west leg of Stewart Parkway. The additional

receiving lane on Edenbower Boulevard would be partially accommodated by reallocating turn lanes on the southbound approach. The dedicated left-turn and through lanes would be consolidated into a shared left/through lane; however, some additional widening would still be required on the east side of Edenbower Boulevard on the north leg. The additional receiving lanes would need to extend approximately 700 feet to the north of the intersection before tapering 300 feet back to a single lane. This would involve ROW impacts for parcels in the northeast quadrant.

Concept 1, Option C would involve the same ROW impacts as Option B. In this option, the second left-turn lane on the eastbound approach of Stewart Parkway would be accommodated by converting the existing center through lane to a dedicated left-turn lane, with no additional ROW required. As in Option B, the additional receiving lane on Edenbower Boulevard would primarily be accommodated by reallocating turn lanes on the southbound approach by combining the dedicated left-turn and through lanes into a single shared left/through lane. This additional widening would occur on the east side of Edenbower Boulevard on the north leg, as in Option B. Additional receiving lanes would need to extend approximately 700 feet to the north of the intersection before tapering 300 feet back to a single lane. This would involve ROW impacts for parcels in the northeast quadrant.

Concept 1 – Environmental, Land Use, and Socioeconomic Assessment

This concept would involve some property impacts for each of the proposed options, although Option B and Option C would involve fewer impacts than Option A. Only Option A may involve environmental impacts (trees, shrubs, etc.). All three options would require additional access control considerations that could affect some business operations.

Concept 1, Option A would involve removal and/or modification of parking for parcels immediately adjacent to the Stewart Parkway frontage in the northwest and northeast quadrants. Parking could be removed and/or converted to parallel or angle orientations to maintain appropriate drive-isle widths in the northwest quadrant, and minimize impacts in the northeast and southeast quadrants. Stewart Parkway would be widened to the north to add dual left-turn lanes on the west leg. Edenbower Boulevard would require an additional receiving lane, which would be accommodated by widening on the east side of the north leg. This would involve property impacts for parcels in the northeast quadrant, within the merge area, including some potential building impacts. Additional design refinement would be needed to more accurately assess the extent of property impact.

Depending on project extents, Option A has potential for the following environmental impacts:

- **Wetlands & Waters.** Sweetbrier Creek and its associated wetland and riparian corridor is north of Stewart Parkway and widening for the second eastbound left-turn lane would bring the roadway closer to the creek, especially near Mercy Drive. Newton Creek and its associated wetland and riparian corridor, which include Coho Salmon and Winter Steelhead habit area, are located south of the Stewart Parkway/Edenbower Boulevard intersection. The creek could be impacted by widening Stewart Parkway east of

Edenbower Boulevard. A wetland and waters delineation is necessary to establish the true resource extents and potential for impacts.

- **Floodplain.** Newton Creek has an associated 100-year floodplain. If the project encroaches on the floodplain, the project may have to demonstrate it will be consistent with applicable FEMA and local floodplain standards through the local land use permitting process.

No direct impacts to Title VI populations would be associated with Option A; however, it would involve widening the east and west legs of Stewart Parkway as well as the north leg of Edenbower Boulevard. While traffic signal timing would be modified with increased crossing times, pedestrians are generally less comfortable at large intersections. This could have some minimal effect on disadvantaged populations traveling on foot and using the nearby transit facilities.

Concept 1, Option B would involve fewer property impacts than Option A. The second left-turn lane on the eastbound approach of Stewart Parkway would be accommodated by converting the existing center through lane to a shared through/left turn lane; thus, would no property impacts are anticipated along Stewart Parkway. However, the additional receiving lane on Edenbower Boulevard would still be needed. Although it could be partially accommodated by reallocating turn lanes on the southbound approach, some additional widening would still be required on the east side of Edenbower Boulevard on the north leg. Additional receiving lanes would need to extend approximately 700 feet to the north of the intersection before tapering 300 feet back to a single lane. This would involve property impacts for parcels in the northeast quadrant, within the merge area, including some potential building impacts. Additional design refinement would be needed to more accurately assess the extent of property impact.

Option B would only involve widening the north leg of Edenbower Boulevard; thus it would have an even smaller effect on disadvantaged populations traveling on foot and using the nearby transit facilities than Option A.

Concept 1, Option C would involve the same ROW impacts as Option B. In this option, the second left-turn lane on the eastbound approach of Stewart Parkway would be accommodated by converting the existing center through lane to a dedicated left-turn lane, with no additional ROW required. As in Option B, the additional receiving lane on Edenbower Boulevard would be partially accommodated by reallocating turn lanes on the southbound approach but would still require some roadway widening that would result in property impacts for parcels in the northeast quadrant including some potential building impacts would occur. Additional design refinement would be needed to more accurately assess the extent of property impact.

Like Options A and B, the socioeconomic effects of Option C would also be minimal. Because it would only involve widening the north leg of Edenbower Boulevard; the effects would be similar to Option B and less than Option A.

Concept 1 – Cost Opinions

Estimates include roadway widening and sidewalk replacement but no ROW acquisition or environmental mitigation costs. The estimates for this concept are:

- Concept 1, Option A improvements are preliminarily estimated at $1.6 million.
- Concept 1, Option B improvements are estimated at $700 thousand.
- Concept 1, Option C improvements are estimated at $700 thousand.

4.3.2. Concept 2 – Edenbower Boulevard/Stewart Parkway: Install Multi-Lane Roundabout

As described in Concept 1, the signalized intersection of Edenbower Boulevard and Stewart Parkway would not meet applicable operational standards during the PM peak period, would have queuing issues for multiple movements, and would have sight distance concerns associated with obstructions in the SW quadrant.

Concept 2 would improve the Edenbower Boulevard/Stewart Parkway intersection by adding additional capacity by replacing the currently signalized intersection with a two-lane roundabout. The general alignment and layout of the roundabout is illustrated in Figure 4-6.

Concept 2 – Traffic Operations and Safety

Existing (2012) and future (2035) traffic demand at this intersection would be the same as the demand described for Concept 1. Concept 2 could accommodate this demand, reduce delay and queuing during peak periods, and meet agency standards with a 2035 forecast v/c ratio of 0.85 and LOS D operations

This intersection has the highest number of crashes within the IMSA. In general, roundabouts lessen the potential for collisions by reducing the number of conflict points and slowing traffic movements.

Bicyclists may have difficulty traveling with vehicular traffic, depending on experience level, but can be provided the option to dismount and become a pedestrian to navigate the intersection via crosswalks.

Pedestrian crossing widths would be shortened by the addition of islands via two-stage crossings. Crosswalks would be located one vehicle behind the yield line, so approaching vehicles interact with pedestrians first, then vehicles inside the roundabout, not simultaneously. Additional traffic control, such as pedestrian-activated beacons may also be installed.

Concept 2 – Basic Roadway Geometries and Right-of-Way Requirements

This concept would involve significant ROW impacts. All approaches would need to be widened or realigned to accommodate the footprint of the roundabout. Further refinement of this design would need to be completed in order to fully understand the impacts to each approach.

Concept 2 – Environmental , Land Use, and Socioeconomic Assessment

Potential impacts to consider for Concept 2 are similar to those for Concept 1, but more extensive in the southwest and southeast quadrants. This concept would likely have no residence or business displacements. However, several commercial or institutional parking lots may be impacted including a parking lot for the Department of Forestry. Due to the number of parking lots and spaces in the immediate area, significant businesses impacts due to loss of parking are not anticipated. Parking could be removed and/or converted to parallel or angle orientations to maintain appropriate drive-isle widths in the northwest quadrant, and minimal impacts in the northeast and southeast quadrants.

This project should be vetted with Mercy Hospital and emergency response personnel due to the change in traffic operations and potential for intersection closure during construction.

Depending on project extents, Concept 2 also has potential for similar wetland and floodplan impacts outlined for Concept 1 but would also include a potential parks and trails impact. Charles S. Gardiner Park is connected to and accessed by Edenbower Boulevard via trail along Newton Creek. If the project extends to the trail access off of Edenbower Boulevard, there could be 4(f) impacts.

No direct impacts to Title VI populations would be associated with Concept 2; however, roundabouts have a mixed reception from walking and bicycling populations. Although designed to accommodate non-auto traffic, some users, particularly bicyclists, can find traveling through roundabouts more challenging. This could have some minimal effect on disadvantaged populations traveling on foot or by bicycle.

Concept 2 – Cost Opinions

The estimated cost of Concept 2 is approximately $2.6 million excluding ROW acquisition. The estimate assumes full closure of the intersection for construction. A staged construction approach would incur significantly more cost and ROW take.

4.3.3. Concept 3 – Edenbower Boulevard/Stewart Parkway: Realign Intersection for Major Traffic Flow and Close South Approach

As described in Concept 1, the signalized intersection of Edenbower Boulevard and Stewart Parkway would not meet applicable operational standards during the PM peak period, would have queuing issues for multiple movements, and would have sight distance concerns associated with obstructions in the SW quadrant.

Concept 3 would improve operations at the Edenbower Boulevard/Stewart Parkway intersection by eliminating the connection to Edenbower Boulevard south of Stewart Parkway and realigning the intersection to better accommodate the major vehicular movements. The north (Edenbower Boulevard) and west (Stewart Parkway) legs of the intersection would be realigned to create an east-west major street and the current east leg (Stewart Parkway) would

"T" into the new Edenbower Boulevard mainline as the south leg. Figure 4-7 shows a high level conceptual view of the proposed improvement.

Concept 3 – Traffic Operations and Safety

Existing (2012) and future (2035) traffic demand at this intersection would be the same as the demand described for Concept 1. The proposed closure of the south leg (Edenbower Boulevard) would redirect approximately 20 percent of the peak total entering volumes (approximately 24,300 vpd in 2012 and 31,700 vpd in 2035) to other access points and driveways on Stewart Parkway.

Even with the shifts in traffic demand, Concept 3 would provide a reduction in intersection delay and queuing (at Edenbower Boulevard/Stewart Parkway) during peak periods and meet the dual mobility standard with a v/c ratio of 0.83 and LOS C operations. However, the 20 percent of redirected vehicles would experience out-of-direction travel, and potentially increase delay at alternate access points. Further evaluation these traffic impacts would need to be completed in order to fully understand the impacts. Also, this concept may require the addition of new alternate access.

This intersection has the highest number of crashes within the IMSA. Over 60 percent of the crashes at this intersection are rear end collisions and under current conditions, the eastbound-left and southbound-right movements make up almost half of the total entering peak volume. By realigning the intersection, the major movements can more easily travel through the intersection.

Realigning the intersection provides the opportunity to address the identified sight distance concerns associated with obstructions in the southwest quadrant.

Concept 3 would simplify intersection operations and would not widen any of the intersection approaches. For pedestrians, crossings would be the same or shorter than current crosswalks. For bicyclists, the westbound through movement on Stewart Parkway would become a left-turn movement but would have no opposing traffic flow. The eastbound left-turn movement to Edenbower Boulevard would become a simpler through movement. Bicycle and pedestrian access to the businesses to the south along Edenbower Boulevard could still be provided with this concept.

Concept 3 would require additional access control considerations because of the proximity to the realigned intersection and merge points associated with the improvements.

Concept 3 – Basic Roadway Geometries and Right-of-Way Requirements

The improvement would have significant ROW impacts, as shown in Figure 4-7. Depending on the geometric alignment of the east-west main route, impacts to the property on the northwest corner of the intersection could be significant. Additionally, Edenbower Boulevard north of Stewart Parkway (north leg) would require an additional northbound receiving lane, which would be accommodated by widening both sides of the roadway. The additional receiving lane

would need to extend approximately 700 feet to the north of the intersection before tapering 300 feet back to a single lane, which would impact approximately 1,000 feet of roadway frontage.

Additional access to the properties currently served by the south leg of Edenbower Boulevard has not been shown but any new connections would also have geometric and ROW impacts.

Concept 3 – Environmental , Land Use, and Socioeconomic Assessment

Concept 3 would have property impacts due to roadway realignment. Depending on the geometric alignment of the east-west main route, impacts to the property on the northwest corner of the intersection could be significant. Additionally, the need for two receiving lanes on the north leg would require widening north of the intersection, impacting properties on either side of Edenbower Boulevard.

Unlike Concepts 1 and 2, Concept 3 would also have potentially significant economic impacts to businesses served by the south leg of Edenbower Boulevard. The south leg of Edenbower Boulevard provides the closest signalized access with all movements served. Businesses south of this intersection would be served by the existing right-in right-out driveway on Stewart Parkway; however; vehicles wanting to make left turns while entering or exiting the commercial area would have to travel approximately two-thirds of a mile out of direction to the signalized intersection of Renann Street and Stewart Parkway. The Albertsons parking lot would likely experience an increase in cut-through traffic as drivers seek access to Stewart Parkway. Businesses served by the south leg of Edenbower Boulevard and the adjacent parking lots would likely experience economic hardship from the closure of Edenbower Boulevard due to access limitations and a potential reduction in pass-by traffic demand.

A new connection to Stewart Parkway that would provide additional access to the properties currently served by the south leg of Edenbower Boulevard has not been shown, but would have potential land use and environmental impacts.

The parking lot at Albertsons west of Edenbower and south of Stewart parkway is also a bus stop. The Umpqua Transit Agency should be consulted to identify potential impacts areas for coordination if this concept is carried forward.

No direct impacts to Title VI populations would be associated with Concept 3. Non-auto travel would be simplified with Concept 3 which could provide a minimal socioeconomic benefit. Convenient transit access should be maintained through coordination with Umpqua Transit Agency.

Potential environmental impacts to consider for Concept 3 are similar to those for Concept 1. These include Sweetbrier Creek north of Stewart Parkway and Newton Creek south of the Stewart Parkway/Edenbower Boulevard intersection.

Concept 3 – Cost Opinions

The estimated cost of Concept 3 is approximately $1.9 million excluding ROW acquisition. Any provision for additional access to the properties currently served by the south leg of Edenbower Boulevard has not been shown but any new connections would add to the project cost.

The estimate assumes full closure of the intersection for construction. A staged construction approach would incur significantly more cost and ROW take.

4.3.4. Concept 4 – Edenbower Boulevard/Stewart Parkway: Create "T" Intersection and Close South Approach

As described in Concept 1, the signalized intersection of Edenbower Boulevard and Stewart Parkway would not meet applicable operational standards during the PM peak period, would have queuing issues for multiple movements, and would have sight distance concerns associated with obstructions in the SW quadrant.

Similar to Concept 3, Concept 4 would realign the Edenbower Boulevard/Stewart Parkway intersection by eliminating access to Edenbower Boulevard south of Stewart Parkway. The north (Edenbower Boulevard) and east (Stewart Parkway) legs of the intersection would be realigned to create a north-south major street. The current west leg (Stewart Parkway) would "T" into the new Edenbower Boulevard mainline roadway.

Two options for the realigned intersection were developed for this concept:

- **Option A**: Realign the west leg of the intersection to "T" into a newly aligned north-south Edenbower connecting the existing north and east legs. Stripe one left-turn lane and one right-turn lane on the eastbound Stewart Parkway approach, dual left turn lanes and one through lane on the northbound Stewart Parkway approach, and one right-turn lane and one through lane on the southbound Edenbower Boulevard approach. Figure 4-8 and shows a high level conceptual view of the proposed improvement.
- **Option B**: Travel lanes on the approaches for Option B would be the same as those described for Option A except that eastbound Stewart Parkway would have two left-turn lanes rather than a single left-turn lane. The dual turn lanes would require a second northbound receiving lane on Edenbower Boulevard to the north of the intersection. Figure 4-9 and shows a high level conceptual view of the proposed improvement.

Concept 4 – Traffic Operations and Safety

Existing (2012) and future (2035) traffic demand at this intersection would be the same as the demand described for Concept 1. The proposed closure of the south leg (Edenbower Boulevard) would redirect approximately 20 percent of the peak total entering volumes to other access points and driveways on Stewart Parkway, as described for Concept 3.

Concept 4, Option A realigns the intersection with less skew than the existing configuration and addresses sight distance concerns caused by the existing horizontal curvature and obstructions associated with the existing configuration. This realignment and lane configuration changes would provide an improvement over baseline operations during peak periods but would exceed the v/c ratio mobility standard (0.85) with a v/c ratio of 0.90 for the projected 2035 volumes. The option would meet LOS mobility standards with a LOS D.

Option A would simplify intersection operations but could widen the north leg of Edenbower Boulevard. For pedestrians, crossings would be the same or shorter than current crosswalks except on the north leg, which would require more crossing time from the traffic signal. For bicyclists, the eastbound left-turn movement to Edenbower Boulevard would no longer have any opposing traffic to consider. Bicycle and pedestrian access to the businesses to the south along Edenbower Boulevard could still be provided with this concept.

Concept 4, Option B realigns the intersection similar to Option A, but provides dual left-turn lanes on the eastbound approach. Sight distance issues at intersection approaches are addressed by the realignment, and peak period operations are expected to dramatically improve. The intersection would meet the dual mobility standards with a v/c ratio of 0.60 and LOS B operations.

Bicycle and pedestrian features for Option B would be similar to those for Option A except that the west leg of Stewart Parkway would remain five lanes wide, similar to the current configuration.

Both options for Concept 4 would require additional access control considerations because of the proximity to the realigned intersection and merge points associated with the improvements.

Concept 4 – Basic Roadway Geometries and Right-of-Way Requirements

The geometric layouts for Concept 4 are shown in Figure 4-8 and Figure 4-9 for Options A and B, respectively.

Concept 4, Option A would involve fewer ROW impacts in the northwest quadrant than Concept 3. The west leg of Stewart Parkway would remain the same cross-section to facilitate dual left-turn lanes on the south leg. The north leg would require minor widening to align the southbound through movement with the receiving lanes.

Concept 4, Option B would have the same ROW impacts as those detailed for Option A except along Edenbower Boulevard north of the intersection. Some additional widening over Option A would be needed to provide the second northbound receiving lane for the dual left-turn lanes on the west leg (eastbound approach). Additional receiving lanes would need to extend approximately 700 feet to the north of the intersection before tapering 300 feet back to a single lane.

As with Concept 3, additional access to the properties currently served by the south leg of Edenbower Boulevard has not been shown but any new connections would also have geometric and ROW impacts.

Concept 4 – Environmental , Land Use, and Socioeconomic Assessment

Concept 4, Option A Concept 4 would have minor property impacts due to roadway realignment. These would occur in the northwest quadrant along the frontage of the Department of Forestry. The properties on the east side of Stewart Parkway and Edenbower Boulevard would also be impacted by the intersection realignment. It is likely that impacts to parking on properties could be avoided.

Concept 4, Option B would have the same impacts as those detailed for Option A except along Edenbower Boulevard north of the intersection. Some additional widening over Option A would be needed to provide the second northbound receiving lane for the dual left-turn lanes on the west leg (eastbound approach). Additional receiving lanes would need to extend approximately 700 feet to the north of the intersection before tapering 300 feet back to a single lane.

Concept 4 would have the same potentially significant economic impacts to businesses as Concept 3 because of the closure of the south leg of Edenbower Boulevard that would cause access limitations and a potential reduction in pass-by traffic demand. It would also have similar potential impacts to the transit stop and bus routing.

No direct impacts to Title VI populations would be associated with either option of Concept 4. Non-auto travel would be simplified with Concept 4 which could provide a minimal socioeconomic benefit. Convenient transit access should be maintained through coordination with Umpqua Transit Agency.

The potential for environmental impacts would be lower for Concept 4 than Concept 3.

Concept 4 – Cost Opinions

Estimates include roadway realignment but no ROW acquisition or environmental mitigation costs. The estimates for this concept are:

- Concept 4, Option A improvements are preliminarily estimated at $1.6 million.
- Concept 4, Option B improvements are estimated at $1.9 million.

Any provision for additional access to the properties currently served by the south leg of Edenbower Boulevard has not been shown, but any new connections would add to the project cost.

The estimate assumes full closure of the intersection for construction. A staged construction approach would incur significantly more cost and ROW take.

4.3.5. Concept 5 – Edenbower Boulevard/Aviation Drive: Extend Westbound Right-Turn Bay

By the year 2035, the signalized intersection of Edenbower Boulevard at Aviation Drive is expected to experience queues that exceed available storage for the westbound right-turn lane. Westbound traffic is expected to regularly queue back approximately halfway between Aviation Drive and Stephens Street, and depending on the traffic from Stephens Street, may occasionally queue back even further.

Concept 5 would enhance safety for both turning and through vehicles by extending the current westbound right-turn bay to allow vehicles to decelerate safely in a lane separated from higher-speed through traffic. This concept would also improve operations for westbound through traffic. Concept 5 is illustrated in Figure 4-10.

Concept 5 – Traffic Operations and Safety

Current traffic demand at this intersection is approximately 16,700 vpd total daily volumes entering the intersection, with higher 2035 forecast demand of approximately 19,800 vpd. The current right-turn demand during the peak hour from Edenbower Boulevard to Aviation Drive accounts for approximately 13 percent of the westbound traffic at this intersection.

Ten crashes were reported at this location in the 5-year analysis period, the majority of which were rear end collisions. Most of the collisions involved vehicles traveling through on Edenbower Boulevard. Nevertheless, extending the right-turn turn bay would improve safety by allowing vehicles to decelerate away from through traffic. There would also be operational benefits for both the turning and through vehicles through reduced delays. This concept would also reduce the likelihood that traffic would back up over the track under high traffic volume conditions.

Concept 5 – Basic Roadway Geometries and Right-of-Way Requirements

The improvement would likely require additional ROW, and would modify the northeast corner of the intersection to extend the existing westbound right-turn bay an appropriate length (from 100 to 175 feet) to allow queuing vehicles to avoid conflicts with westbound through traffic. This lane would likely require an additional 10 feet of ROW to accommodate the lane extension since existing ROW on Edenbower Boulevard narrows from 80 feet where the right-turn lane is present to approximately 70 feet where the cross section is only three lanes. Lighting and sidewalks would need to be relocated in this concept.

Concept 5 – Environmental , Land Use, and Socioeconomic Assessment

Some additional ROW would likely be needed on the north side of Edenbower Boulevard but the property is currently undeveloped. There are some freshwater forested/shrub wetlands identified to the north but the improvement is not expected to extend into any undisturbed areas. No socioeconomic effects are anticipated.

Concept 5 – Cost Opinions

The estimated cost of Concept 5 is approximately $75,000, excluding costs for ROW acquisition.

4.3.6. Concept 6 – Edenbower Boulevard/Stephens Street: Extend Left-Turn Bays

At the signalized intersection of Edenbower Boulevard and Stephens Street, the eastbound left-turn lane queue currently exceeds available striped storage bay. The northbound left-turn lane queues are expected to exceed turn lane storage under future conditions (year 2035).

Concept 6 restripes the center two-way, left-turn lane to delineate longer left-turn storage bays on the eastbound and northbound approaches of the intersection, as shown in Figure 4-11.

Concept 6 – Traffic Operations and Safety

Current traffic demand at this intersection is approximately 19,850 vpd with a 2035 forecast demand of approximately 22,800 vpd. The current peak hour left-turn demand on the eastbound approach is 57 percent of total eastbound approach volume, and the northbound left-turn demand is 43 percent of the total northbound approach volume; these ratios are close to what is expected in the future as well.

There were 12 reported crashes at this location within the 5-year crash analysis period. The majority of these incidents were rear end or turning movement crashes on the northbound and eastbound approaches.

The proposed improvement extends the delineated storage for the northbound and eastbound left-turn lanes by restriping the two-way, left-turn lane. Additional storage would prevent left-turn queues from interfering with the flow of through traffic by reducing the likelihood of spillover from left-turn lanes. Additional storage can benefit intersection operations by reducing delay for through movements caused by left-turning vehicles stopped in the through travel lane. It can also reduce delays for the left-turn movements by improving accessibility to the turn lane.

The longer left-turn lanes would also provide safety benefits. The potential for rear-end crashes may reduce because left-turning vehicles would be less likely to be slowing or stopping in the adjacent through travel lane when long queues are present.

The proposed left-turn lane extensions might trigger the need for changes in signal timing and railroad pre-emption clean-outs. If this becomes the case, a revised signal matrix should be included in an application by the road authority to ODOT Rail Division for an Order authorizing alteration of the roadway approaches to the crossing.

Concept 6 – Basic Roadway Geometries and Right-of-Way Requirements

The improvement would modify the striping of the northbound and eastbound left-turn lanes to provide appropriate storage bay length to allow queuing vehicles to avoid conflicts with through traffic. Due to the existing center two-way left-turn lane on Edenbower Boulevard and

Stephens Street, this restriping can be accommodated within the existing ROW. No additional widening would be necessary to complete this improvement.

Concept 6 – Environmental , Land Use, and Socioeconomic Assessment

The project would be completed all within existing ROW. No potential for land use or environmental impacts identified. No socioeconomic effects are anticipated.

Concept 6 – Cost Opinions

The cost of Concept 6 is estimated at less than $15,000.

4.4. Interchange Ramp Improvements

While the current interchange ramps and terminals have some features that may deviate from the desired geometric layout, a detailed review of crash data for the period between January 1, 2006, and December 31, 2010 did not identify consistent crash patterns associated with ramp geometry. However, two concepts have been developed to address citizen concerns raised about driver expectation and perceived safety on the westbound to northbound on-ramp. A brief summary of the projects is presented in Table 4-3, with locations identified in Figure 4-12 and Figure 4-13.

Table 4-2. Interchange Ramp Improvement Concepts

ID	Location	General Description	Purpose
7	Westbound to Northbound On-Ramp	Provide additional delineation in gore area with chevron paint	Address driver expectation concerns
8	Westbound to Northbound On-Ramp	Install a visual barrier on the west side of the northbound on-ramp	Address driver expectation concerns

4.4.1. Concept 7 – Westbound to Northbound On-Ramp: Gore Area Delineation

With the previous addition of the northbound loop on-ramp, the existing westbound to northbound on-ramp was extended to provide adequate spacing between the two ramp merge points on the freeway. The ramp extension resulted in a long painted gore area that is only delineated by a white line on either side of the restricted area. The IAMP advisory committees identified concerns that the geometry of the on-ramp is unusual and drivers do not know when they should start looking at mainline traffic to prepare to merge onto the freeway.

Concept 7 would install additional delineation between the I-5 northbound mainline and westbound to northbound on ramp to improve safety. The gore area would be painted with a chevron pattern to provide a visual cue to drivers to let them know when they should prepare to merge with freeway traffic.

Concept 7 – Traffic Operations and Safety

The westbound to northbound on-ramp had eight crashes in the 5-year analysis period. Further investigation into the crash data did not identify a consistent pattern other than that the majority of the crashes (rear-end and sideswipe) could potentially be related to the unique configuration of the NB On-Ramp. The long ramp may cause drivers to begin looking over their shoulders well before necessary to make the merging movement to the mainline. Since the length of the ramp cannot be shortened, more distinctive pavement markings in the gore may provide a better visual cue for drivers to keep them from prematurely looking back toward the freeway traffic instead of focusing on the roadway and vehicles in front of them.

The enhanced gore delineation would have no impact on vehicular capacity, as all striping would occur within the existing gore.

Concept 7 – Basic Roadway Geometries and Right-of-Way Requirements

Improvements included in this concept would occur within the available right of way (ROW). The on-ramp length meets standards although it may seem excessive to the average driver. Painting in the gore area would provide delineation between the mainline and on-ramp.

Concept 7 – Environmental , Land Use, and Socioeconomic Assessment

No environmental, land use, or socioeconomic impacts associated with the proposed improvements are anticipated.

Concept 7 – Cost Opinions

The estimated cost of Concept 7 is $20,000 and assumes 8-inch striping.

4.4.2. Concept 8 – Westbound to Northbound On-Ramp: Visual Barrier

Concept 8 addresses the same issue discussed for Concept 7 related to driver expectation and behavior on the westbound to northbound on-ramp. Concept 8 would install a visual barrier on the west side of the on ramp in the form of a concrete barrier with glare shields to prohibit drivers from prematurely looking at the mainline traffic to prepare to merge. This concept could be done in conjunction with Concept 7, or as a standalone improvement.

Concept 8 – Traffic Operations and Safety

This concept has the same type of operational and safety benefits as Concept 8.

The installation of a concrete barrier could be designed to have no impact on vehicular capacity, since a guardrail on the west side currently defines the unobstructed roadway width of the ramp.

Concept 8 – Basic Roadway Geometries and Right-of-Way Requirements

Improvements included in this concept would occur within the available right of way (ROW).

Concept 8 – Environmental , Land Use, and Socioeconomic Assessment

No environmental, land use, or socioeconomic impacts associated with the proposed improvements are anticipated.

Concept 8 – Cost Opinions

The estimated cost of Concept 8 is $100,000. This estimate assumes concrete barrier with glare shields.

4.5. Multi-Modal Improvements

Two potential multi-modal improvements were identified during the concept development process to improve the safety and continuity of pedestrian facilities in the study area. A brief summary of the projects is presented in Table 4-3.

Table 4-3. Multi-Modal Improvement Concepts

ID	Location	General Description	Purpose
9	Northbound Ramp Terminal	Improve east-west pedestrian crossing across north leg	Improve safety and continuity of pedestrian facilities
10	Edenbower Blvd from Broad St to Stewart Pkwy	Enhance pedestrian north-south pedestrian crossings along the west side of Edenbower Blvd.	Improve safety and continuity of pedestrian facilities

4.5.1. Concept 9 – Northbound Ramp Terminal: Improve North Side Pedestrian Crossing

When the eastbound to northbound loop on-ramp was installed, it included an eastbound right-turn lane with raised island that reduces the pedestrian crossing distance along the south side Edenbower Boulevard at the ramp terminal. Crosswalks are striped perpendicular to the right-turn movement onto the freeway as well as the off-ramp approach to Edenbower Boulevard. The loop ramp eliminated the left-turn movement from eastbound Edenbower Boulevard and a raised median was installed in the former left-turn lane. However, no changes were made to the pedestrian crossing on the north side of the ramp terminal.

Concept 9 would shorten the pedestrian crossing distance for the westbound to northbound on-ramp by installing a raised island or extending the curb and sidewalk in the northwest quadrant of the intersection. Either of these options could include a striped pedestrian crosswalk. See Figure 4-14 for an illustration of potential improvements.

Concept 9 – Traffic Operations and Safety

This concept would shorten the crossing distance for pedestrians by either providing a raised island or extending the existing corner in the northwest quadrant. The shorter crossing distance would reduce pedestrian exposure at the conflict point with vehicular traffic. The

addition of striped crosswalks would further increase driver awareness of potential pedestrian activity, but would not be required with the construction of the raised surface.

This concept could be designed to have no impact on vehicular capacity, since a guardrail on the west side currently defines the unobstructed roadway width of the ramp.

Concept 9 – Basic Roadway Geometries and Right-of-Way Requirements

Construction of a raised island or curb extension would need to account for the turning requirements onto the freeway for the westbound right-turning traffic as well as the through movement from the northbound off-ramp. Improvements included in this concept would occur within the available right of way (ROW).

Concept 9 – Environmental , Land Use, and Socioeconomic Assessment

Improving the safety of the pedestrian crossings benefits the transportation disadvantaged population through better general access to community facilities and transit.

No environmental or land use impacts associated with the proposed improvements are anticipated.

Concept 9 – Cost Opinions

The estimated cost of Concept 9 is approximately $20,000

4.5.2. Concept 10 - Edenbower Boulevard from Broad Street to Stewart Parkway – Enhance Pedestrian Crossings

Currently there are sidewalks and striped bike lanes along both sides of Edenbower Boulevard; however, there are no striped crosswalks between the southbound ramp terminal and Stewart Parkway. Furthermore, the curb ramps along the west side of Edenbower are currently a single-ramp design, which provide less directional guidance for visually impaired pedestrians and wheelchairs, when compared to separate directional ramps at a corner.

Concept 10 would add striped crosswalks at Broad Street, Sweetbrier Avenue, Plateau Drive (north), and Plateau Drive (South) for north-south pedestrian travel along the west side of Edenbower Boulevard. Also, curb ramps would be enhanced at these locations to provide improved directional guidance where appropriate. See Figure 4-15 for an illustration of potential improvement locations.

Concept 10 – Traffic Operations and Safety

Striped crosswalks would help identify the presence of pedestrian activity and increase visibility to motorists turning onto the side streets. Clearly defined and frequent crosswalks may encourage slower travel speeds along Edenbower Boulevard.

The striping of the crosswalks themselves would have no impact on vehicular capacity since motorists are supposed to yield to pedestrians crossing the roadway even at intersection locations where a crosswalk is not striped. However, driver compliance may be greater with the striped crosswalks which may result in a negligible reduction in vehicular capacity.

Concept 10 – Basic Roadway Geometries and Right-of-Way Requirements

Improvements included in this concept would occur within the available right of way (ROW).

Concept 10 – Environmental, Land Use, and Socioeconomic Assessment

Improving the safety of the pedestrian crossings benefits the transportation disadvantaged population through better general access to community facilities and transit.

No environmental or land use impacts associated with the proposed improvements are anticipated.

Concept 10 – Cost Opinions

The estimated cost of Concept 10 is approximately $25,000.

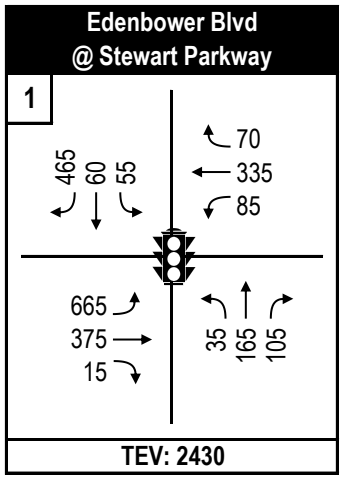
4.6. Evaluation Matrix

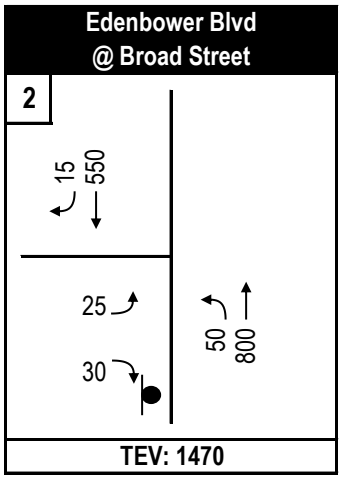
The information presented in this memo is also summarized in the attached matrix for a summary comparison of alternatives.

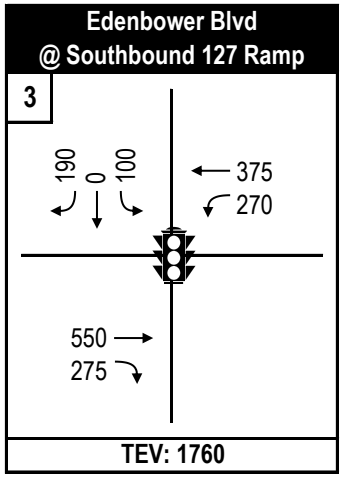
Attachments:

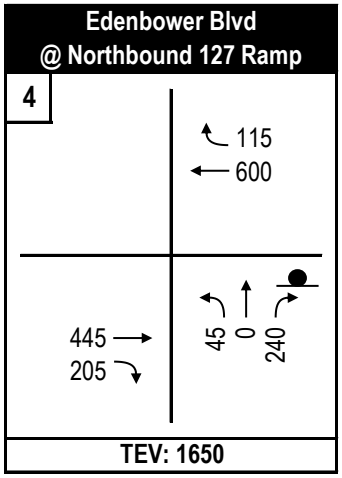
Figure 4-1. 2012 PM Peak Volumes
Figure 4-2. 2035 PM Peak Volumes
Figure 4-3. Concept 1, Option A – Edenbower/Stewart Intersection – Add Second Eastbound Left-Turn Lane
Figure 4-4. Concept 1, Option B – Edenbower/Stewart Intersection – Add Second Shared Left-Through Lane
Figure 4-5. Concept 1, Option C – Edenbower/Stewart Intersection – Convert Eastbound Through to Left-Turn Lane
Figure 4-6. Concept 2 – Edenbower/Stewart Intersection – Install a Multi-Lane Roundabout
Figure 4-7. Concept 3 – Edenbower/Stewart Intersection – Realign for Major Traffic Flow
Figure 4-8. Concept 4, Option A – Edenbower/Stewart Intersection – Create "T" Intersection
Figure 4-9. Concept 4, Option B – Edenbower/Stewart Intersection – Create "T" Intersection with Dual Lefts
Figure 4-10. Concept 5 – Edenbower/Aviation Intersection – Extend Westbound Right-Turn Bay
Figure 4-11. Concept 6 – Edenbower/Stephens Intersection – Extend Left-Turn Bays
Figure 4-12. Concept 7 – Westbound to Northbound On-Ramp – Paint Gore Area
Figure 4-13. Concept 8 – Westbound to Northbound On-Ramp – Install Visual Barrier
Figure 4-14. Concept 9 – Northbound Ramp Terminal: Improve North Side Pedestrian Crossing
Figure 4-15. Concept 10 –Broad Street to Stewart Parkway – Enhance Pedestrian Crossings

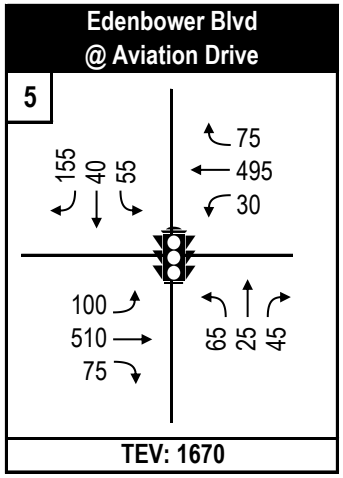
Evaluation Matrix

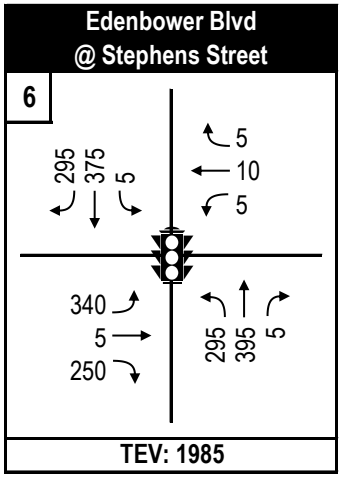










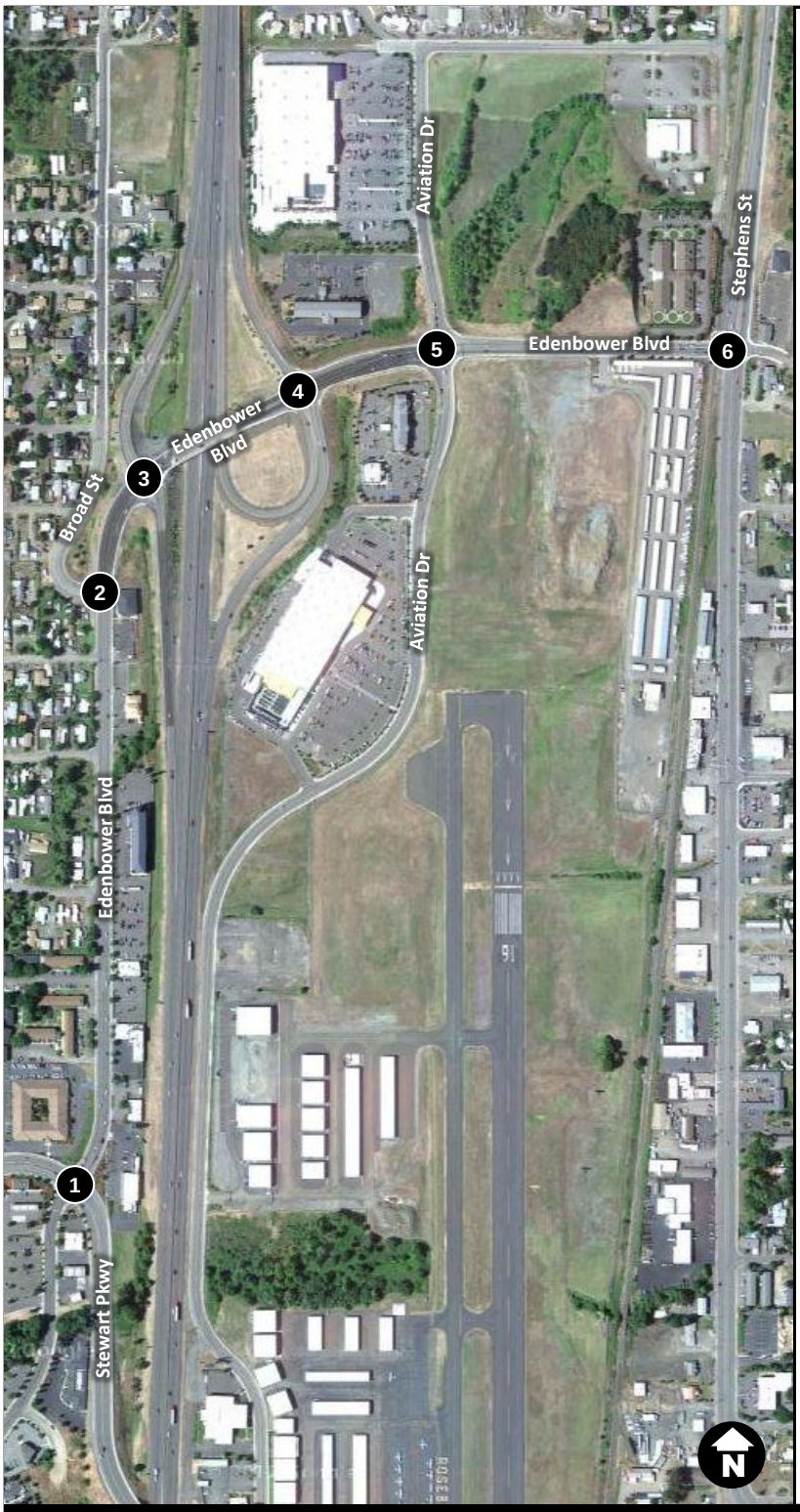


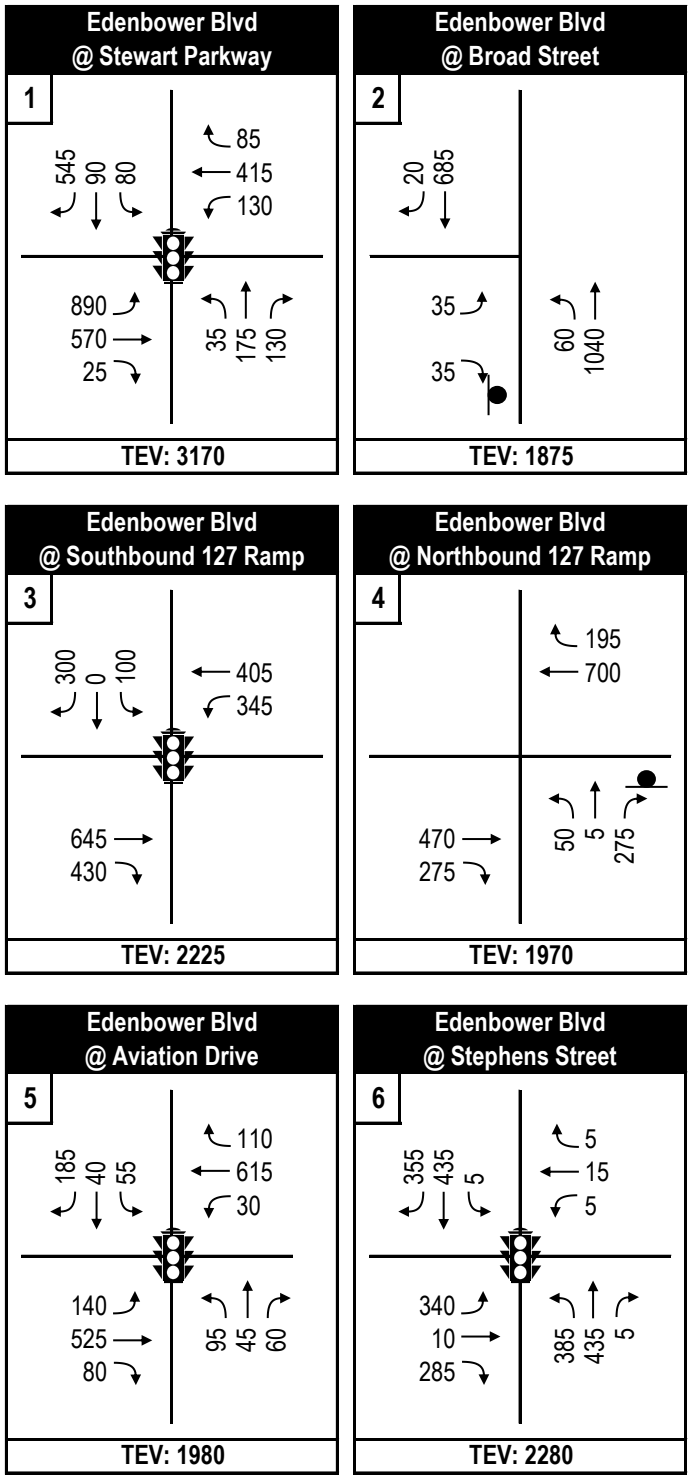
I-5 Exit 127 (North Roseburg) IAMP

Legend

- Allowable Movement
- TEV: Total Entering Volume
- ### PM Peak Hour Turning Movement Volume
- Signalized Intersection
- STOP Controlled Approach

Figure 4-1
2012 Baseline
PM Peak Hour Volumes



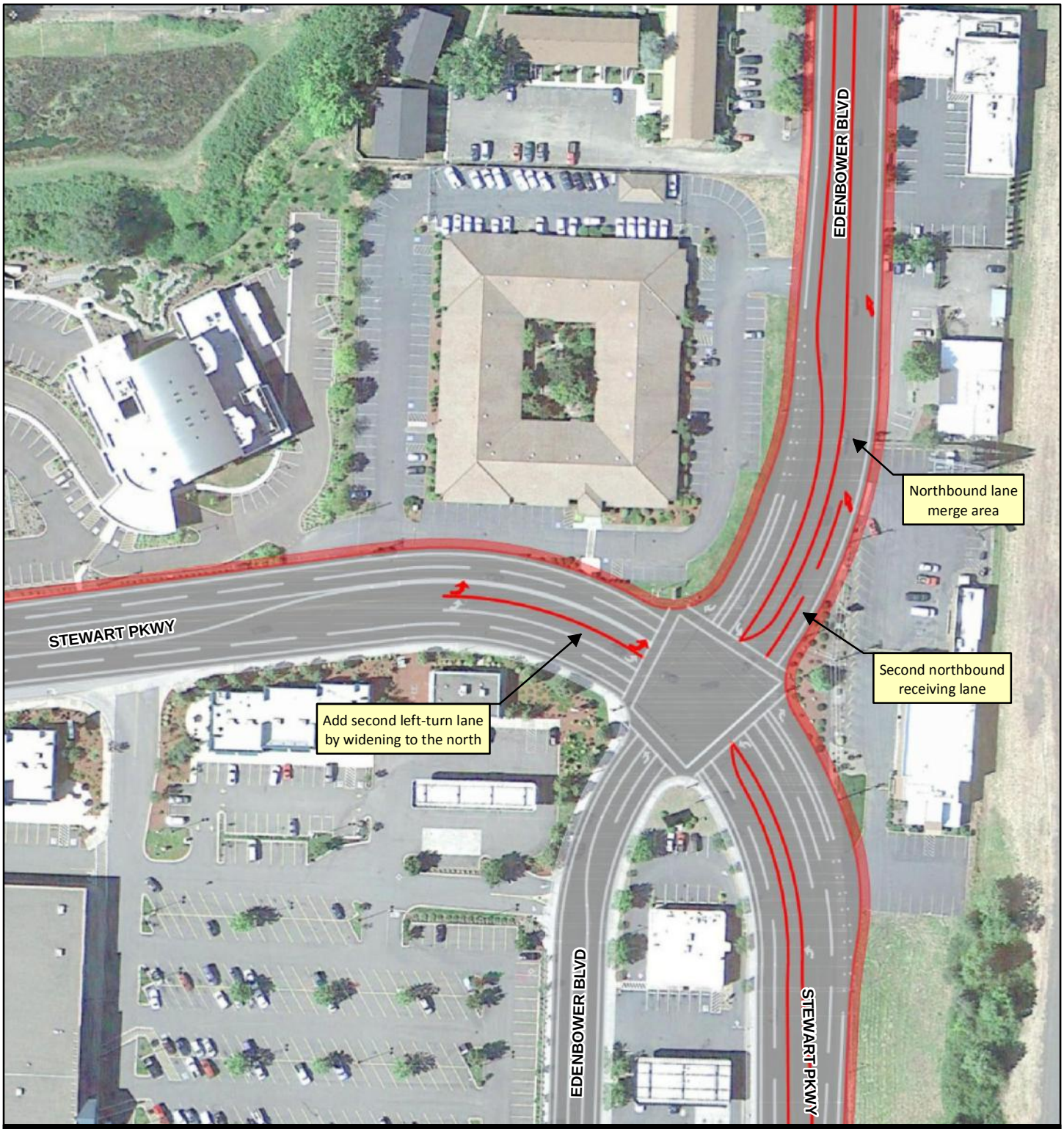


I-5 Exit 137 (North Roseburg) IAMP

Legend

- Allowable Movement
- TEV: Total Entering Volume
- ### PM Peak Hour Turning Movement Volume
- Signalized Intersection
- STOP Controlled Approach

Figure 4-2
2035 Future Baseline PM Peak Hour Volumes

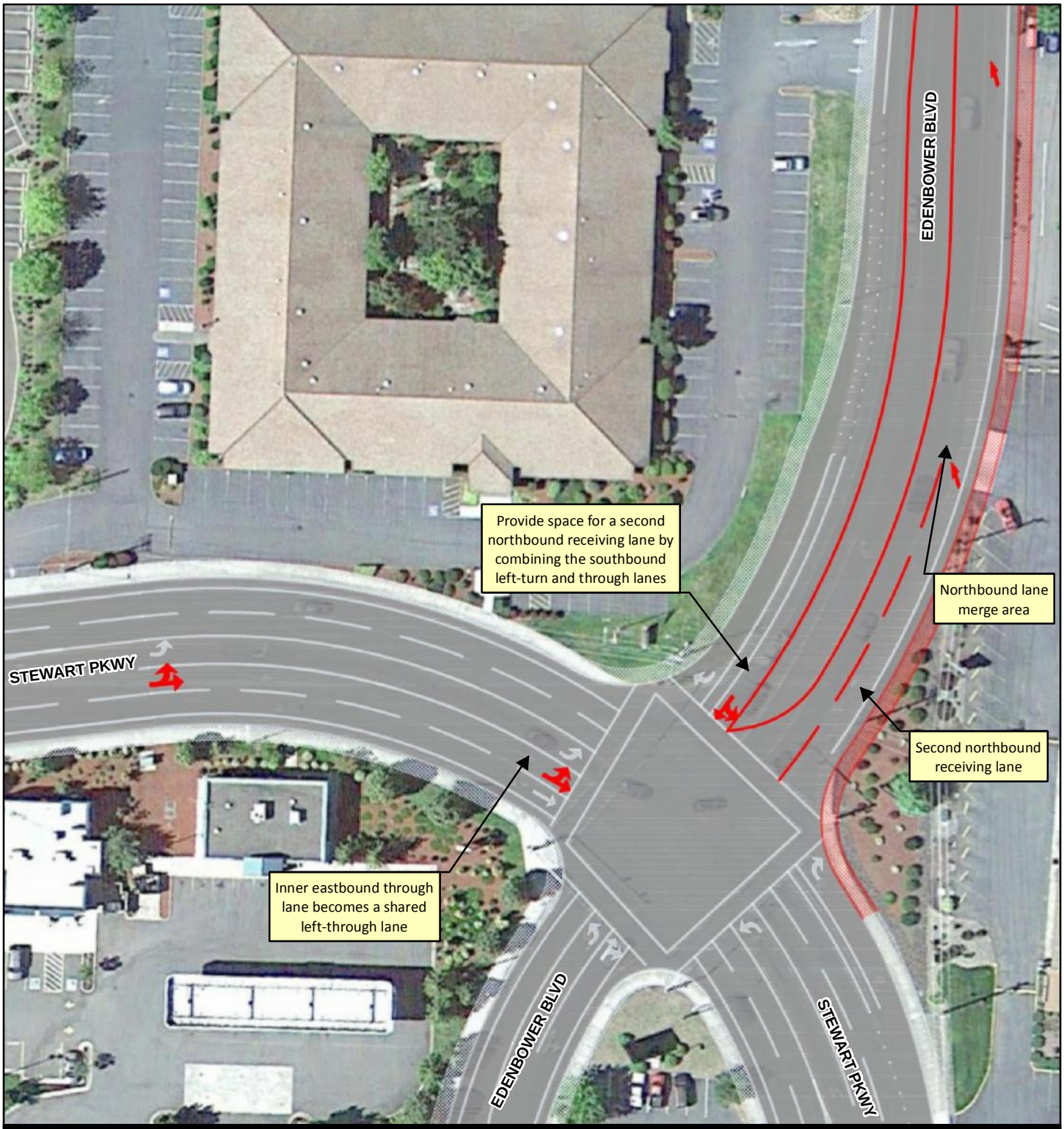


I-5 Exit 127 (North Roseburg) IAMP

Legend

- Proposed Lane Configuration
- Existing Lane Configuration
- Estimated Boundary of Impacts
- Proposed Striping

Figure 4-3
Concept 1 - Option A
Add 2nd Eastbound Left-Turn Lane

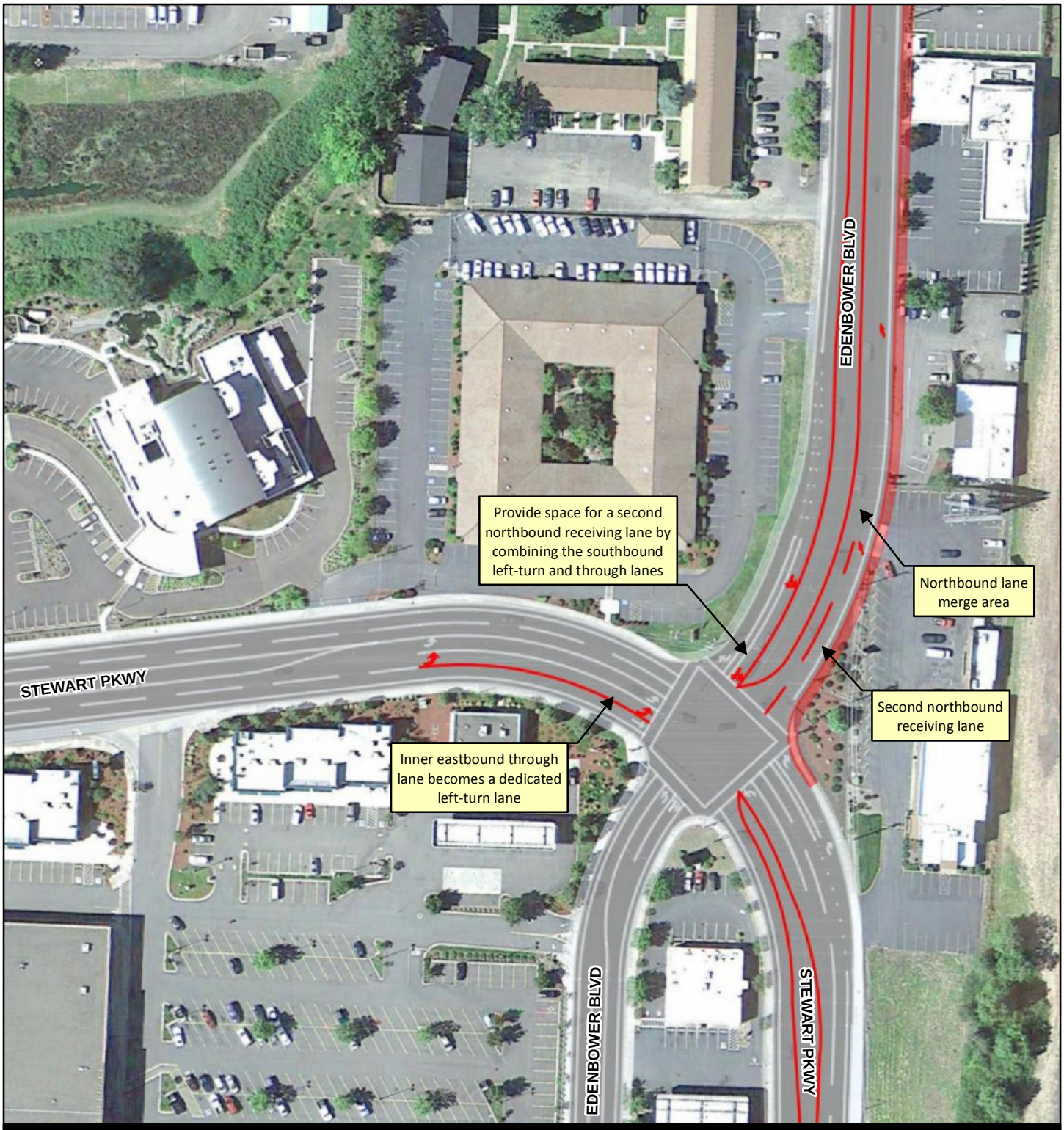


I-5 Exit 127 (North Roseburg) IAMP

Legend

- Proposed Lane Configuration
- Existing Lane Configuration
- Estimated Boundary of Impacts
- Proposed Striping

Figure 4-4
Concept 1 - Option B
Create Eastbound Shared Left-Through Lane

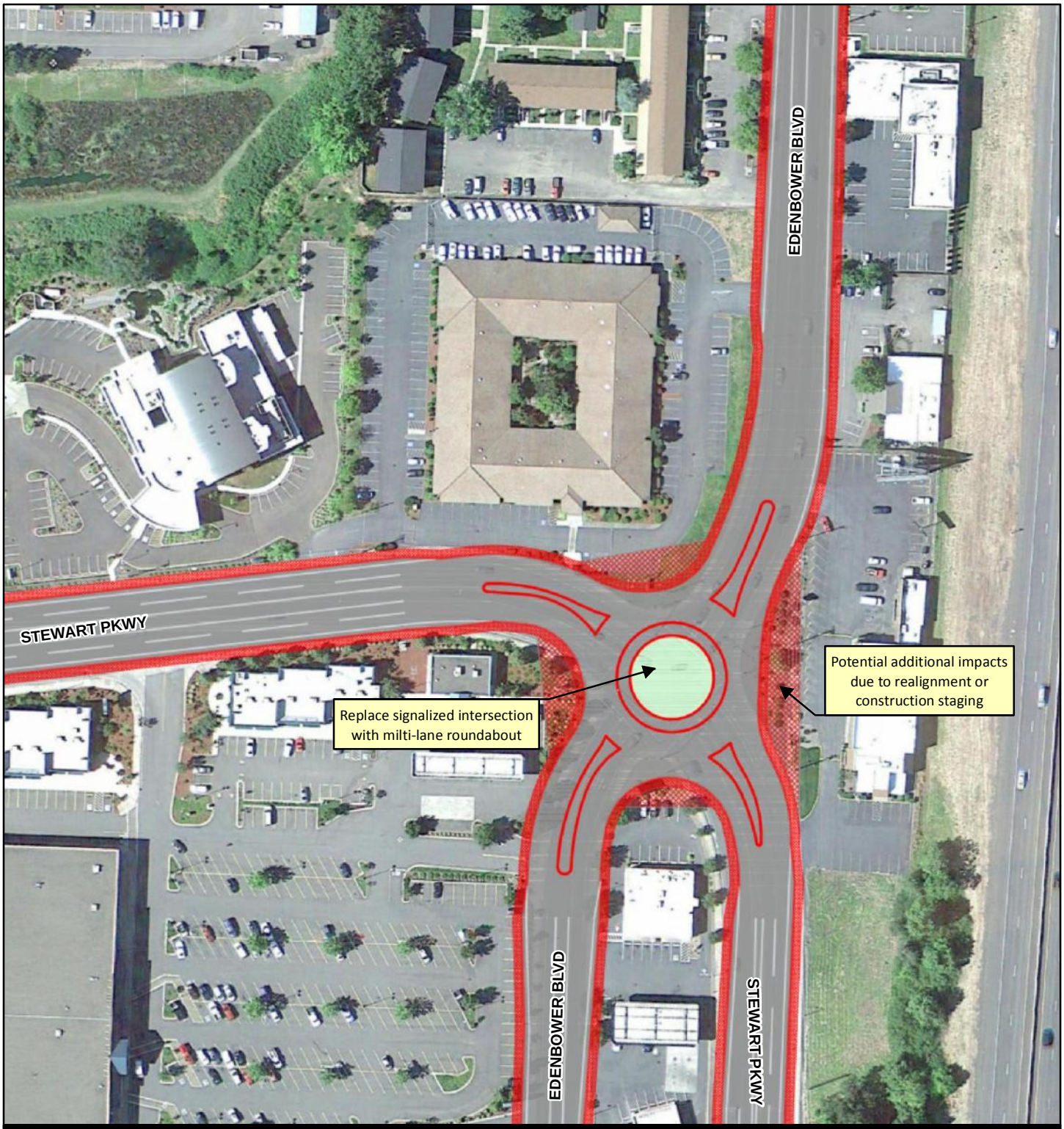


I-5 Exit 127 (North Roseburg) IAMP

Legend

- Proposed Lane Configuration
- Existing Lane Configuration
- Estimated Boundary of Impacts
- Proposed Striping

Figure 4-5
Concept 1 - Option C
Reallocate Center Through-Lane to Left-Turn Lane

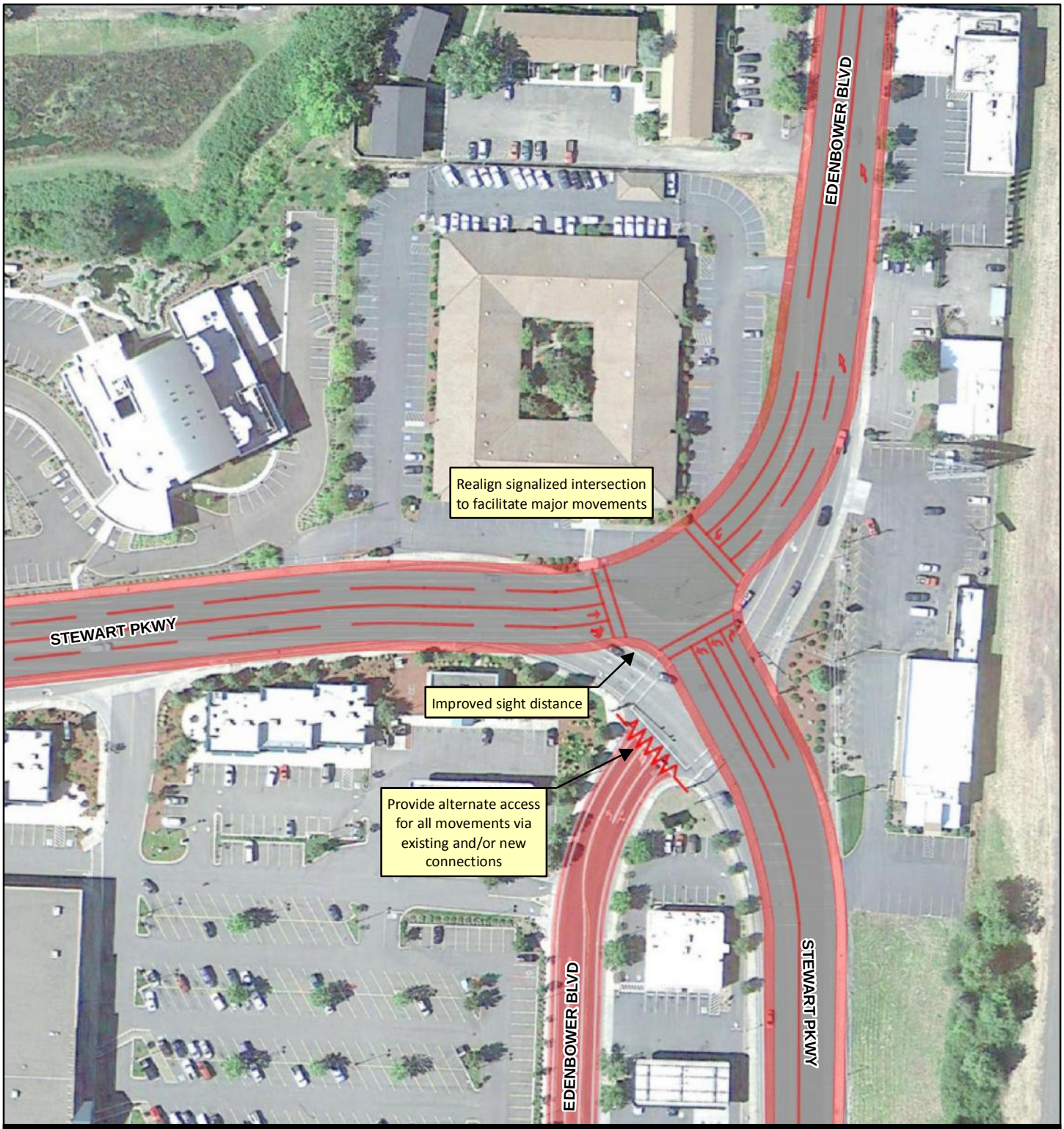


I-5 Exit 127 (North Roseburg) IAMP

Legend

- Proposed Lane Configuration
- Existing Lane Configuration
- Estimated Boundary of Impacts
- Proposed Striping
- Proposed Roundabout

Figure 4-6
Concept 2
Install Multi-Lane Roundabout

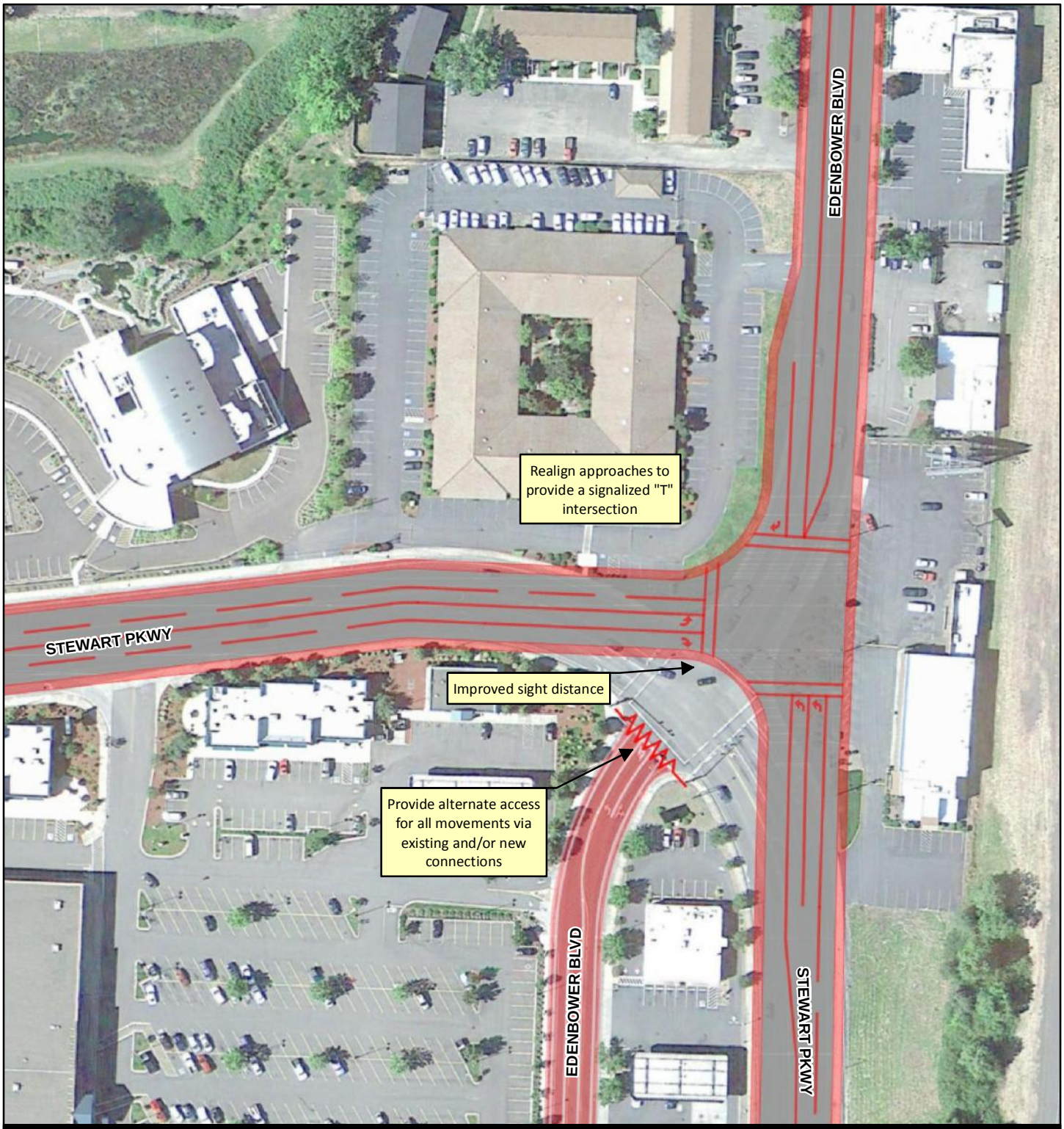


I-5 Exit 127 (North Roseburg) IAMP

Legend

- Proposed Lane Configuration
- Existing Lane Configuration
- Estimated Boundary of Impacts
- Proposed Striping
- Proposed Access Closure

Figure 4-7
Concept 3
Realign Intersection to East-West "T"

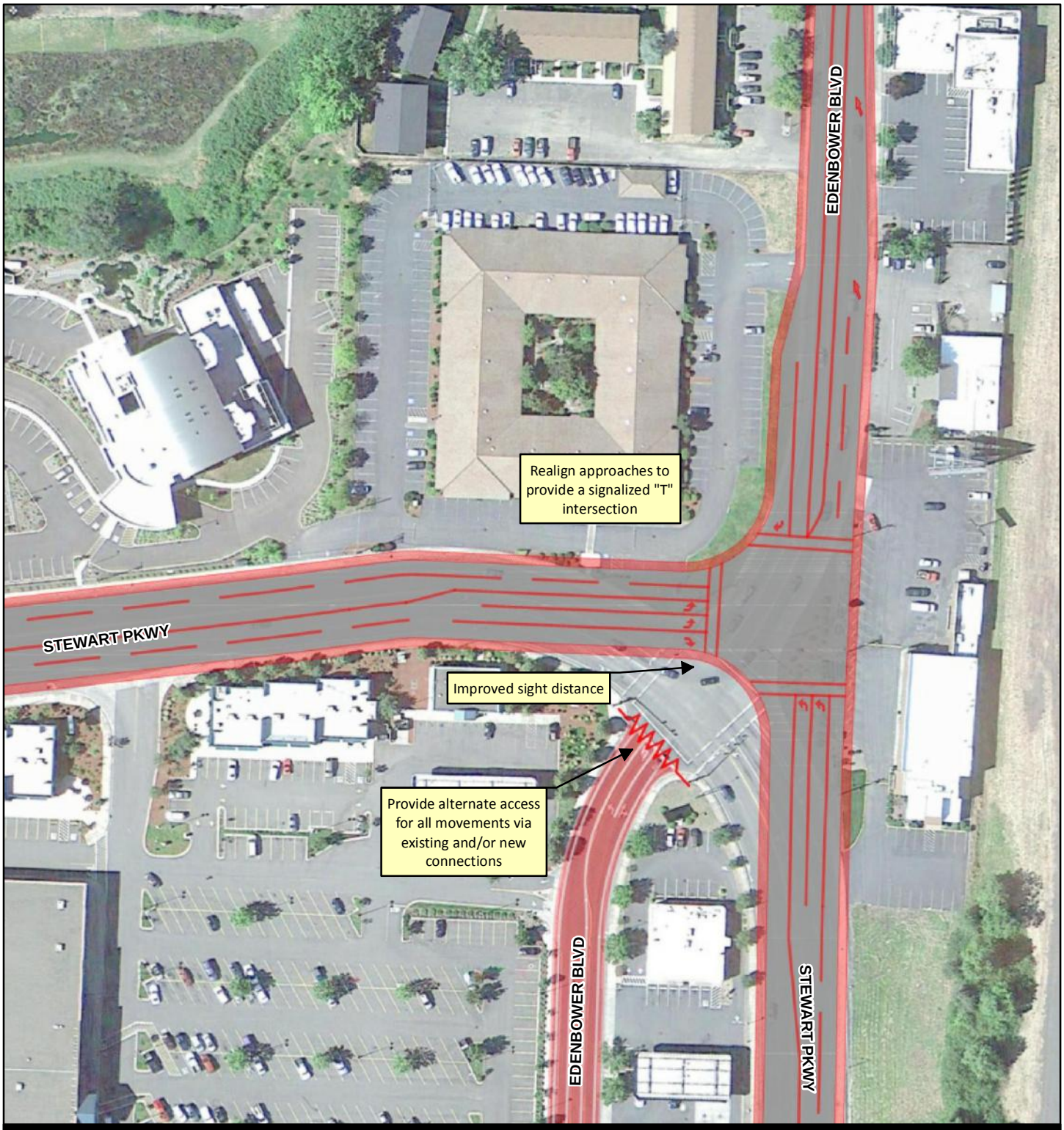


I-5 Exit 127 (North Roseburg) IAMP

Legend

- Proposed Lane Configuration
- Existing Lane Configuration
- Estimated Boundary of Impacts
- Proposed Striping
- Proposed Access Closure

Figure 4-8
Concept 4 - Option A
Realign Intersection to North-South "T"

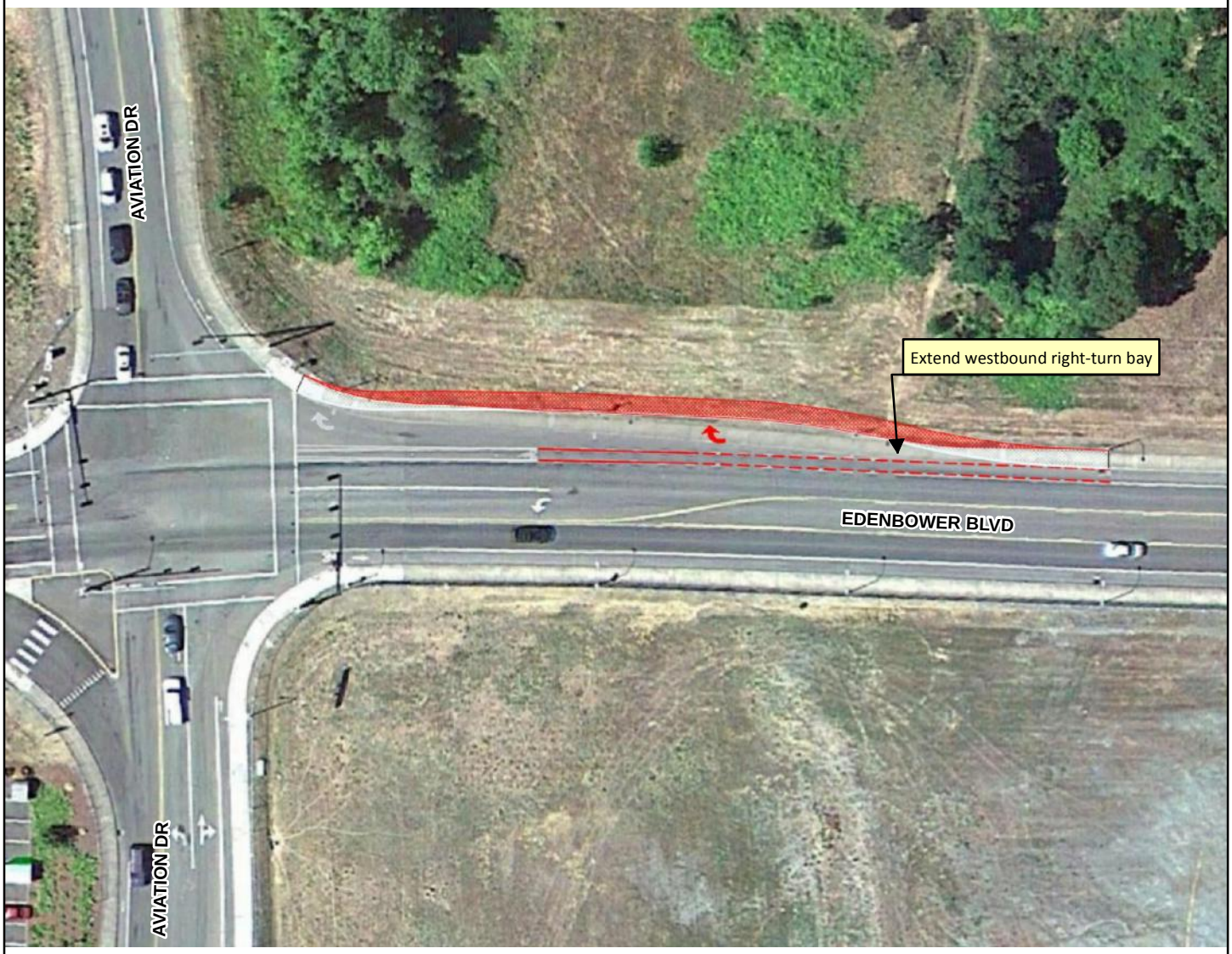


I-5 Exit 127 (North Roseburg) IAMP

Legend

- Proposed Lane Configuration
- Existing Lane Configuration
- Estimated Boundary of Impacts
- Proposed Striping
- Proposed Access Closure

Figure 4-9
Concept 4 - Option B
Realign Intersection to North-South "T"



I-5 Exit 127 (North Roseburg) IAMP

Legend

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

Figure 4-10
Concept 5
Extend Westbound Right-Turn Bay

I-5 Exit 127 (North Roseburg) IAMP

Legend

Proposed Lane Configuration

Proposed Striping

Existing Lane Configuration
Proposed Striping

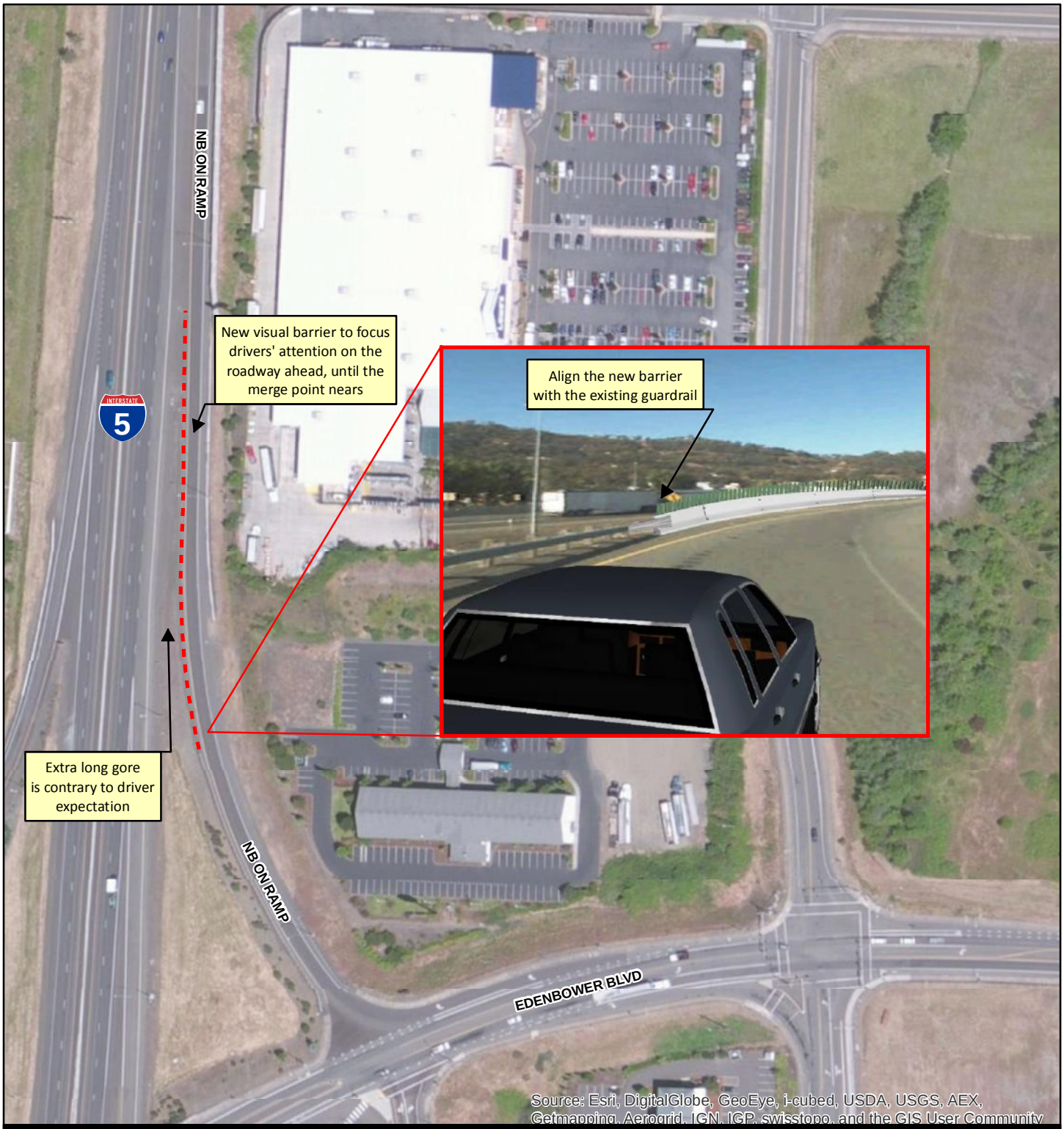
Figure 4-11
Concept 6
Extend Left-Turn Bays

I-5 Exit 127 (North Roseburg) IAMP

Legend

Proposed Gore Striping

Figure 4-12
Concept 7
Delineate Gore Area With Chevron Paint

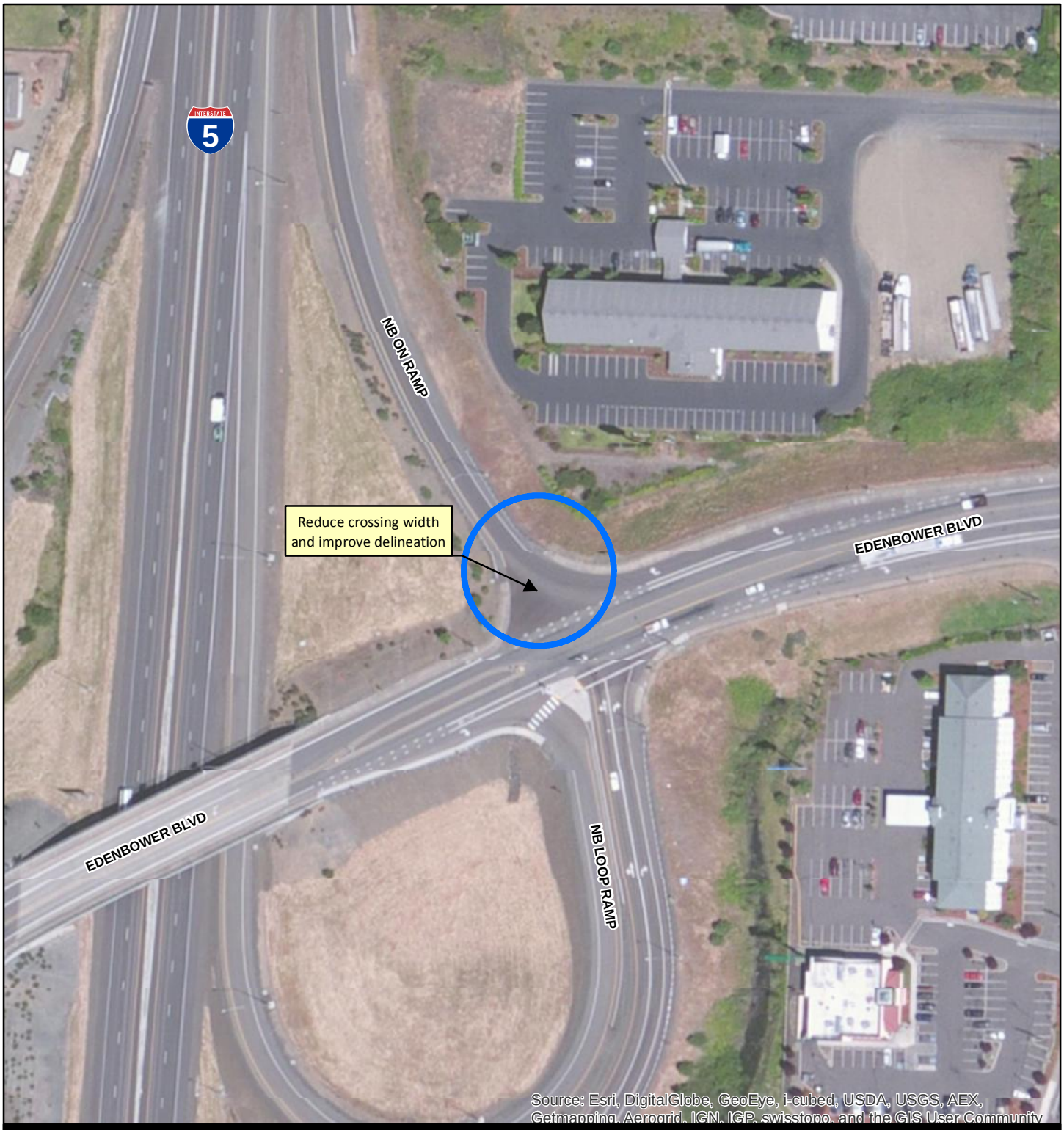


I-5 Exit 127 (North Roseburg) IAMP

Legend

Proposed Visual (concrete) Barrier

Figure 4-13
Concept 8
Install Visual Barrier



I-5 Exit 127 (North Roseburg) IAMP

Legend

Proposed Pedestrian Improvements

Figure 4-14
Concept 9
Improve North Side Pedestrian Crossing

I-5 Exit 127 (North Roseburg) IAMP

Legend

Proposed Pedestrian Improvements

Figure 4-15
Concept 10
Improve Pedestrian Crossings Along Edenbower Blvd

IAMP 127 Improvement Concepts – Summary Evaluation Matrix

ID	Location	General Description	Purpose	Traffic Operations and Safety[1,2,3]	Basic Roadway Geometry and Right of Way[4]	Environmental, Land Use and Socioeconomic[5]	Cost Opinion[6]
Intersection Improvements							
1	Edenbower Blvd at Stewart Pkwy	Increase capacity by adding a second eastbound left-turn lane on Stewart Pkwy Concept 1, Option A (Figure 4-3) ▪ Add second left-turn lane on eastbound Stewart Pkwy ▪ Widen Edenbower Blvd to add second northbound receiving lane ▪ Modify signals for protected left turns Concept 1, Option B (Figure 4-4) ▪ Convert one through lane on eastbound Steward Pkwy to a shared left-through lane ▪ Restripe Edenbower Blvd and widen to provide second northbound receiving lane ▪ Modify signal timing for split phasing on Steward Pkwy Concept 1, Option C (Figure 4-5) ▪ Convert one through lane on eastbound Steward Pkwy to a dedicated left-turn lane ▪ Restripe Edenbower Blvd and widen to provide second northbound receiving lane	Improve operations	Baseline ▪ Current ADT = 24,300 vpd and Forecast ADT = 31,700 vpd ▪ Forecast PM peak eastbound left-turns = 890 vph ▪ Forecast PM peak v/c ratio = 1.02 with LOS E operations with current intersection configuration ▪ 37 crashes during a 5-year study period All Options: ▪ Reduces conflicts between through movements and excessive queuing from left-turn lanes ▪ Access control may be needed for dual left-turn lanes on Stewart Pkwy and northbound lane merge on Edenbower Blvd ▪ None of the options address sight distance concerns on Stewart Pkwy Option A ▪ Forecast v/c ratio = 0.77 with LOS C operations (meets city standards) with dual eastbound left-turn lanes ▪ Protected left turns for all approaches potentially reduces turning movement and angle crashes from left turns ▪ Wider pedestrian crossings on three approaches Option B ▪ Forecast v/c ratio = 0.84 with LOS D operations (meets city standards) with one exclusive eastbound left-turn lane and a shared eastbound left-through lane ▪ Eliminates the dedicated southbound left-turn lane on Edenbower Blvd and creates a shared left/through lane ▪ Wider pedestrian crossing on one approach Option C ▪ Forecast v/c ratio = 0.83 with LOS C operations (meets city standards) with dual eastbound left-turn lanes ▪ Eliminates the dedicated southbound left-turn lane on Edenbower Blvd and creates a shared left/through lane ▪ Through lane converted to left-turn lane creates a "trap" lane ▪ Wider pedestrian crossing on one approach	▪ Preliminary layouts assume AASHTO criteria and ODOT standards ▪ Stewart Pkwy and the north leg of Edenbower Blvd based on 40 mph design speed ▪ South leg of Edenbower Blvd based on 25 mph design speed Option A ▪ Assumes Stewart Pkwy widened on north side for a length of approximately 600 feet to add second eastbound left-turn lane requires ROW acquisition and impacts some parking lots ▪ Assumes Edenbower Blvd widened primarily on east side for a length of approximately 1,000 ft (lane + merge) to add second northbound receiving lane which requires ROW acquisition and impacts parking lots; may require some widening on east side to avoid building impacts ▪ Assumes Stewart Pkwy also widened east of Edenbower Blvd to align the westbound through lanes with the receiving lanes which may require ROW acquisition and cause minor parking impacts Option B ▪ Less ROW acquisition than Option A ▪ No additional ROW required on the west leg of Stewart Pkwy ▪ Additional receiving lane on Edenbower Blvd partially accommodated by reallocating turn lanes on the southbound approach, reducing ROW needs and parking impacts compared to Option A Concept 1, Option C ▪ Same as Option B	▪ No residence or business displacements with any options ▪ Access control plan must consider economic impacts to affected properties Option A ▪ Roadway widening on both Stewart Pkwy and Edenbower Blvd impacts several parking lots ▪ Mercy Dr from Stewart Pkwy is the entrance for Mercy Hospital. Impacts to hospital emergency access must be avoided ▪ Widening Stewart Pkwy northward brings roadway closer to Sweetbrier Creek and its associated wetland and riparian corridor ▪ Widening on Stewart Pkwy east of intersection could extend to Newton Creek and its associated wetland and riparian corridor ▪ If project is within 100-year floodplain for Newton Creek, it may have to demonstrate it will be consistent with applicable FEMA and local floodplain standards ▪ Minimal impacts to disadvantaged populations from three wider pedestrian crossings Option B ▪ Parking impacts present on Edenbower Blvd north of intersection and Stewart Pkwy east of intersection ▪ Potential for environmental impacts is lower because project extents are reduced ▪ Minimal impacts to disadvantaged populations from one wider pedestrian crossing Concept 1, Option C ▪ Same as Option B	▪ Option A: $1.6 million ▪ Option B: $700,000 ▪ Option C: $700,000 ▪ Estimates include widening and sidewalk replacement ▪ Estimates do not include ROW acquisition costs or environmental mitigation
2	Edenbower Blvd at Stewart Pkwy	Install multi-lane roundabout with dual approach lanes on all legs (Figure 4-6)	Improve operations and safety	Baseline ▪ Current ADT = 24,300 and Forecast ADT = 31,700 ▪ Forecast PM peak v/c ratio = 1.02 with LOS E operations with current intersection configuration ▪ 37 crashes during a 5-year study period Concept 2 ▪ Forecast v/c ratio = 0.85 with LOS D operations (meets city standards) with multi-lane roundabout ▪ Roundabouts reduce conflict points and generally have both fewer and less severe crashes ▪ Improves sight distance on Stewart Pkwy ▪ Bicyclists may have trouble traveling with vehicular traffic but can travel as pedestrians through the intersection ▪ Pedestrian crossing width shortened	▪ Preliminary layouts assume AASHTO criteria and ODOT standards ▪ Stewart Pkwy and the north leg of Edenbower Blvd based on 40 mph design speed ▪ South leg of Edenbower Blvd based on 25 mph design speed ▪ All approaches require widening or realignment to accommodate footprint of multi-lane roundabout ▪ ROW acquisition needed in all quadrants surrounding the intersection	▪ Roadway widening on both Stewart Pkwy and Edenbower Blvd impacts several parking lots ▪ Potential environmental impacts are similar to those identified for Concept 1, Option A (Sweetbriar Creek and Newton Creek) ▪ Widening on Edenbower Blvd south of intersection could extend to trail accessing Charles S. Gardiner Park which could result in 4(f) impacts ▪ Minimal effect on disadvantaged populations traveling on foot or by bicycle. ▪ Project should be vetted with Mercy Hospital and emergency response personnel due to the change in traffic operations and potential for intersection closure during construction	▪ $2.6 million ▪ Estimates do not include ROW acquisition costs or environmental mitigation ▪ Assumes full closure of the intersection for construction; staged construction would incur significantly more cost

IAMP 127 Improvement Concepts – Summary Evaluation Matrix

ID	Location	General Description	Purpose	Traffic Operations and Safety[1,2,3]	Basic Roadway Geometry and Right of Way[4]	Environmental, Land Use and Socioeconomic[5]	Cost Opinion[6]
3	Edenbower Blvd/Stewart Pkwy	Realign intersection to better accommodate major vehicular traffic movements and close access to Edenbower Blvd south of intersection (Figure 4-7)	Improve operations and safety	Baseline ▪ Current ADT = 24,300 and Forecast ADT = 31,700 ▪ Forecast PM peak v/c ratio = 1.02 with LOS E operations with current intersection configuration ▪ Major movement in PM peak hour is eastbound left and southbound right ▪ 37 crashes during a 5-year study period Concept 3 ▪ Redirects traffic from south leg of Edenbower Blvd to other access points and driveway on Stewart Pkwy increasing travel distance and inconveniencing drivers ▪ Forecast v/c ratio = 0.83 with LOS C operations (meets city standards) with intersection realignment ▪ Reduces volume of vehicles turning left, decreasing the likelihood of turning/angle crashes ▪ Addresses sight distance issues on Stewart Pkwy ▪ Pedestrians crossings the same or shorter than current crosswalks ▪ Bicycle travel simplified with fewer approaches ▪ Access control may be needed near realigned intersection and along northbound lane merge on Edenbower Blvd	▪ Preliminary layouts assume AASHTO criteria and ODOT standards ▪ Stewart Pkwy and the north leg of Edenbower Blvd based on 40 mph design speed ▪ ROW acquisition needed for intersection realignment and for merge lane on Edenbower Blvd north intersection ▪ Does not include any layouts for local network or access connections to address closure of south leg of Edenbower Blvd	▪ Significant impact to property on northwest corner of intersection ▪ Property and parking impacts present on Edenbower Blvd north of intersection ▪ Closure of south leg of Edenbower Blvd likely to have significant economic impacts to the businesses served by the roadway from limited accessibility and reduction in passby traffic ▪ Could affect Umpqua Transit bus stop on south side of Stewart Pkwy – convenient access should be maintained ▪ Non-auto travel simplified which could provide a minimal socioeconomic benefit ▪ Potential environmental impacts are similar to those identified for Concept 1, Option A (Sweetbriar Creek and Newton Creek) ▪ Access control plan must consider economic impacts to affected properties	▪ $1.9 million ▪ Estimates do not include ROW acquisition costs or environmental mitigation ▪ Excludes costs for any local network or access connections to address closure of Edenbower Blvd ▪ Assumes full closure of the intersection for construction; staged construction would incur significantly more cost
4	Edenbower Blvd at Stewart Pkwy	Realign intersection to form a perpendicular "T" intersection and close access to Edenbower Blvd south of intersection Concept 4, Option A (Figure 4-8) ▪ Install a single left-turn lane on the west leg, and dual left-turn lanes on the south leg. Concept 4, Option B (Figure 4-9) ▪ Install dual left-turn lanes on the west and south legs of the intersection.	Improve operations and safety	Baseline ▪ Current ADT = 24,300 and Forecast ADT = 31,700 ▪ Forecast PM peak v/c ratio = 1.02 with LOS E operations with current intersection configuration ▪ Major movement in PM peak hour is eastbound left and southbound right ▪ 37 crashes during a 5-year study period All Options ▪ Redirects traffic from south leg of Edenbower Blvd to other access points and driveway on Stewart Pkwy increasing travel distance and inconveniencing drivers ▪ Improves sight distance by straightening approaches and eliminating intersection skew ▪ Pedestrians crossings the same or shorter than current crosswalks ▪ Bicycle travel simplified with few approaches Option A ▪ Forecast v/c ratio = 0.90 with LOS D operations (does not meet city standard) ▪ Eliminates need for dual left-turn lanes on eastbound Stewart Pkwy and additional receiving lanes on northbound Edenbower Blvd ▪ Access control may be needed near realigned intersection Option B ▪ Forecast v/c ratio = 0.60 with LOS B operations (meets city standard) ▪ Provides dual left-turn lanes on eastbound Stewart Pkwy ▪ Access control may be needed near realigned intersection and along northbound lane merge on Edenbower Blvd	▪ Preliminary layouts assume AASHTO criteria and ODOT standards ▪ Stewart Pkwy and the north leg of Edenbower Blvd based on 40 mph design speed ▪ Preliminary concept does not include any layouts for local network or access connections to address closure of south leg of Edenbower Blvd Option A ▪ Minimal additional ROW acquisition aside from impacts due to realignment, mostly focused in northwest quadrant ▪ Does not require any roadway widening beyond area affected by realignment Option B ▪ Additional ROW acquisition needed compared to Option A for widening of Edenbower Blvd north of the intersection	▪ Closure of south leg of Edenbower Blvd likely to have significant economic impacts to the businesses served by the roadway from limited accessibility and reduction in passby traffic ▪ Could affect Umpqua Transit bus stop on south side of Stewart Pkwy – convenient access should be maintained ▪ Non-auto travel simplified which could provide a minimal socioeconomic benefit ▪ Potential environmental impacts are similar to those identified for Concept 1, Option A (Sweetbriar Creek and Newton Creek) ▪ Access control plan must consider economic impacts to affected properties Option A ▪ Some property and parking impacts on northwest corner of intersection Option B ▪ Same impacts as Option A for northwest corner ▪ Property and parking impacts on Edenbower Blvd north of intersection for merge lane	▪ Option A: $1.6 million ▪ Option B: $1.9 million ▪ Estimates do not include ROW acquisition costs or environmental mitigation ▪ Excludes costs for any local network or access connections to address closure of Edenbower Blvd ▪ Assumes full closure of the intersection for construction; staged construction would incur significantly more cost

IAMP 127 Improvement Concepts – Summary Evaluation Matrix

ID	Location	General Description	Purpose	Traffic Operations and Safety[1,2,3]	Basic Roadway Geometry and Right of Way[4]	Environmental, Land Use and Socioeconomic[5]	Cost Opinion[6]
5	Edenbower Blvd at Aviation Dr	Extend westbound right-turn bay (Figure 4-10)	Address queuing concerns	Baseline ▪ Current ADT = 16,700 and Forecast ADT = 19,800 ▪ 10 crashes during a 5-year study period (mostly rear end) Concept 5 ▪ Extending the 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 ▪ Less queuing reduces likelihood of queues extending to railroad tracks	▪ Widening Edenbower Blvd to extend westbound right-turn lane requires additional ROW on north side of roadway ▪ Lighting and sidewalks need to be relocated	▪ Mapped wetlands identified in close proximity to the project although any roadside wetland area likely highly degraded ▪ Improvement not anticipated to extend into undisturbed area ▪ No socioeconomic effects are anticipated	▪ $75,000 ▪ Estimate does not include ROW acquisition costs or environmental mitigation
6	Edenbower Blvd at Stephens St (OR 99)	Extend striped eastbound left-turn bay and northbound left-turn bay (Figure 4-11)	Address queuing concerns	Baseline ▪ Current ADT = 19,850 and Forecast ADT = 22,800 ▪ 12 crashes during a 5-year study period (mostly rear end and turning) Concept 6 ▪ Reduces conflicts between through movements and excessive queuing from left-turn lanes which improves safety ▪ May reduce delay for other travel movements ▪ May trigger the need for changes in signal timing related to railroad activity	▪ Project completed within the existing paved roadway	▪ No impacts	▪ $15,000
Interchange Ramp Improvements							
7	Westbound to Northbound On-Ramp	Provide additional delineation in gore area with chevron striping (Figure 4-12)	Address driver expectation concerns	Baseline ▪ Current ADT = 1,150 vpd and Forecast ADT = 1,950 vpd ▪ 8 crashes during a 5-year study period Concept 7 ▪ Provides visual cue to drivers of the appropriate time to merge ▪ No impact on capacity	▪ Project completed within the existing paved roadway ▪ Assumes 8" striping	▪ No impacts	▪ $20,000
8	Westbound to Northbound On-Ramp	Install a visual barrier on the westbound to northbound on-ramp (Figure 4-13)	Address driver expectation concerns	Baseline ▪ Current ADT = 1,150 vpd and Forecast ADT = 1,950 vpd ▪ 8 crashes during a 5-year study period Concept 7 ▪ 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	▪ Project completed within the existing paved roadway ▪ Assumed concrete barrier with glare shields	▪ No impacts	▪ $100,000
Multimodal Improvements							
9	Northbound Ramp Terminal	Improve east-west pedestrian crossing across northbound on-ramp by adding a raised island or extending existing curb and sidewalk (Figure 4-14)	Improve safety and continuity of pedestrian facilities	Baseline ▪ Current ADT = 16,500 vpd and Forecast ADT = 19,700 vpd ▪ 13 crashes during a 5-year study period (majority of crashes occurred before or during reconstruction of northbound loop-ramp) Concept 9 ▪ Shortens distance pedestrian has to cross intersection with raised island or curb and sidewalk extension ▪ Could include striped crosswalk to further increase driver awareness of pedestrian activity ▪ Reduces pedestrian exposure with vehicular traffic ▪ No reduction in vehicular capacity ▪ Vehicle carrying capacity similar to other on-ramps at interchange	▪ Construction of raised island or curb extension needs to meet geometric requirements for westbound right turn and northbound through movement from off-ramp ▪ Improvements within existing paved roadway	▪ No environmental or land use impacts ▪ Benefits transportation disadvantaged with improved safety for pedestrians	▪ 20,000

IAMP 127 Improvement Concepts – Summary Evaluation Matrix

ID	Location	General Description	Purpose	Traffic Operations and Safety[1,2,3]	Basic Roadway Geometry and Right of Way[4]	Environmental, Land Use and Socioeconomic[5]	Cost Opinion[6]
10	Edenbower Blvd from Broad St to Stewart Pkwy	Enhance pedestrian crossings by installing striped crosswalks and directional ADA compliant curb ramps for north-south travel along west side of Edenbower Blvd (Figure 4-15)	Improve safety and continuity of pedestrian facilities	Baseline ▪ Current ADT = 14,800 and Forecast ADT = 18,650 ▪ 5 crashes during 5 year study period Concept 10 ▪ Enhanced curb ramps improve directional guidance ▪ Striped crosswalks help identify the presence of pedestrian activity and increase visibility to motorists turning onto side streets ▪ Clearly defined and frequent crosswalks may encourage slower travel speeds along Edenbower Blvd ▪ No impact on vehicular capacity	▪ Improvements within the available ROW	▪ No environmental or land use impacts ▪ Benefits transportation disadvantaged with improved safety for pedestrians	▪ $25,000

Acronyms: vpd= vehicles per day; vph = vehicles per hour; mph = miles per hour; v/c ratio = volume-to-capacity ratio; LOS = level of service

Notes:

1. Traffic operations were evaluated for concepts that were identified to address operational deficiencies. The operational assessment focuses on the volume-to-capacity (v/c) ratio for the 2012 existing and 2035 future condition.
2. At intersections where potential changes in traffic control or turn lanes were considered, the procedures in the ODOT Analysis Procedures Manual (APM) were followed.
3. Some improvements are may address safety as well as traffic operations deficiencies. Crash patterns from the five-year analysis period (2006 through 2010) are discussed for those improvements that influence safety.
4. Illustrations were developed for concepts that involve infrastructure improvements.
5. Impacts to resources were qualitatively assessed based on the data assembled for the environmental and land use reconnaissance. The level of analysis of the study area is designed to identify those areas judged to have considerable potential for conflict.
6. Rough order of magnitude cost opinions were developed using present day dollars and are consistent with standard estimating methods. The estimates include a contingency factor but do not include right-of-way costs. The cost opinions are intended to help differentiate alternatives by approximating the relative costs of each project.

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

Technical Memorandum #5
Preferred Alternative

Prepared for

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5. PREFERRED ALTERNATIVE

This technical memorandum summarizes the recommendations for the improvements that constitute the preferred alternative for the I-5 Exit 127 IAMP. These recommendations are based on feedback from the Technical and Citizen Advisory Committees, comments received at the Public Open House, and input from ODOT, City, and County staff.

5.1. Alternatives Considered

The alternatives analysis presented in Technical Memorandum #4 focused on three areas for consideration within the interchange study area:

- Intersection Improvements
- Interchange Ramp Improvements
- Multimodal Improvements

During and following the review of the alternatives analysis, several other ideas were identified for consideration. These have been assessed and recommendations are presented in a new category of improvements: *Additional Improvements*. A table at the end of the memorandum summarizes the recommendations for all of the concepts considered.

The figures illustrating the alternatives previously discussed in Technical Memorandum #4 have not been repeated in this memorandum; however, new figures illustrating additional improvements are attached.

5.2. Intersection Improvements

Six potential intersection improvements were identified during the conceptual development to bring the operations up to standards, provide additional capacity, or address safety concerns. Some of these projects are standalone concepts while others may ultimately be combined into an overall intersection concept.

5.2.1. Concept 1 – Edenbower Boulevard/Stewart Parkway: Add Second Eastbound Left-Turn Lane

Concept 1 considers adding capacity to the Edenbower Boulevard/Stewart Parkway intersection. This concept would install dual left-turn lanes on the eastbound approach of Stewart Parkway, add a second northbound receiving lane on Edenbower Boulevard, and modify signal timing to accommodate the new lane configurations. The purpose of the improvement is to address safety concerns associated with queuing and improve operations to meet the City's dual v/c and LOS standard. Over time, significant congestion at this intersection would potentially impact operations at the interchange ramps.

Three options for creating a second left-turn lane on Stewart Parkway were developed for this concept. All three options include adding the second northbound receiving lane on Edenbower

Boulevard north of Stewart Parkway, but the lane configurations differ between options. The Concept 1 improvement options include:

- **Option A**: Add a second left-turn lane on the eastbound approach of Stewart Parkway by widening the roadway to the north. Widen Edenbower Boulevard to include two northbound receiving lanes which merge back to a single lane. Modify the traffic signal to provide protected left-turn phasing on all approaches.
- **Option 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. Widen Edenbower Boulevard to include two northbound receiving lanes but try to minimize widening impacts by reducing the number of southbound approach lanes from three (left, through, and right) to two (left-through and right) lanes. Traffic signal changes include split phasing (one approach is stopped while the opposing approach proceeds) on Stewart Parkway.
- **Option C**: Add a second left-turn lane on the eastbound approach by converting the existing center through lane to a dedicated left-turn lane. Widen Edenbower Boulevard to include two northbound receiving lanes but try to minimize widening impacts by reducing the number of southbound approach lanes from three (left, through, and right) to two (left-through and right) lanes.

Discussion

Of the three options under consideration, Option A would provide the most operational benefits during the PM peak hour with 2035 forecast volumes.

Option B would provide a slightly smaller reduction in delay and queuing during peak periods, compared to Option A, but would result in fewer impacts to adjacent lands. This option is expected to meet operational standards. Split phasing[1] on Stewart Parkway would be required to accommodate the new shared eastbound left-through lane configuration. This type of phasing has more limited flexibility to adapt to shifts in traffic patterns over time, or future growth at the intersection.

Option C provides similar operations to Option B. However, it creates a “trap” lane when the inner eastbound through lane becomes a dedicated left-turn lane; trap lanes are not considered desirable as they have the potential to challenge driver expectation.

Recommendation

Concept 1, Option A is recommended as an element of the I-5 Exit 127 IAMP. The project 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. The widening of Stewart Parkway to add a dedicated second eastbound left-turn lane is

[1] Split phasing is a method of signal timing that sequences traffic flow so that opposing approaches proceed consecutively rather than concurrently.

recommended as a medium priority project. Triggers for the improvements will be based on operational need and safety.

5.2.2. Concept 2 – Edenbower Boulevard/Stewart Parkway: Install Multi-Lane Roundabout

Concept 2 would improve the Edenbower Boulevard/Stewart Parkway intersection by adding additional capacity by replacing the currently signalized intersection with a two-lane roundabout.

Discussion

Concept 2 would accommodate anticipated vehicular demand, reduce delay and queuing during peak periods, and meet agency standards with a 2035 forecast v/c ratio of 0.85 and LOS D operations. A roundabout would have potential to improve safety for vehicular traffic by reducing conflict points, although it would require additional considerations for pedestrian and bicycle travel. The right-of-way impacts would be significant as all approaches would need to be widened or realigned to accommodate the footprint of the roundabout.

Recommendation

Concept 2 is not recommended for the I-5 Exit 127 IAMP. Although it would address safety and operational deficiencies, it would do so at a substantially higher cost and require the most right-of-way compared to other concepts.

5.2.3. Concept 3 – Edenbower Boulevard/Stewart Parkway: Realign Intersection for Major Traffic Flow and Close South Approach

Concept 3 would eliminate the connection to Edenbower Boulevard south of Stewart Parkway and realign the intersection to better accommodate the major vehicular movements. The north (Edenbower Boulevard) and west (Stewart Parkway) legs of the intersection would be realigned to create a west-north - major street and the current east leg (Stewart Parkway) would “T” into the new Edenbower Boulevard mainline as the south leg.

Discussion

The proposed closure of the south leg (Edenbower Boulevard) would redirect approximately 20 percent of the total peak volume entering the intersection (approximately 24,300 total entering vehicles [TEV] in 2012 and 31,700 TEV in 2035) to other access points and driveways on Stewart Parkway.

Concept 3 would provide a reduction in intersection delay and queuing (at Edenbower Boulevard/Stewart Parkway) during peak periods and meet the dual mobility standard with a v/c ratio of 0.83 and LOS C operations. However, the 20 percent of redirected vehicles would experience out-of-direction travel, increase delay at alternate access points, and have potential economic impacts for adjacent businesses.

Recommendation

Concept 3 is not recommended as an element of the I-5 Exit 127 IAMP. The concept would improve operations at the intersection, but the closure of the south leg is not supported due to anticipated traffic and economic impacts.

5.2.4. Concept 4 – Edenbower Boulevard/Stewart Parkway: Create "T" Intersection and Close South Approach

Similar to Concept 3, Concept 4 would realign the Edenbower Boulevard/Stewart Parkway intersection by eliminating access to Edenbower Boulevard south of Stewart Parkway. The north (Edenbower Boulevard) and east (Stewart Parkway) legs of the intersection would be realigned to create a north-south major street. The current west leg (Stewart Parkway) would "T" into the new Edenbower Boulevard mainline roadway.

Two options for the realigned intersection were developed for this concept:

- **Option A**: Realign the west leg of the intersection to "T" into a newly aligned north-south Edenbower connecting the existing north and east legs. Stripe one left-turn lane and one right-turn lane on the eastbound Stewart Parkway approach, dual left turn lanes and one through lane on the northbound Stewart Parkway approach, and one right-turn lane and one through lane on the southbound Edenbower Boulevard approach.
- **Option B**: Travel lanes on the approaches for Option B would be the same as those described for Option A except that eastbound Stewart Parkway would have two left-turn lanes rather than a single left-turn lane.

Discussion

Option A would realign the intersection with less skew than the existing configuration and addresses sight distance concerns caused by the existing horizontal curvature and obstructions associated with the existing configuration. This realignment and lane configuration changes would provide an improvement over baseline operations during peak periods but would exceed the v/c ratio mobility standard (0.85) with a v/c ratio of 0.90 for the projected 2035 volumes. The option would meet LOS mobility standards with a LOS D.

Option B would realign the intersection similarly to Option A, but provides dual left-turn lanes on the eastbound approach. Sight distance issues at intersection approaches are addressed by the realignment, and peak period operations are expected to dramatically improve. The intersection would meet the dual mobility standards with a v/c ratio of 0.60 and LOS B operations.

Similar to Concept 3, both Option A and Option B would require closing the south leg (Edenbower Boulevard), and would redirect approximately 20 percent of the total peak volume entering the intersection to other access points and driveways on Stewart Parkway. Redirected vehicles would experience out-of-direction travel, increase delay at alternate access points, and have potential economic impacts for adjacent businesses.

Recommendation

Neither Option A nor Option B of Concept 4 is recommended as an element of the I-5 Exit 127 IAMP. The concept would improve operations at the intersection, but the closure of the south leg is not supported due to anticipated traffic and economic impacts.

5.2.5. Concept 5 – Edenbower Boulevard/Aviation Drive: Extend Westbound Right-Turn Bay

Concept 5 would enhance safety and improve operations for both turning and through vehicles by extending the current westbound right-turn bay to allow vehicles to decelerate safely in a lane separated from higher-speed through traffic.

Discussion

The improvement would likely require additional ROW, and would modify the northeast corner of the intersection to extend the existing westbound right-turn bay an appropriate length (from 100 to 175 feet) to allow queuing vehicles to avoid blocking the westbound through traffic. Extension of the turn lane would require cutting into and stabilizing the hillside next to Edenbower Boulevard which will increase the cost of this improvement.

Recommendation

Concept 5 is recommended for the I-5 Exit 127 IAMP as a low priority project. Queuing should be monitored over time and the turn lane extension would be triggered when queues consistently spill out of the existing turn lane into the adjacent through lane.

5.2.6. Concept 6 – Edenbower Boulevard/Stephens Street: Extend Left-Turn Bays

Concept 6 restripes the center two-way, left-turn lanes to delineate longer left-turn storage bays on the eastbound and northbound approaches of the intersection of Edenbower Boulevard and Stephens Street.

Discussion

The proposed improvement extends the delineated storage for the northbound and eastbound left-turn lanes by restriping the two-way, left-turn lanes. Additional storage would prevent left-turn queues from interfering with the flow of through traffic by reducing the likelihood of spillover from left-turn lanes. Additional storage can benefit intersection operations by reducing delay for through movements caused by left-turning vehicles stopped in the through travel lane. It can also reduce delays for the left-turn movements by improving accessibility to the turn lane.

This restriping can be accommodated within the existing ROW because of the existing center two-way left-turn lanes on both Edenbower Boulevard and Stephens Street.

Recommendation

Concept 6 is recommended as at transportation system management (TSM) improvement for the I-5 Exit 127 IAMP as a medium priority project. Queuing should be monitored over time and striping changes would be triggered when queues consistently extend beyond the existing striped turn lane.

5.3. Interchange Ramp Improvements

Two potential improvements were identified to address driver expectation concerns on the interchange ramps.

5.3.1. Concept 7 – Westbound to Northbound On-Ramp: Gore Area Delineation

Concept 7 would install additional delineation between the I-5 northbound mainline and westbound to northbound on ramp to improve safety. The gore area would be painted with a chevron pattern to provide a visual cue to drivers to let them know when they should prepare to merge with freeway traffic.

Discussion

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. Since the length of the ramp cannot be shortened, more distinctive pavement markings in the gore may provide a better visual cue for drivers to keep them from prematurely looking back toward the freeway traffic instead of focusing on the roadway and vehicles in front of them.

The enhanced gore delineation would have no impact on vehicular capacity, as all striping would occur within the existing gore. However, visual delineation would incur additional maintenance costs.

Recommendation

Since the crash history does not identify any noteworthy patterns, Concept 7 is not recommended as an element of the I-5 Exit 127 IAMP. However, crash rates on the ramp should continue to be monitored for safety.

5.3.2. Concept 8 – Westbound to Northbound On-Ramp: Visual Barrier

Concept 8 would install a visual barrier on the west side of the on ramp in the form of a concrete barrier with glare shields to prohibit drivers from prematurely looking at the mainline traffic to prepare to merge.

Discussion

This concept has the same type of safety benefits as Concept 7. The installation of a concrete barrier could be designed to have no impact on vehicular capacity, since a guardrail on the west side currently defines the unobstructed roadway width of the ramp. However, installing a barrier would incur additional maintenance costs.

Recommendation

Since the crash history does not identify any noteworthy patterns, Concept 8 is not recommended as an element of the I-5 Exit 127 IAMP. However, crash rates on the ramp should continue to be monitored for safety

5.4. Multi-Modal Improvements

Two potential multi-modal improvements were identified during the concept development process to improve the safety and continuity of pedestrian facilities in the study area.

5.4.1. Concept 9 – Northbound Ramp Terminal: Improve North Side Pedestrian Crossing

Concept 9 would shorten the pedestrian crossing distance for the westbound to northbound on-ramp and create a crossing that is more consistent with the crossings at the other ramp connections with Edenbower Boulevard.

Discussion

Two options were described for this concept: one would extend the curb and sidewalk on the northwest corner of the intersection while the other could construct an island channelizing the right turns from Edenbower Boulevard. The extension of the northwest corner appears to be the more feasible layout with the current roadway width. The shorter crossing distance would reduce pedestrian exposure at the conflict point with vehicular traffic. Striping crosswalks could further increase driver awareness of potential pedestrian activity, but striped crosswalks are not required with the improvement.

Construction of a curb extension would need to account for the turning requirements onto the freeway for the westbound right-turning traffic as well as the through movement from the northbound off-ramp. Improvements included in this concept would occur within the available right of way (ROW).

Recommendation

Concept 9 is recommended as an element of the I-5 Exit 127 IAMP. The preferred improvement is the extension of the northwest corner rather than the channelizing island. The project addresses an existing deficiency and should be considered as a high to medium priority.

5.4.2. Concept 10 – Edenbower Boulevard from Broad Street to Stewart Parkway: Enhance Pedestrian Crossings

Concept 10 would add striped crosswalks at Broad Street, Sweetbrier Avenue, Plateau Drive (north), and Plateau Drive (South) for north-south pedestrian travel along the west side of Edenbower Boulevard. Also, curb ramps would be enhanced at these locations to provide improved directional guidance where appropriate.

Discussion

Striped crosswalks would help identify the presence of pedestrian activity and increase visibility to motorists turning onto the side streets. Clearly defined and frequent crosswalks may encourage slower travel speeds along Edenbower Boulevard.

The striping of the crosswalks themselves would have no impact on vehicular capacity since motorists are supposed to yield to pedestrians crossing the roadway even at intersection locations where a crosswalk is not striped.

Recommendation

Concept 10 is not recommended as an element of the I-5 Exit 127 IAMP due to cost. If new construction impacts any of the existing crossings, then an improvement would be warranted.

5.5. Additional Improvements

During and following the evaluation of the alternatives analysis, several other ideas were identified for consideration. These ideas are discussed below with recommendations for those improvements that would be included in the preferred alternative for the I-5 Exit 127 IAMP. Many of the suggested improvements should only be implemented if a specific trigger (i.e., queuing, crash frequency, increased delay) is met.

5.5.1. Concept A-1 – Signalize Northbound Ramp Terminal

Concept A-1 considers signalizing the I-5 Northbound Ramp Terminal at Edenbower Boulevard if operations or crashes become a concern. The purpose of this improvement is to address traffic operations and safety.

Discussion

Without a traffic signal, side street traffic must pull out into the traffic on Edenbower Boulevard when adequate gaps in the traffic stream are available. Making right turns is relatively easy but making left turns can be difficult, particularly during the peak commuting periods . Conditions for making left turns will only get worse as traffic volumes on the expressway continue to increase.

There were 13 crashes reported at the northbound ramp terminal. The crash rate was 0.43 crashes/million entering vehicles (mev), which was equal to the critical crash rate for this intersection. There were two minor-injury crashes reported at this location, and no serious/fatal injuries. There is not a pronounced trend observed in crash types. Ten of the crashes at this intersection occurred in the years prior to or during the construction of the eastbound to southbound loop ramp.

Preliminary signal warrants, based on traffic volumes, are not met under existing conditions (year 2012) or within five years. If unexpected land use changes direct more traffic to this location, or the frequency of turning or angle collisions increase, a signal may be warranted.

The addition of a traffic signal would reduce delays and queues for some movements, particularly for left turns from the northbound off-ramp. However, through traffic on Edenbower Boulevard would experience increased delay throughout the day.

The addition of a traffic signal would likely reduce the frequency and severity of the turning and angle collisions by stopping the through traffic on Edenbower Boulevard to allow vehicles to turn from the northbound off-ramp. However, a signal installation typically increases the potential for rear-end collisions due to a high frequency of stopping vehicles, but rear end collisions are typically much less severe than high speed turning and angle collisions.

Recommendation

Concept A-1 is recommended as an element of the I-5 Exist 127 IAMP as a low priority project. This project would only be implemented if an increased pattern of turning and angle collisions develops or traffic volumes increase beyond what is currently projected and triggers a vehicular warrant.

5.5.2. Concept A-2 – Signal Coordination on Edenbower Boulevard

Concept A-2 considers signal coordination on Edenbower Boulevard from Stephens Street through the southbound ramp terminal. The purpose of this improvement would be to manage delays and queuing in the corridor to reduce future operational or safety concerns.

Discussion

Although queuing between intersections does not currently interfere with operations, as traffic volumes grow or patterns shift over time, queuing may become a concern. One of the ways to manage the queuing between intersections would be to coordinate the traffic signals to benefit certain travel patterns. This can be done by manually creating signal timing plans with consistent cycle lengths and coordinated off-sets. Although ultimately, an interconnected signal system may be desirable. The adverse impact of signal coordination could be increased delay for some of the minor traffic movements as heavy traffic flows are favored.

Recommendation

Concept A-2 is recommended as a high to medium priority TSM measure for the I-5 Exit 127 IAMP. Queues should be monitored along Edenbower Boulevard between Stephens Street and the I-5 southbound ramp terminal. Signal coordination can be implemented through adjustments to existing signal plans without investment in an interconnected system. Signal interconnect may be necessary as a long-term (low priority) project.

5.5.3. Concept A-3 – Speed Reduction on Edenbower Boulevard

Concept A-3 considers reducing the posted speed on Edenbower Boulevard between Stewart Parkway and the Southbound Ramp Terminal if crashes become a concern. The purpose of this improvement is to address geometric concerns and safety.

Discussion

The curve of Edenbower Boulevard between Broad Street and the I-5 Southbound Ramp Terminal is identified in the I-5 State of the Interstate Report as sharp for the posted speed of 40 miles per hour (mph). There is no pattern of crashes associated with the roadway curvature in the most recent five years of crash data.

However, with increased traffic volumes in the corridor and potential changes in lane configurations on Edenbower Boulevard near Stewart Parkway, a speed study may be conducted to determine if a speed reduction in the corridor is appropriate.

Recommendation

Concept A-3 is not recommended as an element of the I-5 Exist 127 IAMP but speeds should be reassessed after implementation of Concept 1. Recommendations for a reduction in posted speed could result at that time. Otherwise, a speed study and possible reduction in posted speed should be considered any time it appears that drivers are changing their behavior or travel speeds on this section of roadway, or if a crash pattern associated with roadway curvature develops. The City would be responsible for initiating the speedy study.

5.5.4. Concept A-4 – Edenbower Boulevard/Stewart Parkway: Sight Distance

Concept A-4 considers improvements to mitigate the existing sight distance limitations that restrict visibility for drivers traveling through the intersection on the eastbound (Stewart Parkway) and northbound (Edenbower Boulevard) approaches. The purpose of this improvement is to improve safety.

Discussion

Obstructions in the southwest quadrant limit the sight distance for drivers traveling through the intersection on the eastbound (Stewart Parkway) and northbound (Edenbower Boulevard) approaches. Vehicles heading eastbound on Stewart Parkway cannot see the main overhead traffic signal until they are between 100 and 150 feet from the intersection. Although a secondary/supplemental pole mounted signal for the eastbound traffic has been installed to address this concern, unfamiliar drivers may not identify it or understand its purpose. Vehicles heading northbound on Edenbower Boulevard and taking a right-turn-on-red only have 125 to 150 feet of unobstructed sight distance, when looking west for conflicting eastbound through traffic.

This intersection has the highest crash rate (0.83 crashes/mev) and number of reported collisions (37) within the study area in the five-year analysis period, but crash data does not identify a trend of crashes related to the identified sight distance limitations.

Increasing the intersection sight distance at this location would require a change in the geometric configuration or removing roadside obstructions (trees, shrubs, etc.). As an alternative to, or in concert with increasing sight distance, including a “no right turn on red” limitation for northbound traffic may serve as an appropriate mitigation.

Recommendation

Concept A-4 is recommended as an element of the I-5 Exist 127 IAMP with medium priority because the improvement may respond to safety concerns. Sight distance improvements should be considered with Concept 1 improvements, but may also be triggered if a crash pattern associated with limited sight distance develops.

5.6. Summary of Recommendations

The following table summarizes each of the concepts and the recommendations for implementation.

Table 5-1. 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** *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*
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	Not recommended as project but ramp safety should be monitored
Concept 8 – Westbound to Northbound On-Ramp: Visual Barrier	Not recommended as project but ramp safety should be monitored
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
ADDITIONAL CONSIDERATION CONCEPTS	
Concept A-1 – Signalize Northbound Ramp Terminal	**Low Priority**
Concept A-2 – Signal Coordination on Edenbower Boulevard	**High To Medium Priority**

Table 5-1. Summary of IAMP 127 Concepts

Concept	Recommendation
Concept A-3 – Speed Reduction on Edenbower Boulevard	Not recommended as project but speeds should be reassessed after implementation of Concept 1
Concept A-4 – Edenbower Boulevard/Stewart Parkway: Sight Distance	**Medium Priority**

5.7. Operations with Recommended Improvements

Traffic operations with the combined recommendations have been evaluated based on 2035 conditions from the 2035 LU 1.2 travel demand model. Table 5-2 summarizes operations for all intersections. All study area intersections would meet mobility standards with the 2035 forecasts.

Table 5-2: Operations with Recommended Improvements

Intersection	Critical Movement[1]	V/C Ratio[2]	LOS[2]	Mobility Standard[3]
Edenbower Blvd. at Stewart Pkwy. (Signalized)	Overall	V/C = 0.82[4]	LOS = C	LOS D V/C <= 0.85
Edenbower Blvd. at Broad St.	EB L/R	V/C = 0.26	LOS = C	LOS D V/C <= 0.85
Edenbower Blvd. at SB Ramp Terminal (Signalized)	Overall	V/C = 0.69	LOS = B	LOS D V/C <= 0.85
Edenbower Blvd. at NB Ramp Terminal	NB R	V/C = 0.48	LOS = D	LOS D V/C <= 0.85
Edenbower Blvd. at Aviation Dr. (Signalized)	Overall	V/C = 0.61	LOS = B	LOS D V/C <= 0.85
Edenbower Blvd. at Stephens St. (Signalized)	Overall	V/C = 0.71	LOS = C	LOS D V/C <= 0.85

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, while the Douglas County TSP identifies standards for County facilities.
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 the near left-turn lane and merge into the northbound traffic flow on Edenbower Boulevard.

Source: Synchro HCM Intersection Analysis Report

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

Technical Memorandum #6
Access Management Plan

Prepared for

Oregon Department of Transportation, Region 3
3500 NW Stewart Parkway
Roseburg, Oregon 97470

Prepared by

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Portland, Oregon

December 2014

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6. ACCESS MANAGEMENT PLAN

Access management is an essential tool for protecting the function of an interchange and is included in this Interchange Area Management Plan (IAMP) process. Within the Interchange Management Study Area (IMSA), access management addresses access points that may influence travel to and from the interchange. The goal of access management is to maintain capacity for traffic flow 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. The 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.

Although access management identifies the potential need for some access restrictions for properties along Edenbower Boulevard and Stewart Parkway, access management actions in this plan do not prevent the properties from being used and developed in a manner consistent with their adopted comprehensive planning designations. Access management instead will help to ensure that property owners continue to be able to utilize site advantages of the properties by improving traffic circulation 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.

6.1. Access Standards

Both ODOT and the City of Roseburg have access management standards that apply to the IMSA. The access management standards applicable to this project are summarized in Table 6-1. These standards are based on the OHP and the City of Roseburg Land Use and Development Ordinance.

Currently, the existing public street network does not meet the interchange standards and this IAMP does not include projects that will relocate any roadways. However, opportunities to reduce access frequency and/or conflicts on Edenbower Boulevard should be pursued by the City of Roseburg whenever a public infrastructure or private development project is constructed. ODOT will not permit any new access points on Edenbower Boulevard between Broad Street and Aviation Drive.

Table 6-1. Access Spacing Standards

Segment Characteristic	Access Spacing Standard
ODOT – Interchange Ramp Terminals - Fully Developed Urban[1]	
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)	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 17 in the revised OHP-Effective January 1, 2012 Amended May 3, 2012 : Access Management Spacing Standards for Freeway Interchanges with Two-Lane Crossroads
3. City of Roseburg Land Use and Development Ordinance.

6.2. Existing Access Inventory

Access inventory data was obtained from aerial photography for Edenbower Boulevard from Stewart Parkway to Stephens Street (OR 99). This data includes public street intersections and public/private approaches to Edenbower Boulevard. A total of 34 accesses were identified: 16 on the left side (west and north) and 18 on the right side (east and south).

Aerial mapping depicting access locations is shown in a figure at the end of this memorandum (Figure 6-1). Table 6-2 accompanies Figure 6-1 and provides details for public and private approaches including: use, width, and distance to next intersection/driveway along the same side. Because access spacing is measured along one side of the roadway without regard for connections on the opposite side, Table 6-2 is broken into two sections summarizing accesses on the left side (west and north) and on the right side (east and south) of the roadway separately.

When compared to the applicable spacing standards, few of the driveway accesses meet current spacing standards based on roadway jurisdiction. 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 of the state-controlled segment between Broad Street and Aviation Drive, the 500–foot spacing standards identified in the City of Roseburg Land Use and Development Ordinance for arterial streets apply to Edenbower Boulevard. None of the accesses 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.

Table 6-2. Driveway Access Spacing between Roadways

Map ID	Type	Description	Access Width (ft)	Distance to Next Access (ft)	Spacing Standard (ft) State	Spacing Standard (ft) Local
Left Side of Edenbower Boulevard						
2	Public	NW Stewart Pkwy	70	352	NA	500[2]
6	Private	Forest Service Offices	32	101		
8	Private	Garden Hills Apartment	28	174		
10	Private	Garden Hills Apartment	20	116		
12	Private	Garden Hills Apartment	28	318		
14	Public	Plateau Dr (south)	40	27		
15	Private	Private Residence off Plateau	12	490		
18	Public	Plateau Dr (north)	40	353	1320[1] --	
20	Public	Sweetbrier Ave	40	247		
22	Public	Broad Street	40	498	1320[1] 750 or 990[1]	NA
24	**Public**	**I-5 SB Off Ramp**	46	**662**		
26	**Public**	**I-5 NB On Ramp**	36	**585**		
28	Public	Aviation Dr	40	764		500[2]
30	Private	Alzheimer Care Facility	30	329	NA	
32	Public	NE Stephens St	84	170		
34	Private	Douglas Co. Association of Realtors	22	n/a		
Right Side of Edenbower Boulevard						
1	Public	NW Stewart Pkwy	80	233	NA	500[2]
3	Private	Real Estate and Convenience Store	32	89		
4	Private	Veterinarian Business	24	82		
5	Private	Veterinarian Business	30	76		
7	Private	Furniture Store	24	79		
9	Private	Furniture Store	28	228		
11	Private	Applebees	24	136		
13	Private	Applebees	28	241		
16	Private	Sleep Inn Suites Hotel	28	312		
17	Private	Sleep Inn Suites Hotel	28	285	1320[1] --	
19	Private	Real Estate Office	28	237		
21	Private	Real Estate and Eye Doctor's offices	30	577	1320[1] 750 or 990[1]	
23	**Public**	**I-5 SB On Ramp**	**76**	**654**		NA
25	**Public**	**I-5 NB On/Off Ramp**	**76**	**532**		
27	Public	Aviation Drive	40	611		500[2]
29	Private	Tom Thumb Mini Storage	35	461	--	
31	Public	NE Stephens St	78	98	NA	
33	Private	Business	20	n/a		

Notes:
1. Access spacing standard for statewide highways come from Table 7 of OAR 734-51 Temporary Rules – Effective January 1, 2012 Amended May 3, 2012 (Table 17 in the revised OHP).
2. City of Roseburg Land Use and Development Ordinance.

Source David Evans and Associates, Inc.:

6.3. Access Management Techniques and Objectives

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 include:

- ***Controlling Intersection Spacing***: Maintaining minimum distances between intersections, particularly those with traffic signals, can improve the flow of traffic, which reduces congestion and improves air quality for heavily traveled corridors.
- ***Managing Driveway Spacing***: Fewer driveways spaced further apart can allow for more orderly merging of traffic and present fewer challenges to drivers.
- ***Adding Turning Lanes***: Dedicated left- and right-turn lanes keep through-traffic flowing.
- ***Installing Median Treatments***: Two-way left-turn lanes and non-traversable, raised medians are some of the most effective means to regulate access and reduce crashes.

Objectives when implementing access management along Edenbower Boulevard under City jurisdiction include:

- Consider exceptions to access spacing standards to take advantage of existing property boundaries and existing or planned public streets and to accommodate environmental constraints.
- Replace private approaches with public streets, where feasible, to provide consolidated access to multiple properties.
- Ensure all properties impacted by improvements on the roadway are provided reasonable access to the transportation system.
- Align approaches on opposite sides of roadways where feasible to reduce turning conflicts.

6.4. Access Management Plan Implementation

The Access Management Plan for I-5 Exit 127 and Edenbower Boulevard from Stewart Parkway to Stephens Street includes a variety of measures identified 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. Both ODOT and the City of Roseburg have responsibility for implementing the plan.

Access management policies and actions for I-5 Exit 127 and Edenbower Boulevard are illustrated in Figure 6-2 and identified below:

Policy 1: Access management techniques shall be applied with a desire to move towards achieving applicable access spacing standards over time.

Policy 2: Consolidation, closure, or modification of driveways shall be considered when any of the following conditions are met:

- *Properties develop or redevelop and when reasonable access can be provided with a single access point or via a local street.*
- *Future roadway improvements move into design and construction.*
- *The annual accident rate is 20 percent greater than the statewide rate for similar roadways or a highway segment has an ODOT SPIS rating in the worst 10 percent.*

Policy 3: Turn limitations shall be considered when any of the following conditions are met:

- *Future roadway improvements move into design and construction.*
- *The annual accident rate is 20 percent greater than the statewide rate for similar roadways or a highway segment has an ODOT SPIS rating in the worst 10 percent.*

Specific access management actions include:

Action 1: Access management measures will be evaluated when design begins for the Edenbower Boulevard/Stewart Parkway improvements. The evaluation of potential measures should include:

- *Consolidation or closure of driveways on Edenbower Boulevard to reduce turning and merging conflicts along the east side of the roadway, extending 500 feet north of Stewart Parkway.*
- *Turn limitations on Edenbower Boulevard to reduce turning and merging conflicts along the east side of the roadway, extending 500 feet north of Stewart Parkway.*
- *Turn limitations on Edenbower Boulevard in the vicinity of standing queues.*

Action 2: Access management measures will be evaluated when design begins for the Edenbower Boulevard/Stephens Street turn lane extensions. The evaluation of potential measures should include:

- *Turn limitations on Edenbower Boulevard and Stephens Street in the vicinity of standing queues.*

Access management actions proposed in this plan may result in some restrictions or 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.

6.5. Key Principles of Access Management Plan

The Access Management Plan for the IAMP was developed balancing the key principles of safety and mobility for all users with regional and local economic vitality. These principles were applied in the following manner:

1. **Safety:** Crash data was evaluated to identify locations where turning or angle collisions have occurred at accesses along the highway. These types of collisions generally result in more frequent and severe injuries.

- *Recommended Actions: No locations for safety-related access restrictions are currently identified but potential access modifications should be evaluated if future safety concerns are identified on the Exit 127 ramp connections to the freeway or along Edenbower Boulevard between Stewart Parkway and Stephens Street.*
- *Triggers: Access modifications should be considered at locations with a continued pattern of turning and/or angle collisions that can be reduced through access restriction or when a location is in the worst 10% in the SPIS (only applicable at the interchange).*
- *Economic Considerations: No access modifications to address existing safety issues are identified at this time. Future access restrictions would not be constructed without reasonable alternate access unless an identified hazard that adversely affects public health, safety, or welfare prevails.*

2. **Mobility:** Projects were identified that improve corridor mobility for all system users while maximizing the use of existing infrastructure.
   - *Recommended Actions: The City of Roseburg project to improve the Edenbower Boulevard/Stewart Parkway intersection should consider access management to reduce the frequency of turning and merging conflicts on the east side of the roadway (for approximately 500 feet) with implementation of this project. The City of Roseburg extensions of the left-turn lanes at the Edenbower Boulevard/Stephens Street intersection may consider access management in areas with standing queues.*
   - *Triggers: Implementation of these projects would be triggered by congestion (v/c ratio > 0.85) of safety (crash patterns related to queuing).*
   - *Economic Considerations: Reducing congestion and queuing and/or improving safety realizes economic benefits (improved land values, vehicle costs, energy usage, and pollution).*

Attachments:

Figure 6-1. Existing Access Inventory
Figure 6-2. Access Management Plan Actions

I-5 Exit 127 (North Roseburg) IAMP

Legend

- City Limits
- Interstate
- Highway
- Arterial Road
- Local Road

Access Location by Type

- Private
- Public

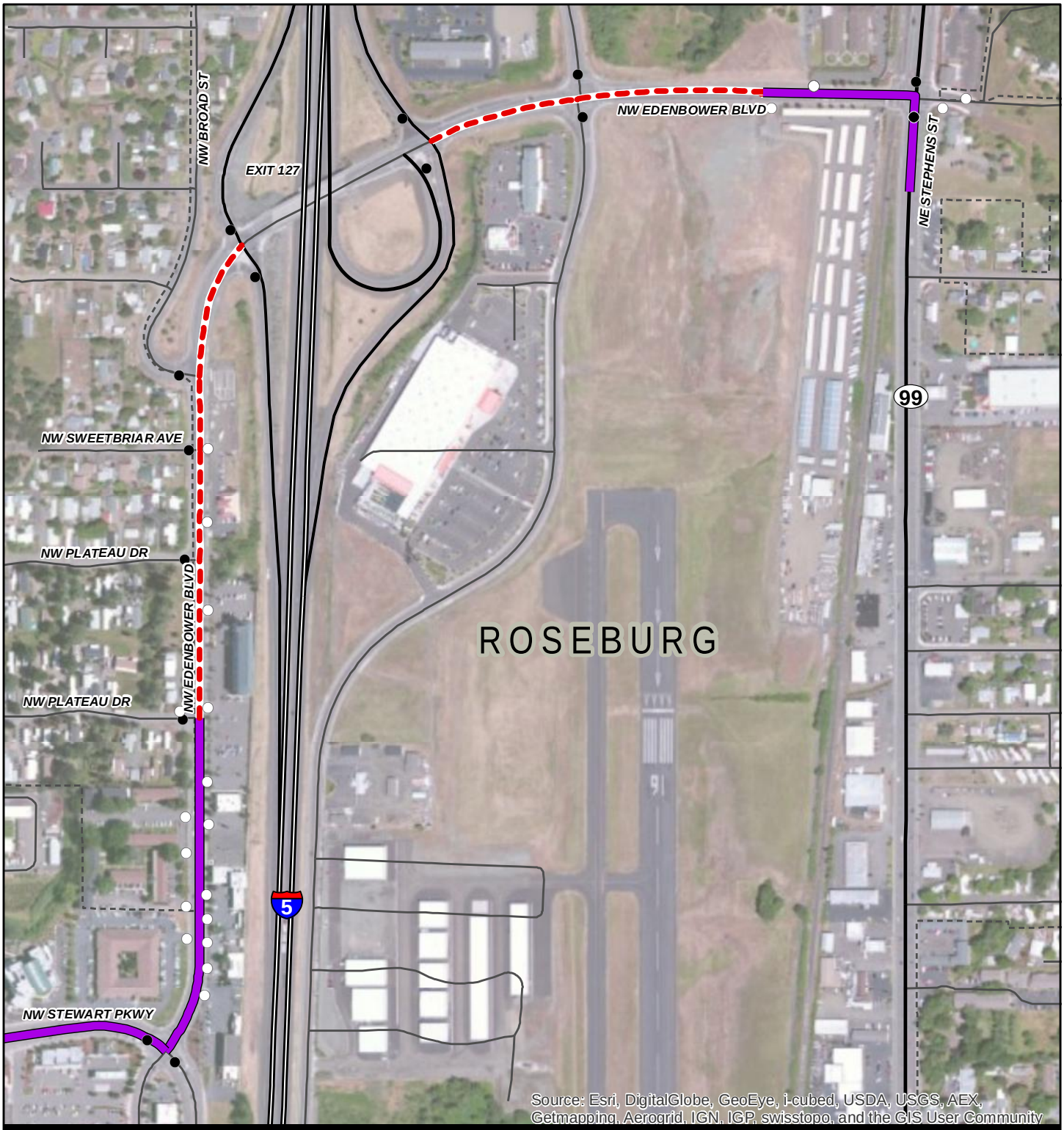
Note: Number call outs match the access inventory table.

N

0 600 1,200 Feet

Figure 6-1

Existing Access Inventory



I-5 Exit 127 (North Roseburg) IAMP

Legend

Access Location by Type

- Private
- Public
- Access Review due to Project Implementation, Redevelopment or Safety Concerns
- Access Review due to Redevelopment or Safety Concerns

N

0 600 1,200 Feet

Figure 6-2

Access Management Plan Actions

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

Technical Memorandum #7
Interchange Management Actions

Prepared for

Oregon Department of Transportation, Region 3
3500 NW Stewart Parkway
Roseburg, Oregon 97470

Prepared by

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December 2014

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7. INTERCHANGE MANAGEMENT ACTIONS

An integral part of the IAMP process is providing an action plan to protect the function of the interchange and its influence area. This memorandum explores a set of measures under the heading "management actions" that could be employed at or near I-5 Exit 127. It is a companion to *Technical Memorandum #5: Preferred Alternative*, which identifies the system improvements needed to meet forecast demand, and *Technical Memorandum #6: Access Management Plan*. While some actions are also discussed in these other documents, additional options that do not require infrastructure improvements are presented here.

7.1. Potential Management Actions

Management actions, as applied to Interchange Area Management Plans (IAMPs) are intended to preserve the capacity of an interchange for as long as possible. The toolkit of potential management actions includes four overarching elements:

- **Local System Improvements** that enhance the local street network to disperse trips and reduce congestion near an interchange
- **Transportation Demand Management Strategies** that provide travel options to reduce the number of trips or vehicles on the road
- **Transportation System Management Measures** that improve system efficiency and reduce delays
- **Land Use and Development Strategies** that guide land use development to result in fewer trips in the interchange area

Many management actions are most applicable when applied throughout a region or in a large urban area. Nonetheless, a positive impact may be produced even if the action is limited to the I-5 Exit 127 study area. The management tools with potential to preserve capacity at I-5 Exit 127 are described below. The discussion includes a brief description, a qualitative assessment of applicability and potential benefits, a summary of the actions that would be required to implement them, a qualitative assessment of potential adverse impacts, and identification of the implementing agency.

7.1.1. Benefits of Management Actions at I-5 Exit 127

I-5 Exit 127 has potential for traffic growth between the ramp terminals as well as on and off of Interstate 5 (I-5). Roadway improvements have been identified to address area growth which requires an investment by ODOT and the City of Roseburg. As such, a plan to assist these agencies with the long-term transportation system management in the area around the interchange is critical.

As described in the *Technical Memorandum #3: Future Baseline Traffic Conditions*, only one of the study area intersections would not meet operational standards during the PM peak hour with the forecasts developed from the 2035 travel demand forecasting model.

Management actions have the potential to reduce the total traffic at the interchange and manage the rate of growth. These actions can extend the life of the interchange and provide for incremental implementation of additional I-5 Exit 127 area improvements, allowing individual components to be funded and built when needed. Given the funding constraints and statewide demand for both interchange and local system improvements, it could take many years to develop a funding package and construct any additional improvements recommended in the IAMP.

7.2. Local System Improvements

Local system improvements relate to enhancing the effectiveness of the local street network to provide circulation and access for the community near the interchange without relying solely on the interchange or its approach roadways.

7.2.1. General Description

Local system improvements can include enhancing the local street network, developing an access management plan, and considering alternative mobility standards. These actions are described below followed by a summary of their application for IAMP 127.

Enhancing the Local Street Network

A robust and well-connected local street network provides many benefits to the surrounding area. Local street networks are critical to providing access to property and they also distribute traffic over a number of streets rather than concentrating trips on just a few arterial roadways thus ensuring sufficient capacity for development to occur. As a local roadway network is developed to support property development, traffic circulation can be enhanced by limiting the use of cul-de-sacs and requiring new streets to connect with existing streets.

An enhanced local street network also dovetails with access management on higher volume roadways. By providing access to properties, the local street network also reduces the need to provide direct property access on major roadways, such as state highways and arterial streets. As a result, the local network can improve overall traffic flow and safety of the transportation system.

Access Management

Access management is a set of techniques that state and local governments can use to control access to highways, major arterials, and other roadways. Access management strategies are designed to extend the operational life of the interchange by reducing congestion, improving traffic flow, reducing crashes, and reducing conflicting vehicle movements. Access management techniques are discussed in *Technical Memorandum #6, Access Management Plan*, and include:

- ***Access Spacing***: By increasing the distance between traffic signals and other public roadway connections, flow of traffic on major arterials can be improved. This also reduces congestion and improves air quality for heavily traveled corridors.

- ***Driveway Spacing***: Fewer driveways spaced further apart could allow for more orderly merging of traffic and present fewer challenges to drivers.
- ***Turning Lanes:*** Dedicated left- and right-turn lanes, and indirect left-turns and U-turns could be considered to keep through-traffic flowing.
- ***Median Treatments:*** Two-way left-turn lanes and non-traversable, raised medians are examples of some of the most effective means to regulate access and reduce crashes.

The Oregon Highway Plan (OHP) spacing standards are 1,320 feet (¼ mile) from the interchange for a full access (with or without a traffic signal). In fully developed urban areas, limited access (right-in/right-out) access may be permitted 750 feet from the interchange off ramps or before the interchange on ramps.

Establish Lower Mobility Standards

The majority of the management action tools consider modifications to demand (controlling growth) or providing/modifying roadway capacity. This action is focused on policy and creates a lower mobility standard (higher acceptable v/c ratio standard) to acknowledge physical and financial constraints at the interchange. It provides for increased congestion in accordance with the existing adopted local land use plan and becomes part of the OHP.

7.2.2. Applicable Actions, Benefits, and Implementation Issues for IAMP 127

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

The City of Roseburg TSP identifies some long-range (16-20 years) improvements that would expand the roadway network outside of the existing UGB but there are no other network connections in the vicinity of I-5 Exit 127. However, the City can continue to expand the local street network and maintain connectivity to support future development and provide a variety of local circulation options. A robust and well-connected local street network provides options for local travel around the city without reliance on the freeway system for local travel. Although topography, the freeway, the rail line, and the airport limit circulation options in the vicinity of I-5 Exit 127, local road improvements can create connections that relieve traffic demand on Edenbower Boulevard help maximize the life of I-5 Exit 127.

The preferred alternative includes a project to provide additional capacity at the Stewart Parkway/ Edenbower Boulevard intersection. The project would add a second eastbound left-turn lane from Stewart Parkway to Edenbower Boulevard, which would be widened to include a second northbound receiving lane.

An access management plan for Edenbower Boulevard was developed in Technical Memorandum #6. This plan includes conditions that trigger the need to implement access management measures in the IMSA. These include:

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

One project, the capacity improvements at the Stewart Parkway/Edenbower Boulevard intersection, would trigger consideration of access modifications to maintain safe operating conditions with the dual left-turn lanes on Stewart Parkway and the northbound merge lane on Edenbower Boulevard. Access management may come under review with other projects, such as the extension of left- or right-turn lanes on Edenbower Boulevard and on Stephens Street.

Under the current economic environment and physical/environmental constraints, alternative mobility standards do not appear to be necessary and will not be pursued at this time.

7.3. Transportation Demand Management Strategies

Transportation Demand Management (TDM) strategies are designed to reduce vehicle demand, especially for commuter trips in the peak periods.

7.3.1. General Description

Typically, TDM strategies include provision of services or facilities intended to shift travelers to different modes, to non-peak times, or by trip elimination choices, such as telecommuting. 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.

TDM Strategies that Shift Modes

The following strategies are designed to offer choices and encourage people to commute in a way other than driving alone, resulting in fewer vehicles on the road during the peak periods.

Carpool Programs: This strategy encourages and supports commuters to share the ride with other commuters who live and work in the same general area. Carpools may receive preferential parking, or incentives such as a small stipend, reduced parking rate or coupons. Carpools enjoy the benefit of a reduced commute cost because the price of gasoline and parking is typically shared.

Vanpool Programs: This strategy involves providing vans for groups to use for commuting. These can be employer sponsored vans, private vans, or agency sponsored vans. Vanpools can be arranged for large employers, or for locations where several employers are located in close proximity.

Transit: Transit can be a cost saving and stress-reducing alternative to commuting by personal automobile. In order for transit to be a reliable alternative to personal automobiles, transit service should be offered approximately every 30 minutes and extend

beyond the peak periods. Transit commuters need to have confidence that they will be able to get home if they need to leave work early or stay late.

Bicycling: Many people choose to commute by bicycle for health, stress-reduction, and environmental reasons. The provision of safe and convenient bicycle facilities have long been recognized as one of the key prerequisites for increased bicycling for transportation purposes. Conversely, the absence of good, safe bicycle facilities discourages all but the most dedicated cyclists from using this mode for transportation. In addition, the provision of showers, clothing storage, and safe, secure bicycle parking is recommended.

Walking: When people live close to work, they may have the option to walk. Some do so for health reasons, stress reduction, and for the connection they feel with their community. Most transit riders are also walkers for some portion of their commute. Safe walking facilities such as sidewalks and separated paths are important features to incorporate in projects to encourage walking.

TDM Strategies that Shift Trips to Non-Peak Periods

Employers can have a significant impact on reducing peak hour trips by reducing the number of employees who are expected to arrive during the morning peak (approximately 7 am to 9 am) and depart during the evening peak (approximately 4 pm to 6 pm). Methods to reduce peak hour arrivals and departures include offering flexible work schedules, and shifting work schedules.

Flexible Work Schedules: An example of a flexible work schedule might require employees to be present during core hours of 9:30 to 3:30, and allowing arrivals and departures around that time while maintaining an 8 hour work day. Another example involves working fewer days per week, such as working 4-10s (four ten-hour days).

Off-Peak Shifts: An example of an off-peak shift might be having a work day start at 6 am and end at 2 pm. Another shift might start at 2 pm and end at 9 pm. This is a common practice in industry because it allows for multiple shifts in a 24-hour period.

TDM Strategy that Eliminates Trips

One TDM strategy can eliminate trips altogether.

Telecommuting: This strategy allows employees to work from home for some portion of or all of their work. Telecommuting is gaining popularity and acceptance and is available to more professions as a result of improvements in technology. Various office functions including technical support, call center operations, and order processing are increasingly being conducted using telecommuting and dispersed workers. Employers who offer telecommuting are able to market it as a benefit, and telecommuting often results in cost savings to the employer because of reduced office space and equipment requirements.

7.3.2. Applicable Actions, Benefits, and Implementation Issues for IAMP 127

Goals and policies from the State and the City of Roseburg contain provisions that embrace TDM measures. Urban areas with populations over 25,000 are required by the Oregon

Transportation Planning Rule (TPR) to address TDM. Although the City of Roseburg population is below 25,000, the urban area that also includes the Green Urban Unincorporated Area (UUA) and the City of Winston does exceed 25,000.

The City of Roseburg TSP includes a variety of goals and objectives that are directly or indirectly related to TDM:

> **Objective 1A**: Manage projected travel demand consistent with community, land use, environmental, economic, and livability goals.
>
> **Objective 2F:** The City shall every 3 to 5 years use the walkability and bikeability checklists as a tool to help determine how walkable and bikeable Roseburg is, and where improvements are needed.
>
> **Objective 2G:** In order to improve the health of Roseburg's citizens and reduce the dependence on automobiles for all travel, developments or improvement plans will promote walking or cycling for many trips.
>
> **Objective 3A:** Facilitate development or redevelopment on sites that are best supported by the overall transportation system and that reduce motor vehicle dependency by promoting walking, bicycling, and transit. This may include altering land use patterns through changes to type, density, and design.
>
> **Objective 4E**: Undertake efforts to reduce per capita vehicle miles traveled (VMT) and single occupancy vehicle (SOV) demand through transportation demand management (TDM) strategies.
>
> **Goal 5. Balanced Transportation System:** Facilitate the development of bus stops, bike lanes, sidewalks, and multi-use paths in the Roseburg UGB to provide more transportation options for Roseburg residents and visitors. (This goal includes 12 supporting objectives.)

Implementing TDM strategies is most successful when there are incentives and when making the switch to a non-personal-auto mode of travel is relatively simple, particularly for intermediate to long distance trips. Establishment of Transportation Management Associations (TMA) are useful because a TMA typically takes on the responsibility of promoting TDM programs, organizing carpool and vanpool programs, obtaining grants, distributing incentives, and working with transit agencies to provide additional transit service and/or reduced cost transit passes. Roseburg does not currently have a TMA established.

The following TDM improvements are recommended in the preferred alternative:

- Northbound Ramp Terminal: Improve north side pedestrian crossing (medium priority based on existing deficiency)
- Future Transit: Support a future transit route along the Edenbower Boulevard; however, transit stops must not be located where they could impact the safe and efficient operations of the interchange ramp terminals

7.4. Transportation System Management Measures

Transportation System Management (TSM) measures are designed to make maximum use of existing transportation facilities.

7.4.1. General Description

TSM measures typically include:

- Traffic engineering measures that improve the operations and efficiency of streets and intersections
- System monitoring and traveler information systems (e.g., ITS systems, variable message signs, etc.) including incident management systems (e.g., incident response and recovery teams)
- Facility management systems (e.g., ramp meters, special use lanes, signal priority for special users such as transit).

These strategies are described below.

Traffic Engineering Measures

Traffic engineering measures such as signal timing changes, provision of turn lanes, turn restrictions, and restricting on-street parking to increase the number of travel lanes without road widening are included in this category. These traffic engineering measures are routinely included as part of the traffic analyses used in conjunction with the design process for intersection and roadway projects. Optimizing traffic signal operations, for example, is performed by the traffic engineer before specifying the number of lanes and queue storage requirements for the intersection design.

Such measures must consider all movements at an intersection, including side-street traffic, main street traffic, transit, bicycles, and pedestrians. Competing priorities can arise between modes and directions of traffic and both county and state policy and objectives must be considered when setting priorities. For example, additional turn lanes may reduce delay at intersections for automobiles, but increase the crossing distance for pedestrians, making their crossing less safe. Or, turn movement restrictions may increase throughput on a roadway, but reduce access to business. Decisions regarding access restrictions especially require involvement and input from the community.

System Monitoring and Traveler Information Systems

System monitoring employs Intelligent Transportation Systems (ITS) technologies that enable jurisdictions to monitor traffic, respond to traffic crashes and vehicle breakdowns more quickly, and communicate with the travelers in real time. System monitoring requires deployment of infrastructure like a Traffic Operations Center (TOC) with video and closed circuit TV, and surveillance cameras, detection equipment and traffic sensors on highways to improve the capability of agencies to keep track of the transportation system on a real time basis. This

system monitoring capability allows the operators in a TOC to dynamically adjust signal timing, dispatch emergency vehicles, and provide information to the motorists.

The real time traffic information can be shared with travelers in a variety of ways, by variable message signs, highway advisory radio, 5-1-1 Traveler Phone Information, web sites, and specialized warning systems (such as fog warnings), to let them make their own decisions about when to drive and what route to choose.

Facility Management Measures

Facilities can be managed to improve the performance of the street and highway system or provide operational advantages for specific users. Facility management measures are tied into the system monitoring and traveler information systems discussed above and can be used to benefit users of alternative modes of transportation and TDM programs discussed in the previous section of this memorandum.

Ramp Meters: Ramp meters, which are used on the on-ramps to freeways and other limited access highways, can be used for two different purposes. First, ramp meters can discourage drivers from using freeways to bypass congestion on local roads. Second, when traffic demand is high, ramp metering can adjust the metering rate such that the density on the freeway remains below the critical value, thereby increasing flow or preventing traffic breakdown of the freeway mainline. Its benefits can be reaped when the traffic flows are neither too light (in which case metering is not needed) nor too high (in which breakdown will happen anyway). Ramp meters increase travel times and meter the rate of flow entering the highway. In its simplest application, ramp meters set minimum intervals between vehicles entering the freeway from the ramp with a fixed-time signal.

Preferential lanes: This measure involves the reservation of a travel lane for a preferred group such as high occupancy vehicles and transit. It is often used at ramp meter locations, allowing transit to bypass waiting vehicles and providing travel time savings and reliability for transit.

Traffic Signal Priority: This measure is used primarily for transit in regions that experience significant congestion and delay at intersections. In general, prioritization allows transit to receive a green light for a few seconds before other vehicles so that it can advance ahead of a queue, or it can hold a light green for a few seconds longer to allow a bus to get through a signal before it turns red.

7.4.2. Applicable Actions, Benefits, and Implementation Issues for IAMP 127

A number of transportation system management measures were evaluated in *Technical Memorandum #4 – Alternative Analysis and Technical Memorandum #5: Preferred Alternative.* Concepts considered included 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.

The following TSM improvements are recommended in the preferred alternative:

- Edenbower Boulevard/Aviation Drive: Extend westbound right-turn bay (low priority triggered by queuing/safety)
- Edenbower Boulevard/Stephens Street: Extend left-turn bays (medium priority triggered by queuing/safety)
- Northbound Ramp Terminal: Improve north side pedestrian crossing (medium priority based on existing deficiency)
- Northbound Ramp Terminal: Install traffic signal for off-ramp (low priority triggered by signal warrants)
- Edenbower Boulevard: Implement signal coordination from Stephens Street to southbound ramp terminal (ongoing priority in response to changing conditions as reflected by delays and queues)
- Edenbower Boulevard at Stewart Parkway: Address sight distance limitations through removal of roadside obstructions and potentially restricting right-turn-on-red movements on the northbound approach (medium priority triggered by safety or in concert with intersection improvements)

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 through Roseburg may become necessary.

7.5. Land Use and Development Strategies

Several potential land use and development strategies are available with the potential to directly or indirectly influence the transportation impacts of future development.

7.5.1. General Description

Some potential land use and development strategies include:

- Using trip budgets or trip caps to directly manage traffic impacts of developments;
- Retaining the current Comprehensive Plan designations and land use zoning

These strategies are described below.

Directly Manage Traffic from Development

The practice of limiting trips, or placing “trip caps” or “trip budgets” involves permitting development projects based on the number of trips each will generate, in the context of development within a specified area. These programs can provide a measure of flexibility for developers while limiting the total impact of development. A development that did not use all the allowable traffic generation potential might be able to pass on its unused traffic potential to an adjacent development that could be allowed to generate more traffic. As long as the total traffic generation from the area remained within limits, the interchange operations would be protected.

Trip Caps: A trip cap program is implemented when capacity at the interchange is limited. By establishing the maximum number of trips that can be accommodated at the interchange, more strategic development decisions can be made.

Trip Budgets: A trip budget program may be implemented when a reasonable build out growth scenario can be accommodated at the interchange. The trip budget allocates trips over time in support of long-term economic goals.

Retain Current Comprehensive Plan and Land Development Ordinance Designations and Regulations

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 and Douglas County that their Comprehensive Plans and TSPs remain valid or, if changes are needed, the TPR requirements will be met and the City or County 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 Urban Area Comprehensive Plan and Map (posted March 2011)
- City of Roseburg Transportation System Plan (2006)
- City of Roseburg Land Use and Development Ordinance (2013)
- Douglas County Comprehensive Plan and Map (2010)
- Douglas County Transportation System Plan (1998, amended through 2012)
- Douglas County Land Use and Development Ordinance (2010)

7.5.2. Applicable Actions, Benefits, and Implementation Issues for IAMP 127

Technical Memorandum #:3 Future Baseline Traffic Conditions evaluated the future baseline condition consistent with the currently approved City of Roseburg and Douglas County population growth forecasts and the current Roseburg and Douglas County zoning.

With the uses permitted under current zoning and current population forecasts, the ramp terminals would not be near or exceed OHP mobility standards in 2035. A change in the zoning and development in the area or more rapid population growth could increase demand at the interchange ramps which, in turn, could potentially lead to congestion and failing traffic operations at the interchange.

Implementing a "trip budget" program for the I-5 Exit 127 study area would be a specific solution that would help protect the function of the interchange and keep intersections operating acceptably. By limiting the total traffic in the study area, the community could be reasonably assured that a preferred interchange concept could operate well for a period of at least 20 years.

Implementing a "trip cap" or "trip budget" program could also be tied to various intermediate phases of the interchange and other infrastructure improvements. Trip caps might specify what total development would be allowed prior to modifying one or the other of the interchange ramps under the preferred concept. Under this "trip cap" or "trip budget" approach, transportation improvements would be tied with the development necessitating them.

Although analysis based on current zoning and population forecasts does not indicate that the I-5 Exit 127 is likely to become congested over the next 20 years, a trip budget could be considered to simply ensure that transportation infrastructure keeps pace with and supports development, which in turn, supports the useful life of the interchange.

7.6. Summary of Recommended Actions

Vehicle trip generation associated with anticipated future growth in the region is not expected to cause traffic operations at I-5 Exit 127 to exceed ODOT mobility standards prior to the 20-year planning horizon. However, the intensity, timing and location of actual development may result in more congestion than is estimated by the model. Therefore, several actions are recommended to maintain and preserve the capacity of the interchange and key area intersections.

Recommended actions include:

City of Roseburg: Continue to expand the local street network and maintain connectivity to support future development and provide a variety of local circulation options. A robust and well-connected local street network provides options for local travel around the city without reliance on the freeway system for local travel. Although topography, the freeway, the rail line, and the airport limit circulation options in the vicinity of I-5 Exit 127, local road improvements

can create connections that relieve traffic demand on Edenbower Boulevard help maximize the life of I-5 Exit 127.

ODOT and City of Roseburg: Adopt an Access Management Plan for the I-5 Exit 127 area. Adoption of the access management plan is critical to the long-term safe and efficient operations of the interchange.

City of Roseburg: Implement Transportation Demand Management strategies in cooperation with other jurisdictions within the urban area. TDM strategies that encourage the use of carpools, vanpools, bicycling and walking should be continued. The recommended improvements in *Technical Memorandum #5: Preferred Alternative* includes one TDM pedestrian enhancement project. Additionally, support for a future transit route along the Edenbower Boulevard is recommended with the provision that future transit stops must not be located where they could impact the safe and efficient operations of the interchange ramp terminals

ODOT and City of Roseburg: Implement Transportation System Management measures to improve efficiency and maintain safety. Signal interconnection, coordination, and optimization should be included when future signals (I-5 Northbound Off-Ramp) are designed and constructed. The recommended improvements in *Technical Memorandum #5: Preferred Alternative* and *Technical Memorandum #6: Access Management Plan* include TSM measures such as signal optimization and coordination, changes in traffic control, right-turn-on-red restrictions, restriping, pedestrian enhancements, and extensions of turn lanes needed to address future operational deficiencies.

City of Roseburg: Retain, through adoption of the IAMP, current adopted Comprehensive Plan and Land Development Ordinance designations and regulations to ensure that the land uses within the IAMP study area remain supportive of the function of the interchange. The IAMP assumes that, within the study area the Roseburg will maintain their:

- Current land use designations with current uses and densities
- Plan and code amendment processes
- Requirements for traffic impact studies
- Processes for notification to ODOT regarding land use actions that may affect state transportation facilities

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

Technical Memorandum #8
Implementation

Prepared for

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December 2014

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Figure 8-1. Vacant and Redevelopable Land

8. IMPLEMENTATION

This memorandum identifies the actions needed to implement the Interchange Area Management Plan (IAMP) for I-5 Exit 127 (North Roseburg). The management measures in the previous technical memoranda focus on physical changes to transportation facilities. This memorandum focuses on changes to plans and regulations which affect the land uses that generate trips.

8.1. Land Use and Transportation Issues

This memorandum uses the relevant plans and policies review in Appendix A of *Technical Memorandum #1: Definition and Background* as a basis for determining potential changes to plans and codes that would manage transportation and land uses, provide safe and efficient operations, and minimize future major improvements.

The key land use issue identified in Technical Memorandum #2: Existing Conditions Analysis is:

> *Potential future development of industrial or mixed use designated lots could generate truck or other traffic along NW Edenbower Boulevard.*

The existing conditions technical memorandum identified 171 lots totaling 173.18 acres of vacant land and 259 lots totaling 380.91 acres of redevelopable land. The vacant parcels are distributed throughout the IMSA, with some concentration in the northeast area that is designated industrial (IND) and southwest areas that are designated commercial (COM) and Medium Density Residential (MDR). Large redevelopable parcels are east of I-5 and north of General Avenue, outside the city limits. These are designated IND and Residential Open Space (ROS). Figure 8-1 maps the vacant and redevelopable parcels in the IMSA.

Most of the southern two-thirds of the IMSA is developed with uses that are unlikely to redevelop during the 20-year planning period. The residential areas, airport, Army National Guard center, Mercy Medical Center, USFS office, and shopping center are unlikely to develop with more intensive uses that would generate additional traffic than considered in *Technical Memorandum #3: Future Baseline Traffic Conditions*. Some of the vacant lands north of Edenbower Boulevard are likely to be developed as zoned with industrial or residential uses. Development of these lands could add traffic in the IMSA via Aviation Drive or Stephens Street.

The key future operational issue identified in Technical Memorandum #3: Future Baseline Traffic Conditions is:

> *Stewart Parkway at Edenbower Boulevard would fail to meet operational standards and experience significant queuing for several of the movements. Overall traffic demand is expected to exceed intersection capacity. Extensive queuing would create safety concerns.*

8.2. Adopted Policies, Plans, and Ordinances

The interchange improvements are consistent with the City of Roseburg Urban Area Comprehensive Plan, Transportation System Plan (TSP), and City of Roseburg Land Use and

Development Ordinance (LUDO). ODOT is relying on the currently adopted plans, policies, and codes to ensure that the land uses within the study area remain supportive of the function of the interchange. This study assumes that, within the management area, the City of Roseburg will:

- Maintain its current land use designations with current uses and densities
- Ensure that future designations for parcels currently within the UGB but outside the city limits will not generate more traffic than can be accommodated at the interchange.
- Maintain plan and code amendment processes that ensure adequate notification and opportunity for input to ODOT on land development applications that may affect state transportation facilities.
- Maintain requirements for traffic impact studies.
- Ensure that the threshold for traffic improvements provided by a development is adequate.

This IAMP assumes that the City of Roseburg either will retain the current comprehensive plan and zoning designations and code provisions that the IAMP relies on to protect the performance of the North Roseburg interchange, or that the City of Roseburg will notify ODOT and jointly undertake an evaluation of impacts to the interchange and potentially amend the IAMP if it proposes to change designations. The City of Roseburg Urban Area Comprehensive Plan and the LUDO maintain a variety of zoned uses within the management area, including residential, commercial, and employment, and public facilities designations. Changes to the current plan designations and 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 could approach capacity more rapidly than anticipated, shortening the life of the new interchange and hastening the need for costly investments for additional interchange improvements.

Since provisions of the City of Roseburg Urban Area Comprehensive Plan and LUDO are adopted by reference into this IAMP, ODOT has the ability to review and weigh in on proposed amendments to plans and codes, before their adoption by the City of Roseburg, to ensure that any changes to these land use controls would avoid development that would jeopardize the achievement of the goal and objectives of the IAMP. ODOT relies on requirements that local comprehensive plans and implementing ordinances be consistent with the OHP, which includes this IAMP once the OTC adopts it, to ensure that future land use actions do not create traffic volumes that will exceed the mobility performance standards for the interchange and related facilities.

The following provisions of the City of Roseburg Urban Area Comprehensive Plan and LUDO are adopted by reference into this IAMP:

1. The City of Roseburg Urban Area Comprehensive Plan designations within the IMSA, as shown on the adopted City of Roseburg Urban Area Comprehensive Plan Map and described in the City of Roseburg Urban Area Comprehensive Plan.

2. The City of Roseburg zoning designations within the Interchange Management Area, as shown on the adopted City of Roseburg zoning map (see Figure 1) and described in the City of Roseburg LUDO.

The IAMP relies on the provisions summarized in Table 8-1. The left column indicates the document reference and the right column indicates the relevant IAMP section(s).

Table 8-1. Roseburg Documents Adopted by Reference with IAMP

<table>
<tr><th>Provision</th><th>IAMP Reference</th></tr>
<tr><td colspan="2">Roseburg Urban Area Transportation System Plan (2006), Chapter 7: Preferred Alternative, Roadway Plan</td></tr>
<tr><td>Access Management, page 7-28
Table 7.5 Proposed Roseburg Access Management – Minimum Spacing Standards
<table>
<tr><th>Functional Classification</th><th>Minimum Spacing (Feet)</th></tr>
<tr><td>Arterial</td><td>500</td></tr>
<tr><td>Collector</td><td>200</td></tr>
</table></td><td>Access Management Plan</td></tr>
<tr><td>Mobility Standards, page 7-44
The following is the proposed performance measure standard for the City of Roseburg (not including Downtown District):
Volume-to-capacity ratios and level of service (LOS):
Arterial = 0.85/D or E
Collector = 0.85/D or E
Local = 0.90/D or E
Signalized intersections = D
Unsignalized intersections = E</td><td>Intersection Improvements, Interchange Ramp Improvements Transportation System Management Measures</td></tr>
<tr><td colspan="2">City of Roseburg Urban Area Comprehensive Plan</td></tr>
<tr><td>Economics Element
<u>Objective 8</u>. Continue to develop the urban area as a regional distribution, trade and service center.
<u>Objective 10</u>. Ensure compatibility between industrial lands and adjacent areas.
<u>Objective 12</u>. Provide the necessary public facilities and services to allow economic development.</td><td rowspan="2">Land Use Management Measures, Transportation System Management Measures, Additional Improvements</td></tr>
<tr><td>Public Facilities and Services Element
<u>Goal:</u> To provide a timely, orderly and efficient arrangement of public facilities and services to serve as a framework for community development.
<u>Objective 1</u>. Provide a level of public facilities and services adequate to meet the needs of existing and planned development.
<u>Objective 2</u>. Direct the location and timing of urban development by means of capital improvement planning which is closely coordinated with the Comprehensive Plan.
<u>Objective 3</u>. Optimize the utilization of existing facilities.
<u>Objective 5</u>. Strive for continued and improved cooperation and coordination between other units of government as well as other public and private organizations which provide services to the urban area's citizens.
<u>Policy 1</u>. Facility and service planning in the Roseburg urban area shall use the Comprehensive Plan as the basis for decisions to ensure that needs of the urban area are met in a timely, orderly and efficient manner.</td></tr>
</table>

Table 8-1. Roseburg Documents Adopted by Reference with IAMP

Provision	IAMP Reference
Land Use and Urbanization Element Objective 11. Relate land use actions to housing, open space, recreation, transportation, utilities, shopping facilities, jobs, police and fire protection and other special needs. ***Urbanization. Land Use, and Growth Management*** **Urban Growth** Policy 6. The extension of sewer, water, storm drainage, and transportation facilities within the urban growth boundary shall be in conformity with and adopted growth management program. **Residential Development** Goal: To promote and encourage residential densities and designs that conserve land and energy, minimize unnecessary and costly public service extensions and maintain the unique geographic character of the urban area; to enhance and protect the quality of existing neighborhoods; and to ensure varied living areas and housing types for residents of all income levels and an adequate supply of serviced, developable land to support such housing. Objective 2. Residential areas shall be protected by zoning ordinance, subdivision ordinance, and other regulations from any land use activity involving an excessive level of noise, pollution, traffic volume, nuisances, and hazards to residents. **Commercial Development** Goal: To encourage and promote the health and vitality of the central City core as a focus of civic and business life and to encourage the following variety of commercial activities in selected outlying areas: 1. Community shopping and service facilities. 2. Neighborhood shopping and service facilities. 3. Convenience stores. 4. Commercial office structure. 5. Specialized shopping areas. **Industrial Development** Goal: To encourage and promote industrial development which strengthens the economic base of the community and minimize air, noise, water, and visual pollution. **Public and Semi-Public Buildings and Lands Development** Goal: To provide for an arrangement of public and semi-public facilities and services which complement private development and meet the needs of Roseburg area residents. **Transportation Development** Goal: To insure the provision and coordination of transportation facilities and services that reflect desired development pattern and are timed to coincide with community needs and to minimize the adverse impacts of traffic on residential areas. Policy 1. When practical, the circulation system shall utilize existing facilities and rights-of-way, and on-street parking shall be removed in preference to widening streets for additional travel lanes. Policy 3. Transportation facilities shall be designed and constructed to minimize noise energy consumption, neighborhood disruption, cost, and social, environmental and institutional disruptions, and to encourage the use of public transit, bikeway, and walkways. Policy 4. Traffic movement on arterial streets should be facilitated by limiting or controlling access wherever possible.	Land Use Management Measures, Transportation System Management Measures, Additional Improvements

Table 8-1. Roseburg Documents Adopted by Reference with IAMP

Provision	IAMP Reference
City of Roseburg Land Use and Development Ordinance	
Chapter 3: Site Development, Article 1: Site Plan Review Section 3.1.020 Site Plan Review Required Section 3.1.040 Criteria and Standards (Ord. No. 3279, 3/2008), b to e **Chapter 5: Procedures, Article 1: Development Approval Procedures** Section 5.1.030 Coordination of Development Approval, 1 Section 5.1.070 General Provisions Regarding Notice, c Section 5.1.150 Decision of the Director, 1 **Chapter 5: Procedures, Article 4: Zone Change** Section 5.4.040 Conditions of Approval, d and e **Chapter 5: Procedures, Article 8: Conditional Use Permits** Section 5.8.060 Criteria, c Section 5.8.060 Conditions, d and e **Chapter 6: Land Divisions, Article 1: Partitions and Subdivisions** Section 6.1.050 Requirements and Standards for Preliminary Plans, 1, 1, and 3	Land Use Management Measures

8.3. Implementation Measures

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

The elements recommended for formal adoption as part of the 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.

8.3.1. State Actions

Adoption of the OHP is a state responsibility. After the City of Roseburg adopts the I-5 Exit 127 IAMP, the OTC will adopt it as a transportation facility plan—an amendment to the OHP, per PLA 01, ODOT Transportation Facility Plan Adoption Process effective October 12, 2006.

ODOT will continue to coordinate with the City of Roseburg as planning documents get updated and amended and during the development review process to ensure the interchange is protected.

8.3.2. City of Roseburg Actions

The City of Roseburg will:

- Adopt this IAMP as a refinement plan to its TSP (City of Roseburg Urban Area Comprehensive Plan amendment).
- Retain, through adoption of the IAMP, current adopted Comprehensive Plan and Land Development Ordinance designations and regulations to ensure that the land uses

within the IAMP study area remain supportive of the function of the interchange. The IAMP assumes that, within the study area the Roseburg will maintain their:

  - Current land use designations with current uses and densities
  - Plan and code amendment processes
  - Requirements for traffic impact studies
  - Processes for notification to ODOT regarding land use actions that may affect state transportation facilities

- When future land use actions are proposed, continue to coordinate with ODOT to ensure that actions and improvements are consistent with the defined function of the IAMP.

Adoption of provisions of the City of Roseburg Urban Area Comprehensive Plan and LUDO by reference into this IAMP ensures that there would be no violation of the mobility performance standards for the interchange and related facilities. No amendments to the City of Roseburg Urban Area Comprehensive Plan, TSP, or LUDO are recommended at this time.

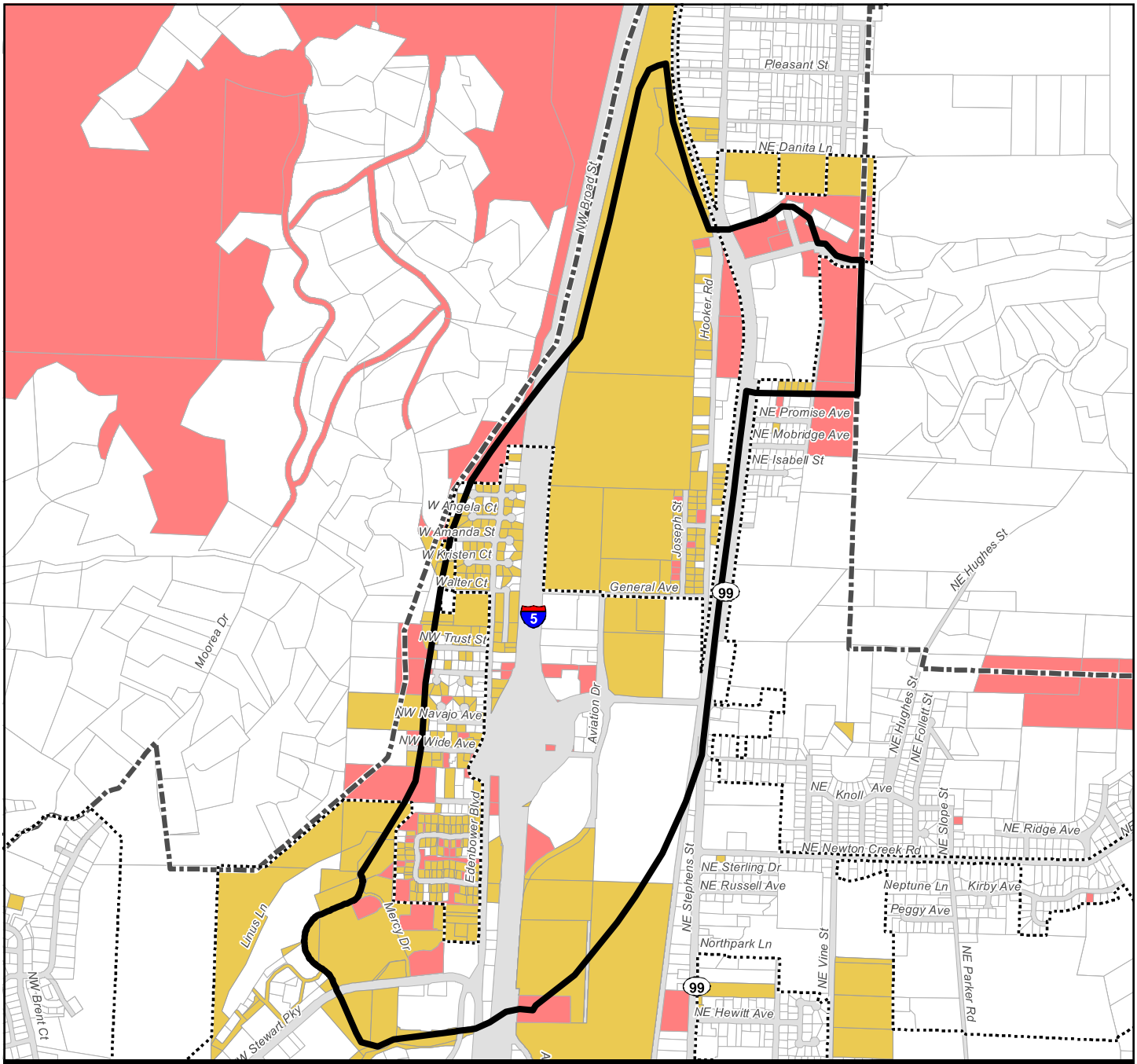
8.3.3. Future Interchange Design Changes

If an alternative interchange design is proposed in the future, additional traffic work would be needed to amend the IAMP. Additional measures would need to be considered, and City of Roseburg amendments may be needed.

If future changes of other circumstances in the IMSA result in the need for changes to the IAMP, ODOT and the City shall jointly prepare amendments to the IAMP management actions and an accompanying funding plan to implement those actions.

Attachments:

Figure 8-1. Vacant and Redevelopable Land



I-5 Exit 127 (North Roseburg) IAMP

Legend

- Urban Growth Boundary (UGB)
- City Limits
- Interchange Management Study Area (IMSA)
- Vacant Land
- Redevelopable Land
- Tax Lots

Figure 8-1
Vacant and Redevelopable Lands

N

0 900 1,800
Feet

Source Info:
City of Roseburg, Oregon, 2010-2012
ESRI, 2009

I-5 Exit 127 (North Roseburg)
Interchange Area Management Plan
Douglas County, Oregon

Technical Memorandum #9
Public Involvement Summary

Prepared for

Oregon Department of Transportation, Region 3
3500 NW Stewart Parkway
Roseburg, Oregon 97470

Prepared by

David Evans and Associates, Inc.
2100 SW River Parkway
Portland, Oregon

December 2014

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9.2.2. Public Open Houses 9-2

Appendix A. Citizen and Technical Advisory Committee Meeting Materials

Appendix B. Public Open House Meeting Materials

9. PUBLIC INVOLVEMENT SUMMARY

The public involvement process for I-5 Exit 127 Interchange Area Management Plan (IAMP) included a technical advisory committee (TAC), a citizen advisory committee (CAC), and general public outreach.

9.1. Advisory Committees

Two advisory committees were formed to provide input during the development of the IAMP:

- The TAC provided technical and policy guidance and served as the primary body making recommendations about the project. The committee was composed primarily of ODOT and local jurisdiction staff.
- The CAC provided stakeholder input and offered recommendations to the TAC. The committee was composed of interested citizens, property owners, business representatives, and other stakeholders along the corridor.

Four meetings were scheduled during development of the IAMP. For the first two meetings, the committees convened separately with the CAC meeting on one day and the TAC meeting the following day. The second two meetings were joint meetings which members of both committees attended.

Meetings were held on the following dates:

1. April 1 & 2, 2013 – Topic: Introduction, Existing Deficiencies, Future Deficiencies and Concept Development (Separate meetings of the CAC and TAC)
2. August 12 & 13, 2013 – Topic: Concept Development and Analysis, Additional Ideas (Separate meetings of the CAC and TAC)
3. January 9, 2014 – Topic: Preferred Alternative Recommendations, Protecting Interchange Function (Joint meeting of the CAC and TAC)
4. June 11, 2014 – Topic: Draft Plan, Implementation (Joint meeting of the CAC and TAC)

Meeting materials, including agendas and summaries (with presentations) are attached in Appendix A.

9.2. General Public Outreach

General public outreach included web-accessible materials and two public open houses.

9.2.1. Website

ODOT project documents (technical memoranda and reports) were posted on the ODOT Region 3 website for three interchanges in the City of Roseburg for public access. (http://www.oregon.gov/ODOT/HWY/REGION3/Pages/I-5exit127IAMP.aspx)

9.2.2. Public Open Houses

Public open houses were held as informational exchanges where staff and consultant presented and explained project information and the general public could provide input and comment on issues and concerns of importance to them.

Two public open houses were held during development of the I-5 Exit 127 IAMP Management Plan. Open houses were held on the following dates:

1. April 1, 2013 – Topic: Introduction, Existing Deficiencies, and Future Deficiencies
2. August 12, 2013 – Topic: Concept Development and Analysis, Additional Ideas

Meeting materials, including agendas and summaries (with presentations) are attached in Appendix B.

The public open houses were advertised using a variety of outreach tools including:

- Radio ads
- Radio stories
- Newspaper ads
- Newspaper stories
- TV stories
- Billboards
- Table Tents
- Website
- Flyers
- Chamber Newsletters

Attachments:
Appendix A. Citizen and Technical Advisory Committee Meeting Materials
Appendix B. Public Open House Meeting Materials

Appendix A. Citizen and Technical Advisory Committee Meeting Materials

I-5 Exit 127 Interchange Area Management Plan
Citizen Advisory Committee

Meeting #1

11:00 AM to 1:00 PM

April 1, 2013

ODOT Region 3 Offices
3500 NW Stewart Parkway
Roseburg, OR 97470

AGENDA

---

1. Introductions — Allie Krull, ODOT

2. Work Completed — Jennifer Danziger, DEA; Angela Rogge, DEA
   - Project Definition
   - Existing Conditions
   - Future Baseline Conditions
   - Draft Deficiency Matrix

3. Project Discussion — All
   - Concept Development

4. Next Steps — Jennifer Danziger, DEA; Allie Krull, ODOT
   - Schedule
   - Upcoming meetings

I-5 Exit 127

Interchange Area Management Plan

Citizen Advisory Committee
April 1, 2013

Presentation Topics

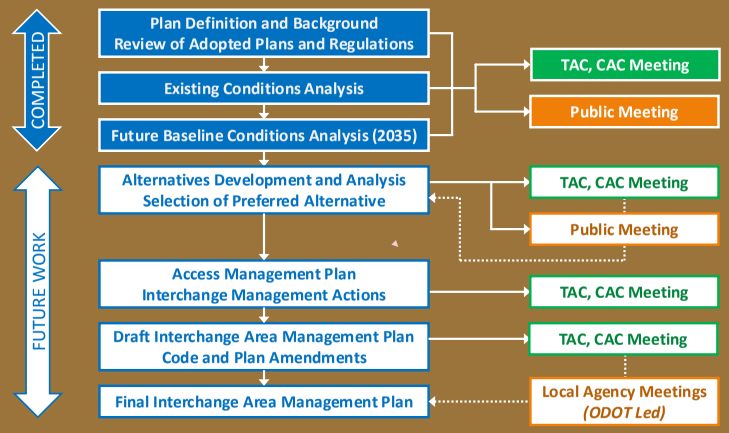
1. Project Overview
   - Purpose
   - Process
   - Goals & Objectives
2. Work Completed
   - Environmental and Land Use Reconnaissance
   - Existing Conditions Analysis
   - Future Analysis
   - Summary of Deficiencies
3. Next Steps

What is an IAMP?

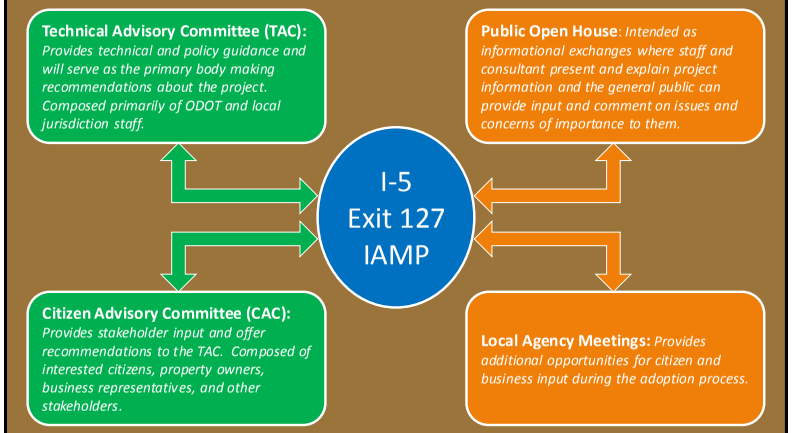
- A plan for managing the interchange and surrounding areas through the year 2035
- A plan to protect the function and capacity of the interchange and cross streets
- A plan expressing the management objectives of ODOT, Douglas County, and Roseburg

IAMP Planning Area

Planning Process



Public Involvement Process



IAMP Goal

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 Douglas County communities.

IAMP Objectives

- Protect the function of the interchange and Edenbower Road 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.

IAMP Objectives (continued)

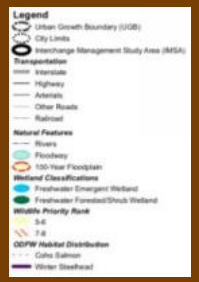
- Incorporate bicycle and pedestrian elements, such as sidewalks, bike lanes, and pathways, as well as corresponding roadway crossings.
- Develop an access management plan that provides for safe and acceptable operations on the transportation network, and moves towards achieving the applicable access 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

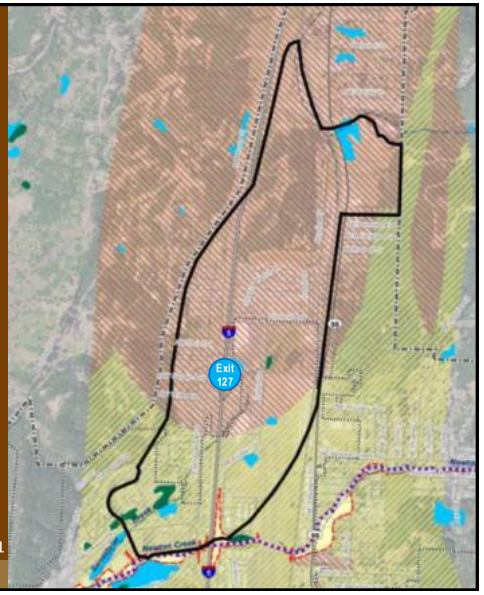
Environmental and Land Use Reconnaissance

Reconnaissance was performed to understand existing environmental and land use issues and help inform the process of developing conceptual alternatives.

- Environmental Reconnaissance
  - Natural resources such as riparian corridors, wetlands, wildlife habitat, and recreation trails
  - Wildlife crossings and threatened and endangered species
  - Floodplains and floodways

Natural Features



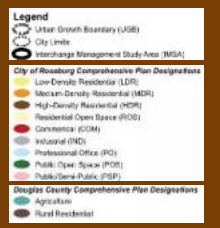


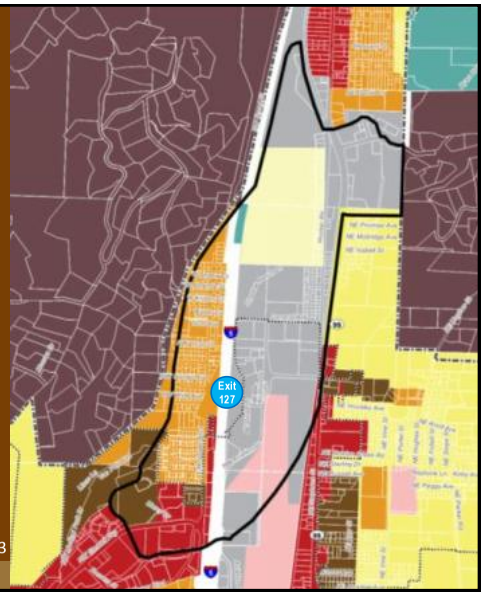
Land Use Reconnaissance (continued)

- Land Use Summary
  - Zoning and Comprehensive Plan designations
  - Community features
    - Parks and recreation areas
    - Historical and Archaeological Resources
    - Section 4(f) and 6(f) resources
- Socioeconomic and Environmental Justice

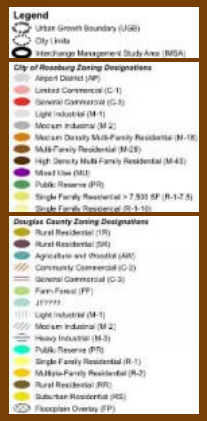
Tech Memo #2 includes an Environmental and Land Use "Red Flag" Summary

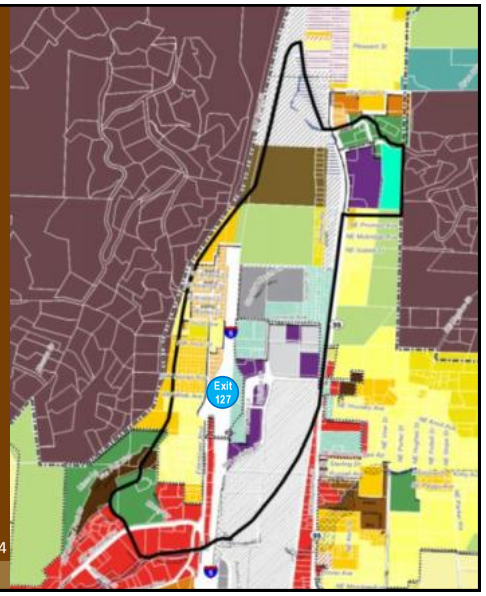
Comprehensive Plan



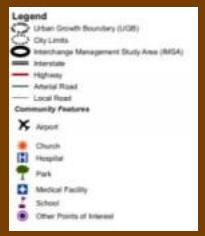


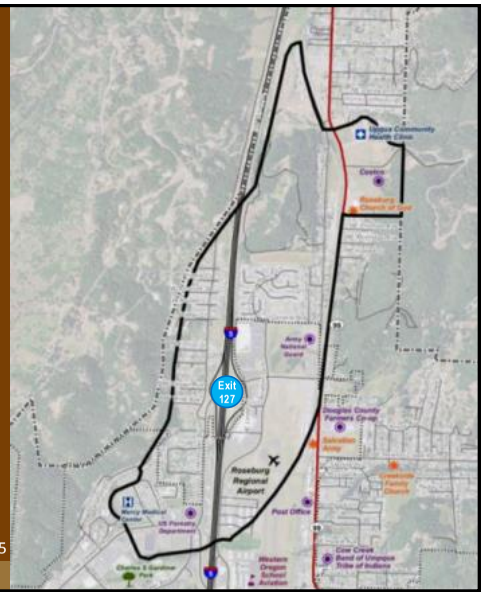
Zoning Map





Community Features



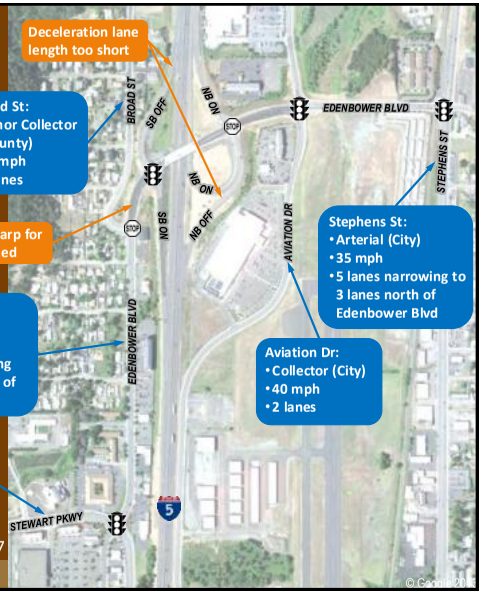


Existing Condition Analysis

- Transportation System Inventory
  - Roadways
  - Access
  - Pedestrian and Bicycle Facilities
  - Transit
  - Freight
  - Rail
- Traffic Conditions
  - Design Hourly Volumes - 2012
  - Traffic Operations – 6 intersections and Freeway
  - Crash History – 2006 through 2010

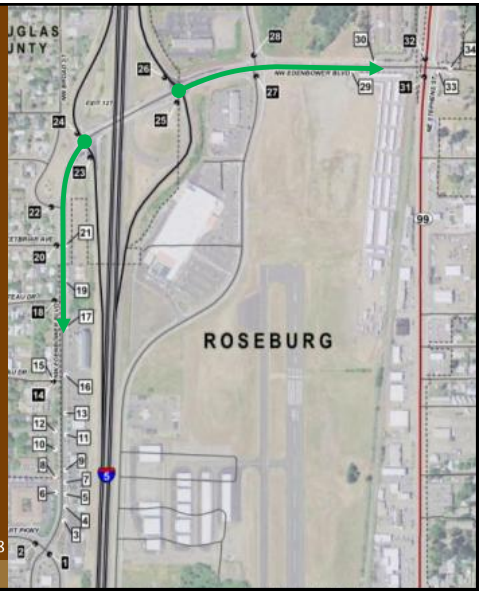
Roadway Facilities

Legend
- Traffic Signal
- Stop Sign



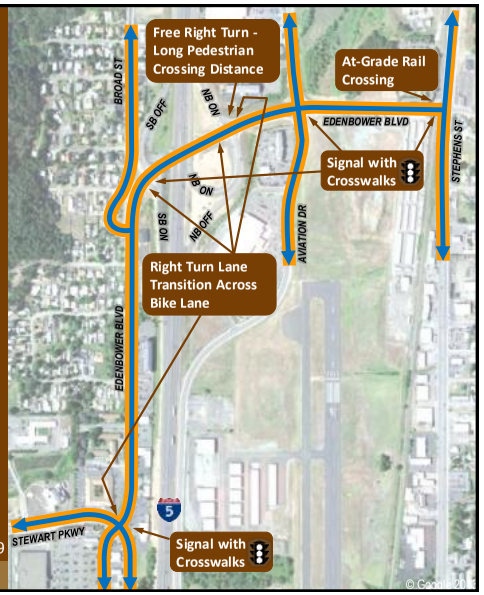
Access Inventory

Legend
- Private Access
- Public Access
- ¼ mile from Interchange Ramps (ODOT Standard)



Bicycle & Pedestrian Facilities

Legend
- Bike Lanes
- Sidewalks



Transit & Rail Facilities

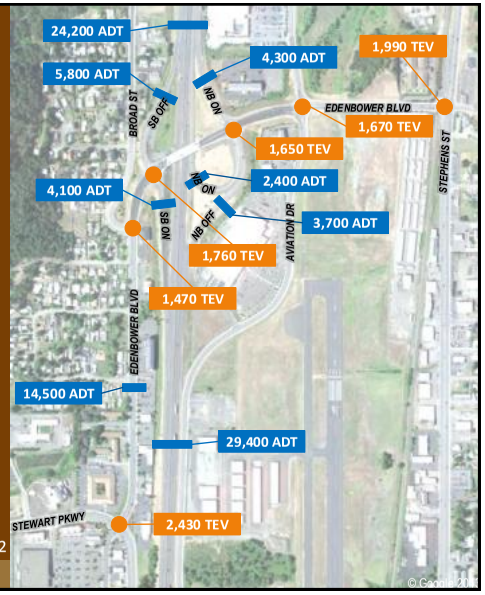
Legend
- Umpqua Transit Red Route
- Umpqua Transit Green Route
- Umpqua Transit Orange Route
- Umpqua Transit Stop
- Central Oregon and Pacific (CORP) Railroad

Dial-a-ride service is also provided in study area

Existing Traffic Volumes

- 6 intersections along Edenbower Boulevard
- Freeway merge/diverge points
- Traffic count data primarily collected in 2012
- Common peak hour between 4:30 and 5:30 PM
- Converted to design hourly volumes (DHV) = 30th highest hour

Existing Traffic Volumes



Legend

TEV = Total Entering Vehicles (at an intersection in 1 hour)

ADT = Average Daily Traffic (on a roadway segment)

2012 TEV

2010 ADT

Intersection Operations Evaluation

- Performance Measures
  - Volume/Capacity Ratio
    - *Volume = Traffic Demand*
    - *Capacity = Maximum Throughput*
  - Level of Service A through F based on delay
  - 95th Percentile Queues
- Performance Standards

Location	ODOT	Roseburg	Douglas County
I-5 Mainline	V/C <= 0.80	-	-
I-5 NB Ramp Terminal	V/C <= 0.85	-	-
I-5 SB Ramp Terminal	V/C <= 0.85	-	-
Edenbower Blvd		LOS D or better	-
Stewart Pkwy	-	LOS D or better	-
Broad St	-	LOS D or better	V/C <= 0.95
Aviation Dr	-	LOS D or better	-
Stephens St	V/C <= 0.85	LOS D or better	-

2012 Existing Intersection Operations

Intersection	Critical Movement	V/C Ratio	LOS	Operational Standards	
				OHP	City/County
1. Edenbower Blvd at Stewart Pkwy	Overall	0.85*	C	-	LOS D
2. Edenbower Blvd at Broad St	EB L/R	0.13	B	-	LOS D/0.95
3. Edenbower Blvd at SB Ramp Terminal	Overall	0.57	B	0.85	LOS D
4. Edenbower Blvd at NB Ramp Terminal	NB R	0.42	B	0.85	LOS D
5. Edenbower Blvd at Aviation Dr	Overall	0.50	B	-	LOS D
6. Edenbower Blvd at Stephens St	Overall	0.67*	C	-	LOS D

Acronyms: EB = eastbound; WB = westbound; NB = northbound; and SB = southbound. L = left; T = through; and R = right.

* 95th percentile queues exceed available storage in one or more travel lanes

2012 Existing Freeway Operations

Direction/Location	V/C Ratio	
	Design Hour (4:30-5:30 PM)	Alternate Hour (7:30-8:30 AM)
I-5 Northbound		
Mainline South of IC 127	0.30	0.19
Diverge: IC 127 Northbound Off Ramp	0.14	0.12
Mainline between Off and On Ramps	0.24	0.14
Merge: IC 127 Eastbound to Northbound On Ramp	0.29	0.15
Mainline between On Ramps	0.29	0.15
Merge: IC 127 Westbound to Northbound On Ramp	0.32	0.17
Mainline North of IC 127	0.31	0.17
I-5 Southbound		
Mainline North of IC 127	0.26	0.24
Diverge: IC 127 Southbound Off Ramp	0.14	0.14
Mainline between Off and On Ramps	0.20	0.18
Merge: IC 127 Southbound On Ramp	0.30	0.22
Mainline South of IC 127	0.29	0.22

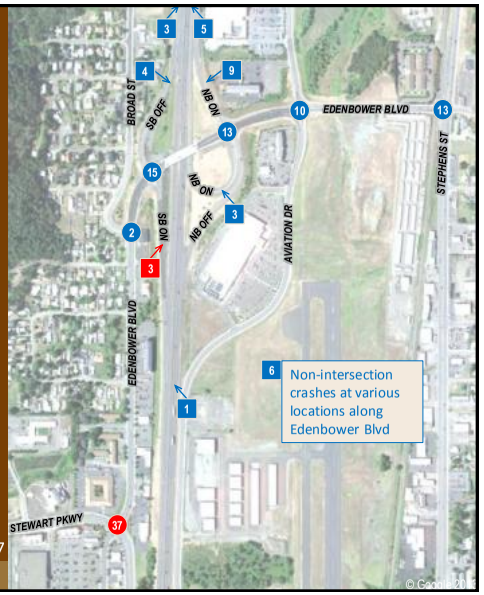
Safety Summary

- 124 crashes over 5 years (2006 through 2010)
  - 2 crashes resulted in severe injury(s)
  - 49 crashes resulted in minor injury(s)
- 28 Freeway Crashes
  - Comparable to average crash rates for interstate freeways
- Critical Crash Rates
  - Used to identify locations that warrant further investigation
  - One intersection: Edenbower Blvd & Stewart Pkwy
- Worst 10% Safety Priority Index System (SPIS) Site
  - No SPIS locations in study area

IAMP 127 Crash Summary

Legend

- Intersection Crashes
- Segment Crashes
- Severe Injuries Occurred
- Other Injuries or Property Damage Only



Future Baseline Condition Analysis

- Future Traffic Volumes
  - 2035 – Analysis year
  - Based on Roseburg Travel Demand Model
    - Assumes 1.2 percent population growth in City
    - Assumes 1.0 percent population growth outside City

Land Use	2009	2035	Growth
Population	22,203	29,628	33%
Employment	24,315	28,243	16%

  - Peak Hour Volumes at Intersections
  - Average Daily Volumes on Segments

Future Baseline Traffic Volumes

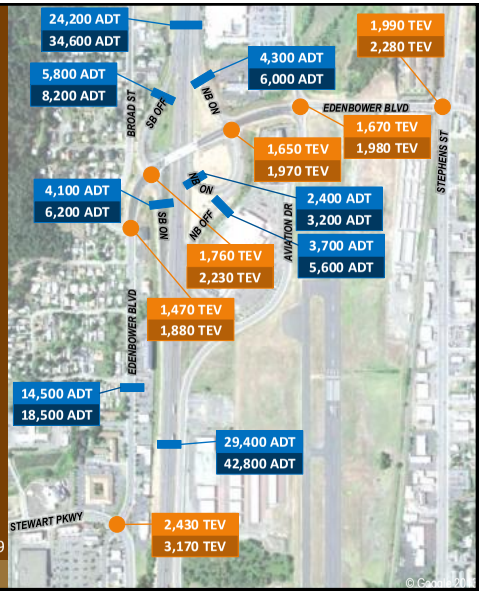
Legend

TEV = Total Entering Vehicles (at an intersection in 1 hour)

ADT = Average Daily Traffic (on a roadway segment)

2012 TEV
2035 TEV

2010 ADT
2035 ADT



2035 Future Baseline Intersection Operations

Intersection	Critical Movement	V/C Ratio	LOS	Operational Standards	
				OHP	City/County
1. Edenbower Blvd at Stewart Pkwy	Overall	1.02*	E	-	LOS D
2. Edenbower Blvd at Broad St	EB L/R	0.23	C	-	LOS D/0.95
3. Edenbower Blvd at SB Ramp Terminal	Overall	0.69	B	0.85	LOS D
4. Edenbower Blvd at NB Ramp Terminal	NB R	0.49	C	0.85	LOS D
5. Edenbower Blvd at Aviation Dr	Overall	0.61*	B	-	LOS D
6. Edenbower Blvd at Stephens St	Overall	0.71*	C	-	LOS D

Acronyms: EB = eastbound; WB = westbound; NB = northbound; and SB = southbound. L = left; T = through; and R = right.

* 95th percentile queues exceed available storage in one or more travel lanes

2035 Future Baseline Freeway Operations

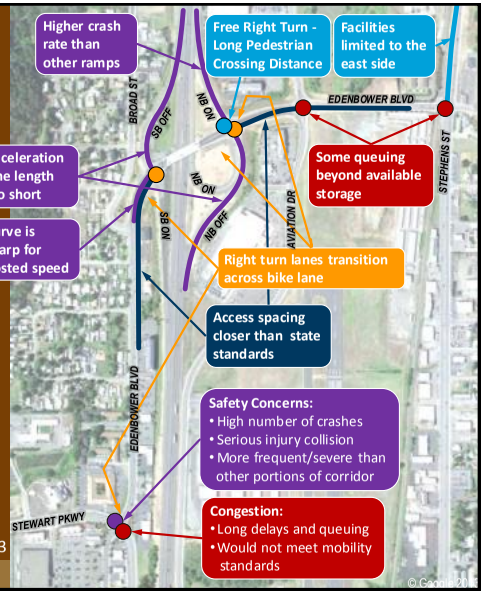
Direction/Location	V/C Ratio	
	Design Hour (4:30-5:30 PM)	Alternate Hour (7:30-8:30 AM)
I-5 Northbound		
Mainline South of IC 127	0.43	0.28
Diverge: IC 127 Northbound Off Ramp	0.16	0.19
Mainline between Off and On Ramps	0.36	0.20
Merge: IC 127 Eastbound to Northbound On Ramp	0.42	0.22
Mainline between On Ramps	0.41	0.22
Merge: IC 127 Westbound to Northbound On Ramp	0.47	0.24
Mainline North of IC 127	0.46	0.24
I-5 Southbound		
Mainline North of IC 127	0.37	0.36
Diverge: IC 127 Southbound Off Ramp	0.19	0.20
Mainline between Off and On Ramps	0.28	0.27
Merge: IC 127 Southbound On Ramp	0.46	0.32
Mainline South of IC 127	0.45	0.31

Expected Crash Frequency per Year

Location	Expected Crash Frequency per Year	
	Existing	Baseline
Segments along Edenbower Blvd.		
Stewart Pkwy to Broad St.	2.03	2.29
Broad St. to SB Ramp Terminal	0.22	0.28
SB Ramp Terminal to NB Ramp Terminal	0.26	0.30
NB Ramp Terminal to Aviation Dr.	0.26	0.31
Aviation Dr. to Stephens St.	0.63	0.71
Intersections		
Edenbower Blvd. at Stewart Pkwy.	5.53	6.41
Edenbower Blvd. at Broad St.	0.64	0.78
Edenbower Blvd. at SB Ramp Terminal	2.25	2.82
Edenbower Blvd. at NB Ramp Terminal	2.02	2.28
Edenbower Blvd. at Aviation Dr.	1.94	2.22
Edenbower Blvd. at Stephens St.	2.60	2.81
Total	**18.38**	**21.23**

- Predictions were made using:
  - Crash characteristics for the facility type
  - HSM crash modification factors
  - Forecast ADTs
  - Existing crash data (for calibration purposes)
- Higher future volumes → slightly higher overall crash frequency

Identified Issues



LEGEND

- Spot Issue
- Segment Issue
- Safety
- Operational
- Access
- Pedestrian
- Bicycle

Next Steps

- Concept Analysis and Evaluation
- Selection of Preferred Concepts
- Upcoming Meeting Dates
  - Next TAC and CAC Meetings

I-5 Exit 127 Interchange Area Management Plan
Citizen Advisory Committee

Meeting #1

11:00 AM to 1:00 PM

April 1, 2013

ODOT Region 3 Offices
3500 NW Stewart Parkway
Roseburg, OR 97470

ATTENDANCE

Greg Gardner	Lowe's
Brian Davis	City of Roseburg Staff (substitute for Paul Hintz)
Burt Tate	Bike/Ped Coalition (substitute for John McLean)
Gordon Brown	City of Roseburg Planning Commission (substitute for Scott Ingeman)
Richard Weckerle	City of Roseburg Public Works Commission

I-5 Interchange 127 Area Management Plan
Citizen Advisory Committee (CAC)

Meeting #1
11:00 AM – 1:00 PM
April 1, 2013

ODOT Region 3 Offices
3500 NW Stewart Parkway
Roseburg, OR 97470

Meeting Notes

Attendees: See Attached List

Introductions

Allie Krull opened the first Citizen Advisory Committee (CAC) meeting with a round of introductions, where each person in attendance stated their name and community or organization they were representing. She introduced herself as the ODOT project manager and identified the consultant team from David Evans and Associates (DEA).

Work Completed

Jennifer Danziger, the Consultant project manager, provided the group with a description of the project study area, planning process, public involvement, and goals/objectives that will guide this study. These items were summarized in slides 2 through 9 and are presented in Technical Memorandum #1 – Definition and Background.

Jennifer went on to summarize the environmental and land use reconnaissance done in the study area and present maps specific to the study area. Angela Rogge, the Consultant Traffic Analyst, summarized the work that has been conducted thus far to evaluate existing and future baseline conditions. Slides 10 through 32 summarize the findings which are presented in:

- Technical Memorandum #2 – Existing Conditions Analysis
- Technical Memorandum #3 – Future Baseline Traffic Conditions

Jennifer and Angela summarized the list of deficiencies that have been identified through observations and analyses to date.

Project Discussion

Jennifer and Angela opened the floor up for comments, suggestions, and concerns regarding the deficiencies summarized. The intent was to gain perspective and ideas for the next phase of the project: concept development.

The following comments/questions were received during the discussion:

- Can you explain more about access spacing and access management?
- Sight distance on northbound off-ramp is a problem when making a left onto Edenbower Boulevard.

- Maybe a lower speed on Edenbower Boulevard, such as 25 mph, is more appropriate.
- Post what coordination speed is for traffic signals and people will drive it.
- Pine Street speed was reduced and people learned.
- Trains are shorter and operate on a regular schedule. They are generally not a problem.
- Any chance of light rail transit coming to Roseburg?
- Broad Street may be City jurisdiction now. *DEA will confirm.*
- Queuing at Stewart Parkway and Stephens Street intersections with Edenbower Boulevard is accurate.
- Maybe convert one through lane on Stewart Parkway to a left-turn lane to improve how the intersection operates. There is more traffic turning left than going through.
- Maybe longer green time for left turns would work better; the storage bay is never cleared during busy times of day.
- It's difficult to see traffic in sideview mirror when using the westbound to northbound on-ramp.
- The 13 crashes at the northbound off-ramp intersection with Edenbower Boulevard are likely related to left turns.
- Vehicles turning left from Stephens to Edenbower can slow as they go over the railroad tracks.
- Check crossing signal types. Will we convert to audible signals?
- Aviation Drive is working much better with city improvements.
- Aviation Drive is striped with two solid yellow lines in front of driveways to Lowes, which may cause confusion about turning.
- Would think that more development would occur outside city limits than inside because taxes are lower.
- Surprised that employment growth is so much lower than population growth.
- Can we beautify the interchange? Exit 127 is the entry to the city. Soften the area with landscaping and get rid of the chain link fence.
- Concern that ODOT will not listen to the CAC based on past experience.

Next Steps

DEA will take comments from the advisory committee meetings and open house and use them to develop improvement alternatives to address deficiencies for the next phase of the project. Analysis of the concepts will be conducted; concepts evaluation and presentation will occur during the next TAC and CAC meetings which are expected to occur in July or August 2013. We will provide as much notice as possible about the schedule for future meetings.

Attachments:
Attendance Sheet
PowerPoint Presentation

I-5 Exit 127 Interchange Area Management Plan
Technical Advisory Committee

Meeting #1

10:00 AM to 12:00 PM

April 2, 2013

ODOT Region 3 Offices
3500 NW Stewart Parkway
Roseburg, OR 97470

AGENDA

---

1. Introductions — Allie Krull, ODOT

2. Work Completed — Jennifer Danziger, DEA; Angela Rogge, DEA
   - Project Definition
   - Existing Conditions
   - Future Baseline Conditions
   - Draft Deficiency Matrix

3. Project Discussion — All
   - Concept Development

4. Next Steps — Jennifer Danziger, DEA; Allie Krull, ODOT
   - Schedule
   - Upcoming meetings

I-5 Exit 127

Interchange Area Management Plan

Technical Advisory Committee
April 2, 2013

Oregon Department of Transportation

Presentation Topics

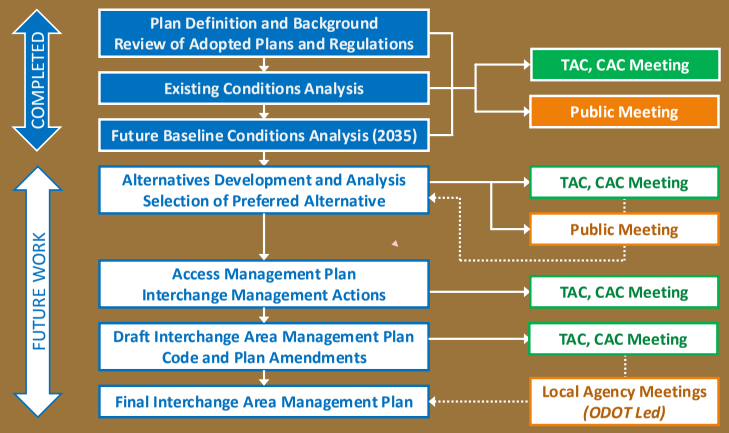
1. Project Overview
   - Process
   - Goals & Objectives
2. Work Completed
   - Environmental and Land Use Reconnaissance
   - Existing Conditions Analysis
   - Future Analysis
   - Summary of Deficiencies
3. Next Steps

What is an IAMP?

- A plan for managing the interchange and surrounding areas through the year 2035
- A plan to protect the function and capacity of the interchange and cross streets
- A plan expressing the management objectives of ODOT, Douglas County, and Roseburg

IAMP Planning Area

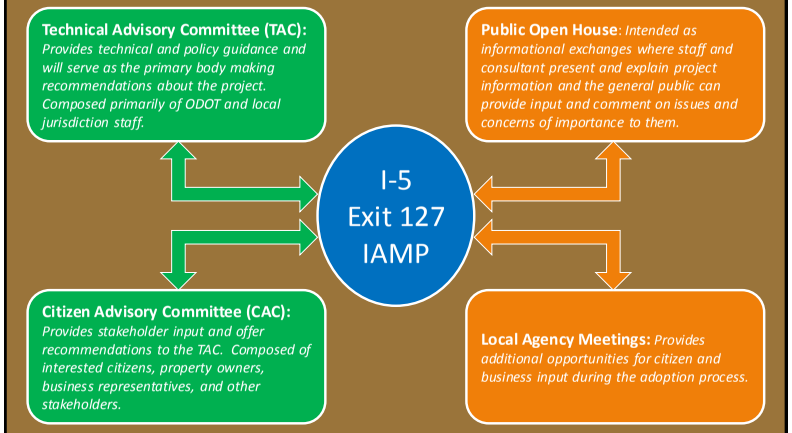
Planning Process



CAC & Open House Comments

- Citizen Advisory Committee
  - 5 attended
  - General agreement with issues
  - Supportive of recent improvements
  - NB on-ramp sight distance
  - NB off-ramp sight distance
- Open House
  - 8 attended
  - City Councilor, residents, business owners
  - Heard about meeting from newspaper & radio
  - General agreement with issues
  - No roundabout!

Public Involvement Process



IAMP Goal

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 Douglas County communities.

IAMP Objectives

- Protect the function of the interchange and Edenbower Road 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.

IAMP Objectives (continued)

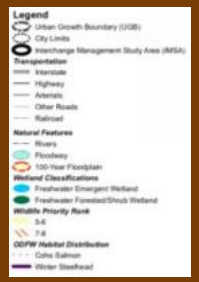
- Incorporate bicycle and pedestrian elements, such as sidewalks, bike lanes, and pathways, as well as corresponding roadway crossings.
- Develop an access management plan that provides for safe and acceptable operations on the transportation network, and moves towards achieving the applicable access 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

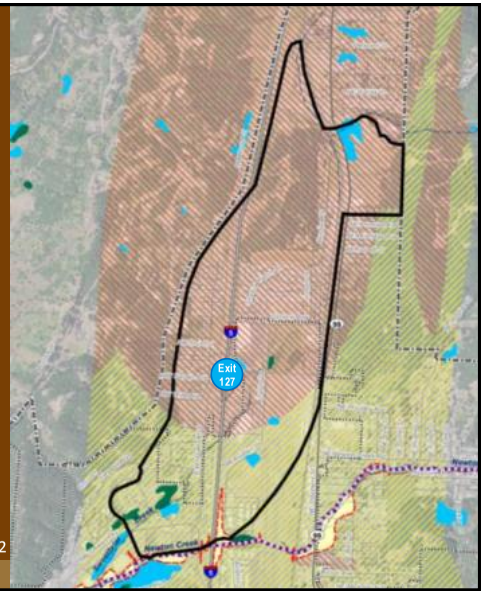
Environmental and Land Use Reconnaissance

Reconnaissance was performed to understand existing environmental and land use issues and help inform the process of developing conceptual alternatives.

- Environmental Reconnaissance
  - Natural resources such as riparian corridors, wetlands, wildlife habitat, and recreation trails
  - Wildlife crossings and threatened and endangered species
  - Floodplains and floodways

Natural Features



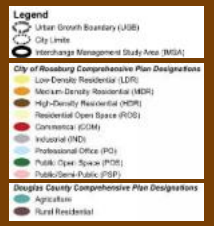


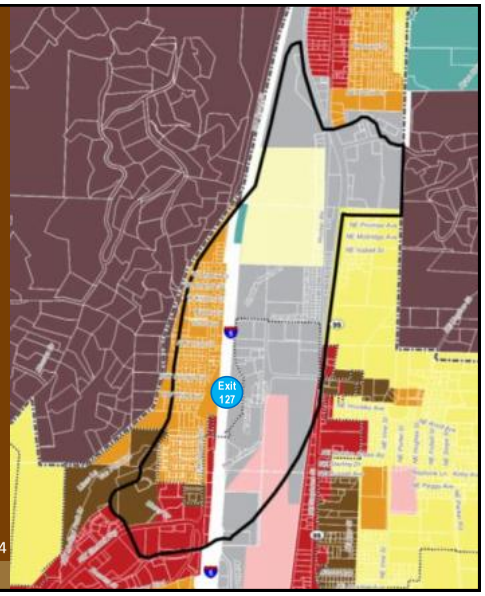
Land Use Reconnaissance (continued)

- Land Use Summary
  - Zoning and Comprehensive Plan designations
  - Community features
    - Parks and recreation areas
    - Historical and Archaeological Resources
    - Section 4(f) and 6(f) resources
- Socioeconomic and Environmental Justice

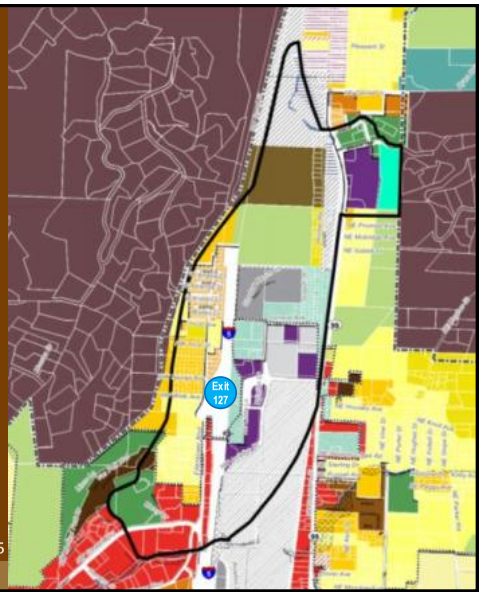
Tech Memo #2 includes an Environmental and Land Use "Red Flag" Summary

Comprehensive Plan

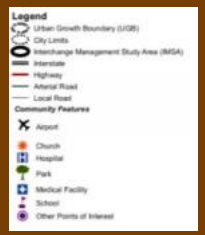


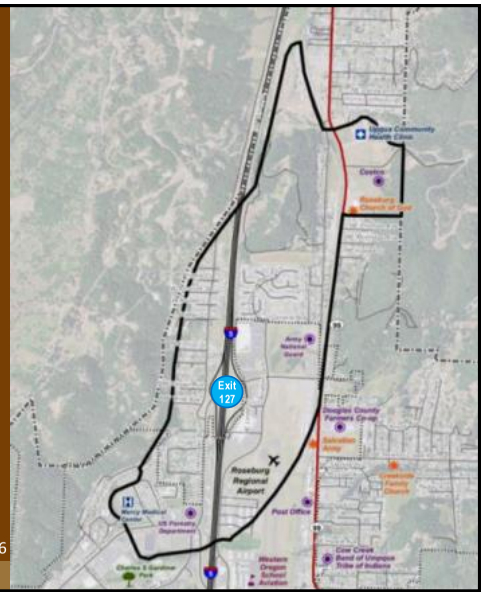


Zoning Map



Community Features

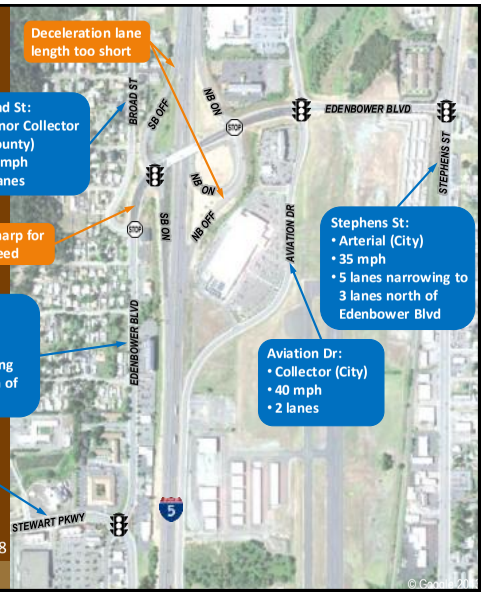




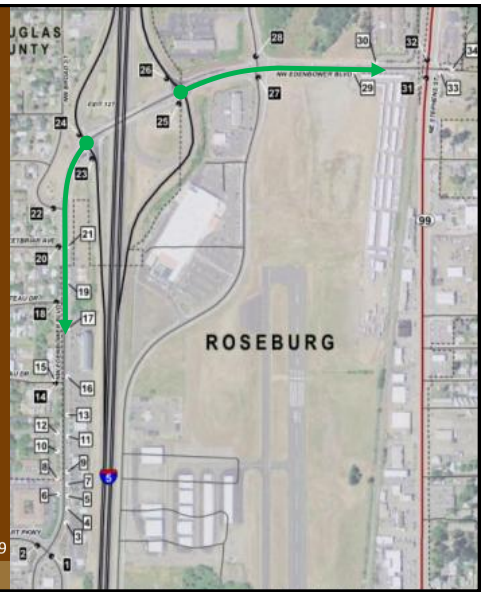
Existing Condition Analysis

- Transportation System Inventory
  - Roadways
  - Access
  - Pedestrian and Bicycle Facilities
  - Transit
  - Freight
  - Rail
- Traffic Conditions
  - Design Hourly Volumes - 2012
  - Traffic Operations – 6 intersections and Freeway
  - Crash History – 2006 through 2010

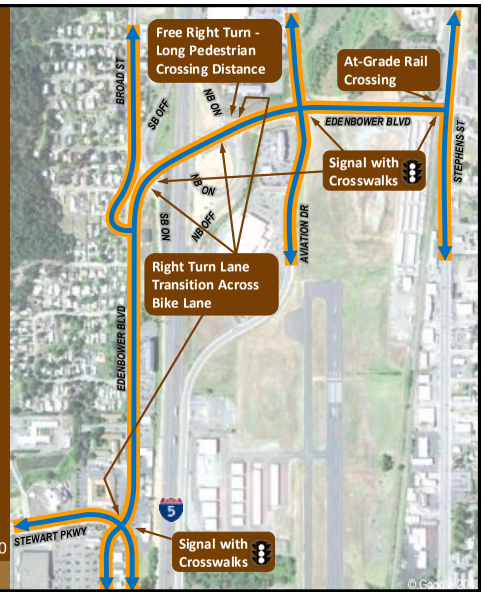
Roadway Facilities



Access Inventory



Bicycle & Pedestrian Facilities



Transit & Rail Facilities

Legend

- Umpqua Transit Red Route
- Umpqua Transit Green Route
- Umpqua Transit Orange Route
- Umpqua Transit Stop
- Central Oregon and Pacific (CORP) Railroad

Dial-a-ride service is also provided in study area

Existing Traffic Volumes

- 6 intersections along Edenbower Boulevard
- Freeway merge/diverge points
- Traffic count data primarily collected in 2012
- Common peak hour between 4:30 and 5:30 PM
- Converted to design hourly volumes (DHV) = 30th highest hour

Existing Traffic Volumes

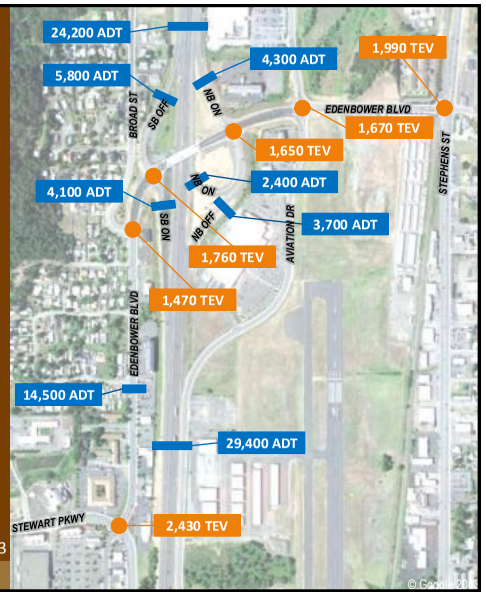
Legend

TEV = Total Entering Vehicles (at an intersection in 1 hour)

ADT = Average Daily Traffic (on a roadway segment)

2012 TEV

2010 ADT



Intersection Operations Evaluation

- Performance Measures
  - Volume/Capacity Ratio
    - *Volume = Traffic Demand*
    - *Capacity = Maximum Throughput*
  - Level of Service A through F based on delay
  - 95th Percentile Queues
- Performance Standards

Location	ODOT	Roseburg	Douglas County
I-5 Mainline	V/C <= 0.80	-	-
I-5 NB Ramp Terminal	V/C <= 0.85	-	-
I-5 SB Ramp Terminal	V/C <= 0.85	-	-
Edenbower Blvd		LOS D or better	-
Stewart Pkwy	-	LOS D or better	-
Broad St	-	LOS D or better	V/C <= 0.95
Aviation Dr	-	LOS D or better	-
Stephens St	V/C <= 0.85	LOS D or better	-

2012 Existing Intersection Operations

Intersection	Critical Movement	V/C Ratio	LOS	Operational Standards	
				OHP	City/County
1. Edenbower Blvd at Stewart Pkwy	Overall	0.85*	C	-	LOS D
2. Edenbower Blvd at Broad St	EB L/R	0.13	B	-	LOS D/0.95
3. Edenbower Blvd at SB Ramp Terminal	Overall	0.57	B	0.85	LOS D
4. Edenbower Blvd at NB Ramp Terminal	NB R	0.42	B	0.85	LOS D
5. Edenbower Blvd at Aviation Dr	Overall	0.50	B	-	LOS D
6. Edenbower Blvd at Stephens St	Overall	0.67*	C	-	LOS D

Acronyms: EB = eastbound; WB = westbound; NB = northbound; and SB = southbound. L = left; T = through; and R = right.

* 95th percentile queues exceed available storage in one or more travel lanes

2012 Existing Freeway Operations

Direction/Location	V/C Ratio	
	Design Hour (4:30-5:30 PM)	Alternate Hour (7:30-8:30 AM)
I-5 Northbound		
Mainline South of IC 127	0.30	0.19
Diverge: IC 127 Northbound Off Ramp	0.14	0.12
Mainline between Off and On Ramps	0.24	0.14
Merge: IC 127 Eastbound to Northbound On Ramp	0.29	0.15
Mainline between On Ramps	0.29	0.15
Merge: IC 127 Westbound to Northbound On Ramp	0.32	0.17
Mainline North of IC 127	0.31	0.17
I-5 Southbound		
Mainline North of IC 127	0.26	0.24
Diverge: IC 127 Southbound Off Ramp	0.14	0.14
Mainline between Off and On Ramps	0.20	0.18
Merge: IC 127 Southbound On Ramp	0.30	0.22
Mainline South of IC 127	0.29	0.22

Safety Summary

- 124 crashes over 5 years (2006 through 2010)
  - 2 crashes resulted in severe injury(s)
  - 49 crashes resulted in minor injury(s)
- 28 Freeway Crashes
  - Comparable to average crash rates for interstate freeways
- Critical Crash Rates
  - Used to identify locations that warrant further investigation
  - One intersection: Edenbower Blvd & Stewart Pkwy
- Worst 10% Safety Priority Index System (SPIS) Site
  - No SPIS locations in study area

IAMP 127 Crash Summary

Legend

- Intersection Crashes
- Segment Crashes
- Severe Injuries Occurred
- Other Injuries or Property Damage Only

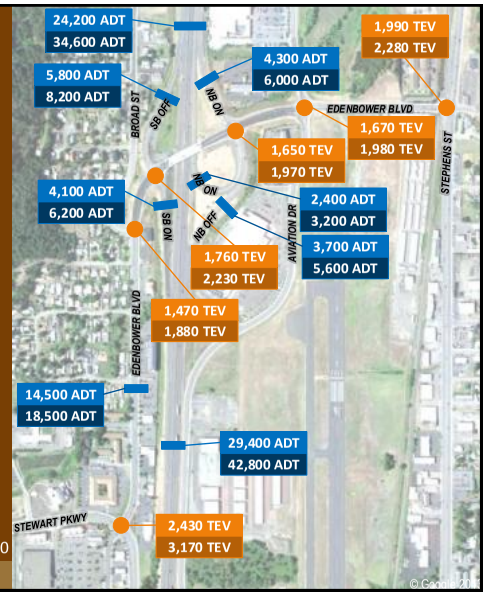
Future Baseline Condition Analysis

- Future Traffic Volumes
  - 2035 – Analysis year
  - Based on Roseburg Travel Demand Model
    - Assumes 1.2 percent population growth in City
    - Assumes 1.0 percent population growth outside City

Land Use	2009	2035	Growth
Population	22,203	29,628	33%
Employment	24,315	28,243	16%

  - Peak Hour Volumes at Intersections
  - Average Daily Volumes on Segments

Future Baseline Traffic Volumes



Legend

TEV = Total Entering Vehicles (at an intersection in 1 hour)

ADT = Average Daily Traffic (on a roadway segment)

2012 TEV
2035 TEV
2010 ADT
2035 ADT

2035 Future Baseline Intersection Operations

Intersection	Critical Movement	V/C Ratio	LOS	Operational Standards	
				OHP	City/County
1. Edenbower Blvd at Stewart Pkwy	Overall	1.02*	E	-	LOS D
2. Edenbower Blvd at Broad St	EB L/R	0.23	C	-	LOS D/0.95
3. Edenbower Blvd at SB Ramp Terminal	Overall	0.69	B	0.85	LOS D
4. Edenbower Blvd at NB Ramp Terminal	NB R	0.49	C	0.85	LOS D
5. Edenbower Blvd at Aviation Dr	Overall	0.61*	B	-	LOS D
6. Edenbower Blvd at Stephens St	Overall	0.71*	C	-	LOS D

Acronyms: EB = eastbound; WB = westbound; NB = northbound; and SB = southbound. L = left; T = through; and R = right.

* 95th percentile queues exceed available storage in one or more travel lanes

2035 Future Baseline Freeway Operations

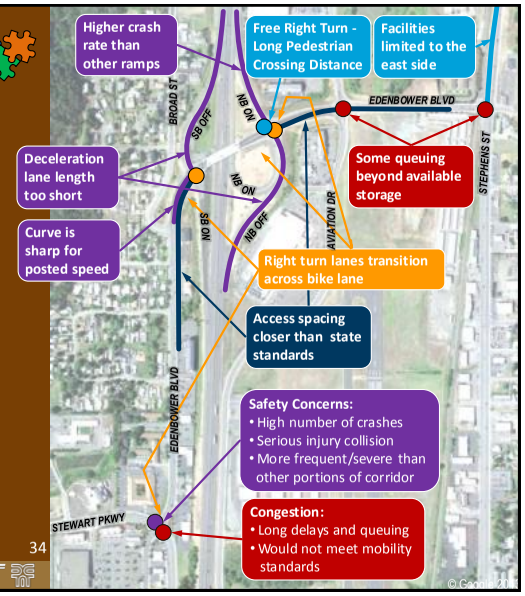
Direction/Location	V/C Ratio	
	Design Hour (4:30-5:30 PM)	Alternate Hour (7:30-8:30 AM)
I-5 Northbound		
Mainline South of IC 127	0.43	0.28
Diverge: IC 127 Northbound Off Ramp	0.16	0.19
Mainline between Off and On Ramps	0.36	0.20
Merge: IC 127 Eastbound to Northbound On Ramp	0.42	0.22
Mainline between On Ramps	0.41	0.22
Merge: IC 127 Westbound to Northbound On Ramp	0.47	0.24
Mainline North of IC 127	0.46	0.24
I-5 Southbound		
Mainline North of IC 127	0.37	0.36
Diverge: IC 127 Southbound Off Ramp	0.19	0.20
Mainline between Off and On Ramps	0.28	0.27
Merge: IC 127 Southbound On Ramp	0.46	0.32
Mainline South of IC 127	0.45	0.31

Expected Crash Frequency per Year

Location	Expected Crash Frequency per Year	
	Existing	Baseline
Segments along Edenbower Blvd.		
Stewart Pkwy to Broad St.	2.03	2.29
Broad St. to SB Ramp Terminal	0.22	0.28
SB Ramp Terminal to NB Ramp Terminal	0.26	0.30
NB Ramp Terminal to Aviation Dr.	0.26	0.31
Aviation Dr. to Stephens St.	0.63	0.71
Intersections		
Edenbower Blvd. at Stewart Pkwy.	5.53	6.41
Edenbower Blvd. at Broad St.	0.64	0.78
Edenbower Blvd. at SB Ramp Terminal	2.25	2.82
Edenbower Blvd. at NB Ramp Terminal	2.02	2.28
Edenbower Blvd. at Aviation Dr.	1.94	2.22
Edenbower Blvd. at Stephens St.	2.60	2.81
Total	**18.38**	**21.23**

- Predictions were made using:
  - Crash characteristics for the facility type
  - HSM crash modification factors
  - Forecast ADTs
  - Existing crash data (for calibration purposes)
- Higher future volumes → slightly higher overall crash frequency

Identified Issues



Next Steps

- Concept Analysis and Evaluation
- Selection of Preferred Concepts
- Upcoming Meeting Dates
  - Next TAC and CAC Meetings

KRULL Allie

Distribution List Name: IAMP127 TAC

Members:

(MDanielle@cityofroseburg.org)	MDanielle@cityofroseburg.org - out
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~~HANNEMAN Roxanne M * ODOT~~	Roxanne.M.HANNEMAN@odot.state.or.us
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WEIDNER Tara J	Tara.J.WEIDNER@odot.state.or.us
Angela Reggie	
~~Teresa Clemons~~	
Brian Davis - in for Paul	

I-5 Interchange 127 Area Management Plan
Technical Advisory Committee (TAC)

Meeting #1
10:00 AM – 12:00 PM
April 2, 2013

ODOT Region 3 Offices
3500 NW Stewart Parkway
Roseburg, OR 97470

Meeting Notes

Attendees: See Attached List

Introductions

Allie Krull opened the first Citizen Advisory Committee (CAC) meeting with a round of introductions, where each person in attendance stated their name and community or organization they were representing. She introduced herself as the ODOT project manager and identified the consultant team from David Evans and Associates (DEA).

Work Completed

Jennifer Danziger, the Consultant project manager, provided the group with a description of the project study area, planning process, public involvement, and goals/objectives that will guide this study. These items were summarized in slides 2 through 9 and are presented in Technical Memorandum #1 – Definition and Background.

Jennifer went on to summarize the environmental and land use reconnaissance done in the study area and present maps specific to the study area. Angela Rogge, the Consultant Traffic Analyst, summarized the work that has been conducted thus far to evaluate existing and future baseline conditions. Slides 10 through 32 summarize the findings which are presented in:

- Technical Memorandum #2 – Existing Conditions Analysis
- Technical Memorandum #3 – Future Baseline Traffic Conditions

Jennifer and Angela summarized the list of deficiencies that have been identified through observations and analyses to date.

Project Discussion

Jennifer and Angela opened the floor up for comments, suggestions, and concerns regarding the deficiencies summarized. The intent was to gain perspective and ideas for the next phase of the project: concept development.

The following comments/questions were received during the discussion:

- We did check deceleration lengths when the ramp designs were updated and thought it was sufficient. Turn lanes were added to shorten queue lengths.
- How is the noon hour for traffic volumes? *DEA will check.*

- Signing for right-turn to yield to bike/ped has worked in places outside the study area.
- Aviation Drive queuing was fixed by actuation.
- The signal timing was set to provide a gap for side street traffic (northbound off-ramp and Broad Street), but depending on when you arrive at the intersection you may have to wait for it (people can get impatient).
- Roundabout would have eliminated need for two future signals and was originally JTA funded.
- Traffic counts in 2009 (after Costco) were lower than the zone change projection.
- The City is currently looking at whether or not improvements are warranted at Stephens Street at Edenbower Boulevard (southbound right-turn overlap), as well as Broad Street at Edenbower Boulevard (difficult to enter/exit Edenbower).
- A significant amount of the residents off of Broad Street are elderly.
- Were there any bike/ped crashes in the study area? (Response: No, there weren't any reported)
- We could look at coordination between Stephens Street and Aviation Drive.
- There have been some minor changes in traffic patterns since Costco went in and the OR 99 Bridge was reopened.
- Are the crashes on the northbound on-ramp rear end crashes? Could they be due to truck traffic having to go uphill?
- Could there be geometric concerns with I-5 traveling "up" while the on ramp is a sag curve?

Next Steps

DEA will take comments from the advisory committee meetings and open house and use them to develop improvement alternatives to address deficiencies for the next phase of the project. Analysis of the concepts will be conducted; concepts evaluation and presentation will occur during the next TAC and CAC meetings which are expected to occur in July or August 2013. We will provide as much notice as possible about the schedule for future meetings.

Attachments:
Attendance Sheet
PowerPoint Presentation

I-5 Exit 127 Interchange Area Management Plan
Citizen Advisory Committee

Meeting #2

10:00 AM to 12:00 PM

August 12, 2013

ODOT Region 3 Offices
3500 NW Stewart Parkway
Roseburg, OR 97470

AGENDA

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1. Introductions	Alexandra Krull, ODOT
2. Update on Project Status	Alexandra Krull, ODOT
• Overview of Process	Jennifer Danziger, DEA
• Current Status	
3. IAMP Improvement Concepts	Jennifer Danziger, DEA
• Concept Development	Joshan Rohani, DEA
• Concept Analysis	
4. Discussion	All
• Ideas for modifications to concepts or additional concepts that could be evaluated	
• Input for selection of preferred concepts	
5. Next Steps	Jennifer Danziger, DEA
• Schedule	Alexandra Krull, ODOT
• Upcoming meetings	

I-5 Exit 127

Interchange Area Management Plan

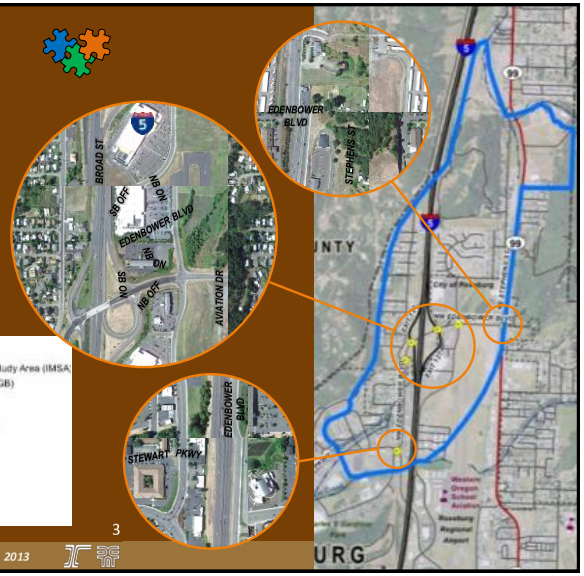
Citizen Advisory Committee
August 12, 2013

Oregon Department of Transportation

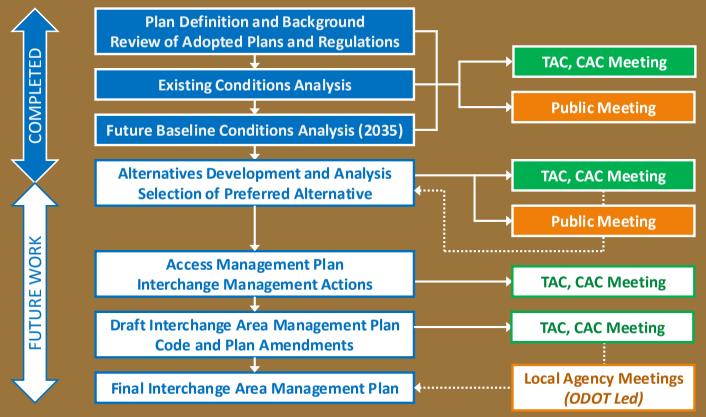
Presentation Topics

1. Project Overview Recap
2. Concept Development
3. Concept Alternatives Analysis
4. Discussion
   - Ideas for modifications to concepts or additional concepts that could be evaluated
   - Input for selection of preferred concepts
5. Next Steps

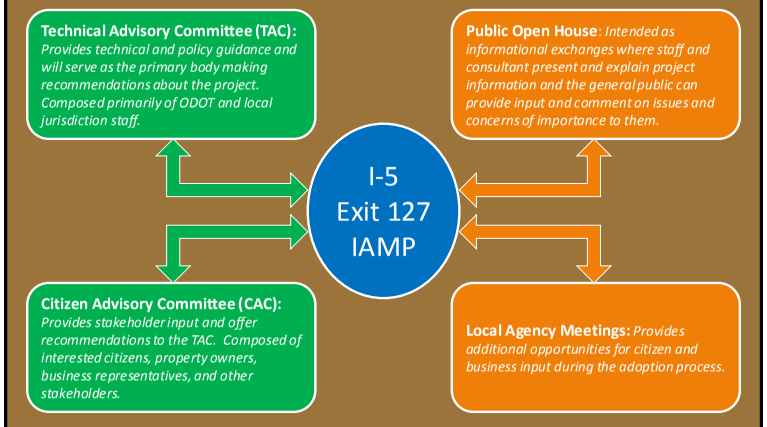
IAMP Planning Area



Planning Process



Public Involvement Process



Concept Development

- Concepts are intended to address identified deficiencies
  - Existing and Future Conditions (2012 and 2035)
  - Operations (congestion, delays, queuing)
  - Safety (crash patterns, potential conflicts)
  - Geometry
- Concepts were developed to meet IAMP Objectives

IAMP Objectives

- Protect the function of the interchange and Edenbower Rd
- Improve safety and maximize operational efficiency
- Address future needs
- Identify potential local system enhancements
- Incorporate bicycle and pedestrian elements
- Develop an access management plan
- Coordinate planning efforts
- Prioritize improvements for potential funding mechanisms

Types of Improvements

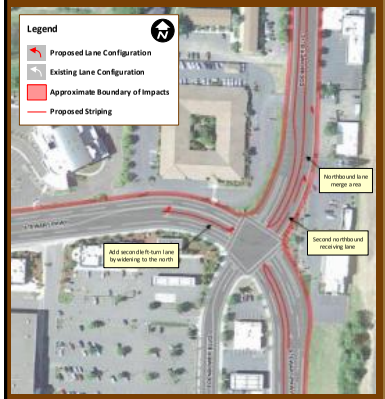
- Intersection Improvements
  Potential improvements to improve traffic flow, provide additional capacity, or address safety concerns at individual intersections.
- Interchange Ramp Improvements
  Potential ramp modifications to address concerns about driver expectation.
- Multi-Modal Improvements
  Potential improvements to enhance safety and continuity of pedestrian facilities.

Concept Evaluation Criteria

- Traffic Operations and Safety
  - *Does the improvement address existing operational or safety concerns?*
  - *Does it address system deficiencies?*
  - *Would it cause additional concerns?*
- Basic Roadway Geometry and Right of Way (ROW)
  - *How might the improvement look?*
  - *Would it require additional right of way?*
  - *Are there additional factors to consider in design?*
- Environmental and Land Use
  - *Would it have any potential impact to environmental resources?*
  - *How would it affect adjacent land uses?*
- Cost Opinion*
  - *How much would it cost?*

** Cost opinions do not include estimates of ROW costs or mitigation.*

Concept 1, Option A – Add Second Eastbound Left-Turn Lane



Purpose: Improve operations

Description:
- Add second EB left turn lane on Stewart Pkwy
- Widen Edenbower Blvd for second NB lane
- Modify signal timing

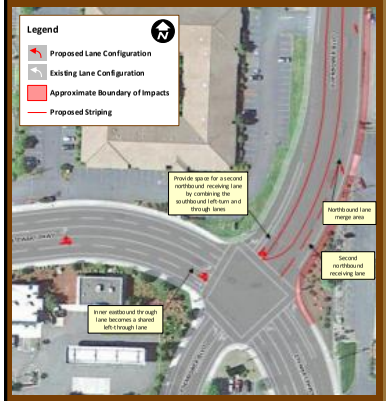
Traffic Operations & Safety:
- Improves operations from over capacity conditions with no changes to demand at 75% of capacity (meets standards)
- Reduces queuing and delays for EB left turns
- May improve safety by reducing conflicts between left-turn queues and through traffic
- Requires merge on NB Edenbower Blvd
- May require access control in merge area
- Does not improve sight distance on Stewart Pkwy

Basic Roadway Geometry & Right of Way (ROW):
- Widens Stewart Pkwy west of Edenbower Blvd to add EB left-turn lane and east of Edenbower Blvd to align though lanes
- Widens Edenbower Blvd to add NB merge lane

Environmental & Land Use:
- Impacts parking lots where widening occurs
- Could have minor impacts to wetland corridors associated with Sweetbriar and Newton Creeks

Cost Opinion:
- $1.6 million

Concept 1, Option B – Create Eastbound Shared Left-Through Lane



Purpose: Improve operations

Description:
- Convert one through lane on EB Stewart Pkwy to a shared left-through lane
- Restripe Edenbower Blvd and widen to provide second NB receiving lane
- Modify signal timing

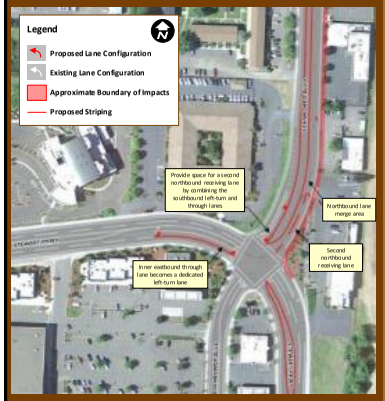
Traffic Operations & Safety:
- Improves operations from over capacity conditions with no changes to demand at 80% of capacity (meets standards)
- Reduces queuing and delays for EB left turns
- May improve safety by reducing conflicts between left-turn queues and through traffic
- Requires merge on NB Edenbower Blvd
- May require access control in merge area
- Does not improve sight distance on Stewart Pkwy

Basic Roadway Geometry & Right of Way (ROW):
- No widening on Stewart Pkwy
- Less widening on Edenbower Blvd than Option A because second NB lane partially accommodated by reallocating lanes on the SB approach

Environmental & Land Use:
- Impacts parking lots where widening occurs
- Less potential for impacts to wetland corridors associated with Sweetbriar and Newton Creeks than Option A

Cost Opinion:
- $700,000

Concept 1, Option C – Convert an Eastbound Through Lane to a Left-Turn Lane



Purpose: Improve operations

Description:
- Convert one through lane on EB Stewart Pkwy to a dedicated left-turn lane
- Restripe Edenbower Blvd and widen to provide second NB receiving lane

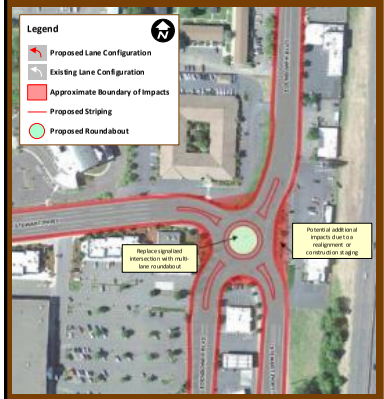
Traffic Operations & Safety:
- Improves operations from over capacity conditions with no changes to demand at 80% of capacity (meets standards)
- Reduces queuing and delays for EB left turns
- May improve safety by reducing conflicts between left-turn queues and through traffic
- Requires merge on NB Edenbower Blvd
- May require access control in merge area
- Does not improve sight distance on Stewart Pkwy
- Converting EB through lane to dedicated left-turn lane can "trap" some drivers who intend to go straight

Basic Roadway Geometry & Right of Way (ROW):
- No widening on Stewart Pkwy
- Less widening on Edenbower Blvd than Option A because second NB lane partially accommodated by reallocating lanes on the SB approach

Environmental & Land Use:
- Parking lot impacts similar to Option B
- Less potential for impacts to wetland corridors associated with Sweetbriar and Newton Creeks than Option A

Cost Opinion:
- $700,000

Concept 2 – Install Multi-Lane Roundabout



Purpose: Improve operations and safety

Description:
- Install multi-lane roundabout with dual approach lanes on all legs

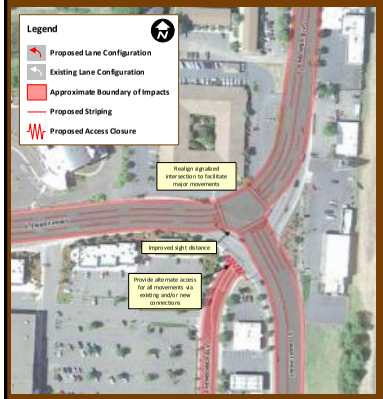
Traffic Operations & Safety:
- Improves operations from over capacity conditions with no changes to demand at 85% of capacity (meets standards)
- Roundabouts reduce conflict points and generally have both fewer and less severe crashes
- Improves sight distance on Stewart Pkwy
- Bicyclists may have trouble traveling with vehicular traffic but can travel as pedestrians through the intersection
- Pedestrian crossing widths shortened

Basic Roadway Geometry & Right of Way (ROW):
- All approaches require widening or realignment to accommodate footprint of multi-lane roundabout
- All quadrants surrounding the intersection would incur ROW impacts

Environmental & Land Use:
- Impacts parking lots where widening occurs
- Could have minor impacts to wetland corridors associated with Sweetbriar and Newton Creeks
- Widening could affect Edenbower Blvd trail accessing Charles S. Gardiner Park
- Project should be vetted with Mercy Hospital

Cost Opinion:
- $2.6 million

Concept 3 – Realign Intersection to East-West "T"



Purpose: Improve operations and safety

Description:
- Realign intersection to better accommodate major vehicular traffic movements
- Close access to Edenbower Blvd south of intersection

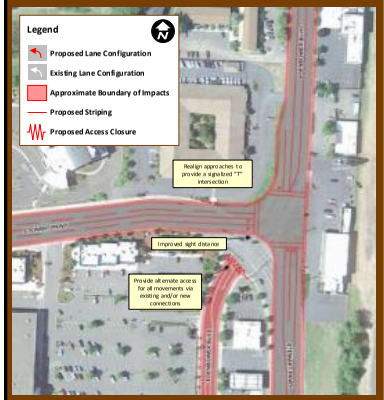
Traffic Operations & Safety:
- Improves operations from over capacity conditions with no changes to demand at 83% of capacity (meets standards)
- Redirects traffic from south leg of Edenbower Blvd → increased travel distance and more inconvenience
- Reduces volume of vehicles turning left, decreasing the likelihood of turning/angle crashes
- Addresses sight distance issues on Stewart Pkwy
- May require access control in merge area

Basic Roadway Geometry & Right of Way (ROW):
- Intersection realignment will require property acquisition
- Does not include local network or access connections to address closure of south leg of Edenbower Blvd

Environmental & Land Use:
- Impacts property and parking lots, particularly on northwest corner of intersection
- Closing south leg of Edenbower Blvd would have economic impacts to businesses served by roadway
- Low potential for impacts to wetland corridors associated with Sweetbriar and Newton Creeks
- Could affect Umpqua Transit but stop

Cost Opinion:
- $1.9 million

Concept 4, Option A – Realign Intersection to North-South "T"



Purpose: Improve operations and safety

Description:
- Realign intersection to north-south perpendicular "T"
- Close access to Edenbower Blvd south of intersection
- Provide single EB left-turn lane on Stewart Pkwy

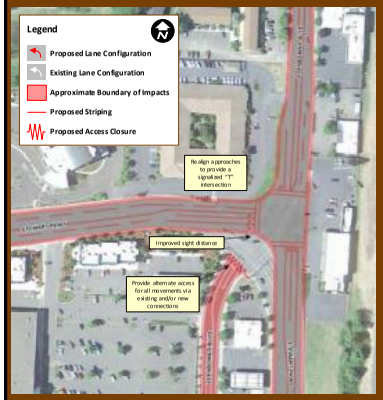
Traffic Operations & Safety:
- Improves operations from over capacity conditions with no changes to demand at 90% of capacity (not standard)
- Circulation impacts same as Concept 3
- Addresses sight distance issues on Stewart Pkwy
- May require access control near realigned intersection

Basic Roadway Geometry & Right of Way (ROW):
- Does not include local network or access connections to address closure of south leg of Edenbower Blvd
- Intersection realignment will require property acquisition
- Does not require any roadway widening beyond area affected by realignment

Environmental & Land Use:
- Impacts property and parking lots where realignment occurs
- Economic impacts same as Concept 3
- Transit impacts same as Concept 3
- Low potential for impacts to wetland corridors associated with Sweetbriar and Newton Creeks

Cost Opinion:
- $1.6 million

Concept 4, Option B – Realign Intersection to North-South "T" with Dual Left Turns



Purpose: Improve operations and safety

Description:
- Realign intersection to north-south perpendicular "T"
- Close access to Edenbower Blvd south of intersection
- Provide two EB left-turn lanes on Stewart Pkwy
- Widen Edenbower Blvd for second NB lane

Traffic Operations & Safety:
- Improves operations from over capacity conditions with no changes to demand at 60% of capacity (meets standard)
- Circulation impacts same as Concept 3
- Addresses sight distance issues on Stewart Pkwy
- May require access control near realigned intersection and along Edenbower Blvd

Basic Roadway Geometry & Right of Way (ROW):
- Does not include local network or access connections to address closure of south leg of Edenbower Blvd
- Intersection realignment will require property acquisition
- Widens Edenbower Blvd to add NB merge lane

Environmental & Land Use:
- Same impacts as Option A for northwest corner
- Property and parking impacts on Edenbower Blvd north of intersection for merge lane
- Same economic and transit impacts as Concept 3
- Low potential for impacts to wetland corridors associated with Sweetbriar and Newton Creeks

Cost Opinion:
- $1.9 million

Concept 5 – Extend Westbound Right-Turn Bay

Purpose: Address queuing concerns

Description:
- Extend WB right-turn bay at the intersection of Aviation Dr and Edenbower Blvd

Traffic Operations & Safety:
- Improve safety by allowing the right-turn traffic to get out of the way of through traffic
- Keeps bike lane clear of stopped vehicles

Basic Roadway Geometry & Right of Way (ROW):
- Widens Edenbower Blvd to extend westbound right-turn lane on north side of roadway
- Lighting and sidewalks need to be relocated

Environmental & Land Use:
- Mapped wetlands identified in close proximity although any roadside wetland area likely to be highly degraded
- Improvement not anticipated to extend into undisturbed area

Cost Opinion:
- $75,000

Concept 6 – Extend Left-Turn Bays

Purpose: Address queuing concerns

Description:
- Extend striped EB left-turn bay on Edenbower Blvd at Stephens St
- Extend NB left-turn bay on Stephens St at Edenbower Blvd

Traffic Operations & Safety:
- May improve safety by reducing conflicts between left-turn queues and through traffic
- May reduce delay for other travel movements

Basic Roadway Geometry & Right of Way (ROW):
- Project would occur within the existing paved roadway

Environmental & Land Use:
- No impacts

Cost Opinion:
- $15,000

Concept 7 – Delineate Gore Area with Chevron Paint

Purpose: Address driver expectation concerns

Description:
- Provide additional delineation in gore area of the northbound on-ramp with chevron striping

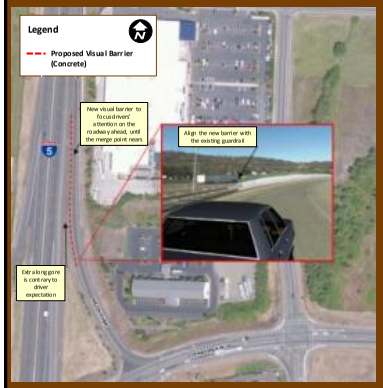
Traffic Operations & Safety:
- Provides visual cue to drivers of the appropriate time to merge
- No impact on capacity

Basic Roadway Geometry & Right of Way (ROW):
- Project would occur within the existing paved roadway
- Assumes 8" striping

Environmental & Land Use:
- No impacts

Cost Opinion:
- $20,000

Concept 8 – Install Visual Barrier



Purpose: Address driver expectation concerns

Description:
- Install a visual barrier on the westbound to northbound on-ramp

Traffic Operations & Safety:
- 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

Basic Roadway Geometry & Right of Way (ROW):
- Project would occur within the existing paved roadway
- Assumes concrete barrier with glare shields

Environmental & Land Use:
- No impacts

Cost Opinion:
- $100,000

Concept 9 – Improve North Side Pedestrian Crossing

Purpose: Improve safety and continuity of pedestrian facilities

Description:
- Improve east-west pedestrian crossing across NB on-ramp by adding a raised island or extending existing curb and sidewalk

Traffic Operations & Safety:
- Shortens distance pedestrian has to cross intersection with raised island or curb and sidewalk extension
- Could include striped crosswalk to further increase driver awareness of pedestrian activity
- Reduces pedestrian exposure with vehicular traffic
- No reduction in vehicular capacity
- Vehicle carrying capacity would be similar to other on-ramps at interchange

Basic Roadway Geometry & Right of Way (ROW):
- Construction of raised island or curb extension needs to meet geometric requirements for WB right turn and NB through movement from off-ramp
- Improvements would occur within existing paved roadway

Environmental & Land Use:
- No impacts

Cost Opinion:
- $20,000

Concept 10 – Enhance Pedestrian Crossing along Edenbower Boulevard

Purpose: Improve safety and continuity of pedestrian facilities

Description:
- Enhance pedestrian crossings by installing striped crosswalks and directional ADA compliant curb ramps for north-south travel along west side of Edenbower Blvd

Traffic Operations & Safety:
- Enhanced curb ramps improve directional guidance
- Striped crosswalks help identify the presence of pedestrian activity and increase visibility to motorists turning onto side streets
- Clearly defined and frequent crosswalks may encourage slower travel speeds along Edenbower Blvd
- No impact on vehicular capacity

Basic Roadway Geometry & Right of Way (ROW):
- Improvements would occur within the available ROW

Environmental & Land Use:
- No impacts

Cost Opinion:
- $25,000

Next Steps

- Selection of Preferred Improvements
  - Analysis of modified or additional concepts
  - Recommendation for preferred combination of improvements
- Access Management Plan
  - Actions that may be triggered as
    - Land use changes occur (new development or redevelopment)
    - Future roadway improvements are implemented
    - Safety and operational issues arise
- Other Management Actions
  - Actions that protect and extend the life of the interchange for all modes of travel

I-5 Exit 127 Interchange Area Management Plan

Citizen Advisory Committee

Meeting #2

10:00 AM to 12:00 PM

August 12, 2013

ODOT Region 3 Offices
3500 NW Stewart Parkway
Roseburg, OR 97470

ATTENDANCE

Name	Organization
John McLean	Roseburg Bicycle/Pedestrian Coalition
Jeff Nelson	City of Roseburg
Scott Ingeman	Planning Comm.
Paul Hintz	

Filename: IAMP127 CAC2 Attendance 081213.docx

I-5 Interchange 127 Area Management Plan

Citizen Advisory Committee (CAC)

Meeting #2
10:00 AM – 12:00 PM
August 12, 2013

ODOT Region 3 Offices
3500 NW Stewart Parkway
Roseburg, OR 97470

Meeting Notes

Attendees: See Attached List

Introductions

Allie Krull opened the first Citizen Advisory Committee (CAC) meeting with a round of introductions.

Work Completed

Jennifer Danziger, the Consultant project manager, provided the group with an overview of the project and where we are in the planning process.

Jennifer went on to explain the concept development process, the types of improvements developed and how they were evaluated. The concepts presented were meant to exhaust all possible solutions regardless of cost and impact. Slides 10 through 22 summarize the concepts which are presented in Technical Memorandum #4 – Concept Development and Evaluation.

Project Discussion

As they moved through the presentation of concepts, Jennifer and Joshan opened the floor up for comments, suggestions, and concerns regarding the proposed concepts. The intent was to gain perspective and ideas for the next phase of the project: selection of preferred alternative.

The following comments/questions were received during the discussion:

- **Concept 1A – Add Second Eastbound Left-Turn Lane**
    - There was concern expressed about the merge area north of Stewart Pkwy and how it would function.
    - What would happen to driveway access where there are two lanes on Edenbower Boulevard?
    - The posted speed of 40 mph seems to cause people to drive too fast when approaching traffic signals

- **Concept 1B – Create Eastbound Shared Left-Through Lane**
    - Positive feedback was received for the shared lane.
    - In general, large trucks will use the outer left-turn lane because it makes turning easier.

    - Can we reduce the outside receiving lane width on Edenbower Boulevard, it seems to wide in the concept drawing?
    - Split phasing would give drivers confidence that they were going to get through the signal.

- **Concept 1C – Convert an Eastbound Through Lane to a Left-Turn Lane**
    - I can see the concern about a trap lane.
    - Committee expressed a preference for Option 1B over 1C.

- **Concept 2 – Install Multi-Lane Roundabout**
    - Roundabouts don't work well when "shoe-horned" into restricted areas.
    - This is the second busiest intersection in Roseburg; it doesn't seem like the right place to introduce a roundabout, much less one with multiple lanes.

- **Concept 3 – Realign Intersection to East-West "T"**
    - A number of committee members expressed concern about the large impacts to businesses and the Forest Service building.
    - This option doesn't work any better than left-turn lanes.

- **Concept 4A/4B – Realign Intersection to North-South "T"/ with dual left-turns**
    - Again, committee was concerned about the large impacts to businesses and the Forest Service building.
- **General Comments for Stewart Parkway/Edenbower Boulevard Intersection**
    - Committee prefers Concept 1B for Edenbower/Stewart intersection improvements
    - There was a question about how long drivers are waiting at intersection now. Someone said as they've heard 80 seconds.

- **Concept 5 – Extend Westbound Right-Turn Bay (Edenbower Blvd/Aviation Dr)**
    - General feedback that the intersection works well now.
    - Project should only be considered if there is an issue.

- **Concept 6 – Extend Left-Turn Bays (Edenbower Blvd/Stephens St)**
    - One committee member questioned why there is no right-turn on red (RTOR). *Response was that RTOR is restricted because of the RR tracks; don't want someone pulling forward onto the tracks and then stopping while waiting for a gap in traffic.*

- **Concept 7 – Delineate Gore Area with Chevron Paint**
    - Committee seemed to think this was a reasonable solution.
    - Someone suggested that ODOT merge both ramps together before merging with I-5 instead of having two separate merges with freeway traffic.

- **Concept 8 – Install Visual Barrier**
    - Committee thought this might be possible if Concept 7 doesn't work.
- **Concept 9 – Improve North Side Pedestrian Crossing**
    - Concept makes sense to the committee.
- **Concept 10 – Enhance Pedestrian Crossing along Edenbower Boulevard**
    - Improving pedestrian crossing along Edenbower Boulevard doesn't seem to have a lot of benefits.
    - Cost to fix ramps would be higher than what estimates show.
    - Striping couldn't go in without replacing the ramps since they are substandard
- General comments that the posted speed may be too high around the curve on Edenbower Blvd heading east into the southbound ramp terminal. Can anything be done to lower the speed?

Next Steps

DEA will take comments from the advisory committee meetings and open house and use them to select a preferred alternative to address deficiencies for the next phase of the project. Analysis of the refined concepts will be conducted; a presentation of the preferred alternative will occur during the next TAC and CAC meetings. We will provide as much notice as possible about the schedule for future meetings.

Attachments:
Attendance Sheet
PowerPoint Presentation

I-5 Exit 127 Interchange Area Management Plan
Technical Advisory Committee

Meeting #2

10:00 AM to 12:00 PM

August 13, 2013

ODOT Region 3 Offices
3500 NW Stewart Parkway
Roseburg, OR 97470

AGENDA

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1. Introductions	Alexandra Krull, ODOT
2. Update on Project Status	Alexandra Krull, ODOT
• Overview of Process	Jennifer Danziger, DEA
• Current Status	
• Summary of CAC Meeting and Open House	
3. IAMP Improvement Concepts	Jennifer Danziger, DEA
• Concept Development	Joshan Rohani, DEA
• Concept Analysis	
4. Discussion	All
• Ideas for modifications to concepts or additional concepts that could be evaluated	
• Input for selection of preferred concepts	
5. Next Steps	Jennifer Danziger, DEA
• Schedule	Alexandra Krull, ODOT
• Upcoming meetings	

I-5 Exit 127

Interchange Area Management Plan

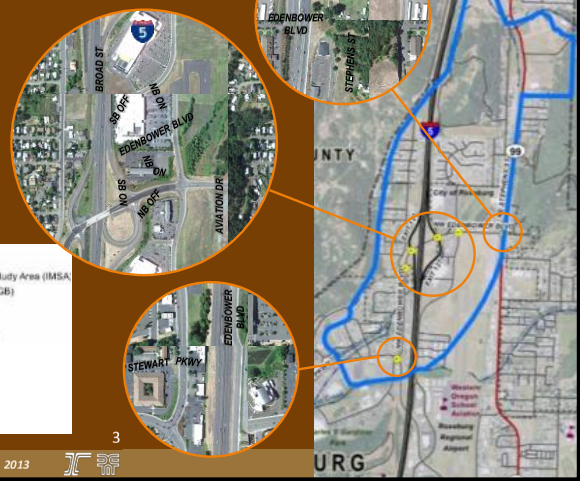
Technical Advisory Committee
August 13, 2013

Oregon Department of Transportation

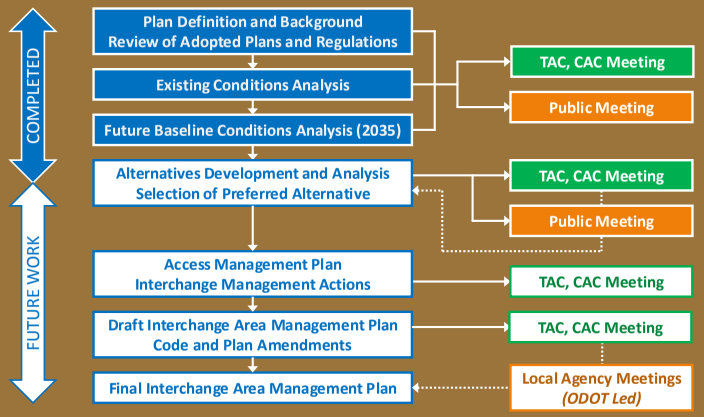
Presentation Topics

1. Project Overview Recap
2. Concept Development
3. Concept Alternatives Analysis
4. Discussion
   - Ideas for modifications to concepts or additional concepts that could be evaluated
   - Input for selection of preferred concepts
5. Next Steps

IAMP Planning Area



Planning Process



Other Outreach

- CAC Meeting
  - 2 Citizen Reps + 2 Roseburg Staff
    - Bike & Ped Committee
    - Planning Commission
- Open House
  - 5 signed in (not staff)
    - Bike & Ped Coalition
    - Residents
    - Business owner
  - 1-2 others who didn't sign in
    - Knife River

Concept Development

- Concepts are intended to address identified deficiencies
  - Existing and Future Conditions (2012 and 2035)
  - Operations (congestion, delays, queuing)
  - Safety (crash patterns, potential conflicts)
  - Geometry
- Concepts were developed to meet IAMP Objectives

IAMP Objectives

- Protect the function of the interchange and Edenbower Rd
- Improve safety and maximize operational efficiency
- Address future needs
- Identify potential local system enhancements
- Incorporate bicycle and pedestrian elements
- Develop an access management plan
- Coordinate planning efforts
- Prioritize improvements for potential funding mechanisms

Types of Improvements

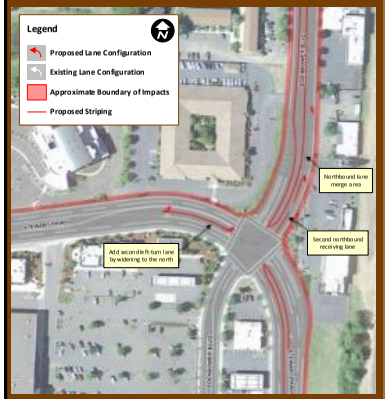
- Intersection Improvements
  Potential improvements to improve traffic flow, provide additional capacity, or address safety concerns at individual intersections.
- Interchange Ramp Improvements
  Potential ramp modifications to address concerns about driver expectation.
- Multi-Modal Improvements
  Potential improvements to enhance safety and continuity of pedestrian facilities.

Concept Evaluation Criteria

- Traffic Operations and Safety
  - *Does the improvement address existing operational or safety concerns?*
  - *Does it address system deficiencies?*
  - *Would it cause additional concerns?*
- Basic Roadway Geometry and Right of Way (ROW)
  - *How might the improvement look?*
  - *Would it require additional right of way?*
  - *Are there additional factors to consider in design?*
- Environmental and Land Use
  - *Would it have any potential impact to environmental resources?*
  - *How would it affect adjacent land uses?*
- Cost Opinion*
  - *How much would it cost?*

** Cost opinions do not include estimates of ROW costs or mitigation.*

Concept 1, Option A – Add Second Eastbound Left-Turn Lane



Purpose: Improve operations

Description:
- Add second EB left turn lane on Stewart Pkwy
- Widen Edenbower Blvd for second NB lane
- Modify signal timing

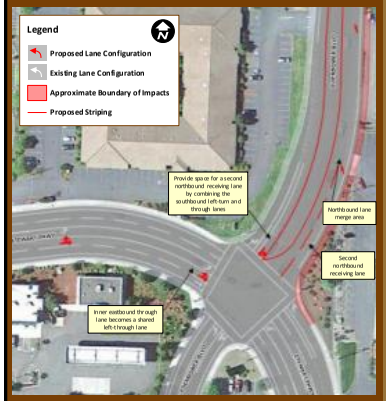
Traffic Operations & Safety:
- Improves operations from over capacity conditions with no changes to demand at 75% of capacity (meets standards)
- Reduces queuing and delays for EB left turns
- May improve safety by reducing conflicts between left-turn queues and through traffic
- Requires merge on NB Edenbower Blvd
- May require access control in merge area
- Does not improve sight distance on Stewart Pkwy

Basic Roadway Geometry & Right of Way (ROW):
- Widens Stewart Pkwy west of Edenbower Blvd to add EB left-turn lane and east of Edenbower Blvd to align though lanes
- Widens Edenbower Blvd to add NB merge lane

Environmental & Land Use:
- Impacts parking lots where widening occurs
- Could have minor impacts to wetland corridors associated with Sweetbriar and Newton Creeks

Cost Opinion:
- $1.6 million

Concept 1, Option B – Create Eastbound Shared Left-Through Lane



Purpose: Improve operations

Description:
- Convert one through lane on EB Stewart Pkwy to a shared left-through lane
- Restripe Edenbower Blvd and widen to provide second NB receiving lane
- Modify signal timing

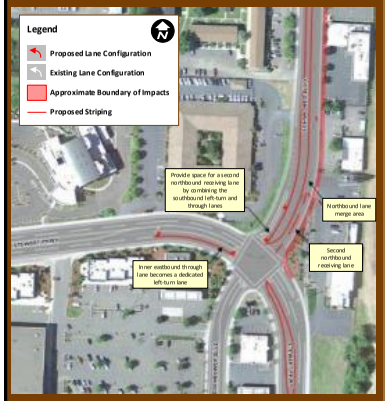
Traffic Operations & Safety:
- Improves operations from over capacity conditions with no changes to demand at 80% of capacity (meets standards)
- Reduces queuing and delays for EB left turns
- May improve safety by reducing conflicts between left-turn queues and through traffic
- Requires merge on NB Edenbower Blvd
- May require access control in merge area
- Does not improve sight distance on Stewart Pkwy

Basic Roadway Geometry & Right of Way (ROW):
- No widening on Stewart Pkwy
- Less widening on Edenbower Blvd than Option A because second NB lane partially accommodated by reallocating lanes on the SB approach

Environmental & Land Use:
- Impacts parking lots where widening occurs
- Less potential for impacts to wetland corridors associated with Sweetbriar and Newton Creeks than Option A

Cost Opinion:
- $700,000

Concept 1, Option C – Convert an Eastbound Through Lane to a Left-Turn Lane



Purpose: Improve operations

Description:
- Convert one through lane on EB Stewart Pkwy to a dedicated left-turn lane
- Restripe Edenbower Blvd and widen to provide second NB receiving lane

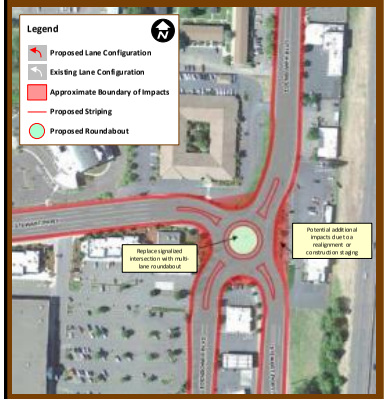
Traffic Operations & Safety:
- Improves operations from over capacity conditions with no changes to demand at 80% of capacity (meets standards)
- Reduces queuing and delays for EB left turns
- May improve safety by reducing conflicts between left-turn queues and through traffic
- Requires merge on NB Edenbower Blvd
- May require access control in merge area
- Does not improve sight distance on Stewart Pkwy
- Converting EB through lane to dedicated left-turn lane can "trap" some drivers who intend to go straight

Basic Roadway Geometry & Right of Way (ROW):
- No widening on Stewart Pkwy
- Less widening on Edenbower Blvd than Option A because second NB lane partially accommodated by reallocating lanes on the SB approach

Environmental & Land Use:
- Parking lot impacts similar to Option B
- Less potential for impacts to wetland corridors associated with Sweetbriar and Newton Creeks than Option A

Cost Opinion:
- $700,000

Concept 2 – Install Multi-Lane Roundabout



Purpose: Improve operations and safety

Description:
- Install multi-lane roundabout with dual approach lanes on all legs

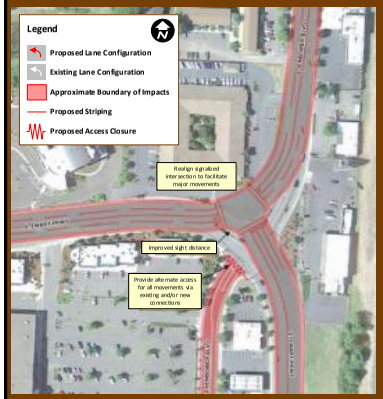
Traffic Operations & Safety:
- Improves operations from over capacity conditions with no changes to demand at 85% of capacity (meets standards)
- Roundabouts reduce conflict points and generally have both fewer and less severe crashes
- Improves sight distance on Stewart Pkwy
- Bicyclists may have trouble traveling with vehicular traffic but can travel as pedestrians through the intersection
- Pedestrian crossing widths shortened

Basic Roadway Geometry & Right of Way (ROW):
- All approaches require widening or realignment to accommodate footprint of multi-lane roundabout
- All quadrants surrounding the intersection would incur ROW impacts

Environmental & Land Use:
- Impacts parking lots where widening occurs
- Could have minor impacts to wetland corridors associated with Sweetbriar and Newton Creeks
- Widening could affect Edenbower Blvd trail accessing Charles S. Gardiner Park
- Project should be vetted with Mercy Hospital

Cost Opinion:
- $2.6 million

Concept 3 – Realign Intersection to East-West "T"



Purpose: Improve operations and safety

Description:
- Realign intersection to better accommodate major vehicular traffic movements
- Close access to Edenbower Blvd south of intersection

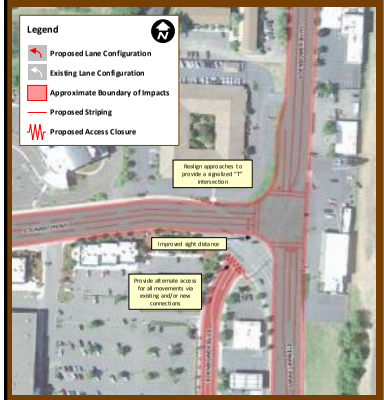
Traffic Operations & Safety:
- Improves operations from over capacity conditions with no changes to demand at 83% of capacity (meets standards)
- Redirects traffic from south leg of Edenbower Blvd → increased travel distance and more inconvenience
- Reduces volume of vehicles turning left, decreasing the likelihood of turning/angle crashes
- Addresses sight distance issues on Stewart Pkwy
- May require access control in merge area

Basic Roadway Geometry & Right of Way (ROW):
- Intersection realignment will require property acquisition
- Does not include local network or access connections to address closure of south leg of Edenbower Blvd

Environmental & Land Use:
- Impacts property and parking lots, particularly on northwest corner of intersection
- Closing south leg of Edenbower Blvd would have economic impacts to businesses served by roadway
- Low potential for impacts to wetland corridors associated with Sweetbriar and Newton Creeks
- Could affect Umpqua Transit but stop

Cost Opinion:
- $1.9 million

Concept 4, Option A – Realign Intersection to North-South "T"



Purpose: Improve operations and safety

Description:
- Realign intersection to north-south perpendicular "T"
- Close access to Edenbower Blvd south of intersection
- Provide single EB left-turn lane on Stewart Pkwy

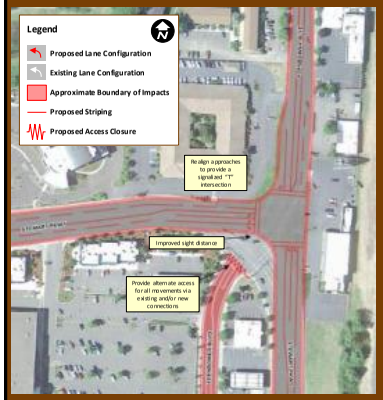
Traffic Operations & Safety:
- Improves operations from over capacity conditions with no changes to demand at 90% of capacity (not standard)
- Circulation impacts same as Concept 3
- Addresses sight distance issues on Stewart Pkwy
- May require access control near realigned intersection

Basic Roadway Geometry & Right of Way (ROW):
- Does not include local network or access connections to address closure of south leg of Edenbower Blvd
- Intersection realignment will require property acquisition
- Does not require any roadway widening beyond area affected by realignment

Environmental & Land Use:
- Impacts property and parking lots where realignment occurs
- Economic impacts same as Concept 3
- Transit impacts same as Concept 3
- Low potential for impacts to wetland corridors associated with Sweetbriar and Newton Creeks

Cost Opinion:
- $1.6 million

Concept 4, Option B – Realign Intersection to North-South "T" with Dual Left Turns



Purpose: Improve operations and safety

Description:
- Realign intersection to north-south perpendicular "T"
- Close access to Edenbower Blvd south of intersection
- Provide two EB left-turn lanes on Stewart Pkwy
- Widen Edenbower Blvd for second NB lane

Traffic Operations & Safety:
- Improves operations from over capacity conditions with no changes to demand at 60% of capacity (meets standard)
- Circulation impacts same as Concept 3
- Addresses sight distance issues on Stewart Pkwy
- May require access control near realigned intersection and along Edenbower Blvd

Basic Roadway Geometry & Right of Way (ROW):
- Does not include local network or access connections to address closure of south leg of Edenbower Blvd
- Intersection realignment will require property acquisition
- Widens Edenbower Blvd to add NB merge lane

Environmental & Land Use:
- Same impacts as Option A for northwest corner
- Property and parking impacts on Edenbower Blvd north of intersection for merge lane
- Same economic and transit impacts as Concept 3
- Low potential for impacts to wetland corridors associated with Sweetbriar and Newton Creeks

Cost Opinion:
- $1.9 million

Concept 5 – Extend Westbound Right-Turn Bay

Purpose: Address queuing concerns

Description:
- Extend WB right-turn bay at the intersection of Aviation Dr and Edenbower Blvd

Traffic Operations & Safety:
- Improve safety by allowing the right-turn traffic to get out of the way of through traffic
- Keeps bike lane clear of stopped vehicles

Basic Roadway Geometry & Right of Way (ROW):
- Widens Edenbower Blvd to extend westbound right-turn lane on north side of roadway
- Lighting and sidewalks need to be relocated

Environmental & Land Use:
- Mapped wetlands identified in close proximity although any roadside wetland area likely to be highly degraded
- Improvement not anticipated to extend into undisturbed area

Cost Opinion:
- $75,000

Concept 6 – Extend Left-Turn Bays

Purpose: Address queuing concerns

Description:
- Extend striped EB left-turn bay on Edenbower Blvd at Stephens St
- Extend NB left-turn bay on Stephens St at Edenbower Blvd

Traffic Operations & Safety:
- May improve safety by reducing conflicts between left-turn queues and through traffic
- May reduce delay for other travel movements

Basic Roadway Geometry & Right of Way (ROW):
- Project would occur within the existing paved roadway

Environmental & Land Use:
- No impacts

Cost Opinion:
- $15,000

Concept 7 – Delineate Gore Area with Chevron Paint

Purpose: Address driver expectation concerns

Description:
- Provide additional delineation in gore area of the northbound on-ramp with chevron striping

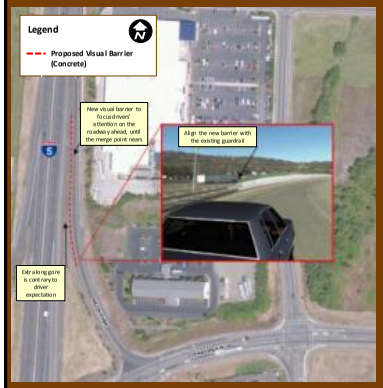
Traffic Operations & Safety:
- Provides visual cue to drivers of the appropriate time to merge
- No impact on capacity

Basic Roadway Geometry & Right of Way (ROW):
- Project would occur within the existing paved roadway
- Assumes 8" striping

Environmental & Land Use:
- No impacts

Cost Opinion:
- $20,000

Concept 8 – Install Visual Barrier



Purpose: Address driver expectation concerns

Description:
- Install a visual barrier on the westbound to northbound on-ramp

Traffic Operations & Safety:
- 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

Basic Roadway Geometry & Right of Way (ROW):
- Project would occur within the existing paved roadway
- Assumes concrete barrier with glare shields

Environmental & Land Use:
- No impacts

Cost Opinion:
- $100,000

Concept 9 – Improve North Side Pedestrian Crossing

Purpose: Improve safety and continuity of pedestrian facilities

Description:
- Improve east-west pedestrian crossing across NB on-ramp by adding a raised island or extending existing curb and sidewalk

Traffic Operations & Safety:
- Shortens distance pedestrian has to cross intersection with raised island or curb and sidewalk extension
- Could include striped crosswalk to further increase driver awareness of pedestrian activity
- Reduces pedestrian exposure with vehicular traffic
- No reduction in vehicular capacity
- Vehicle carrying capacity would be similar to other on-ramps at interchange

Basic Roadway Geometry & Right of Way (ROW):
- Construction of raised island or curb extension needs to meet geometric requirements for WB right turn and NB through movement from off-ramp
- Improvements would occur within existing paved roadway

Environmental & Land Use:
- No impacts

Cost Opinion:
- $20,000

Concept 10 – Enhance Pedestrian Crossing along Edenbower Boulevard

Purpose: Improve safety and continuity of pedestrian facilities

Description:
- Enhance pedestrian crossings by installing striped crosswalks and directional ADA compliant curb ramps for north-south travel along west side of Edenbower Blvd

Traffic Operations & Safety:
- Enhanced curb ramps improve directional guidance
- Striped crosswalks help identify the presence of pedestrian activity and increase visibility to motorists turning onto side streets
- Clearly defined and frequent crosswalks may encourage slower travel speeds along Edenbower Blvd
- No impact on vehicular capacity

Basic Roadway Geometry & Right of Way (ROW):
- Improvements would occur within the available ROW

Environmental & Land Use:
- No impacts

Cost Opinion:
- $25,000

Next Steps

- Selection of Preferred Improvements
  - Analysis of modified or additional concepts
  - Recommendation for preferred combination of improvements
- Access Management Plan
  - Actions that may be triggered as
    - Land use changes occur (new development or redevelopment)
    - Future roadway improvements are implemented
    - Safety and operational issues arise
- Other Management Actions
  - Actions that protect and extend the life of the interchange for all modes of travel

I-5 Exit 127 Interchange Area Management Plan

Technical Advisory Committee

Meeting #2

10:00 AM to 12:00 PM

August 13, 2013

ODOT Region 3 Offices
3500 NW Stewart Parkway
Roseburg, OR 97470

ATTENDANCE

Name	Organization
Brian Barta	ODOT/Roadway Design
Dave Warwick	ODOT/Tech Services
PETER SCHUYTEMA	ODOT/TRANSPORTATION PLANNING ANALYSIS
Jeff Nelson	City of Roseburg
Pam Simleness	ODOT / Right of Way
Ray Lapke	ODOT / Traffic Operations
JOSHAN ROHANI	DEA
Aaron Brooks	ODOT/Traffic Analyst

Filename: IAMP127 TAC2 Attendance 081313.docx

I-5 Interchange 127 Area Management Plan
Technical Advisory Committee (TAC)

Meeting #2

10:00 AM to 12:00 PM

August 13, 2013

ODOT Region 3 Offices
3500 NW Stewart Parkway
Roseburg, OR 97470

Meeting Notes

Attendees: See Attached List

Introductions

Allie Krull opened the second Technical Advisory Committee (TAC) meeting with a round of introductions.

Work Completed

Jennifer Danziger, the Consultant project manager, provided the group with an overview of the project and where we are in the planning process. She them provided a summary of the CAC Meeting and Open House.

Jennifer went on to explain the concept development process, the types of improvements developed and how they were evaluated. The concepts presented were meant to consider a wide range of possible solutions regardless of cost and impact. Slides 10 through 22 summarize the concepts which are presented in Technical Memorandum #4 – Concept Development and Evaluation.

Project Discussion

As they moved through the presentation of concepts, Jennifer and Joshan opened the floor up for comments, suggestions, and concerns regarding the proposed concepts. The intent was to gain perspective and ideas for the next phase of the project: selection of preferred alternative.

The following comments/questions were received during the discussion:

- **Concept 1A – Add Second Eastbound Left-Turn Lane**
  - The merge lane needs to be long enough to get used; otherwise no one will use the extra left-turn lane and no benefit will be realized
  - DEA needs to make sure the lane utilization used in the analysis reflects user reality; this will impact the v/c ratios calculated for the intersection.
- **Concept 1B – Create Eastbound Shared Left-Through Lane**
  - Avoid split phasing; it doesn't have long-term ability to adapt to future growth.
  - Lane utilization assumptions are a concern with this option as well.

- **Concept 1C – Convert an Eastbound Through Lane to a Left-Turn Lane**
    - No trap lane; worsens safety because drivers may switch lanes at the last minute.
    - Lane utilization assumptions are a concern with this option as well.
- **General to Concept 1:**
    - Can we look at a combination of adding lane (1A) on Stewart and reducing lanes on Edenbower to narrow its width and impact to adjacent properties?
    - Explain why dual left-turn lane works; I'm concerned that most will stay in one lane because of the traffic merge on Edenbower.
    - DEA needs to address turn and merge lane lengths, focus on minimizing impacts to adjacent properties, and revise analysis parameters.

- **Concept 2 – Install Multi-Lane Roundabout**
    - A roundabout does improve safety because it has fewer access conflicts
    - A roundabout probably won't be acceptable to the community.

- **Concept 3 – Realign Intersection to East-West "T"**
    - Is this a 40 mph curve?
    - The city may be investigating a speed reduction on Edenbower in the future.
    - Need to address access and how you would serve businesses if you close off Edenbower to the south of the intersection.

- **Concept 4A/4B – Realign Intersection to North-South "T"/ with dual left-turns**
    - Crashes will still be same with signal and still same crossing concerns for bikes and pedestrians.
    - Still need to address access for businesses served by Edenbower to the south of the intersection. Maybe left-in/right-in/right-out on Stewart Parkway would be feasible.

- **Concept 5 – Extend Westbound Right-Turn Bay (Edenbower Blvd/Aviation Dr)**
    - No comments

- **Concept 6 – Extend Left-Turn Bays (Edenbower Blvd/Stephens St)**
    - We should consider a right-turn overlap but that may require changes in lane striping and phasing. DEA should look into this possibility.

- **Concept 7 – Delineate Gore Area with Chevron Paint**
    - Chevrons would work well. Could include texture with chevrons.

- **Concept 8 – Install Visual Barrier**
    - Could consider as a second phase if Concept 7 doesn't work.

- **Concept 9 – Improve North Side Pedestrian Crossing**
    - This improvement seems reasonable.

- **Concept 10 – Enhance Pedestrian Crossing along Edenbower Boulevard**
    - This project would not be a priority. Ramp improvements could be considered with another project, should one occur, but are not recommended as standalone improvement for the city.

Next Steps

DEA will take comments from the advisory committee meetings and open house and use them to select a preferred alternative to address deficiencies for the next phase of the project. Analysis of the refined concepts will be conducted; a presentation of the preferred alternative will occur during the next TAC and CAC meetings. We will provide as much notice as possible about the schedule for future meetings.

Attachments:
Attendance Sheet
PowerPoint Presentation

I-5 Exit 127 Interchange Area Management Plan
Citizen Advisory and Technical Advisory Committee

Joint Meeting #3

1:00 PM to 3:00 PM

January 9, 2014

ODOT Region 3 Offices
3500 NW Stewart Parkway
Roseburg, OR 97470

AGENDA

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1. Introductions	Alexandra Krull, ODOT
2. Preferred Alternative	Jennifer Danziger, DEA
• Concepts presented at last meeting	Joshan Rohani, DEA
• Additional concept considerations	
3. Protecting Interchange Function	Jennifer Danziger, DEA
• Access management	Joshan Rohani, DEA
• Other management actions	
4. Discussion	All
5. Next Steps	Jennifer Danziger, DEA
	Alexandra Krull, ODOT

Filename: IAMP127 TACCAC3 Agenda 010914

I-5 Exit 127

Interchange Area Management Plan

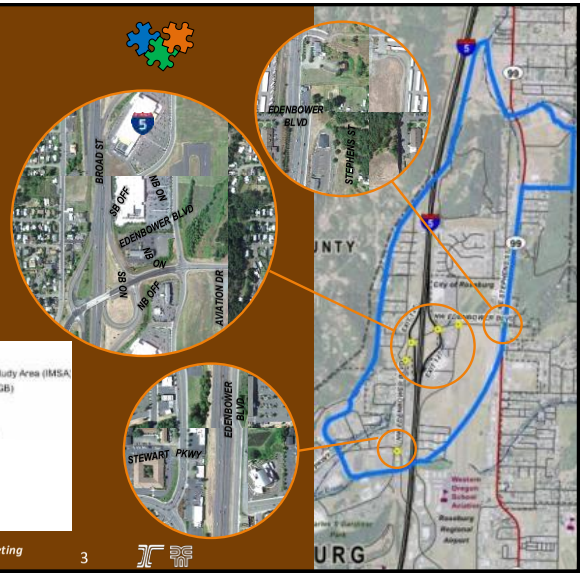
Citizen & Technical
Advisory Committees
Joint Meeting
January 9, 2014

Oregon Department of Transportation

Presentation Topics

1. Preferred Alternative
   - Concepts presented previously
   - Additional concept considerations
2. Protecting Interchange Function
   - Access Management
   - Other Management Actions
3. Discussion
   - Final recommendations for IAMP

IAMP Planning Area



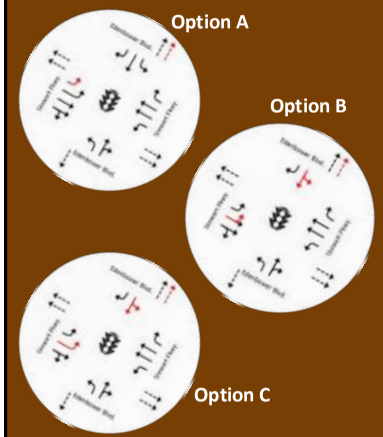
Concept Recommendations

- Project Goals and Objectives
- Discussion from TAC and CAC Meetings
- Input from Public Open Houses
- Agency Recommendations

IAMP Objectives

- Protect the function of the interchange and Edenbower Rd
- Improve safety and maximize operational efficiency
- Address future needs
- Identify potential local system enhancements
- Incorporate bicycle and pedestrian elements
- Develop an access management plan
- Coordinate planning efforts
- Prioritize improvements for potential funding mechanisms

Concept 1 – Add Second Eastbound Left-Turn Lane



Recommended: Yes

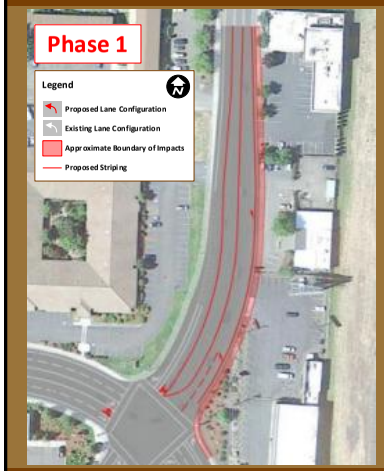
Highlights:

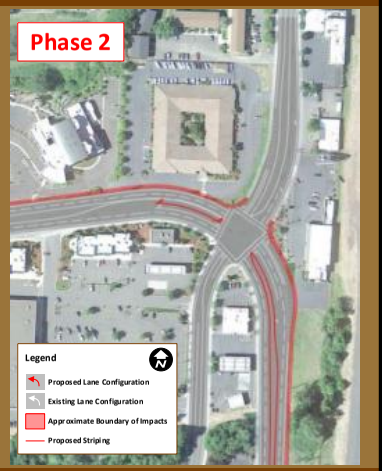
- Three options considered
- Option A provides greatest operational benefits but at highest cost
- Option B meets standard but provides less flexibility to accommodate future demand – has fewer impacts to adjacent lands
- Option C provides some operational improvement but "trap" lane is not desirable

Priority:

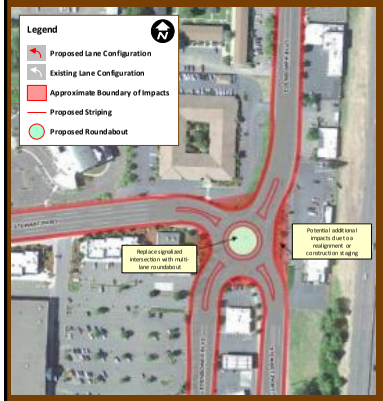
- Phase 1 (Option B) – medium priority ($520,000)
- Phase 2 (modified Option A) – low priority ($1,200,000)
- Both phases triggered by operational need

Concept 1 – Phasing Illustrations





Concept 2 – Install Multi-Lane Roundabout

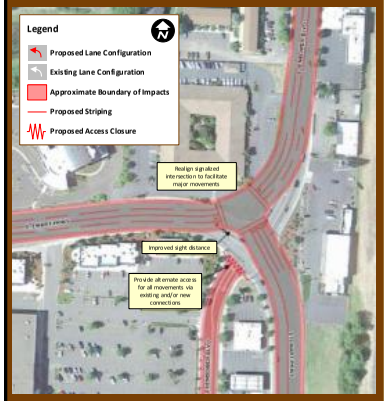


Recommended: No

Highlights:

- Accommodates additional demand and meets standard
- Reduces conflict points which improves safety
- Significant right-of-way impacts on all approaches
- Highest cost

Concept 3 – Realign Intersection to East-West "T"

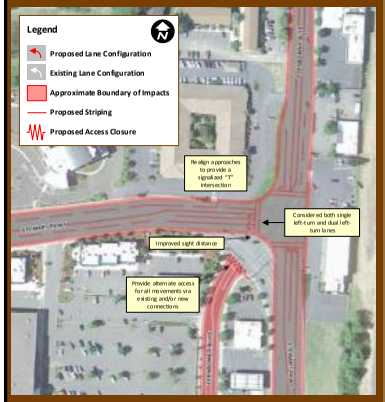


Recommended: No

Highlights:

- Accommodates additional demand and meets standard
- Closes south leg of Edenbower resulting in significant out-of-direction travel and economic impacts

Concept 4 – Realign Intersection to North-South "T"



Recommended: No

Highlights:

- Accommodates additional demand and meets standard if dual left-turn lanes are provided
- Closes south leg of Edenbower resulting in significant out-of-direction travel and economic impacts

Concept 5 – Extend Westbound Right-Turn Bay

Recommended: Yes

Highlights:

- Responds to increased demand for the right-turn movement with additional storage capacity
- Prevents queues building up and spilling into through travel lane which can give rise to safety concerns
- Requires cutting into and stabilizing hillside next to Edenbower

Priority:

- Low priority ($120,000)
- Triggered by queuing/safety

Concept 6 – Extend Left-Turn Bays

Recommended: Yes

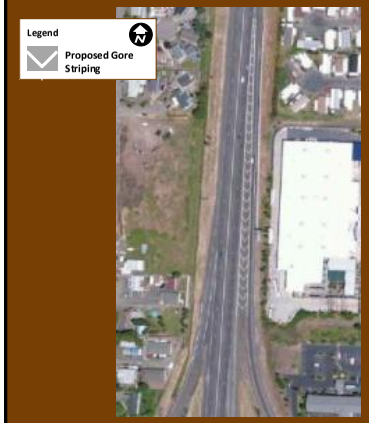
Highlights:

- Extends delineated storage to accommodate longer queues
- Prevents queues building up and spilling into through travel lane which can give rise to safety concerns
- Accommodated within existing roadway

Priority:

- Medium priority ($15,000)
- Triggered by queuing/safety

Concept 7 – Delineate Gore Area with Chevron Paint



Recommended: Yes

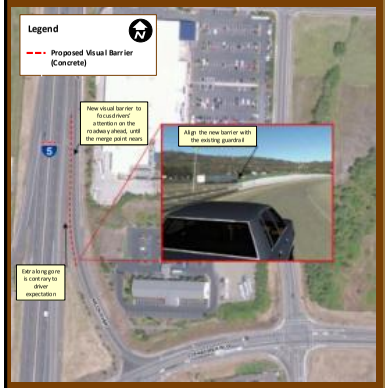
Highlights:

- Enhanced delineation to provide better visual cue for merging
- Additional maintenance costs
- Accommodated within existing roadway

Priority:

- Low priority ($20,000)
- Triggered by safety

Concept 8 – Install Visual Barrier



Recommended: Yes

Highlights:

- Additional delineation to provide better visual cue for merging
- Additional maintenance costs
- Accommodated within existing roadway

Priority:

- Low priority ($100,000)
- Triggered by safety

Concept 9 – Improve North Side Pedestrian Crossing

Recommended: Yes

Highlights:

- Shorter crossing distance reduces pedestrian exposure
- Should be consistent with other pedestrian treatments in area

Priority:

- Medium priority ($20,000)
- Existing deficiency

Concept 10 – Enhance Pedestrian Crossing along Edenbower Boulevard

Recommended: No

Highlights:

- Striped crosswalks would help identify presence of pedestrians
- Curb cuts would be improved but at relatively high cost

Note: If new construction impacts any existing crossings, then an improvement would be warranted.

Additional Concepts

- Concept A-1 – Signalize Northbound Ramp Terminal
- Concept A-2 – Signal Coordination on Edenbower Boulevard
- Concept A-3 – Speed Study on Edenbower Boulevard
- Concept A-4 – Edenbower Boulevard/Stewart Parkway: Sight Distance

Concept A-1 – Signalize Northbound Ramp Terminal

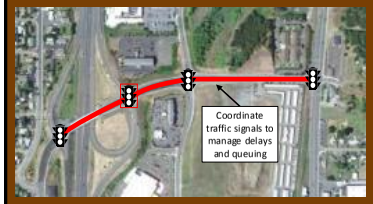
Recommended: Yes

Purpose:
- Addresses long-term traffic operations and safety

Highlights:
- Preliminary traffic signal warrants not met within next five years and forecasts do not show long-term need
- A signal may be warranted if land use changes direct more traffic to the interchange or the frequency of turning or angle collision increases
- Traffic signals have trade offs in both vehicular delay and crash patterns and should not be installed without meeting warrants

Priority:
- Low priority ($500,000)
- Triggered by signal warrants

Concept A-2 – Signal Coordination on Edenbower Boulevard



Recommended: Yes

Purpose:
- Manage delays and queuing for safety and operations

Highlights:
- Queuing between intersections does not currently interfere with operations
- Queues could develop as traffic volumes grow or shift over time
- Traffic signal coordination could be implemented manually with consistent cycle lengths and phasing plans
- Ultimately interconnected signal system may be desirable

Priority:
- High to medium priority TSM measure
- Triggered by queuing

Concept A-3 – Speed Study on Edenbower Boulevard

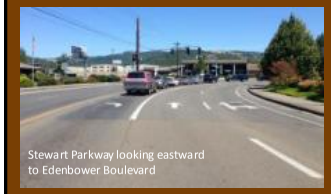
Recommended: Yes

Purpose:
- Reassess travel speeds and posted speeds based on geometric modifications and safety

Highlights:
- 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
- Speed study would be needed to determine if speed reduction is ultimately appropriate

Priority:
- Medium priority TSM measure
- Speed study conducted following Phase 1 improvements at Edenbower/Stewart intersection

Concept A-4 – Edenbower Boulevard/Stewart Parkway: Sight Distance



Stewart Parkway looking eastward to Edenbower Boulevard

Edenbower Boulevard looking westward along Stewart Parkway

Recommended: Yes

Purpose:
- Address sight distance concerns and improve safety

Highlights:
- Obstructions in southwest quadrant limit sight distance
- Eastbound Stewart Parkway has supplemental signal head
- Drivers on northbound Edenbower Boulevard making a right turn on red have limited sight distance but no crash pattern present at this time
- "No turn on red" could be implemented on northbound Edenbower
- Removal of roadside obstructions may be necessary

Priority:
- Medium priority TSM measure
- Triggered by safety

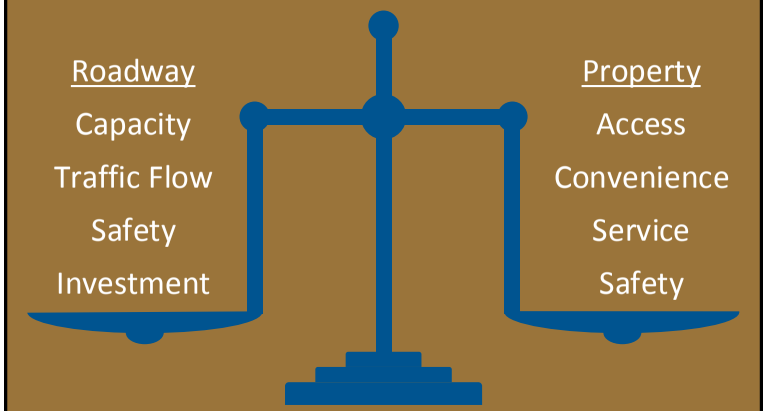
Operations with Recommended Improvements

Intersection	Critical Movement[1]	V/C Ratio[2]	LOS[2]	Mobility Standard[3]
Edenbower Blvd. at Stewart Pkwy. (Signalized)	Overall	V/C = 0.82[4]	LOS = C	LOS D V/C <= 0.85
Edenbower Blvd. at Broad St.	EB L/R	V/C = 0.26	LOS = C	LOS D V/C <= 0.85
Edenbower Blvd. at SB Ramp Terminal (Signalized)	Overall	V/C = 0.69	LOS = B	LOS D V/C <= 0.85
Edenbower Blvd. at NB Ramp Terminal	NB R	V/C = 0.48	LOS = D	LOS D V/C <= 0.85
Edenbower Blvd. at Aviation Dr. (Signalized)	Overall	V/C = 0.61	LOS = B	LOS D V/C <= 0.85
Edenbower Blvd. at Stephens St. (Signalized)	Overall	V/C = 0.71	LOS = C	LOS D V/C <= 0.85

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, while the Douglas County TSP identifies standards for County facilities.
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 the near left-turn lane and merge into the northbound traffic flow on Edenbower Boulevard.

Source: Synchro HCM Intersection Analysis Report

Access Management



Oregon Highway Plan and Division 51

- Oregon Highway Plan addresses access management in Goal 3
  - Supporting policies regarding classification and spacing standards, medians, interchanges, deviations, and appeals
  - Appendix C: Access Spacing Standards
  - Revised to address Senate Bill 264 which suggested revisions to Oregon's management of access on state facilities
- Oregon Administrative Rule (OAR) 734-051 (Division 51)
  - Detailed requirements, action definitions, and the access spacing standards for state facilities

Access Spacing Standards

Segment Characteristic	Access Spacing Standard
ODOT – Interchange Ramp Terminals - Fully Developed Urban[1]	
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	750 feet[2]
Other Public/Private Access Points	
Roseburg – Arterial (Edenbower)	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 17 in the revised OHP-Effective January 1, 2012 Amended May 3, 2012 : Access Management Spacing Standards for Freeway Interchanges with Two-Lane Crossroads
3. City of Roseburg Land Use and Development Ordinance.

Private Approaches

OAR 734-051-4020, Standards and Criteria for Approval of Private Approaches:

(8)(c) The spacing standards in Tables 3 through 6 do not apply to approaches in existence prior to January 1, 2012, except when:

(A) A new approach road is requested or an existing approach permit is subject to change of use under ORS 374.312; and

(B) Where infill development or infill redevelopment occurs the approach road spacing standards will be a department determination; the department shall determine whether the approach road spacing or safety is improved by moving in the direction of the spacing standards in Tables 3 through 6; and

(C) Where a highway or interchange project occurs the approach road spacing standard will be a department determination; the department shall consider whether the approach road spacing or safety is improved by moving in the direction of the applicable spacing standards in Tables 3 through 6.

Access Inventory

Legend

- Private Access
- Public Access
- ¼ mile from Interchange Ramps (ODOT Standard)

Access Management Techniques

- Controlling Intersection Spacing
  - Improved flow, less congestion
- Managing Driveway Spacing
  - Fewer conflicts, more orderly traffic flow
- Adding Turn Lanes
  - Separates turning and through traffic
- Installing Median Treatments
  - Separates turning traffic, can restrict some movements

Access Management Implementation

Access management actions would be taken when one or more of the following triggers occurs:

- Applications for land use changes or development are submitted
  Example: *"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."*
- Future roadway improvements move into design and construction
  Example: *"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."*
- Safety and or operational problems arise
  Example: *"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."*

Access Management Plan Actions

Legend

- Private Access
- Public Access
- Access Consolidation/ Turn Restriction/ Closure
- Proposed Project

Access Management Plan Actions

Stewart Parkway west of Edenbower Boulevard

1. Consolidate/close driveways in an effort to move towards achieving applicable access spacing standards.
2. Evaluate potential turn limitations along Stewart Parkway.

Edenbower Boulevard from Stewart Parkway to Plateau Drive (south)

3. Consolidate/close driveways in an effort to move towards achieving applicable access spacing standards.
4. Evaluate potential turn limitations along Edenbower Boulevard.

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

5. Consolidate/close driveways in an effort to move towards achieving applicable access spacing standards.

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

6. Evaluate potential turn limitations along Edenbower Boulevard.

Potential Management Actions

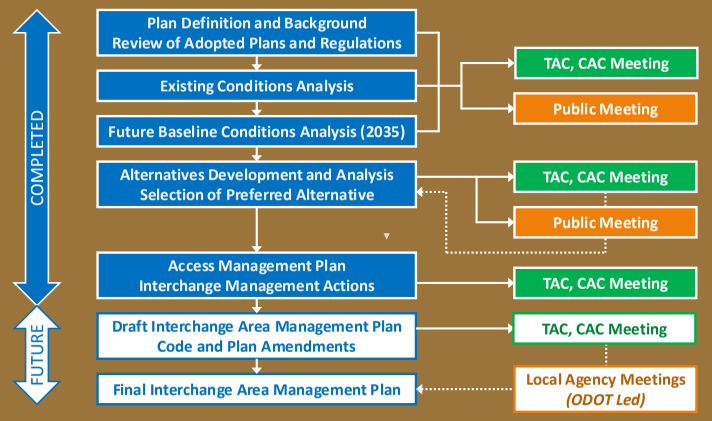
Management actions are intended to preserve the capacity of an interchange for as long as possible. The toolkit of potential management actions includes four overarching elements:

- **Local System Improvements** that enhance the local street network to disperse trips and reduce congestion near an interchange
- **Transportation Demand Management Strategies** that provide travel options to reduce the number of trips or vehicles on the road
- **Transportation System Management Measures** that improve system efficiency and reduce delays
- **Land Use and Development Strategies** that guide land use development to result in fewer trips in the interchange area

Recommended Actions

- **City of Roseburg:** Continue to expand the local street network and maintain connectivity to support future development and provide a variety of local circulation options.
- **ODOT and City of Roseburg:** Adopt an Access Management Plan for the I-5 Exit 127 area.
- **City of Roseburg and Douglas County:** Implement Transportation Demand Management strategies in cooperation with other jurisdictions within the urban area.
- **ODOT and City of Roseburg:** Implement Transportation System Management measures to improve efficiency and maintain safety.
- **City of Roseburg:** Retain, through adoption of the IAMP, current adopted Comprehensive Plan and Land Development Ordinance designations and regulations.

Planning Process



Next Steps

- Prepare Draft IAMP for I-5 Exit 127
  - Spring 2014
  - Review period
  - Final round of meetings
- Finalize IAMP for I-5 Exit 127
  - Summer 2014
  - Additional agency coordination/outreach through ODOT

I-5 Exit 127 Interchange Area Management Plan
Citizen Advisory and Technical Advisory Committee

Joint Meeting #3

1:00 PM to 3:00 PM

January 9, 2014

ODOT Region 3 Offices
3500 NW Stewart Parkway
Roseburg, OR 97470

ATTENDANCE

Name	Organization

Filename: IAMP127 TACCAC3 Attendance 010914.docx

I-5 Exit 127 Interchange Area Management Plan
Citizen Advisory and Technical Advisory Committee

Joint Meeting #3

1:00 PM to 3:00 PM

January 9, 2014

ODOT Region 3 Offices
3500 NW Stewart Parkway
Roseburg, OR 97470

Meeting Notes

Attendees: See Attached List

Introductions

Allie Krull, the Overall ODOT project manager, opened the third (combined) Technical Advisory (TAC) and Citizen Advisory Committee (CAC) meeting with a round of introductions.

Status Update

Jennifer Danziger, the Consultant project manager, provided the group with an overview of the work that has occurred since our last meetings.

Jennifer briefly reviewed our overarching goals and objectives, then went on to explain the Preferred Alternative development process, which was based on the group's recommendations made for the previously-presented concepts. In addition, she mentioned that several new concepts were developed and included in the currently proposed Preferred Alternative.

Preferred Alternative (Information in Tech Memo #5)

As Joshan Rohani moved through the presentation of the Preferred Alternative, the team opened the floor up for comments, suggestions, and concerns. Because the advisory committees had already provided recommendations that led to this Preferred Alternative, the advisory committees were asked for specific feedback/input in the following areas:

- Confirmation of each component of the Preferred Alternative
- Confirmation of the priority of each component of the Preferred Alternative
- Implementation considerations that should be described in the final project sheets for each component of the Preferred Alternative

The following comments/questions were received during the discussion:

- **Concept 1 – Add Second Eastbound Left-Turn Lane (Phased Implementation)**
    - General support for this concept, with a phased implementation plan
    - Comments:

        - Provide additional language that supports why this improvement is included in the IAMP (e.g. how it interacts with the function of the interchange, impacts to access management, etc.)
        - The revised design that minimizes impacts on surrounding ROW is a positive change.
        - Considerations of lane utilization and merge distances seem appropriate.
    - Notes for implementation:
        - Could implement Option 1B (shared left lane) or 1C (trap left lane) as phase 1.
        - If 1C is implemented as phase 1, would need to identify appropriate signage and striping for the "trap lane".

- **Concept 2 – Install Multi-Lane Roundabout**
    - Not Recommended.
- **Concept 3 – Realign Intersection to East-West "T"**
    - Not Recommended.
- **Concept 4A/4B – Realign Intersection to North-South "T"/ with dual left-turns**
    - Not Recommended.
- **Concept 5 – Extend Westbound Right-Turn Bay (Edenbower Blvd/Aviation Dr)**
    - Unanimous support for this concept, as a low priority.
- **Concept 6 – Extend Left-Turn Bays (Edenbower Blvd/Stephens St)**
    - Unanimous support for this concept as a medium priority.
- **Concept 7 – Delineate Gore Area with Chevron Paint**
    - Unanimous support for this concept as a low priority, triggered by safety.
- **Concept 8 – Install Visual Barrier**
    - General support for this concept as a low priority, triggered by safety.
- **Concept 9 – Improve North Side Pedestrian Crossing**
    - Unanimous support for this concept, as a high priority.
    - Notes for implementation:
        - Pedestrian "island" not necessary
        - Extend curb/sidewalk in the NW corner of the NB ramp terminal to shorten the pedestrian crossing width
        - Crosswalk striping not necessary
- **Concept 10 – Enhance Pedestrian Crossing along Edenbower Boulevard**
    - Not recommended.

Additional Concepts Included in Preferred Alternative:

- **Concept A1 – Signalize Northbound Ramp Terminal**
  - Unanimous support for this concept, triggered by signal warrants.
  - Comments:
    - Check the current/future AM peak period to confirm it's not currently warranted.
    - The group discussed alternative ramp alignments, but ultimately agreed that it would be against ODOT guidelines and not ideal to connect the NB off ramp with other adjacent facilities.
  - Notes for implementation:
    - If this signal is installed, the adjacent signals would need to be coordinated
    - The current timing of signals in this corridor is set up to provide gaps along Edenbower for NB ramp terminal traffic.
- **Concept A2 – Signal Coordination on Edenbower Boulevard**
  - Unanimous support for this concept, triggered by a signal installation at the NB ramp terminal or demonstrated need for coordination.
  - Comments:
    - The current timing of signals in this corridor is setup to provide gaps along Edenbower for NB ramp terminal traffic (currently unsignalized).
- **Concept A3 – Speed Study on Edenbower Boulevard**
  - Unanimous support for this concept, triggered by geometric modifications to Edenbower Boulevard (i.e. Concept 1).
- **Concept A4 – Edenbower Boulevard/Stewart Parkway: Sight Distance**
  - Unanimous support for this concept, triggered by safety, or improvements to intersection geometry and/or signals.
  - Notes for implementation:
    - Any combination of intersection sight distance improvements or "no turn on red" restrictions could be implemented.
    - Should be coordinated with Concept 1 improvements.

Access Management (Information in Tech Memo #6)

Jennifer described the goals, guidelines, and standards associated with interchange area access management. The group discussed how the current public and private access points compare with spacing standards.

- **Stewart Parkway west of Edenbower Boulevard**
  - Unanimous support for the following actions, in addition to supplemental management actions:

        - Consolidate/close driveways in an effort to move towards achieving applicable access spacing standards.
        - Evaluate potential turn limitations along Stewart Parkway.

- **Edenbower Boulevard from Stewart Parkway to Plateau Drive (south)**
    - Unanimous support for the following actions, in addition to supplemental management actions:
        - Consolidate/close driveways in an effort to move towards achieving applicable access spacing standards.
        - Evaluate potential turn limitations along Edenbower Boulevard.

- **Edenbower Boulevard from Plateau Drive (south) to I-5 SB Ramp Terminal**
    - Unanimous support for the following actions, in addition to supplemental management actions:
        - Consolidate/close driveways in an effort to move towards achieving applicable access spacing standards.

- **Edenbower Boulevard from I-5 NB Ramp Terminal to Stephens Street**
    - Unanimous support for the following actions, in addition to supplemental management actions:
        - Evaluate potential turn limitations along Edenbower Boulevard.

Potential Management Actions(Information in Tech Memo #7)

Jennifer provided an overview of the toolkit of potential management actions that can be used to preserve interchange function. She then reviewed those that are recommended for IAMP 127. Discussion of the recommended actions indicated general support, and did not raise any significant concerns. The City of Roseburg is in the process of updating their land use development ordinances. DEA will coordinate recommendations for amendments necessary to implement the IAMP.

Next Steps

DEA will take comments from this advisory committee meeting, as well as other submitted comments, and use them to prepare a draft Interchange Area Management Plan (IAMP). A draft IAMP should be ready for review by early April.

Attachments:
Attendance Sheet
PowerPoint Presentation

I-5 Exit 127 Interchange Area Management Plan
Citizen Advisory and Technical Advisory Committee

Joint Meeting #4

1:00 PM to 3:00 PM

June 11, 2014

ODOT Region 3 Offices
3500 NW Stewart Parkway
Roseburg, OR 97470

AGENDA

1.	Introductions	Alexandra Krull, ODOT
2.	Draft IAMP	Jennifer Danziger, DEA
	• Organization	Angela Rogge, DEA
	• Recommended improvements	
	• Implementation	
3.	Discussion	All
4.	Next Steps	Alexandra Krull, ODOT

Filename: IAMP127 TACCAC4 Agenda 061114

I-5 Exit 127

Interchange Area Management Plan

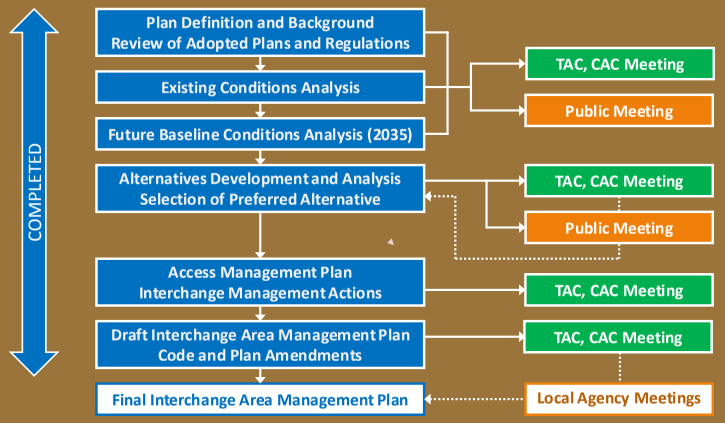
Citizen & Technical
Advisory Committees
Joint Meeting
June 11, 2014

Oregon Department of Transportation

Presentation Topics

1. Process Update
2. Draft Plan
   - Organization
   - Recommended Improvements
   - Implementation
3. Discussion
   - Final recommendations for IAMP

Planning Process



Draft Plan Organization

VOLUME 1

1. INTRODUCTION
2. EVALUATION OF BASELINE CONDITIONS
3. IAMP IMPROVEMENTS
4. MANAGEMENT STRATEGIES
5. IMPLEMENTATION
APPENDIX – PROJECT SHEETS

Draft Plan Organization

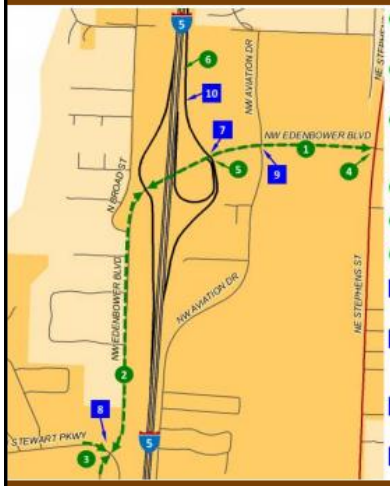
VOLUME 2

- Tech Memos 1 through 8
  - Updated to address comments received
- Tech Memos 9 & 10
  - TM #9: Public Involvement Summary
  - TM #10: Title VI Summary

IAMP Improvements

- Summary Table (9)
  - 10 Improvements
    - 6 Transportation System Management
    - 4 Infrastructure
  - Description
  - Implementation (Priority, Trigger)
  - Estimated cost & general funding categories
- Summary Figure (7)
  - Locations
  - Brief descriptions

Locations of Recommended Improvements



1. **Edenbower Boulevard Signal Timing Coordination:** *Maintain signal coordination from the I-5 southbound ramp terminal through Stephens St (High to Medium Priority)*
2. **Edenbower Boulevard Speed Study:** *Conduct speed study and reduce posted speed between Stewart Pkwy and I-5 Southbound Ramp Terminal if appropriate (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 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 (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)*

IAMP Improvements

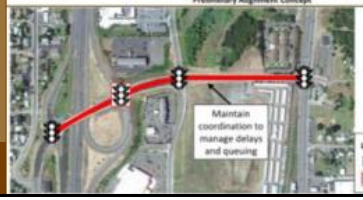
- Project Sheets (Appendix)
  - 1 page
  - Each sheet identifies
    - Location (map)
    - Description & purpose
    - Roadway characteristics (traffic, speed, crash history)
    - How improvement addresses deficiencies (i.e., before & after project)
    - Additional considerations
    - Cost opinion
    - Implementation (priorities, triggers, related projects)
    - Illustration

Project 1. Edenbower Blvd: Maintain Signal Coordination

Project 1. Edenbower Blvd: Maintain Signal Coordination

Description	Maintain signal coordination along Edenbower Blvd
Purpose	• Manage delays and queuing for safety and operations
Roadway Characteristics	• 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	**Existing/Future Deficiency** • 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 **With Improvement** • 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	• 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	• Less than $10,000 assuming infrastructure is ready
Implementation	• 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

Project 2. Edenbower Blvd: Speed Study

Description	Conduct speed study and reduce posted speed if appropriate
Purpose	• Reassess travel speeds and posted speeds based on geometric modifications and safety
Roadway Characteristics	• 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** • 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** • Posted speed would be appropriate for roadway geometry and would be consistent driver behavior
Additional Considerations	• Speed study would be needed to determine if speed reduction is ultimately appropriate • Speed study should follow improvements at Edenbower/Stewart intersection (Project 4)
Cost Opinion	• Less than $5,000
Implementation	• 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

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

Description	Provide adequate sight distance to maintain safe intersection operations
Purpose	• Address sight distance concerns and improve safety
Roadway Characteristics	• 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)
How Improvement Addresses Deficiencies	**Existing/Future Deficiency** • 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 **With Improvement** • Improved sight distance • Potentially fewer eastbound rear-end collisions • Potentially fewer angle collisions between eastbound and northbound vehicles
Additional Considerations	• "No turn on red" could be implemented on northbound Edenbower Blvd • Removal of roadside obstructions may be necessary
Cost Opinion	• Less than $10,000
Implementation	• 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

Preliminary Alignment Concept

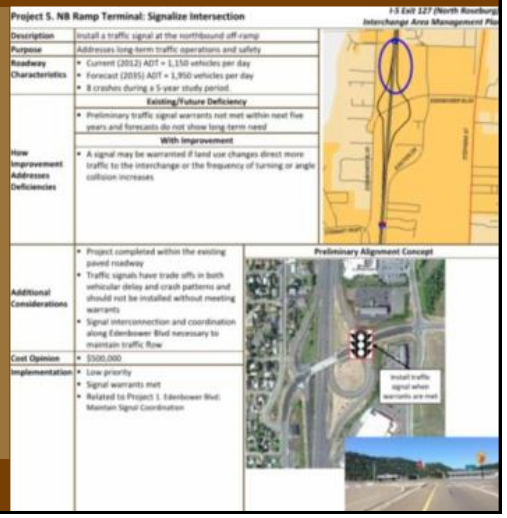
Project 4. Edenbower Blvd/ Stephens St: Extend Left-Turn Bays

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

Description	Extend striped eastbound left-turn bay on Edenbower Blvd and northbound left-turn bay on Stephens St
Purpose	• Address queuing concerns
Roadway Characteristics	• 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** • Queuing sometimes interferes with adjacent travel lane • Conditions will worsen in future as traffic volumes grow **With Improvement** • 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	• Project completed within the existing paved roadway • Could be paired with turn restrictions at some accesses within influence of left-turn bays
Cost Opinion	• $15,000
Implementation	• Medium priority • Queues interfering with adjacent travel lanes • Crash patterns related to queue buildup • Related to Project 1. Edenbower Blvd: Maintain Signal Coordination

Preliminary Alignment Concept

Project 5. NB Ramp Terminal: Signalize Intersection



Project 5. NB Ramp Terminal: Signalize Intersection

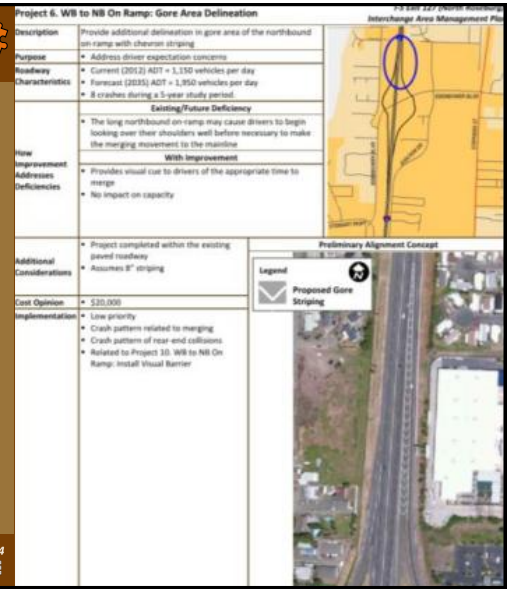
I-5 Exit 127 (North Roseburg) Interchange Area Management Plan

Description	Install a traffic signal at the northbound off-ramp
Purpose	Addresses long-term traffic operations and safety
Roadway Characteristics	• 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** • Preliminary traffic signal warrants not met within next five years and forecasts do not show long-term need **With Improvement** • 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	• 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
Cost Opinion	• $500,000
Implementation	• Low priority • Signal warrants met • Related to Project 1. Edenbower Blvd: Maintain Signal Coordination

Preliminary Alignment Concept

Install traffic signal when warrants are met

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



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

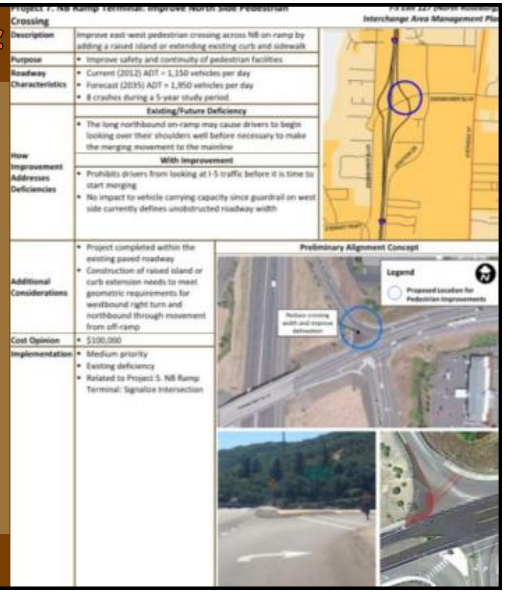
I-5 Exit 127 (North Roseburg) Interchange Area Management Plan

Description	Provide additional delineation in gore area of the northbound on-ramp with chevron striping
Purpose	• Address driver expectation concerns
Roadway Characteristics	• 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** • 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** • Provides visual cue to drivers of the appropriate time to merge • No impact on capacity
Additional Considerations	• Project completed within the existing paved roadway • Assumes 8" striping
Cost Opinion	• $20,000
Implementation	• 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

Preliminary Alignment Concept

Legend: Proposed Gore Striping

Project 7. NB Ramp Terminal: Improve North Side Pedestrian Crossing



Project 7. NB Ramp Terminal: Improve North Side Pedestrian Crossing

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

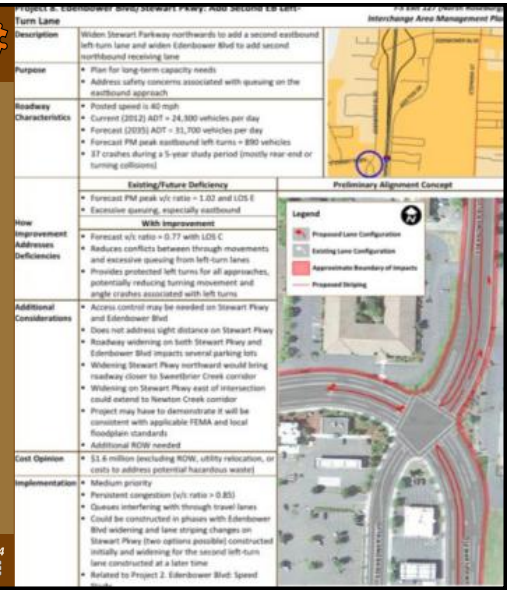
Description	Improve east-west pedestrian crossing across NB on-ramp by adding a raised island or extending existing curb and sidewalk
Purpose	• Improve safety and continuity of pedestrian facilities
Roadway Characteristics	• Current (2012) ADT = 1,150 vehicles per day • Forecast (2035) ADT = 1,950 vehicles per day • 8 crashes during a 5-year study period
How Improvement Addresses Deficiencies	**Existing/Future Deficiency** • 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** • 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	• 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
Cost Opinion	• $100,000
Implementation	• Medium priority • Existing deficiency • Related to Project 5. NB Ramp Terminal: Signalize Intersection

Preliminary Alignment Concept

Legend: Proposed Location for Pedestrian Improvements

Reduce crossing width and improve delineation

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



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

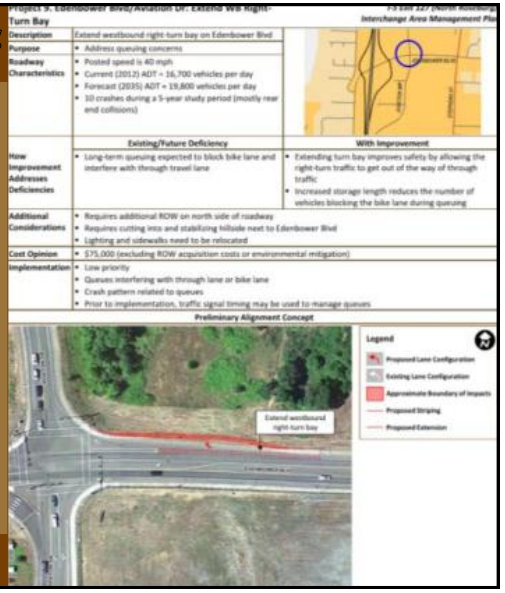
I-5 Exit 127 (North Roseburg) Interchange Area Management Plan

Description	Widen Stewart Parkway northwards to add a second eastbound left-turn lane and widen Edenbower Blvd to add second northbound receiving lane
Purpose	• Plan for long-term capacity needs • Address safety concerns associated with queuing on the eastbound approach
Roadway Characteristics	• 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)
How Improvement Addresses Deficiencies	**Existing/Future Deficiency** • Forecast PM peak v/c ratio = 1.02 and LOS E • Excessive queuing, especially eastbound **With Improvement** • 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
Additional Considerations	• 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 Sweetbriar 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
Cost Opinion	• $1.6 million (excluding ROW, utility relocation, or costs to address potential hazardous waste)
Implementation	• 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

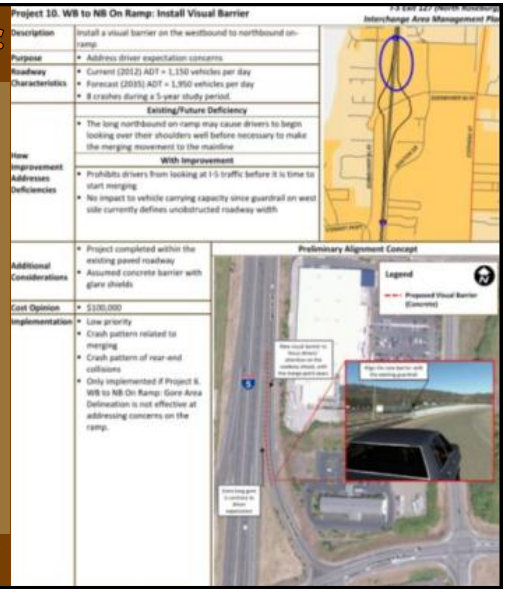
Preliminary Alignment Concept

Legend: Proposed Lane Configuration; Existing Lane Configuration; Approximate Boundary of Impacts; Proposed Striping

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



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



Implementation

- Implementation of the I-5 Exit 127 IAMP will need to occur at the local and state level
  - Adopted as an amendment to the OHP
  - Adopted as part of the City of Roseburg TSP

- IAMP adopts by reference elements of
  - Roseburg TSP
  - Roseburg Comprehensive Plan
  - Roseburg Land Use Development Ordinance

State Actions

- New policy statement for consideration:
  - *Future investments by the State to increase capacity within the I-5 Exit 127 interchange management study area shall require the City of Roseburg to adopt the I-5 Exit 127 IAMP.*
- Continue to coordinate with the City of Roseburg
  - Urban Area Comprehensive Plan
  - Land Use Development Ordinance
  - Development Review Process
- IAMP adopts by reference
  - Roseburg Comprehensive Plan designations within IMSA
  - Roseburg Zoning designations within IMSA

City Actions

- Adopt this IAMP as a refinement plan to its TSP
- Retain, through adoption of the IAMP, current adopted Comprehensive Plan and Land Development Ordinance designations and regulations

  The IAMP assumes that, within the IMSA, Roseburg will maintain their:
  - Current land use designations with current uses and densities
  - Plan and code amendment processes
  - Requirements for traffic impact studies
  - Processes for notification to ODOT regarding land use actions that may affect state transportation facilities
- Continue to coordinate with ODOT in evaluating land use actions that could affect the function of the interchange

Next Steps

- Prepare Draft IAMP for I-5 Exit 127
  - Review period
- Finalize IAMP for I-5 Exit 127
  - Summer 2014

I-5 Exit 127 IAMP

Thank you for taking the time to participate in the process. Your input has helped shape this plan to better meet the needs of the community and the interchange users.

IAMP 127 TAC/CAC June 11, 2014

Alexandra Kruse	ODOT
Jennifer Danziger	DEA
Angela Rogge	DEA
Richard S. WECKERLE	Roseburg P.W.C.
Jeff Nelson	COR
Scotty Ingman	Planning Commission
Eric Standley	O-Dot
Dave Warrick	ODOT Tech Svcs.
Brian Davis	City of Roseburg
Mel Cherney	RETIRED
Ray Lapke	ODOT
Aaron Brooks	ODOT
John McLean	BIKEWALK Roseburg
Chris Hunter	

I-5 Exit 127 Interchange Area Management Plan
Citizen Advisory and Technical Advisory Committee

Joint Meeting #4

1:00 PM to 3:00 PM

June 11, 2014

ODOT Region 3 Offices
3500 NW Stewart Parkway
Roseburg, OR 97470

Meeting Notes

Attendees: See Attached List

Introductions

Allie Krull, the Overall ODOT project manager, opened the fourth (combined) Technical Advisory (TAC) and Citizen Advisory Committee (CAC) meeting with a round of introductions.

Draft Plan Overview

Jennifer Danziger, the Consultant project manager, provided the group with an overview of the draft plan structure. (See slides 4 & 5.)

Review of Recommended Projects

Angela Rogge reviewed the 10 projects that were included in the draft IAMP. (See slides 6 through 18.) Because the draft plan already includes comments on the recommended project list, the advisory committees were asked for specific feedback/input in the following areas:

- Confirmation of each project in the Draft IAMP
- Confirmation of the priority of each project in the Draft IAMP
- Implementation considerations that should be described in the final project sheets for each project in the Draft IAMP

The following comments/questions were received during the discussion:

- **Project 1 – Edenbower Blvd: Maintain Signal Coordination**
  - System is interconnected already. Coordination with Stephens Street has not been needed to date.
  - Will continue to monitor and maintain signal coordination in Edenbower corridor.
- **Project 2 – Edenbower Blvd: Speed Study**
  - Could do speed study if the City of Roseburg makes a request.
- **Project 3 – Edenbower Blvd/Stewart Pkwy: Provide Adequate Sight Distance**
  - Do we account for local traffic vs. visitors? *Model cannot specifically break this information down. Visibility is a concern either way.*

    - Did crash data include right-turn lane on Edenbower Boulevard at Stewart Parkway? *Yes. No crashes associated with sight distance limitations in 5 years analyzed.*

- **Project 4 – Edenbower Blvd/Stephens Street: Extend Left-Turn Bays**
    - No comments.
- **Project 5 – NB Ramp Terminal: Signalize Intersection**
    - No comments.
- **Project 6 – WB to NB On Ramp: Gore Area Delineation**
    - No comments.
- **Project 7 – NB Ramp Terminal: Improve North Side Pedestrian Crossing**
    - No comments.
- **Project 8 – Edenbower Blvd/Stewart Pkwy: Add Second EB Left-Turn Lane**
    - City would like to construct full project, not in phases.
- **Project 9 – Edenbower Blvd/Aviation Dr: Extend WB Right-Turn Bay**
    - No comments.
- **Project 10 – WB to NB On Ramp: Install Visual Barrier**
    - No comments.

Implementation (Information in Tech Memo #8)

Jennifer provided an overview of the implementation and the actions that would be taken by both the state and city. (See slides 19 through 21.)

Next Steps

Additional comments on the Draft IAMP or Tech Memo #8 can be submitted through June 30, 2014. DEA will incorporate meeting comments and other comments to prepare a final IAMP that ODOT will take through the adoption process.

Attachments:
Attendance Sheet
PowerPoint Presentation

Appendix B. Public Open House Meeting Materials

I-5 Exit 127 IAMP

COMPLETE THE PICTURE. BUILD THE PLAN.

Interstate 5 Exit 127

Interchange Area Management Plan (IAMP)

April 1, 2013

WELCOME

Oregon Department of Transportation

What is an IAMP?

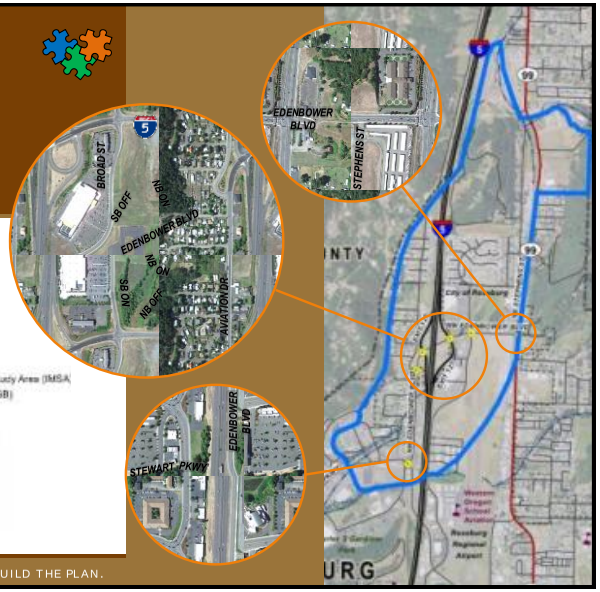
- A plan for managing the interchange and surrounding areas through the year 2035
- A plan to protect the function and capacity of the interchange and cross streets
- A plan expressing the management objectives of ODOT, Roseburg, and Douglas County

IAMP Goal & Objectives

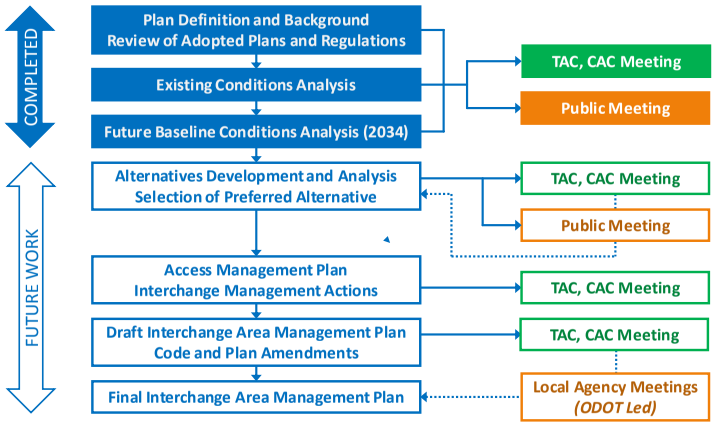
Develop a plan for improvements for Interchange 127 that can be implemented over time to maximize the function of the existing interchange and address the long-term needs of Roseburg and other nearby Douglas County communities.

- Protect the function of the interchange and Edenbower Road.
- Develop concepts to improve safety and maximize operational efficiency.
- Address future growth needs of Roseburg and Douglas County.
- Identify local system projects that connect and complement the interchange.
- Incorporate bicycle and pedestrian elements.
- Develop an access management plan for safe and acceptable operations.
- Coordinate planning efforts with other plans and projects in the study area.
- Prioritize IAMP improvements considering potential funding.

IAMP Planning Area



Planning Process



COMPLETE THE PICTURE. BUILD THE PLAN.

Public Involvement Process

Technical Advisory Committee (TAC): *Provides technical and policy guidance and will serve as the primary body making recommendations about the project. Composed primarily of ODOT and local jurisdiction staff.*

Public Open House: *Intended as informational exchanges where staff and consultant present and explain project information and the general public can provide input and comment on issues and concerns of importance to them.*

I-5 Exit 127 IAMP

Citizen Advisory Committee (CAC): *Provides stakeholder input and offer recommendations to the TAC. Composed of interested citizens, property owners, business representatives, and other stakeholders.*

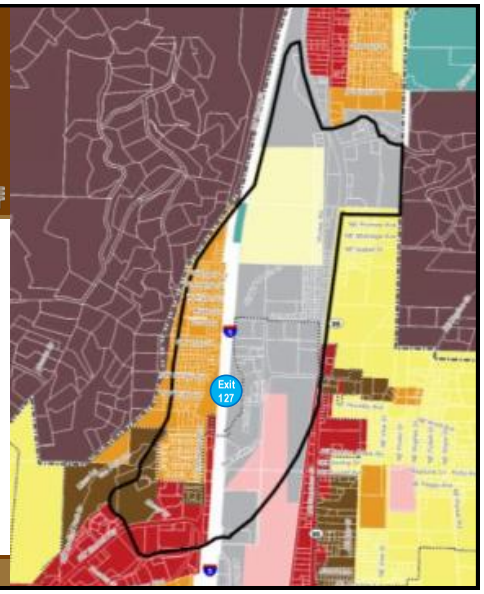
Local Agency Meetings: *Provides additional opportunities for citizen and business input during the adoption process.*

COMPLETE THE PICTURE. BUILD THE PLAN.

Natural Features

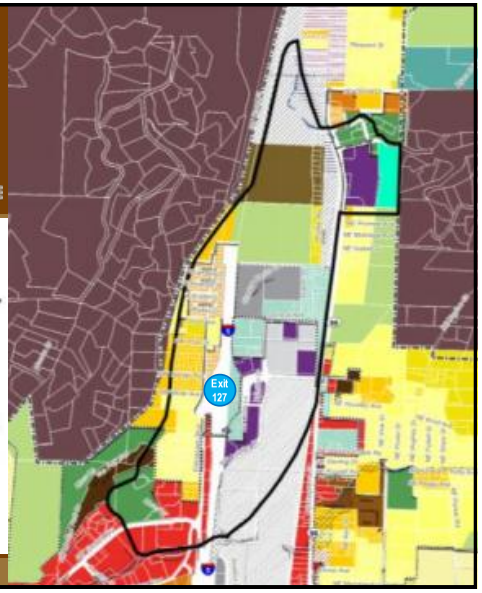
COMPLETE THE PICTURE. BUILD THE PLAN.

Comprehensive Plan



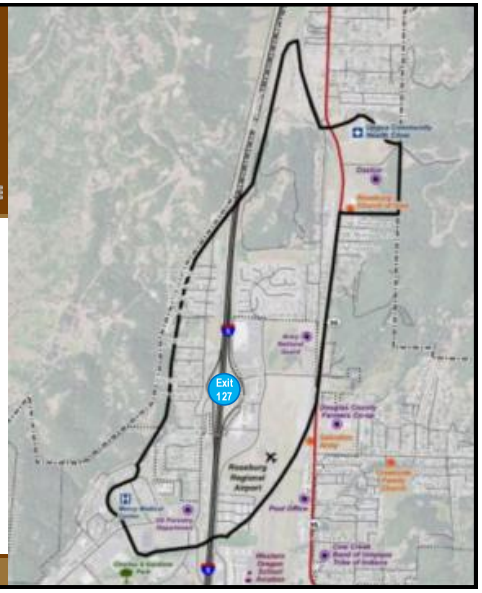
COMPLETE THE PICTURE. BUILD THE PLAN.

Zoning Map



COMPLETE THE PICTURE. BUILD THE PLAN.

Community Features



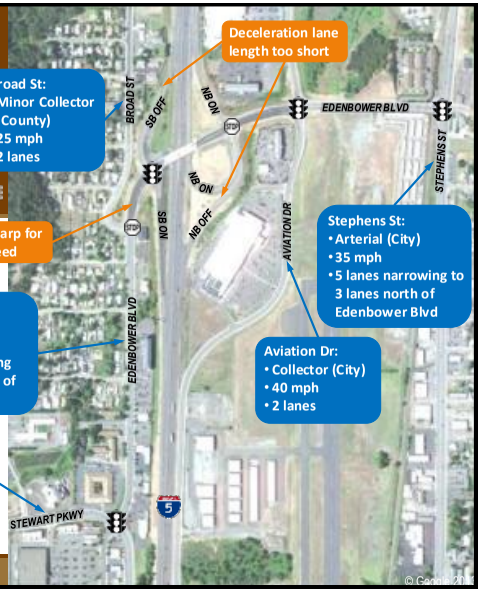
COMPLETE THE PICTURE. BUILD THE PLAN.

Existing Condition Analysis

- Transportation System Inventory
  - Roadways
  - Access
  - Pedestrian and Bicycle Facilities
  - Transit
  - Freight
  - Rail
- Traffic Conditions
  - Design Hourly Volumes - 2012
  - Traffic Operations – 6 intersections and Freeway
  - Crash History – 2006 through 2010

COMPLETE THE PICTURE. BUILD THE PLAN.

Roadway Facilities



COMPLETE THE PICTURE. BUILD THE PLAN.

Access Inventory

Legend

- Private Access
- Public Access
- ¼ mile from Interchange Ramps (ODOT Standard)

COMPLETE THE PICTURE. BUILD THE PLAN.

Bicycle & Pedestrian Facilities

Legend

- Bike Lanes
- Sidewalks

COMPLETE THE PICTURE. BUILD THE PLAN.

Transit & Rail Facilities

Legend

- Umpqua Transit Red Route
- Umpqua Transit Green Route
- Umpqua Transit Orange Route
- Umpqua Transit Stop
- Central Oregon and Pacific (CORP) Railroad

COMPLETE THE PICTURE. BUILD THE PLAN.

Safety Summary

- 124 crashes over 5 years (2006 through 2010)
  - 2 crashes resulted in severe injury(s)
  - 49 crashes resulted in minor injury(s)
- 28 Freeway Crashes
  - Comparable to average crash rates for interstate freeways
- Critical Crash Rates
  - Used to identify locations that warrant further investigation
  - One intersection: Edenbower Blvd & Stewart Pkwy
- Worst 10% Safety Priority Index System (SPIS) Site
  - No SPIS locations in study area

COMPLETE THE PICTURE. BUILD THE PLAN.

IAMP 127 Crash Summary

Legend

- Intersection Crashes
- Segment Crashes
- Severe Injuries Occurred
- Other Injuries or Property Damage Only

Future Baseline Condition Analysis

- Future Traffic Volumes
  - 2035 – Analysis year
  - Based on Roseburg Travel Demand Model
    - Assumes 1.2 percent population growth in City
    - Assumes 1.0 percent population growth outside City
  - Peak Hour Volumes at Intersections
  - Average Daily Volumes on Segments

Future Baseline Traffic Volumes

Legend

TEV = Total Entering Vehicles (at an intersection in 1 hour)

ADT = Average Daily Traffic (on a roadway segment)

2012 TEV
2035 TEV

2010 ADT
2035 ADT

Identified Issues

LEGEND

- Spot Issue
- Segment Issue

- Safety
- Operational
- Access
- Pedestrian
- Bicycle

Next Steps

- Develop Projects to Address Deficiencies
  - Concept Analysis and Evaluation
  - Selection of Preferred Concepts

We're looking for your input and ideas. Please take a few minutes to fill out a comment card.

How Did You Hear About the Open House?

- Radio ads
- Radio story
- Newspaper ad
- Newspaper story
- TV story
- Billboards
- Table Tents
- Website
- Flyer
- Chamber Newsletter

Help us keep you and others informed about future meetings. Place a sticker next to the advertising sources that brought the meeting to your attention.

IAMP 127 OPEN HOUSE

ROSEBURG, OR APRIL 1, 2013

ATTENDANCE SHEET

Name	Agency/Organization	Phone #	Email
Bob Cotterell	City of Roseburg	541-430-0845	Rob@enactlink.com
Nikki Messenger	City of Roseburg	541 492-6887	NMessenger@cityofroseburg.org
Frank Reading	ODOT		
Nadine Sjurt	[illegible]	672-6407	d3a[illegible]13@q.com
Robert Wandell		541-643-3169	N/A
Jody Tatone	Remax Pivot Realty	541 673-3272	
Pete Carlhart	KRM	679-6744	
Rick Roberts	TAXPAYER	541-817-9052	

I-5 Interchange 127 Area Management Plan

Open House

Meeting #1

3:30 PM – 6:30 PM

April 1, 2013

ODOT Region 3 Offices
3500 NW Stewart Parkway
Roseburg, OR 97470

Meeting Summary

Eight people signed in to the Open House. The sign-in sheet is attached.

The following comments were received from comment cards submitted during the open house:

- No traffic circles
- There needs to be a light at the northbound ramp terminal.
- Large trucks take up the bike lane when turning right onto Edenbower Boulevard from Stephens Street.
- Please pre-plan so we don't have the U.C.C roadway moved again. Standardization and synchronized and with flashing yellow arrows at appropriate intersections.

Comment cards are attached.

Attachments:
Sign-In Sheet
Comment Cards

IAMP 127 OPEN HOUSE

ROSEBURG, OR APRIL 1, 2013

ATTENDANCE SHEET

Name	Agency/Organization	Phone #	Email
Bob Cotterell	City of Roseburg	541-430-0845	Rob@enactlink.com
Nikki Messenger	City of Roseburg	541 492-6887	NMessenger@cityofroseburg.org
Frank Reading	ODOT		
Nadine Sjurt	[illegible]	672-6407	d3a[illegible]13@q.com
Robert Wandell		541-643-3169	N/A
Jody Tatone	Remax Pivot Realty	541 673-3272	
Pete Carlhart	KRM	679-6744	
Rick Roberts	TAXPAYER	541-817-9052	

IAMP 127 Open House
April 1, 2013

Name (Optional): R. Peters

Company/Affiliation (if applicable): Self

Address: 1243 N.E. ~~Stephen~~ Malheur

Phone: 541 817 9052 Email:

Where did you hear about the Open House?

☒ Radio ads ☐ Radio story ☐ Newpaper ad ☐ Newspaper story ☐ TV story

☐ Billboards ☐ Table Tents ☐ Website ☐ Flyer ☐ Chamber Newsletter

Do you have any special concerns/thoughts regarding these projects? Any specific safety concerns? Traffic concerns? Ideas?

Please put your comments about this project on the <u>REVERSE</u> of this card.

COMMENT/SUGGESTIONS: Please pre-plan so we do not have the 2nd C.C. Broadway being moved again! Standardization and synchronized and with flashing yellow arrow at appropriate intersections.

IAMP 127 Open House
April 1, 2013

Name (Optional): B COTTERELL

Company/Affiliation (if applicable): CITY OF ROSEBURG - COUNCILOR

Address: 1052 W. NEBO

Phone: 541-430-0945 Email: BOBC@EARTHLINK.COM

Where did you hear about the Open House?

☒ Radio ads ☐ Radio story ☐ Newpaper ad ☐ Newspaper story ☐ TV story

☐ Billboards ☐ Table Tents ☐ Website ☐ Flyer ☐ Chamber Newsletter

Do you have any special concerns/thoughts regarding these projects? Any specific safety concerns? Traffic concerns? Ideas?

Please put your comments about this project on the <u>REVERSE</u> of this card.

COMMENT/SUGGESTIONS: NO TRAFFIC CIRCLES

IAMP 127 Open House
April 1, 2013

Name (Optional): Robert Wandell

Company/Affiliation (if applicable): —

Address: 690 NE Ventura St. Roseburg

Phone: 541-643-3169 Email: —

Where did you hear about the Open House?

☒ Radio ads ☐ Radio story ☐ Newpaper ad ☐ Newspaper story ☐ TV story

☐ Billboards ☐ Table Tents ☐ Website ☐ Flyer ☐ Chamber Newsletter

Do you have any special concerns/thoughts regarding these projects? Any specific safety concerns? Traffic concerns? Ideas?

Please put your comments about this project on the <u>REVERSE</u> of this card.

COMMENT/SUGGESTIONS: Large Trucks Cant Turn Rt. off Stevens on To Edenbour without Taking up Bike Lane.

Need Light @ North Bound I5 on To Edenbour. Exit 127

IAMP 127 Open House
April 1, 2013

Name (Optional): Jody Tatone

Company/Affiliation (if applicable): Remax Professional Realty

Address: 2955 NW Edenbower Blvd Roseburg Or

Phone: 541 673-3272 Email:

Where did you hear about the Open House?

☐ Radio ads ☐ Radio story ☐ Newpaper ad ☒ Newspaper story ☐ TV story

☐ Billboards ☐ Table Tents ☐ Website ☐ Flyer ☐ Chamber Newsletter

Do you have any special concerns/thoughts regarding these projects? Any specific safety concerns? Traffic concerns? Ideas?

Please put your comments about this project on the <u>REVERSE</u> of this card.

COMMENT/SUGGESTIONS:

I-5 Exit 127 IAMP

COMPLETE THE PICTURE. BUILD THE PLAN.

Interstate 5 Exit 127

Interchange Area Management Plan (IAMP)

August 12, 2013

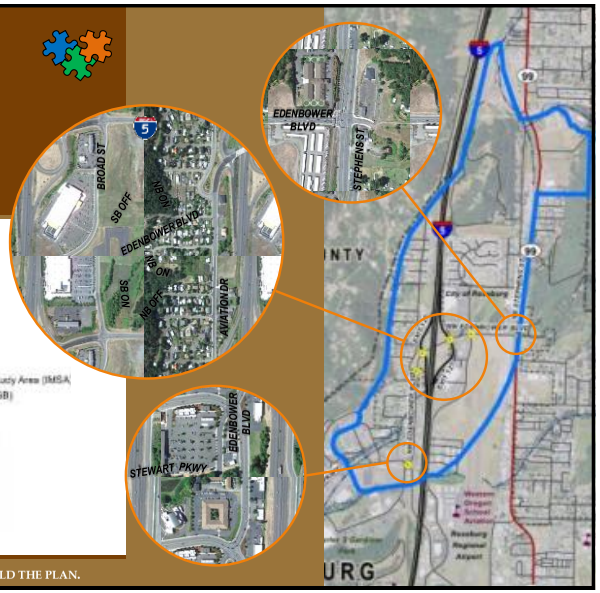
WELCOME

Oregon Department of Transportation

What is an IAMP?

- A plan for managing the interchange and surrounding areas through the year 2035
- A plan to protect the function and capacity of the interchange and cross streets
- A plan expressing the management objectives of ODOT, Roseburg, and Douglas County

IAMP Planning Area

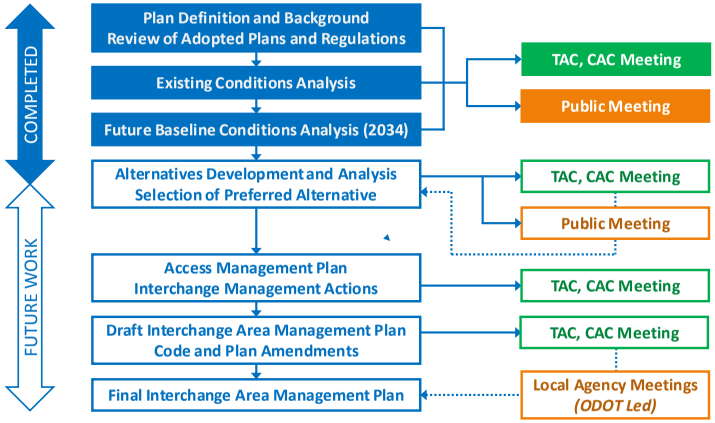


IAMP Goal & Objectives

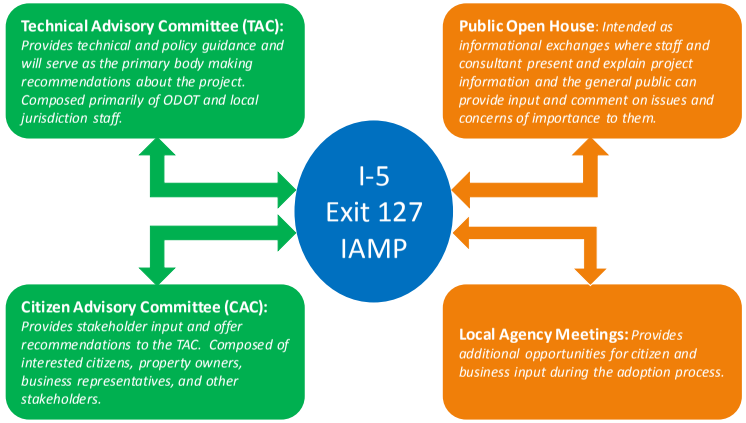
Develop a plan for improvements for Interchange 127 that can be implemented over time to maximize the function of the existing interchange and address the long-term needs of Roseburg and other nearby Douglas County communities.

- Protect the function of the interchange and Edenbower Road.
- Develop concepts to improve safety and maximize operational efficiency.
- Address future growth needs of Roseburg and Douglas County.
- Identify local system projects that connect and complement the interchange.
- Incorporate bicycle and pedestrian elements.
- Develop an access management plan for safe and acceptable operations.
- Coordinate planning efforts with other plans and projects in the study area.
- Prioritize IAMP improvements considering potential funding.

Planning Process



Public Involvement Process



Concept Development

- Concepts are intended to address identified deficiencies
  - Existing and Future Conditions (2012 and 2035)
  - Operations (congestion, delays, queuing)
  - Safety (crash patterns, potential conflicts)
  - Geometry
- Concepts were developed to meet IAMP Objectives

Types of Improvements

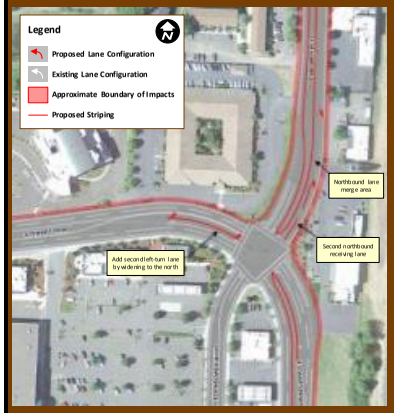
- Intersection Improvements
  Potential improvements to improve traffic flow, provide additional capacity, or address safety concerns at individual intersections.
- Interchange Ramp Improvements
  Potential ramp modifications to address concerns about driver expectation.
- Multi-Modal Improvements
  Potential improvements to enhance safety and continuity of pedestrian facilities.

Concept Evaluation Criteria

- Traffic Operations and Safety
  - *Does the improvement address existing operational or safety concerns?*
  - *Does it address system deficiencies?*
  - *Would it cause additional concerns?*
- Basic Roadway Geometry and Right of Way (ROW)
  - *How might the improvement look?*
  - *Would it require additional right of way?*
  - *Are there additional factors to consider in design?*
- Environmental and Land Use
  - *Would it have any potential impact to environmental resources?*
  - *How would it affect adjacent land uses?*
- Cost Opinion*
  - *How much would it cost?*

** Cost opinions do not include estimates of ROW costs or mitigation.*

Concept 1, Option A – Add Second Eastbound Left-Turn Lane



Purpose: Improve operations

Description:
- Add second EB left turn lane on Stewart Pkwy
- Widen Edenbower Blvd for second NB lane
- Modify signal timing

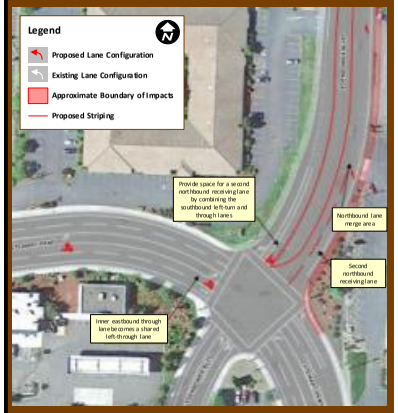
Traffic Operations & Safety:
- Improves operations from over capacity conditions with no changes to demand at 75% of capacity (meets standards)
- Reduces queuing and delays for EB left turns
- May improve safety by reducing conflicts between left-turn queues and through traffic
- Requires merge on NB Edenbower Blvd
- May require access control in merge area
- Does not improve sight distance on Stewart Pkwy

Basic Roadway Geometry & Right of Way (ROW):
- Widens Stewart Pkwy west of Edenbower Blvd to add EB left-turn lane and east of Edenbower Blvd to align though lanes
- Widens Edenbower Blvd to add NB merge lane

Environmental & Land Use:
- Impacts parking lots where widening occurs
- Could have minor impacts to wetland corridors associated with Sweetbriar and Newton Creeks

Cost Opinion:
- $1.6 million

Concept 1, Option B – Create Eastbound Shared Left-Through Lane



Purpose: Improve operations

Description:
- Convert one through lane on EB Stewart Pkwy to a shared left-through lane
- Restripe Edenbower Blvd and widen to provide second NB receiving lane
- Modify signal timing

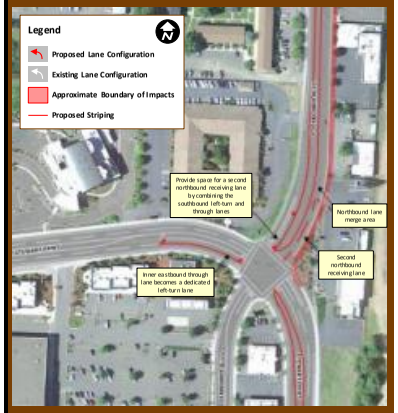
Traffic Operations & Safety:
- Improves operations from over capacity conditions with no changes to demand at 80% of capacity (meets standards)
- Reduces queuing and delays for EB left turns
- May improve safety by reducing conflicts between left-turn queues and through traffic
- Requires merge on NB Edenbower Blvd
- May require access control in merge area
- Does not improve sight distance on Stewart Pkwy

Basic Roadway Geometry & Right of Way (ROW):
- No widening on Stewart Pkwy
- Less widening on Edenbower Blvd than Option A because second NB lane partially accommodated by reallocating lanes on the SB approach

Environmental & Land Use:
- Impacts parking lots where widening occurs
- Less potential for impacts to wetland corridors associated with Sweetbriar and Newton Creeks than Option A

Cost Opinion:
- $700,000

Concept 1, Option C – Convert an Eastbound Through Lane to a Left-Turn Lane



Purpose: Improve operations

Description:
- Convert one through lane on EB Stewart Pkwy to a dedicated left-turn lane
- Restripe Edenbower Blvd and widen to provide second NB receiving lane

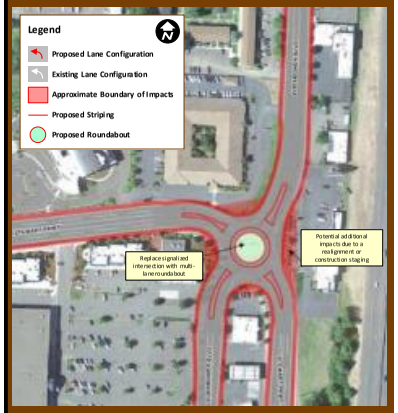
Traffic Operations & Safety:
- Improves operations from over capacity conditions with no changes to demand at 80% of capacity (meets standards)
- Reduces queuing and delays for EB left turns
- May improve safety by reducing conflicts between left-turn queues and through traffic
- Requires merge on NB Edenbower Blvd
- May require access control in merge area
- Does not improve sight distance on Stewart Pkwy
- Converting EB through lane to dedicated left-turn lane can "trap" some drivers who intend to go straight

Basic Roadway Geometry & Right of Way (ROW):
- No widening on Stewart Pkwy
- Less widening on Edenbower Blvd than Option A because second NB lane partially accommodated by reallocating lanes on the SB approach

Environmental & Land Use:
- Parking lot impacts similar to Option B
- Less potential for impacts to wetland corridors associated with Sweetbriar and Newton Creeks than Option A

Cost Opinion:
- $700,000

Concept 2 – Install Multi-Lane Roundabout



COMPLETE THE PICTURE. BUILD THE PLAN.

Purpose: Improve operations and safety

Description:
- Install multi-lane roundabout with dual approach lanes on all legs

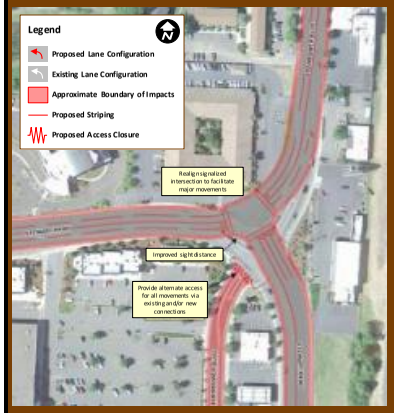
Traffic Operations & Safety:
- Improves operations from over capacity conditions with no changes to demand at 85% of capacity (meets standards)
- Roundabouts reduce conflict points and generally have both fewer and less severe crashes
- Improves sight distance on Stewart Pkwy
- Bicyclists may have trouble traveling with vehicular traffic but can travel as pedestrians through the intersection
- Pedestrian crossing widths shortened

Basic Roadway Geometry & Right of Way (ROW):
- All approaches require widening or realignment to accommodate footprint of multi-lane roundabout
- All quadrants surrounding the intersection would incur ROW impacts

Environmental & Land Use:
- Impacts parking lots where widening occurs
- Could have minor impacts to wetland corridors associated with Sweetbriar and Newton Creeks
- Widening could affect Edenbower Blvd trail accessing Charles S. Gardiner Park
- Project should be vetted with Mercy Hospital

Cost Opinion:
- $2.6 million

Concept 3 – Realign Intersection to East-West "T"



COMPLETE THE PICTURE. BUILD THE PLAN.

Purpose: Improve operations and safety

Description:
- Realign intersection to better accommodate major vehicular traffic movements
- Close access to Edenbower Blvd south of intersection

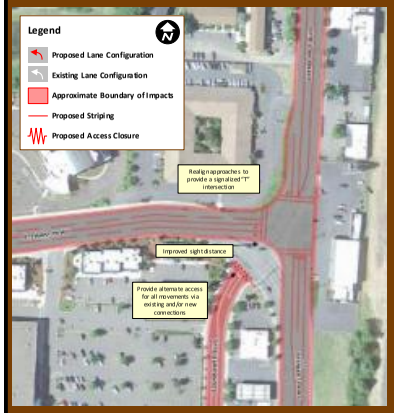
Traffic Operations & Safety:
- Improves operations from over capacity conditions with no changes to demand at 83% of capacity (meets standards)
- Redirects traffic from south leg of Edenbower Blvd → increased travel distance and more inconvenience
- Reduces volume of vehicles turning left, decreasing the likelihood of turning/angle crashes
- Addresses sight distance issues on Stewart Pkwy
- May require access control in merge area

Basic Roadway Geometry & Right of Way (ROW):
- Intersection realignment will require property acquisition
- Does not include local network or access connections to address closure of south leg of Edenbower Blvd

Environmental & Land Use:
- Impacts property and parking lots, particularly on northwest corner of intersection
- Closing south leg of Edenbower Blvd would have economic impacts to businesses served by roadway
- Low potential for impacts to wetland corridors associated with Sweetbriar and Newton Creeks
- Could affect Umpqua Transit but stop

Cost Opinion:
- $1.9 million

Concept 4, Option A – Realign Intersection to North-South "T"



COMPLETE THE PICTURE. BUILD THE PLAN.

Purpose: Improve operations and safety

Description:
- Realign intersection to north-south perpendicular "T"
- Close access to Edenbower Blvd south of intersection
- Provide single EB left-turn lane on Stewart Pkwy

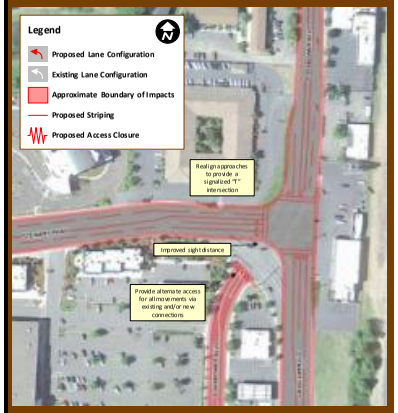
Traffic Operations & Safety:
- Improves operations from over capacity conditions with no changes to demand at 90% of capacity (not standard)
- Circulation impacts same as Concept 3
- Addresses sight distance issues on Stewart Pkwy
- May require access control near realigned intersection

Basic Roadway Geometry & Right of Way (ROW):
- Does not include local network or access connections to address closure of south leg of Edenbower Blvd
- Intersection realignment will require property acquisition
- Does not require any roadway widening beyond area affected by realignment

Environmental & Land Use:
- Impacts property and parking lots where realignment occurs
- Economic impacts same as Concept 3
- Transit impacts same as Concept 3
- Low potential for impacts to wetland corridors associated with Sweetbriar and Newton Creeks

Cost Opinion:
- $1.6 million

Concept 4, Option B – Realign Intersection to North-South "T" with Dual Left Turns



COMPLETE THE PICTURE. BUILD THE PLAN.

Purpose: Improve operations and safety

Description:
- Realign intersection to north-south perpendicular "T"
- Close access to Edenbower Blvd south of intersection
- Provide two EB left-turn lanes on Stewart Pkwy
- Widen Edenbower Blvd for second NB lane

Traffic Operations & Safety:
- Improves operations from over capacity conditions with no changes to demand at 60% of capacity (meets standard)
- Circulation impacts same as Concept 3
- Addresses sight distance issues on Stewart Pkwy
- May require access control near realigned intersection and along Edenbower Blvd

Basic Roadway Geometry & Right of Way (ROW):
- Does not include local network or access connections to address closure of south leg of Edenbower Blvd
- Intersection realignment will require property acquisition
- Widens Edenbower Blvd to add NB merge lane

Environmental & Land Use:
- Same impacts as Option A for northwest corner
- Property and parking impacts on Edenbower Blvd north of intersection for merge lane
- Same economic and transit impacts as Concept 3
- Low potential for impacts to wetland corridors associated with Sweetbriar and Newton Creeks

Cost Opinion:
- $1.9 million

Concept 5 – Extend Westbound Right-Turn Bay

Purpose: Address queuing concerns

Description:
- Extend WB right-turn bay at the intersection of Aviation Dr and Edenbower Blvd

Traffic Operations & Safety:
- Improve safety by allowing the right-turn traffic to get out of the way of through traffic
- Keeps bike lane clear of stopped vehicles

Basic Roadway Geometry & Right of Way (ROW):
- Widens Edenbower Blvd to extend westbound right-turn lane on north side of roadway
- Lighting and sidewalks need to be relocated

Environmental & Land Use:
- Mapped wetlands identified in close proximity although any roadside wetland area likely to be highly degraded
- Improvement not anticipated to extend into undisturbed area

Cost Opinion:
- $75,000

COMPLETE THE PICTURE. BUILD THE PLAN.

Concept 6 – Extend Left-Turn Bays

Purpose: Address queuing concerns

Description:
- Extend striped EB left-turn bay on Edenbower Blvd at Stephens St
- Extend NB left-turn bay on Stephens St at Edenbower Blvd

Traffic Operations & Safety:
- May improve safety by reducing conflicts between left-turn queues and through traffic
- May reduce delay for other travel movements

Basic Roadway Geometry & Right of Way (ROW):
- Project would occur within the existing paved roadway

Environmental & Land Use:
- No impacts

Cost Opinion:
- $15,000

COMPLETE THE PICTURE. BUILD THE PLAN.

Concept 7 – Delineate Gore Area with Chevron Paint

Purpose: Address driver expectation concerns

Description:
- Provide additional delineation in gore area of the northbound on-ramp with chevron striping

Traffic Operations & Safety:
- Provides visual cue to drivers of the appropriate time to merge
- No impact on capacity

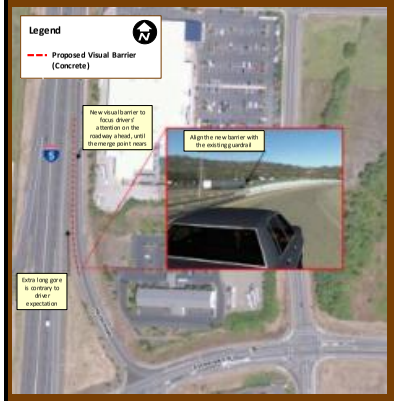
Basic Roadway Geometry & Right of Way (ROW):
- Project would occur within the existing paved roadway
- Assumes 8" striping

Environmental & Land Use:
- No impacts

Cost Opinion:
- $20,000

COMPLETE THE PICTURE. BUILD THE PLAN.

Concept 8 – Install Visual Barrier



Purpose: Address driver expectation concerns

Description:
- Install a visual barrier on the westbound to northbound on-ramp

Traffic Operations & Safety:
- 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

Basic Roadway Geometry & Right of Way (ROW):
- Project would occur within the existing paved roadway
- Assumes concrete barrier with glare shields

Environmental & Land Use:
- No impacts

Cost Opinion:
- $100,000

COMPLETE THE PICTURE. BUILD THE PLAN.

Concept 9 – Improve North Side Pedestrian Crossing

Purpose: Improve safety and continuity of pedestrian facilities

Description:
- Improve east-west pedestrian crossing across NB on-ramp by adding a raised island or extending existing curb and sidewalk

Traffic Operations & Safety:
- Shortens distance pedestrian has to cross intersection with raised island or curb and sidewalk extension
- Could include striped crosswalk to further increase driver awareness of pedestrian activity
- Reduces pedestrian exposure with vehicular traffic
- No reduction in vehicular capacity
- Vehicle carrying capacity would be similar to other on-ramps at interchange

Basic Roadway Geometry & Right of Way (ROW):
- Construction of raised island or curb extension needs to meet geometric requirements for WB right turn and NB through movement from off-ramp
- Improvements would occur within existing paved roadway

Environmental & Land Use:
- No impacts

Cost Opinion:
- $20,000

Concept 10 – Enhance Pedestrian Crossing along Edenbower Boulevard

Purpose: Improve safety and continuity of pedestrian facilities

Description:
- Enhance pedestrian crossings by installing striped crosswalks and directional ADA compliant curb ramps for north-south travel along west side of Edenbower Blvd

Traffic Operations & Safety:
- Enhanced curb ramps improve directional guidance
- Striped crosswalks help identify the presence of pedestrian activity and increase visibility to motorists turning onto side streets
- Clearly defined and frequent crosswalks may encourage slower travel speeds along Edenbower Blvd
- No impact on vehicular capacity

Basic Roadway Geometry & Right of Way (ROW):
- Improvements would occur within the available ROW

Environmental & Land Use:
- No impacts

Cost Opinion:
- $25,000

Next Steps

- Selection of Preferred Improvements
  - Analysis of modified or additional concepts
  - Recommendation for preferred combination of improvements

We're looking for your input and ideas. Please take a few minutes to fill out a comment card.

How Did You Hear About the Open House?

- Radio ads
- Radio story
- Newspaper ad
- Newspaper story
- TV story
- Billboards
- Table Tents
- Website
- Flyer
- Chamber Newsletter

Help us keep you and others informed about future meetings. Place a sticker next to the advertising sources that brought the meeting to your attention.

Thank you for your participation!

Keep an eye out for upcoming opportunities to learn about planning for other interchanges:

- *I-5 Exit 124 (Harvard Avenue)*
- *I-5 Exit 125 (Garden Valley Boulevard)*

IAMP 127 OPEN HOUSE

ROSEBURG, OR AUGUST 12, 2013

ATTENDANCE SHEET

Name	Agency/Organization	Phone #	Email
Dick Dolgonas	Roseburg Bicycle/ Pedestrian Coalition	672-1757	dolgonas@msn.com
Lloyd Scherbinske		541-440-5427	
RONALD R LAWLER		541-957-1126	
JOHN MCDONALD	ROSEBURG PLANNING COMMISSION	—	—
Jeff Nelson	COR		
Jason Gorg		672-1525	
GAN			

I-5 Interchange 127 Area Management Plan

Open House

Meeting #2

4:00 PM – 7:00 PM

August 12, 2013

ODOT Region 3 Offices
3500 NW Stewart Parkway
Roseburg, OR 97470

Meeting Summary

Seven people signed in to the Open House. The sign-in sheet is attached.

The following comments were received from one comment card submitted during the open house:

- Bicycle & pedestrian impacts need to be explicit considerations.
- I think there are higher priorities that need to be addressed elsewhere in Roseburg. We need to take care of current needs of the existing streets before we build or mode changes.
- Our streets need to work for all users. The need to be attractive and useable for all ages and abilities.

Comment card is attached.

Attachments:
Sign-In Sheet
Comment Cards

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

Technical Memorandum #10
Title VI and Environmental Justice

Prepared for

Oregon Department of Transportation, Region 3
3500 NW Stewart Parkway
Roseburg, Oregon 97470

Prepared by

David Evans and Associates, Inc.
2100 SW River Parkway
Portland, Oregon

December 2014

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10. TITLE VI AND ENVIRONMENTAL JUSTICE

Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations of February 11, 1994, requires agencies undertaking federal projects to identify low-income and minority populations; assess whether high and adverse human health or environmental impacts would result from the alternatives; and ensure participation of low-income and minority populations in the transportation decision making process.

Additional underserved populations are the "transportation disadvantaged." These are those persons who, because of physical or mental disability, income status, or age, are unable to transport themselves or to purchase transportation and are, therefore, dependent upon others to obtain access to health care, employment, education, shopping, social activities, or other life-sustaining activities. Projects receiving federal assistance must also evaluate impacts to these populations to comply with the Age Discrimination Act of 1975, Federal-Aid Highways Act, Rehabilitation Act of 1973 and Americans with Disabilities Act of 1990.

This memorandum summarizes the efforts to address Title VI and Environmental Justice during the development of the I-5 Exit 127 Interchange Area Management Plan (IAMP).

10.1. Identification

The low-income and minority populations within the Interchange Management Study Area (IMSA) are discussed below along with elements of the transportation infrastructure that serve the transportation disadvantaged.

10.1.1. Socioeconomic Data

Socioeconomic data for the IMSA was drawn primarily from the U.S. Census Bureau. The census tracts reviewed for this memorandum represent the following geographical areas:

- Census tract 800 represents the portion of the IMSA west of I-5
- Census tract 900 represents the eastern section
- Census tract 1200 represents the area south and east of the IMSA

Based on the data from the American Community Survey (ACS) and 2010 Census, the IMSA is less diverse than the state. Census tract 800 (92.3%) and 900 (92.7%) have similar race and ethnicity composition to Douglas County with most people identifying themselves as white only. However, Census tract 1200 is more diverse than the census tracts with a higher percentage of people identifying themselves with being two or more races (3.9 percent). Table 10-1 provides a summary of race and ethnicity survey data.

Table 10-1. Race and Ethnicity, Percentage of Total Population (2010 Decennial Cenus)

Geography		Race									
		% White	% Non-white	% Black or African American	% American Indian & Alaska Native	% Asian	% Native Hawaiian & Other Pacific Islander	% Some Other Race	% Two or More Races	% Not Hispanic	% Hispanic
Oregon		83.6	16.4	1.8	1.4	3.7	0.3	5.3	3.8	88.3	11.7
Douglas County		92.4	7.6	0.3	1.8	1	0.1	1.2	3.2	95.3	4.7
Census Tract	800	92.3	7.7	0.3	0.9	2.4	0.2	1.0	2.9	96.2	3.8
	900	92.7	7.3	0.4	1.5	1.3	0	1.5	2.6	95.1	4.9
	1200	90.6	9.4	0.4	1.9	1.1	0.2	1.8	3.9	93.6	6.4

Source: DEC_10_SF1_QTP3

Douglas County tends to have an older population than the state which is confounded in Census tracts 800. However, Census tracts 900 and 1200, have a younger median population than the state, county or census tracts 800.

Table 10-2. Age by Census Tracts (2010 Decennial Cenus)

Geography		Median Age; Total (Estimate)	% Under 18	% 65 and older
Oregon		38.4	22.6	23.4
Douglas County		46.1	20.5	28.1
Census Tract	800	51.9	18.4	29.4
	900	48.5	19.3	28.2
	1200	35.8	24.5	21.4

Source: DEC_10_SF1_P13 and DEC_10_SF1_P12

Persons are considered to be in poverty status when income earned is less than the income threshold. The poverty threshold is a measure of annual pretax cash income which falls below a federal measure of poverty that is recalculated each year. The percent of population in poverty for the IMSA is shown in Table 10-3. As shown in the table, and in Figure 10-1, the census tracts in the IMSA have a lower percentage of individuals living in poverty than Douglas County or the state. However, census tract 1200 has a substantially higher amount (34 percent). Additionally, census tract 1200 has a higher percentage of persons with disability and female head of households with children. Figure 10-2 shows the disabled populations broken down by census tracts within the IMSA, while Figure 10-3 shows percentages of female head of households with children.

Table 10-3. Percent of Individuals Below Poverty Level (2010 American Community Survey 5-Year Estimates)

Geography		Percent Population for Whom Poverty Status is Determined	% Persons with Disability	% Female Head of Household w/Children
Oregon		14%	19	6
Douglas County		16%	23	6
Census Tract	800	11%	20	4
	900	11%	22	6
	1200	34%	24	13

Source: ACS B17001. Poverty Status in the Past 12 Months by Sex by Age - Universe: Population for Whom Poverty Status Is Determined

10.1.2. Transportation Infrastructure

The non-auto transportation (i.e., pedestrian, bicycle, and transit) infrastructure was reviewed as part of the system inventory to identify potential barriers in the system.

Bicycle and Pedestrian 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. Table 10-4 provides a summary of these facilities.

Table 10-4. Management Area Bicycle and Pedestrian Inventory

Location	Jurisdiction	Bicycle Facilities		Pedestrian Facilities		On-Street Parking	Rail Crossings
		Type	Width	Type	Width		
Edenbower Blvd.	City of Roseburg	Bike Lanes: both directions	6’	Sidewalks: both sides	6-8’	No	At-grade west of Stephens
Stewart Pkwy	City of Roseburg	Bike Lanes: both directions	5-6’	Sidewalks: both sides Crosswalks: at Edenbower	6-7’	No	No
Broad St.	Douglas County	Bike Lanes: both directions	8’	Sidewalks: both sides Crosswalks: none	5-6’	No	No
Aviation Dr.	City of Roseburg	Bike Lanes: both directions	5-6’	Sidewalks: both sides Crosswalks: at Edenbower	6-7’	No	No
Stephens St.	City of Roseburg	Bike Lanes: both directions	6’	Sidewalks: both sides south of Edenbower, east only north of Edenbower Crosswalks: at Edenbower	5-6’	No	No

Transit Inventory

Umpqua Transit serves the study area with Paratransit (U-Trans Direct), fixed route, and commuter bus service on weekdays. Bus routes near Interchange 127 include the Orangeline, the Redline, and Greenline routes. The Redline and Greenline travel along Stewart Parkway and Stevens Street along the same path. They travel through the southern portion and eastern portions of the IMSA. They have stops on Stewart Parkway west of Edenbower Boulevard and on Stephens Street/OR99 two blocks south of Edenbower Boulevard. Buses stop every hour between 6:50 am and 6:40 pm. The Orangeline runs north-south along Stephens Street/OR99 and has a stop two blocks south of Edenbower Boulevard. Buses stop 8 times daily between 7:00 am and 7:00 pm, mainly directed at morning and evening commuters. There is no bus service along Edenbower Boulevard within the IMSA.

Paratransit, or dial-a-ride, service is provided five days per week between 6:50 am and 6:30 pm for people with qualifying disabilities who cannot use the fixed route service. The Paratransit route provides public transportation for people with disabilities within a three-quarter mile radius of the existing bus routes.

Greyhound Bus Lines has a terminal in downtown Roseburg, approximately four miles from Interchange 127. Currently, nine buses per day operate between Portland and California (six southbound and three northbound) from the terminal in Roseburg.

Transportation Barriers

Potential transportation barriers in the IMSA include a lack of public transit service on weekends. Additionally, the residential area west of the interchange is not served by transit nor is the mobile home park northeast of the interchange. Bus lines only run along OR 99 and other major roads in the IMSA making it difficult for rural residents to utilize. For disabled or elderly populations who have limited income, the existing paratransit fare ($4.00) may be unaffordable. Other potential transportation barriers could include access to services particularly health services for environmental justice populations in rural areas, language barriers especially in the southeast of the IMSA (census block 1200), and barriers to public transit information access.

10.2. Outreach

The public involvement process for I-5 Exit 127 Interchange Area Management Plan (IAMP) included a technical advisory committee (TAC), a citizen advisory committee (CAC), and general public outreach. Actions specifically related to protected populations are discussed below.

10.2.1. Advisory Committees

Two advisory committees were formed to provide input during the development of the IAMP:

- The TAC provided technical and policy guidance and served as the primary body making recommendations about the project. The committee was composed primarily of ODOT

and local jurisdiction staff. A representative from the Public Health Department was invited to sit on the TAC but the offer was declined.

- The CAC provided stakeholder input and offered recommendations to the TAC. The committee was composed of interested citizens, property owners, business representatives, and other stakeholders along the corridor. The CAC included a member of the bicycling community.

10.2.2. General Public Outreach

General public outreach included web-accessible materials and two public open houses.

10.2.3. Website

ODOT project documents (technical memoranda and reports) were posted on the ODOT Region 3 website for three interchanges in the City of Roseburg for public access (http://www.oregon.gov/ODOT/HWY/REGION3/Pages/I-5exit127IAMP.aspx). The state's website has a link to the Google Translation tool that automatically translates the website into other languages. This tool allows primary information on the ODOT Region 3 website to be viewed in languages other than English and does include project contact information. It does not provide useful translations of linked documents; a special request for translated documents is needed to view the technical memoranda and reports.

10.2.4. Public Open Houses

Public open houses were held as informational exchanges where staff and consultant presented and explained project information and the general public could provide input and comment on issues and concerns of importance to them. Translator/TDD services were available upon request. All meetings were held in ADA accessible facilities.

The public open houses were advertised using a variety of outreach tools including:

- Radio ads
- Radio stories
- Newspaper ads
- Newspaper stories
- TV stories
- Billboards
- Table Tents
- Website
- Flyers
- Chamber Newsletters

Specific outreach to businesses that serve Title VI populations included table toppers in a little deli/market that is very close to and frequented regularly by low income populations.

10.3. Inclusion

Environmental, land use, and socioeconomic considerations part of the concept evaluation and selection of projects to be included in the IAMP. Impacts to resources were qualitatively assessed based on the data assembled for the environmental and land use reconnaissance that

included identification of Title VI populations in the study area. The level of analysis of the study area is designed to identify those areas judged to have considerable potential for conflict.

The specific socioeconomic (Title VI) considerations in the evaluation included:

- Would the footprint of the concept expand into areas where minority and/or low-income populations have been identified?

  None of the projects included in the IAMP involve significant expansion of the transportation infrastructure. Projects that may require additional right of way are located in areas with commercial or industrial zoning.

- Would the concept benefit or impact the transportation disadvantaged population by changing the sidewalk or bicycle network?

  Within the transportation network considered for the IAMP, the bicycle network is complete with bike lanes on all arterial and collector roadways. The sidewalk network is also complete with the exception of one link where adjacent railroad tracks conflict with pedestrian activity.

  One project to improve the safety of the pedestrian crossing of the westbound-to-northbound on-ramp is included the IAMP. This project would benefit disadvantaged populations.

  One project would widen the roadway to add left-turn and receiving lanes resulting in a longer crossing for both pedestrians and bicyclists. Signal timing will need to be modified to accommodate the longer crossing distances. This would have minimal impacts to disadvantaged populations.

- Would the concept benefit or impact the transportation disadvantaged population by changing access to transit?

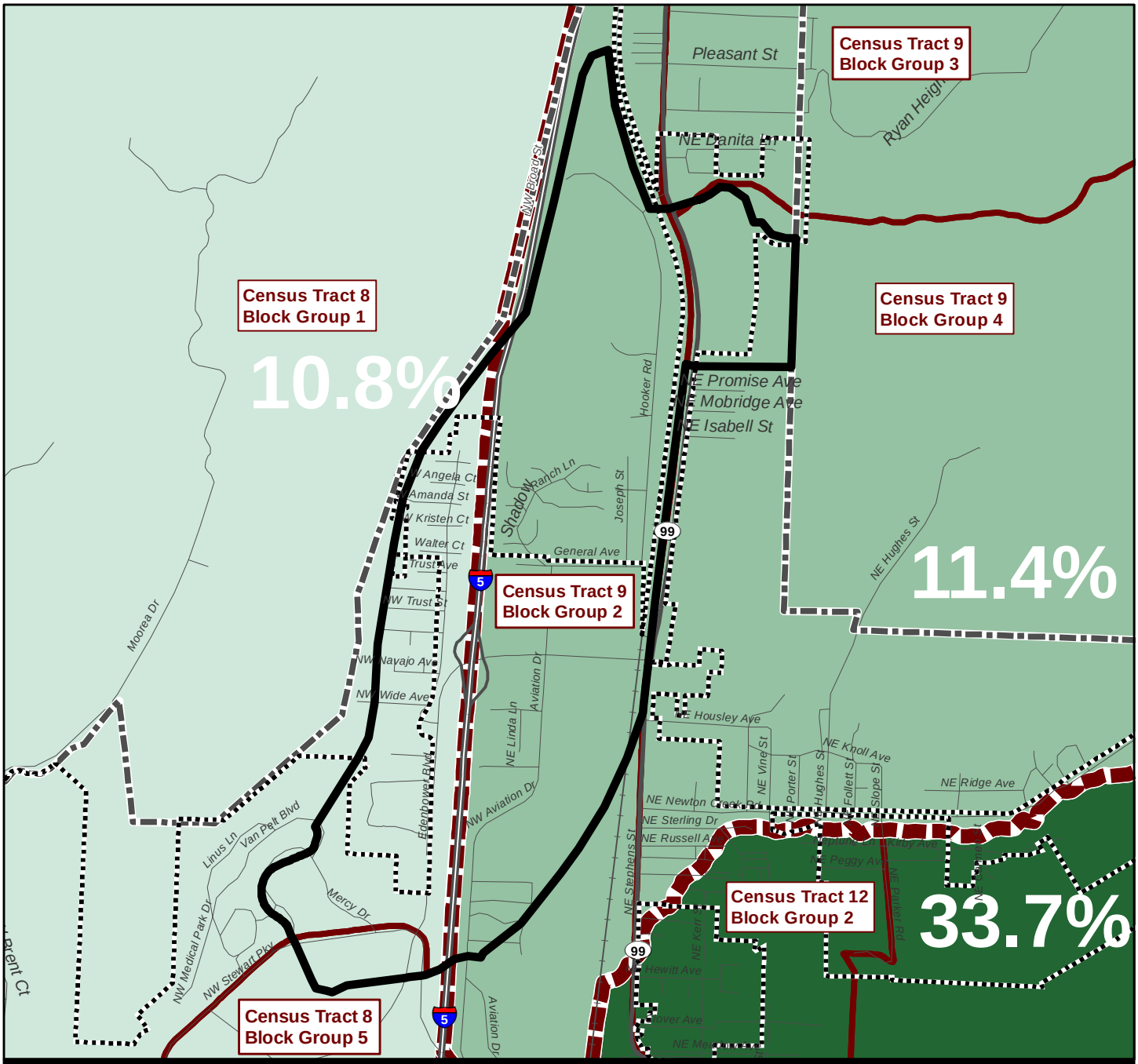
  Bus routes run near I-5 Exit 127 on Stewart Parkway and Stevens Street but there is currently no service provided along Edenbower Boulevard in the IMSA.

  The IAMP supports a future transit route along the Edenbower Boulevard but requires that transit stops must not be located where they could impact the safe and efficient operations of the interchange ramp terminals.

- Would the concept benefit or impact the transportation disadvantaged population by changing access to community resources, particularly those that serve minority and/or low-income populations?

  None of the projects included in the IAMP would change access to community resources.

Attachments:
Figure 10-1. Poverty
Figure 10-2. Disability
Figure 10-3. Female Head of Household



I-5 Exit 127 (North Roseburg) IAMP

Legend

- Urban Growth Boundary (UGB)
- City Limits
- Interchange Management Study Area (IMSA)
- Census Tract
- Block Group

Transportation

- Interstate
- Highway
- Arterials
- Other Roads
- Railroad

2010 Percent Poverty

- < 10%
- 10% to 20%
- 20% to 30%
- > 30%

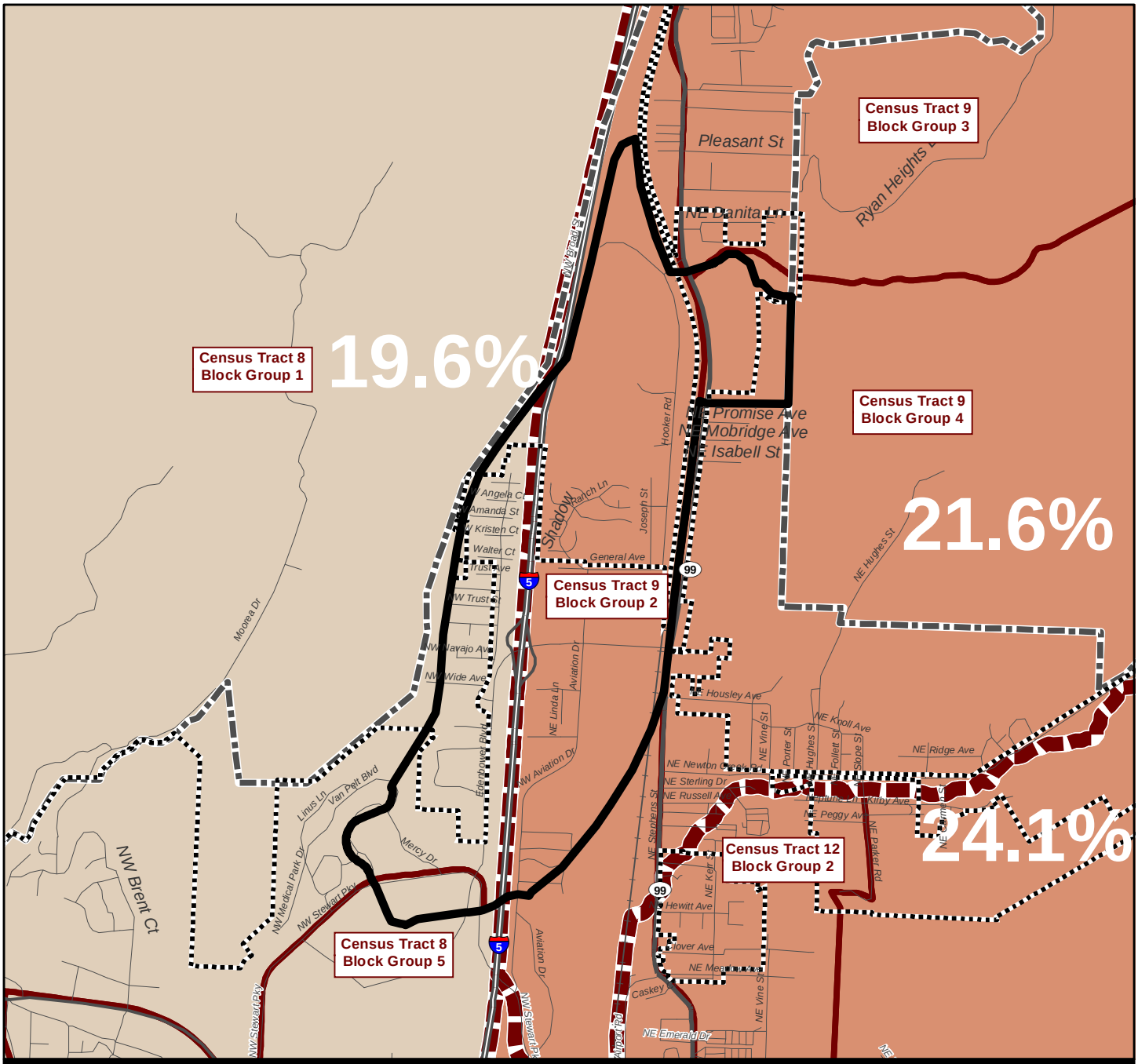
N

0 1,200 2,400

Feet

Source Info:
ACS 5-Year, 2010
City of Roseburg, Oregon, 2010-2012
Douglas County, Oregon, 2010-2012

Figure 10-1
Poverty



I-5 Exit 127 (North Roseburg) IAMP

Legend

- Urban Growth Boundary (UGB)
- City Limits
- Interchange Management Study Area (IMSA)
- Census Tract
- Block Group

Transportation

- Interstate
- Highway
- Arterials
- Other Roads
- Railroad

2010 Percent Disability

- < 20%
- 20% to 30%
- > 30%

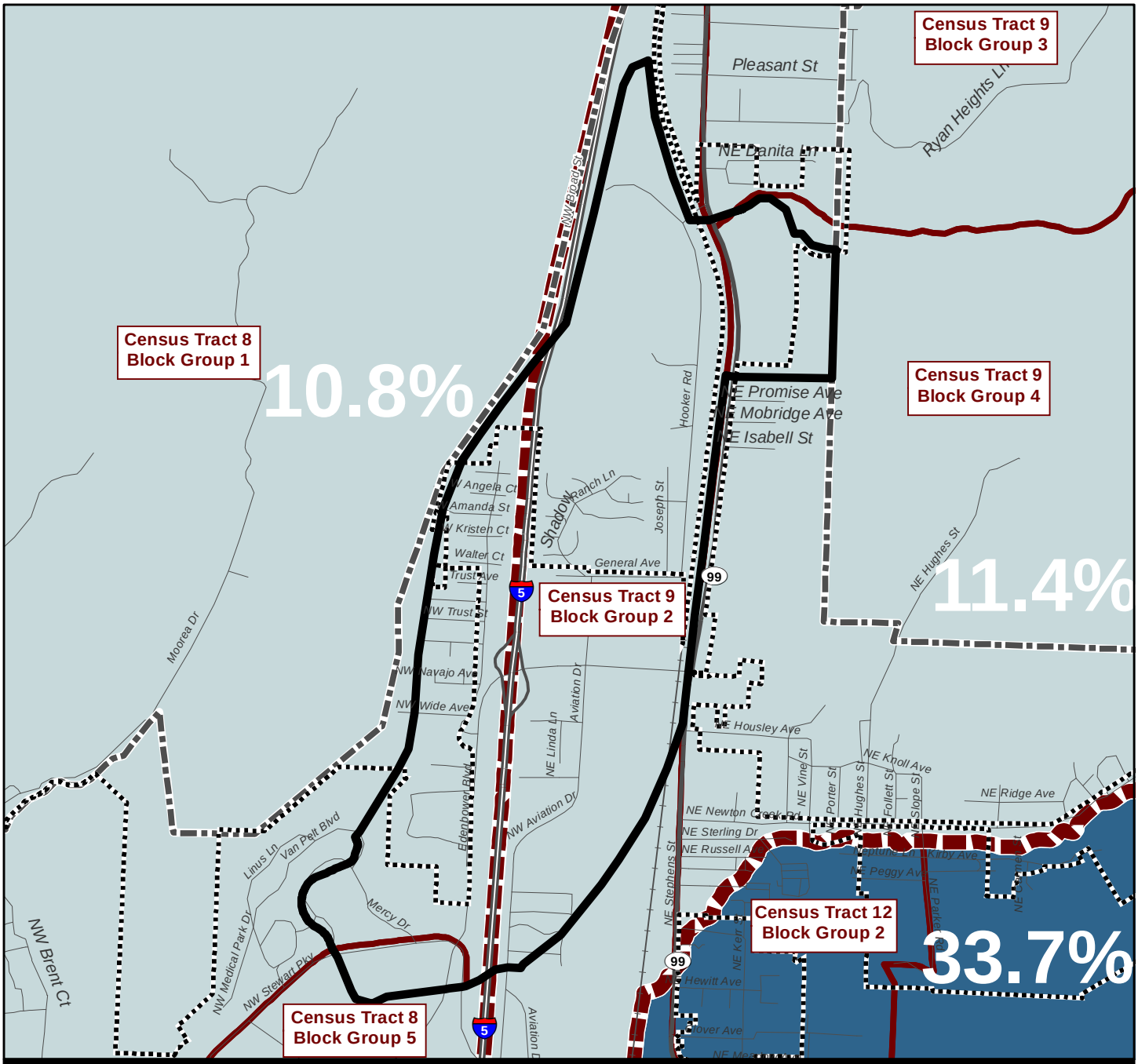
N

0 1,200 2,400

Feet

Source Info:
Census, 2000
City of Roseburg, Oregon, 2010-2012
Douglas County, Oregon, 2010-2012

Figure 10-2
Disability



I-5 Exit 127 (North Roseburg) IAMP

Figure 10-3
Female Head of Household

Legend

- Urban Growth Boundary (UGB)
- City Limits
- Interchange Management Study Area (IMSA)
- Census Tract
- Block Group

Transportation

- Interstate
- Highway
- Arterials
- Other Roads
- Railroad

2010 Percent Female Head of Household

- 10% to 20%
- 20% to 30%
- 30% to 40%

N

0 1,200 2,400
Feet

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

N. Roseburg
Fairgrounds Road