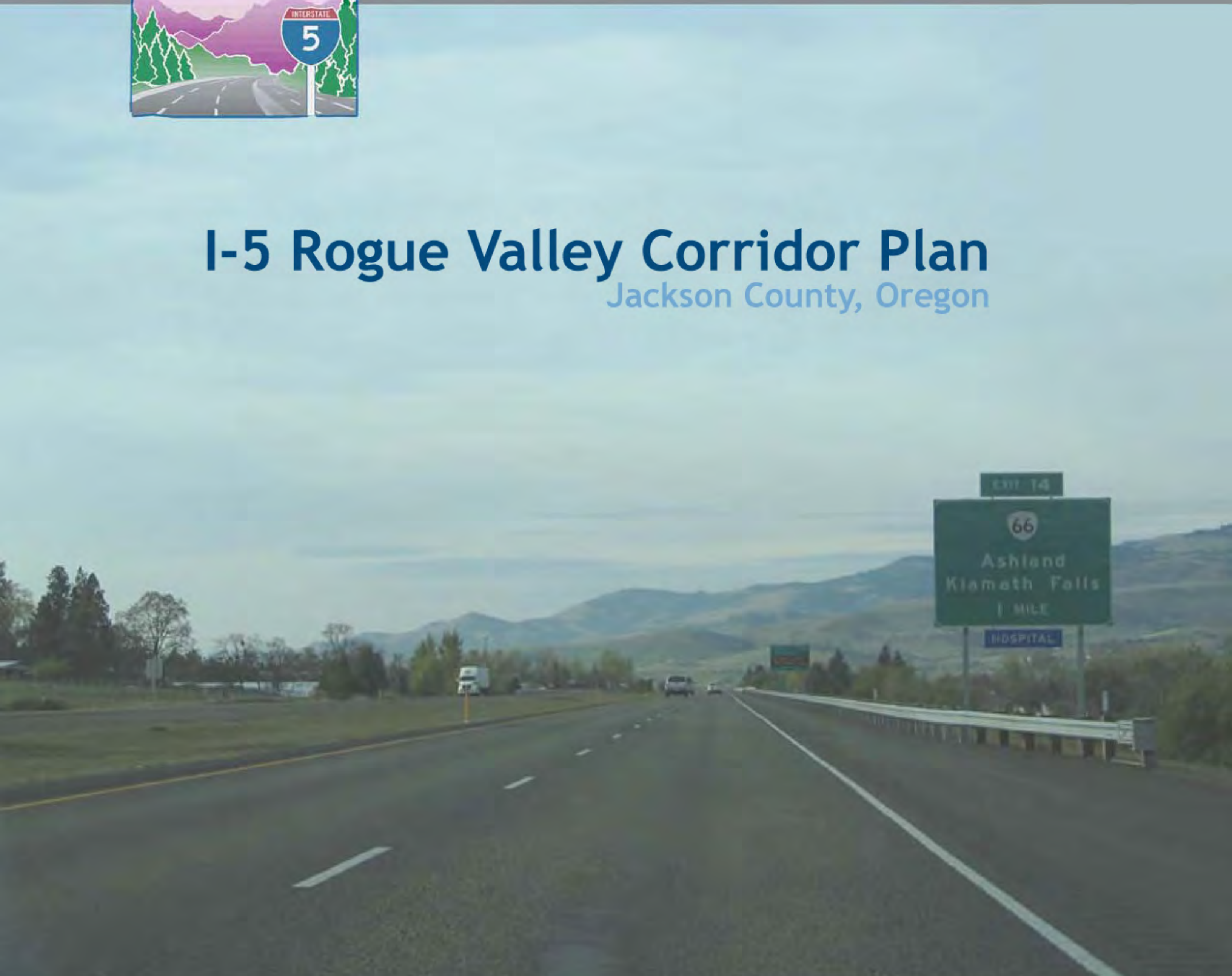
I-5 Rogue Valley Corridor Plan

Jackson County, Oregon



Oregon Department of Transportation

I-5 Rogue Valley Corridor Plan

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List of Acronyms

ATR	Automatic Traffic Recorders
BRT	Bus Rapid Transit
CCTV	Closed-Circuit Television
CORP	Central Oregon and Pacific Railroad
Corridor Plan	I-5 Rogue Valley Corridor Plan
dBA	A-weighted decibel
d/c	Demand-to-capacity
DHV	Design Hour Volume
DMS	Dynamic Message Signs
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FRA	Federal Railroad Administration
HAR	Highway Advisory Radio
HCM	Highway Capacity Manual
HCS	Highway Capacity Software
HERS	Highway Economic Requirement System
HOV	High Occupancy Vehicle
HV	Heavy Vehicle
I-5	Interstate 5
IAMP	Interchange Area Management Plan
ITS	Intelligent Transportation Systems
LCV	Longer Combination Vehicle
LOS	Level of Service
MP	Mile Point
mph	Miles Per Hour
MSA	Metropolitan Statistical Area
MVMT	Million Vehicle Miles Traveled
NRHP	National Register of Historic Places
ODOT	Oregon Department of Transportation
OHP	Oregon Highway Plan
ONHIC	Oregon Natural Heritage Information Center
OR 99	Oregon Highway 99
PMT	Project Management Team
RPS	Regional Problem Solving
RTP	Regional Transportation Plan
RVMPO	Rogue Valley Metropolitan Planning Org.
RWIS	Roadway Weather Information System
STA	Special Transportation Area
TDM	Transportation Demand Management
TOC	Traffic Operations Center
TPAU	Transportation Analysis Unit
TSM	Transportation System Management
UBA	Urban Business Area
U.S.	United States
v/c	volume-to-capacity
VMS	Variable Message Signs
VMT	Vehicle Miles Traveled
vpd	Vehicles Per Day
vph	Vehicles Per Hour
VSL	Variable speed limits
WCTU	White City Terminal & Utility Company
WIM	Weigh-in-Motion

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Executive Summary

The *I-5 Rogue Valley Corridor Plan* (Corridor Plan) assesses existing and future transportation conditions along 25 miles of the Interstate 5 (I-5) mainline from Interchange 11 south of Ashland to Interchange 35 north of Central Point. The Corridor Plan identifies strategies and improvements to enhance transportation safety and capacity within the corridor.

Purpose

This Corridor Plan builds upon ODOT's previous efforts to assess the physical and operating conditions of the statewide I-5 corridor and to forecast future travel demand and devise a regional I-5 corridor plan through the Rogue Valley region. It follows *The I-5 State of the Interstate Report* (Interstate Report), released in 2000, which focused on identifying deficiencies along the entire Oregon portion of the I-5 corridor. The Interstate Report and this subsequent Corridor Plan for the urbanized Rogue Valley region are intended to help ODOT meet the needs of a new century by identifying and addressing, in order of priority, the most pressing problems, region by region, along the I-5 corridor. The Corridor Plan's solutions meet ODOT's Mission Statement: *Provide a safe, efficient transportation system that supports economic opportunity and livable communities for Oregonians.*

Four deficiencies were identified in the I-5 study area through research, analysis, and consultation with corridor stakeholders:

1. Potential hazardous conditions caused by roadway design issues such as lane merges and traffic weaving conflicts;
2. Projected high levels of congestion at interchanges that could impact future I-5 mainline operations;
3. Over-reliance on trucks for freight transport, while other freight modes (e.g., rail and air) are underutilized; and
4. Increased congestion combined with rapid growth and budgetary constraints, causing competing demand on this section of I-5.

Goals and Objectives

In response to these deficiencies, the goals developed for the Corridor Plan are:

Goal 1: Improved Efficiency of Traffic Operations,

Goal 2: Improved Safety in the I-5 Corridor,

Goal 3: Improved Mainline Operations at Interchanges, and

Goal 4: Improved Freight Operations.

Existing Conditions

An existing inventory of transportation resources and operating conditions was conducted along with environmental and land use reconnaissance of the Corridor Plan area to 200 feet either side of I-5.

Traffic volumes vary across the Corridor Plan area, with the lowest volumes at the south end and the highest volumes in the Medford area. Traffic south of Interchange 14 (Green Springs) is composed primarily of long-distance travelers crossing the Siskiyou Mountains, 35 percent of which are Heavy Vehicles (HV—semi trucks with one trailer or more). North of Interchange 14, overall traffic volumes are higher but the HV percentage is only 15 percent.

Existing operational analysis focused on the freeway corridor and how the highway operates both on the mainline sections and where traffic joins or departs from the highway at the interchanges. Analysis shows that the freeway system is operating with relatively free flow operations. These results also indicate that the system has available capacity to accommodate some future growth in traffic demand before capacity is reached.

OR 99 serves as an important north/south transportation route within the Rogue Valley. This highway provides access and connections to the communities along OR 99 and serves as an alternative freight and emergency detour route to I-5. OR 99 provides an option for local traffic, and therefore can ease congestion, enhance traffic flow on I-5, and improve freight operations. It is recommended that ODOT continue to work closely with the affected cities to make certain that OR 99 is managed both to serve local traffic needs and also to be available as an alternate freight route, and when needed, as a emergency detour route for I-5.

The project team conducted research and mapped known constraints in an effort to identify “red flag” areas judged to have considerable potential for conflict. The Corridor Plan identifies land use designations; threatened and endangered species; hazardous materials; rail service; transportation facilities; Bear Creek, historic and archaeological, and Section 4(f) resources; I-5 right-of-way issues; and air quality, noise quality, socioeconomic, and environmental justice conditions.

Future Conditions

The Corridor Plan evaluated future conditions for two scenarios: year 2034 using the forecasting assumptions from the Regional Transportation Plan (RTP) and year 2050 using the growth assumptions that were the basis for the Regional Problem Solving (RPS), which assumes that population in the Rogue Valley doubles. The 2034 RTP scenario assumptions indicate a freeway system that would generally operate with relatively free flow operations except in both directions of I-5 between Interchange 27 and 30, which could experience some congestion during the PM peak hour. Operations along the freeway system with the 2050 scenario assumptions begin to show some stress during the PM peak hour. Congestion would be present on the section of freeway between Interchanges 21 and 33 in the northbound direction and between Interchanges 19 and 30 in the southbound direction.

Although operational analysis for the Corridor Plan is limited to I-5, in order to understand how changes on I-5 impact the Rogue Valley transportation system, some high level analysis of all roadways in the Rogue Valley Metropolitan Planning Organization (RVMPO) travel demand model were completed. Analysis of the transportation network within the urbanized Rogue Valley region for the 2034 scenario suggests that most of the system would not be over capacity except portions of OR 62, Delta Water Road, Barnett Road, Belknap Road, North

Phoenix Road, South Valley View Road, and OR 99. Advancing to the 2050 scenario, conditions along these roadway sections predictably worsen during the PM peak hour and extend beyond what was displayed for the 2034 scenario but much of the network is forecasted to continue to operate within capacity.

Corridor Concepts

Corridor concepts are strategies to improve future traffic operation and safety deficiencies. Concepts later can be refined and developed into improvement projects. The concepts for the Corridor Plan analysis were developed based on the goals and objectives and the results of the existing conditions and future year analysis. The Project Management Team (PMT) developed and evaluated corridor concepts by:

- Identifying concept selection criteria;
- Identifying potential improvement concepts;
- Evaluating concept impacts; and
- Identifying high performing concepts.

The PMT identified priorities to be addressed in the concept evaluation, such as effects of inclement weather delays at the Siskiyou Pass, improvements to the Medford viaduct, and coordination with the RVMPO efforts to assess the OR 99 corridor. Based on the priorities, 20 concepts were identified for the I-5 corridor under five categories:

- Safety Enhancement Measures
- Transportation System Management (TSM) Measures
- Capacity Enhancement Measures
- Least Cost Planning Solutions
- Transportation Demand Management (TDM) Measures

Concept impacts were evaluated through:

- Quantitative evaluations using Rogue Valley Travel Demand Model and Highway Capacity software;
- Qualitative evaluations using similar project experience and professional knowledge; and
- Cost opinions using standard unit costs information and methodologies.

Each concept was evaluated according to two categories of criteria: (1) the degree to which the concept maximizes benefits (freeway operations, safety, freight movement, vehicle capacity, person capacity, circulation and access, local economy, and phasing potential) and (2) degree to which the concept minimizes adverse impacts (environmental/cultural, properties, and local roadway system). Each concept was scored for each criterion. The criteria are weighted based upon the priorities identified by the PMT.

Project Prioritization

Seven high performing concepts are recommended as future projects:

Safety Enhancement Measures

- Port of Entry—Auxiliary Lane Option: Extend NB on-ramp into an auxiliary lane with Interchange 19 off-ramp
- Southbound Weigh Station: Extend Interchange 19 SB on-ramp into an auxiliary lane with SB Weigh Station
- Emergency Turnaround: Upgrade existing emergency turn-out to provide truck turnaround during winter pass closures
- Incident Response System: Add incident response vehicles and cameras to the corridor

Transportation System Management (TSM)

- OR 99 Corridor Coordinated Traffic Signal System: Synchronize traffic signals on targeted segments along the OR 99 corridor
- Ramp Metering: Incorporate dynamic ramp metering at applicable interchanges

Capacity Enhancement Measures

- Enhanced Local Arterial/Collector Connections – Area 2 (Medford to Phoenix): Improve local street connections that provide viable local alternative routes. Enhanced Local Arterial/Collector Connections are recommended for additional study and analysis as part of a future environmental study for the Medford Viaduct .

Concept Phasing

Corridor concepts were grouped into three phases: short term (2 to 5 years), medium term (6 to 15 years), and long term (more than 15 years). The intent of the phasing is to define a reasonable timeframe for implementation of the concepts. In developing the phasing recommendations, priority, rank, cost, and ease of Implementation were considered. Short term concepts have high priority and low cost, medium term concepts have medium and high priority and moderate to high cost, and long term concepts have low and medium priority and high cost. Corridor concepts that should or must be implemented concurrently with each other are identified. Other plans and improvements should be implemented in conjunction with the corridor concepts identified in this plan to minimize future implementation costs and costly reconstruction of roadway infrastructure, most importantly, elements of the *Regional ITS Operations & Implementation Plan for the Rogue Valley Metropolitan Area*.

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1. INTRODUCTION

Plan Purpose and Framework

The *I-5 Rogue Valley Corridor Plan* (Corridor Plan) assesses existing and future (2034 and 2050) transportation conditions along 25 miles of the Interstate 5 (I-5) and Oregon Highway 99 (OR 99) corridors from Interchange 11 south of Ashland to Interchange 35 north of Central Point (see Figure 1-1). The Corridor Plan identifies strategies and improvements to enhance transportation safety and capacity within the corridors.

The Corridor Plan builds upon *The I-5 State of the Interstate Report* (Interstate Report), released in 2000, which focused on identifying deficiencies along the entire Oregon portion of the I-5 corridor. The Interstate Report was a transportation conditions report that represented the first phase of a two-phase planning process. By defining problems that Oregon travelers may face, the Interstate Report was intended to serve two purposes: (1) to help Oregon Department of Transportation (ODOT) to focus its planning efforts on the most substantial problems, and (2) to act as a catalyst for the public discussion about how best to invest in I-5 so that it can continue to be an asset to the people of Oregon and western North America. This subsequent Corridor Plan for the urbanized Rogue Valley region is intended to help ODOT meet the needs of a new century by identifying and addressing, in order of priority, the most pressing problems, region by region, along the I-5 corridor. The Corridor Plan's solutions meet ODOT's Mission Statement: *Provide a safe, efficient transportation system that supports economic opportunity and livable communities for Oregonians.*

The Corridor Plan was developed through the preparation of four technical memoranda for the project:

Technical Memorandum #1: Plan Definition and Background defines the problems and establishes goals and objectives (Appendix A).

Technical Memorandum #2: Data Collection Review of Existing Plans documents existing plans and policies, identifies land use and environmental constraints, assesses existing traffic operations and crash history, discusses rail service, and inventories the existing Intelligent Transportation Systems (ITS) infrastructure along the Corridor Plan area (Appendix B).

Technical Memorandum #3: Future Baseline Traffic Conditions assesses future (2034) no-build conditions (Appendix C).

Technical Memorandum #4: Alternative Corridor Concept Analysis identifies 20 concepts in 5 categories and evaluates strengths and weaknesses of each, with a cost opinion (Appendix D).

Corridor Plan Area

For analysis purposes, the Corridor Plan area is defined as 200 feet beyond both sides of the I-5 right-of-way boundary between Interchanges 11 and 35.

I-5

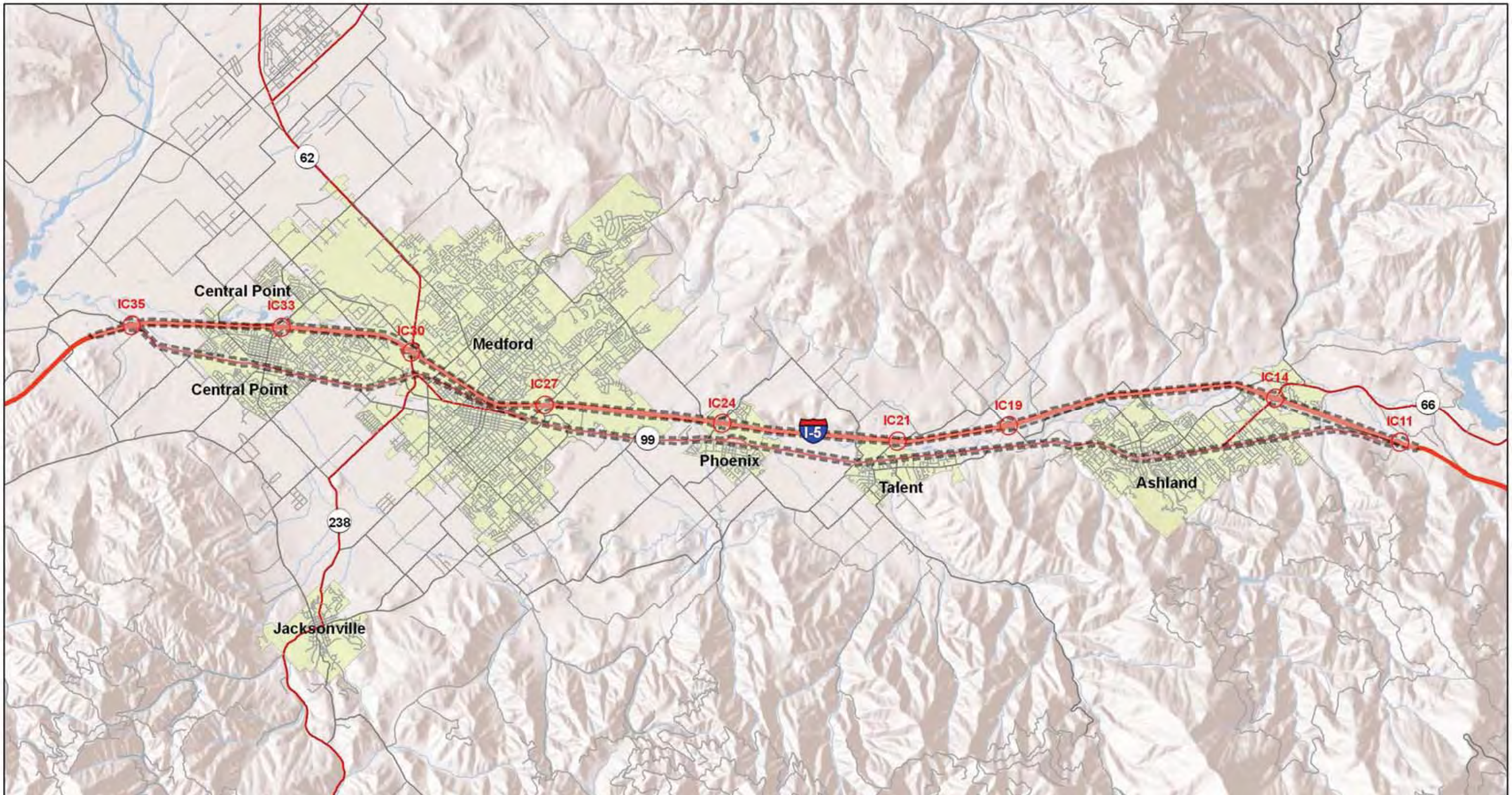
I-5 is a continuous interstate corridor extending through the United States (U.S.) from Mexico to Canada. As Oregon's main north-south transportation facility, it is a critical link for moving commerce and people within the state and into and out of the neighboring states of California and Washington. The corridor connects all of the major population centers of the western seaboard, including San Diego, Santa Ana, Anaheim, Los Angeles, Sacramento, Portland, and Seattle.

Constructed between 40 and 50 years ago, the freeway was designed to provide enough capacity for a 20-year period of projected travel demand. Today, with many more users than projected and few substantial upgrades since its initial construction, I-5 has become quite congested, particularly in urban areas. In rural sections, the roadway is affected by high truck and recreational vehicle traffic demands. With a quarter of the nation's exports and imports passing through the corridor annually, I-5 is the third most heavily traveled truck corridor in the U.S. Consequently, I-5 is also a federally designated Trade Corridor in recognition of its critical role in the nation's commerce.

The entire I-5 corridor is one of six interstate routes across the nation selected by the U.S. Department of Transportation for the "Corridors of the Future" program, which is aimed at developing innovative national and regional approaches to reduce congestion and improve the efficiency of freight delivery. The corridor was selected for its potential to use public and private resources to reduce traffic congestion. The concepts include building new roads and adding lanes to existing roads, building truck-only lanes and bypasses, and integrating real-time traffic technology such as lane management that can match available capacity on roads to changing traffic demands.

I-5 passes through many of Oregon's largest cities, where the freeway must serve interstate travel as well as interurban, commuter, and regional freight traffic—all vital functions for these local economies. As would be expected, the Portland, Salem, Eugene/Springfield, Roseburg, and Medford metropolitan areas are among the most heavily congested along the Oregon portion of the corridor. OR 99 functions as an alternate or business route for many of these urban areas, including the Rogue Valley region.

Local demand in urban areas greatly influences the functionality of I-5. Auto-oriented development near interchanges has often affected ramp terminal intersection operations and, at times, the freeway's mainline operations. In some locales, I-5 has come to operate as an alternate Main Street by serving high percentages of local trips rather than the long-distance trips for which it is primarily intended.



2 1 0 2 Miles

Source Data: Jackson County, ESRI, Oregon GEO

Legend

Proposed Planning Area

Interchange

I-5: Rogue Valley Corridor Study

Figure 1-1
Vicinity Map

January 2009

OR 99

OR 99 serves as an important north/south transportation route within the Rogue Valley. This highway provides access and connections to the communities along OR 99 and serves as an alternative freight and emergency detour route to I-5. As I-5 becomes increasingly congested over time, local trips are likely to shift to the OR 99 parallel roadway. OR 99 also serves as an important emergency detour route when inclement weather and major accidents close I-5. OR 99 provides an option for local traffic, and therefore can ease congestion, enhance traffic flow on I-5, and improve freight operations. While the State of Oregon retains jurisdiction on the operation and management of some sections of OR 99 within the Rogue Valley, ODOT works closely with the local jurisdictions within Jackson County on balancing through traffic with the transportation needs of the local communities. In the corridor study area, ODOT works to coordinate OR 99 transportation planning with several local road authorities, including Ashland, Central Point, Medford, and Phoenix. Transportation planning coordination among all agencies along OR 99 is important to enable the State of Oregon and local jurisdictions to manage the highway both to serve local needs and also to retain the section of OR 99 within the Rogue Valley as an important alternate freight and emergency detour route to I-5.

ODOT recognizes that OR 99 serves as a main street through many communities in the corridor. ODOT created the Special Transportation Area (STA) and Urban Business Area (UBA) highway segment designations in order to formally recognize certain segments of state highways as main streets, where through traffic movement will be balanced with the needs for local access and circulation. An STA may be designated within urban growth boundaries and not on designated OHP Freight Routes or Expressways. A UBA is a highway segment designation that may be applied to existing areas of commercial activity or future nodes or various types of centers of commercial activity within urban growth boundaries or urban unincorporated community boundaries. These designations allow ODOT to apply highway design standards, mobility standards, and access management spacing standards that are different from those of other highway designations. In 2005, two segments of OR 99 in Ashland were designated STA and UBA, and one segment in Phoenix was designated STA. It is recommended that ODOT continue to work closely with the affected cities to make certain that OR 99 is managed both to serve local traffic needs and also to be available as an alternate freight route, and when needed, as a emergency detour route for I-5.

Congestion can affect on-time freight delivery by causing delay. If severe enough, it can force businesses to restructure shipping patterns, change employee deployment and shifts, and alter warehousing, production, and inventory practices. Although congestion within the Rogue Valley region affects freight operations to some degree, congestion in the Portland metropolitan region, which is beyond the purview of this Corridor Plan, also accounts for many of the delays in southern Oregon. Furthermore, truck operators must abide by federal Hours of Service rules issued by the Federal Motor Carrier Safety Administration that limit the number of daily and weekly hours of driving to reduce driver fatigue. Congestion-related delays affect the mileage that can be covered during driving shifts and lead to increased delivery times, which can force companies to increase inventories and operating costs.

Portions of I-5 in the Corridor Plan study area have now reached or have exceeded their original design life, and high demands are creating operational and safety problems. Construction to add capacity is becoming increasingly difficult—financially, environmentally, and politically. Overall system deficiencies, regional issues, and local "hot spots" can have a major impact on the social and economic fabric of the state. These deficiencies can be compounded by local land use decisions.

Goals and Objectives

The following goals and objectives were developed through input provided by the PMT and community stakeholders, including local residents, business owners, elected officials, and government staff.

Goal 1: Improved Efficiency of Traffic Operations

Problem Statement: I-5 and OR 99 from Ashland to Central Point have experienced increased congestion as a result of rapid growth in the Rogue Valley region, but budgetary constraints and competing demands limit the viability of capital-intensive capacity enhancements and economic development potential.

Goal Statement: Develop and implement management measures and limited physical improvements that maximize the efficiency of existing roadway facilities through 2034.

Objectives:

- *Explore options to mitigate impacts caused by delays at the Siskiyou Pass summit (e.g., delays caused by winter weather conditions).*
- *Explore options to improve alternate north-south connections east of I-5.*
- *Improve efficiency of the existing transportation system through Transportation Demand Management (TDM) strategies, Transportation System Management (TSM) measures, and Intelligent Transportation System (ITS) technology.*
- *Identify potential improvements to the Medford viaduct that incorporate incident management and other measures to maximize efficiency.*
- *Coordinate with the Rogue Valley Metropolitan Planning Organization (RVMPO) efforts to assess the OR 99 corridor and develop strategies that reduce vehicular congestion and support economic development.*

Goal 2: Improved Safety in the I-5 Corridor

Problem Statement: Roadway design issues, such as lane merges and weaving conflicts, result in potentially hazardous conditions along I-5.

Goal Statement: Develop and implement measures to mitigate hazardous roadway conditions along I-5.

Objectives:

- *Explore improvement options for the southbound weigh station and northbound Port of Entry ramps.*

- *Identify high incident locations and develop measures for mitigation.*
- *Implement measures to better enable enforcement of traffic laws and to expedite incident response times.*

Goal 3: Improved Mainline Operations at Interchanges

Problem Statement: Several interchanges in the Rogue Valley are projected to experience high levels of congestion by 2020 (*The I-5 State of the Interstate Report*) that could potentially impact I-5 mainline operations, including ramp queuing, high merge/diverge volumes, and weaving movements.

Goal Statement: Maintain efficient operations of the I-5 mainline through interchanges by identifying capacity constraints and implementing physical improvements.

Objectives:

- *Integrate findings from the Corridor Plan with findings from the Interchange Area Management Plans (IAMPs) that are completed and from those that are under way.*
- *Limit the impacts of arterial system on I-5 mainline operations.*

Goal 4: Improved Freight Operations

Problem Statement: Continued economic prosperity in Oregon and the Pacific Northwest is hindered by over-reliance on trucks for freight transport, while other freight modes (e.g., rail and air) are underutilized.

Goal Statement: Identify physical and managerial improvements that maximize freight mobility and develop recommended policies and measures that can be implemented statewide to optimize the use of all modes of freight transport.

Objectives (Rail Operations):

- *Identify improvements for safety conflicts around existing rail tracks.*
- *Review general land use compatibility with the freight rail corridor and recommend potential changes to support increased rail usage.*
- *Identify potential state and federal funding to improve existing rail tracks and service.*
- *Identify constraints in the system today and determine how to improve operations and increase utilization.*

Objectives (Truck Operations):

- *Identify operations improvements at the Port of Entry.*
- *Explore and identify potential efficiency improvements that would ease congestion on existing interchanges and connecting roadways that arises from the transfer between double and triple trailers before entering or after leaving California.*
- *Explore viable solutions to enable more direct travel to and from delivery destinations and improve coordination for enhanced multimodal transport.*

- *Identify truck layover areas and implement improvements to enable staging of freight trucks during Siskiyou Pass closures.*
- *Develop expedited methods of informing truck operators of pending roadway changes ahead, such as construction or the closure of, or delays on, the Siskiyou Pass due to inclement weather.*

2. EVALUATION OF EXISTING CONDITIONS

Understanding the baseline conditions in the corridor planning area is an essential first step in developing the corridor plan. As background, the regulatory framework that guides the process was reviewed and summarized. Existing transportation system and traffic conditions in the management area were then evaluated to identify deficiencies. Land use within the management area is presented and potential land use or environmental constraints are identified.

Overview of the Regulatory Framework

State and local regulations, policies, and transportation and land use plans provided the legal framework for preparing the Corridor Plan. The code language contained within these documents provides guidance to the state and local jurisdictions on how to manage transportation facilities and land uses. The review included state documents, regional documents, Intelligent Transportation Systems (ITS) plans, commuter rail studies, transportation system plans, interchange area management plans, and environmental studies and reports.

Transportation Inventory

This section provides a short description of the highway facilities, rail facilities, and ITS facilities. Technical Memorandum #2 in Appendix B provides a short description for each of the interchanges, ports of entry, roadway inventory, bicycle and pedestrian facilities, emergency vehicle turnouts.

Highway Facilities

The Corridor Plan covers an area approximately 24 miles in length, with roadways crossing over flat to rolling terrain. There are nine interchanges, two port of entry locations (one northbound and one southbound), one rest area serving southbound traveling motorists only at Exit 22, one planned rest area, and one designated emergency vehicle turnout. These locations are shown on Figure 1-1, the Vicinity Map.

I-5 through the Rogue Valley region comprises a four-lane cross-section with two 12-foot-wide lanes in each direction. The posted speed in the corridor is 65 mph, except in the Medford area between Interchange 27 and Interchange 30, where the posted speed drops to 55 mph. The roadway is generally non-barrier-separated with a 76-foot-wide vegetated median. A 16-foot-wide barrier median is used on the viaduct from milepoint (MP) 27 to MP 30.6 and from MP 12.99 south into the Siskiyou Pass. Shoulders through the Corridor Plan area are paved and vary in width from 4 feet to 24 feet, with the left (inside) shoulder generally 4 feet wide and the right (outside) shoulder generally 10 feet wide.

Rail Facilities

The Rogue Valley region is served by two railroad lines. The Central Oregon and Pacific Railroad (reporting mark “CORP”) is a short line railroad owned by RailAmerica, Inc. The White City

Terminal & Utility (WCTU) Railway Company, a short line railroad on 14 miles of track accessing an industrial area in White City, Oregon, is part of RailService, Inc. Currently, both railroad lines are exclusively freight lines, with 90 percent of their deliveries consisting of forest products.

The nearest passenger rail service available is AMTRAK, located in Klamath Falls, Oregon. The Federal Railroad Administration (FRA) establishes nine classes of track and safety standards that prescribe the maximum speed of operation for both freight and passenger trains. CORP trackage is maintained to FRA Class 1 and 2 conditions, which limit maximum speeds to 10 miles per hour (mph) for Class 1 or 25 mph for Class 2. Hence, improvements necessary to provide a competitive passenger rail service south to Medford and beyond would require substantial reconstruction.

Intelligent Transportation Systems (ITS)

Intelligent Transportation Systems (ITS) refers to a group of information-based technologies that assist in monitoring traffic flow, providing warning and advisory messages to motor vehicle drivers, regulating traffic flow via metering and routing control, and providing rapid emergency incident response capabilities for law enforcement personnel. The 2004 RVMPO *Regional ITS Operations & Implementation Plan for the Rogue Valley Metropolitan Area* was part of a federal initiative to use ITS to increase the efficiency of existing transportation infrastructure, improve overall system performance and reduce the need to add capacity. In Northern California and Southern Oregon, ODOT, FHWA, Caltrans, the Oregon State Police, and California Highway Patrol formed California-Oregon Advanced Transportation Systems (COATS). The COATS project has provided an ongoing forum for collaboration on rural ITS applications and for coordinating I-5 operations. For example, accomplishments of the COATS project are the bi-state Siskiyou Pass operations plan and improved communications among ODOT's Transportation Operations Center in Medford.

Existing ITS Programs

The Rogue Valley region has a sizeable amount of ITS infrastructure currently in place. The communications network within the Corridor Plan area comprises fiber optic cable, twisted-pair copper, radio, cellular telephone, and, eventually, a wireless mesh Ethernet network. Many of the ITS field devices in the Medford metropolitan area have been deployed to address incidents on the I-5 viaduct through Medford. Because the viaduct is an elevated facility, it has a greater potential for icy conditions. Furthermore, the absence of shoulders on the viaduct to enable disabled vehicles to leave the travel lanes adds a level of complexity for emergency response personnel assessing an incident. Therefore, ODOT has deployed an advanced "ICE" warning sign, cameras, a weather station, and mayday phones.

ITS Deployment Plan

The ITS deployment plan for the Rogue Valley details how and when ITS projects will be deployed. The highest priority projects are scheduled for deployment in a five-year timeframe and are summarized as follows:

Network Surveillance. To improve traveler information and enhance monitoring capabilities for traffic management, maintenance, and emergency management personnel, additional closed-circuit television (CCTV) cameras will be deployed at key intersections of the Rogue Valley region. The cameras will monitor the roadway for congestion, trouble spots, incidents, equipment failures, and traffic signal operations.

Table 2-1. Existing ITS Infrastructure

ITS Infrastructure	Quantity	Location	Purpose
Traffic Operations Center (TOC)	1	Oregon Police Dispatch in Central Point	Manage and coordinate response to incidents
Closed-Circuit Television (CCTV) Cameras	6 (ODOT) 2 (City of Medford)	Along the viaduct through Medford	Identify incidents
Dynamic Message Signs (DMS)	4	3 along I-5 southbound at Table Rock Road in Central Point, Mountain Avenue near Ashland, and Crowson Road in Ashland, 1 along I-5 northbound near Phoenix	Apprise motorists of changes in the local road conditions
Automatic Traffic Recorders (ATRs)	3 (ODOT) 6 (City of Medford)	1 on OR 62 (MP 1.09), 1 on OR 99 in Talent (MP 15.82), and 1 on the I-5 Medford viaduct at MP 28.33; 2 on East McAndrews Road east and west of the Royal Avenue intersection, 2 on Barnett Road east and west of Black Oak Drive, 2 on North Phoenix Road north and south of the Barnett Road intersection	Collect traffic volume, speed, occupancy data
Roadway Weather Information System (RWIS)	1	I-5 Medford viaduct	Collect and monitor weather (temperature, wind speed, wind direction, humidity) and road conditions (surface temperature)
Highway Advisory Radio (HAR)	1	On I-5 near Ashland with an approximate two-mile range	Low-power roadside transmitters operate in AM or FM frequencies and provide pass condition information for southbound traffic prior to climbing the Siskiyou Pass; the existing system is near the end of its life cycle and has not been considered reliable during recent harsh weather conditions
Weigh-in-Motion (WIM) Systems	2	North of Ashland	Report weight of large trucks electronically at highway speeds

Traffic Data Collection System. Currently, annual traffic counts are conducted manually for transportation planning purposes. By deploying system detectors to automate the collection and storage of traffic volume, speed, and occupancy data, this project will enable better management of the regional roadway network. Traffic counts collected on a daily basis throughout the year will provide real-time traffic congestion information to the public and will improve travel times. Finally, system detectors that automatically detect incidents can reduce incident response times.

I-5 Siskiyou Pass Traveler Information. ODOT intends to provide a graphical display of real-time and forecasted weather conditions on I-5 over the Siskiyou Pass. The project will install additional weather information stations, road temperature sensors, CCTV cameras, HAR, and DMS, and will provide access to this information, including highway advisory messages, via a web page.

Incident Management in the Freeway Corridor. No formal incident management program is currently in place within the Rogue Valley region. Although ODOT District 8 has no immediate plans to implement such a program, it may be reconsidered if regional growth continues as projected. However, many of the local agencies, such as ODOT District 8, Jackson County, and the City of Medford, do have portable DMS and other incident management equipment on hand that can be deployed in the event of an incident or major emergency in order to support local emergency agency operations.

In cooperation with local Rogue Valley agencies, ODOT Region 3 developed a regional Emergency Detour Contingency Manual to address protocol for incident response for major incidents along the I-5 corridor. In the event of a major incident on I-5, vehicles would be directed to emergency detour routes, depending upon the location of the incident. The manual depicts detour information, sign placement, and locations of traffic control. Furthermore, the manual includes additional details for a complete closure of the I-5 viaduct through Medford between Exits 27 and 30. These details include traffic control deployment, procedures, and responsibilities for ODOT, City of Medford Public Works Department, City of Central Point Maintenance Department, Medford Police Department, and Rogue Valley Central Communications.

Currently this plan is implemented manually and includes placement of portable variable message signs. In the future, ODOT plans to deploy fixed trailblazer (right/left arrow) signs or changeable fixed message signs to display one of several preset fixed messages on detour routes, DMS, CCTV cameras to monitor roadway performance, and alternative traffic signal timing plans to accommodate changes in traffic patterns.

Existing Traffic Operations

Freeway traffic operations were evaluated using traffic volume data collected in 2008 and adjusted to represent design hourly volumes (DHVs).

Traffic Volumes

Traffic volumes vary across the Corridor Plan area, with the lowest volumes at the south end and the highest volumes in the Medford area. Traffic south of Interchange 14 (Green Springs) is composed primarily of long-distance travelers crossing the Siskiyou Mountains. Approximately 14,700 vehicles per day (vpd) pass through this portion of the corridor, and a relatively high proportion (35 percent) of that volume is composed of HV operation (HV being generally defined as semi trucks with one trailer or more). The calculated DHV is 1,725 vehicles per hour (vph), with an HV percentage of approximately 25, which is representative of actual traffic flow during the PM peak hour during the summer months.

North of Interchange 14, traffic volumes increase to approximately 39,600 vpd around the Talent area and Interchange 21 (West Valley View), but the HV percentage drops to around 15 percent, because the traffic composition is influenced more by the surrounding urban and rural land uses of the Talent and Ashland areas. The mainline DHV is approximately 4,475 vph, with an HV percentage of 8 percent.

Traffic volumes peak in Medford between Interchange 27 (South Medford) and Interchange 30 (North Medford), with approximately 48,200 vpd and a HV percentage of 13 percent. The mainline DHV is approximately 5,315 vph, with an HV percentage of 8 percent.

At the north end in the Central Point area north of Interchange 35 (Seven Oaks), traffic volumes drop to approximately 38,800 vpd and the HV percentage increases to around 16 percent. The mainline DHV is approximately 3,365 vph, with an HV percentage of approximately 8 percent.

Traffic Operations

Three elements of freeway operations were evaluated. The mainline sections between interchanges, where traffic volumes are generally highest, were analyzed. However, it is also important to understand how the traffic along interchange ramps interacts with the mainline freeway traffic through an analysis of the points where traffic enters or merges onto the freeway and where it exits or diverges from the freeway.

Operational Standards

The Oregon Highway Plan (OHP)[1] 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 standards for peak hour operating conditions for all highways in Oregon based on the location and classification of the highway segment being examined. These standards are based on the volume-to-capacity (v/c) ratio where volume is the traffic demand and capacity is maximum throughput. The OHP policy also specifies that the v/c ratio standards be maintained for ODOT facilities through a 20-year horizon. The applicable standard for the freeway (I-5) is a maximum v/c ratio of 0.80.

Although ODOT's OHP Highway Mobility Standards are the overriding operations standards for Oregon highways, level of service (LOS) is another a widely accepted descriptor of traffic operations (based on delay) that uses a six-level grading system with LOS A indicating best performance and LOS F indicating failing conditions. The LOS concept requires consideration of

[1] Table 6: Maximum volume to capacity ratios for peak hour operating conditions, 1999 Oregon Highway Plan, Amendment 05-16, Oregon Department of Transportation.

factors such as travel speed, delay, frequency of traffic flow interruptions, relative freedom for traffic maneuvers, driving comfort, convenience, and operating cost.

Operational Findings

Analysis of existing DHV, which is generally representative of PM peak hour operations in the summer, using the Highway Capacity Software (HCS) freeway facilities model, shows existing I-5 operations at LOS C or better in the northbound direction with a peak v/c ratio of 0.61 in the Medford area between Interchange 27 and Interchange 30. In the southbound direction, I-5 also operates at LOS C or better, except between Interchange 30 and the off-ramp to Interchange 27, which operates at LOS D (which indicates conditions that are nearing congestion) with a v/c ratio of 0.65. These findings, using these two mobility standards, indicate that the freeway system is operating with relatively free-flow operations, except southbound approaching Interchange 27, which currently is nearing congested conditions during typical PM peak hour operations. These results also indicate that the system has limited capacity available to accommodate some future growth in traffic demand before capacity is reached.

Other Operational Issues

Operations along the Corridor Plan area are also affected by other attributes in addition to traffic volumes and roadway capacity. Two of the issues repeatedly heard during interviews and meetings with local citizens are delays associated with closure or restricted access across the Siskiyou Pass due to inclement weather, and changeover of longer combination vehicles (i.e., changeover of triple trailer trucks to shorter trucks).

Siskiyou Pass Closure Impacts

At 4,310 feet elevation, the Siskiyou Summit marks the highest point along the entire I-5 corridor from Mexico to Canada. The pass features some of the steepest grades in the Interstate Highway System, dropping 2,300 feet into the Rogue Valley region within a distance of seven miles. In addition, the pass includes several hazardous curves and is frequently hit with bad weather (including snow, ice, and fog) during the winter season. Consequently, it is common for the highway to be closed one to four times during the winter months by transportation authorities due to hazardous conditions. The speed limit is 55 mph (90 km/h), but lower limits are set for larger vehicles.

Closure of the Siskiyou Summit during these inclement winter weather events causes substantial turmoil along the interstate corridor as far north as Grants Pass, with truck stops and rest areas becoming staging areas until the summit once again reopens. However, the most severe impacts associated with closure of the summit occur in the vicinity of Interchange 14 in Ashland. Even limited restrictions caused by chaining requirements, which do not necessarily close the corridor, disrupt interstate operations as trucks and vehicles queue along the interstate in the vicinity of Interchange 14. Passenger cars tend to pose a minimal impact, since local motorists tend to stay home during these events or, if from outside the area and passing through, they check into area hotels. The high impacts in the vicinity of Interchange 14 involve the high volume of trucks waiting to cross the summit and finding a place for them to wait. At the interchange, approximately 90 percent of the total roadway freight truck volume lines up along the interstate shoulder and southbound on-ramp. The remaining spillover truck volume tends to queue up on Ashland's local streets, such as Washington Street and Mistletoe Road, and in parking lots, primarily at the Bi-Mart located off of Tolman Creek Road south of Ashland Street.

Longer Combination Vehicles (LCVs)

Longer combination vehicles (LCVs) are among the largest vehicles on our nation's highways. Typically a large truck with tractor-trailer configurations of two or more trailers, an LCV may exceed 80,000 pounds in gross vehicle weight and approach 120 feet in overall length. LCVs are generally classified under three vehicle types: Rocky Mountain double, turnpike double, and triple trailer.

Rocky Mountain doubles consist of one long trailer ranging from 45 to 48 feet in length followed by a shorter trailer of 26 to 28 feet in length. Turnpike doubles tow two long trailers each of which is 45 to 48 feet in length. Finally, the triple trailer configuration consists of three shorter trailers, each of which ranges from 26 to 28 feet in length.

LCVs are permitted in some states and prohibited or limited to certain types in others. For example, California restricts all three LCV categories on their interstates and state routes, while Washington only allows for the Rocky Mountain doubles. Oregon restricts Rocky Mountain doubles and turnpike doubles, but it permits the short double and triple trailers—except south of Interchange 14 in Ashland, where triple trailers are not permitted.

The various limitation measures imposed on these vehicles among the three "I-5 States" require truck freight delivery operators to manage changeover locations in order to maximize the cargo-carrying capacity per driver to the extent allowed within the prospective states. Therefore, changeover locations are staged in the least restrictive state along the corridor, which, in the case of I-5, is Oregon. The Rogue Valley region is the logical location for this changeover to occur in the southern end of the Oregon I-5 corridor where, for example, freight delivered south via triple trailers must unhook to a single trailer configuration before continuing into California and, likewise, freight destined north into Oregon from California can add trailers into either the Rocky Mountain double or triple trailer configuration. The process is repeated in the Portland region at the northern end of the Oregon I-5 corridor before entering, or after leaving, Washington.

Individual companies that use LCVs through Oregon typically have their changeover sites situated in the Medford-Central Point area east of I-5 in the vicinity of the Rogue Valley-Medford International Airport. Although not concentrated within a specific location, nonetheless these sites enable ready access to I-5 via either Interchange 30 or Interchange 33. These large vehicles still must traverse local city streets through commercial districts and skirt some existing residential areas.

Crash History

A crash analysis was performed for the mainline of I-5 for the full length of the corridor from one mile north of Interchange 35 to one mile south of Interchange 11 based on crash listings from 2003 to 2007. The crash analysis was conducted to identify existing high crash locations or consistent crash patterns.

ODOT's Safety Priority Index System (SPIS) identified one location in the corridor that met one of two criteria during the previous three years. The two criteria are: (1) three or more crashes at the same location, or (2) one or more fatal crashes at the same location. The location is in the Phoenix area between MP 23.91 and MP 24.09, and had a total of ten crashes, with one fatality.

This section summarizes the crash data for mainline I-5 in both directions and the interchange ramps. These are reported crashes that were recorded as occurring on mainline I-5 or on the on-ramps and off-ramps to I-5. Crashes recorded on the connecting roadways, intersections, and overpasses were not included in this analysis. For the full length of the corridor from one mile north of Interchange 35 to one mile south of Interchange 11, there were 392 reported crashes between 2003 and 2007[2]. Approximately 20 percent of all crashes involved heavy trucks. There were 220 crashes in the northbound direction (56 percent of the total) and 172 crashes in the southbound direction (44 percent of the total). The crashes are spread along the full length of the corridor, with approximately 60 percent of the crashes between Interchange 30 in Medford and Interchange 21 in Talent. About half of the crashes were crashes with only property damage, and the other half resulted in at least one injury. There were seven fatalities, with six of those occurring on mainline I-5.

On mainline I-5, the majority of crashes occurred during the day and under clear and dry conditions. The most common causes of crashes were driving improperly or driving too fast, with almost 50 percent of the crashes resulting in property damage only. Friday was the most common day of the week for crashes, and 2006 had the most crashes in a year. Rear-end crashes were the most common type of crash recorded, followed by fixed-object crashes, side-swipe crashes, and non-collision crashes.

Northbound Crash History

There were a total of 220 crashes in the northbound direction on mainline I-5 and the northbound ramps. Interchange 30 had the highest number of crashes with 29, followed closely by Interchange 27 with 25 crashes. At Interchange 30, the most common crash was a rear-end crash in the vicinity of the northbound off-ramp, indicating that there may be insufficient storage distance and/or stopping sight distance on the existing off-ramp. The highest number of crashes on mainline I-5 occurred between Interchange 21 and Interchange 24, with 22 crashes in that area. On mainline I-5 and the ramps, rear-end crashes were the most common (total of 81), followed closely by fixed-object crashes (total of 71). Approximately half the crashes

[2] Crash data was adjusted to account for construction work (a non-recurring event) during this period, which may have been a factor in four additional crashes.

resulted in property damage only and half in an injury. There were a total of four fatalities, with three occurring along mainline I-5 and one occurring on the Interchange 27 off-ramp.

Northbound crash rates on mainline I-5 are relatively low, ranging from a segment low of 0.09 crashes per million vehicle miles traveled (crashes/mvmt) between Interchange 33 and Interchange 35 to high of 0.48 crashes/mvmt south of Interchange 11. Only the crash rate at the southern end of the Corridor Plan area (0.48 crashes/mvmt) is higher than the year 2007 average crash rate for interstate freeways of 0.38crashes/mvmt.

Southbound Crash History

There were a total of 172 crashes in the southbound direction on mainline I-5 and the southbound ramps. Mainline I-5 between Interchange 27 and Interchange 24 had the highest number of crashes with 22, followed closely by Interchange 30 with 20 crashes. At Interchange 30, the most common crash was a rear-end crash in the vicinity of the southbound off-ramp, indicating that there may be insufficient storage distance and/or stopping sight distance on the existing off-ramp. On mainline I-5, fixed-object crashes (total of 28) were the most common, followed closely by rear-end crashes (total of 24). On the ramps, rear-end crashes (total of 44) were the most common crash type. Approximately half the crashes resulted in property damage only and half in an injury. In the southbound direction, there were a total of three fatalities, with all three occurring along mainline I-5.

Southbound crash rates on mainline I-5 are relatively low, ranging from no crashes between Interchange 21 and the Suncrest Rest Area to a high of 0.26 crashes/mvmt north of Interchange 35 and between Interchanges 24 and 27. None of the segment crash rates are higher than the year 2007 average crash rate for interstate freeways of 0.38 crashes/mvmt.

Environmental and Land Use Reconnaissance

The consultant team conducted research and mapped known environmental constraints in an effort to identify “red flag” areas judged to have considerable potential for conflict. Figure 2-1 illustrates the resources in the corridor for 200 feet to either side of I-5 as well as 100 feet to either side of OR 99.

Land Use Designations and Section 4(f) Resources

The Corridor Plan area passes linearly through the cities of Central Point, Medford, Phoenix, Talent, and Ashland and through mainly agricultural areas (Exclusive Farm Use zones) between each city. OR 99 is a main street through the cities. Zoned land uses in the Corridor Plan area range from agricultural to residential to industrial. Within the cities, zoning tends to be commercial and industrial along the highways, particularly adjacent to OR 99. The historic, greenway, and transit oriented development overlay zoning may require conditional use permits or design reviews for transportation improvements. Medford and Phoenix have freeway overlay designations to regulate signs.

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 from conversion to highways. Section

4(f) resource lands within the Corridor Plan area consist of the federal, state, and local parks, historic structures (including resources eligible or potentially eligible for inclusion on the National Register of Historic Places (NRHP—not yet identified), and bicycle paths. 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 purpose and need for the project would impact some Section 4(f) property, then the alternative with the least impact must be selected unless it is not feasible and prudent.

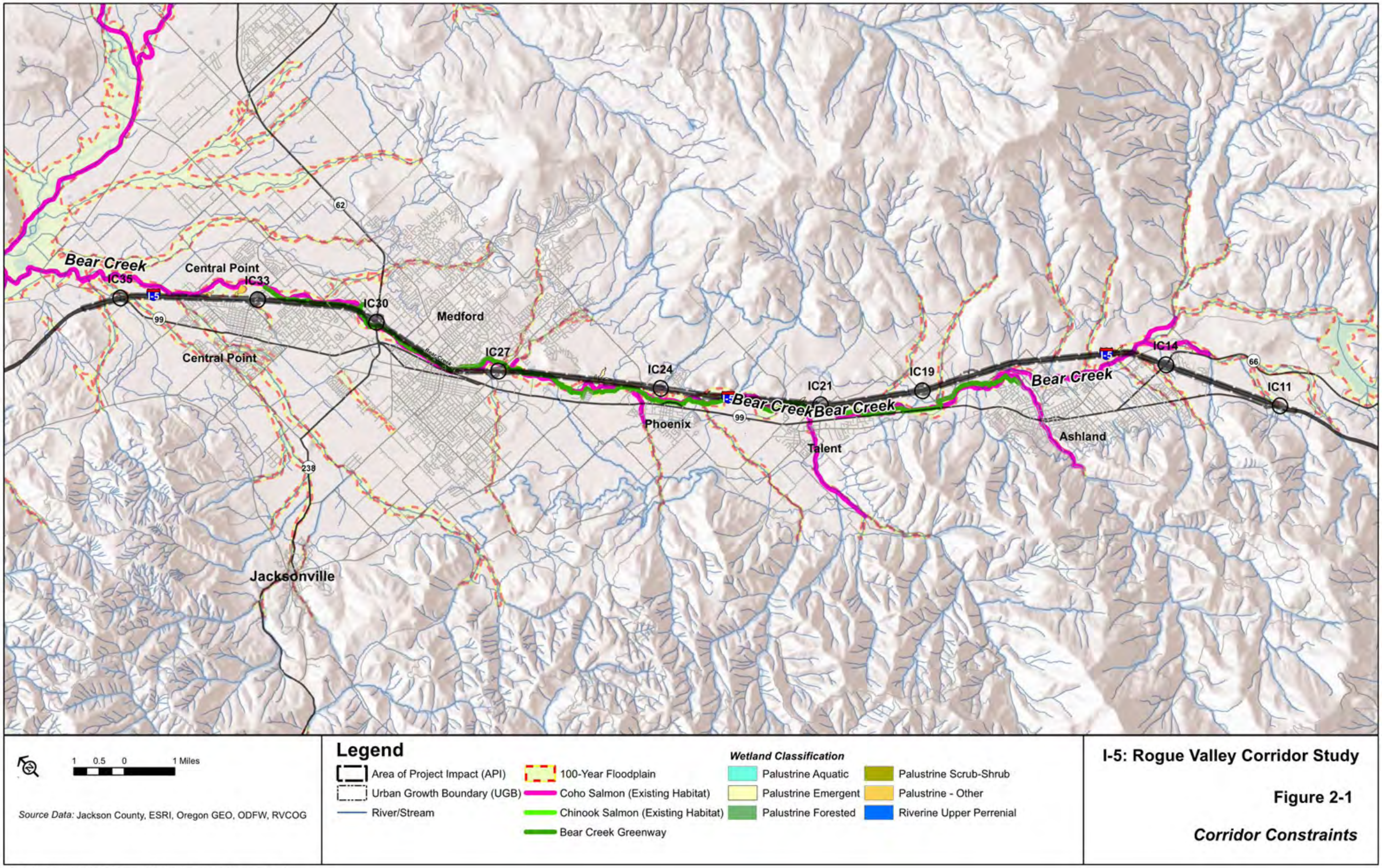
Bear Creek

Bear Creek, which is indicated in Figure 2-1, is a key riparian corridor traversing the Corridor Plan area for much of its length.

The Federal Emergency Management Agency (FEMA)-designated flood areas in the vicinity of the Corridor Plan area generally trace Bear Creek and its tributaries. I-5 roughly parallels the Bear Creek 100-year floodplain and 500-year floodplain between Central Point and Ashland. The freeway crosses Bear Creek and its floodplain at six locations: three in Medford (north of downtown, downtown, and again south of downtown), once in Phoenix, again north of Talent, and a sixth time outside Ashland north of Interchange 14, where I-5 veers south toward the Siskiyou Pass and away from Bear Creek. In addition, I-5 crosses floodplains of Bear Creek tributaries at various locations, including Jackson Creek and Griffin Creek north of Central Point; Myer Creek south of Talent; and Kirchen Creek, Gaerky Creek, and Hamilton Creek in the vicinity of Ashland.

The OR 99 corridor is impacted by 100-year and 500-year floodplain crossings at Jackson Creek and Griffin Creek (Central Point); Coleman Creek and Anderson Creek (Phoenix); Wagner Creek (Talent); and Ashland Creek, Clay Creek, and Hamilton Creek (Ashland).

Bear Creek is designated as Essential Salmonid Habitat by the Oregon Department of State Lands. Bear Creek supports runs of coho and chinook salmon, steelhead trout, and resident cutthroat trout. The U.S. Environmental Protection Agency (EPA) lists Bear Creek as a “303(d)” stream due to flow modification, habitat modification, summer temperatures, and fecal coliform levels. One riverine, upper perennial (R3UBH) area is within the Corridor Plan area. The riverine area is located approximately 1.3 miles northwest of I-5 Interchange 33 and totals 1.3 acres in size. The Bear Creek Greenway, shown in Figure 2-1, is a linear park that also provides valuable habitat for wildlife. Ultimately, the Bear Creek Greenway Foundation intends to complete the greenway from Ashland to Central Point, and eventually to the confluence with the Rogue River near Gold Hill. A multi-use path that follows the creek within the Bear Creek Greenway was designated as a National Scenic Trail in 1975, and is part of the Oregon Recreational Trail system.



I-5: Rogue Valley Corridor Study

Figure 2-1

Corridor Constraints

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The City of Medford adopted the Bear Creek (B-C) Overlay Zoning District in 1989 to protect the wildlife habitat within the greenway. The City of Medford has proposed a Riparian Corridor Ordinance for adoption into the Medford Land Development Code. The ordinance provides for a riparian corridor boundary of 50 feet, measured from the top-of-bank along both sides of waterways with an average annual flow of less than 1,000 cubic feet per second and identified as being fish-bearing streams, or other waterways having riparian areas determined to be significant, which includes Bear Creek.

The City of Ashland Comprehensive Plan, adopted in 1991, has identified Bear Creek as a water resource and the wetlands within the Bear Creek Greenway as a riparian resource. The City of Ashland has recently proposed an amendment to the Ashland Land Use Ordinance that would add Water Resource Protection Zones to the Comprehensive Plan. This amendment is proposed for consistency with the Ashland Comprehensive Plan concerning the goals and policies related to the preservation and protection of Ashland's wetlands and riparian areas, which includes Bear Creek and the Bear Creek Greenway.

Historic and Archaeological Resources

ODOT's Rogue Valley Office Archaeologist identified nine recorded archaeological resources at six locations within 200 feet of I-5.

The Corridor Plan area is located within the northern part of the Medford Downtown Historic District Area, which is predominantly commercial, but also contains numerous residential structures. The Corridor Plan area traverses part of each of Ashland's four Historic Districts: the Downtown District, the Siskiyou-Hargadine District, the Railroad District, and the Skidmore Academy District. The Railroad District and the Downtown District, in addition to their local historic district designation, are on the NRHP. These districts feature many historic homes, churches, and commercial and civic buildings.

I-5 Right-of-Way

The Senior Right-of-Way Agent for ODOT Region 3 did not identify right-of-way constraints along I-5, other than Section 6(f) properties adjacent to the Medford viaduct and its approaches that would perhaps make widening prohibitively expensive. The Medford viaduct is a 3,229-foot-long steel beam and girder bridge that carries the I-5 corridor over Bear Creek and then parallel to its north bank opposite downtown Medford. For example, Hawthorne Park, located at the northern approach of the viaduct, would be affected should any proposed I-5 roadway widening occur.

Impacts associated with OR 99 would be more complicated. Much of the roadway width currently does not meet acceptable state standards. Along some roadway sections, exact right-of-way dimensions are unknown. Furthermore, the roadway provides multiple accesses to adjacent business and residential properties. Hence, potential right-of-way impacts could be increased because of these various constraints.

Air Quality

The Medford metropolitan area is an EPA-designated Air Quality Maintenance Area, meaning that it has a history of non-attainment, but now consistently meets EPA standards set by National Ambient Air Quality Standards. The area encompassed by the Medford urban growth boundary (a smaller area within the maintenance area) was redesignated from non-attainment to attainment by the EPA in 2002, while the area within the Air Quality Maintenance Area was redesignated from non-attainment to attainment in 2005. Analysis by the RVMPO has found that through the horizon of the 2009-2034 Regional Transportation Plan (RTP) and the 2010 Metropolitan Transportation Improvement Plan, and in intervening years, emissions from transportation will not exceed current federal and state air quality standards.

Noise Quality

Although no detailed noise impact study has been performed for the I-5 Rogue Valley Corridor Plan, a noise assessment was conducted for the South Medford (Exit 27) Interchange Project Draft Environmental Impact Statement. Existing noise levels at the sites were in a range from 50 to 69 A-weighted decibels (dBA—a scale that provides a more accurate measure of what the human ear can actually hear than decibels). At peak noise levels, slightly more than a third of the areas studied approached or exceeded the Federal Highway Administration (FHWA) criteria of 67 dBA for residences and other sensitive land uses. Likewise, noise assessments conducted as part of the Fern Valley Interchange (Exit 24) Environmental Assessment identified multiple locations that exceeded the FHWA criteria.

Socioeconomic and Environmental Justice

Socioeconomic and environmental justice indicators include population change, income, poverty levels, employment sector trends, unemployment rates, and minority populations. The U.S. Census Bureau documented a 23.8 percent population increase within the Medford Metropolitan Statistical Area (MSA) (which is identical to the Jackson County boundaries) between 1990 and 2000, compared with a 20.4 percent population increase for the state as a whole. The Medford MSA population has increased from 181,269 in 2000 to 205,305 in 2008—a 13.3 percent increase compared with a 10.8 percent increase for the state during the same time period. Over 90 percent of the area’s growth is a direct result of new arrivals from outside the region.

The Bear Creek Valley Regional Problem Solving (RPS) Project team concludes that the region has become a destination of choice for retirees, primarily from western states, and especially from California, and therefore has a relatively older population than the state as a whole.

Based on the *Economic Opportunities Analysis* drafted by ECONorthwest for the Bear Creek Valley RPS Project, nearly 60 percent of Jackson County households recorded less than $50,000 annual income, compared with 54 percent for the state as a whole. Annual per capita income in Jackson County was $33,516 in 2007 compared with $35,143 for all of Oregon. Oregon’s per capita personal income is consistently lower than that of the U.S., and Jackson County’s per capital personal income consistently ranks lower than Oregon’s.

Poverty levels are mixed in the Central Point – Medford – Phoenix area, with some portions having 40 to 50 percent of the population in poverty. In the Talent – Ashland area, areas east of I-5 have a poverty rate of 20 to 30 percent, while areas west of I-5 have less than 10 percent of the population in poverty. Poverty data are from the U.S. Census Bureau income earned in the previous 12 months (1999).

According to the Oregon Employment Department, the sectors with the most employment in Jackson County, in descending order, were Retail Trade, Educational and Health Services, and Government. Sectors recording the greatest amount of growth since 2001 included Construction, Financial Activities, and Educational and Health Services. Sectors displaying declines in employment between 2001 and 2008 were Information, Manufacturing, and State Government.

Between 2000 and 2008, Medford MSA unemployment rates ranged from 6.0 percent to 7.5 percent, trending slightly lower than the state average. The 2009 global recession affected the region and state, resulting in double-digit unemployment rates. As of April 2009, Jackson County recorded 13.9 percent of its workforce as unemployed compared to 11.9 percent for the state.

The U.S. Census Bureau identifies minorities as individuals who are members of the population groups including Black or African American, American Indian and Alaska Native, Asian, Native Hawaiian and other Pacific Islander, other race, two or more races, and of Hispanic origin. The minority population in all of the categories, including all minority races combined, is not above 50 percent in the surrounding Corridor Plan area.

Threatened and Endangered Species

According to the Oregon Natural Heritage Information Center (ONHIC) database that documents federally listed and state listed, threatened, or endangered species, only one species is listed in the Corridor Plan area. The Coho salmon (*Oncorhynshus Kisutch)* is a threatened species. A "threatened species" is one that is likely to become endangered in the foreseeable future throughout all or a substantial portion of its range. There are no endangered species listed in the Corridor Plan area. An "endangered species" is one that is in danger of extinction throughout all or a substantial portion of its range. Once listed as threatened or endangered, a species is afforded the full range of protections available under the Endangered Species Act (ESA), including prohibitions on killing, harming or otherwise "taking" a species. In some instances, species listing can be avoided by the development of Candidate Conservation Agreements that may remove threats facing the candidate species.

Hazardous Materials

In July 2009, ODOT Region 3 Hazardous Materials Group performed an assessment of the I-5 corridor through the Rogue Valley region to identify known sources of contamination within the Corridor Plan area. Table 2-2 lists the number of identified hazardous waste sites by type.

Table 2-2. Summary of Identified Hazardous Waste Sites

Database Record	Total Sites Found
Federal	
National Priorities List (NPL)	0
Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS)	0
Resource Conservation and Recovery Act (RCRA) Generators	37
Emergency Response Notification System (ERNS)	2
State	
Environmental Cleanup Site Information System (ECSIS)	21
Oregon State Fire Marshall's Hazardous Materials Incidents	54
Oregon Permitted Solid Waste Landfills	1
Leaking Underground Storage Tanks (LUSTs)	85
Listed Underground Storage Tanks (USTs)	21

Source: ODOT 2009.

3. FUTURE BASELINE TRAFFIC CONDITIONS (2034 AND 2050)

The Corridor Plan evaluated future conditions for two scenarios: year 2034 using the forecasting assumptions from the Regional Transportation Plan (RTP) and year 2050 using the growth assumptions that were the basis for the Regional Problem Solving (RPS), which assumes that population in the Rogue Valley doubles.

Future Traffic Demand

The Corridor Plan uses a year 2009 existing conditions travel demand model in conjunction with the future 2034 and 2050 models to forecast future traffic growth. The projected traffic growth is then added to the year 2008 existing traffic volume collected for the Corridor Plan.

2034 Regional Transportation Plan Model

The 2034 baseline scenario uses the RVMPO financially constrained RTP land use and roadway assumptions for year 2034. The current revision of the RTP for 2009-2034, adopted by the RVMPO on March 24, 2009, provides a summary of the regional transportation actions anticipated to occur in the Corridor Plan area through 2034.

The land use assumptions for the 2034 RVMPO travel demand model are from the RTP and generally reflect existing land development patterns in the Corridor Plan area.

The transportation network used in the future baseline analysis is the financially constrained RTP system. This network includes the completion of the new Interchange 27 improvements, which are currently under construction and, therefore, not part of the existing conditions analysis. There are also five projects on I-5 in the RTP, including the Fern Valley Interchange project. The most expensive project in the 2034 RTP is the improvements to Interchange 24.

2050 Regional Problem Solving Model

The Bear Creek Valley RPS Project examined the long-term needs for additional lands for urban development to accommodate a doubling of the region's population. In support of this effort, ODOT's Transportation Planning and Analysis Unit (TPAU) developed various land use scenarios for the region that would accommodate the forecasted doubling of population. Subsequent analysis focused on transportation system improvements needed to address the forecasted demands of the different land use scenarios.

The project report identifies urban reserves and community buffers as well as standards and processes for further planning and refinement of these areas. For the Corridor Plan, the RPS model assumes that the region accommodates growth through the adoption of a "Regional Attractor" scenario, which represents a land use pattern where employment growth in the region is concentrated in defined regional centers.

The 2050 baseline analysis for this Corridor Plan assumes the same RTP-based roadway improvements as the 2034 analysis but with the addition of a four-lane limited access OR 62 bypass road from north of Poplar Drive to north of Vilas Road.

I-5 Traffic Volume and Distribution

Both the forecasted 2034 and 2050 traffic volumes reveal similar volume trends compared to the existing counts. Traffic volumes vary across the Corridor Plan area. The lowest volumes occur at the southern end of the area, while the highest volumes currently occur and are forecasted to continue to occur at the north end of the corridor in the Medford area. Figure 3-1 and Figure 3-2 summarize the daily traffic volumes and PM peak hour traffic volumes on I-5 for 2034 and 2050, respectively.

Both the 2034 and 2050 scenarios indicate that over half (54 percent for both 2034 and 2050) of the trips on I-5 are entering and exiting the freeway within the Corridor Plan area and thus, are trips local to the Rogue Valley area. The second largest user group on I-5 is southbound trips originating north of the Corridor Plan area that exit somewhere within the Corridor Plan area (31 percent for both 2034 and 2050) and northbound trips that originate within the Corridor Plan area and leave the Corridor Plan area to the north (28 percent for both 2034 and 2050). Through traffic that never gets on or off I-5 in the Corridor Plan area ranges between 10 and 12 percent for both scenarios. A small portion of the total traffic volume on I-5 enters from the south and stays somewhere within the Corridor Plan area or originates within the Corridor Plan area and leaves via I-5 to the south. As I-5 becomes increasingly congested over time, some of these local trips are likely to shift to parallel roadways such as OR 99.

I-5 and OR 99 Volume Distribution

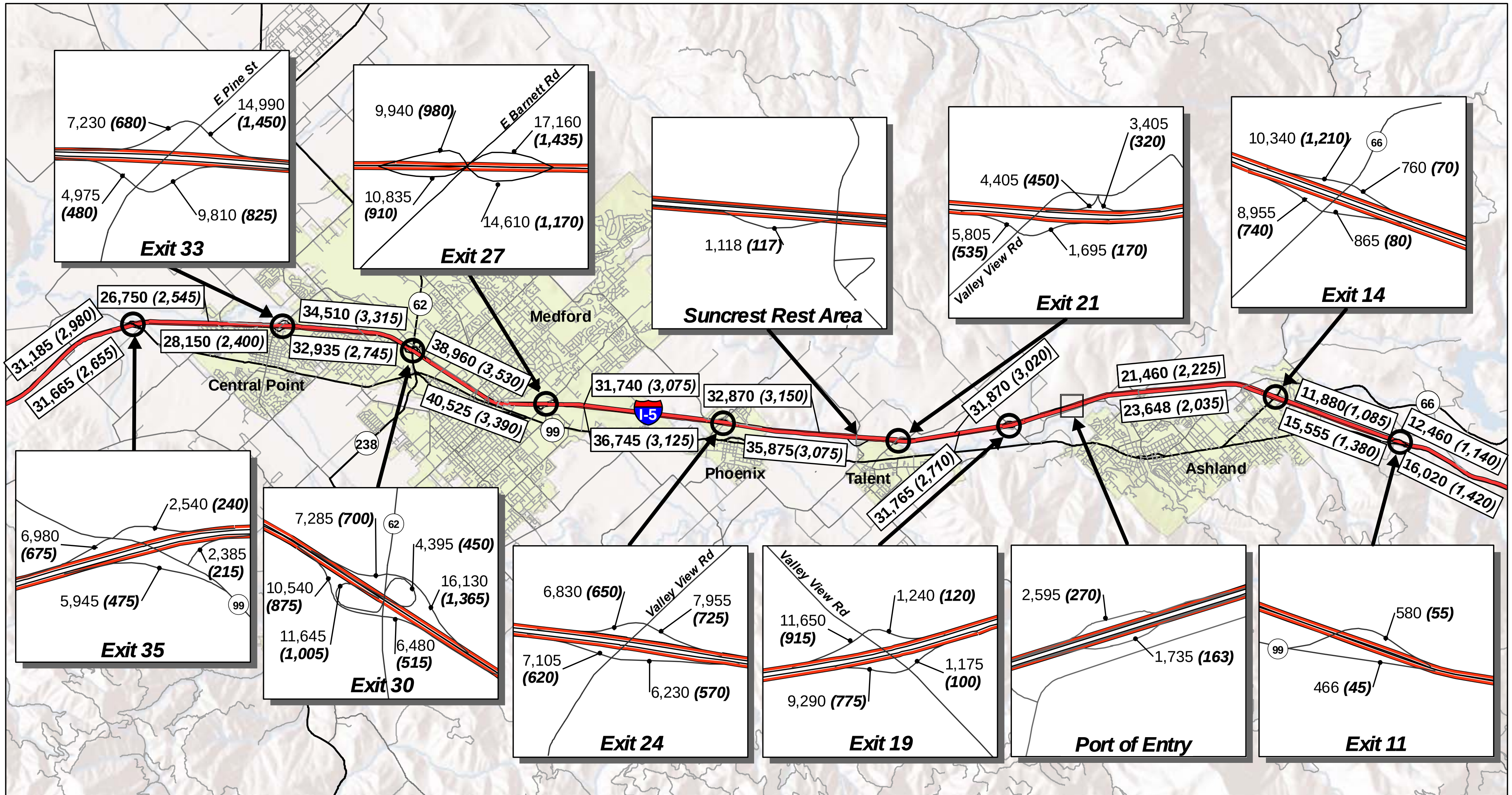
With over half of the traffic on I-5 being local traffic that stays within the Corridor Plan area, there is a high potential for I-5 users to shift to adjacent parallel routes, such as OR 99, when there is congestion on I-5. Although a comparison of the split, or relative share, of traffic on I-5 and OR 99 recorded in 2009 and estimated in 2034 reveals minimal change, the proportion of traffic using OR 99 compared to I-5 is expected to increase in 2050 relative to 2034. However, the majority of total traffic volume using both corridors would still favor I-5 in 2050 at all locations. Table 3-1**,** Figure 3-1 and Figure 3-2 summarize the PM peak hour volume on I-5 and OR 99 in the 2034 and 2050 RVMPO travel demand model.

Table 3-1. I-5 and OR 99 PM Peak Hour Volume Comparison

	2034			2050		
Location	**I-5**	**OR 99**	**Split I-5/OR 99**	**I-5**	**OR 99**	**Split I-5/OR 99**
1: South of IC 35	4,543	957	83%/17%	5,541	1,356	80%/20%
2: IC 30 to IC 33	5,369	2,733	66%/34%	6,302	3,377	65%/35%
3: IC 27 to IC 30	6,026	2,453	71%/29%	7,215	3,382	68%/32%
4: IC 24 to IC 27	5,866	1,724	77%/23%	7,933	3,311	71%/29%
5: IC 21 to IC 24	5,721	1,167	83%/17%	6,639	2,431	73%/27%
6: IC 19 to IC 21	5,175	969	84%/16%	5,956	1,357	81%/19%
7: IC 14 to IC 19	3,681	2,307	61%/39%	4,409	2,575	63%/37%
8: IC 11 to IC 14	2,075	85	96%/4%	2,438	102	96%/4%

IC = Interchange

Source: RVMPO travel demand model combined northbound and southbound volumes at screenline locations.



Source Data: Jackson County, ESRI, ODOT, Oregon GEO

Legend

- Interchange
- Port of Entry

10,000 *(1,000)* Mainline I-5 Daily Traffic ***(PM Peak Hour Volume)***

5,000 ***(500)*** I-5 Ramp Daily Traffic ***(PM Peak Hour Volume)***

I-5: Rogue Valley Corridor Plan

Figure 3-1

2034 Daily Traffic and PM Peak Hour Volume

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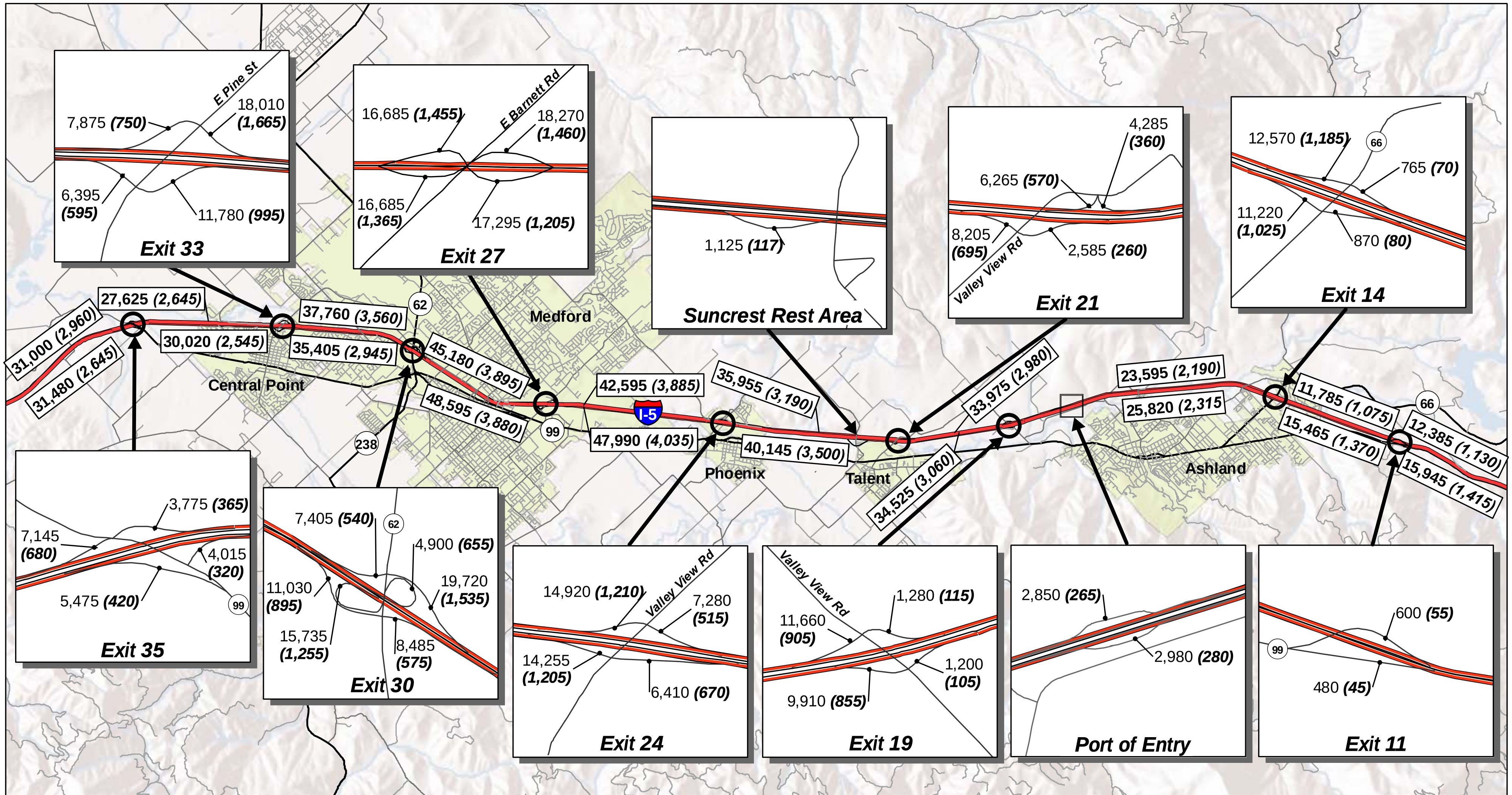

Source Data: Jackson County, ESRI, ODOT, Oregon GEO

Legend

- Interchange
- Port of Entry
- 10,000 *(1,000)* Mainline I-5 Daily Traffic ***(PM Peak Hour Volume)***
- 5,000 ***(500)*** I-5 Ramp Daily Traffic ***(PM Peak Hour Volume)***

I-5: Rogue Valley Corridor Plan

Figure 3-2

2050 Daily Traffic and PM Peak Hour Volume

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I-5 Traffic Operations

Freeway traffic operations were evaluated for both the 2034 RTP scenario and the 2050 RPS scenario.

2034 Regional Transportation Plan Scenario

The 2034 RTP scenario assumptions indicate a freeway system that would generally operate with relatively free flow operations during the PM peak hour and not exceed the Oregon Highway Plan (OHP) operational threshold—a v/c ratio of 0.80, as shown in Figure 3-3. The northbound lanes of I-5 would operate with a v/c ratio of 0.80 and LOS of D or better, except between Interchanges 27 and 33 in Medford, where the off-ramp to Interchange 27 would operate at a v/c ratio of 0.84 and LOS F and the off-ramp to Interchange 33 would operate at a v/c ratio of 0.79 and LOS F. The southbound direction of I-5 would operate with a v/c ratio at or below 0.80 and LOS D or better, except between Interchanges 27 and 30 in Medford, where the off-ramp to Interchange 27 would operate at a v/c ratio of 0.80 and LOS E. Hence, without additional improvements, both directions of I-5 between Interchange 27 and 30 could experience some congestion during the PM peak hour in 2034.

2050 Regional Problem Solving Scenario

As displayed in Figure 3-4, operations along the freeway system with the 2050 scenario assumptions begin to show some stress during the PM peak hour. Northbound I-5 would operate at LOS D or better south of Interchange 21 in Talent and north of Interchange 33 in Central Point, but the section of freeway between Interchanges 21 and 33 would operate at LOS F with v/c ratios between 0.81 and 0.97. The v/c ratio on I-5 in the northbound direction would exceed the OHP operational threshold of 0.80 on the majority of freeway segments from the Interchange 21 on-ramp to the Interchange 33 off-ramp.

In the southbound direction, I-5 would operate similarly to the northbound direction, with LOS D or better operations south of Interchange 19, north of Ashland, and north of Interchange 30 in Medford. From Interchange 30 to Interchange 19, the freeway would operate at LOS F. The v/c ratio in the 2050 base model would exceed the OHP operational threshold of 0.80 on the majority of freeway segments from the Interchange 30 on-ramp to the Interchange 21 off-ramp. The v/c ratios for the southbound freeway segments expected to exceed the operational threshold range from 0.88 to 1.00. In this area, both directions of I-5 are likely to experience congestion in 2050 without additional improvements.

RVMPO Roadway Capacity

Although operational analysis for the Corridor Plan is limited to I-5, in order to understand how changes on I-5 impact the Rogue Valley transportation system, the demand-to-capacity (d/c) ratio on all the roadways in the RVMPO travel demand model were calculated. The d/c ratio is the ratio of the total demand for the analysis period divided by the total capacity for the period.

Analysis of the transportation network within the urbanized Rogue Valley region for the 2034 scenario suggests that most of the system will not be over capacity. As displayed in Figure 3-5, the majority of roadways show a d/c ratio for the 2034 baseline PM peak hour of under 1.0. Exceptions include portions of OR 62, Delta Water Road, Barnett Road, Belknap Road, Phoenix Road, South Valley View Road, and OR 99, where the d/c ratio is greater than 1.0, suggesting overcapacity. Advancing to the 2050 scenario, conditions along these roadway sections predictably worsen during the PM peak hour and extend beyond what was displayed for the 2034 scenario (see Figure 3-6). Still, much of the network is forecasted to continue to operate within capacity.

The Highway Economic Requirements System (HERS)

The Highway Economic Requirements System – State Version (HERS-ST) was created as an economic decision-making tool to be used in conjunction with traffic analysis for traffic planning. This tool compares the expected benefits, over the life of the improvement, with the cost of implementing the improvement. The v/c ratio deficiency level was set at 0.80, and the benefit/cost ratio threshold was set at 1. When these thresholds are exceeded, HERS-ST suggests one of six improvement "types": pavement, widening, and/or alignment corrections. If HERS-ST selected an improvement that exceeded what the state had coded for the section, then it was assigned as a "high cost." The majority of the areas where a resurfacing with lanes added at high cost is suggested are on the mainline and at interchanges between Interchange 24 and Interchange 33. The rest of the improvements are resurfacing with lanes added at normal cost and are on either on- or off-ramps between Interchange 19 and Interchange 35.

Table 3-2. Recommended Improvements from HERS-ST

Year & Location	Milepost	Unimproved Conditions V/C Ratio	Recommended Improvement	Benefit/ Cost Ratio	Improved Conditions v/c Ratio
2018					
IC 19 SB I-5 Off-Ramp	18.92-19.26	1.20	Resurface, Add 1 lane, Normal cost	1.01	0.65
IC 30 SB I-5 On-Ramp (loop)	30.11-30.42	0.85	Resurface, Add 1 lane, Normal cost	1.43	0.32
2023					
IC 30 SB I-5 Off-Ramp	30.23-30.56	1.44	Resurface, Add 2 lanes, High cost	1.64	0.55
IC 33 NB I-5 Off-Ramp	32.49-32.70	1.56	Resurface, Add 2 lanes, High cost	2.54	0.61
2028					
IC 21 SB I-5 Off-Ramp	21.27-21.40	1.16	Resurface, Add 1 lane, Normal cost	2.92	0.61
IC 24 NB I-5 On-Ramp	24.32-24.62	0.80	Resurface, Add 1 lane, Normal cost	1.21	0.30
IC 24 SB I-5 Off-Ramp	24.41-24.62	1.42	Resurface, Add 2 lanes, High cost	1.90	0.53
IC 33 SB I-5 Off-Ramp	32.90-33.05	1.00	Resurface, Add 1 lane, Normal cost	1.65	0.53
IC 35 NB I-5 On-Ramp	35.49-35.81	1.06	Resurface, Add 1 lane, Normal cost	2.16	0.56
2033					
NB Mainline	27.58-29.98	0.80	Resurface, Add 1 lane, High cost	1.11	0.57
SB Mainline	36.99-38.07	0.86	Resurface, Add 1 lane, Normal cost	1.78	0.58
IC 19 NB I-5 On-Ramp	19.26-19.49	0.81	Resurface, Add 1 lane, Normal cost	2.24	0.30
IC 24 NB I-5 Off-Ramp	24.17-24.40	0.99	Resurface, Add 1 lane, Normal cost	2.12	0.53
2038					
NB Mainline	30.75-32.5	0.84	Resurface, Add 1 lane, High cost	1.32	0.59
SB Mainline	23.82-24.05	0.93	Resurface, Add 1 lane, High cost	1.26	0.64
SB Mainline	27.58-29.84	0.87	Resurface, Add 1 lane, High cost	1.18	0.61

Table 3-2. Recommended Improvements from HERS-ST

Year & Location	Milepost	Unimproved Conditions V/C Ratio	Recommended Improvement	Benefit/ Cost Ratio	Improved Conditions v/c Ratio
2043					
NB Mainline	23.19-24.17	0.88	Resurface, Add 1 lane, High cost	1.61	0.62
SB Mainline	30.29-32.15	0.88	Resurface, Add 1 lane, High cost	1.20	0.60
2048					
SB Mainline	30.84-31.82	0.93	Resurface, Add 1 lane, High cost	1.01	0.64
SB Mainline	32.15-32.5	0.93	Resurface, Add 1 lane, High cost	1.02	0.64
IC 24 SB I-5 On-Ramp	24.05-24.38	0.91	Resurface, Add 1 lane, High cost	1.18	0.63
IC 30 SB I-5 Off-Ramp	29.84-30.11	0.89	Resurface, Add 1 lane, High cost	1.31	0.62
IC 30 NB I-5 Off-Ramp	29.98-30.36	1.44	Resurface, Add 2 lanes, High cost	1.48	0.55
2053					
SB Mainline	19.1-19.26	0.90	Resurface, Add 1 lane, High cost	1.17	0.63
SB Mainline	21.2-21.4	0.90	Resurface, Add 1 lane, High cost	1.17	0.62
SB Mainline	24.4-24.62	0.90	Resurface, Add 1 lane, High cost	1.01	0.62
IC 21 SB I-5 On-Ramp	20.96-21.2	0.90	Resurface, Add 1 lane, High cost	1.16	0.63
IC 21 SB I-5 Off-Ramp	21.4-23.82	0.88	Resurface, Add 1 lane, High cost	1.09	0.62
IC 33 NB I-5 Off-Ramp	32.49-32.70	1.21	Resurface, Add 2 lanes, High cost	1.10	0.77

NB = northbound; SB = southbound.

Future Safety Deficiencies

Much of the crash data analyzed and incidents summarized in the crash summary section could be exacerbated by the higher traffic volumes forecasted. For example, it is likely that the cross weaving traffic associated with the placement of the northbound Port of Entry in proximity to the Interchange 19 off-ramp would intensify, leading to continued public insistence on finding a solution.

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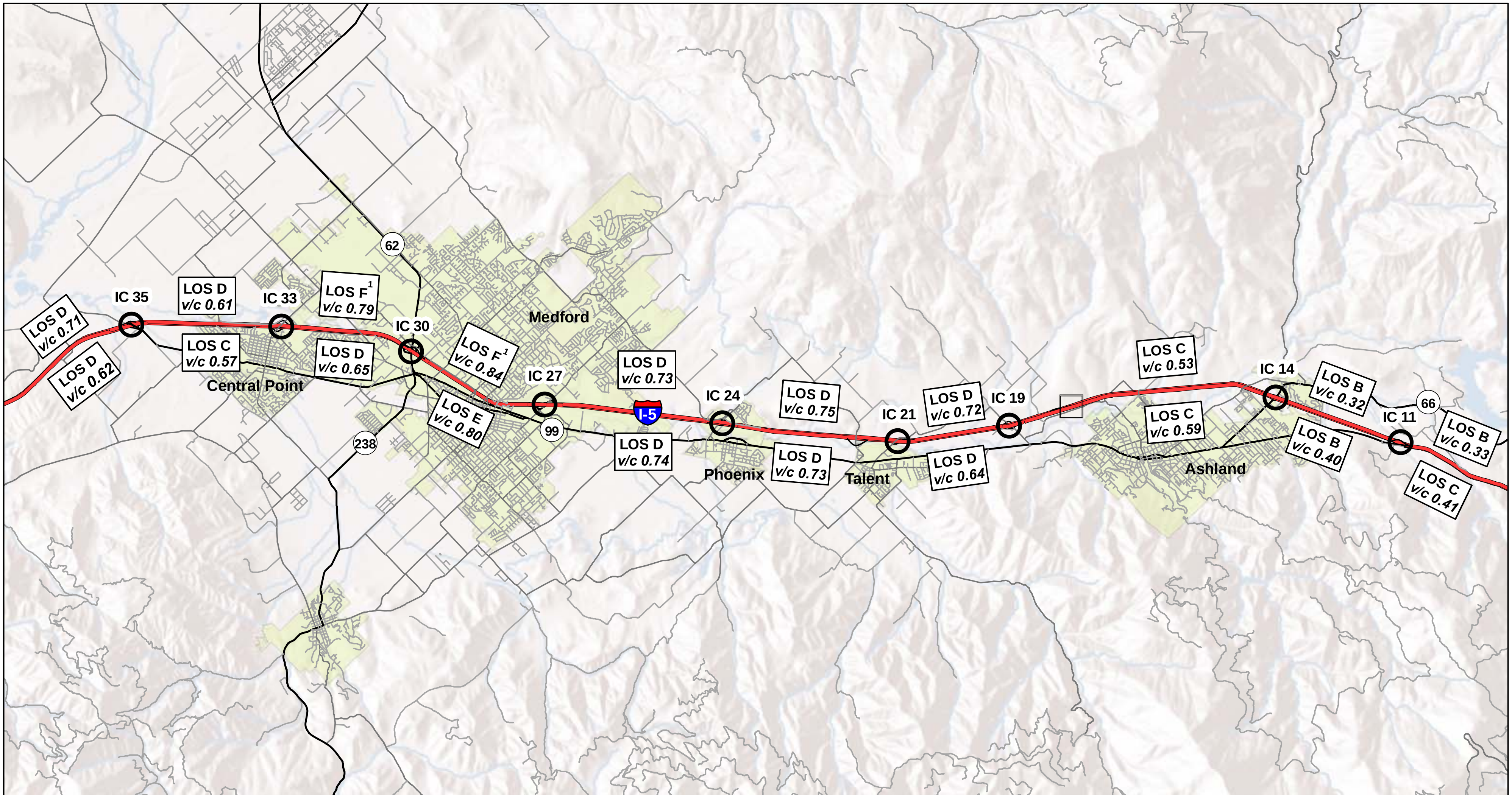

Source Data: Jackson County, ESRI, ODOT, Oregon GEO

Legend

- Interchange
- Port of Entry
- LOS / *v/c*: Level of Service / ***Volume/Capacity Ratio***
- LOS F[1]: LOS F @ Off-Ramp Influence Area

I-5: Rogue Valley Corridor Plan

Figure 3-3

2034 Operations

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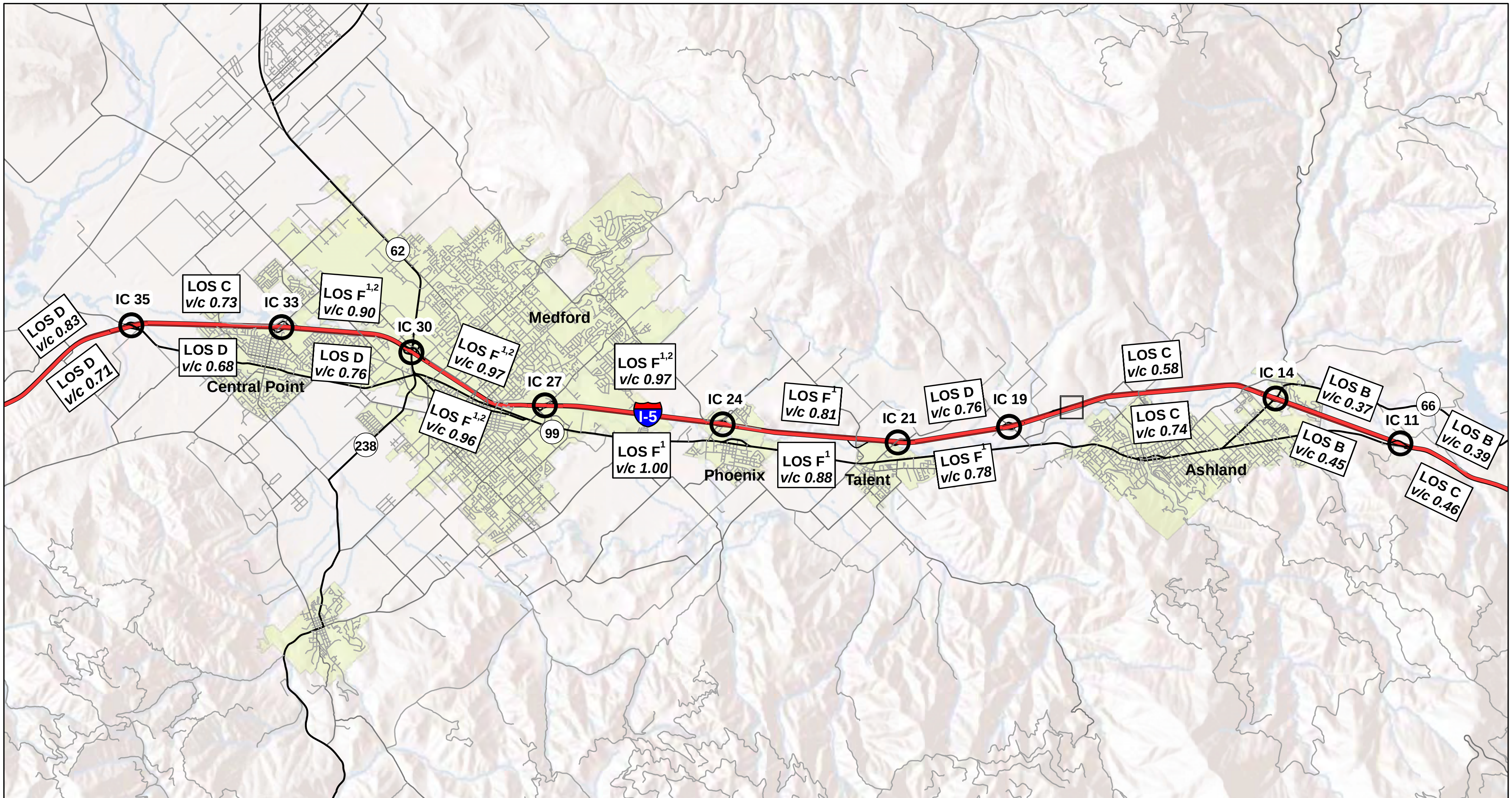

Source Data: Jackson County, ESRI, ODOT, Oregon GEO

Legend

- Interchange
- Port of Entry
- LOS / *v/c*: Level of Service / *Volume/Capacity Ratio*
- LOS F[1]: LOS F @ Off-Ramp Influence Area
- LOS F[2]: LOS F @ On-Ramp Influence Area

I-5: Rogue Valley Corridor Plan

Figure 3-4

2050 Operations

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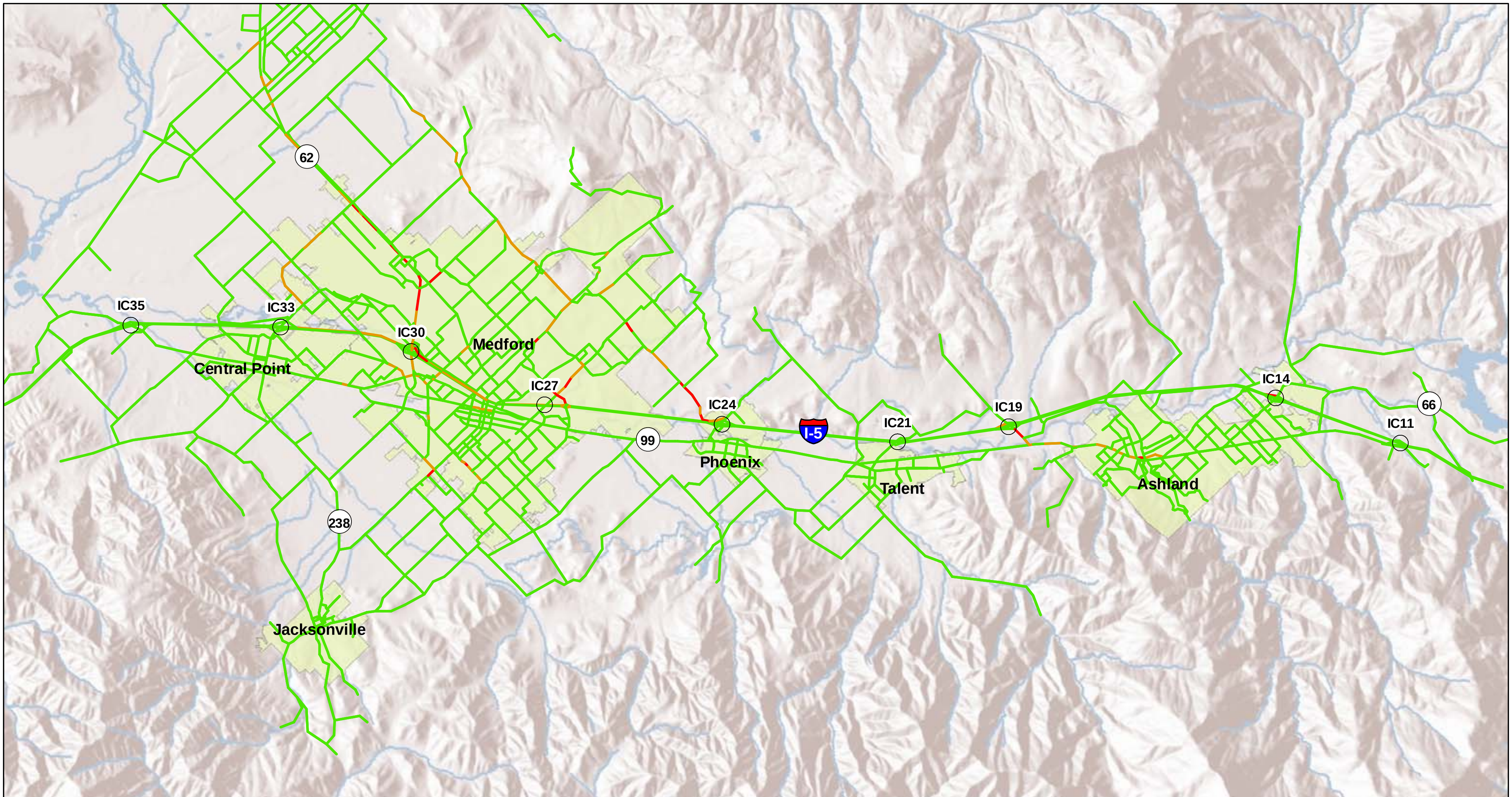

Source Data: Jackson County, ESRI, Oregon GEO

Legend

◯ Interchange

2034 Demand to Capacity Ratio

- Greater Than 0.99
- 0.80 to 0.99
- Less Than 0.80

I-5: Rogue Valley Corridor Plan

Figure 3-5

2034 Demand-to-Capacity Ratio

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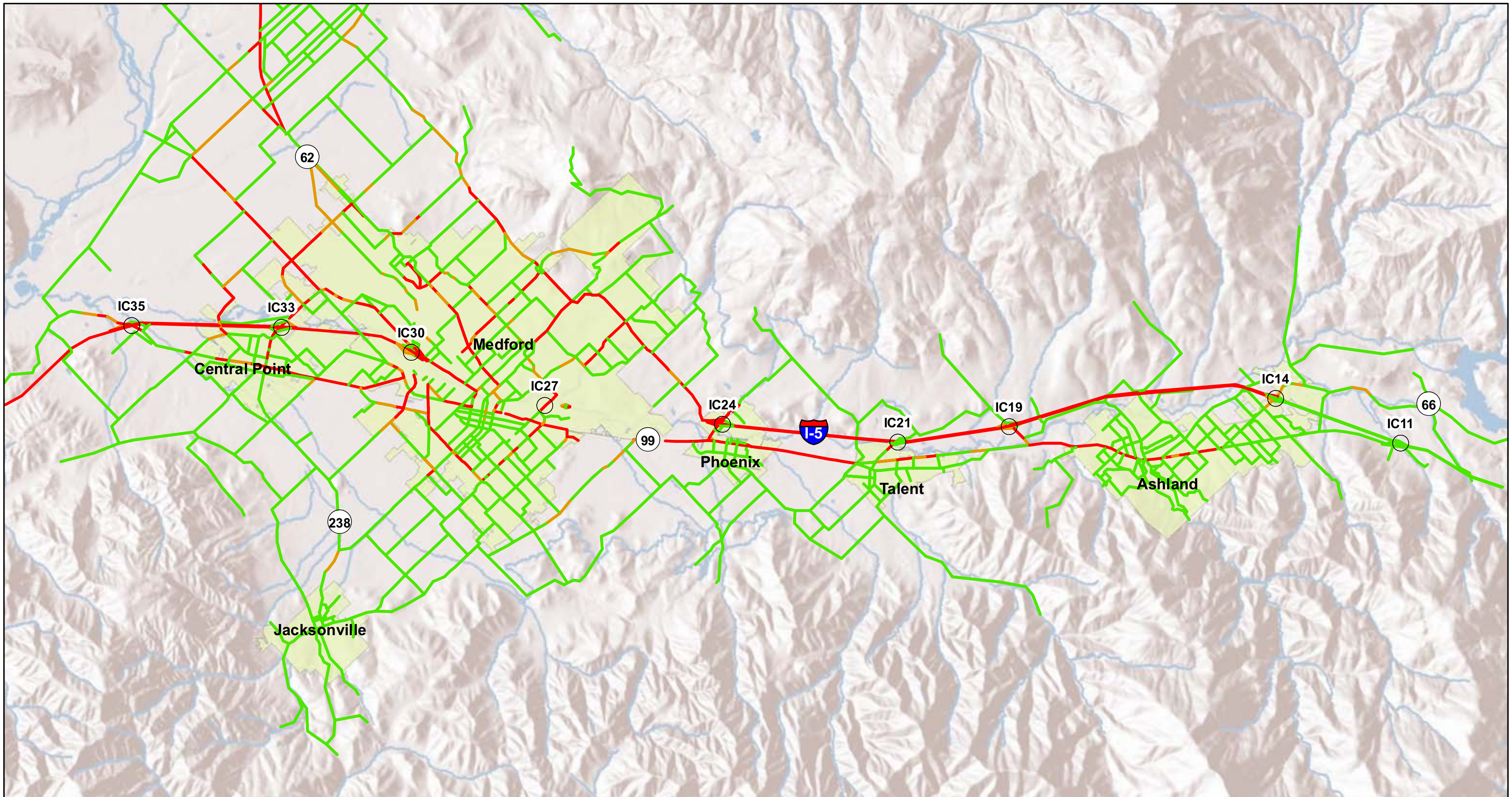

Source Data: Jackson County, ESRI, Oregon GEO

Legend

○ Interchange

DCR

- Greater Than 0.99
- 0.80 to 0.99
- Less Than 0.80

I-5: Rogue Valley Corridor Plan

Figure 3-6

2050 Demand-to-Capacity Ratio

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4. CORRIDOR CONCEPTS

Corridor concepts are strategies to improve future traffic operation and safety deficiencies. Concepts later can be refined and developed into improvement projects. The project team developed and evaluated corridor concepts using these five steps:

1. Identify concept selection criteria.
2. Identify potential improvement concepts.
3. Evaluate concept impacts.
4. Identify high performing concepts.
5. Evaluate corridor concepts according to the evaluation criteria.

Corridor Concept Development

Concepts for the analysis were developed based on the goals and objectives and the results of the existing conditions and future year analyses. The PMT and government staff identified the priorities to be addressed in the concept evaluation. These priorities are:

- Explore options to mitigate impacts caused by delays at the Siskiyou Pass summit (e.g., delays caused by winter weather conditions).
- Explore options to improve alternate north-south connections east of I-5.
- Improve efficiency of the existing transportation system through Transportation Demand Management (TDM) strategies, Transportation System Management (TSM) measures, and Intelligent Transportation System (ITS) technology.
- Identify potential improvements to the Medford viaduct that incorporate incident management and other measures to maximize efficiency.
- Coordinate with the Rogue Valley Metropolitan Planning Organization (RVMPO) efforts to assess the OR 99 corridor and develop strategies that reduce vehicular congestion and support economic development.
- Maintain efficient operations of the I-5 mainline through interchanges by identifying capacity constraints and implementing physical improvements.
- Explore improvement options for the southbound weigh station and northbound Port of Entry ramps.
- Limit the impacts of arterial system on I-5 mainline operations.
- Identify truck layover areas and implement improvements to enable staging of freight trucks during Siskiyou Pass closures.
- Develop expedited methods of informing truck operators of pending roadway changes ahead, such as construction on, the closure of, or delays on the Siskiyou Pass because of inclement weather.

Based on these priorities, 20 concepts were identified for the I-5 corridor that can be grouped into the following five concept categories:

- Safety Enhancement Measures
- Transportation System Management (TSM) Measures
- Capacity Enhancement Measures
- Least Cost Planning Solutions

- Transportation Demand Management (TDM) Measures

The following section describes each proposed concept starting first by identifying the problem, then the proposed solution, and finally summarizing the strengths and impacts of each. The locations of each physical improvement are shown graphically in Figure 4-1 for 2034 and Figure 4-2 for 2050.

Corridor Concepts—Safety Enhancement Measures

Seven safety enhancement measures were identified and evaluated. These include:

- Port of Entry – Auxiliary Lane Option
- Port of Entry – Modified On-Ramp Option
- Southbound Weigh Station
- Temporary Overnight Truck Facilities
- Emergency Turnaround
- Medford Viaduct Shoulder
- Incident Response Vehicles

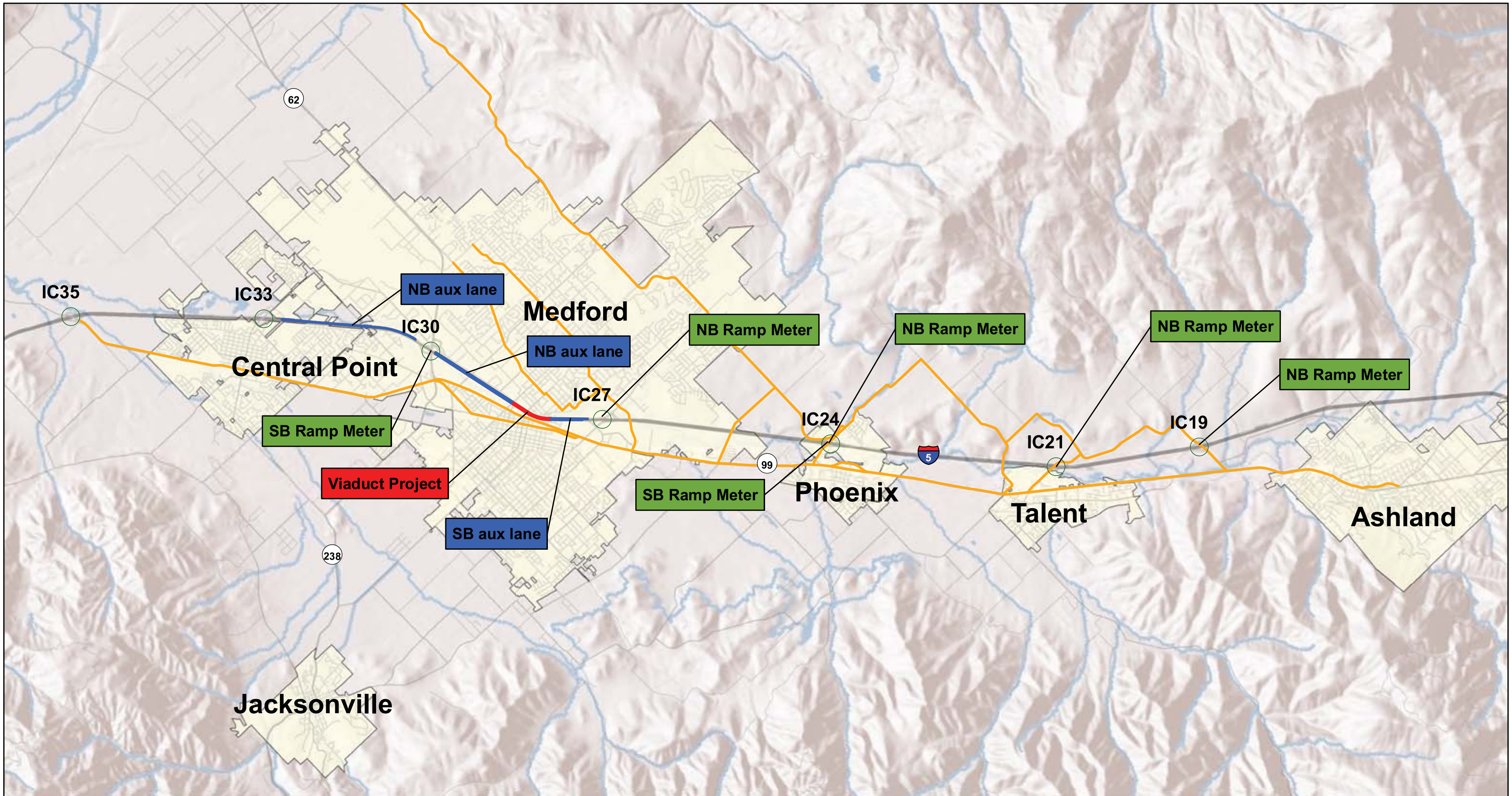
Port of Entry – Auxiliary Lane Option

Problem. There are safety concerns associated with the substandard distance between the northbound on-ramp from the Port of Entry weigh station and the northbound off-ramp at Interchange 19.

Proposed solution. Add an auxiliary lane between the on-ramp of the northbound weigh station (Port of Entry) facility and the northbound off-ramp at Interchange 19. The auxiliary lane would provide additional room for trucks to accelerate up to freeway speeds before having to merge into the mainline travel lanes.

Strengths. An auxiliary lane would immediately improve safety on the freeway and would provide additional freeway capacity for future northbound traffic approaching Interchange 19. Potential right-of-way impacts should be limited to the exit ramp area, where the widening shifts to the outside to align with the existing ramp. Land use and environmental impacts would be minor for this concept. Constructing the widened pavement in the median would avoid any potential lengthening for the Butler Creek box culvert.

Potential impacts. This option maintains the existing on-ramp, which has horizontal and vertical curves that impact the ability of heavy trucks to accelerate. Adding the auxiliary lane northbound would require widening and shifting through lanes to the median side for most of the length to allow the widening under the Butler Creek Road Bridge. Constructing the widened pavement in the median would also avoid any potential lengthening for the Butler Creek box culvert, and any potential right-of-way impacts would likely be limited to the exit ramp area, where the widening shifts to the outside to align with the existing ramp. Shifting through lanes to the inside would require installation of substantial median barrier and guardrail terminals to protect the closer through lanes from opposing traffic and the median bridge pier. This option may have Bear Creek floodplain impacts and add new impervious surface (1.2 acres). An archeological site has been identified within 200 feet of MP 17.28-17.45 (near Ashland).



Source Data: Jackson County, ESRI, Oregon GEO

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I-5: Rogue Valley Corridor Study

Figure 4-1

2034 Potential Concepts

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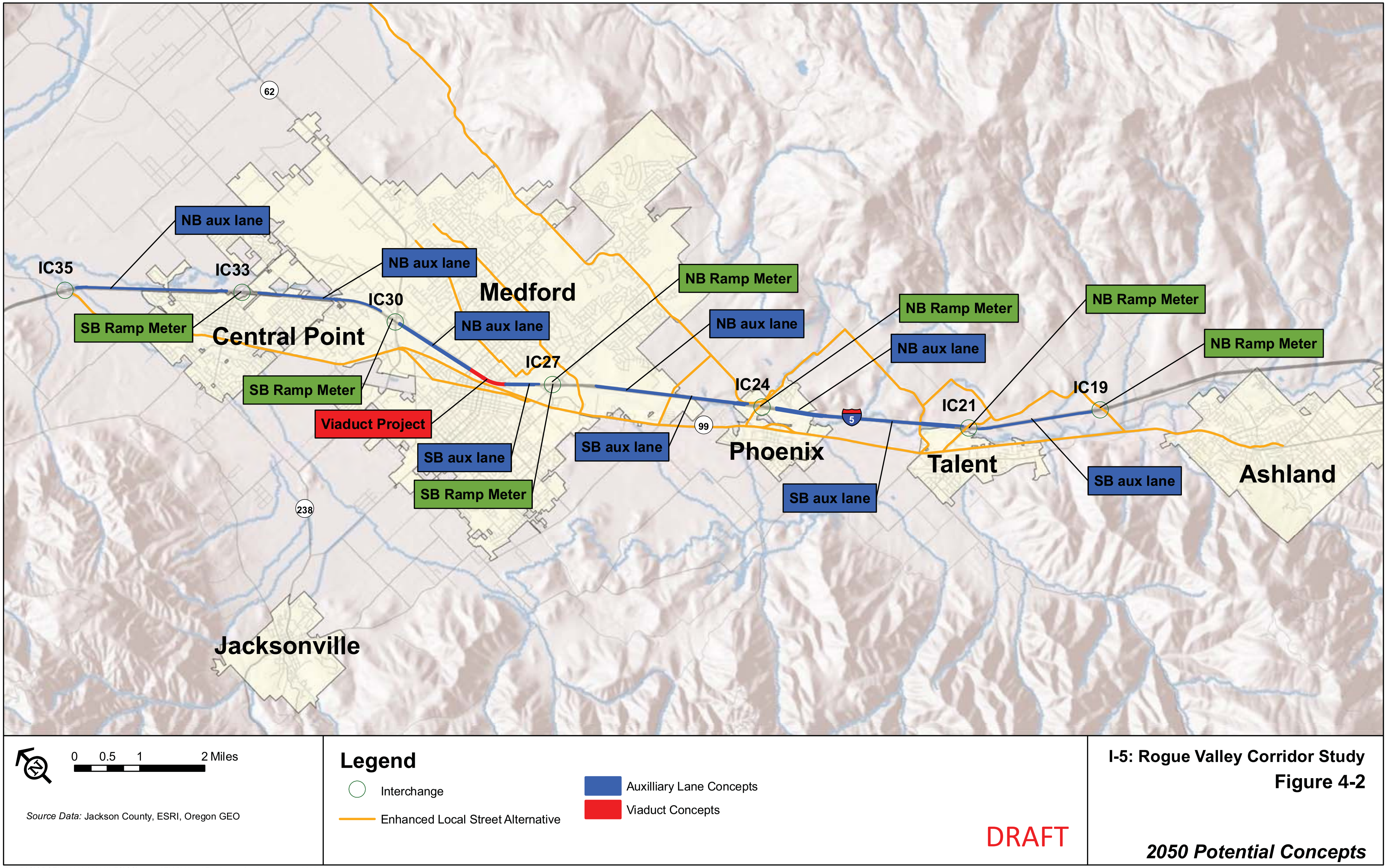

Source Data: Jackson County, ESRI, Oregon GEO

DRAFT

I-5: Rogue Valley Corridor Study

Figure 4-2

2050 Potential Concepts

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Port of Entry – Modified On-Ramp Option

Problem. There are safety concerns associated with the substandard distance between the northbound on-ramp from the Port of Entry weigh station and the northbound off-ramp at Interchange 19.

Proposed solution. Relocate the Port of Entry on-ramp approximately 1,000 feet to the south of its current location, thus creating a longer acceleration lane that would enable safer merging of trucks onto the freeway. Shifting the on-ramp to the south would require changing the internal circulation at the Port of Entry to allow trucks in the parking area to circle back around to the new on-ramp location, which would be just north of the truck scales. Extending the ramp at the merge point on the freeway is not an option because of the Butler Creek Road Bridge, which prohibits widening the freeway to the outside. Shifting the through lanes to the median side would allow lengthening of the acceleration lane, but the impacts and cost would be similar to a full auxiliary lane.

Strengths. Shifting the on-ramp for the Port of Entry facility farther to the south would immediately improve safety on the freeway and would improve the poor horizontal and vertical curvature of the existing ramp for trucks not using the parking facilities. Constructing the widened pavement in the median should also avoid any potential lengthening for the Butler Creek box culvert, and any potential right-of-way impacts should be limited to the exit ramp area, where the widening shifts to the outside to align with the existing ramp. The Modified On-Ramp Option would avoid the potential floodplain impacts of the Auxiliary Lane Option.

Potential impacts. This option would add traffic on the north side of the scale house, which may not be desirable for the site operations. A loop ramp would be required from the truck parking area back to the south, which could potentially require some right-of-way. It may have Bear Creek floodplain impacts and add new impervious surface (1.8 acres). An archeological site has been identified within 200 feet of MP 17.28-17.45 (near Ashland).

Southbound Weigh Station

Problem. Trucks preparing to exit at the weigh station are positioned in the same section of the right travel lane as vehicles merging onto the I-5 southbound mainline. This cross-weaving traffic movement causes safety concerns.

Proposed solution. Add an auxiliary lane between the southbound on-ramp at Interchange 19 and the southbound off-ramp at the weigh station to lengthen the acceleration lane and enable safer merging for vehicles entering the mainline travel lanes.

Strengths. This option immediately improves safety on the freeway and would provide additional freeway capacity to accommodate future growth in southbound traffic approaching the weigh station. It would avoid any potential lengthening for the Butler Creek box culvert and have minor land use and environmental impacts.

Potential impacts. This option might have Butler Creek 100-year floodplain impacts and would add 0.77 acres of impervious surface. An archaeological site has been identified within 200 feet of MP 17.28-17.45 (near Ashland). There might be noise impacts associated with bringing the interstate closer to sensitive noise receivers.

Temporary Overnight Truck Facilities

Problem. There are safety concerns related to having numerous trucks parked along the I-5 shoulder, ramp terminals, and nearby local streets when the I-5 Siskiyou Pass closes.

Proposed solution. Temporarily divert trucks to the Jackson County Fairgrounds, distribution centers, industrial parks, and other public and private properties.

Strengths. The only physical improvements for this option would be the installation of signage within existing, disturbed right-of-way. The overnight parking facilities could be in locations already equipped to accommodate large trucks and could be located to avoid impacts such as noise. There may be reduced emissions from idling diesel engines and reduced VMT because of trucks not taking longer alternate routes.

Potential impacts. It would require ODOT and local governments to negotiate an agreement among the various property owners, businesses, and/or institutions. Directing trucks to parking facilities may increase vehicle miles traveled (VMT).

Emergency Turnaround

Problem. There are operational and safety concerns due to having only one designated emergency vehicle turnout in the corridor at MP 16.7 near the North Mountain Avenue overpass.

Proposed solution. Expand the turnout to provide a turnaround location for mainly southbound trucks when the I-5 Siskiyou Pass is closed due to weather conditions.

Strengths. It would enable law enforcement or ODOT to signal trucks to turn off I-5 southbound and move out of the flow of traffic.

Potential impacts. There are no potential impacts, but trucks can turn around at any interchange.

Medford Viaduct Shoulder

Problem. There is diminished operation efficiency, particularly when incidents close one or both travel lanes, because there is no shoulder.

Proposed solution. Add a 12-foot right side shoulder by reconstructing and widening the existing viaduct structure.

Strengths. It would provide a continuous shoulder along most of I-5 through the Rogue Valley. The shoulder would enable a vehicle to move out of the flow of traffic, provide a buffer area should a motorist need to take evasive action, and allow emergency vehicles such as ambulances and police cars to bypass traffic congestion.

Potential impacts. It would not add capacity to the viaduct or improve traffic operations. It would be very expensive and encroach upon adjacent residential and commercial properties. It would have impacts to Hawthorne Park and Bear Creek Greenway, including 1 acre of floodplain impacts and the addition of 1.6 acres of impervious surface. There would be a potential for socioeconomic and environmental justice impacts because of the high percentage of minority and persons living below the poverty line in this area of Medford and displacements from additional right-of-way. There would be historical and cultural impacts in the Medford downtown Historic District.

Incident Response System

Problem. There are operational and safety concerns as a result of the lack of an incident response system.

Proposed solution. Deploy incident response system to patrol patrol I-5 during peak crash periods and expand the existing traffic operations center (TOC).

Strengths. It would reduce incident response time and improve operations on I-5 during incidents.

Potential impacts. Increased number of CCTV cameras needed. ODOT and the local governments would need to expand and upgrade the existing TOC., Additional personnel costs.

Corridor Concepts — Transportation System Management Measures

Three TSM concepts were identified and evaluated. These include:

- Designated Alternate Truck Route
- OR 99 Corridor Coordinated Traffic Signal System
- Ramp Metering

Designated Alternate Truck Route

Problem. Weather-caused closures of the Siskiyou Pass cause operations and safety concerns.

Proposed solution. Locate variable message signs (VMS) along I-5 throughout the Willamette Valley to alert southbound traffic to pending pass closures and advise an alternate route onto OR 58 from Interchange 188 to U.S. 97 south past Klamath Falls.

Strengths. It would improve operations and safety of both the freeway and local system because fewer trucks would be parked along the I-5 shoulder, interchange ramps, and local arterials and collectors. The OR 58/U.S. 97 detour is the same length as I-5, so there would be no increase in VMT. It would reduce the number of trucks affected by closure of the Siskiyou Pass and therefore would reduce delays and cause less out-of-direction travel for trucks.

Potential impacts. The necessary upgrades to OR 58/U.S. 97 (it is a single lane of traffic in each direction) may have environmental and land use impacts. The OR 58/U.S. 97 route has tight curves and narrow lanes as it crosses the Cascade Range summit; I-5 allows for faster and more constant travel speeds.

OR 99 Corridor Coordinated Traffic Signal System

Problem. OR 99 is not a fully viable alternative to I-5 for local traffic.

Proposed solution. Implement a more comprehensive coordinated and adaptive traffic signal system on targeted segments in urbanized areas of OR 99 between Interchanges 11 and 35.

Strengths. This measure would improve traffic flow by enabling groups of cars traveling on the highway to proceed through multiple intersections without stopping. Synchronizing traffic signals would have the immediate benefit of improving travel speeds and reducing vehicle stops and idling time, resulting in a decrease in vehicle emissions. Because this measure would not require physical improvements, no considerable land use or environmental impacts are anticipated.

Potential impacts. It is not always possible to retain progression throughout a network of signals, particularly on two-way streets where congestion during rush hours can interfere with any coordination. A signal system may have little effect on traffic demand on I-5. Trips shifted to OR 99 may increase VMT and emissions slightly over similar trips taken on free-flowing I-5.

Ramp Metering

Problem. There is a need to maintain level of service on the freeway and prevent the freeway from exceeding capacity.

Proposed solution. Install ramp meters to restrict the total flow of traffic entering the freeway, temporarily storing it on the ramps and thus regulating traffic flow along the mainline. The potential locations are identified in Technical Memorandum #4 prepared for this Corridor Plan. Detectors embedded into the roadway measure and calculate traffic flow, speed, and occupancy levels to determine the number of vehicles that can leave the ramp.

Strengths. Ramp meters increase the effective freeway capacity by eliminating multiple, closely spaced cars from entering the freeway as a dense group, which can increase travel speeds, decrease travel times, and improve mainline traffic flow without adding additional capacity. All of these benefits would result in a decrease in vehicle emissions, which would reduce pollutant emissions along mainline I-5. The delay caused by the ramp meter waiting period may cause some drivers to choose other routes, thereby reducing demand for the freeway. Physical improvements would be limited to minor widening of existing on-ramps and the installation of meters within existing right-of-way.

Potential impacts. Minor widening of existing on-ramps would be required to create adequate space for queuing, and this minor widening will create additional impervious surface, causing new sources of stormwater runoff. Queuing on the ramps could extend onto the local street system. Ramp metering would force vehicles to stop before they entered and merged onto the highway; these stops would offset any air quality benefits gained to a certain extent. Providing ramp metering in conjunction with the enhanced parallel routes options would decrease corridor-wide VMT approximately 2 to 3 percent.

Corridor Concepts — Capacity Enhancement Measures

Five capacity enhancement concepts were identified and evaluated. These include:

- Additional Mainline Travel Lane
- Auxiliary Travel Lanes
- Enhanced Local Arterial/Collector Connections
- Expanded Medford Viaduct
- Directional High Occupancy Vehicle Lanes

Additional Mainline Travel Lane

Problem. ODOT mobility standards will not be met in the future on certain segments of I-5.

Proposed solution. Add a continuous third travel lane in both directions between Interchange 21 (Talent) and Interchange 33 (Central Point), which may require widening of the Medford viaduct, reconfiguring five interchanges (21, 24, 27, 30, and 33), and constructing multiple structures, one I-5 bridge underpass, and four I-5 stream crossing bridges.

Strengths. The freeway system would operate with free flow operations during the PM peak hour under both 2034 and 2050 scenarios.

Potential impacts. Widening to construct the additional mainline lane would require structural work, median barriers, retaining walls, viaduct construction, and right-of-way acquisition. It may have substantial impacts on Hawthorne Park (a Section 4(f) resource), the Bear Creek floodplain, and endangered species and would add new impervious surface. Several archeological sites have been identified within 200 feet of I-5. Right-of-way acquisition and residential displacements would have a high potential for environmental justice concerns due to the high percentage of minorities and persons living below the poverty level in the immediate area of the Medford viaduct and other areas in proximity to I-5. Noise impacts would occur where widening and new structures would bring roadways closer to sensitive noise receivers. Other concepts under consideration, such as auxiliary travel lanes, could effectively address operational needs in the freeway corridor with fewer anticipated impacts. In the short term, VMT and emissions likely would not change, because trips would be shifted from local roadways to the freeway. However, in the long term, VMT and emissions likely would increase.

Auxiliary Travel Lanes

Problem. ODOT mobility standards will not be met in the future on certain segments of I-5.

Proposed solution. Add travel lanes of limited duration that feed traffic onto and off of the mainline from the on-ramp of one interchange to the off-ramp of the next successive interchange. The potential locations are identified in Technical Memorandum #4 prepared for this Corridor Plan.

Strengths. Auxiliary lanes can be added at segments that are expected to exceed ODOT's mobility standards. Implementing the improvements as individual projects means much more flexibility in funding those improvements.

Potential impacts. Widening to construct the auxiliary lanes would require structural work, median barriers, retaining walls, viaduct construction, and right-of-way acquisition. Right-of-way acquisition and residential displacements would have a high potential for environmental justice concerns due to the high percentage of minorities and persons living below the poverty level in the immediate area of the Medford viaduct and other areas in proximity to I-5. Noise impacts would occur where widening and new structures would bring roadways closer to sensitive noise receivers. The concept may have substantial impacts on the Bear Creek floodplain (0.1 to 1.8 acre) and endangered species and add new impervious surface (4.4 to 7.1 acres). Several archeological sites have been identified within 200 feet of I-5. However, the impacts would be less extensive than widening the highway for a fixed distance.

Enhanced Local Arterial/Collector Connections

Problem. Viable alternatives to using I-5 for local trips are needed.

Proposed solution. Coordinate the traffic signals, and construct future connectors east of I-5 in the Medford area.

When evaluating the operational benefits to I-5 of the potential enhanced local connectors on a corridor-wide level, the displacement and environmental impacts mask the benefits to I-5 operations in some segments. Therefore, the operational benefits versus impacts were evaluated on a smaller scale than that used for the other concepts. In the Medford area, the traffic analysis of enhancing local connectors shows a movement of traffic off I-5 to use the local roadways, which is a benefit to I-5 operations. In the areas north and south of Medford, analysis shows a mixed or negative effect to I-5; that is, it shows that more vehicles would use the local roads to access I-5 and would add traffic to the highway. Based on the results of the analysis and the population centers, the I-5 corridor was divided into three areas:

- Area 1: Central Point and North Medford—Interchange 30 to Interchange 35
- Area 2: Medford—Interchange 24 to Interchange 30
- Area 3: Phoenix to Ashland—Interchange 11 to Interchange 24

The segments overlap so that the traffic analysis could include operations on entire interchanges, instead of attempting to divide operations on ramps into different segments.

The Area 2 connectors are North Phoenix Road/North Foothills Road, Crater Lake Avenue, Table Rock Road and Highland Drive/Sunrise Avenue/Springbrook Road. From Corey Road, North Foothills Road would be extended north to Atlantic Avenue through White City as described in the Jackson County Transportation System Plan. Where Atlantic Avenue currently truncates at Avenue H, the roadway would cross and extend northwestward to East Dutton Road, where it would connect with OR 62 (Crater Lake Highway). A Crater Lake Avenue corridor extension would follow East Main Street south on Willamette Avenue, then east onto Siskiyou Boulevard to Highland Drive, then south on Highland Drive to Interchange 27. North beyond Delta Waters Road, the Highland Drive/Sunrise Avenue/Springbrook Road corridor could eventually continue to Coker Butte Road.

The potential for enhanced connectors south of Medford in Area 3 consist largely of rural roads that crisscross along the east side of the I-5 corridor between Phoenix and north Ashland. The potential connectors are South Valley View Road, West Valley View Road, Suncrest Road, Payne Road, Fern Valley Road, and a planned extension of South Stage Road east of OR 99 and over/under I-5 to North Phoenix Road to connect between Interchanges 24 and 27.

Strengths. This concept may enhance traffic flow within the system, reduce delay in many areas, and minimize overall pollution. In Area 1, OR 99 between Medford and Central Point, Crater Lake Avenue/OR 62, and Sunrise Avenue would carry additional traffic in 2034 and 2050.

In Area 2, with ramp meters, I-5 would experience a decrease in traffic volume through Medford and the viaduct area between Interchanges 27 and 33 for the peak and daily periods. Without ramp meters, I-5 would experience a decrease in traffic volumes beginning farther south at Interchange 24 when compared to the ramp metering alternative. This is likely due to the improved freeway operations in the ramp metering alternative that attract additional longer distance trips, while the shorter trips shift to the local street system. Also, in 2050, OR 99 through parts of downtown Medford would experience a decrease in traffic volumes.

In Area 3 in 2050, OR 99 through Talent and Phoenix would experience a decrease in traffic volumes.

Potential impacts. The analysis shows that this Enhanced Local Arterial/Collector Connections concept alone provides little benefit to relieving traffic demand on I-5. Therefore, operations of the freeway would not be substantially improved with only this concept.

For any of the local system enhancements, there could be substantial environmental and land use impacts associated with construction and operation of the roadway improvements. For example, Goal 5 impacts would be likely, because numerous creeks and the associated 100-year floodplain are in the area of the concepts (including Bear Creek, which is in proximity to OR 99 in several areas). They may have substantial impacts on Hawthorne Park, a Section 4(f) resource. There are also historical resources and districts in proximity to the area of the concepts, making historical impacts likely. Displacements associated with widening and road network improvements could adversely impact environmental justice communities in the concept area. Noise impacts are likely as a result of extending roads into new areas and widening roads, thus bringing them closer to sensitive noise receivers. Extending roads that are at the edge of the Urban Growth Boundary could have overall environmental impacts associated with taking previously rural land and changing the use of the land to transportation use, which is an urbanized use.

The traffic analysis shows that VMT would increase much faster on the enhanced arterial and collector road network than it would on I-5 without the enhanced connections.

Area 1 would experience very little decrease in traffic volume on I-5 between Interchanges 30 and 35 for the peak and daily periods. The expansion of OR 99 would have environmental and property impacts.

In Area 2 in 2034 and 2050, a number of arterials and collectors would experience an increase in traffic. The expansion of the arterials and collectors would have environmental and property impacts.

In Area 3, with and without ramp meters, I-5 would experience additional traffic volume between Interchanges 19 and 24 during the peak and daily period. These volume changes are likely because the enhancements to local roads allow drivers to quickly reach I-5, their desired route. OR 99 between Interchange 19 and downtown Ashland would carry additional traffic in 2034 and 2050. The expansion of local arterials and collectors to provide additional capacity would have environmental and property impacts.

Expanded Medford Viaduct

Problem. The geographic, physical, and built features surrounding the viaduct pose challenging constraints for any effort to expand capacity in the existing corridor.

Proposed solution. Expand or replace the existing viaduct structure to accommodate six lanes of through traffic—three lanes northbound and three lanes southbound—as well as to provide for the ODOT standard roadway shoulders, either with a new viaduct that is essentially double for the ODOT standard roadway shoulders, either with a new viaduct that is essentially double the width of the existing structure or by stacking the opposing travel lanes (i.e., northbound travel lanes stacked directly over the southbound travel lanes).

Strengths. The freeway section between Interchange 27 and Interchange 30 would meet ODOT operational standards in 2034 and 2050 and there would be lower emissions due to less stop-and-go travel and safer conditions due to full shoulders.

Potential impacts. It may have substantial impacts on the Bear Creek floodplain (1.2 to 2.6 acres), the greenway (crossings and routings under and adjacent to I-5 may require relocation), and Hawthorne Park (0.1 to 0.5 acre of the Section 4(f) resource), and it would add new impervious surface (2.0 to 4.7 acres). Widening the existing structure would encroach upon adjacent residential and commercial properties. Right-of-way acquisition and residential displacements would have a high potential for environmental justice concerns due to the high percentage of minorities and persons living below the poverty level in the immediate area of the Medford viaduct and other areas in proximity to I-5. The scale of impacts would be smaller for adding a third lane while retaining the existing 3-foot shoulders than it would be for the option of adding the third lane with standard 12-foot shoulders. Improvements would be very expensive.

Directional High Occupancy Vehicle Lanes

Problem. Additional capacity and improved operations are needed to alleviate peak hour congestion on the freeway.

Proposed solution. Install directional high occupancy vehicle (HOV) or reversible lanes to allow traffic flow in one direction during the morning rush hour, and then in the opposite direction in the afternoon and evening. Overhead traffic lights and lighted street signs would notify drivers which lanes are open or closed to driving or turning.

Strengths. Induced carpooling and transit modes may reduce single-occupancy vehicles. Emissions may decrease because of higher vehicle operating speeds in HOV lanes, and the increase in VMT as a result of additional capacity would be offset by the reduction in single-occupancy vehicle trips.

Potential impacts. Additional capacity would be limited to one direction of travel at a time, and HOV lanes tend to be underutilized because of the limited number of potential users. Widening to construct the HOV lane would require structural work, median barriers, retaining walls, viaduct construction, and right-of-way acquisition except where the freeway has a wide median or full-width shoulders. Right-of-way acquisition and residential displacements would have a high potential for environmental justice concerns due to the high percentage of minorities and persons living below the poverty level in the immediate area of the Medford viaduct and other areas in proximity to I-5. Noise impacts would occur where widening and new structures would bring roadways closer to sensitive noise receivers. The concept may have substantial impacts to the Bear Creek floodplain, wetlands, and the Hawthorne Park Section 4(f) resource.

Corridor Concepts — Least Cost Planning Solutions

Two least cost planning concepts were identified and evaluated. These include:

- Peak Hour Shoulder Use
- Variable Speed Limits

Peak Hour Shoulder Use

Problem. Additional temporary highway capacity is needed, but it should be provided while minimizing the need for acquisition of right-of-way or major reconstruction.

Proposed solution. Allow flexible use of hard shoulders as temporary auxiliary travel lanes. DMS would inform motorists and indicate emergency turnouts. The interval placement of interchanges along the I-5 corridor would limit the use of hard shoulders exclusively to temporary auxiliary lanes.

Strengths. Added capacity could improve travel flow, and it could be accomplished with minimal construction and few environmental impacts. Peak hour usage would reduce congestion and increase travel speeds, thereby reducing vehicle emissions.

Potential impacts. Widening to provide a continuous 12-foot outside shoulder or emergency turnout area would encroach on the entrance and exit ramp lengths and gore striping. Right-of-way acquisition and residential displacements would have a high potential for environmental justice concerns due to the high percentage of minorities and persons living below the poverty level in the immediate area of the Medford viaduct and other areas in proximity to I-5. Noise impacts would occur where widening and new structures would bring roadways closer to sensitive noise receivers. The concept may have substantial impacts to the Bear Creek floodplain, wetlands, and the Hawthorne Park Section 4(f) resource. Vehicle breakdowns in the shoulders would need to be removed immediately to avoid the potential for high speed crashes. The Oregon Legislature might need to amend the Oregon Revised Statutes to add an exception to “failure to drive within a lane” and to redefine “shoulder” to include use of hard shoulders as temporary auxiliary lanes.

Variable Speed Limits

Problem. There is diminished operation efficiency and congestion in the Corridor.

Proposed solution. Install variable speed limits (VSL)—digital signage that displays posted speed limits that change based on road, traffic, and weather conditions. Variable speed limits can improve capacity by maintaining smooth traffic flow during congested time periods and also improve safety by restricting speeds during adverse conditions.

Strengths. Although VMT would not change, because vehicles would take the same routes, traffic congestion and local air pollution would be reduced because of the longer period of free flow conditions. The benefits could be recognized immediately. Because this measure would not require physical improvements, no significant land use or environmental impacts are anticipated.

Potential impacts. There have been only a few VSL projects in the United States. In some cases, more congestion was reported with the VSL than without.

Corridor Concepts — Transportation Demand Management Measures

Four TDM concepts were identified and evaluated. These include:

- Intermodal Freight Hub
- Bus Service Improvements
- Commuter Rail
- Bus Rapid Transit

Intermodal Freight Hub

Problem. Rail shipments destined for south of Ashland (to California) must go north through Eugene and then divert onto the Union Pacific line because there is no rail available in the Rogue Valley south of Ashland.

Proposed solution. Establish an intermodal freight hub at Interchange 35 where the CORP, two state highways (OR 99 and OR 140), and I-5 converge.

Strengths. Shippers would have a choice of cost-effective options and could reduce their reliance on a single mode of transport. There may be a reduction of VMT and emissions as a result of truck loads being transferred onto rail, which has a much lower rate of emissions on a per ton basis than trucks. There may be economic benefits.

Potential impacts. Additional local VMT and vehicle emissions may occur because of an Increase in local truck trips and operating and idling at the freight hub.

Bus Service Improvements

Problem. Bus services need enhancement, particularly in the OR 99 corridor from Crowson Road in Ashland to Interchange 35 north of Central Point.

Proposed solution. Reduce headways, expand coverage and hours of service, and add new routes to destinations not currently served.

Strengths. According to the RVMPO North-South Travel Demand Study, transit demand is not currently met within the corridor. Bus Route 10 (Ashland) runs along OR 99 and serves Ashland, Talent, Phoenix, and Medford. This route was shown to operate over capacity (passengers exceeded seating) in the period from 2007 to 2008, suggesting that there may be latent demand for transit that would benefit from more frequent service in the corridor. No environmental or land use impacts would occur, since no new infrastructure or construction would be required. There may be decreased VMT and vehicle emissions because of fewer automobile trips.

Potential impacts. Transit service improvements would have a limited ability to shift traffic off of I-5 and is unlikely to improve freeway operations, both because local transit cannot serve the large percentage of trips that begin or end outside of the transit service area or freight trips, and because of the relatively low housing and job density, free parking, and limited congestion in the corridor.

Commuter Rail

Problem. Transit services need enhancement.

Proposed solution. Add commuter rail on the CORP between Central Point and Ashland.

Strengths. The strengths of this option are similar to those described for the *Bus Service Improvements* concept but perhaps more limited to the north-south travel corridor. Some minor improvements in operations of the transportation system might result from reduced vehicular demand. Commuter rail riders would benefit from reliable travel times that would not be impacted by congestion on the roadways. Unless the commuter rail service included park-and-ride facilities, this concept would not result in negative environmental or land use impacts; the commuter rail would be placed within existing railroad right-of-way. If the commuter rail could attract consistent ridership, local air quality could be improved. Given the existing and projected levels of congestion on I-5, commuter rail has some potential (though less than transit service generally) to reduce VMT and emissions in the corridor.

Potential impacts. Commuter rail would be limited to the north-south travel corridor. Commuter rail would have longer travel times than auto or other transit modes because of low track speeds and stops. Track upgrades and stations would have high costs. Constructing stations would require right-of-way acquisition and construction of rail crossings. Commuter rail generally needs higher employment densities and better pedestrian connections than those that currently exist in the corridor.

Bus Rapid Transit

Problem. Transit services need enhancement.

Proposed solution. Add a dedicated bus lane and implement signal prioritization on non-rural portions of OR 99 from Ashland to Central Point. These improvements would allow the bus to operate separately, without interference from other modes.

Strengths. The strengths of this option are similar to those described for the *Commuter Rail* concept. However, bus rapid transit (BRT) would likely have higher ridership, since buses can cover a wide area and then converge on the dedicated lanes for part of their trip to avoid congestion. Because of more reliable service and better travel times compared to automobiles, the BRT ridership would likely be higher than the ridership associated with improvements to regular bus service. There would be minor improvements in operations from reduced vehicular demand. If BRT could attract consistent ridership, VMT and emissions would be reduced.

Potential impacts. Adding the dedicated bus lane, and potentially adding a park-and-ride lot, would require additional impervious surface, displacements, and cultural resource disturbance from widening the existing roadways.

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5. CORRIDOR CONCEPTS PRIORITIZATION AND PHASING

To help prioritize potential improvements in the Corridor Plan, a set of evaluation criteria were developed and applied to each concept. Three categories of criteria were developed: (1) the degree to which the concept maximizes benefits, (2) the degree to which the concept minimizes impacts, and (3) the cost opinion. Each concept was scored for each criterion. The criteria are weighted based upon the priorities identified by the PMT and government staff as listed in Section 6, Public and Agency Involvement.

Corridor Concept Evaluation Criteria and Scoring Matrix

Figure 5-1 lists the corridor concepts and shows the score of each by criterion.

Maximizes Benefits

Concepts were scored based on their ability to maximize the benefit of that criterion. For example, concepts that improve safety in the project corridor were scored higher than concepts that have no effect on safety.

- **Freeway Operations:** The concept improves operations or capacity on I-5. Benefits that accrue include reductions in travel time, reduction in congestion and delays, and increased travel speeds.
- **Safety:** The concept improves safety in the I-5 corridor. There is potential for crashes to be reduced, for improved service times for emergency responders, and for a reduction in nonrecurrent crash-related delay and congestion.
- **Freight Movement:** The concept improves freight movement in the I-5 corridor by reducing delay for heavy vehicles, improving travel time reliability and providing alternate routes for freight movement.
- **Vehicle Capacity:** The concept improves the overall vehicular capacity in the I-5 corridor. This goal may be accomplished several ways—by adding capacity or by maintaining traffic flow conditions on the highway mainline, or by measures that improve merging and diverging freeway sections.
- **Person Capacity:** The concept improves overall person capacity in the project corridor by creating opportunities to move more people through a section of the corridor.
- **Circulation and Access:** The concept helps and improves local roadway system circulation patterns and provides improved access to residential, commercial, and industrial properties. Improvements include additional roadway capacity, transit improvements or optimization of the traffic signal system.
- **Local Economy:** The concept has a positive effect on the local or regional economy by reducing travel delays, increasing freight movements or providing additional accessibility to residential, commercial, and industrial areas.
- **Phasing Potential:** The concept has the ability to be built or implemented in stages over a period of time. The concept could be funded in numerous stages, could tap into

multiple sources of funds, and/or could be built in parts that are separated from other concepts.

Minimizes Impacts

Concepts are scored based on their ability to minimize impacts of that criterion. For example, concepts that cost less to build or implement would be given higher priority than projects that are more expensive.

- **Environmental/Cultural:** The concept as constructed or implemented minimizes the effects on the built and natural environment. This includes affects on land use, environmental, cultural or historic resources, as well as impacts to environmental justice communities.
- **Properties**: The concept as constructed or implemented minimizes the effect on properties that would fall in potential right-of-way that would need to be acquired.
- **Local Roadway System**: The concept would minimize impacts on the local roadway system.

Cost Opinion

The cost opinion is an order-of-magnitude estimate ranging from low (represented by a single symbol: $) to high (represented by four symbols: $$$$).

High Priority Concepts

The matrix identifies the following as high priority concepts:

Safety Enhancement Measures

- Port of Entry—Auxiliary Lane Option
- Southbound Weigh Station
- Emergency Turnaround
- Incident Response System/Vehicles

Transportation System Management (TSM)

- OR 99 Corridor Coordinated Traffic Signal System
- Ramp Metering

Capacity Enhancement Measures

- Enhanced Local Arterial/Collector Connections – Area 2 (Medford to Phoenix)

	Concepts	Freeway Operations	Safety	Freight Movement	Vehicle Capacity	Person Capacity	Circ & Access	Local Economy	Phasing Potential	Environ. & Cultural	Properties	Local Roadway System	Cost[1]	Rank	Priority[2]	Strengths	Potential Impacts/Challenges
Safety Enhancement Measures																	
Port of Entry—Auxiliary Lane Option	Extend NB on-ramp into an auxiliary lane with Interchange 19 off-ramp	Medium	High	High	Medium	Low	Low	Low	Low	Medium	High	High	$	3	High	Immediately improve safety and add capacity for future NB traffic approaching Interchange 19; minor right-of-way, land use, and environmental impacts; avoids lengthening the Butler Creek box culvert	Keeps the existing on-ramp that heavy trucks have difficulty accelerating on; substantial median barrier and guardrails; Bear Creek floodplain impacts; add 1.2 acres of new impervious surface; archaeological site within 200 feet of MP 17.28-17.45
Port of Entry—Modified On-Ramp Option	Shift on-ramp approximately 1,000 feet to the south	Medium	Low	Low	Medium	Low	Low	Low	Low	High	High	High	$	5	Medium	Immediately improve safety and improve the ramp for trucks; minor right-of-way impacts; avoids floodplain impacts and lengthening the Butler Creek box culvert	Add traffic on the north side of the scale house; need right-of-way for a new loop ramp; Bear Creek floodplain impacts; add 1.8 acres of new impervious surface; archaeological site within 200 feet of MP 17.28-17.45
SB Weigh Station	Add auxiliary lane between the SB on-ramp at Interchange 19 and the SB off-ramp at the weigh station	Low	Medium	Medium	Medium	Low	Low	Low	Low	High	High	High	$	4	High	Immediately improve safety and add capacity for future SB traffic to weigh station; avoid any potential lengthening of the Butler Creek box culvert	Butler Creek 100-year floodplain; add 0.77 acres of impervious surface; archaeological site within 200 feet of MP 17.28-17.45; noise impacts with closer I-5
Temporary Overnight Truck Facilities	Coordinate efforts to enable a temporary, large-scale public/private truck stop/rest area (e.g., fairgrounds, distribution centers) along the Corridor Plan vicinity during inclement weather events	Medium	High	High	Low	Low	Low	High	High	High	High	High	$$	6	Medium	Signage would be the only physical improvement; facilities could be in locations already equipped to accommodate large trucks and avoid noise impacts; reduced emissions from idling diesel engines	Need negotiated agreement to use facilities
Temporary Overnight Truck Facilities	Add right side 12-foot shoulder	Medium	High	Medium	Low	Low	Medium	Medium	Low	Medium	Medium	Medium	$$	7	Medium	Allow emergency vehicles to bypass traffic; enable a vehicle to move out of the flow of traffic; buffer for evasive action	Would not add capacity to the viaduct or improve traffic operations; very expensive; displacements of and encroachment upon adjacent residential and commercial properties; impacts to Bear Creek Park and Bear Creek Greenway; 1 acre of floodplain impacts; add 1.6 acre impervious surface; environmental justice impacts; Medford downtown Historic District
Emergency Turnaround	Upgrade existing emergency turn-out to provide truck turnaround during winter pass closures	Low	Low	Low	Low	Low	Medium	Low	Low	High	High	High	$	2	High	Enable the sheriff or local police to signal trucks to turn off I-5 southbound and move out of the flow of traffic	None, but trucks can turn around at any interchange
Incident Response System	Add incident response system and infrastructure to the corridor	Low	High	Low	Low	Low	Low	Low	Low	Low	Low	Low	$	1	High	Reduce incident response time; improve operations on I-5 during incidents	Need to add closed circuit television cameras; need to expand and upgrade the Traffic Operations Center
Transportation System Management (TSM)																	
Designated Alternate Truck Route	Upgrade OR 58/US 97 as an alternate route during inclement weather conditions and alert truck drivers via VMS placed in the Willamette Valley corridor of conditions in the Siskiyou Pass and advise taking alternate route	Low	Medium	High	Medium	Medium	High	High	Low	Low	Low	Low	$$$$	3	Low	Improve operations and safety of both the freeway and local system; fewer trucks affected by pass closure; no increase in VMT	Need OR 58-U.S. 97 upgrades from two narrow lanes with tight curves; I-5 has faster and more constant travel speed and therefore lower emissions
OR 99 Corridor Coordinated Traffic Signal System	Synchronize traffic signals along the entire length of the OR 99 corridor	Low	High	Low	Medium	Medium	High	Medium	High	High	High	High	$	2	High	Reduce delay and minimize pollution; improve traffic flow and travel speeds; reduce vehicle stops and idling time	Difficult to maintain signal progression; little affect on traffic demand on I-5; trips on OR 99 may increase VMT and emission slightly over similar trips taken on free-flowing I-5
Ramp Metering	Incorporate dynamic ramp metering at applicable interchanges	High	Medium	High	High	High	Low	Medium	High	High	High	Medium	$	1	High	Increase freeway capacity; improve operations on the I-5 mainline by increasing travel speeds, decreasing travel times, and improving traffic flow; decrease in vehicle emissions	Decreased capacity of the ramps would create queuing on the ramps that could extend onto the local street system; drivers diverting to local routes could impact operations on other parts of the roadway system; ramp metering would force vehicles to stop before they entered and merged onto the highway; these stops could offset any air quality benefits gained by the improved I-5 operations
Capacity Enhancement Measures																	
Additional Mainline Travel Lanes	Continuous travel lanes along the I-5 mainline	High	High	High	High	High	High	High	Medium	Low	Low	Medium	$$$$	2	Low	Improve capacity and operate with free flow operations during the PM peak hour under both 2034 and 2050 scenarios	Substantial environmental and land use impacts; in the long term, VMT and emissions likely would increase
Auxiliary Travel Lanes	Between ramp terminals	High	High	High	High	High	High	High	High	Medium	High	High	$$$	1	Medium	Improve capacity and operate with relatively free flow operations during the PM peak hour under both 2034 and 2050 scenarios; concept can be implemented in phases in response to need for improving flexibility to fund improvements	Each section of auxiliary lane would require widening of the roadway including substantial structural work, median barriers, retaining walls, viaduct construction, and right-of-way acquisition
Enhanced Local Arterial/Collector Connections	Improve local street connections that provide viable local alternative routes	Low	Low	Low	Medium	Medium	High	High	High	Low	Low	Low	$$$$	3	Low	Enhance traffic flow within the roadway system, reduce delay in many areas, and minimize overall pollution	Little benefit to relieving traffic demand on I-5; operations of the freeway would not be substantially improved; potential for substantial environmental and land use impacts associated with construction and operation of the roadway improvements Little benefit in Area 3, which is half the length, makes the overall rank "low"
Area 1: Central Point and North Medford - Interchange 30 to 35		Medium	Low	Medium	High	Medium	High	High	High	Low	Low	Low	see above	see above	Medium	Improve capacity of OR 99	I-5 would experience very little change, or a decrease, in traffic volume between Interchanges 30 and 35 for the peak and daily periods
Area 2: Medford to Phoenix - Interchange 30 to 24		Medium	High	High	High	Medium	High	High	High	Low	Low	Low	see above	see above	High	I-5 would experience a decrease in traffic volume in certain areas; OR 99 through parts of downtown Medford would experience a decrease in traffic volumes in 2050	In 2034 and 2050, a number of arterials and collectors would experience an increase in traffic; the expansion of the arterials and collectors to provide additional capacity would have environmental and property impacts; the expansion of OR 99 to provide more capacity would have environmental and property impacts
Area 3: Phoenix to Ashland - Interchange 24 to 11		Low	Low	Low	Medium	Medium	High	Medium	High	Low	Low	Low	see above	see above	Low	In 2050, OR 99 through Talent and Phoenix would experience a decrease in traffic volumes	I-5 would experience additional traffic volume between Interchanges 19 and 24 during the peak and daily period; OR 99 between Interchange 19 and downtown Ashland would carry additional traffic in 2034 and 2050; and the expansion of the arterials and collectors to provide additional capacity would have environmental and property impacts
Expand Medford Viaduct	Enhance capacity either horizontally (3 lanes each direction) or vertically (stacked 3 lanes above/3 lanes below)												see below	see options below	Low[3]	Would allow the freeway section between Interchange 27 and Interchange 30 to meet ODOT operational standards in 2034 and 2050: the resulting smoother traffic flow, with less stop-and-go travel would result in lower emissions; and if full shoulders are provided, the safety of the viaduct would also be improved	Substantial impacts: encroachment upon adjacent residential and commercial properties; additional environmental impacts would include impacts to Bear Creek Park (0.1 to 0.5 acre) and Bear Creek Greenway (crossings and routings under and adjacent to I-5 may require relocation), floodplain impacts (1.2 to 2.6 acres), and the addition of new impervious surface (2.0 to 4.7 acres), which would increase runoff to Bear Creek unless mitigated; and the scale of impacts would be smaller for adding a third lane while retaining the existing 3-foot shoulders compared to the option of adding the third lane with standard 12-foot shoulders
3 Lanes, Minimum Shoulders		High	Low	High	High	High	Low	Medium	Low	Medium	Medium	High	$$	1	Medium	see above	see above
3 Lanes, Standard Shoulders		High	Medium	High	High	High	Low	Medium	Low	Low	Low	High	$$$$	2	Medium	see above	see above
Vertically Stacked Viaduct		High	Low	High	High	High	Low	Medium	Low	Low	Low	High	$$$$	4	Low	see above	see above
Directional HOV Lane	Add directional HOV lane that can be used in either direction based on AM or PM peak	Low	Low	Low	High	High	Low	Low	Low	Medium	High	High	$$$	3	Low	Some operational improvements and additional capacity	The additional lane tends to be underutilized compared to the adjacent travel lanes because of the limited number of potential users; substantial impacts including: structural work, median barriers, retaining walls, viaduct construction, and right-of-way acquisition and environmental impacts including 4(f) and 6(f) impacts to Bear Creek, Goal 5 impacts because of impacts to Bear Creek's floodplain and associated wetland impacts, increases in impervious surface and attendant runoff, and potential environmental justice impacts particularly in Medford's downtown area
Least Cost Planning Solutions																	
Peak Hour Shoulder Use	Open I-5 shoulder for an additional travel lane during PM peak hour	High	Low	Medium	High	High	Low	Medium	High	Medium	High	High	$$$	2	Medium	Increased capacity and improved travel flow; reduced vehicle emissions	Oregon Revised Statute 801.477 (2) establishes failure to drive within a lane as a serious traffic violation, and Section 811.370 establishes failure to drive within a lane as a Class B traffic violation. Although the ORS does not define "lane" or "travel lane," it does define a roadway as being exclusive of the shoulder in Section 801.450. The Legislature would need to add an exception to failure to drive within a lane in Section 801.370 and redefine "shoulder" in Section 801.480 to include use of hard shoulders as temporary auxiliary lanes. Potential for substantial built and environmental impacts. Safety issues if vehicle breakdowns in the shoulders could create potential for high speed crashes.
Variable Speed Limits	Use variable speed signs to control traffic flow	Medium	Medium	Low	High	High	Low	Low	High	High	High	High	$$	1	Medium	Enhance traffic flow, reduce delay, and minimize pollution by maintaining smooth traffic flow during congested time periods or improve safety by restricting speeds during adverse conditions; could have positive impacts on localized air quality; and there are no considerable land use or environmental impacts anticipated	Although VSL has been widely implemented in Europe, projects in the United States have been more limited and not all transportation departments have rated the implementation to be highly successful; in a limited number of cases, more congestion was reported with the VSL than without
Transportation Demand Management (TDM)																	
Intermodal Freight Hub	Establish intermodal freight hub in the vicinity of Interchange 35	Medium	Medium	High	Low	Medium	Medium	High	Medium	Low	Low	Low	$$	1	Medium	Reduce shippers' reliance on a single mode of transport; reduce VMT and emissions due to increased rail use; economic benefits	Additional local VMT and vehicle emissions due to an increase in local truck trips and operating and idling at the freight hub
Transit Service Improvements	Shorten Rogue Valley Transit District transit headways (add destinations/routes; Central Point transit oriented development (TOD) and Med TOD; extend hours)	Low	Low	Low	Low	High	High	Medium	High	High	High	Low	$$	1	Medium	No environmental or land use impacts since no new infrastructure or construction; decreased VMT and vehicle emissions	Would not measurably change the demand on I-5; no substantial improvement of freeway operations
Commuter Rail	Minimal upgrade of existing tracks within the urban area to accommodate commuter rail service (i.e., Astoria)	Low	Medium	Low	Low	Medium	Low	Low	Medium	Medium	High	High	$$$$	4	Low	Minor improvements in operations from reduced vehicular demand; reduced VMT and emissions if commuter rail could attract consistent ridership; no environmental or land use impacts since within existing railroad right-of-way	Limited to the north-south travel corridor; longer travel times than autos; high cost; right-of-way acquisition; rail crossing issues at stations
Bus Rapid Transit (BRT)	Incorporate a BRT line along the OR 99 alignment between Ashland and Central Point and along the OR 62 alignment between Medford and White City	Low	Medium	Low	Low	High	Low	Low	High	High	High	Low	$$$	3	Low	Minor improvements in operations; reduced VMT and emissions if BRT could attract consistent ridership	Added impervious surface, displacements, and cultural resource disturbance from widening the existing roadways to add the BRT lane

[1] Cost is an order-of-magnitude estimate ranging from $ to $$$$.
[2] Each concept was evaluated according to two categories of criteria: the degree to which the concept
[3] The "Low" ranking considers the entire corridor; it is not a sum of the rankings of the three different options

Maximizes Benefits
- **Freeway Operations:** Reduce travel time, congestion, and delays
- **Safety:** Reduce crashes; faster emergency response
- **Freight Movement:** Reduce delay, improve travel time reliability, and provide alternate routes
- **Vehicle Capacity:** Add capacity or maintain traffic flow or improve merging and diverging
- **Person Capacity:** Move more people through
- **Circulation and Access:** Improve local roadway system circulation pattern;, provide improved access to properties
- **Local Economy:** Reduce travel delays, increase freight movements, or provide additional accessibility to properties
- **Phasing Potential:** Can be built, implemented, and/or funded in stages

Minimizes Impacts
- **Environmental/Cultural:** Effects on land use, environmental, cultural/historic resources, or environmental justice communities
- **Properties:** Property acquisition
- **Local Roadway System:** Effects on local arterials and collectors

I-5: Rogue Valley Corridor Study

Figure 5-1

Corridor Concept Scoring Matrix

Phasing

Corridor concepts were grouped into phases: short term (2 to 5 years), medium term (6 to 15 years), and long term (more than 15 years). The intent of the phasing is to define a reasonable time frame for implementation of the concepts. The corridor concepts shown in Figure 5-1. Figure 5-2 shows the phasing.

The following issues were considered when developing the phasing recommendations:

- **Priority and rank.** The priority score (high, medium, low) determined by the project team and the ranking within each concept category (i.e., Safety Enhancement, Capacity Enhancement, etc.) as shown on Figure 5-1.

- **Cost.** Lower-cost projects were generally placed in the short-term or medium-term phases Higher-cost projects were generally placed in the medium-term or long-term phases, recognizing that funding constraints affect phasing.

- **Ease of implementation.** This considers project impacts, constraints, and costs, as well as the need to construct or include other related improvements.

Corridor concepts that should or must be implemented concurrently with each other also are identified in Figure 5-2. For example, ramp metering and variable speed limits concepts are low-cost, complementary projects that could be implemented in tandem to manage operation of the I-5 corridor under peak hour, congested traffic conditions. Another example is the OR 99 corridor coordinated traffic signal system concept, which could be paired with several capacity and/or operations concepts to provide overall region benefit along the I-5 and OR-99 corridors.

Other plans and improvements should be implemented in conjunction with the corridor concepts identified in this plan to minimize future implementation costs and costly reconstruction of roadway infrastructure. Most importantly, elements of the *Regional ITS Operations & Implementation Plan for the Rogue Valley Metropolitan Area (RVITS)* should be implemented where planned ITS improvements overlap corridor concepts contained in this plan. At a minimum, backbone ITS infrastructure (conduit, vaults, etc.) should be installed at the time of construction of other improvements to minimize future ITS implementation costs.

Enhanced Local Arterial/Collector Connections are recommended for additional study and analysis as part of a future environmental study for the Medford Viaduct and are not intended as separate projects.

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2012 - 2016

Concept ID	Project	Complimentary or Required Project
7	Incident Response System *Cost: $60,000 to $150,000 per vehicle*	None
1	Port of Entry---Auxiliary Lane Option *Cost: $1 to 2 million*	SB Weigh Station auxiliary lane
9	OR 99 Corridor Coordinated Traffic Signal System *Cost: Not calculated*	None
6	Emergency Turnaround *Cost: $300,000 to $1,500,000*	Incident Response System
10	Ramp Metering *Cost: up to $300,000 per ramp except exit 27 ($1 to 4 million per ramp)*	Variable Speed Limits

2017 - 2026

Mid-Term 5-15 Years

Concept ID	Project	Complimentary or Required Project
14	Enhanced Local Arterial /Collector Connections - Area2: Medford to Phoenix - Interchange 30 to 24 *Cost: Not calculated*	OR 99 corridor coordinated traffic signal system; Medford Viaduct expansion EA/ EIS
3	SB Weigh Station Auxiliary Lane *Cost: $1 to 2 million*	None
16,17,18	Medford Viaduct Expansion *Cost: $40 to 110 million*	Environmental Assessment/ EIS; OR 99 corridor coordinated traffic signal system; ramp metering; variable speed limits; enhanced local arterial/ collector connections - Area 2: Medford to Phoenix; Auxiliary Lanes NB and SB between exits 27 and 30
21	Variable Speed Limits *Cost: Not calculated*	Ramp metering
22	Intermodal Freight Hub *Cost: Not calculated*	Additional mainline travel lanes; variable speed limits
23	Transit Service Improvements *Cost: Not calculated*	OR 99 corridor coordinated traffic signal system; commuter rail; bus rapid transit
4	Temporary Overnight Truck Facilities *Cost: Not calculated*	None
12	NB Auxiliary Lane Exit 30 to 33; NB and SB Auxiliary Lane Between Exits 27 and 30. *Cost: See Appendices (Tech Memo 4, page 3-22).*	Medford Viaduct expansion; ramp metering; variable speed limits

2027+

Long-Term 15+ Years

Concept ID	Project	Complimentary or Required Project
12	Auxiliary Lanes: NB between exits 21 and 24, 24 and 27, 33 and 35; SB between exits 27 and 24, 24 and 21, 21 and 19. *Cost: See Appendices (Tech Memo 4, page 3-22).*	Ramp metering; variable speed limits
24	Commuter Rail *Cost: Not calculated*	Transit service improvements; bus rapid transit
25	Bus Rapid Transit *Cost: Not calculated*	OR 99 corridor coordinated traffic signal system; transit service improvements; commuter rail
8	Designated Alternate Truck Route *Cost: Not calculated*	None
13	Enhanced Local Arterial/ Collector Connections - Area 1: Central Point and North Medford - Interchange 30 to 35. *Cost: Not calculated*	OR 99 corridor coordinated traffic signal system; commuter rail; bus rapid transit
15	Enhanced Local Arterial/ Collector Connections - Area 3: Phoenix to Ashland - Interchange 24 to 11 *Cost: Not calculated*	Port of Entry auxiliary lane; SB Weigh Station auxiliary lane; OR 99 corridor coordinated traffic signal system

I-5: Rogue Valley Corridor Plan

Figure 5-2

Corridor Concepts Phasing

6. PUBLIC AND AGENCY INVOLVEMENT

Public involvement played an important role throughout the Corridor Plan process. A PMT consisting of representatives from ODOT and other state and local agencies was formed to provide technical and policy guidance throughout the planning process. The PMT served as the decision-making body for the Corridor Plan. The general public was kept informed and had opportunities to learn more about the Corridor Plan and to comment on items of interest through two public meetings conducted in an “open house” format and project postings on the ODOT Region 3 website. In addition, the PMT informed local elected officials through local agency presentations. All meeting discussions were summarized and documented.

Project Management Team

The PMT included the following representatives

ODOT Members

Mike Baker, Project Manager

Shirley Roberts, Planning

Thanh Nguyen, TPAU, Senior Transportation System Analyst

David Warrick, Technical Services, Interchange Engineer

Debbie Timms, Right-of-Way

Sven Johnson, Motor Carrier Transportation Division (MCTD), District Manager

Dan Dorrell, District 8 Traffic

State and Regional Government Members

William L. Matson, Oregon State Police (Central Point)

Vicki Guarino, Rogue Valley Metropolitan Planning Organization (RVMPO), Program Manager

Mike Montero, Rogue Valley Area Commission on Transportation (RVACT)

Local Government Members

John Vial, Jackson County

David Chapman, City of Ashland City Council

Dave Jacob, City of Central Point, Community Planner

Don Burt, City of Central Point

Tom Humphrey, City of Central Point, Community Development Director

Chris Clayton, City of Central Point, City Administrator

Al Densmore, City of Medford, City Council

Alex Georgevitch, City of Medford, Transportation Manager

Laurel Prairie-Kuntz, City of Phoenix, Planning Director

Bob Lewis, City of Phoenix, Public Works Director

Jeff Ballard, City of Talent

Five PMT meetings were held during the process but not all members attended all five PMT meetings. The meeting dates and actions are summarized in Table 6-1.

Table 6-1. PMT Meetings

Meeting date	Actions
January 29, 2009	Defined the Corridor Plan area, problem statement, and the goals and objectives.
April 2, 2009	Reviewed existing plans, environmental reconnaissance, existing land use summary, and existing facilities.
October 29, 2009	Evaluated future baseline traffic operating conditions and the alternatives analysis matrix.
November 18, 2010	Presented 2034 RTP and 2050 RPS models and volumes; outlined concept priorities and categories; and proposed safety and capacity enhancement measures, least cost planning solutions, and TDM measures.
May 10, 2011	Reviewed the issues/challenges, goals, existing facilities and operations, 2034 scenario, 2050 scenario, and future safety deficiencies. Outlined the steps the project team took to develop concepts and evaluation criteria, assess potential impacts, and identify high performing concepts.

Public Meetings

Two public meetings were held during the planning process.

Public Meeting #1

The first public meeting was held on April 1, 2009, at the Medford Armory. ODOT published a press release announcing the meeting on March 30, 2009. Twelve members of the public attended. ODOT and the consultant team began the meeting with a presentation. The presentation presented the plan goals, existing conditions, and corridor deficiencies. It summarized the five primary work tasks: (1) define problems and establish goals and objectives, (2) collect data, (3) assess future (2034) no-build conditions, (4) identify potential projects and strategies and conduct corridor concept analysis, and (5) develop preferred alternative(s). The team briefed the audience on the planning process and public coordination efforts. A question-and-answer session followed in which comments were made in six categories: communications, design, operations, planning process, the Siskiyou Pass, and rail.

At both public meetings, members of the public were asked to provide their names and addresses on an attendance sheet and comment cards were available.

Public Meeting #2

The second public meeting was held on May 10, 2011, at Lava Lanes in Medford. ODOT published a press release announcing the meeting on May 2, 2011. Eleven members of the public attended. ODOT and the consultant team began the meeting with a presentation that outlined the steps the project team took to develop concepts and evaluation criteria, assess potential impacts, and identify high performing concepts. A few members of the public asked questions and provided verbal comments.

Local Agency Presentations

ODOT and the consultant team presented the project to the Medford City Council on January 14, 2010. ODOT also made presentations to the cities of Ashland, Central Point, Phoenix, and Talent, and to the Jackson County Board of Commissioners in January 2010. The presentations included the topics from the first public meeting, as well as findings of future traffic conditions analysis and potential projects and strategies. ODOT staff members explained the corridor concept evaluation criteria, scoring matrix, and high priority concepts to the Talent City Council on July 20, 2011, the Jackson County Board of Commissioners on July 26, 2011, and the Medford City Council in the fall of 2011.

APPENDICES

Tech Memo 2: Data Collection Review of Existing Plans
Tech Memo 3: Future Baseline Traffic Conditions
Tech Memo 4: Alternative Corridor Concept Analysis

I-5 Rogue Valley Corridor Plan

Technical Memorandum #2:
Data Collection Review of Existing Plans

Prepared by:

DAVID EVANS AND ASSOCIATES INC.

Prepared for:

Oregon Department of Transportation

I-5 Rogue Valley Corridor Plan

Technical Memorandum #2:
Data Collection and Review of Existing Plans

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

August 2009

List of Acronyms

AQMA	Air Quality Maintenance Area
ATR	Automatic Traffic Recorders
Caltrans	California Department of Transportation
CCTV	Closed-Circuit Television
CO	Carbon Monoxide
COATS	California-Oregon Advanced Transportation Systems
CORP	Central Oregon & Pacific Railroad
DEIS	Draft Environmental Impact Statement
DEQ	Department of Environmental Quality
DHV	Design Hour Volume
DMS	Dynamic Message Sign
DMU	Diesel Multiple Unit
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FRA	Federal Railroad Administration
FTA	Federal Transportation Administration
HAR	Highway Advisory Radio
HCM	Highway Capacity Manual
HCS	Highway Capacity Software
HDM	Highway Design Manual
HV	Heavy Vehicle
I-5	Interstate 5
IAMP	Interchange Area Management Plan
ITS	Intelligent Transportation Systems
LCV	Longer Combination Vehicle
LOS	Level of Service
MP	Mile Point
MTIP	Metropolitan Transportation Improvement Plan
NAAQS	National Ambient Air Quality Standards
NHS	National Highway System
NOAA	National Oceanic and Atmospheric Administration
OAR	Oregon Administrative Rule
ODFW	Oregon Department of Fish and Wildlife
ODOT	Oregon Department of Transportation
OHP	Oregon Highway Plan
ONHIC	Oregon Natural Heritage Information Center
OR 99	Oregon Highway 99
ORS	Oregon Revised Statute
OTC	Oregon Transportation Commission
OTP	Oregon Transportation Plan
PM	Particulate Matter
PRC	Planning Research Corporation
RPS	Regional Problem Solving
RTP	Regional Transportation Plan
RVITS	Rogue Valley ITS
RVMPO	Rogue Valley Metropolitan Planning Organization
RWIS	Roadway Weather Information System
SIP	Safety Investment Program
SOV	Single-Occupancy Vehicle
SP	Southern Pacific Railroad
SPIS	Safety Priority Index System
SPUI	Single Point Urban Interchange
T & E	Threatened and Endangered
TDM	Transportation Demand Management
TOC	Traffic Operations Center
TPR	Transportation Planning Rule
TSM	Transportation System Management
TSM	Transportation System Management
TSP	Transportation System Plan
UGB	Urban Growth Boundary
UP	Union Pacific Railroad
USC	United States Code
USFWS	U.S. Fish and Wildlife Service
v/c	volume-to-capacity
VMS	Variable Message Signs
VMT	Vehicle Miles Traveled
vpd	Vehicles Per Day
vph	Vehicles Per Hour
WCTU	White City Terminal & Utility
WIM	Weigh-in-Motion
WTI	Western Transportation Institute

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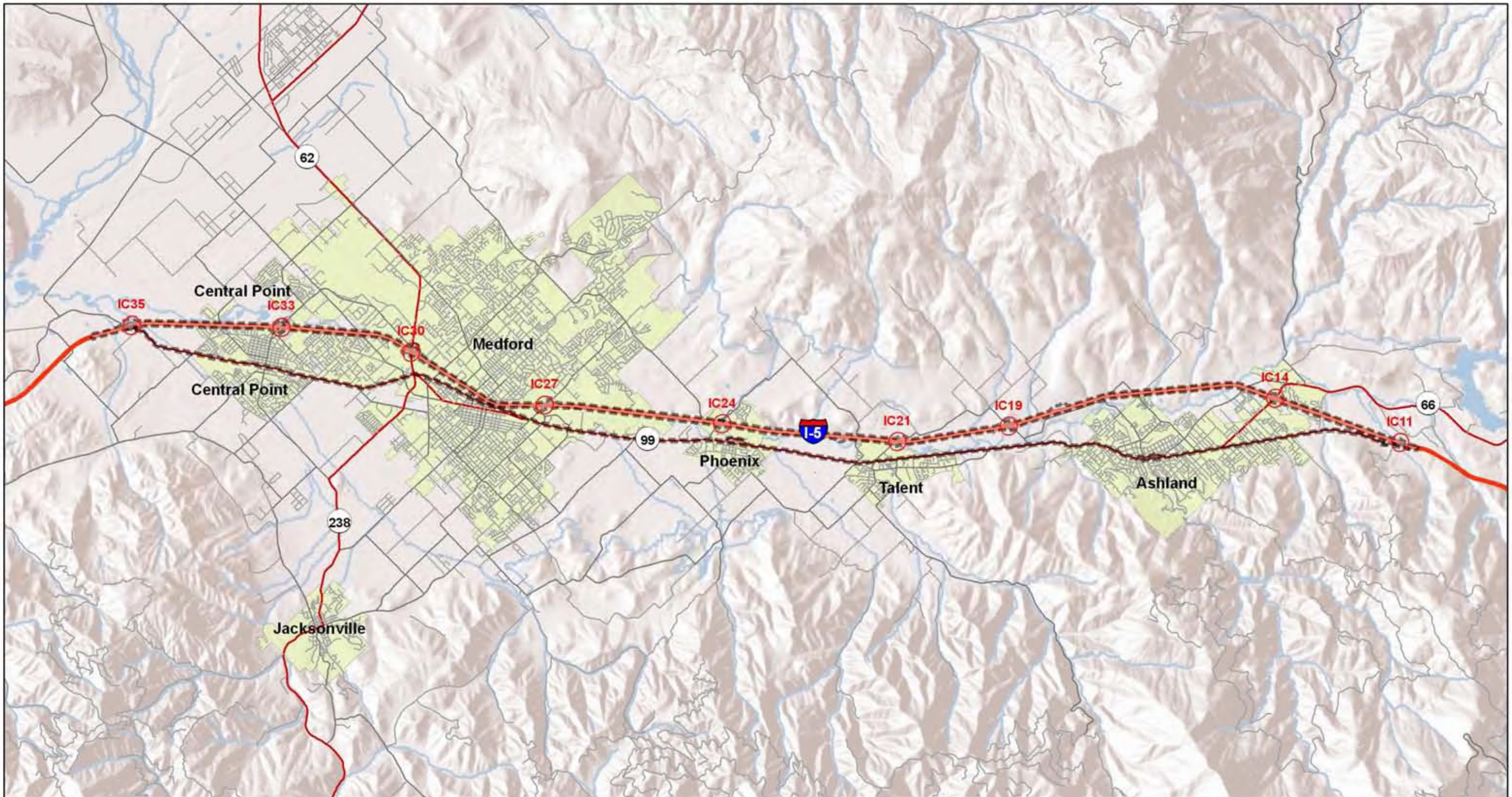
1. INTRODUCTION

This technical memorandum is the second in a series of memorandums that will be prepared for the *I-5 Rogue Valley Corridor Plan* (Corridor Plan). As discussed in Technical Memorandum #1, the Corridor Plan was initiated by the Oregon Department of Transportation (ODOT) to assess existing and future transportation conditions along the Interstate 5 (I-5) and Oregon Highway 99 (OR-99) corridors from Interchange 11 south of Ashland to Interchange 35 north of Central Point, as displayed in **Figure 1-1**. This Technical Memorandum #2 documents existing plans and policies, identifies environmental and land use constraints, assesses existing traffic operations and crash history, discusses rail service, and inventories the existing Intelligent Transportation Systems (ITS) infrastructure along the Corridor Plan area. For analysis purposes, the corridor plan area is defined as 200 feet beyond both sides of the I-5 right-of-way boundary and 100 feet beyond both sides of the OR-99 right-of-way boundary between interchanges 11 and 35.



2 1 0 2 Miles

Source Data: Jackson County, ESRI, Oregon GEO

Legend

Planning Area

Interchange

I-5: Rogue Valley Corridor Study

Figure 1-1

Vicinity Map

June 2009

2. EXISTING PLANS

The review of existing plans and policies included state documents, regional documents, ITS plans, commuter rail studies, transportation system plans, interchange area management plans, and environmental studies and reports.

State Plans and Reports

Six state plans and reports were reviewed.

Oregon Transportation Plan (2006)

The Oregon Transportation Plan (OTP) is the state's long-range multimodal transportation plan. The OTP is the overarching policy document among a series of plans that together form the state transportation system plan (TSP). The OTP considers all modes of Oregon's transportation system as a single system and addresses the future needs of Oregon's airports, bicycle and pedestrian facilities, highways and roadways, pipelines, ports and waterway facilities, public transportation, and railroads. 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.

This OTP supersedes the 1992 OTP, which established a vision of a balanced, multimodal transportation system and called for an expansion of ODOT's role in funding non-highway investments. The current OTP furthers these policy objectives with emphasis on maintaining the assets in place, optimizing the existing system performance, creating sustainable funding, and investing in strategic capacity enhancements. Development of corridor studies is integral to maintaining assets and optimizing system performance.

The Corridor Plan must be consistent with the applicable OTP goals and policies, and, therefore, findings of compatibility will be part of the basis for adoption of the Corridor Plan. The most pertinent OTP goals and policies for corridor planning are as follows:

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 1.3 – 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.

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.

Oregon Highway Plan (1999, with amendments)

The Oregon Highway Plan (OHP) notes that I-5 is a part of the National Highway System and a designated Freight Route. OR-99, which run parallel to the interstate, is a designated District Highway in portions of Medford and Ashland. The OHP further defines specific performance standards for state highways, including priorities for connections to and from freeways and access control standards. The performance and mobility standards in the OHP vary by location and adjacent land use type, establishing a higher level of service expectation in the more rural areas and a lower level of service in urbanized areas.

The 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. The policies applicable to planning for interchange and corridor improvements are described below.

Goal 1 – System Definition

Policy 1A – State Highway Classification System: Establishes that the management objective of Interstate Highways is to provide for safe and efficient, high-speed, continuous-flow operation in urban and rural areas; and for District Highways, to provide for safe and efficient, moderate to high-speed continuous-flow operation in rural areas and moderate to low-speed operation in urban and urbanizing areas.

Policy 1B – Land Use and Transportation: Recognizes the need for coordination between state and local jurisdictions.

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

Police 1E – Lifeline Routes: Recognizes the need for 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 Standards: Sets mobility standards for ensuring a reliable and acceptable level of mobility on the highway system based on highway classification and location by providing the appropriate standards that would allow the corridor area and associated interchanges to function in a manner consistent with OHP mobility standards.

Policy 1G – Major Improvements: Requires maintaining performance and improving safety by improving efficiency and management before adding capacity.

Goal 2 – System Management

Policy 2A – Partnerships: Establishes cooperative partnerships to make more efficient and effective use of limited resources to develop, operate, and maintain the highway and road system.

Policy 2B – Off-System Improvements: Helps local jurisdictions identify and evaluate off-system improvements that would be cost-effective in improving performance of the state highway.

Policy 2E – Intelligent Transportation Systems: Considers services to improve system efficiency and safety through effective incident management, en-route driver information, and traffic control.

Policy 2F – Traffic Safety: Improves the safety of the highway system.

Policy 2G – Rail and Highway Compatibility: States the need to increase safety and transportation efficiency through the reduction and prevention of conflicts between railroad and highway users.

Goal 4 – Travel Alternatives

Policy 4A – Efficiency of Freight Movement: Seeks to balance the needs of long distance and through freight movements with local transportation needs on highway facilities in both urban and rural areas.

Policy 4D – Transportation Demand Management: Supports the efficient use of the state transportation system through investment in efforts that reduce peak period congestion.

Highway Design Manual (2003)

The 2003 Highway Design Manual (HDM) provides uniform standards and procedures for ODOT. The manual is required to be used by ODOT personnel for all planning, development, and construction projects located on state highways. Design specifications, including roadway design, bicycle and pedestrian facility designs, and public transportation facilities, are covered in the HDM and must be used to guide any planning, development, and construction projects recommended for I-5 and those portions of OR-99 that remain as part of the state highway system.

Transportation Planning Rule (TPR): Statewide Planning Goal 12 (Transportation) and Oregon Administrative Rule (OAR), Division 12

The purpose of the Transportation Planning Rule (TPR) is "to implement Statewide Planning Goal 12 (Transportation) and promote the development of safe, convenient and economic transportation systems that are designed to reduce reliance on the automobile so that the air pollution, traffic and other livability problems faced by urban areas in other parts of the country might be avoided." A major purpose of the TPR is to promote more careful coordination of land use and transportation planning, to ensure that planned land uses are supported by and consistent with planned transportation facilities and improvements.

This rule identifies transportation facilities, services, and improvements that may be permitted on rural lands consistent with Goals 3, 4, 11, and 14 without a goal exception. These include replacement of an intersection with an interchange, channelization, and medians. The local government must identify reasonable build design alternatives, assess their impacts, and select the alternative with the least impact.

The Land Conservation and Development Commission adopted amendments to the TPR in March 2005 that clarify how the impacts of plan amendments and zoning changes to transportation facilities are assessed. The amendments stipulate that a significant effect occurs only if a plan amendment or zone change affects the facility by the end of the planning period, not if the effect occurs at any point during the planning period. The primary focus of this rule is to keep land use and transportation in balance. The current amendments include new provisions that pay particular attention to proposed plan or land use regulation amendments within one-half mile of interstate interchanges. The concern here is to protect the state's significant investments in interchanges and in the interstate system.

Oregon Rail Plan (2001)

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 primary railroad serving southwestern Oregon is the Central Oregon & Pacific Railroad (CORP), whose main line (Siskiyou Line) runs south from Eugene through Medford. Based on a conversation between the project team and John Bullion, CORP Assistant General Manager, no rail traffic currently occurs south of the City of Ashland. Therefore, all railroad traffic along the CORP line from Ashland and points north that are destined for California must currently go through Eugene, then divert east across the Cascade summit and south through Klamath Falls, Oregon. The White City Terminal and Utility (WCTU) Railway Company, a short line that interchanges with CORP, operates in a large industrial park in White City, Oregon.

Interstate 5 State of the Interstate Report (2000)

ODOT completed the I-5 State of the Interstate Report in June 2000. The report provides an assessment of the existing and forecasted safety, geometric, and operating conditions along the entire length of I-5 from California to Washington. The document covers a wide range of issues, including:

- Overview of related plans, policies, and studies
- Trends in population, employment, land use, and transportation
- Existing and forecasted conditions for each I-5 interchange and mainline freeway segment
- Environmental conditions and potential development impact areas
- Opportunities for short-term improvements

The report states that, within ODOT's Region 3 (which encompasses southern Oregon, including Medford), travelers will experience significant congestion on I-5 by 2020. Many interchanges in this region are expected to have one or more components (e.g., ramp terminal intersection or ramp junction) operating at an unacceptable level of congestion, if no improvements are made. The problems associated with interchanges are expected to occur more often in the populated portions of the corridor. The Barnett Road Interchange, referred to specifically as a potential problem area, will close entirely once the new South Medford Interchange is complete.

Regional Plans

Three regional plans for the Rogue Valley metropolitan area were reviewed.

Rogue Valley Metropolitan Planning Organization 2009-2034 Regional Transportation Plan (Adopted 2009)

The Rogue Valley Metropolitan Planning Organization (RVMPO) encompasses the urbanized area of Jackson County, including the cities of Ashland, Central Point, Eagle Point, Jacksonville, Medford, Phoenix, and Talent, and the unincorporated area of White City and surrounding Jackson County. As part of its transportation planning responsibilities, the RVMPO prepares and revises its Regional Transportation Plan (RTP). The RTP is a multimodal transportation plan designed to meet the anticipated 25-year transportation needs within the RVMPO planning area boundary. The RTP serves as a guide for the management of existing transportation facilities and for the design and implementation of future transportation facilities through a future model year. The current revision of the RTP for 2009-2034, adopted by the RVMPO on March 24, 2009, provides a summary of the regional transportation actions anticipated to occur in the planning area through 2034. The actions presented are in the context of the respective modes and planning issues and include: multimodal safety and security, transportation system management, transportation demand management, street system, bicycle and pedestrian facilities, transit system, parking, future conditions, and plan consistency. The RTP goals and policies applicable to the Corridor Plan are:

Goal 1 – A Balanced Multimodal System

Plan for, develop, and maintain a balanced multimodal transportation system that will address existing and future needs.

Goal 2 – Safety and Security

Optimize safety and security of the transportation system.

Goal 5 – System Efficiencies

Maximize the efficient use of transportation infrastructure for all users and modes.

Policy 5-1: Add or remove traffic signals and signal networks, including interstate access ramp signals, to improve system efficiency.

Goal 6 – Reducing Reliance on Single-Occupant Vehicles

Use incentives and other strategies to reduce reliance on single-occupant vehicles.

Policy 6-1: Support Transportation Demand Management strategies.

Goal 8 – Cost-Effective Emerging Technologies

Encourage use of cost-effective emerging technologies to achieve regional transportation goals.

Policy 8-1: Implement a comprehensive Intelligent Transportation Systems (ITS) program.

Policy 8-2: Plan a transportation system for the future utilizing the latest technologies.

Goal 9 – Foster Economic Opportunities

Use transportation investments to foster economic opportunities.

Policy 9-1: Accommodate travel demand to create a regional transportation system that supports the local economy

Policy 9-2: Examine options for designated freight routes.

Greater Bear Creek Valley Regional Problem Solving

The State of Oregon, Jackson County, and the cities of Ashland, Central Point, Eagle Point, Jacksonville, Medford, Phoenix, and Talent began a collaborative effort in April 2000 to launch the Greater Bear Creek Valley Regional Problem Solving (RPS) project. Under the authority of Oregon's Regional Problem Solving (RPS) Statute (Oregon Revised Statute (ORS) 197.652-658), multiple jurisdictions working in a collaborative effort may depart from state administrative rules where needed to implement creative solutions to mutually agreed-upon regional land use problems. The process must offer an opportunity to participate with appropriate state agencies and all local governments within the region affected by the problems that are the subject of the problem-solving process.

The RPS process has created a coordinated expansion plan for Jackson County and the cities of Ashland, Central Point, Eagle Point, Jacksonville, Medford, Phoenix, and Talent known as the *Greater Bear Creek Valley Regional Plan* (Regional Plan). Currently in the draft stage, the plan is the only effort of such complexity and scope under RPS to reach this final stage of adoption and acknowledgement. The Regional Plan, when implemented, will establish coordinated urban reserves between the seven participating cities and Jackson County, and will establish regional policies and mechanisms to balance rural and urban land needs to prepare for a future doubling of the regional population.

The purpose of the Greater Bear Creek Valley RPS process is to identify additional lands needed for urban development to accommodate a doubling of the region's population. The jurisdictions involved in the RPS project have agreed upon and adopted a set of goals and policies to guide the development of the Regional Plan .

Goal 1 – Manage Future Regional Growth for the Greater Public Good

Goal 1 includes policies calling for the use of intergovernmental agreements and amendments to comprehensive plans to implement the Regional Plan, increased residential densities across the region, identification of major infrastructure corridors, a more efficient network of public streets, and a balance of jobs and housing on the local and regional levels.

Goal 2 – Conserve Resource and Open Space Lands for their Important Economic, Cultural, and Livability Benefits

Goal 2 includes policies calling for a shared vision of maintaining a commercially viable agricultural land base, uniform standards of agricultural buffering, and the long-term preservation of regionally significant open space.

Goal 3 – Recognize and Emphasize the Individual Identity, Unique Features, and Relative Competitive Advantages and Disadvantages of Each Community within the Region

Goal 3 includes policies calling for mechanisms to enhance individual community identity, increase flexibility in the event of future boundary expansions, and permit an unequal distribution of certain land uses among jurisdictions, and the development of individual definitions of each community based on its unique identity and vision of future urban form.

North-South Travel Demand Study

The RVMPO is preparing to conduct a study intended to develop a long-term multimodal concept plan for the OR-99 Corridor Area as an alternative to I-5 north-south travel from Crowson Road in Ashland to Interchange 35 north of Central Point. The plan will include strategies that reduce vehicular traffic congestion, greenhouse gases, and support economic development along the north-south corridor and beyond the study area. In recognition of the strong influence of land use and multimodal transportation on peak-hour travel, the study will determine the appropriate population density and land use patterns necessary to support transit alternatives such as enhanced commuter transit, bus rapid transit, and commuter rail. The study will also identify transportation options and ITS strategies to reduce vehicle trips and improvements needed to improve bicycle and pedestrian connectivity. The study will develop and evaluate various alternatives to improve mobility of all modes within the study area. Because this project is expected to be under way concurrently with the developing Corridor Plan, close coordination among the two project teams will be established.

Regional Intelligent Transportation System (ITS) Plans and Projects

Two existing ITS projects have a direct impact on the Rogue Valley region.

Regional Intelligent Transportation System (ITS) Operations & Implementation Plan for the Rogue Valley Metropolitan Area – Final Report (July 2004)

In 2004 the RVMPO completed a comprehensive Rogue Valley Intelligent Transportation Systems plan (RVITS). This 20-year plan identifies advanced technologies and management techniques that can relieve traffic congestion, enhance safety, provide services to travelers, and assist transportation system operators in implementing suitable traffic management strategies. The project is part of a federal initiative to use ITS to increase the efficiency of existing transportation infrastructure, improving overall system performance and reducing the need to add capacity. Efficiency is achieved by providing services and information to travelers so that they can make better travel decisions and to transportation system managers so they can better manage the system. To ensure the development of a relevant plan, RVITS was produced with guidance from RVMPO member jurisdictions and key stakeholders from emergency services and communications agencies.

The RVITS plan provides a framework of policies, procedures, and strategies for integration of ITS with the region's existing resources to meet future regional transportation needs and expectations. The plan includes the continuation and expansion of Transportation System Management (TSM) projects and programs that have been under way for some time, such as coordination of traffic signals.

RVITS projects address the following categories:

- Travel and Traffic Management
- Communications
- Public Transportation Management
- Emergency Management
- Information Management
- Maintenance and Construction Management

California-Oregon Advanced Transportation Systems (COATS) Bi-State Rural Integration Project

The southern Oregon - northern California bi-state area contains transportation links vital to the region's economy and commercial industry. Numerous primary and secondary routes serve commercial vehicles destined for urban centers throughout the Pacific Northwest. Unpredictable weather patterns and mountainous topography add to the transportation challenges. Travelers throughout this region must contend with diverse and rapidly changing weather conditions including snow, high winds, fog, and heavy rain. The combination of varied driving conditions and abundant off-road, commercial, and recreational traffic has produced an immediate and expanding need for increased traffic safety measures and information dissemination techniques.

The California-Oregon Advanced Transportation Systems (COATS) project was developed as a joint effort between California Department of Transportation (Caltrans), ODOT, and the Western Transportation Institute (WTI) of Montana State University-Bozeman to facilitate the deployment and use of Intelligent Transportation Systems (ITS). As described earlier, ITS are implemented to enhance safety, improve the movement of people, goods and services, and subsequently promote the economic development of the region. The COATS study area crosses 13 counties in northern California and the southern half of Oregon, and is defined by roadway segments rather by than by county lines that altogether cover over 80,000 square miles. The project was concluded in June 2001 with development of an ITS Strategic Deployment Plan for the COATS region.

At the conclusion of the COATS project, Caltrans and ODOT decided to continue their partnership and their intent to utilize ITS in the region. This decision led to Phase 2 COATS Showcase, a $2.5 million project with the purpose of providing a significant demonstration and evaluation of rural ITS projects that exist to support the goals, objectives, and benefits of the COATS project as stated in the ITS Strategic Deployment Plan. The demonstrations and evaluations are intended to highlight the success stories of ITS in rural areas, but also to identify where problems and deficiencies may be corrected in future deployments.

Among the COATS Showcase projects was a Siskiyou Pass evaluation conducted in an effort to gauge the effectiveness of COATS at improving incident management, improving traveler information, and enhancing traveler mobility. Surveys conducted to assess traveler awareness of the ITS technologies in use in the Siskiyou Pass area and traveler perception of the accuracy and usefulness of these technologies concluded the following:

- Road conditions and weather conditions were the most important factors travelers would use to alter their travel plans. In all four surveys, respondents indicated average travel speed and construction were the least important factors in determining a change in travel plans.
- An overall ranking, based on the average of the rankings from each survey, indicated that “leave later” was the most likely option for Siskiyou Pass travelers faced with a road closure or significant delay. Second, travelers would “take an alternate route” or third, “stop at a nearby town.” Respondents are least likely to “cancel their trip” or “seek an alternate mode of travel.”

The goal of COATS Phase 3 is to provide research and support activities to help California and Oregon achieve the COATS vision. These activities include: fostering bi-state cooperation and communication, promoting technology transfer, assisting in ITS planning and architecture development efforts, evaluating ITS projects and systems, and providing assistance to mainstream deployment of field-tested ITS technologies.

The COATS project is focused on the following three main strategies:

- Address operational efficiency and public safety: Activities include monitoring road weather conditions with road weather information, wind-monitoring stations, automated flood warning systems, automated visibility systems, etc. and monitoring roadway rights-of-way for potential animal-vehicle conflicts or for detecting landslides.
- Advise unfamiliar travelers of unsafe driving conditions: These activities include notification through advance warning systems, variable message signs (VMS), and highway advisory radio (speed/travel conditions, wide loads on narrow lanes, etc.).
- Develop coordination/communication centers among bi-state participants: These activities provide for the development of centers to coordinate, communicate, and cooperate with each other, nearby communities, local organizations, state agencies, and other regions (Redding and Eureka, California, and Salem, Bend, and Medford, Oregon).

Commuter Rail Studies

The RVMPO has commissioned a number of studies over the past several years exploring the potential for commuter rail service between Central Point and Ashland, a distance of approximately 16 miles. Three studies were reviewed.

Southern Oregon Commuter Rail Study (2001)

In 2001, local governments in the Rogue Valley area, along with ODOT's Rail Division, issued a report entitled *Southern Oregon Commuter Rail Study.* At a conceptual level, the study analyzed the technical elements and costs associated with the introduction of commuter rail service between Grants Pass and Ashland along with a shorter segment between Central Point and Ashland. The study presumed the commuter trains would operate over the existing CORP tracks, which parallel OR-99 through most of the area.

The project considered that extensive upgrading of the track structure would be required. The upgrades would include the placement of heavy rail and insertion of thousands of ties, along with installation of a new train control system and upgrades to all grade crossings along CORP's Siskiyou Branch Main between Grants Pass and Ashland. In addition, a 1.5-mile-long bypass track to CORP's Medford yards would need to be constructed to separate the commuter train's operations from CORP's freight activities in the Medford area.

New self-propelled diesel rail cars known as Diesel-Multiple Units (DMUs) were contemplated to carry the passengers, and the construction of numerous park-and-ride facilities was considered. Meanwhile, extensive changes would be made to the existing transit service operated by the Rogue Valley Transit District (RVTD) that would convert its operation to act as a feeder system to the commuter rail operations.

Costs were estimated at three different levels of service:

1. Full service would consist of six roundtrips in the morning and six in the evening between Ashland and Central Point.
2. The second level of service would include the full service trips discussed in Item #1, along with two roundtrips in the AM and two in PM between Grants Pass and Central Point.
3. The third level of service provided six full roundtrips in both the AM and PM peak hours along the full length of the corridor between Grants Pass and Ashland.

Capital costs associated with the three levels of service ranged from $38 million to $90 million annually, with operating costs ranging between $3.6 million and $7.6 million. Projected annual ridership was between 124,000 and 221,000 passengers.

The 2001 study listed 11 items that greatly influence the success of any commuter rail system:

1. Direct Rail Link. Does the corridor have an existing rail line with a reasonably direct route connecting the communities to be served and with sufficient unused capacity to accommodate frequent rush hour passenger service?
2. Support Regional Goals. Have the communities involved adopted land use and transportation goals seeking to:
   A. Concentrate commercial and residential development in and near urbanized areas in the corridor?
   B. Promote higher-density residential development within the corridor?
3. Growing Population/High Density Close to Stations. Is there moderate to rapid growth in population within and along the corridor, with a high concentration of residences and/or business/commercial activity close to proposed station sites?
4. Limited Funding for Highway Projects. Is it difficult to raise funds for new highway projects that would increase traffic capacity in the corridor?
5. High Level of Daily Commuting Within the Corridor. Does the rail line to be used for commuter rail parallel a route used by many corridor residents commuting to and from work?
6. Traffic Congestion. Is traffic congestion on highways paralleling the rail line worsening and becoming severe? Are paralleling highways reaching or exceeding their design carrying capacity?
7. Limited, High Cost Parking. Is parking at commuter destination points limited and expensive?
8. Competitive Transit Times. Can the rail commuter system provide service on a schedule that is competitive to auto commute times?
9. Competitive Transit Costs. Will the cost of using the rail commuter system be competitive with the cost of commuting by automobile?
10. Willingness to Use Transit. Do daily commuters in the corridor have a relatively high propensity to use mass transit?

11. Compelling Circumstances. Does the region need to take drastic action because of some overriding economic, environmental, and/or safety concerns that make it imperative that more people switch from auto commuting to mass transit?

Rogue Valley Commuter Rail Demonstration Project – June 2006 DRAFT Report

The June 2006 Draft Report of the *Rogue Valley Commuter Rail Project* discussed efforts to conduct a demonstration project between Central Point and Ashland utilizing three self-propelled rail diesel cars owned by the ODOT's Rail Division. The cars were purchased in 2002 by ODOT for three years of seasonal excursion service between Portland and Astoria as part of the activities surrounding the bicentennial of the Lewis and Clark Expedition.

RVMPO intended the initial operation to be of limited duration and in a single direction only in order to assess operating costs and prospective ridership levels before substantial financial investments were undertaken. It was assumed that there would be a number of decision points along the way where the service would either continue operating or be terminated. It was presumed that a successful operation would lead to track, signal, and equipment improvements along with increases in the frequency of service.

The purpose of the study was to develop a proposed commuter rail service as a "demonstration" project by developing generalized assessments that involved:

- Infrastructure and operational requirements
- Level of travel market demand – ridership projections
- Financing alternatives
- System-wide costs and benefits
- A preliminary business plan

The effort ended after ODOT sold the rail diesel cars to the Wallawa-Union Railroad before the Rogue Valley region was able to act.

Rogue Valley Commuter Rail Project – Final Report (2007)

The most recent commuter rail study was launched by RVMPO to reflect the unavailability of the ODOT cars. In addition, RVMPO sought information that it could possibly use to approach the Federal Transit Administration (FTA) for potential funding under the agency's "Small Starts" Program.

The most recent study updated the 2006 Draft Report, listing the equipment options to replace the ODOT rail diesel cars that were sold, prepare an update to the capital program to permit bi-directional operations, and revisit earlier ridership projections resulting from increased frequencies permitted by bi-directional operations. Some of the conclusions from the report are:

Equipment: Four train sets of at least 180 seats would be needed in order to provide the contemplated 30-minute service levels, while two sets would be needed for hourly interval service. Estimated capital cost, depending upon the type of cars chosen, could range from $8 million to over $20 million.

Operating Intervals: The study developed two operating scenarios, one for hourly interval service and the other based on 30-minute interval service.

Track Upgrades: The existing CORP's Siskiyou Branch track conditions and maintenance levels limit freight trains to a maximum 25 miles per hour (mph). In order to meet proposed schedules, it would be necessary to operate commuter trains at speeds of approximately 59 mph. To achieve this speed, track upgrades of $16 million to $18 million would be necessary.

Stations: The project envisions seven passenger stations—two each in Central Point and Medford and one each in Phoenix, Talent, and Ashland.

Yearly Operating Costs: Operating costs would vary depending upon the equipment chosen, but a general estimate places yearly operating cost at around $3.8 million.

Transportation System Plans

County and city transportation system plans were reviewed, as well as one trail plan.

Jackson County Transportation System Plan (2005)

Jackson County and ODOT began updating the transportation element of the comprehensive plan in 2001 and completed the adopted Jackson County TSP in March of 2005. The primary study area for the TSP consists of all areas of Jackson County located outside the Urban Growth Boundaries (UGBs) of incorporated cities, although it does include issues identified in local TSPs or the RTP that affect state and county facilities inside UGBs. The proposed improvements are required to be compatible with Jackson County TSP goals and policies.

The TSP has three primary goals: livability, modal components, and integration. The TSP includes associated policies that provide direction for accomplishment of the goals and that "have the force of law." The goals and policies applicable to the Corridor Plan are described below.

Goal 4.1 – Livability

The Livability Goal is to "develop and maintain a safe and multi-modal transportation system capable of meeting the diverse transportation needs of Jackson County while minimizing adverse impacts to the environment and to the County's quality of life." Policies applicable to the Corridor Plan are as follows:

Policy 4.1.2-A – Connectivity: Jackson County will promote a well-connected street and road system to minimize travel distances. This policy, in turn, could potentially spur alternative routes for I-5 and OR 99.

Policy 4.1.4-A – Safety: Jackson County will provide a transportation system that supports access for emergency vehicles and provides for evaluation in the event of a wildfire hazard or other emergency.

Goal 4.2 – Modal Components

The Modal Components Goal is to plan an integrated transportation system that maintains existing facilities and responds to the changing needs of Jackson County by providing effective multimodal transportation options.

Policy 4.2.1-A – Vehicular System: Jackson County will prioritize preservation and maintenance of the existing road system rather than increasing vehicular capacity.

Policies 4.2.1-G through J – Truck Freight: Jackson County will: Balance the need for movement of goods with other uses of county arterials and state highways by maintaining efficient through movement on major truck routes (G). Work with ODOT to identify roadway obstacles and barriers to efficient truck movements on state highways and coordinate highway projects with other freight movement projects and infrastructure (H). Support employment of technology to improve freight mobility (I). Jackson County is committed to maintaining and improving roadway facilities serving inter-modal freight facilities (J).

Policy 4.2.1-P – Coordination: Jackson County will coordinate with ODOT to ensure that highway designations and management policies are appropriate and meet the Goals and Policies of the OHP and the Jackson County TSP. Jackson County will work with ODOT for effective management of highway capacity.

Policies 4.2.1-S and T – MPO Area Traffic Engineering and Performance Standard: Jackson County is committed to maintaining a volume-to-capacity ratio of 0.95 for weekday peak hour vehicular traffic in the MPO area (S). Jackson County will engineer traffic flow to provide efficient transportation system management (T).

Policies 4.2.6-A and B – Bulk Transport and Mass Freight System: Jackson County will continue to plan for rail service as a viable long-term transportation option for the Rogue Valley (A). Jackson County will encourage bulk transportation facilities to provide efficient transport of bulk goods (B).

City of Medford Transportation System Plan (2003)

The Medford TSP establishes the city's short-term and long-term goals and objectives for meeting its existing transportation needs, but also addresses planning for future growth and improvements necessary for providing an effective multimodal transportation system. One of the fundamental strategies is to reduce reliance on the automobile by promoting changes in land use patterns and transportation systems that make it more convenient for people to walk, bicycle, use transit, and drive less to meet their daily needs.

Among the issues addressed in the Medford TSP that have an impact upon the I-5 corridor are the lack of higher order streets (arterial and collectors) on the east side of the freeway that would provide connections for longer distance, north-south through trips from one part of the city to another. Current north-south connections are limited to Foothills Road/N. Phoenix Road on the eastern edge of the UGB and a partial arterial connection provided by Crater Lake Avenue. Medford's two primary I-5 interchanges—South Medford (Exit 27) and North Medford (Highway 62, Exit 30)—are also summarized in the TSP. These two interchanges are discussed below under "Interchange Area Management Plan (IAMPs) and Environmental Technical Reports."

The Medford TSP has eight goals with accompanying policies and implementation strategies. Goals, policies, and implementation strategies relevant to the Corridor Plan are as follows:

Goal 1 – Overall Transportation System

Provide a multimodal transportation system that supports the safe, efficient, and accessible movement of all people and goods, and recognizes the area's role as the financial, medical, tourism, and business hub of Southern Oregon and Northern California.

Policy 1-A: The City of Medford shall manage projected travel demand consistent with community, land use, environmental, economic, and livability goals.

> *Implementation 1-A(1):* Utilize the projections in the Regional Transportation Plan (RTP) regarding projected travel demand over the 20-year planning period in managing transportation system.

Policy 1-B: The City of Medford shall use the Transportation System Plan as the legal basis and policy foundation for decisions involving transportation issues.

> *Implementation 1-B(7):* Include projects and programs adopted in the Medford Transportation System Plan that are of regional or statewide significance, or that require the use of state or federal funding, within the Regional Transportation Improvement Program and State Transportation Improvement Program.

Policy 1-D: The City of Medford's second priority for the use of transportation funds shall be to maximize efficient use of the existing transportation system through use of Transportation System Management (TSM) and Transportation Demand Management (TDM) measures prior to expending transportation funds on capacity improvements.

> *Implementation 1-D(1):* Utilize Transportation Demand Management measures as the first choice for accommodating travel demand and relieving congestion in a travel corridor, before street widening projects are undertaken.

Policy 1-E: The City of Medford's third priority for the use of transportation funds shall be to fund capital improvements that add capacity to the transportation system. These improvements shall be prioritized based on availability of funds, reducing reliance on the automobile, improving safety, relieving congestion, responding to growth, and system-wide benefits.

Implementation 1-E(1): Give priority to funding projects that most increase capacity and relieve congestion, such as intersection improvements as opposed to general street widening, consistent with the adopted level of service (LOS) standards.

Goal 2 – Street System

Provide a comprehensive street system that serves the mobility and multimodal transportation needs of the Medford planning area.

Policy 2-A: The City of Medford shall classify streets so as to provide an optimal balance between mobility and accessibility for all transportation modes consistent with street function.

Implementation 2-A(2): Provide a grid network of higher order (i.e., Arterial, Collector) streets that link the central core and major industrial areas with major highways and that connect with each other and the lower order street system.

Policy 2-G: The City of Medford shall undertake efforts to reduce per capita vehicle miles traveled (VMT) and single-occupancy vehicle (SOV) demand through TDM strategies.

Implementation 2-G(3): Support and assist the efforts of the Rogue Valley Transportation District in maintaining a regional Transportation Demand Management program, which includes such components as a rideshare matching program, carpool/vanpool matching, park-and-ride lots, and information regarding transit service, bicycle routes, telecommuting, etc.

Policy 2-H: The City of Medford shall manage and maintain the transportation system in an efficient, clean, and safe manner.

Implementation 2-H(3): Continue to modernize the traffic signal system and improve its efficiency by ultimately connecting all signals to the centralized traffic control center. Employ traffic signal timing plans that maximize efficiency during different time periods. Provide a program to identify locations for new/modified signals.

Implementation 2-H(4): Utilize Intelligent Transportation Systems (ITS), such as real-time traffic monitoring cameras and management projects, that provide motorist information and incident response/clearance programs to alleviate traffic congestion.

Goal 7 – Freight Movement

Facilitate the provision of a multimodal transport system for the efficient, safe, and competitive movement of goods and services to, from, and within the Medford planning area.

Policy 7-A: The City of Medford shall promote accessibility to transport modes that fulfill the needs of freight shippers.

Implementation 7-A(1): Develop and adequately sign a street system that provides direct and efficient access to and between industrial and commercial centers, regional intermodal freight facilities, and statewide transport corridors.

Implementation 7-A(3): Encourage the development of railroad freight services to industrial and commercial areas.

Implementation 7-A(5): Encourage the development of intermodal freight transfer facilities.

Policy 7-B: The City of Medford shall strive to balance the needs of moving freight with community livability.

Implementation 7-B(2): Work with public agencies and private freight service providers to reduce the number and severity of commercial transport-related accidents.

Implementation 7-B(5): Work with railroads and appropriate state agencies to minimize the blockage of public streets at railroad crossings to facilitate traffic movement, especially emergency service vehicles.

Implementation 7-B(6): Consistent with the Oregon Rail Plan, establish city policy that seeks to avoid or minimize the number of future railroad at-grade crossings when new streets are planned; avoids creating intersections of major streets and railroads where possible, locates new parallel streets at least 500 feet from railroads to allow for industrial development between the tracks and the roadway, and plans community development with sensitivity to rail noise and other potential conflicts.

City of Ashland Transportation System Plan (1998)

The City of Ashland adopted its current TSP in 1998. The City of Ashland TSP addresses Oregon Statewide Planning Goal 12 and the Oregon TPR, which directs cities and counties to develop balanced transportation systems addressing all modes of travel including motor vehicles, transit, bicycles, and pedestrians. The purpose of the Ashland TSP is to define the modal system, and outline and prioritize specific modal improvements which embody the city’s vision for “modal equity.”

The TSP is intended to summarize the results of the public involvement process, the analysis of existing policies and conditions, the impact of future growth on the transportation system, and the identification of alternatives that can address the local transportation system needs in the City of Ashland. In addition to providing information on the existing conditions and constraints of Ashland’s transportation system, the TSP focuses on recommended design standards, identification of system problems, pedestrian and bicycle amenities, recommended access management plan, needed transportation improvements, a financial plan, and an alternatives evaluation and project prioritization.

The City of Ashland TSP provides a list of TPR recommendations and requirements that the City of Ashland expects to be in compliance with. The most applicable sections are:

- Existing Conditions and Constraints: Chapter 4 of the TSP includes an inventory of the existing street network, traffic volumes, traffic control devices, accident history, level of service, a summary of the existing bicycle route system, a summary of existing sidewalks on boulevards, and a summary of the existing transportation system.

- Identification of System Problems: Chapter 6 of the TSP includes a summary of forecast population and employment, a determination of transportation capacity needs, and an ongoing assessment of other roadway needs (safety, bridges, reconstruction, operation/maintenance) by City of Ashland staff through the maintenance program.
- Needed Transportation Improvements: Chapter 9 of the TSP identifies the Interchange 14 (Ashland Street/Green Springs Highway) bridge over I-5 as currently substandard for vehicle, bicycle, and pedestrian travel. The TSP states that the interstate interchange and bridge will need to be upgraded and signalized within the next 20 years.

City of Phoenix Transportation System Plan (1999)

The City of Phoenix TSP was acknowledged by the City Council on October 4, 1999, and acknowledged by the Department of Land Conservation and Development on December 2, 2003. The purpose of this plan is "to meet the existing and future mobility needs of the City of Phoenix." The following goals are taken from Chapter 9, "Modal Plans and Policies."

Goal 2: The City shall coordinate its transportation decision-making with other land use planning decisions and with public agencies providing transportation services or facilities.

Goal 3: Utilize the volume-to-capacity (v/c) standards specified in Table 4-3 to determine transportation facility adequacy (0.80 v/c for I-5; 0.90 v/c for arterials, collectors, and local streets; 0.95 v/c for designated Special Transportation Areas).

Goal 4: Support the use and deployment of transportation demand strategies.

Goal 5: Preserve the function and value of transportation facilities consistent with their classification. More restrictive access policies shall apply to higher-level streets.

Goal 10: Ensure streets are designed, developed, reconstructed, and maintained consistent with their classification.

City of Talent Transportation System Plan (2000)

The City of Talent TSP was initially adopted in April 2000 with update to the TSP adopted in March 2007. The overall goal of the Talent TSP is to provide a safe and efficient transportation system that reduces energy requirements, regional air contaminants, and public costs and provides for the needs of those not able or wishing to drive automobiles. Specific goals applicable the Corridor Plan are listed as follows:

Transportation Demand Management: Reduce the demands placed on the current and future transportation system by the single-occupant automobile.

Streets: Provide a comprehensive system of streets and highways that serves the mobility and multimodal travel needs of the Talent urban area.

City of Central Point Transportation System Plan (2008)

Adopted on December 18, 2008, the City of Central Point TSP is among most recently approved transportation documents within the Corridor Plan area to date. In acknowledgement of its relationship between the TPR and the RTP, the organization of the Central Point TSP closely follows the format described in the TPR – Elements of Transportation System Plans. The goals and policies described below are pertinent to the Corridor Plan and represent the city's vision for maintaining and advancing its transportation system in coordination with its land use program through the year 2030. The ultimate objective of the Central Point TSP is to efficiently and effectively provide for the transportation needs of the community while improving the quality of life of its citizens.

Goal 5.2 – Access Management

The City of Central Point will employ access management strategies to ensure safe and efficient roadways consistent with their designated function.

<u>Policy 5.2.2</u>: The city shall implement the access management strategies presented in the Access Management Plan for Front Street (Highway 99)/Pine Street and the Central Point Highway 99 Corridor Plan.

Goal 5.5 – Transportation Demand Management

The City of Central Point will maintain consistency between transportation demand management (TDM) measures promoted by the city with the regional transportation plan strategies aimed at reducing reliance on the single occupant vehicle (SOV) and reducing vehicle miles traveled (VMT) per capita.

<u>Policy 5.5.1</u>: The city shall coordinate and maintain a consistency in the implementation of transportation demand management strategies with similar regional strategies as presented in the Regional Transportation Plan.

Goal 7.1 – Street System

Provide a comprehensive street system that serves the present and future mobility and travel needs of the Central Point urban area, including provisions for bicycle and pedestrian facilities.

<u>Policy 7.1.2</u>: The city's street system shall contain a network of arterial and collector streets and highways that link the central core area and major industry with regional and statewide highways.

<u>Policy 7.1.5</u>: The city shall actively pursue construction of I-5 interchange improvements at Pine Street.

Goal 10.1 – Rail Freight

The City of Central Point will provide efficient, safe, and effective movement of goods, services, and passengers by rail while maintaining the quality of life for the citizens of the Central Point urban area.

Policy 10.1.1: The city shall encourage both freight and passenger service as part of statewide rail transportation planning efforts.

Goal 11.1 – Truck Freight

The City of Central Point will identify and maintain a truck freight system within the city that serves the city's and region's freight needs in an efficient and safe manner, with minimal adverse impacts on adjacent land uses.

Policy 11.1.1: The city shall cooperate with the RVMPO, Jackson County, ODOT, and the City of Medford in the coordination of design, funding, and improvement of the freight system within the city that enhances freight movement, while improving the overall capacity of the city's street system.

Policy 11.1.2: The Freight System Map presented in Figure 11.2 of the TSP shall be considered by the city as the official freight route system for the City of Central Point. The design and improvement of the street system designated on the Freight System Map shall accommodate large vehicles typical of freight movement.

Policy 11.1.3: The city shall ensure access to truck freight via the local street system, with emphasis on maintaining an efficient and safe designated truck route system.

Bear Creek Greenway Plan

The Bear Creek Greenway is a narrow corridor of publicly owned land that follows the Bear Creek streambed from Ashland (Nevada Street) to Central Point (Pine Street). Development of the Bear Creek Greenway bicycle and pedestrian path began in 1973 when ODOT built the first 3.4-mile section of the pedestrian/bicycle path through Medford. The Bear Creek Greenway currently includes two primary sections:

- Pine Street in Central Point to Barnett Road in Medford; and
- Blue Heron Park in Phoenix to Nevada Street in Ashland.

When complete, the Bear Creek Greenway will provide a 20-mile, multi-use path from the I-5/Seven Oaks Interchange in Central Point to Nevada Street in Ashland. It will serve as an important facility for intercity travel in the I-5/OR-99 corridor. Additionally, a Rogue River Greenway is currently in the planning stages. This greenway will connect the communities of Grants Pass, Rogue River, and Gold Hill and would eventually be linked to the Bear Creek Greenway at the Seven Oaks Interchange.

Interchange Area Management Plans (IAMPs) and Environmental Technical Reports

Interchange Area Management Plans (IAMPs) are developed by ODOT and local governmental agencies to protect the function of interchanges by maximizing the capacity of the interchanges for safe movement from the mainline (I-5) facility, to provide safe and efficient operations between connecting roadways, and to minimize the need for major improvements of existing interchanges. IAMPs are required for new interchanges and should be developed for significant modifications to existing interchanges.

Interchange 14 (Green Springs)

The interchange provides the main link between the I-5 corridor and the southern end of Ashland via Ashland Street, also known as the Green Springs Highway and OR 66. This crossroad also provides one of the few interstate crossings in the vicinity and carries significant local vehicle, bicycle, and pedestrian traffic volumes that do not enter or exit the interstate. The existing interchange is a standard diamond configuration, comprising a two-lane bridge with unsignalized ramp terminals at both ends. A draft IAMP for this interchange is under review by ODOT and the local jurisdictions before eventual adoption by the Oregon Transportation Commission (OTC). The draft document provides a summary of existing conditions, provides future year traffic analysis of interchange design alternatives, explores potential management actions and land use policies, and concludes with an access management plan. The Interchange 14 bridge repair project is grouped under Bundle 314 of the Oregon Bridge Delivery Partners, a consortium of two primary engineering firms tasked with completing the repair and replacement of multiple bridges across the state listed under the Oregon Transportation Investment Act (OTIA) III State Bridge Delivery Program. The existing Interchange 14 bridge will be widened to accommodate two through lanes and one center left-turn lane, with shoulders and sidewalks. Enough width will be provided to accommodate two additional through lanes.

Interchange 19 (North Ashland)

The interchange provides the main link between the I-5 corridor and the northern end of Ashland via OR-99, which intersects South Valley View Road approximately 2,500 feet south of the interchange. Currently a two-lane facility, South Valley View Road has high lane volume due to significant volumes of intraregional trips between Ashland and Medford. In addition to the heavy movement of intraregional trips, the interchange also serves local residents and businesses in the interchange vicinity. South Valley View Road is planned for expansion into a five-lane facility between the interchange and the OR-99 intersection. A draft IAMP is under review by ODOT and the local jurisdictions before eventual adoption by the OTC. The draft document provides a summary of existing conditions, provides future year traffic analysis of interchange design alternatives, explores potential management actions and land use policies, and concludes with an access management plan. Part of the Oregon Bridge Delivery Groups listed under Bundle 314, the Interchange 19 bridge will be a new bridge with two through lanes and one center left-turn lane, with shoulders. Enough width will be provided to accommodate two additional through lanes and sidewalks.

Interchange 24 (Fern Valley) IAMP and Environmental Technical Reports

Development of an IAMP and a Draft Environmental Assessment (EA) are occurring simultaneously for Interchange 24. The purpose of these efforts, as stated on ODOT's website has been to "reduce congestion and improve operational conditions at the Interstate (I-5) interchange with Fern Valley Road, on Fern Valley Road within the City of Phoenix Urban Growth Boundary, and on OR-99 near its intersection with Fern Valley Road." An interim project (stage one) was completed to improve existing conditions in the short term. However, lacking further improvements, the interchange is projected to degrade to unacceptable levels of congestion within 5 to 10 years.

The EA has been assessing two interchange design alternatives, both of which would incorporate a Diverging Diamond (a.k.a. a Crossing Diamond) configuration, where approaching motorists are directed to the left side of the bridge to cross the interstate, enabling interstate-bound drivers to approach the on-ramp without stopping.

Interchange 27 (South Medford) IAMP/Environmental Technical Reports

The South Medford Interchange is a new urban interchange that serves the entire southern part of the city and connects I-5 with the city's commercial core and OR-99. Once fully operational, the new interchange will replace the interchange at Barnett Road, which will become an east-west arterial with no ramp terminal access to I-5. Construction of the interchange was a concept developed several years ago with considerable planning undertaken prior to the start of construction project in 2006. The project was included in the Rogue Valley Metropolitan Planning Organization (RVMPO) RTP and the City of Medford's TSP. An Environmental Impact Statement (EIS) was prepared assessing the impacts of the project on the surrounding area. The Draft EIS was completed in September 2001, and the Final EIS was completed in February 2004.

The previous configuration of the interchange utilized ramps that connect I-5 to Barnett Road. The new interchange, partially operating as this report is being written, replaces the existing interchange at Barnett Road with one connecting to a new arterial, the Garfield-Highland Connector. The new interchange is designed as a Single Point Urban Interchange (SPUI) that brings the I-5 northbound and southbound ramps to a single intersection with the cross street.
Interchange 30 (North Medford) Environmental Technical Reports

The OR 62/I-5 interchange area is a critical modal connection for the OR 62 corridor, which extends from Medford to White City in Jackson County, Oregon. The OTC considers this section of highway to be vital for the economic well-being of the Rogue Valley and, therefore, has designated the segment between I-5 and OR 140 a Statewide National Highway System (NHS) route in the 1999 OHP.

A bypass alternative was chosen by the project team and oversight committee as the best option to significantly improve connectivity in the North Medford Interchange area, The alternative, along with its various design options, is currently undergoing analysis in the Draft Environmental Impact Statement (DEIS). The proposed I-5 on- and off-ramp relocation would connect motorists directly between I-5 and OR 62 instead of requiring intermediate access to Biddle Road. A folded-diamond interchange would be provided to connect OR 62 and Biddle Road. The reduction of traffic volume resulting from the northbound I-5 ramp relocation and improved access control would result in improved mobility along Biddle Road.

Several mitigation measures are recommended for the Build Alternative design, including:

- Change the northbound I-5 off-ramp geometry to include a left-turn lane, a shared right-turn lane, and a right-turn lane on the off-ramp
- Carry only two lanes westbound on OR 62 from Poplar Drive to the folded-diamond ramp
- Add additional turning lanes at the intersection of Poplar Drive and OR 62
- Provide a right-in/right-out access to Fred Meyer from OR 62
- Provide a connection between Bullock Road and the existing Bear Creek Greenway I-5 underpass
- Include a signalized at-grade pedestrian crossing at the northern folded diamond interchange terminal at Biddle Road

Interchange 35 (Seven Oaks) IAMP and Technical Reports

Interchange 35 is principally a rural interchange that connects I-5 with OR-99 to the south and Blackwell Road to the north. OR-99 is a district-level highway that serves the nearby community of Central Point to the south. Blackwell Road serves some industrial lands northeast of the interchange and provides a connection with White City to the southeast.

Interchange 35, including the Blackwell Road overpass on I-5, was found to be functionally obsolete and structurally deficient. The interchange is currently under construction to improve the safety and function of both the overpass and the connections with OR 99 and Blackwell Road. In addition to building a new Blackwell Road overpass, the southbound off-ramp will be reconfigured as a loop ramp connecting to OR-99 from the east. The other ramps will also be constructed to meet highway design standards and improve spacing between ramps.

In the future, Interchange 35 will also function as the western terminus of the OR 140 Freight Route Extension that will connect OR 62 in White City and I-5. As the phased elements of the Freight Route are implemented, more traffic will be accessing the interchange from the north via Blackwell Road. Not only will the freight route increase demand at the interchange, but the potential for conflicts with access to adjacent industrial land will become a greater concern.

OR 62 Environmental Impact Statement

Underway since 2004, the EIS for the OR 62 Corridor encompasses the corridor from Poplar Drive in Medford east to White City and complements improvements completed at the North Medford Interchange. The purpose for the project has been to increase capacity and safety for the highway corridor connecting I-5 with OR 140 and OR 62. The corridor serves as a critical connection for freight, tourism, and commuter traffic in both the local and regional area. The corridor is currently exceeding capacity standards, and future growth in the area is expected to significantly increase traffic volumes throughout the corridor.

The Draft Environmental Impact Statement (DEIS), scheduled for release in the spring of 2009, will disclose such items as right-of-way, social, and environmental effects, and property displacements. The OR 62 Citizens Advisory Committee and Project Development Team unanimously voted to forward a bypass separating local and through traffic as the preferred alternative out of a total of four alternatives that were considered. Through traffic would travel on a parallel limited access highway, with access points at the North Medford Interchange (I-5 exit 30), Vilas Road, near Corey Road in White City, and Dutton Road north of the VA Domiciliary.

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3. ENVIRONMENTAL RECONNAISSANCE

The project team conducted research and mapped known environmental constraints in an effort to identify "red flag" areas judged to have considerable potential for conflict. The information gathered was taken primarily from published documents and maps, Geographic Information System (GIS) data, and conversations with appropriate professional contacts.

Goal 5 Resources

Statewide Planning Goal 5 requires local jurisdictions to inventory riparian corridors, wetlands, wildlife habitat, scenic waterways and other natural resources.

Bear Creek, which is indicated in **Figure 3-1**, is a key riparian corridor traversing the project area for much of its length. Further discussion of Bear Creek is provided in the "Wetlands" subsection. The Bear Creek Greenway, shown in **Figure 3-2**, is a linear park that also provides valuable habitat for wildlife. Ultimately, the Bear Creek Greenway Foundation intends to complete the Greenway from Ashland to Central Point, and eventually to the confluence with the Rogue River near Gold Hill. The multi-use path, which follows the creek within the Bear Creek Greenway, was designated as a National Scenic Trail in 1975, and is part of the Oregon Recreational Trail system.

Jackson County's Comprehensive Plan, adopted in 2004, established Forestry/Open Space Land designations to protect and provide for fish and wildlife habitat, as well as watershed and aquifer recharge areas. These designations protect lands including and adjacent to inventoried Goal 5 resources. The areas designated Forestry/Open Space Land can be found in **Figure 4-1** under Section 4: Land Use Reconnaissance.

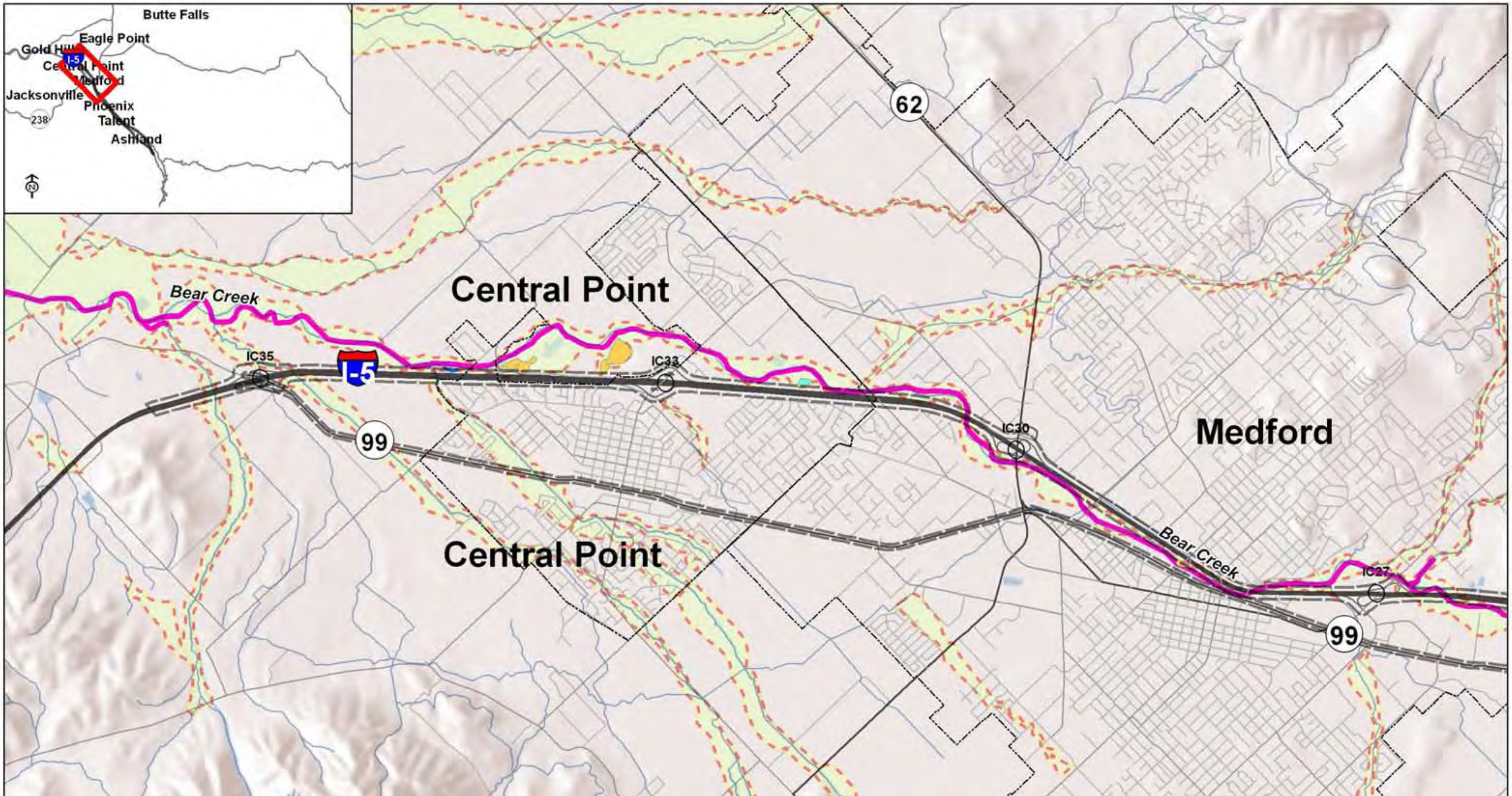
The City of Medford adopted the Bear Creek (B-C) Overlay Zoning District in 1989 to protect the wildlife habitat within the greenway. The City of Ashland Comprehensive Plan, adopted in 1991, has a identified Bear Creek as a water resource and the wetlands within the Bear Creek Greenway as a riparian resource. The Comprehensive Plan has stated goals to:

> *"Reduce the impact of urbanization and other land uses on the quality of water in and around Ashland…"*

and

> *"Protect the quality of riparian resource lands, and preserve their wildlife habitats."*

To comply with Goal 5 requirements for riparian corridors, the City of Medford has proposed a Riparian Corridor Ordinance for adoption into the Medford Land Development Code. The ordinance provides for a riparian corridor boundary of 50 feet, measured from the top-of-bank along both sides of waterways with an average annual flow of less than 1,000 cubic feet per second (cfs) and identified as being fish-bearing streams, or other waterways having riparian areas determined to be significant, which includes Bear Creek(City of Medford, City of Medford Comprehensive Plan, 2000).



0.5 0.25 0 0.5 Miles

Source Data: Jackson County, ESRI, Oregon GEO, ODFW, RVCOG

Legend

- Area of Project Impact (API)
- Urban Growth Boundary (UGB)
- River/Stream
- 100-Year Floodplain
- Coho Salmon (Existing Habitat)
- Chinook Salmon (Existing Habitat)

Wetland Classification

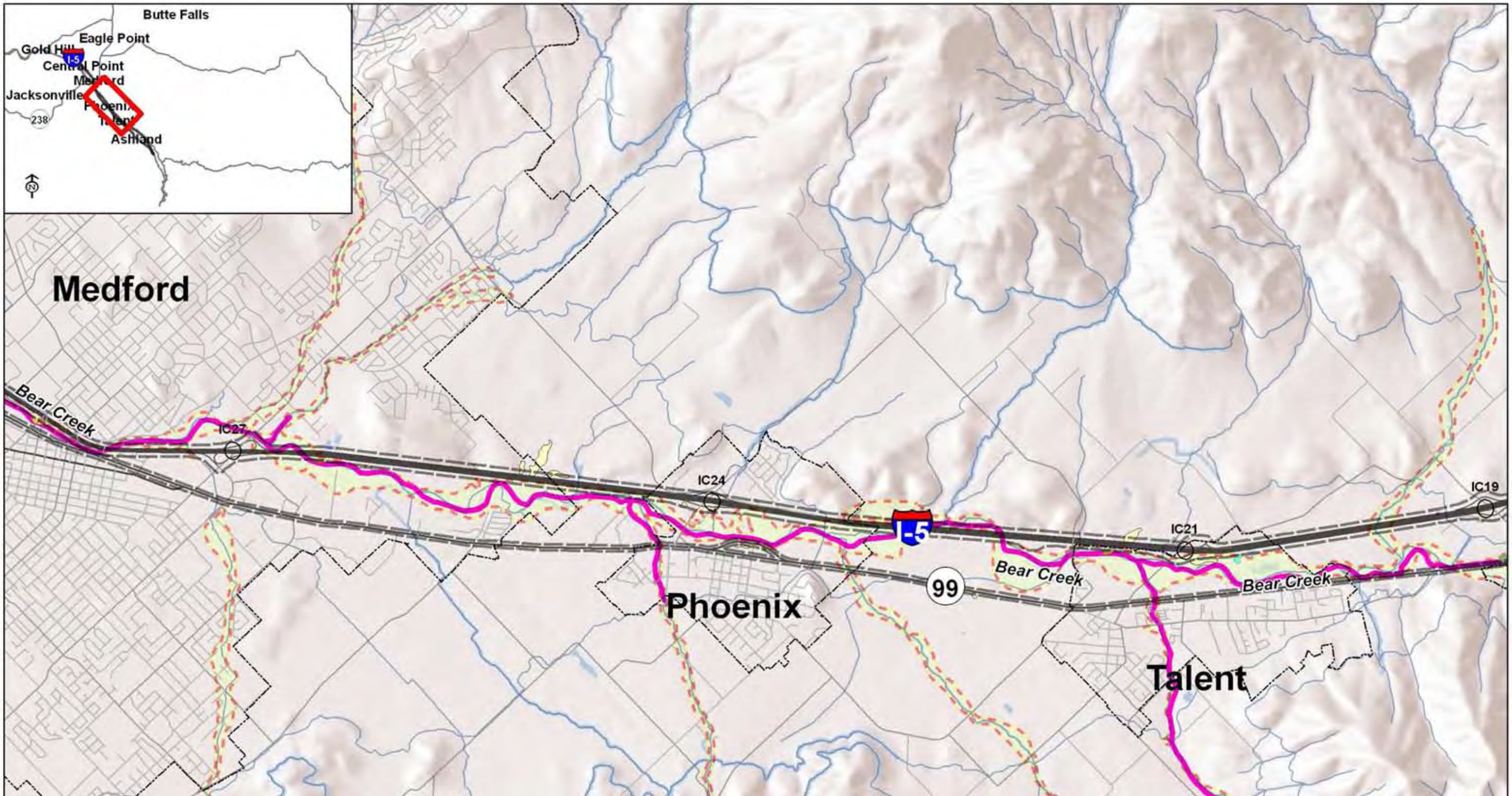
- Palustrine Aquatic
- Palustrine Emergent
- Palustrine Forested
- Palustrine Scrub-Shrub
- Palustrine - Other
- Riverine Upper Perrenial

I-5: Rogue Valley Corridor Study

Figure 3-1 (1 of 3)

Critical Habitats, Floodplains and Wetlands

June 2009



0.5 0.25 0 0.5 Miles

Source Data: Jackson County, ESRI, Oregon GEO, ODFW, RVCOG

Legend

- Area of Project Impact (API)
- Urban Growth Boundary (UGB)
- River/Stream
- 100-Year Floodplain
- Coho Salmon (Existing Habitat)
- Chinook Salmon (Existing Habitat)

Wetland Classification

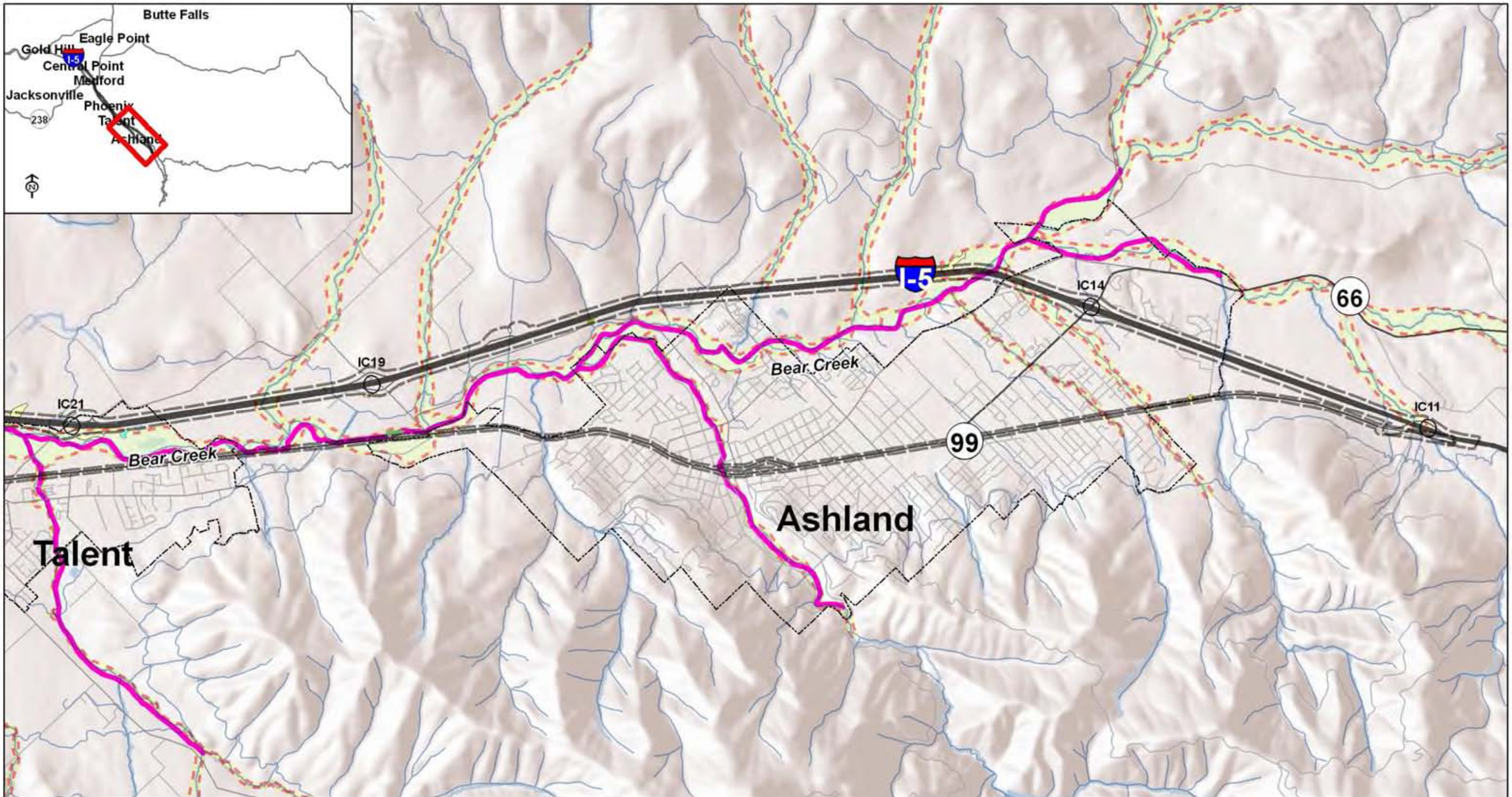
- Palustrine Aquatic
- Palustrine Emergent
- Palustrine Forested
- Palustrine Scrub-Shrub
- Palustrine - Other
- Riverine Upper Perrenial

I-5: Rogue Valley Corridor Study

Figure 3-1 (2 of 3)

Critical Habitats, Floodplains and Wetlands

June 2009



Legend

- Area of Project Impact (API)
- Urban Growth Boundary (UGB)
- River/Stream
- 100-Year Floodplain
- Coho Salmon (Existing Habitat)
- Chinook Salmon (Existing Habitat)

Wetland Classification

- Palustrine Aquatic
- Palustrine Emergent
- Palustrine Forested
- Palustrine Scrub-Shrub
- Palustrine - Other
- Riverine Upper Perrenial

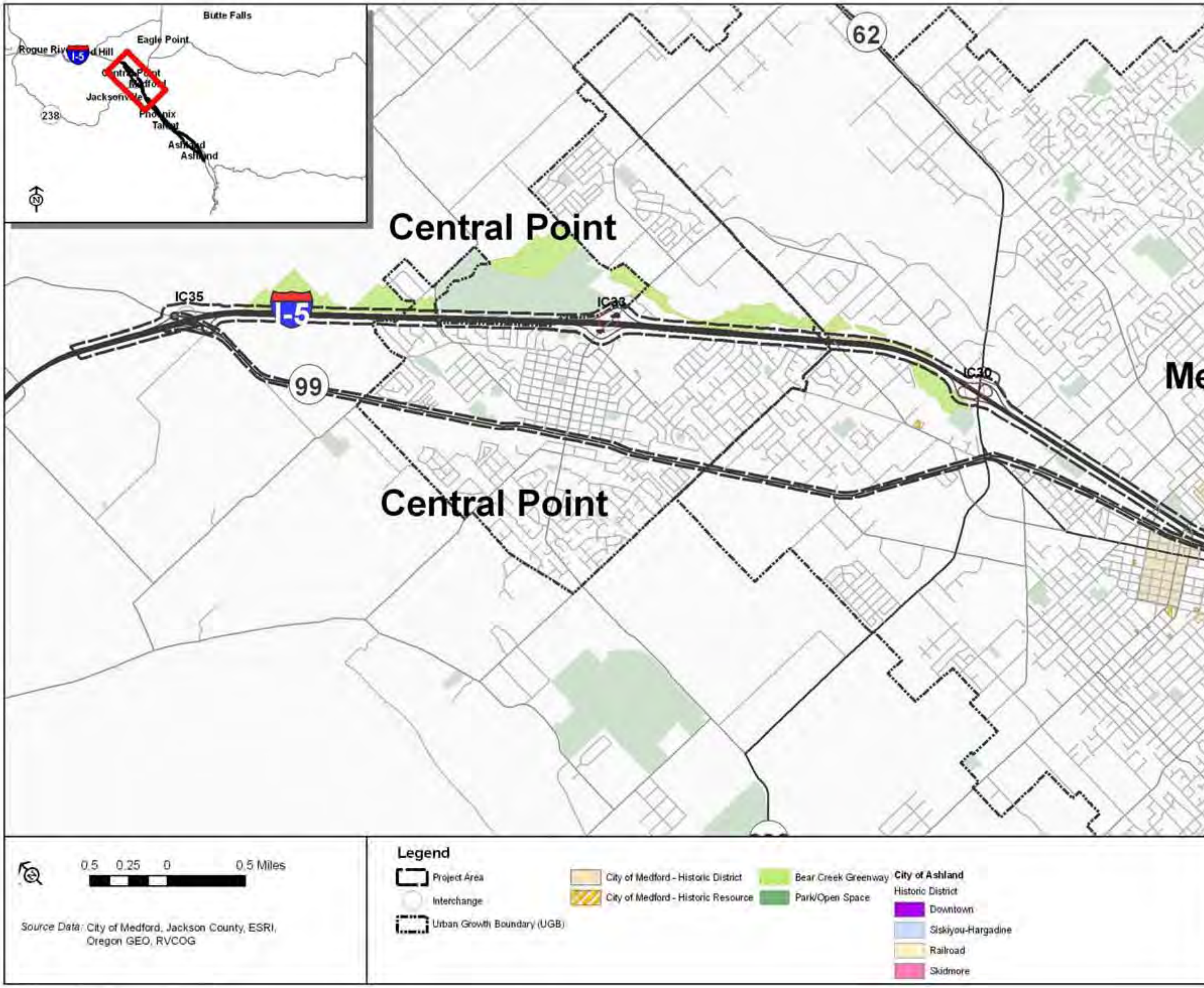
Source Data: Jackson County, ESRI, Oregon GEO, ODFW, RVCOG

I-5: Rogue Valley Corridor Study

Figure 3-1 (3 of 3)

Critical Habitats, Floodplains and Wetlands

June 2009

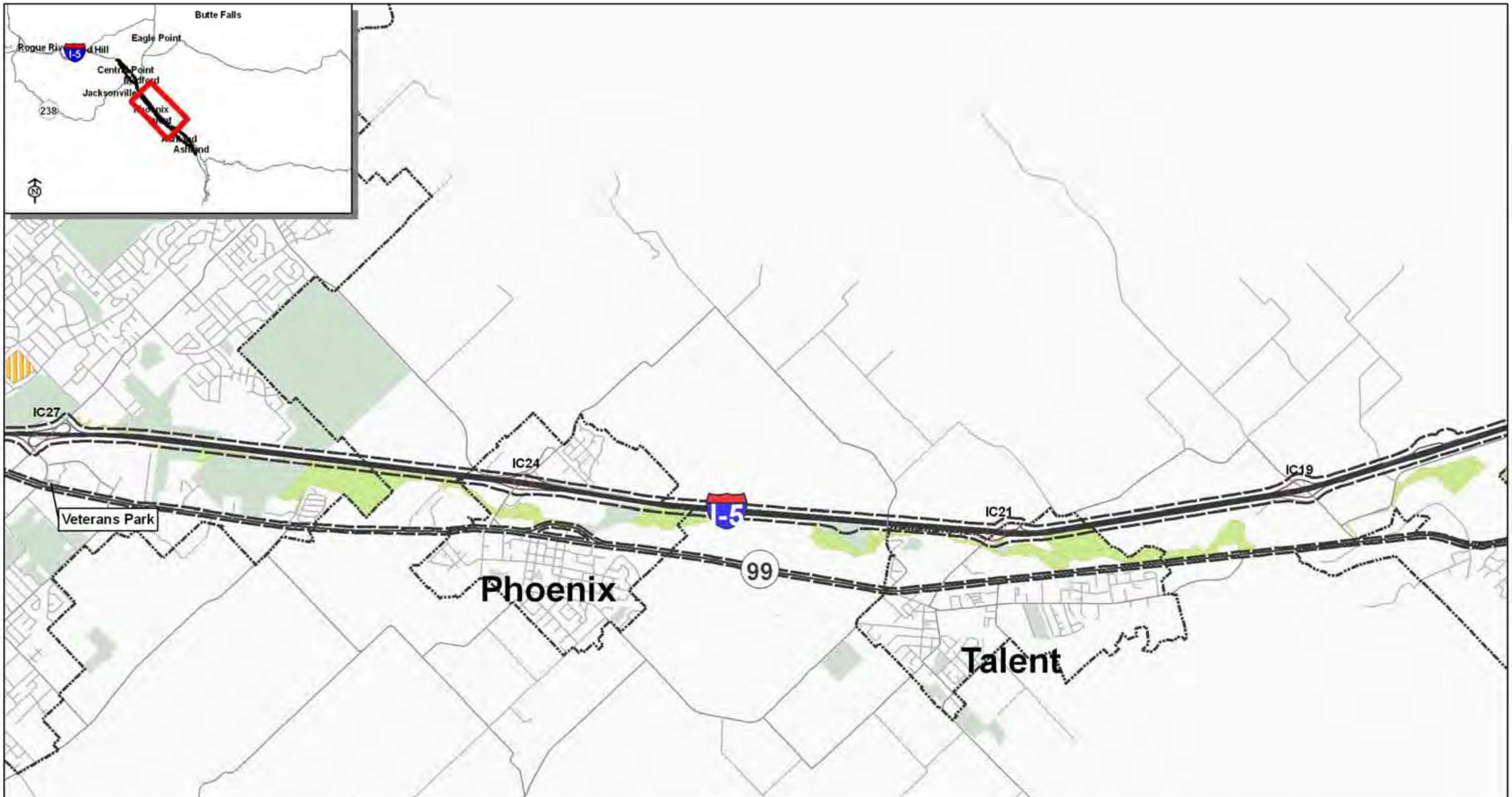


I-5: Rogue Valley Corridor Study

Figure 3-2 (1 of 3)

Cultural Resources and National Historic Sites and Districts

June 2009



0.5 0.25 0 0.5 Miles

Source Data: City of Medford, Jackson County, ESRI, Oregon GEO, RVCOG

Legend

- Project Area
- Interchange
- Urban Growth Boundary (UGB)
- City of Medford - Historic District
- City of Medford - Historic Resource
- Bear Creek Greenway
- Park/Open Space

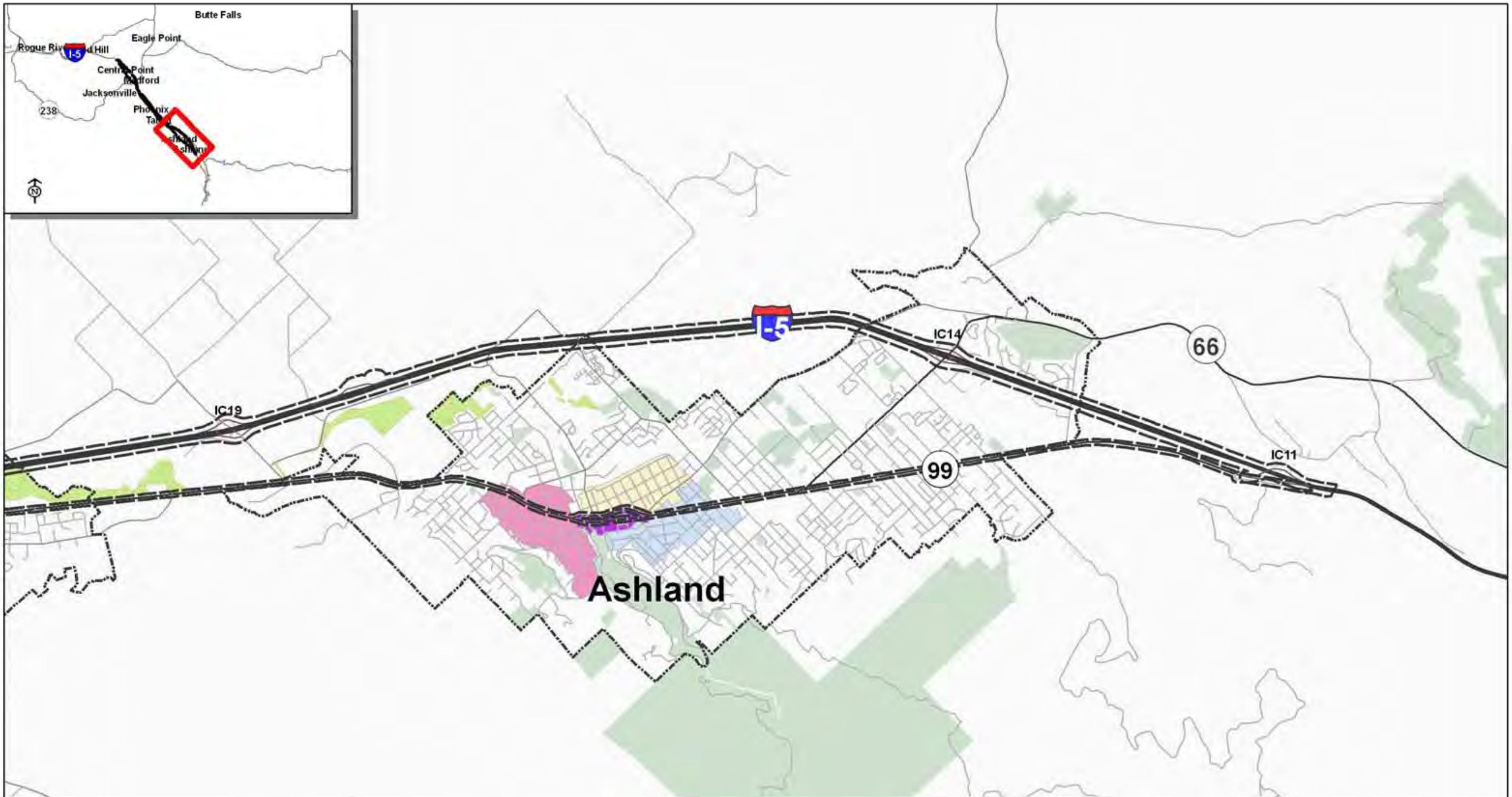
City of Ashland
Historic District
- Downtown
- Siskiyou-Hargadine
- Railroad
- Skidmore

I-5: Rogue Valley Corridor Study

Figure 3-2 (2 of 3)

Cultural Resources and National Historic Sites and Districts

June 2009



0.5 0.25 0 0.5 Miles

Source Data: City of Medford, Jackson County, ESRI, Oregon GEO, RVCOG

Legend

- Project Area
- Interchange
- Urban Growth Boundary (UGB)
- City of Medford - Historic District
- City of Medford - Historic Resource
- Bear Creek Greenway
- Park/Open Space

City of Ashland
Historic District
- Downtown
- Siskiyou-Hargadine
- Railroad
- Skidmore

I-5: Rogue Valley Corridor Study

Figure 3-2 (3 of 3)

Cultural Resources and National Historic Sites and Districts

June 2009

The City of Ashland has recently proposed an amendment to the Ashland Land Use Ordinance adding Water Resource Protection Zones to the Comprehensive Plan. This amendment is proposed for consistency with the Ashland Comprehensive Plan concerning the goals and policies related to the preservation and protection of Ashland's wetlands and riparian areas, which includes Bear Creek and the Bear Creek Greenway. The amendment is also intended to comply with Goal 5.

Further discussion of locally identified wetlands is provided in the "Wetlands" subsection.

FEMA Floodplain/Floodway

Acting through the local planning agencies, the Federal Emergency Management Agency (FEMA) regulates development within floodplains. FEMA-designated flood areas in the vicinity of the Corridor Plan area, also displayed in **Figure 3-1**, generally trace Bear Creek and its tributaries. I-5 roughly parallels the Bear Creek 100-year and 500-year floodplain between Central Point and Ashland. The freeway crosses the stream and floodplain at six locations: three in Medford (north of downtown, downtown, and again south of downtown), once in Phoenix, again north of Talent, and a sixth time outside Ashland north of Interchange 14, where I-5 veers south toward the Siskiyou Pass and away from Bear Creek. In addition, I-5 crosses floodplains of Bear Creek tributaries at various locations, including Jackson Creek and Griffin Creek north of Central Point; Myer Creek south of Talent; and Kirchen Creek, Gaerky Creek, and Hamilton Creek in the Ashland vicinity.

The OR-99 corridor is impacted by 100-year and 500-year floodplain crossings at Jackson Creek and Griffin Creek (Central Point); Coleman Creek and Anderson Creek (Phoenix); Wagner Creek (Talent); and Ashland Creek, Clay Creek, and Hamilton Creek (Ashland).

Wetlands

For this memorandum, wetland data recorded by the US Fish and Wildlife Service, dated 2002, was provided by Jackson County in GIS shapefile format. This shapefile data was overlayed with the Project Area and is shown on **Figure 3-1**.

Bear Creek, which traverses the Area of Potential Impact (API) for most of its entire length, is designated as Essential Salmonid Habitat (ESH) by the Oregon Department of State Lands (DSL). Bear creek supports runs of coho and chinook salmon (please refer to **Figure 3-1**), steelhead trout, and resident cutthroat trout. The U.S. Environmental Protection Agency lists Bear Creek as a "303(d)" stream due to flow modification, habitat modification, summer temperatures, and fecal coliform levels.

One riverine, upper perennial (R3UBH) area is within the API. The riverine area is located approximately 1.3 miles northwest of I-5 Interchange 33 and totaling 1.3 acres in size.

The riparian wetlands are classified as:

- Palustrine, emergent, seasonally flooded (PEMC),
- Palustrine, scrub-shrub, seasonally flooded (PSSA) and saturated (PSSB),
- Palustrine, forested, seasonally flooded (PFOC),
- Palustrine, aquatic bed, semi-permanently flooded, excavated (PABFx) and permanently flooded, excavated (PABHx), and
- Palustrine, unconsolidated bottom (PUBFh)

Riparian and wetland vegetation identified within the Project Area includes Douglas Fir, Siskiyou mixed evergreen forest, Pacific madrone forest/woodland, annual grasslands, and agricultural grassland.

Historic and Archaeological Resources

Under Section 106 of the National Historic Preservation Act of 1966 (Public Law 89-665), 16 United States Code (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.

The project team contacted Jessica Bochart, ODOT's Rogue Valley Office Archaeologist, to identify recorded archeological locations within the Project Area. Six sites were identified within 200 feet of I-5. They are located at the following points, with the direction of I-5 corresponding to which side of the highway the sites are located:

- MP 33.8 – Southbound
- MP 27.2 – Northbound
- MP 26.8 – Southbound (three sites)
- MP 26.5 – Southbound (two sites)
- MP 26.55 – Southbound
- MP 17.28-17.45 – Northbound and Southbound

Figure 3-2 shows Historic Districts and Historic Resources, as identified by the City of Medford and The City of Ashland, within the Project Area. The City of Medford adopted the Historic Preservation Ordinance in 1986, with the purpose of maintaining, preserving and rehabilitating properties of Oregon Historical Significance. The Medford Historic Preservation Overlay district complements the National Historic Preservation Act and NHRP designations. The Project Area is located within the northern part of the Medford Downtown Historic District Area, which is bounded by Riverside Avenue. The district is predominantly commercial, but also contains numerous residential structures. The district also falls within Medford's "City Center" Comprehensive Plan designation and Central Business (CB) overlay zoning district. The Medford Downtown City Center Vision Plan, prepared in 1994, states that:

> …(*t)his emphasis on preservation is critical in the downtown central district... As new infill development and redevelopment is completed in each of the (downtown) districts, the new construction should be undertaken with a sensitivity and respect for the existing historic fabric of the downtown city center."*

The Historic Resources within Medford's Urban Growth Boundary (UGB) are categorized as inventoried historic resources with a significant designation and not having been designated, but potentially significant.

The Project Area traverses part of each of Ashland's four Historic Districts: the Downtown District, the Siskiyou-Hargadine District, the Railroad District, and the Skidmore Academy District. The Railroad District and Downtown District, in addition to their local designation, are on the National Register. These districts feature many historic homes, churches, commercial and civic buildings. The Oregon State Historic Preservation Office (SHPO) lists properties listed in the NHRP, including a listing by county. The property list can be found on the following website: http://www.oregon.gov/OPRD/HCD/NATREG/index.shtml

I-5 Right-of-Way

The project team contacted Debbie Timms, Senior Right-of-Way Agent for ODOT Region 3, for information regarding the I-5 and OR 99 corridors through the Rogue Valley region. She did not identify right-of-way constraints along I-5, other than Section 6(f) properties adjacent to the Medford Viaduct and its approaches that would perhaps make widening prohibitively expensive. For example, the Valley of the Rogue State Park, located at the northern approach of the viaduct, would be impacted should any proposed I-5 roadway widening occur.

Impacts associated with OR-99 would be more complicated. Much of the roadway width currently does not meet acceptable state standards. Along some roadway sections, exact right-of-way dimensions are unknown. Furthermore, the roadway provides multiple accesses to adjacent business and residential properties. Hence, potential right-of-way impacts could be increased because of these various constraints.

Air Quality

Surrounded by mountains, the Rogue Valley tends to hold pollutants produced by industrial plants, woodstoves, motor vehicles, and other sources. In order to address air quality concerns, the federal Environment Protection Agency (EPA) designated two air quality boundaries within the Rogue Valley. Medford's UGB was established as the boundary for carbon monoxide (CO) in 1978, and the Medford-Ashland Air Quality Maintenance Area (AQMA), corresponding to the RVMPO boundary, was designated for particulate matter in 1987.

CO emissions from transportation sources are tied exclusively to tailpipe emissions and are generated from the combustion of fuel. Vehicle tailpipes emit the highest concentrations of CO when idling or traveling at low speeds. Emission rates decrease as speeds increase, reaching a minimum rate between 45 mph and 50 mph, and gradually increase again as the vehicle speed surpasses 50 mph.

Particulate matter (PM) is a complex mixture of extremely small particles and liquid droplets that is made up of a number of components, including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles. The size of particles is directly linked to their potential for causing health problems. The EPA monitors particles that are 10 micrometers in diameter or smaller because those are the particles that generally pass through the throat and nose and enter the lungs. Once inhaled, these particles can affect the heart and lungs and cause serious health effects. The EPA divides particle pollution into two categories differentiated by size, assigning them a notation of PM_{10} or $PM_{2.5}$.

1. PM_{10} (larger than 2.5 micrometers and smaller than 10 micrometers in diameter) are course particles, generally found near roadways and dusty industries.

2. $PM_{2.5}$ (smaller than 2.5 micrometers in diameter) are fine particles that can form when gases that are emitted from power plants, industries, and automobiles react in the air. They are also directly emitted from sources such as forest fires. Essentially, the smaller and lighter the particle is, the longer it will stay in the air.

In the past, the Rogue Valley region exceeded National Ambient Air Quality Standards (NAAQS) for both CO and PM and, subsequently, became a designated non-attainment area for these pollutants. Non-attainment means that a geographic area has not consistently met the clean air levels set by the EPA through the NAAQS. Recent air quality monitoring results have demonstrated consistent compliance with NAAQS, as displayed in **Table 3-1**.

With improved air quality, the Medford metropolitan area is today an EPA-designated maintenance area, meaning that it has had a history of non-attainment, but now consistently meets EPA standards set by NAAQS. The area encompassed by the Medford UGB was redesignated from non-attainment to attainment by the EPA in 2002, while the area within the AQMA was redesignated from non-attainment to attainment in 2005. Analysis by the RVMPO has found that through the horizon of the 2009-2034 RTP and the 2010 Metropolitan Transportation Improvement Plan (MTIP), and in intervening years, emissions from transportation will not exceed current federal and state air quality standards.

Table 3-1. Ambient Air Quality Standards and Data Summaries for the Rogue Valley Region

Pollutant	Medford[4] (2007)	Standard Exceedance Level[4]	
		Federal NAAQS	Oregon
Carbon Monoxide (CO) – Maximum 1-hour average not to be exceeded more than once per year[1]	4.7 ppm	35 ppm	35 ppm
Carbon Monoxide (CO) – Maximum 8-hour average not to be exceeded more than once per year[1]	3.1 ppm	9 ppm	9 ppm
PM_{10} Particulate Matter – Maximum 24-hour average[2]	94 µg/m^3	150 µg/m^3	150 µg/m^3
$PM_{2.5}$ Particulate Matter – 3-year average of annual arithmetic mean[3]	9.7 µg/m^3	15 µg/m^3	Not Specified
$PM_{2.5}$ Particulate Matter – 98th percentile of the 24-hour values determined for each year[3]	30 µg/m^3	35 µg/m^3	Not Specified

Notes:
1. Recorded at Rogue Valley Mall
2. Recorded at Welch Street and Jackson Drive
3. Recorded at Grant Avenue and Belmont Street
4. ppm (parts per million); µg/m3 (micrograms of pollutant per cubic meter of air)

Source: 2007 Oregon Air Quality Annual Report, DEQ

Noise Quality

In addition to the pollutants described above, noise is also a pollutant that is transmitted through the air. Noise comprises three factors as perceived by the human ear: level of sound, frequency, and period of exposure to sound and fluctuations in sound levels. Levels of noise are measured in units called decibels (dB). However, in order to account for sensitivity of the human ear to frequencies, an adjustment is made to the dB measurement scale. The adjusted scale, referred to as the A-weighted decibel (dBA) scale, provides a more accurate measure of what the human ear can actually hear and is used in most environmental noise studies.

The Federal Highway Administration (FHWA) stipulates procedures and criteria for noise assessment studies taken from Title 23 of the Code of Federal Regulations (CFR) Part 772, Procedures for Abatement of Highway Noise and Construction Noise. Applicable to both traffic noise and construction noise, the FHWA Roadway Noise Abatement Criteria (NAC) are assigned to both exterior and interior activities differentiated by land use. Land uses along the corridor include residences, park/recreation areas, commercial, and undeveloped lands. A summary of the FHWA noise regulations are as follows:

- Category B (67 dBA) – Residences, parks, churches
- Category C (72 dBA) – Commercial uses
- Category D (Not Applicable) – Undeveloped lands
- Category E (52 dBA) – Interior of buildings such as residences, motels, and churches

ODOT considers a traffic noise impact to occur when the criteria sound levels predicted to be approached or exceeded are 2 dBA less than the FHWA criteria during the noisiest one-hour period. Therefore, residential properties (Type B property) occur at 65 dBA, and commercial impacts (Type C property) occur at 70 dBA, the noise impact threshold for Category B land uses, such as residential, is 65 dBA.

Although no detailed noise impact study has been performed for the I-5 Rogue Valley Corridor Plan, a noise assessment was conducted for the South Medford (Exit 27) Interchange Project Draft Environmental Impact Statement. Existing noise levels at the sites measured a range from 50 to 69 dBA. At peak noise levels, slightly more than a third of the areas studied approached or exceeded the 67 dBA FHWA criteria for residences and other sensitive land uses. Likewise, noise assessments conducted as part of the Fern Valley Interchange (Exit 24) Environmental Assessment identified multiple locations that exceeded the FHWA criteria.

Visual Resources

Motorists traveling I-5 through the Rogue Valley region are provided opportunities to glimpse some of southern Oregon's many scenic landmarks. Descending into the Rogue Valley from the north, 9,500-foot high Mount McLoughlin, one of the many Cascade volcanoes is viewable on a clear day and serves as a natural gateway entrance into the Rogue Valley. The Upper and Lower Table Rocks also come into view to the north along this approach. Traveling northbound along I-5, motorist descending the Siskiyou Pass into the Ashland vicinity are greeted with a sweeping view of the lower Rogue Valley and the foothills of the Cascade Range. The terrain is relatively flat through the northern portion of the I-5 corridor plan area between Central Point and Talent. South of Interchange 19 (North Ashland), I-5 passes through rolling terrain that provides vantage points for viewing the city of Ashland in the distance and the Siskiyou foothills and range beyond.

The parallel route of OR-99 passes through the downtowns of Central Point, Medford, Phoenix, Talent, and Ashland, providing direct access to the Ashland Shakespearean amenities and Southern Oregon University.

Socioeconomic and Environmental Justice

Population and Community

The U.S. Census Bureau documented a 23.8% population increase within the Medford Metropolitan Statistical Area (MSA) between 1990 and 2000 compared with 20.4% for the state as a whole. The Medford MSA shares the same boundaries with Jackson County. Hence, information pertaining to the MSA and county are the same. So far this decade, the Medford MSA population has increased from 181,269 in 2000 to 205,305 in 2008 – a 13.3 percent increase compared with 10.8 percent for the state during the same time period. As **Table 3-2** suggests, the Medford region has consistently grown at a faster rate than the rest of Oregon. Closer examination, however, reveals that the region's growth rate is more dependent upon net migration into the area and less on natural increase (deaths subtracted from births). Compared with the rest of the state, less than 10 percent of the Medford areas population growth was attributed to natural increase, compared with 35 percent for Oregon. As Table 3-2 demonstrates, over 90 percent of the areas growth is a direct result of new arrivals from outside the region.

Table 3-2. Components of Population Change 2000 to 2008 for Medford MSA and Oregon

Table Style + bold	**Medford MSA[1]**	**Oregon**
Population		
April 1, 2000 Census	181,269	3,421,399
July 1, 2008 PSU[2] Estimate	205,305	3,791,075
Population (Percent) Change 2000 -08	24,036 (13.3%)	369,676 (10.8%)
Components of Population Change		
Natural Increase (Percent of Pop. Change)	2,289 (9.5%)	132,180 (35.7%)
Births	*18,326*	*384,725*
Deaths	*16,037)*	*252,545*
Net Migration (Percent Change 2000-08)	21,747 (90.5%)	237,496 (64.2%)

Notes:

5. Medford Metropolitan Statistical Area (Jackson County)
6. Portland State University

SOURCE: U.S. Census Bureau; Oregon Employment Department (OED); Portland State University (PSU)

The natural increase data suggests that long term residents are older than the state average and, based on **Table 3-3**, so are new residents who move the area from somewhere else. Although the proportion of school age residents (ages 0-17) are roughly equal between the Medford MSA and the state, the gap starts to widen when comparing the working age populations (ages 18-64) and widens even further between the region and the state when comparing the retirement age population (ages 65 and over).

These conclusions parallel those found by the project team involved with the Bear Creek Valley Regional Problem Solving (RPS) Project – citing, for example, that residents over 50 represent a greater share of the total population than the rest of Oregon. It also concludes that the Bear Creek Valley has comparatively fewer residents between 20 and 49 while the smallest population increase came from residents under 5 years old. The RPS also concludes that the region has become a destination of choice for retirees, primarily from western states, and especially from California.

Table 3-3. Population by Age Groups for Medford MSA and Oregon

	Ages 0-17		**Ages 18-64**		**Ages 65 and Over**	
	Population	Percentage	Population	Percentage	Population	Percentage
Medford MSA	46,232	22.5%	126,235	61.5%	32,838	16.0%
Oregon	884,364	23.3%	2,418,169	63.8%	488,542	12.9%

SOURCE: Portland State University (PSU)

Income and Employment

Based on the *Economic Opportunities Analysis* drafted by ECONorthwest for the Bear Creek RPS Project, nearly 60 percent of Jackson County households recorded less than $50,000 annual income, compared with 54 percent of the state as a whole. Annual per capita income in Jackson County was $33,516 in 2007 compared with $35,143 for all of Oregon. Oregon's per capita personal income is consistently lower than the U.S. personal income and Jackson County, in turn, consistently ranks lower than Oregon.

As displayed in **Table 3-4**, the sectors with the most employment in Jackson County were Retail Trade, Educational and Health Services, and Government. Sectors recording the greatest amount of growth since 2001 included Construction, Financial Activities, and Educational and Health Services. Sectors displaying decline were Information, Manufacturing, and State Government.

Between 2000 and 2008, Medford MSA unemployment rates have ranged from 6.0 percent to 7.5 percent, trending slightly lower than the state average. The 2009 global recession has impacted the region and state with double digit unemployment rates. As of April 2009, Jackson County recorded 13.9 percent of its workforce as unemployed compared to 11.9 percent for the state.

Minorities

The U.S. Bureau of Census identifies minorities as individuals who are members of the population groups including Black or African American, American Indian and Alaska Native, Asian, Native Hawaiian and other Pacific Islander, other race, two or more races, and of Hispanic origin.

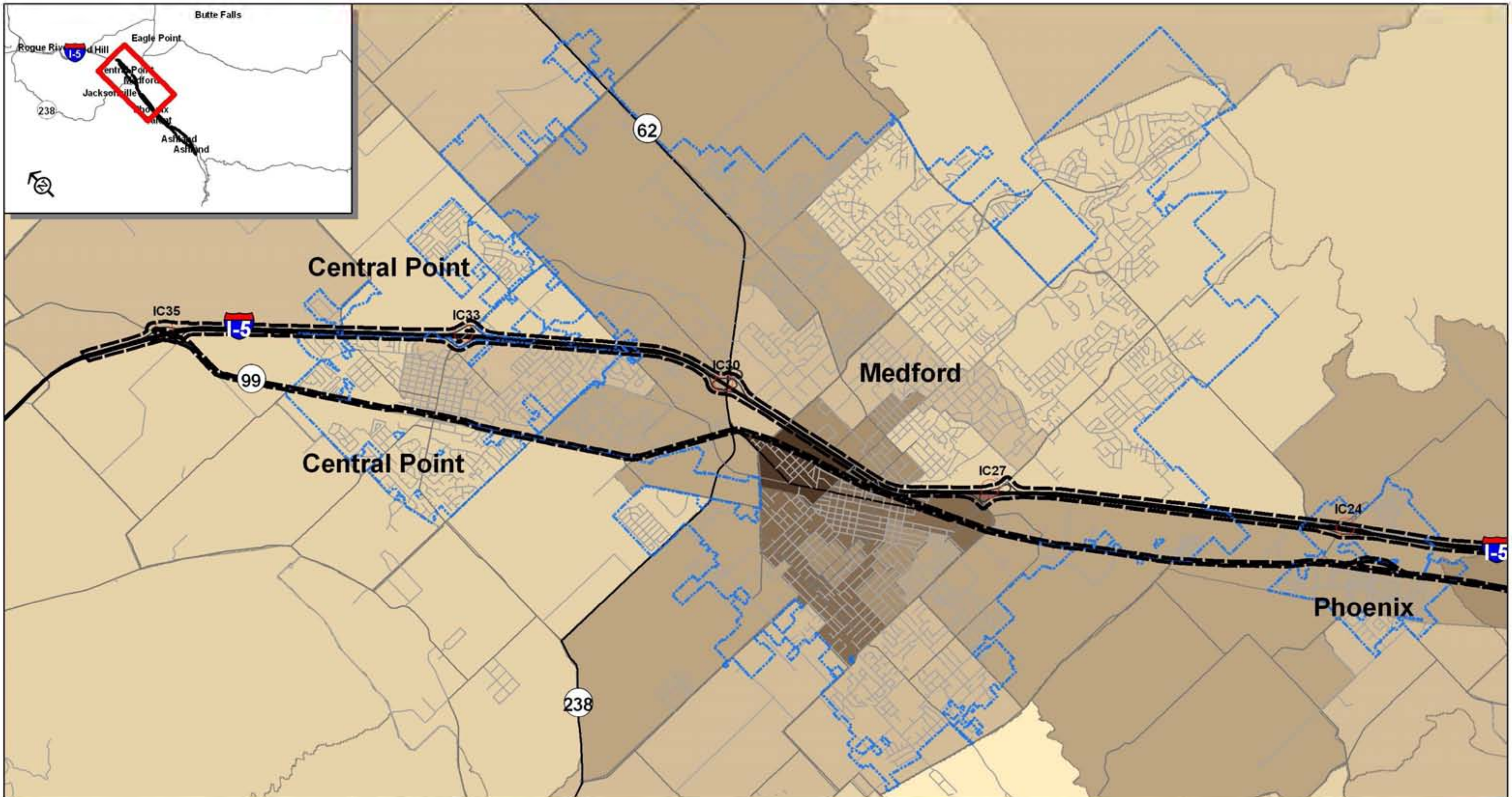
Table 3-4. Non-Farm Payroll Employment in Medford MSA, 2001-2008

Industry	2001	2008	Pct. Change
Total Non-Farm Employment	**74,660**	**81,930**	**9.7%**
Total Private	62,390	69,840	11.9%
Mining and Logging	500	620	24.0%
Construction	3,550	4,680	31.8%
Manufacturing	7,660	7,300	-4.7%
Trade, Transportation, and Utilities	17,630	19,230	9.1%
Wholesale Trade	2,120	2,500	17.9%
Retail Trade	13,150	13,910	5.8%
Transportation, Warehousing, and Utilities	2,360	2,820	19.5%
Information	1,830	1,580	-13.7%
Financial Activities	3,520	4,270	21.3%
Professional and Business Services	6,350	7,530	18.6%
Educational and Health Services	10,260	12,300	19.9%
Leisure and Hospitality	8,610	9,600	11.5%
Other Services	2,660	2,740	3.0%
Government	12,080	12,090	0.1%
Federal Government	1,730	1,730	0.0%
State Government	3,010	2,850	-5.3%
Local Government	7,330	7,510	2.5%

SOURCE: Oregon Employment Department (OED)

Figure 3-3 utilizes the Diversity Index to summarize racial and ethnic diversity in the project area. The index shows the likelihood that two persons chosen at random from the same area, belong to different race or ethnic groups. The index ranges from 0 (no diversity) to 100 (complete diversity). For example, the diversity score for the U.S. is 60, indicating that there is a 60 percent probability that two people randomly chosen from the U.S. population would belong to different race or ethnic groups. Jackson County has a composite Diversity Index of 32.7. Generally, Medford features the highest Diversity Index score, with Ashland having the lowest score.

The minority population in all of the categories, including all minority races combined, is not above 50 percent in the surrounding project area.



0.5 0.25 0 0.5 Miles

Source Data: Jackson County, RVCOG, ESRI, Oregon GEO

Legend

Project Area
Interchange
City Boundary

*Diversity Index**

0.0 - 10.0
10.1 - 20.0
20.1 - 30.0
30.1 - 40.0
40.1 - 50.0
50.1 - 60.0
60.1 - 70.0
70.1 - 80.0
80.1 - 90.0
90.1 - 100.0

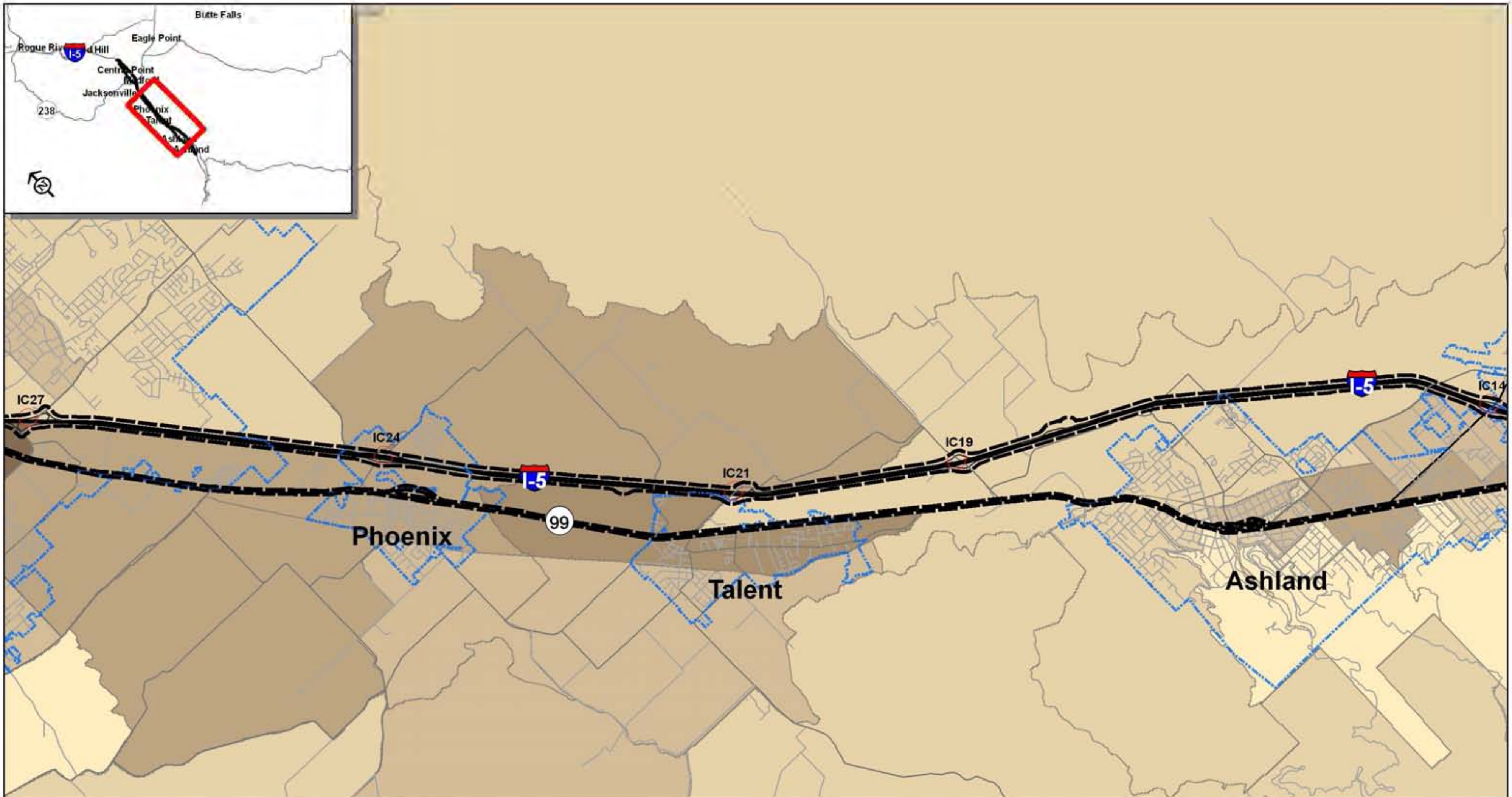
* The 2008 Diversity Index summarizes racial and ethnic diversity. The index shows the likelihood that two persons chosen at random from the same area, belong to different race or ethnic groups. The index ranges from 0 (no diversity) to 100 (complete diversity). For example, the diversity score for the U.S. is 60 which means there is a 60 percent probability that two people randomly chosen from the U.S. population would belong to different race or ethnic groups.

I-5: Rogue Valley Corridor Study

Figure 3-3 (1 of 3)

Ethnic Diversity Index

June 2009



0.5 0.25 0 0.5 Miles

Source Data: Jackson County, RVCOG, ESRI, Oregon GEO

Legend

- Project Area
- Interchange
- City Boundary

*Diversity Index**

- 0.0 - 10.0
- 10.1 - 20.0
- 20.1 - 30.0
- 30.1 - 40.0
- 40.1 - 50.0
- 50.1 - 60.0
- 60.1 - 70.0
- 70.1 - 80.0
- 80.1 - 90.0
- 90.1 - 100.0

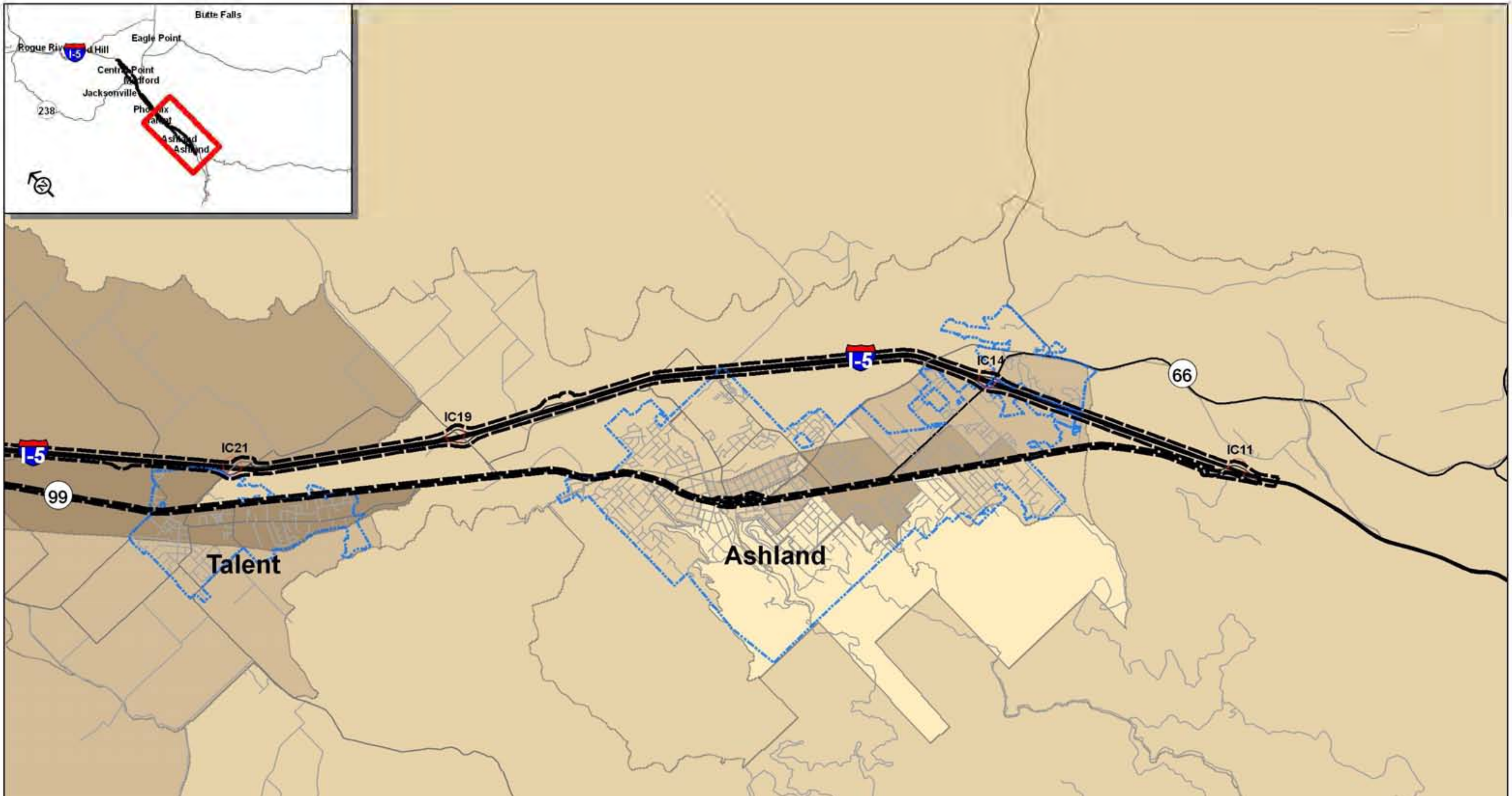
* The 2008 Diversity Index summarizes racial and ethnic diversity. The index shows the likelihood that two persons chosen at random from the same area, belong to different race or ethnic groups. The index ranges from 0 (no diversity) to 100 (complete diversity). For example, the diversity score for the U.S. is 60 which means there is a 60 percent probability that two people randomly chosen from the U.S. population would belong to different race or ethnic groups.

I-5: Rogue Valley Corridor Study

Figure 3-3 (2 of 3)

Ethnic Diversity Index

June 2009



0.5 0.25 0 0.5 Miles

Source Data: Jackson County, RVCOG, ESRI, Oregon GEO

Legend

Project Area

Interchange

City Boundary

*Diversity Index**

0.0 - 10.0	40.1 - 50.0	80.1 - 90.0
10.1 - 20.0	50.1 - 60.0	90.1 - 100.0
20.1 - 30.0	60.1 - 70.0	
30.1 - 40.0	70.1 - 80.0	

* The 2008 Diversity Index summarizes racial and ethnic diversity. The index shows the likelihood that two persons chosen at random from the same area, belong to different race or ethnic groups. The index ranges from 0 (no diversity) to 100 (complete diversity). For example, the diversity score for the U.S. is 60 which means there is a 60 percent probability that two people randomly chosen from the U.S. population would belong to different race or ethnic groups.

I-5: Rogue Valley Corridor Study

Figure 3-3 (3 of 3)

Ethnic Diversity Index

June 2009

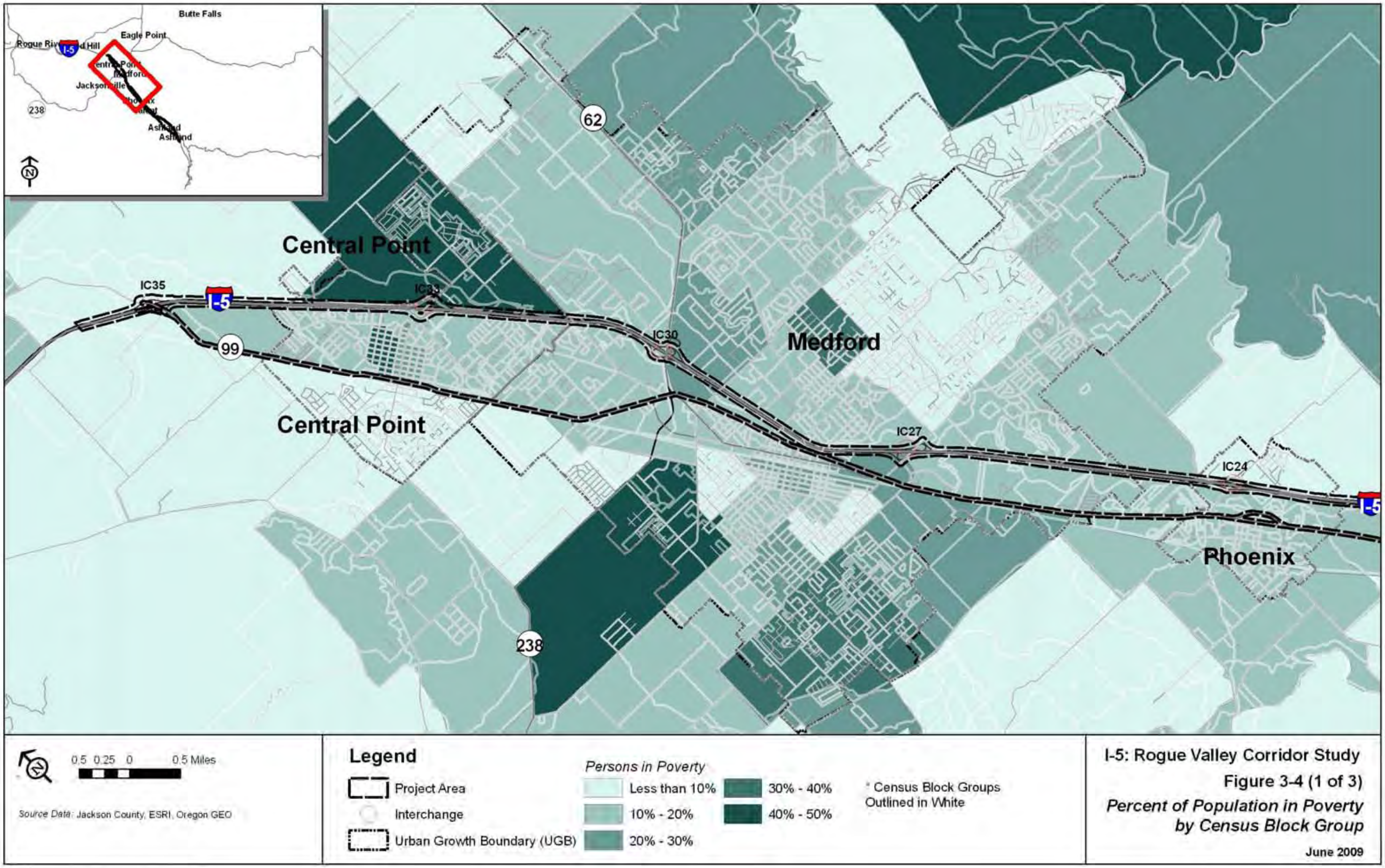
Poverty

In determining the poverty status of families and unrelated individuals, the Census Bureau used income earned in the previous 12 months (1999) and based income threshold on family size, presence and number of children, and age. Persons are in poverty status when income earned is less than the income threshold. The percent of population in poverty for the project area is shown in **Figure 3-4**. In the general project area, parts of Central Point east along I-5 show a poverty rate of 40-50%.

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 whose status is such that they are at some degree of risk of becoming extinct. The ONHIC information, based on reported historic sightings in the vicinity of the I-5/OR-99 corridor through the Rogue Valley, is summarized in **Table 3-5**. Only one species, the Coho Salmon, is listed as a threatened species within the region.

Under state law (ORS 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 (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.

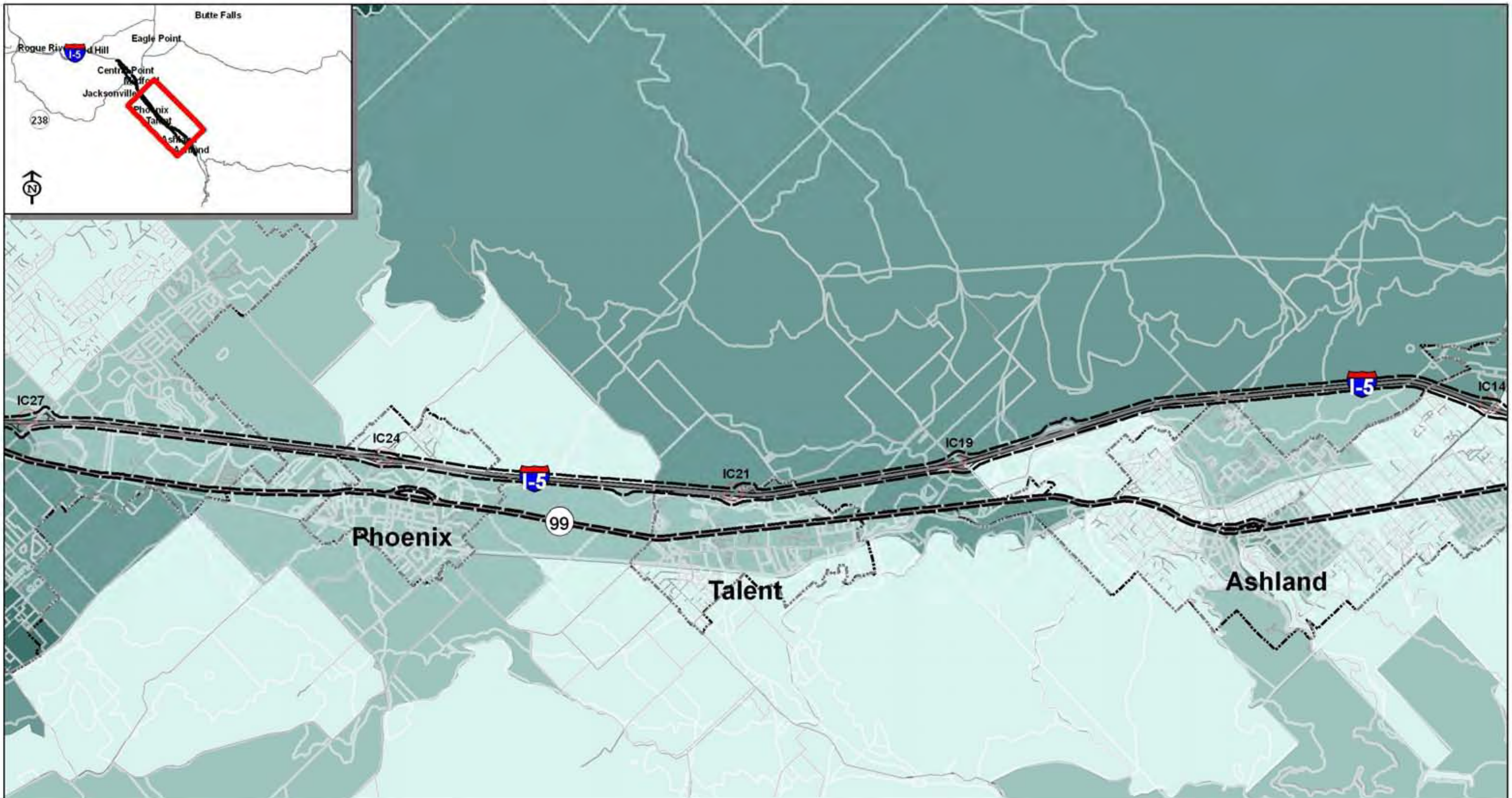


I-5: Rogue Valley Corridor Study

Figure 3-4 (1 of 3)

Percent of Population in Poverty by Census Block Group

June 2009



0.5 0.25 0 0.5 Miles

Source Data: Jackson County, ESRI, Oregon GEO

Legend

- Project Area
- Interchange
- Urban Growth Boundary (UGB)

Persons in Poverty

- Less than 10%
- 10% - 20%
- 20% - 30%
- 30% - 40%
- 40% - 50%

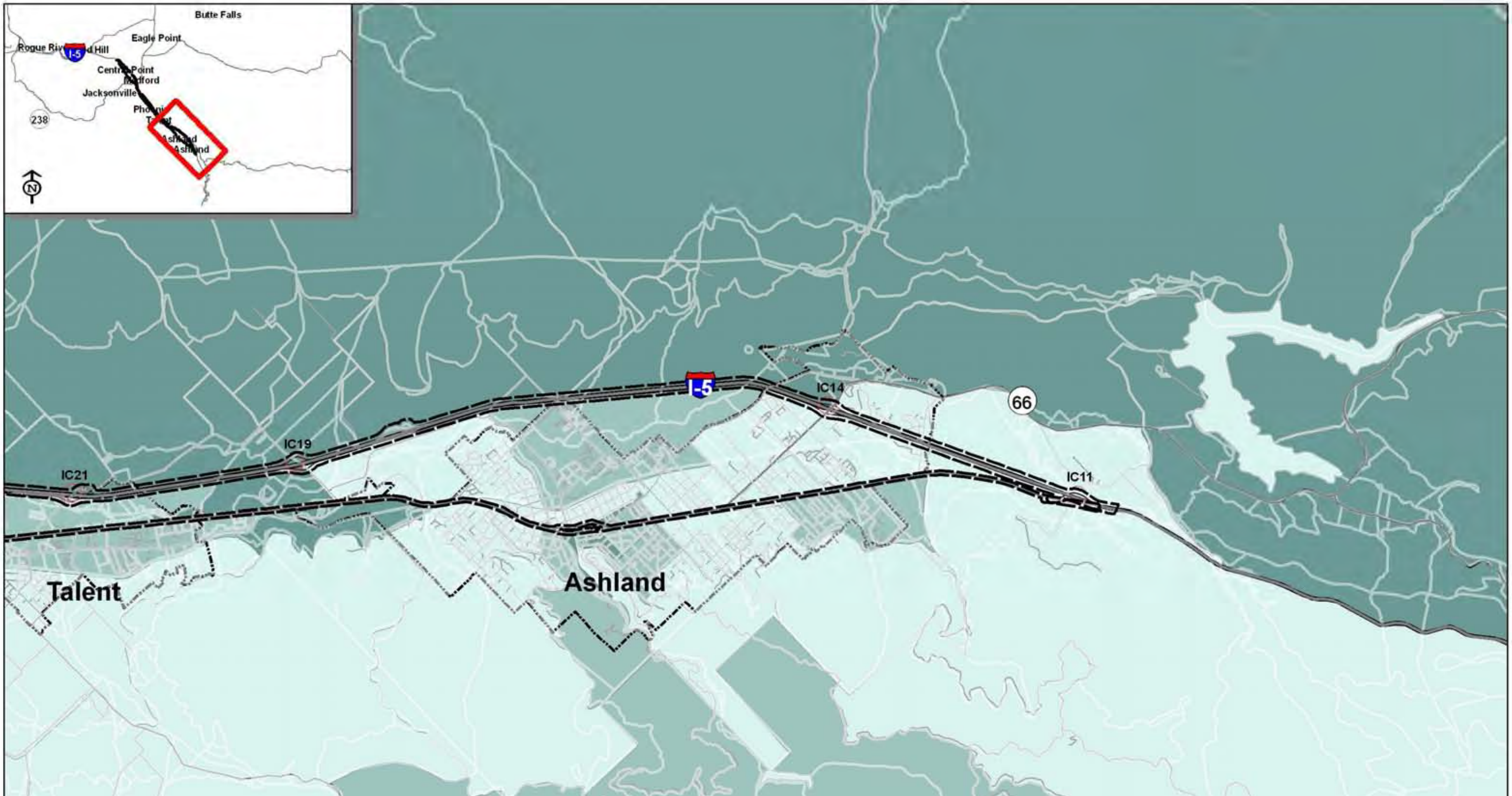
* Census Block Groups Outlined in White

I-5: Rogue Valley Corridor Study

Figure 3-4 (2 of 3)

Percent of Population in Poverty by Census Block Group

June 2009



0.5 0.25 0 0.5 Miles

Source Data: Jackson County, ESRI, Oregon GEO

Legend

- Project Area
- Interchange
- Urban Growth Boundary (UGB)

Persons in Poverty

- Less than 10%
- 10% - 20%
- 20% - 30%
- 30% - 40%
- 40% - 50%

* Census Block Groups Outlined in White

I-5: Rogue Valley Corridor Study

Figure 3-4 (3 of 3)

Percent of Population in Poverty by Census Block Group

June 2009

Table 3-5. ONHIC-Identified Listed Threatened or Endangered Species within I-5/OR-99 Rogue Valley Corridor Area

Common Name	Scientific Name	Status	
		Federal[1]	State[2]
Mammals			
Pallid Bat	*Antrozous Pallidus*	SOC	SV
Townsend's Big-Eared Bat	*Corynorhinus Townsendii*	SOC	SC
Birds			
Tricolored Blackbird	*Agelaius Tricolor*	SOC	No Status
Grasshopper Sparrow	*Ammodramus Savannarum*	No Status	SV
Reptiles/Amphibians			
Northern Pacific Pond Turtle	*Actinemys Marmorata Marmorata*	SOC	SC
Foothill Yellow-Legged Frog	*Rana Boylii*	SOC	SV
Fish			
Coho Salmon	*Oncorhynshus Kisutch*	LT	SC
Steelhead	*Oncorhynchus Mykiss*	No Status	SV
Chinook Salmon	*Oncorhnchus Tshawytscha*	No Status	SC
Insect			
Franklin's Bumblebee	*Bombus Franklini*	SOC	No Status
Plant			
Southern Oregon Buttercup	*Ranunculus Austrooreganus*	No Status	C

Notes:
1. SOC (Species of Concern); LT (Listed Threatened)
2. SV (Sensitive-Vulnerable); SC (Sensitive-Critical); SP (Sensitive-Peripheral); C (Critical)

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 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 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, species listing can be avoided by the development of Candidate Conservation Agreements that may remove threats facing the candidate species.

A species is listed under 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.

Under Oregon's Sensitive Species Rule (OAR 635-100-040), a "sensitive" species classification was created that focuses 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 the threats may prevent them 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.

Hazardous Materials

In July 2009 ODOT Region 3 Hazardous Materials Group performed an assessment of the I-5 corridor through the Rogue Valley region titled *I-5: Rogue Valley Corridor Study Known HazMat Sites,* to identify known sources of contamination within the project area. Sources of hazardous substances which were identified at the project site include heating oil tanks, Aboveground Storage Tanks (ASTs), Underground Storage Tanks (USTs), Hazardous Waste Generators, Oil Water separators, septic systems, solid waste, and suspect building materials (structures build prior to 1974 that may contain asbestos, lead based paint, PCB and fluorescent or High Intensity Discharge Lamps).

ODOT searched through web-based databases to review the available federal and state records for identified hazardous waste sites. The federal databases include the National Priority List (NPL), Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS), Resource Conservation and Recovery Act (RCRA) Generators, and Emergency Response Notification System (ERNS).

The state databases include the Environmental Cleanup Site Information System (ECSIS), the Oregon State Fire Marshal's (OSFM) Hazardous Materials Incidents, Solid Waste Landfills, Leaking Underground Storage Tanks (LUSTs) and Underground Storage Tanks (USTs). Table 3-6 summarizes the databases searched and the search radii used for the project area. The complete report detailing identified hazardous waste sites categorized by site type is provided in **Appendix A**.

Table 3-6. Summary of State Listed Hazardous Waste Sites

Database Record	Search Radius	Total Sites Found
Federal NPL	Plan Area & Adjacent Properties	0
Federal CERCLIS	Plan Area & Adjacent Properties	0
Federal RCRA Generators	Plan Area & Adjacent Properties	37
Federal ERNS	Plan Area & Adjacent Properties	2
State ECSI	Plan Area & Adjacent Properties	21
State Fire Marshall's Spills	Plan Area & Adjacent Properties	54
Oregon Permitted Landfills	Plan Area & Adjacent Properties	1
State LUSTs	Plan Area & Adjacent Properties	85
State Listed USTs	Plan Area & Adjacent Properties	21

Source: ODOT, 2009.

4. LAND USE RECONNAISSANCE (SUMMARY OF BUILT ENVIRONMENT)

This section summarizes existing land use conditions and potential constraints found within the Corridor Plan Area. The information is primarily taken from published documents, maps, GIS data, and from Internet websites, including Jackson County, Rogue Valley Council of Governments (RVCOG), and the cities of Ashland, Talent, Phoenix, Central Point and Medford.

Existing Land Uses

The Corridor Plan Area passes linearly through the cities of Central Point, Medford, Phoenix, Talent and Ashland with largely agricultural areas between each city. OR-99 is a main street through the cities. Zoned land uses in the Corridor Plan Area range from agricultural to industrial as displayed in **Figure 4-1** and described in further detail by jurisdiction below.

Central Point

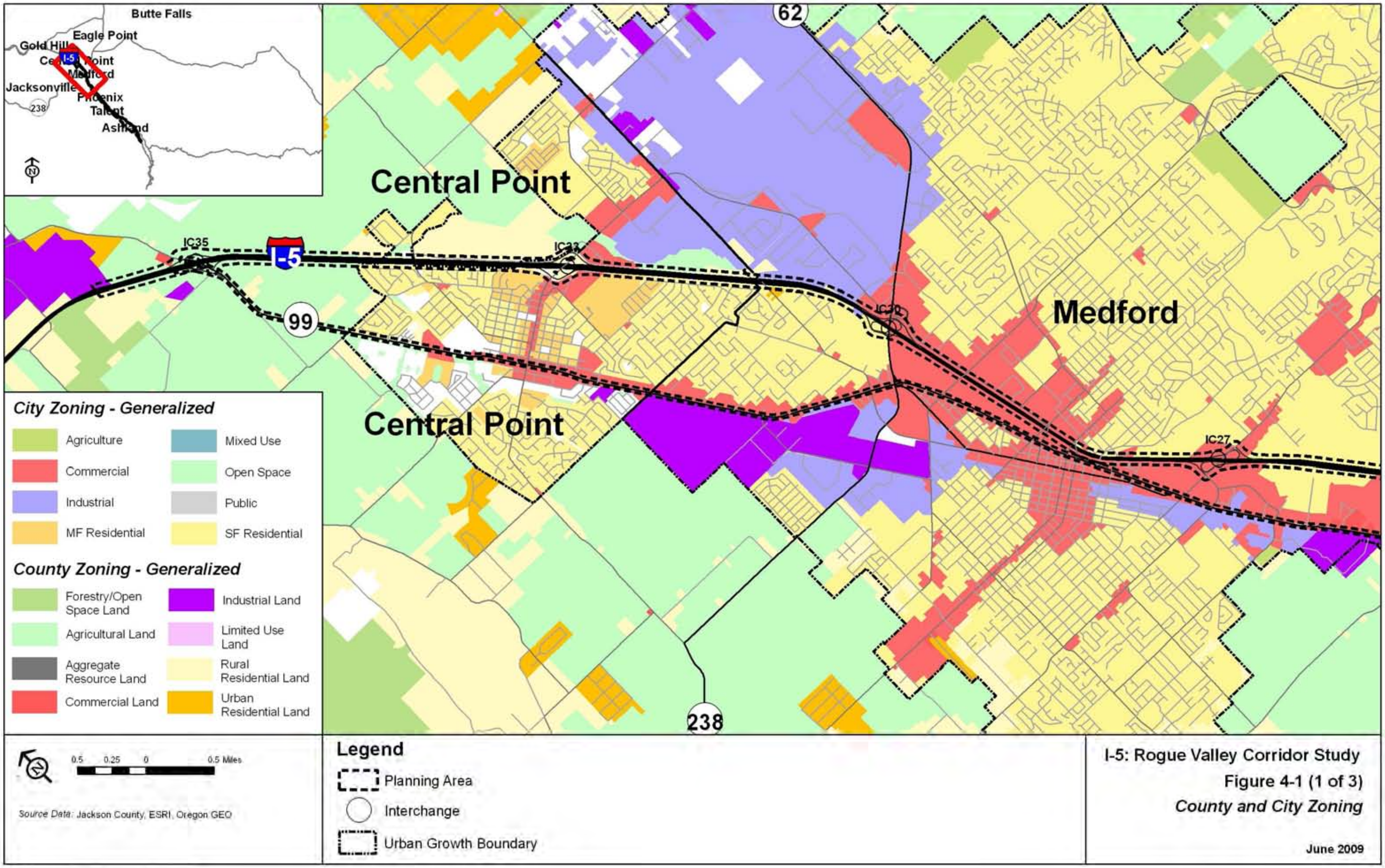
I-5 Corridor

Designated land uses along the west side of I-5 consist primarily of three residential compositions: Multiple Family Residential (R-3), Two-Family Residential (R-2), and Single Family Residential (R-1-6, R-1-8). Portions east of the I-5 corridor under Central Point jurisdiction are zoned for the Bear Creek Greenway. Jackson County Exposition Park (fairgrounds), located adjacent east of and adjacent to the I-5 right-of-way between Interchange 33 and the Upton Road overpass, is outside of Central Point city limits and, thus, under Jackson County jurisdiction. The Central Point Tourist and Office (C-4) zone is designated on the southwest and southeast quadrants of Interchange 33, with a smaller area designated at the northwest quadrant.

The Bear Creek Greenway district is intended to provide for environmental preservation and limited development within the district. The C-4 district purpose is to provide tourist and entertainment facilities to serve residents and tourists passing through the area. Transportation improvements in this zone may require a Conditional Use permit

OR-99 Corridor

The zoned land uses along the corridor are primarily commercial in nature though there are some open space, residential and mixed-uses as well. Much of this area is designated a TOD District or TOD Corridor. The intent of the TOD district and corridor is to "promote efficient and sustainable land development and the increased use of transit as required by the Oregon Transportation Planning Rule." Transportation improvements in this zone may require a Conditional Use permit and specific design standards. There is a Historic Preservation Overlay Zone along the corridor to protect the significant historical resources. Land uses affecting these resources may be subject to a Type 2 to Type 4 process or other form of land use review (see Section Historical and Archaeological Section above).

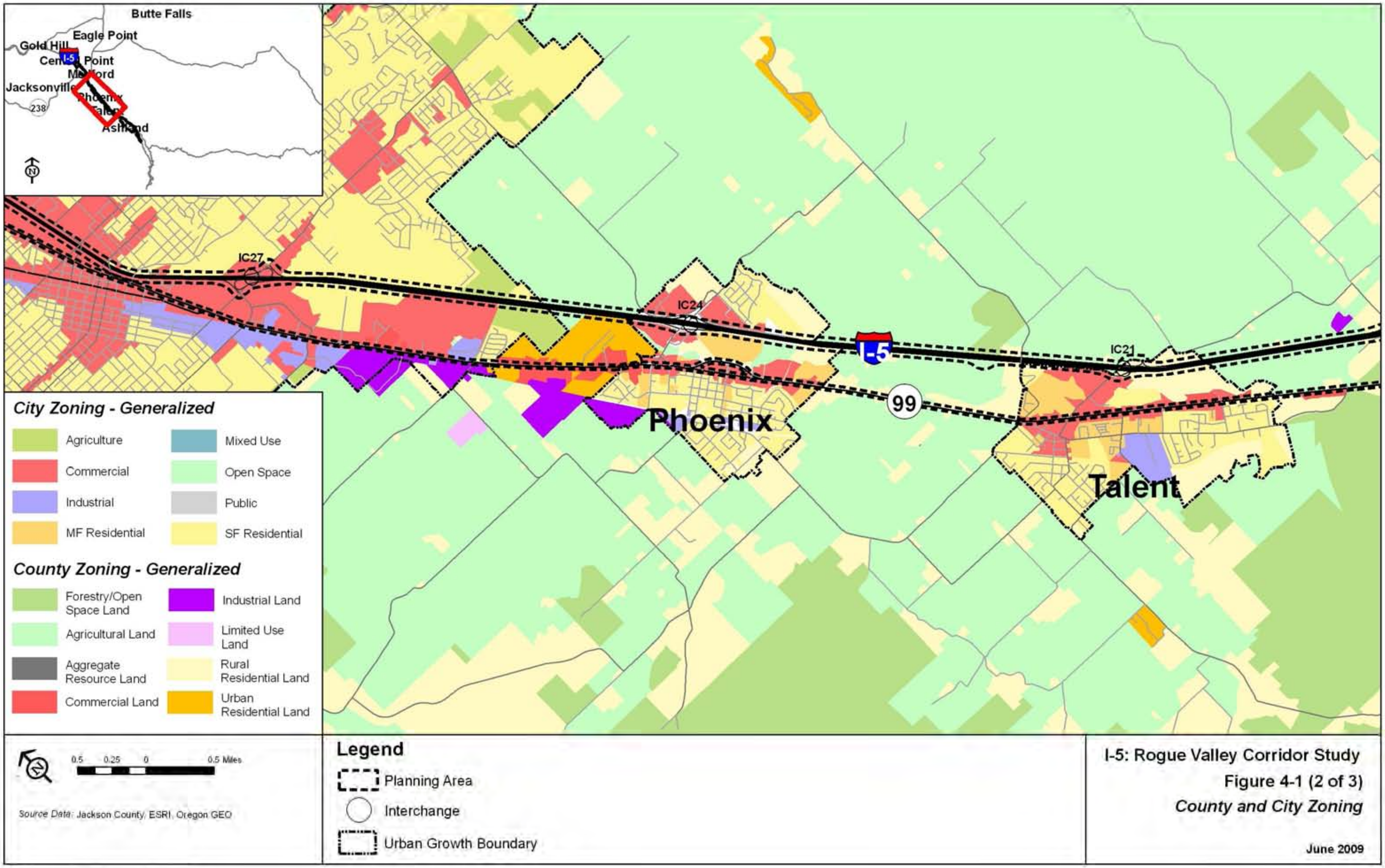


I-5: Rogue Valley Corridor Study

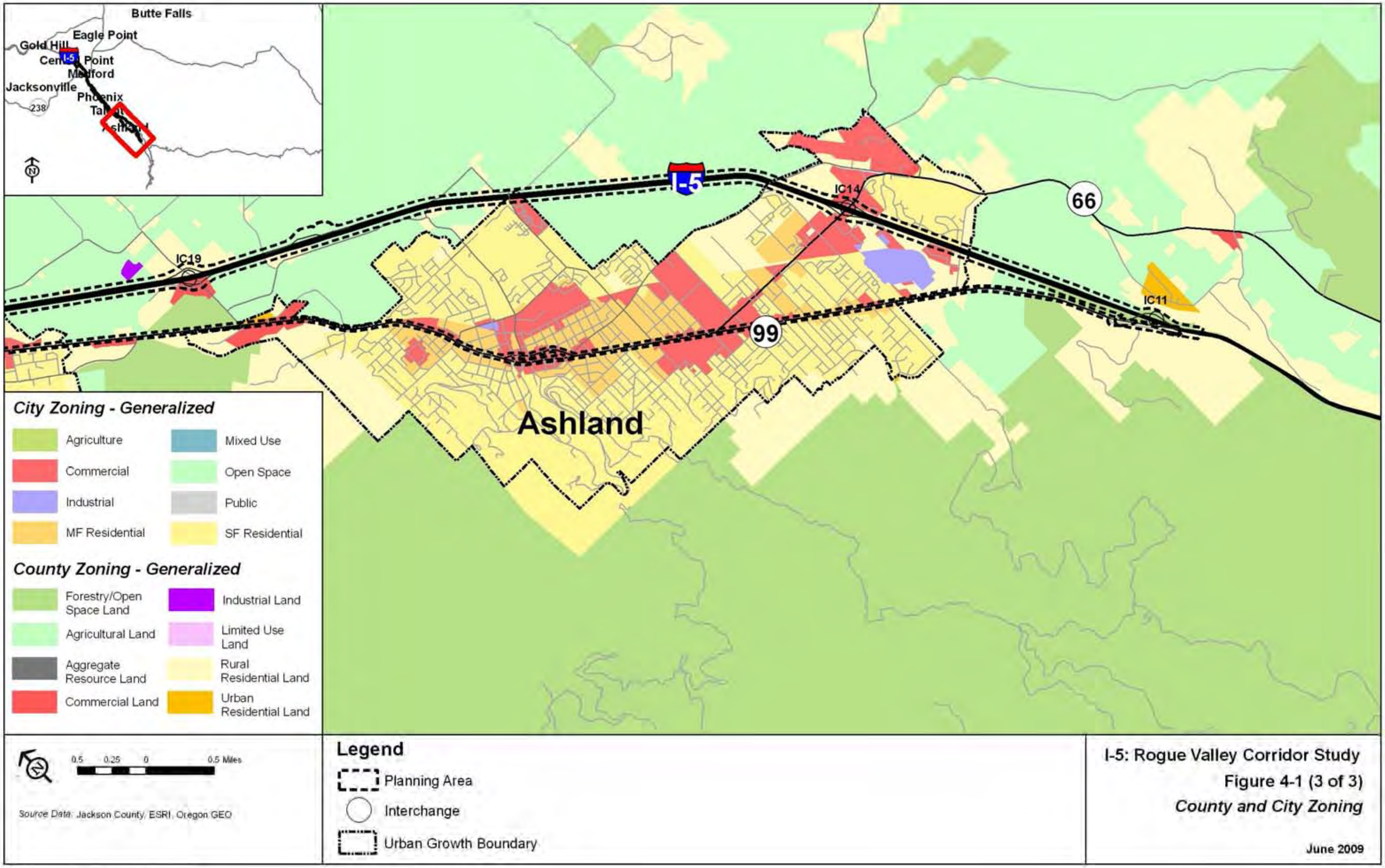
Figure 4-1 (1 of 3)

County and City Zoning

June 2009



I-5: Rogue Valley Corridor Study
Figure 4-1 (2 of 3)
County and City Zoning
June 2009



I-5: Rogue Valley Corridor Study
Figure 4-1 (3 of 3)
County and City Zoning

June 2009

Medford

I-5 Corridor

Properties surrounding the portion of the I-5 corridor through Medford are zoned similar to those occurring along OR-99 as the two corridors align within close proximity of each other. The land uses are commercial near Medford's downtown (Regional C-R, Community C-C, Heavy C-H) residential uses (Single Family – 6 Units/Acre: SFR-6, Single Family – 1 Units/Acre: SFR-00, Single Family – 10 Units/Acre: SFR-10, Multi-Family – 30 Units/Acre: MFR-30) along the northern and southern edges, and an area of industrial along the northeastern edge of the corridor. There is also a freeway overlay to regulate the use of freeway oriented signage. The Historic Preservation Overlay and the Central Business District overlay also apply to portions of the I-5 corridor.

OR-99 Corridor

Designated land uses near the OR-99 corridor are mostly commercial (Regional C-R, Community C-C, Heavy C-H) with some residential uses in the north eastern portion of the corridor (Single Family – 6 Units/Acre: SFR-6, Single Family – 1 Units/Acre: SFR-00, Single Family – 10 Units/Acre: SFR-10, Multi-Family – 30 Units/Acre: MFR-30). There is a Historic Preservation Overlay intended to "protect, enhance, perpetuate, and improve those buildings, structures, objects, sites, and districts that are of local, regional, statewide, or national historic significance." There is also a Central Business district overlay to recognize the unique and historic character of the downtown area as an asset to the community and to provide standards and criteria necessary for its continued development and redevelopment.

Phoenix

I-5 Corridor

The land use designations along the I-5 corridor are Commercial Highway (C-H), High Density Residential (R-3), and Bear Creek Greenway and Farm Residential. There is an I-5 overlay District intended to permit signs visible to travelers on the freeway recognizing the importance of freeway-oriented businesses to the area.

OR-99 Corridor

Land uses through the corridor are zoned Commercial Highway (C-H), High Density Residential (R-3), and Bear Creek Greenway and City Center (C-C). A city goal is to strengthen the City Center as the nucleus of the community. Thus, the City Center District is intended to support this goal through design and appropriate mixed-use standards. The goal of the area designated as Bear Creek Greenway is to maintain, as much as possible, the natural condition of the greenway via limited development standards. The Bear Creek Greenway standards state: *No person, firm, or corporation, whether public or private, shall cause or permit any excavation, fill, stream diversion, removal of vegetation, or other alteration of the natural environment of the Greenway, nor encroach upon any part thereof with buildings, footings, retaining walls, bridges, piers, abutments, dams, diversion weirs, rip-rap, or any other physical feature without first securing the express written consent of the Phoenix Planning Commission.* There is also a

Historic Overlay along OR-99 where historic resources are to be preserved and may not be altered or demolished without approval by the Historic Review Board.

Talent

Land use designations adjacent to the OR-99 corridor through Talent are commercial in nature, specifically Highway Commercial (CH), Interchange Commercial (CI), and Highway Central Business District (CBH). Past the commercial areas, the designated land uses change to residential, mainly Mobile Homes (RS-MH) and High Density Residential (RM-22). The only portion of property under City of Talent jurisdiction that abuts I-5 is zoned CH.

There are several districts, area plans and overlays in the corridor area:

- The Old Town District Design Standards purpose is "to respect and enhance the character of Talent's original core areas while maintaining the city's traditional, rural, vernacular architectural heritage."
- The Floodway, Parks, Greenway Overlay zone is intended to protect significant resources located within its boundaries that contribute to the unique character of the community. This zone sets minimum standards applicable to new development in or adjacent to areas designated as floodplains, greenways, wetlands, and riparian areas.
- The Historical Overlay is intended to protect historical resources because they contribute to the unique character of the community. Therefore, any projects that may affect these resources must go through design review.
- A supplement to the City of Talents Comprehensive Plan, the West Valley View Vision Master Plan aims to, among other things, create an accessible, multi-modal community The foundation of the Plan is reconfiguring and aligning some of the major streets that provide an entry into Talent such as OR-99.
- The Wagner Creek Greenway Connector Plan a key means to connect the downtown to the existing Bear Creek Trail for pedestrians and bicyclists. A portion of the Wagner Creek Greenway Trail has been constructed. The entire completed trail will be approximately 1.5 miles long. This trail will pass OR-99.

Ashland

I-5 Corridor

The only portion of the I-5 corridor that crosses through the City of Ashland occurs in the vicinity of Interchange 14 and the southeastern end of the UGB. There is a small area zoned commercial (C-1) and an area zoned health center (H-C). The H-C district is designed to "provide the type of environment suitable for the development of health related services and residential uses, and related activities, while reducing the conflicts between uses through appropriate design". The Detail Site Review Zone is also applicable to a portion of the Corridor Plan Area.

OR-99 Corridor

Land uses adjacent to the corridor through Ashland are varied, passing through Ashland's retail commercial district (C-1 – D overlay) with varying densities of residential areas (R-2, R-3) north and south surrounding the downtown core. Past downtown, the corridor passes through the Southern Oregon University campus. At the southern edge of the corridor, the former Croman Mill Site, an industrially zoned area is currently undergoing review for potential redevelopment as a mixed use employment center.

The C-1 district is designed to "stabilize, improve and protect the characteristics of those areas providing commercial commodities and services. "

The intent of the Detail Site Review Zone is to: *regulate the manner in which land in the City is used and developed, to reduce adverse effects on surrounding property owners and the general public, to create a business environment that is safe and comfortable, to further energy conservation efforts within the City, to enhance the environment for walking, cycling, and mass transit use, and ensure that high quality development is maintained throughout the City.*

Jackson County

I-5 Corridor

Land use designations along the I-5 corridor within Jackson County jurisdiction are primarily agricultural Exclusive Farm Use (EFU) with a small area of industrial north of Central Point and a small area of rural residential in the southern end of the corridor.

OR-99 Corridor

The OR-99 corridor within Jackson County is largely designated agricultural (EFU) with intermittent commercial and industrial uses. The majority of industrially zoned lands is situated between Central Point and Medford and the commercial properties are primarily between Medford and Phoenix with high density residential to the east that stretches to the I-5 corridor.

The purpose of the Agricultural Land designation is to implement Statewide Planning Goal 3 by preserving agricultural lands for farm use and preventing uses and activities incompatible with farm-related activities. Commercial Land is established to provide markets in appropriate locations for the efficient and economic exchange of goods and services. The Industrial Land designation is intended to provide a supply of sites of suitable sizes, types, locations, and service levels to meet the economic objectives of the region. Urban Residential Lands are areas that have been allowed through the Statewide Goal exception process or are within urban growth, urban containment, or urban unincorporated community boundaries.

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 (DOT) and their agencies. Highway projects that use public parks 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; or
- 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 4(f) resource is not "prudent," one must find that there are unique problems or unusual factors involved with the use of such an alternative. This means that the cost, social, economic and environmental impacts, and/or community disruption resulting from such alternatives reach extraordinary magnitudes.

Section 4(f) resource lands within the project area consist of the parks described in the following subsection plus historic structures discussed previously in *Section 3: Historic and Archaeological Resources* and all bicycle paths. In addition, structures eligible or potentially eligible for inclusion on the NRHP within the Corridor Plan Area but not yet identified are potential candidates for Section 4(f) status. 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 purpose and need for the project would impact some 4(f) property, then the alternative with the least impact must be selected unless it is not feasible and prudent.

Parks and Recreation Areas

The Bear Creek Greenway (also discussed in *Section 3: Historic and Archaeological Resources*) is a narrow corridor of public-owned land that follows the lush Bear Creek streambed from Ashland to Central Point. The Greenway is spread out over 600 acres of pristine southern Oregon landscape and will one day include a continuous 21-mile path from Oak Street in Ashland to the Seven Oaks Interchange in Central Point.

Parks located within or near the corridors include:

Central Point

I-5 Corridor

- Summerfield Park (2 acres, undeveloped), runs along Upton Road to Scenic Avenue
- Glen Grove Wayside Park (.25 acres), 1138 Glengrove Avenue

<u>OR-99 Corridor</u>

- Griffin Oaks Park (.56 acres), Silver Creek Road
- Civic Park, Silver Creek Road

Medford

<u>I-5 Corridor</u>

- Hawthorne Park and Pool (20 acres), Jackson Street
- Table Rock Park (undeveloped), Table Rock Road
- Railroad Park (49 acres), Central Lake Highway
- Bear Creek Park (100 acre), Highland Drive and Barnett Road, near I-5 Exit 27.
- Larson Creek Multi-Use Path is being developed to link the Bear Creek Greenway to neighborhoods along Larson Creek.

<u>OR-99 Corridor</u>

- US Cellular Community Park, south of Barnett Road between OR-99 and I-5
- Veteran's Memorial Park, corner of Stewart Avenue and OR-99

Phoenix

<u>I-5 Corridor</u>

- Blue Heron Community Park (24 acres)
- City Hall Park Facilities, 112 W 2nd

Talent

<u>I-5 Corridor</u>

- Whacker's Hollow/De Young (19.49 acres) located along I-5
- Lynn Newbry Park (2.46 acre) located along I-5

Ashland

<u>OR-99 Corridor</u>

- Lithia Park (93 acres), downtown, off Main Street
- Triangle Park (.5 acre), between Siskiyou Boulevard, Iowa and Morton Streets.
- Bluebird Park (.25 acre) along Ashland Creek on the corner of E. Main and Water Streets.
- Scenic Park (1.5 acres) north of downtown Ashland, near the intersection of Maple Street and Scenic Drive.

Jackson County

There are no parks along the I-5 and OR-99 corridors within Jackson County jurisdiction.

Community Features

Community features located within or near the I-5 and OR-99 corridors include:

Central Point

I-5 Corridor

- Jewett Elementary, 1001 Manzanita
- Rogue Valley Family Fun Center, Penninger Rd., Central Point, OR 97502

OR-99 Corridor

- Central Point City Hall, 140 South Third Street, Central Point, 97502
- Crater High School, 655 N. 3rd, Central Point, 97502
- Mae Richardson Elementary, 200 West Pine Street, Central Point, 97502
- Central Point Elementary, 450 S 4th St., Central Point, 97502
- Oregon State Police, 4500 Rogue Valley Hwy, Central Point, 97502
- Central Point Senior Center 123 N. 2nd Street, Central Point, 97502
- RVCOG, 155 N. 1st Street in Central Point, Oregon
- Jehovah's Witnesses Central, 434 Oak St, Central Point, OR 97502
- Fire Marshall, 4500 Rogue Valley Hwy, Central Point, OR 97502

Medford

I-5 Corridor

- Providence Medford Medical Center: Occupational Medicine, 1390 Biddle Rd, Medford, OR

OR-99 Corridor

- Crossroads School, 400 Earhart St, Medford, OR 97501
- Table Rock Fellowship, 3610 N Pacific Hwy, Medford, OR 97501
- Jerusalem Center Church, 6 Mace Rd, Medford, OR 97501
- Rogue Valley Fellowship, 2373 S Pacific Hwy Medford, OR 97501

Phoenix

OR-99 Corridor

- Rogue Valley South, 4624 S Pacific Hwy Phoenix, OR 97535
- First Baptist Church, 4655 S Pacific Hwy, Phoenix, OR 9753
- Southern Oregon Esd, 5465 S Pacific Hwy, Phoenix, OR 97535
- Jackson County Fire District No 5, 5811 S Pacific Hwy, Phoenix, OR 97535

Talent

OR-99 Corridor

- Valley Bible Fellowship, 616 S Pacific Hwy, Talent, OR 97540

Ashland

I-5 Corridor

- Ashland Community Hospital: Memory Care Center, 905 Skylark Place, Ashland, OR 97520

OR-99 Corridor

- Ashland Community Hospital, 727 N Main St, Ashland, OR 9752
- Jehovah's Witnesses Ashland Kingdom Hall, 700 N Main St, Ashland, OR 97520
- Methodist First United Methodist Church Ashland, 175 N Main St, Ashland, OR 97520
- Ashland Fire & Rescue, 455 Siskiyou Blvd, Ashland, OR 97520
- Christian Missionary Alliance Bible Chapel, 748 Siskiyou Blvd, Ashland, OR 97520
- Southern Oregon University, 1250 Siskiyou Blvd, Ashland, OR 97520
- Chabad Jewish Center-S Oregon, 804 Hillview Dr, Ashland, OR 97520
- First Baptist Church of Ashland, 2004 Siskiyou Blvd Ashland, OR 97520
- Bellview Elementary School, 1070 Tolman Creek Rd Ashland, OR 97520
- Unity In Ashland, 1050 Tolman Creek Rd, Ashland, OR 9752
- La Mare Reservoir
- Ashland Superintendent's Office, 885 Siskiyou Blvd Ashland, OR 97520
- Trinity Episcopal Church, 44 N 2nd St, Ashland, OR 97520
- Meyer Memorial Lake, OR-99
- First Presbyterian Church of Ashland: Calvin Hall, 1615 Clark Ave, Ashland, OR 97520
- County of Jackson Library Services: Ashland Branch Library, 410 Siskiyou Blvd Ashland, OR 97520

Jackson County

I-5 Corridor

- Jackson County Fairgrounds

OR-99 Corridor

- Billings Reservoir

5. SUMMARY OF EXISTING FACILITIES

The Corridor Plan covers an area approximately 24 miles in length, with roadways crossing over flat to rolling terrain. There are nine interchanges, two ports of entry locations (one northbound and one southbound), and one rest area, serving southbound traveling motorists only, located at Exit 22. This section provides a short description of the interchanges, ports of entry, roadway inventory, bicycle and pedestrian facilities, emergency vehicle turnouts, Siskiyou Pass closure impacts, and longer combination vehicle operations.

Interchanges

The Corridor Plan Area includes nine interchanges. Features of each interchange are described below.

Interchange 11 (South Ashland)

Interchange 11 provides access to Ashland via OR-99. The interchange was constructed in 1964 as a Y-interchange with directional service to and from the south via a northbound off-ramp and a southbound on-ramp.

Interchange 14 (Green Springs)

The interchange provides the main link between the I-5 corridor and the southern end of Ashland via Ashland Street, also known as the Green Springs Highway and OR 66. This crossroad also provides one of the few interstate crossings in the vicinity and carries significant local vehicle, bicycle, and pedestrian traffic volumes that do not enter or exit the interstate. The existing interchange is a standard diamond configuration, comprising a two-lane bridge with unsignalized ramp terminals at both ends. A draft IAMP is under review by ODOT and the local jurisdictions.

Interchange 19 (North Ashland)

The interchange provides the main link between the I-5 corridor and the northern end of Ashland via OR-99, which intersects South Valley View Road approximately 2,500 feet south of the interchange. Currently a two-lane facility, South Valley View Road has high lane volume because of significant volumes of intraregional trips between Ashland and Medford. In addition to the heavy movement of intraregional trips, the interchange also serves local residents and businesses in the interchange vicinity. South Valley View Road is planned for expansion into a five-lane facility between the interchange and the OR-99 intersection. A draft IAMP is under review by ODOT and the local jurisdictions.

Interchange 21 (West Valley View)

Interchange 21 provides access to the City of Talent via stop-controlled intersections on Valley View Road. The interchange has a gull wing configuration for the northbound freeway ramp terminals and a half-diamond configuration for the southbound terminals.

Interchange 24 (Fern Valley)

Interchange 24 provides access to the City of Phoenix via signalized intersections on Fern Valley Road. The interchange is a standard diamond interchange with frontage roads on both sides of the freeway. Development of an IAMP and a Draft EA are occurring simultaneously at the interchange. The purpose of both projects has been to "reduce congestion and improve operational conditions at the interchange."

Interchange 27 (South Medford)

Interchange 27 is an urban interchange that serves the entire southern part of Medford and connects I-5 with the city's commercial core and OR-99. The existing partial cloverleaf configuration of the interchange utilizes ramps that connect I-5 to Barnett Road. A proposed new interchange will replace the existing interchange at Barnett Road with one connecting to a new arterial, the Garfield-Highland Connector. The new interchange is designed as a Single Point Urban Interchange that brings the I-5 northbound and southbound ramps to a single intersection with the cross street. Once its ramps to I-5 are severed, Barnett Road will fly over I-5 and serve as the main east-west arterial for the South Medford area.

Interchange 30 (North Medford)

Interchange 30 connects with OR 62 (Crater Lake Highway) and serves the north end of the Medford area. The OR 62/I-5 interchange area is a critical modal connection for the OR 62 corridor, which extends from Medford to White City in Jackson County, Oregon. The interchange is a modified diamond with loop on-ramps to eliminate the need for left-turn traffic signal phases on OR 62.

Interchange 33 (Central Point)

Interchange 33 serves the northern end of the Medford area and the City of Central Point via Pine Street, a five-lane signalized arterial that is the primary east-west link between OR-99 and I-5 in the area. The interchange is a standard diamond interchange with signalized intersections on Pine Street.

Interchange 35 (Seven Oaks)

Interchange 35 is principally a rural interchange that connects I-5 with OR-99 to the south and Blackwell Road to the north. OR-99 is a district-level highway that serves the nearby community of Central Point to the south. Blackwell Road serves some industrial lands northeast of the interchange and provides a connection with White City to the southeast.

The interchange is currently under construction to improve the safety and function of both the overpass and the connections with OR-99 and Blackwell Road. In addition to building a new Blackwell Road overpass, the southbound off-ramp will be reconfigured as a loop ramp connecting to OR-99 from the east. The other ramps will also be constructed to meet highway design standards and improve spacing between ramps.

Weigh Stations

There are two weigh station facilities within the Corridor Plan area, one northbound and one southbound. The northbound weigh station, located south of Interchange 19 at mile point (MP) 18, is significantly larger than the one positioned southbound, and has parking available for approximately 30 trucks. The approximate 2,500-foot distance between the weigh station on-ramp and the off-ramp to Interchange 19 is well below recommended interchange spacing standards, which—combined with the inadequate acceleration length on the weigh station on-ramp—results in poor weaving and merging operations at this location. The northbound facility is tentatively scheduled for renovations that include adding a restroom facility for drivers.

The southbound weigh station, located directly across from the northbound facility, is a smaller facility limited to a truck scale, with no space available for truck parking. Expansion of this facility, including an extended off-ramp and provision of parking spaces, is becoming a high priority for ODOT's Motor Carrier Division.

Rest Area

Only one rest area is located along I-5 within the Corridor Plan area. Situated at MP 22, the Suncrest Rest Area serves southbound I-5 motorists only and has restrooms, picnic tables, drinking water, telephones, accessible facilities, and vending machines. In tandem with efforts to expand the southbound Port of Entry facility, which would provide a more accommodating rest stop for trucks, efforts are also under way to construct a new rest area welcome center in the vicinity of MP 12 that would be exclusively for private motorists.

Roadway Inventory

I-5 through the Rogue Valley region comprises a four-lane cross-section with two 12-foot lanes in each direction. The posted speed in the corridor is 65 mph, except in the Medford area between Interchange 27 and Interchange 30, where the posted speed drops to 55 mph. The roadway is generally non-barrier-separated with a 76-foot-wide vegetated median. A 16-foot-wide barrier median is used on the viaduct from MP 27 to MP 30.6 and from MP 12.99 south into the Siskiyou Pass. Shoulders through the Corridor Plan area are paved and vary in width from 4 feet to 24 feet, with the left (inside) shoulder generally 4 feet wide and the right (outside) shoulder generally 10 feet wide. More detailed lane geometry is provided in **Appendix A**.

Bicycle and Pedestrian Facilities

Although bicyclists do on occasion ride along the I-5 shoulder, the high speed limited access function of the freeway is not conducive for non-motorized modes of travel. Nonetheless, bicyclists are not restricted from riding along the shoulder of I-5 except on the viaduct. The interchanges and overpasses of I-5 have varying levels of bicycle and pedestrian facilities. The Bear Creek Greenway and multi-use trail is a regional bicycle and pedestrian facility that generally parallels I-5 between Ashland and Central Point. The greenway crosses I-5 at multiple locations between Interchange 21 and Interchange 30. With recent completion of a segment of the greenway in the vicinity of Interchange 27 as part of the South Medford Interchange project, the multi-use trail is now a continuous 21-mile path between Interchange 35 north of Central Point to Oak Street in Ashland.

Emergency Vehicle Turnouts

Field review of I-5 found one designated emergency vehicle turnout in the corridor at mile point 16.7 near the North Mountain Avenue overpass.

6. EXISTING TRAFFIC OPERATIONS

Existing traffic counts were collected by ODOT along I-5 and at all interchange ramps. In February and March of 2008, 24-hour counts were collected on ramps. Between 2007 and 2008, 16-hour counts were collected on mainline I-5 south of Exit 11, north of Exit 19, and north of Exit 33. The counts were adjusted and balanced using the ODOT Analysis Procedures Manual to a year 2008 Design Hour Volume (DHV) for each ramp and mainline segment between ramps within the Corridor Plan area.

Traffic volumes vary across the Corridor Plan area, with the lowest volumes at the southern end of the area and the highest volumes in the Medford area. Traffic south of Interchange 14 (Green Springs) is composed primarily of long-distance travelers crossing the Siskiyou Mountains. Approximately 14,700 vehicles per day pass through this southern vicinity of the corridor with a relatively high proportion (35 percent) of that volume comprised of Heavy Vehicle (HV) operation – HV being generally defined as semi-trucks with one trailer or more. The calculated DHV is 1,725 vehicles per hour (vph), with an HV percentage of approximately 25 percent, which is representative of actual traffic flow during the PM peak hour during the summer months.

North of Interchange 14, traffic volumes increase to approximately 39,600 vpd around the Talent area and Interchange 21 (West Valley View), but the HV percentage drops to around 15 percent, because the traffic composition is influenced more by the surrounding urban and rural land uses of the Talent and Ashland areas. The mainline DHV is approximately 4,475 vph, with an HV percentage of 8 percent.

Traffic volumes peak in Medford between Interchange 27 (South Medford) and Interchange 30 (North Medford), with approximately 48,200 vpd and a HV percentage of 13 percent. The mainline DHV is approximately 5,315 vph, with an HV percentage of 8 percent.

At the north end in the Central Point area north of Interchange 35 (Seven Oaks), traffic volumes drop to approximately 38,800 vpd and the HV percentage increases to around 16 percent. The mainline DHV is approximately 3,365 vph, with an HV percentage of approximately 8 percent.

More detailed traffic volumes by direction on the mainline and ramps, are shown in **Figure 6-1**. Detailed traffic calculations and traffic counts are in **Appendix B**.

Existing Condition Traffic Analysis

Transportation professionals have established various operating standards for measuring traffic capacity of roadways. Each standard is associated with a particular level of service (LOS). The LOS concept requires consideration of factors such as travel speed, delay, frequency of traffic flow interruptions, relative freedom for traffic maneuvers, driving comfort, convenience, and operating cost. Six standards have been established, ranging from LOS A (where traffic is relatively free flowing) to LOS F (where the street system is totally saturated with traffic and movement is very difficult).

A comparison of traffic volume demand to capacity is another method of evaluating how well a roadway segment is operating. This comparison is presented as a volume-to-capacity (v/c) ratio. A v/c ratio between 0.0 and 1.0 indicates that recorded volume is less than maximum volume capacity of the roadway. When the v/c ratio is low, traffic conditions are generally free flowing, with minimal congestion and low delays for most roadway segments. As the v/c ratio approaches 1.0, traffic becomes more congested and unstable, with longer delays. Should an incident occur, such as a stall or crash, very long delays and queues would result. If the v/c ratio is over 1.0, the traffic volume demand is greater than capacity, and almost all vehicles would experience queuing and congestion on the roadway. The resulting congestion would also likely affect roadway segments operations in subsequent hours.

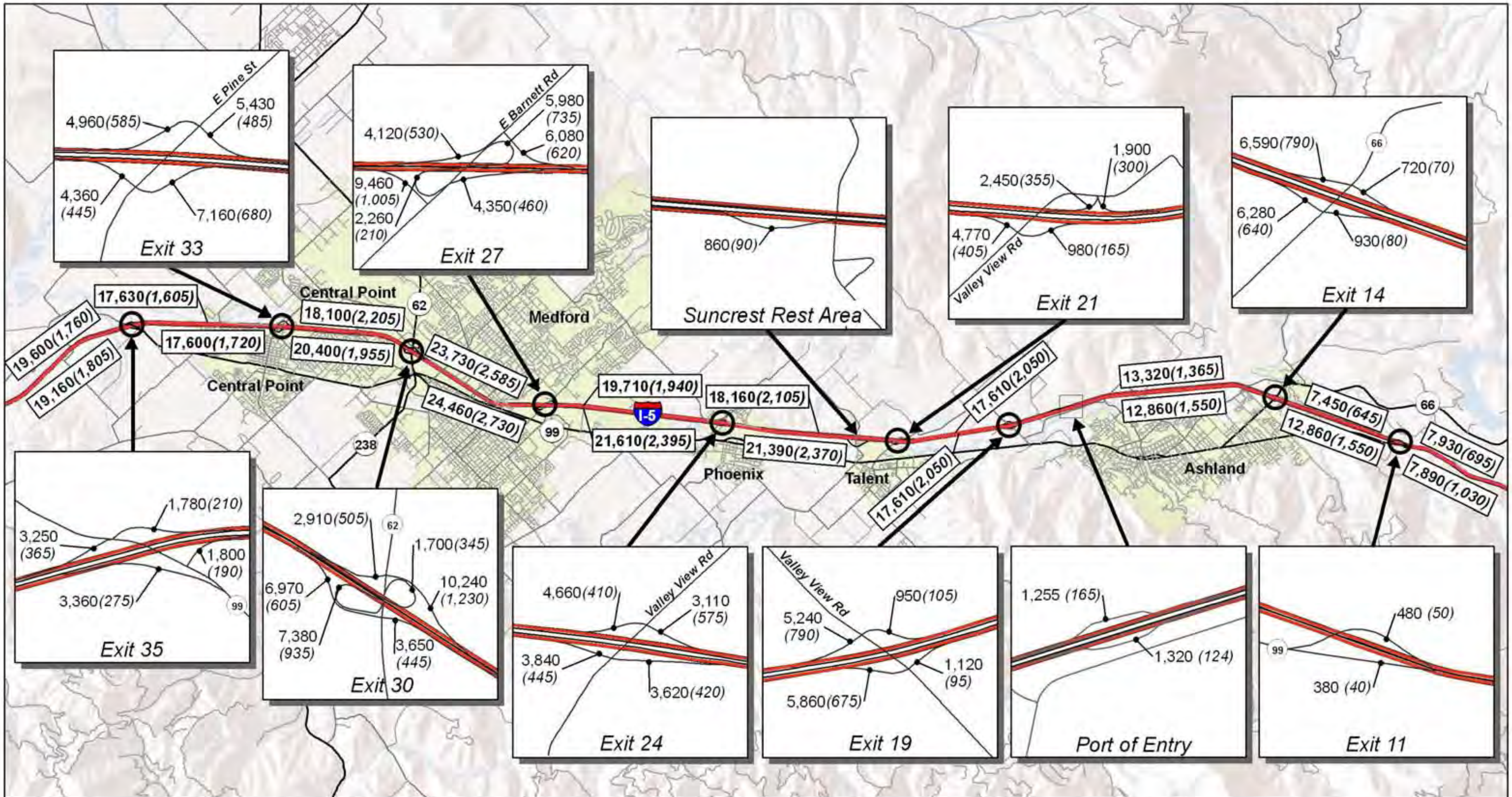
Freeway Operations

Freeway LOS is typically analyzed using the 2000 Highway Capacity Manual (HCM) procedures, which use vehicle density as the basis for determining LOS. **Table 6-1** summarizes the LOS criteria for freeway operations based on the manual's criteria.

Table 6-1. Level of Service Criteria for Freeway Segments

Level of Service	Density (passenger cars per mile per lane- pc/mi/ln)		
	Basic Freeway Segment	**Weaving Segment**	**Ramp Merge and Diverge Areas**
A	≤ 11	≤ 10	≤ 10
B	> 11 and ≤ 18	> 10 and ≤ 20	> 10 and ≤ 20
C	> 18 and ≤ 26	> 20 and ≤ 28	> 20 and ≤ 28
D	> 26 and ≤ 35	> 28 and ≤ 35	> 28 and ≤ 35
E	> 35 and ≤ 45	> 35 and ≤ 43	> 35
F	> 45	> 43	Demand exceeds capacity

Source: Transportation Research Board, Highway Capacity Manual, 2000, p. 23-3 for basic freeway segments, p. 24-3 for weaving segments, and p. 25-5 for ramp merge and diverge areas.



2 1 0 2 Miles

Source Data: Jackson County, ESRI, ODOT, Oregon GEO

Legend

Interchange — 10,000*(1,000)* Average Daily Traffic *(Design Hour Volume)*

Port of Entry

Note: Design Hour Volume is a theoretical volume generally represented by the PM peak hour volume

I-5: Rogue Valley Corridor Study

Figure 6-1

Existing Average Daily Traffic and Design Hour Volume

June 2009

With the existing traffic observations indicating little to no congestion on I-5, the HCM Freeway Facilities Methodology was used to analyze freeway operations using the Highway Capacity Software (HCS). The procedure isolates a freeway system into a succession of freeway sections (i.e., basic, weaving, and ramp). Operations in each freeway section are compared to the adjacent sections, and adjustments are made to account for the interaction between freeway sections. This methodology is not as robust as microsimulation, but it does produce reasonable results for uncongested conditions, as were observed on I-5 under existing conditions within the Corridor Plan area.

Traffic Performance Thresholds

Traffic operational standards are used by agencies to ensure satisfactory traffic mobility within their respective jurisdictions. The ODOT 1999 OHP contains several policies for maintaining highway mobility. The OHP's Highway Mobility Standards (Policy 1F) establish maximum v/c ratio standards for peak hour operating conditions for all highways in Oregon. The 2006 amendment to the OHP provides v/c ratios that are to be used for existing conditions and no-build planning purposes. I-5 is designated as a state and federal freight route on the national highway system. As listed in Table 4.5 of the OHP, the operational standard for existing and no-build conditions on I-5 is a maximum v/c ratio of 0.80.

OHP amendment 00-04 allows the northbound and southbound off-ramps of the South Medford Interchange to have a v/c ratio greater than 1.0 for four hours daily until the new South Medford Interchange is constructed.

Freeway Operational Findings

Analysis of existing DHV, which is generally representative of PM peak hour operations in the summer, using the HCS freeway facilities model, shows I-5 operations at LOS C or better in the northbound direction with a peak v/c ratio of 0.61 in the Medford area between Interchange 27 and Interchange 30. In the southbound direction, I-5 also operates at LOS C or better, except between Interchange 30 and the off-ramp to Interchange 27, which operates at LOS D with a v/c ratio of 0.65. These findings indicate that the freeway system is operating with relatively free flow operations, except southbound approaching Interchange 27, which currently is nearing congested conditions during typical PM peak hour operations. These results also indicate that the system has available capacity to accommodate some future growth in traffic demand before capacity is reached. Detailed operational results are in **Appendix B**.

Operational Issues

Operations along the Corridor Plan area are also impacted by other attributes in addition to traffic volumes and roadway capacity. Two of the issues repeatedly heard during interviews and meetings with local citizens are delays associated with closure or restricted access across the Siskiyou Pass due to inclement weather, and changeover of longer combination vehicles (e.g. triple trailer trucks).

Siskiyou Pass Closure Impacts

At 4,310 feet elevation, the Siskiyou Summit marks the highest point along the entire I-5 corridor from Mexico to Canada. The pass features some of the steepest grades in the Interstate Highway System, dropping 2,300 feet into the Rogue Valley region within a distance of seven miles. In addition, the pass includes several hazardous curves and is frequently hit with bad weather (including snow, ice, and fog) during the winter season. Consequently, it is common for the highway to be closed one to four times during the winter months by transportation authorities due to hazardous conditions. The speed limit is 55 mph (90 km/h), but lower limits are set for larger vehicles.

Based on information received by the project team, closure of the Siskiyou Summit during these inclement winter weather events causes substantial turmoil along the interstate corridor as far north as Grants Pass, with truck stops and rest areas becoming staging areas until the summit once again reopens. However, the most severe impacts associated with closure of the summit occur in the vicinity of Interchange 14 in Ashland. Even limited restrictions caused by chaining requirements, which do not necessarily close the corridor, disrupt interstate operations as trucks and vehicles queue along the interstate in the vicinity of Interchange 14. Passenger cars tend to pose a minimal impact, since local motorists tend to stay home during these events or, if from outside the area and passing through, they check into area hotels. The high impacts in the vicinity of Interchange 14 involve the high volume of trucks waiting to cross the summit and finding a place for them to wait. At the interchange, approximately 90 percent of the total roadway freight truck volume lines up along the interstate shoulder and southbound on-ramp. The remaining spillover truck volume tends to queue up on Ashland’s local streets, such as Washington Street and Mistletoe Road, and in parking lots, primarily at the Bi-Mart located off of Tolman Creek Road south of Ashland Street.

Longer Combination Vehicles (LCV)

Longer combination vehicles (LCVs) are among the largest vehicles on our nation’s highways. Typically a large truck with tractor-trailer configurations of two or more trailers, LCVs may exceed 80,000 pounds in gross vehicle weight and approach 120 feet in overall length. LCVs are generally classified under three vehicle types: Rocky Mountain double, turnpike double, and triple trailer.

Rocky Mountain doubles consist of one long trailer ranging from 45 to 48 feet in length followed by a shorter trailer of 26 to 28 feet in length. Turnpike doubles tow two long trailers each 45 to 48 feet in length. Finally, the triple trailer configuration consists of three shorter trailers, each ranging from 26 to 28 feet in length.

LCVs are permitted in some states and prohibited or limited to certain types in others. For example, California restricts all three LCV categories on their interstates and state routes, while Washington only allows for the Rocky Mountain doubles. Oregon restricts Rocky Mountain doubles and turnpike doubles, but it permits the short double and triple trailers—except south of Interchange 14 in Ashland, where triple trailers are not permitted.

The various limitation measures imposed on these vehicles among the three "I-5 States" require truck freight delivery operators to manage changeover locations in order to maximize the cargo-carrying capacity per driver to the extent allowed within the prospective states. Therefore, changeover locations are staged in the least restrictive state along the corridor, which, in the case of I-5, is Oregon. The Rogue Valley region is the logical location for this changeover to occur in the southern end of the Oregon I-5 corridor where, for example, freight delivered south via triple trailers must unhook to a single trailer configuration before continuing into California and, likewise, freight destined north into Oregon from California can add trailers into either the Rocky Mountain double or triple trailer configuration. The process is repeated in the Portland region at the northern end of the Oregon I-5 corridor before entering, or after leaving, Washington.

Individual companies that use LCVs through Oregon typically have their changeover sites situated in the Medford-Central Point area east of I-5 in the vicinity of the Rogue Valley-Medford International Airport. Although not concentrated within a specific location, nonetheless these sites enable ready access to I-5 via either Interchange 30 or Interchange 33. These large vehicles still must traverse local city streets through commercial districts and skirt some existing residential areas.

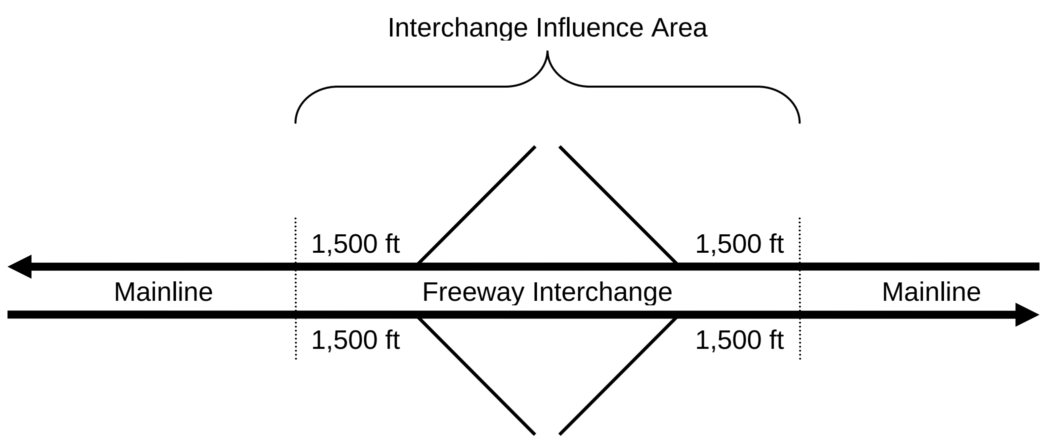
7. CRASH HISTORY

A crash analysis was performed for the mainline of I-5 for the full length of the corridor from one mile north of Interchange 35 to one mile south of Interchange 11. The crash analysis was conducted to identify existing high crash locations or consistent crash patterns.

Analysis Procedure

The analysis included a review of the last five years of ODOT-provided Planning Research Corporation (PRC) crash listings (2003 to 2007), ODOT Safety Priority Index System (SPIS) data, and calculated crash rates. The procedures used to analyze the data are described in the following paragraphs.

Crash data contained in the PRC reports was summarized by operational segment. The operational segments were divided, using HCM as a guide, into mainline segments and interchange influence area segments. The mainline segments are the basic freeway segments on I-5 between freeway interchanges. The interchange influence area segments include interchange ramps, freeway lanes between an interchange on-ramp and off-ramp and freeway lanes within 1,500 feet of the given interchange ramps, as illustrated below. Data were summarized by type and severity for each operational segment of the freeway. After being summarized and attributed to the appropriate segment, crash rates were calculated along the mainline. Ramps were not included in the crash rate calculations.



Crash Reports

PRC reports are generated by ODOT personnel in the Crash Analysis and Reporting Unit from statewide crash databases. The PRC crash listings were obtained from ODOT for the most recent five complete years of reported crashes. It should be noted that the crashes listed are only the crashes reported. From this listing, the type, year, location, and severity of each accident were analyzed.

Crash Rates

The crash rates were calculated from the PRC crash reports. Crash information collected represents crashes that were reported. In Oregon, legally reportable crashes are those involving death, bodily injury, or damage to any one person's property in excess of $1,000 from August 31, 1997, through December 31, 2003, or $1,500 after January 1, 2004.

The segment crash rates were calculated using the following equation:

$$rate_{segment} = \frac{(Crashes \cdot 1{,}000{,}000)}{(365 \cdot Years \cdot Length \cdot ADT)}$$, where

rate segment	= Crash rate per Million Vehicle Miles Traveled (MVMT)
Crashes	= Number of crashes during the time segment
Years	= Number of years being studied
ADT	= Average Daily Traffic (ADT) volumes
Length	= Length of roadway segment being studied (for segment rates)

The number of crashes was determined from the PRC reports. The ADT for corridor crash rates was obtained for each year by averaging the ADT volumes within the corridor presented in the ODOT Transportation Volume Tables (if multiple ADTs are presented). Crash rates were then calculated for the entire five-year (2003 - 2007) study period, using the average of each year's ADT.

Corridor Crash Findings

The results of the I-5 crash analysis are summarized below and displayed in **Figure 7-1.** For each of the segments, the data is summarized by crash type, crash severity, crash rate, and comparable crash rate for the five-year period between 2003 and 2007.

Overall Summary

This section provides a summary of all the analyzed crash data, including mainline I-5 in both directions and the interchange ramps. These are reported crashes that were recorded as occurring on mainline I-5 or on the on-ramps and off-ramps to I-5. Crashes recorded on the connecting roadways, intersections, and overpasses were not included in this analysis. For the full length of the corridor from one mile north of Interchange 35 to one mile south of Interchange 11 there were a total of 396 reported crashes between 2003 and 2007. Approximately 20 percent of the total crashes involved heavy trucks. There were 221 crashes in the northbound direction (56 percent of the total) and 175 crashes in the southbound direction (44 percent of the total). The crashes are spread along the full length of the corridor, with approximately 60 percent of the crashes between Interchange 30 in Medford and Interchange 21 in Talent. About half of the crashes were crashes with only property damage, and the other half resulted in at least one injury. There were a total of seven fatalities, with six of those occurring on mainline I-5.

On mainline I-5, the majority of crashes occurred during the day and under clear and dry conditions. The most common causes of crashes were driving improperly or driving too fast, with almost 50 percent of the crashes resulting in property damage only. Friday was the most common day of the week for crashes, and 2006 had the most crashes in a year. Rear-end crashes were the most common type of crash recorded, followed by fixed-object crashes, side-swipe crashes, and non-collision crashes.

Northbound

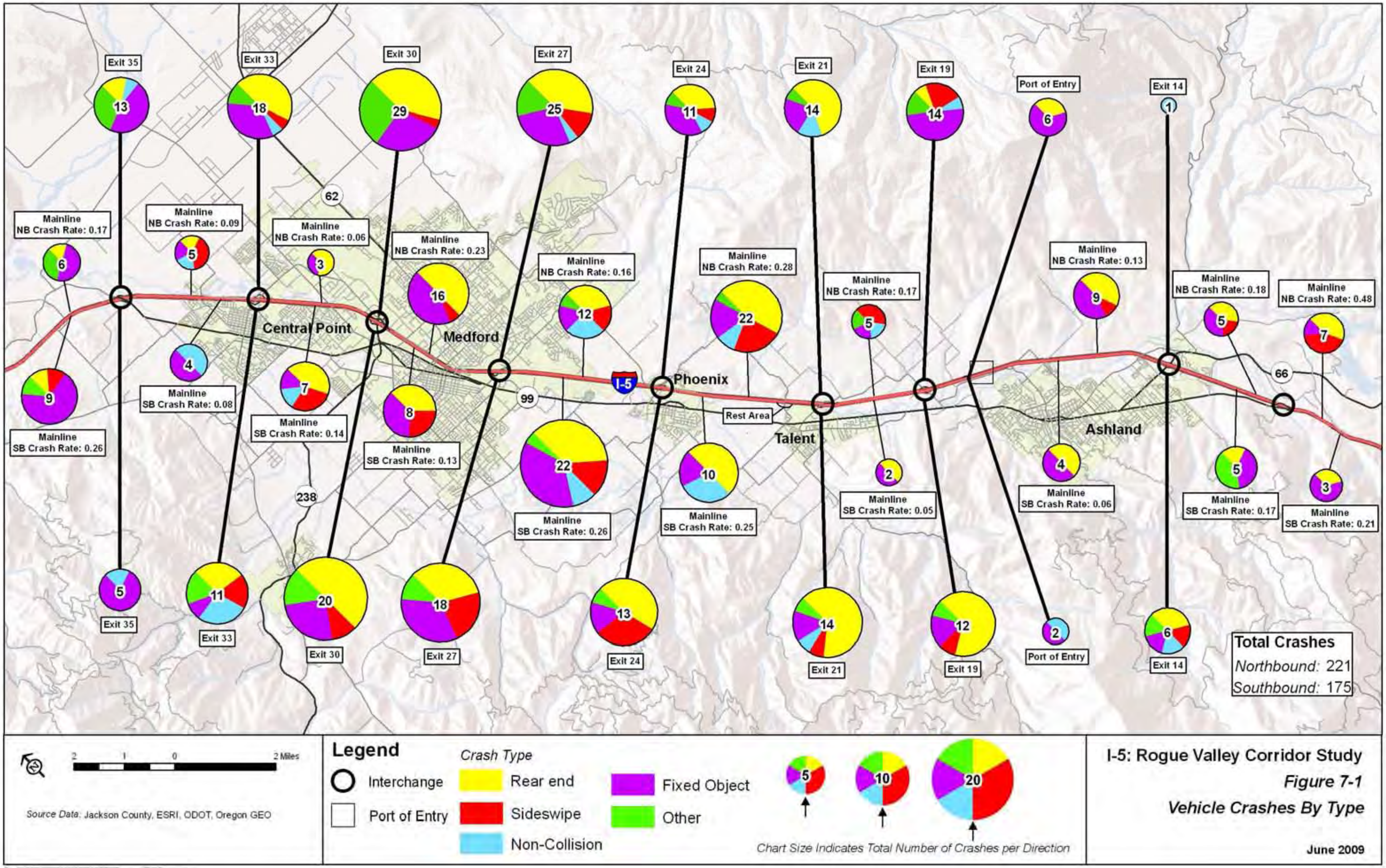
As shown in **Figure 7-1**, there were a total of 221 crashes in the northbound direction on mainline I-5 and the northbound ramps. Interchange 30 had the highest number of crashes with 29, followed closely by Interchange 27 with 25 crashes. At Interchange 30, the most common crash was a rear-end crash in the vicinity of the northbound off-ramp, indicating that there may be insufficient storage distance and/or stopping sight distance on the existing off-ramp. The highest number of crashes on mainline I-5 occurred between Interchange 21 and Interchange 24, with 22 crashes in that area. On mainline I-5 and the ramps, rear-end crashes were the most common (total of 82), followed closely by fixed-object crashes (total of 71). Approximately half the crashes resulted in property damage only and half in an injury. There were a total of four fatalities, with three occurring along mainline I-5 and one occurring on the Interchange 27 off-ramp.

Northbound crash rates on mainline I-5 are relatively low, ranging from a segment low of 0.09 (per MVMT) between Interchange 33 and Interchange 35 to high of 0.48 (per MVMT) south of Interchange 11. Only the crash rate at the southern end of the Corridor Plan area (0.48) is higher than the year 2007 average crash rate for interstate freeways of 0.38 (per MVMT).

Southbound

As shown in **Figure 7-1**, there were a total of 175 crashes in the southbound direction on mainline I-5 and the southbound ramps. Mainline I-5 between Interchange 27 and Interchange 24 had the highest number of crashes with 22, followed closely by Interchange 30 with 20 crashes. At Interchange 30, the most common crash was a rear-end crash in the vicinity of the southbound off-ramp, indicating that there may be insufficient storage distance and/or stopping sight distance on the existing off-ramp. On mainline I-5, fixed-object crashes (total of 29) were the most common, followed closely by rear-end crashes (total of 25). On the ramps, rear-end crashes (total of 44) were the most common crash type. Approximately half the crashes resulted in property damage only and half in an injury. In the southbound direction, there were a total of three fatalities, with all three occurring along mainline I-5.

Southbound crash rates on mainline I-5 are relatively low, ranging from a segment low of 0 between Interchange 21 and the Suncrest Rest Area to a high of 0.26 (per MVMT) north of Interchange 35 and between Interchange 24 and Interchange 27. None of the segment crash rates are higher than the year 2007 average crash rate for interstate freeways of 0.38 (per MVMT).



I-5: Rogue Valley Corridor Study

Figure 7-1

Vehicle Crashes By Type

June 2009

SPIS Data

The Safety Priority Index System is a method developed by ODOT for prioritizing locations where funding for safety improvements can be spent most efficiently and effectively. Based on crash data, the SPIS score is influenced by three components: crash frequency, crash rate, and crash severity. Three years of crash data are analyzed for the SPIS score. SPIS locations meet one of two criteria during the previous three years: (1) three or more crashes at the same location, or (2) one or more fatal crashes at the same location. A list of the top 10 percent of SPIS locations is produced each year. For the year 2008, the Corridor Plan area along I-5 had one location on the top 10 percent SPIS list.

The one SPIS location had a total of 10 crashes, with one fatality, and is located in the Phoenix area between MP 23.91 and MP 24.09.

SIP Data

Oregon Statewide Transportation Improvement Program (STIP) and the Safety Investment Program (SIP) tools have been developed to assist designers in identifying segments of state highways where the largest number of people are being killed or seriously injured in vehicle crashes. The goal of ODOT is to use the STIP and the SIP to reduce the crash fatality rate in Oregon from the 1998 rate of 1.68 to the rate of 1.3 by the year 2010.

Five-mile sections, called SIP segments, of the state highway system are categorized by the number of fatal and severe crashes during a three-year period. The following is the stratification for SIP categories:

- Category 1: 0 fatal or injury A (serious) crashes;
- Category 2: 1 to 2 fatal or injury A crashes;
- Category 3: 3 to 5 fatal or injury A crashes;
- Category 4: 6 to 9 fatal or injury A crashes;
- Category 5: 10 or more fatal or injury A crashes.

When selecting safety projects to be included in the STIP, the SIP category of the section is considered. For roadways with little or no crash history of fatal and serious injury crashes (Categories 1 and 2), minimal safety upgrades are included in the project. Highways with greater crash frequency (Categories 3, 4, and 5) receive more investment in safety improvements, often in stand-alone safety projects. The goal of the STIP-SIP is to create a balance that meets the competing needs of two important transportation facility elements—safety and pavement preservation.

For 2008, I-5 through the Rogue Valley region has two Category 3 (3 to 5 crashes) segments and one Category 4 (6 to 9 crashes) segment. The Category 3 segments are between Ashland and Talent (MP 15 to MP 20) and between Phoenix and Medford (MP 25 to MP 30). The Category 4 segment is located between Talent and Phoenix (MP 20 to MP 25) and includes the one SPIS location.

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8. RAIL SERVICE

The Rogue Valley region is served by two railroad lines. The Central Oregon and Pacific Railroad (reporting mark "CORP") is a short line railroad owned by RailAmerica, Inc., which is based in Jacksonville, Florida. The WCTU Railway Company, a short line railroad on 14 miles of track accessing an industrial area in White City, Oregon, is part of RailService, Inc., which is based in Atlanta, Georgia. Currently, both railroad lines are exclusively freight lines with 90 percent of their delivery consisting of forest products.

The nearest passenger rail service available is AMTRAK located in Eugene, Oregon. The Federal Railroad Administration (FRA) establishes nine classes of track and safety standards that prescribe the maximum speed of operation for both freight and passenger trains. CORP trackage is maintained to FRA Class 1 and 2 conditions, which limits maximum speeds to 10 mph for Class 1 or 25 mph for Class 2. Hence, improvements necessary to provide a competitive passenger rail service south to Medford and beyond would require substantial reconstruction.

Central Oregon and Pacific Railroad (CORP)

The CORP, headquartered in Roseburg, Oregon, is a Class II railroad operating between Black Butte (Weed) in Northern California and Eugene, Oregon. From Eugene, the line continues west to Coos Bay, Oregon. A Class II railroad is defined as a mid-sized freight-hauling railroad with operating revenues greater than $20.5 million but less than $277.7 million for at least three consecutive years.

Traffic on the CORP consists of about 38,000 cars that primarily haul forest commodities such as lumber, logs, and plywood. Remaining shipments consist of liquid petroleum gas, corn, and grain. A large wood products operation in the Roseburg vicinity contributes the bulk of the traffic on the northern end, while shippers south of Grants Pass are the major source of business on the southern end of the line.

Previously a mainline owned by the Southern Pacific Railroad (SP), the railroad was sold in December 1994 in favor of using its route to Eugene via Klamath Falls, Oregon, and the Cascade Summit. In 1996, SP merged with the Union Pacific Railroad (UP) and subsequently adopted the "UP" reporting mark. An operating subsidiary of Union Pacific Corporation, UP is the largest railroad in North America.

Although the CORP operates trackage into northern California, based on a phone conversation with John Bullion, CORP Assistant General Manager, no rail traffic currently occurs south of the City of Ashland. Therefore, all railroad traffic north of Ashland must currently go through Eugene. As a result, Oregon freight shipments destined to go south into California via rail must go north through Eugene and then divert onto the UP line.

White City Terminal & Utility (WCTU) Railway Company

Although not a part of the CORP, this railroad serves as an important connection for CORP in White City, Oregon, because it operates freight switching service on 14 miles of track from a connection with CORP at White City, Oregon. Based on a phone conversation with Norm St. Arnold, Manager for WCTU Railway Company, traffic along the rail line includes lumber, plywood, other forest products, cement, sand and fertilizers, and MEK (methyl ethyl ketone peroxide).

9. INTELLIGENT TRANSPORTATION SYSTEM PROGRAMS AND OPERATIONS

Intelligent Transportation Systems (ITS) refers to a group of information-based technologies that assist in monitoring traffic flow, providing warning and advisory messages to motor vehicle drivers, regulating traffic flow via metering and routing control, and providing rapid emergency incident response capabilities for law enforcement personnel. In 2004 the RVMPO completed a comprehensive ITS for the region. The *Regional ITS Operations & Implementation Plan for the Rogue Valley Metropolitan Area* (RVITS), discussed earlier in *Section 2: Existing Plans* of this report, was part of a federal initiative to use ITS to increase the efficiency of existing transportation infrastructure, improve overall system performance and reduce the need to add capacity. Efficiency is achieved by providing services and information to travelers so that they can make better travel decisions and to transportation system managers so they can better manage the system. A brief summary of existing and proposed ITS programs are provided below. Refer to the RVITS for more detailed information.

Existing ITS Programs

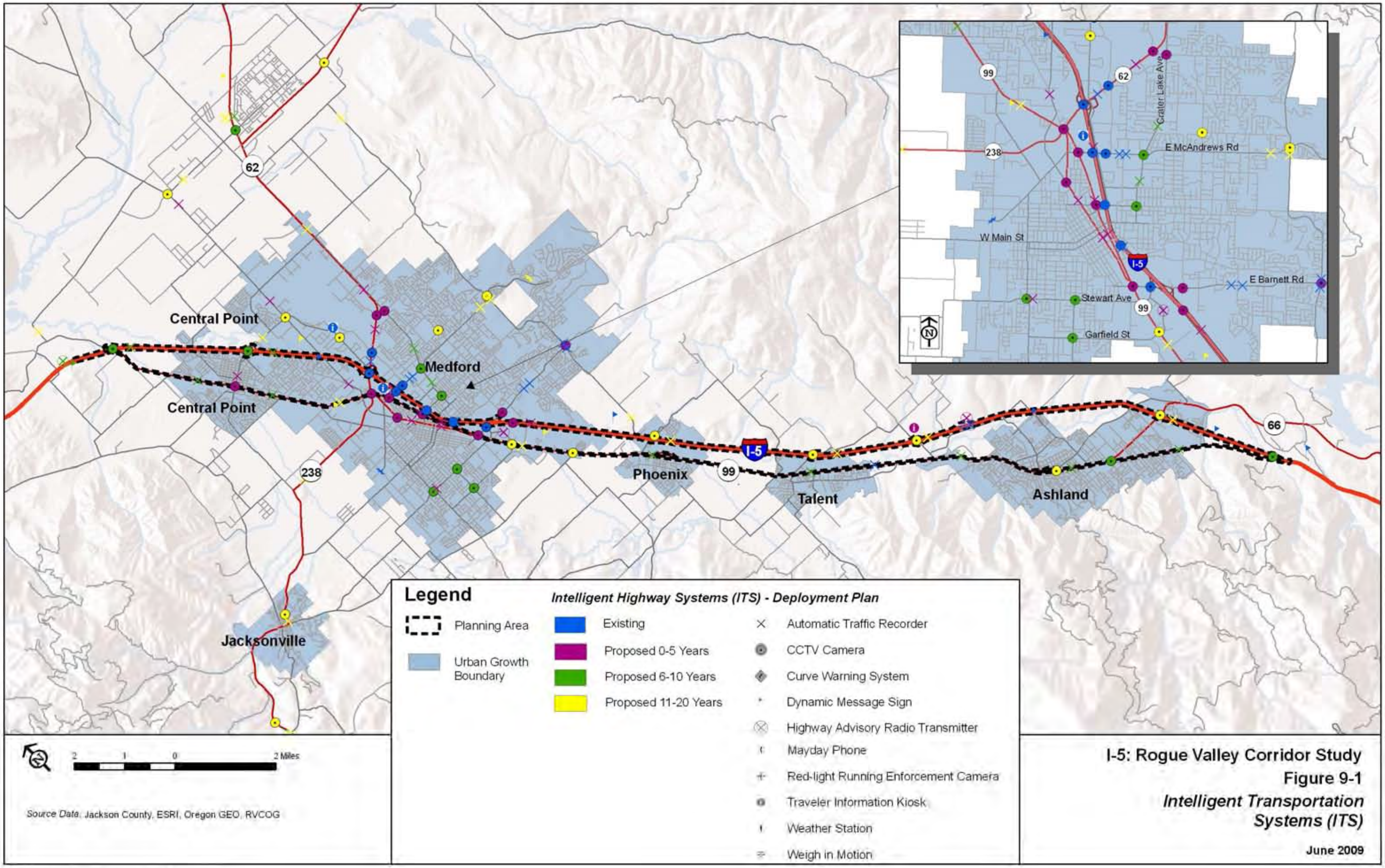
The Rogue Valley region has a sizeable amount of ITS infrastructure currently in place (see **Figure 9-1**). Many of the ITS field devices in the Medford metropolitan area have been deployed to address incidents on the I-5 viaduct through Medford. Because the viaduct is an elevated facility, it has a greater potential for icy conditions. Furthermore, the absence of shoulders on the viaduct to enable disabled vehicles to leave the travel lanes adds a level of complexity for emergency response personnel assessing an incident. Therefore, ODOT has deployed an advanced “ICE” warning sign, cameras, a weather station, and mayday phones. Below is a summary of the overall Rogue Valley ITS infrastructure.

Traffic Operations Center (TOC)

Currently located within a shared facility with the Oregon Police Dispatch in Central Point, the TOC is utilized to manage and coordinate response to incidents and to dispatch ODOT personnel throughout south central Oregon. Dispatchers in the center are responsible for posting messages on the dynamic message signs located throughout the Rogue Valley region.

Closed-Circuit Television (CCTV) Cameras

ODOT currently controls six CCTV cameras to monitor traffic on I-5 within the Corridor Plan area, concentrated primarily along the viaduct through Medford. Video signals from the cameras are transmitted to ODOT TOC. Three cameras on the viaduct communicate via wireless to the weather station site located at Jackson Street (MP 28.94). From the weather station, the video is transmitted to the TOC. The City of Medford operates two cameras that are transmitted via copper twisted-pair cable to Medford City Hall for monitoring. However, the information is not currently posted to a website. Additional cameras are planned in conjunction with the South Medford Interchange project.


Central Point
Central Point
Medford
Phoenix
Talent
Ashland
Jacksonville
62
238
99
I-5
66
Crater Lake Ave
E McAndrews Rd
W Main St
E Barnett Rd
Stewart Ave
Garfield St
Legend
Intelligent Highway Systems (ITS) - Deployment Plan
Planning Area
Urban Growth Boundary
Existing
Proposed 0-5 Years
Proposed 6-10 Years
Proposed 11-20 Years
Automatic Traffic Recorder
CCTV Camera
Curve Warning System
Dynamic Message Sign
Highway Advisory Radio Transmitter
Mayday Phone
Red-light Running Enforcement Camera
Traveler Information Kiosk
Weather Station
Weigh in Motion
2 1 0 2 Miles
Source Data: Jackson County, ESRI, Oregon GEO, RVCOG
I-5: Rogue Valley Corridor Study
Figure 9-1
Intelligent Transportation Systems (ITS)
June 2009

Dynamic Message Sign (DMS)

Typically used to apprise motorists of changes in the local road conditions, a DMS is an electronic sign used to post messages that are variable (any message) or changeable (one of several fixed messages). ODOT currently operates four DMSs within the Corridor Plan area—two signs along I-5 southbound at Table Rock Road in Central Point and Mountain Avenue in Ashland, on I-5 northbound before Exit 11 near Ashland, and past North Phoenix Road near Phoenix. All signs are accessed remotely via a dial-up telephone link.

Automatic Traffic Recorders (ATRs)

Used to collect traffic volume, speed, and occupancy data at a given location, ATRs are typically located upstream from a signalized intersection but are occasionally placed on freeway mainlines as well. Within the Corridor Plan area, ODOT operates three ATRs—one on OR 62 (MP 1.09), one on OR-99 in Talent (MP 15.82), and one on the I-5 Medford viaduct at MP 28.33. The City of Medford, meanwhile, controls six ATRs—two are positioned on East McAndrews Road east and west of the Royal Avenue intersection, two are on Barnett Road east and west of Black Oak Drive, and two are on North Phoenix Road north and south of the Barnett Road intersection.

Roadway Weather Information System (RWIS)

Weather stations, also called roadway weather information systems (RWISs), are used to collect and monitor weather and road conditions that are pertinent to motorists and to maintenance personnel responsible for the roadway operations. Typical weather stations collect temperature, wind speed, wind direction, humidity, and road surface temperature. ODOT currently operates one RWIS within the Corridor Plan area. Positioned on the I-5 Medford viaduct, information from this station is posted on the ODOT website via TripCheck.

Highway Advisory Radio (HAR)

Using low power roadside transmitters that operate in AM or PM frequencies, HAR systems are intended to provide supplemental information to motorists about traffic advisories, construction and maintenance operations, adverse weather or environmental conditions, route diversions, and special events. Only one HAR system is currently in operation within the Corridor Plan area. Positioned on I-5 near Ashland with an approximate two-mile range, the system is used to provide advanced traveler information, especially pass condition information for southbound traffic prior to climbing the Siskiyou Pass. The existing system is near the end of its life cycle and has not been considered reliable during recent harsh weather conditions. Consequently, it is scheduled for eventual replacement.

Weigh-in-Motion (WIM) Systems

Weigh-in-motion (WIM) systems allow large trucks to bypass traditional weigh stations by reporting their weight electronically at highway speeds. Loop detectors embedded in the pavement activate a computer that accepts weight data from scales, space measurements from axle sensors, and height reading from an over-height detector. An electronic reader activates a transponder placed in the truck's windshield and sends a unique acquisition signal to a computer deployed at the roadside weigh station. The roadside computer receives the data and checks the state records for registration, weight declaration, tax status, and safety inspections. In less than a second, the driver is signaled to stop or go. There are currently two WIM systems in place north of Ashland.

Communications Equipment

Communications is a critical component of the ITS infrastructure because local agencies must be able to monitor, control, and operate traffic management devices from remote locations to effectively manage the movement of passengers and goods. The communications network within the Corridor Plan area comprises fiber optic cable, twisted-pair copper, radio, cellular telephone, and, eventually, a wireless mesh Ethernet network.

ITS Deployment Plan

The ITS deployment plan (see **Figure 9-1**) for the Rogue Valley details how and when ITS projects will be deployed. The highest priority projects are scheduled for deployment in a five-year timeframe and are summarized as follows:

Network Surveillance

To improve traveler information and enhance monitoring capabilities for traffic management, maintenance, and emergency management personnel, additional CCTV cameras will be deployed at key intersections of the Rogue Valley region. The cameras will monitor the roadway for congestion, trouble spots, incidents, equipment failures, and traffic signal operations.

Traffic Data Collection System

Currently, annual traffic counts are conducted manually for transportation planning purposes. By deploying system detectors to automate the collection and storage of traffic volume, speed, and occupancy data, this project will enable better management of the regional roadway network. Traffic counts collected on a daily basis throughout the year will provide real-time traffic congestion information to the public and will improve travel times. Finally, system detectors that automatically detect incidents can reduce incident response times.

I-5 Siskiyou Pass Traveler Information

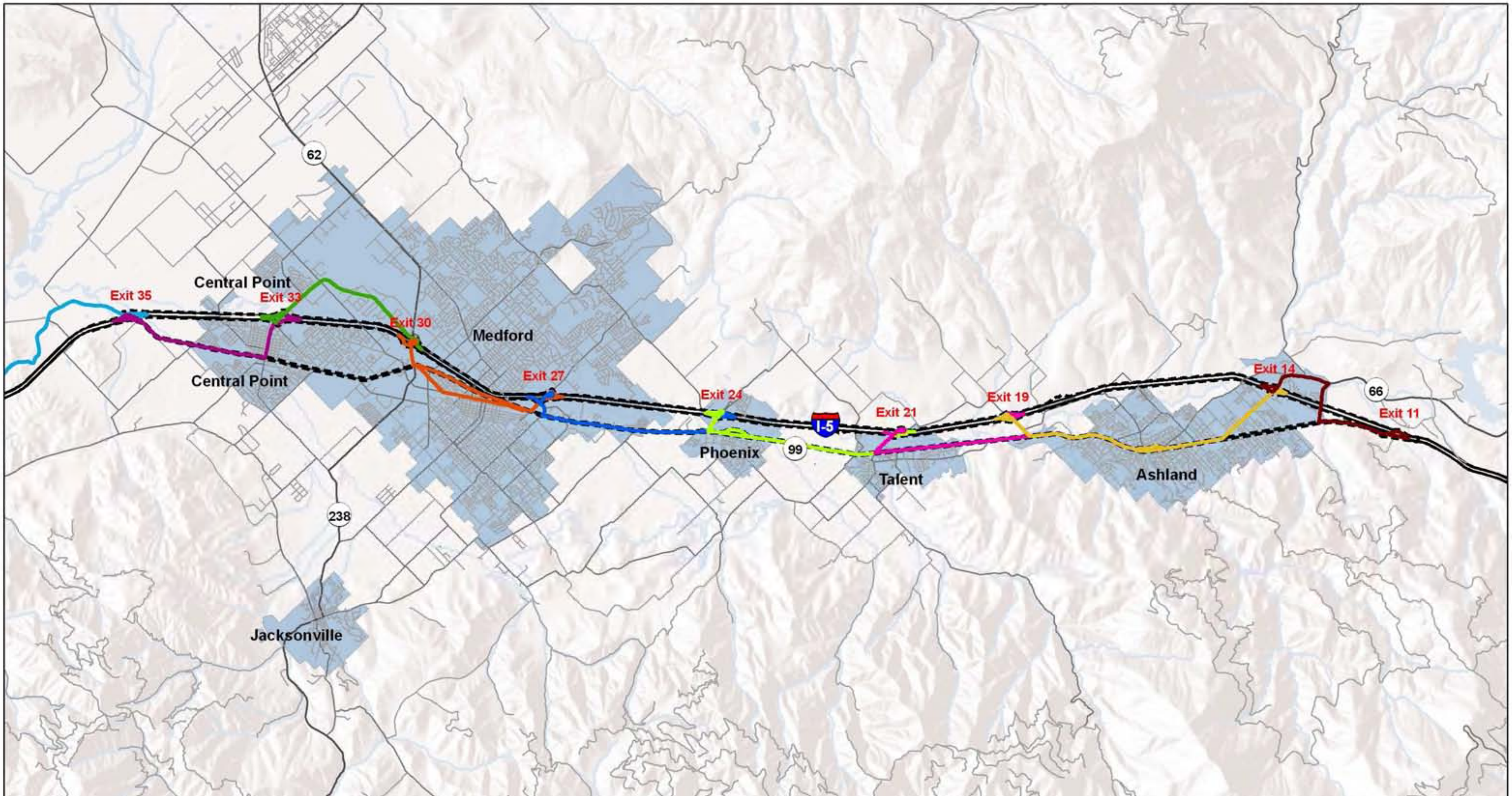
ODOT intends to provide a graphical display of real-time and forecasted weather conditions on I-5 over the Siskiyou Pass. The project will install additional weather information stations, road temperature sensors, CCTV cameras, HAR, and DMS, and will provide access to this information, including highway advisory messages, via a web page.

Incident Management in the Freeway Corridor

No formal incident management program is currently in place within the Rogue Valley region. Although ODOT District 8 has no immediate plans to implement such a program, it may be reconsidered if regional growth continues as projected. However, many of the local agencies, such as ODOT District 8, Jackson County, and the City of Medford, do have portable DMS and other incident management equipment on hand that can be deployed in the event of an incident or major emergency in order to support local emergency agency operations.

In cooperation with local Rogue Valley agencies, ODOT Region 3 developed a regional Emergency Detour Contingency Manual to address protocol for incident response for major incidents along the I-5 corridor. In the event of a major incident on I-5, vehicles would be directed to emergency detour routes, as displayed in **Figure 9-2**, depending upon the location of the incident. The manual depicts detour information, sign placement, and locations of traffic control. Furthermore, the manual includes additional details for a complete closure of the I-5 viaduct through Medford between Exits 27 and 30. These details include traffic control deployment, procedures, and responsibilities for ODOT, City of Medford Public Works Department, City of Central Point Maintenance Department, Medford Police Department, and Rogue Valley Central Communications.

Currently this plan is implemented manually and includes placement of portable variable message signs. In the future, ODOT plans to deploy fixed trailblazer (right/left arrow) signs or changeable fixed message signs to display one of several preset fixed messages on detour routes, DMS, CCTV cameras to monitor roadway performance, and alternative traffic signal timing plans to accommodate changes in traffic patterns.



Source Data: Jackson County, ESRI, Oregon GEO, RVCOG

Legend

Planning Area

Urban Growth Boundary

I-5 Detours

Exits 11-14, Exits 14-19, Exits 19-21, Exits 21-24, Exits 24-27, Exits 27-30, Exits 30-33, Exits 33-35, Exits 35-40

I-5: Rogue Valley Corridor Study

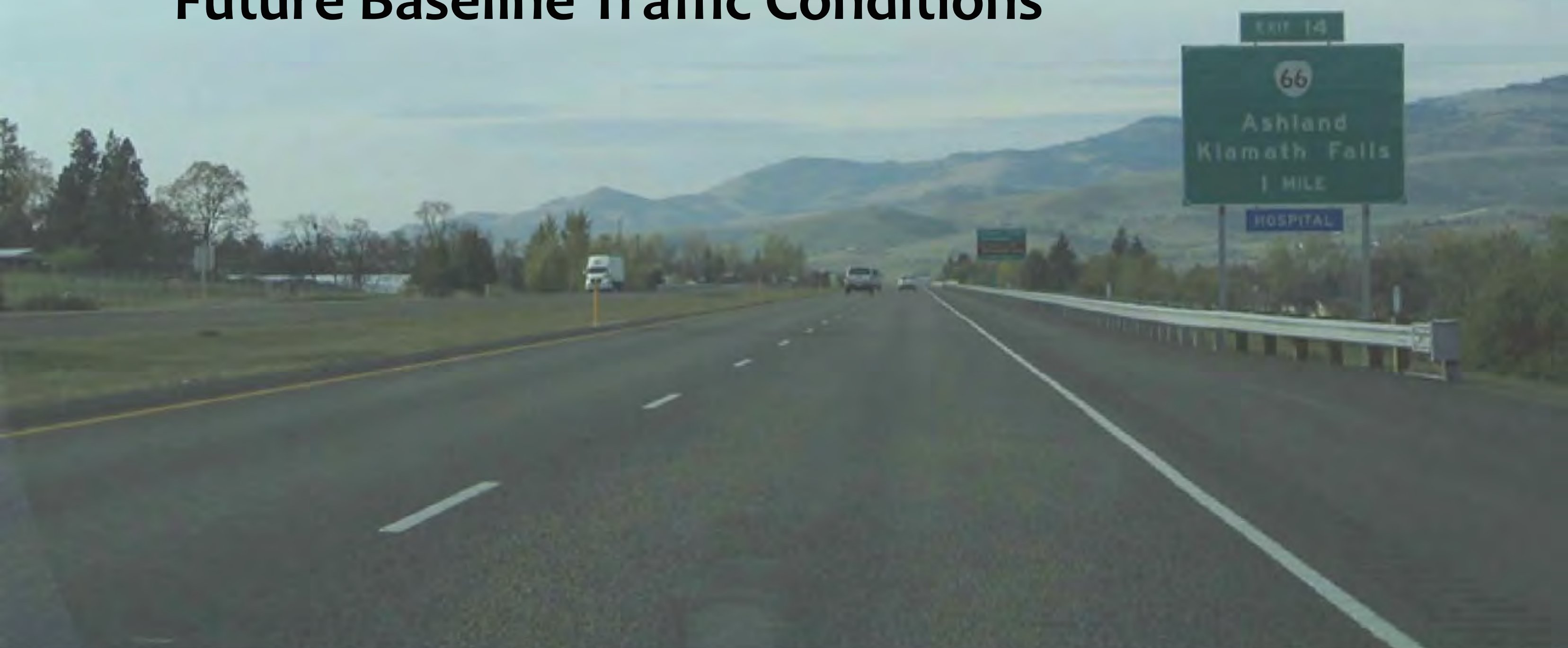
Figure 9-2

Major Emergency Detour Routes for I-5

June 2009

I-5 Rogue Valley Corridor Plan

FINAL
Technical Memorandum #3:
Future Baseline Traffic Conditions



Prepared by:

DAVID EVANS AND ASSOCIATES INC.

Prepared for:

Oregon Department of Transportation

I-5 Rogue Valley Corridor Plan

Technical Memorandum #3:
Future Baseline Traffic Conditions

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August 2010

3. FUTURE BASELINE TRAFFIC CONDITIONS

This technical memorandum is the third in a series of memoranda that will be prepared for the *I-5 Rogue Valley Corridor Plan* (Corridor Plan). As discussed in Technical Memorandum #1, the Corridor Plan was initiated by the Oregon Department of Transportation (ODOT) to assess existing and future transportation conditions along the Interstate 5 (I-5) and Oregon Highway 99 (OR 99) corridors from Interchange 11 south of Ashland to Interchange 35 north of Central Point, as displayed in Figure 3-1**.** For analysis purposes, the Corridor Plan area is defined as 200 feet beyond both sides of the I-5 right-of-way boundary and 100 feet beyond both sides of the OR 99 right-of-way boundary between interchanges 11 and 35. Technical Memorandum #2 documented existing plans and policies, identified environmental and land use constraints, assessed existing traffic operations and crash history, discussed rail service, and inventoried the existing Intelligent Transportation Systems (ITS) infrastructure along the Corridor Plan area.

Technical Memorandum #3 summarizes the future baseline traffic conditions along the Corridor Plan area for the years 2034 and 2050. The 2034 baseline scenario uses the Rogue Valley Metropolitan Planning Organization (RVMPO) financially constrained Regional Transportation Plan (RTP) land use and roadway assumptions for year 2034. The current revision of the RTP for 2009-2034, adopted by the RVMPO on March 24, 2009, provides a summary of the regional transportation actions anticipated to occur in the planning area through 2034. The 2050 baseline scenario also uses the RTP roadway network but with estimated year 2050 land use derived from the RVMPO Regional Problem Solving (RPS) project. The future baseline scenarios will serve as the basis for comparison to future build scenarios that will be summarized in Technical Memorandum #4.

The Corridor Plan uses a year 2009 existing conditions travel demand model in conjunction with the future 2034 and 2050 models to forecast future traffic growth. The projected traffic growth is then added to the existing traffic volume collected for the Corridor Plan.

Travel Demand Forecasting Models

The future traffic model volumes are developed from travel demand forecasting models. Travel demand models have been in use since the 1950s and employ a market-based approach by considering both transportation supply and travel demand for producing traffic forecasts. 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 RVMPO currently uses the EMME/2 computer program for estimating travel demand.

2034 Regional Transportation Plan Model

The travel demand model for the RTP was developed for a base year of 2009 and a forecast year of 2034. Population forecasts were developed from Jackson County's comprehensive plan and are consistent with the official forecasts produced by the state Office of Economic Analysis (OEA). The employment forecasts were developed from a number of different sources including the Economic Opportunities Analysis conducted in the RVMPO planning area in 2007 for the RPS project, U.S. Commerce Department data, shorter-term economic forecasts by the state OEA, Oregon Employment Department data and outlook, and consultation with local jurisdictions. The resulting population and employment forecasts for the region are summarized in Table 3-1.

Table 3-1. Regional Transportation Plan Growth Forecasts

	2006	2009	2015	2020	2026	2034
Population	157,272	172,665	191,994	207,502	225,596	248,324
Households	64,678	69,302	76,670	82,582	89,504	98,486
Employment	110,459	115,430	125,371	133,566	148,772	150,666

Source: 2009-2034 Regional Transportation Plan, April 27, 2009, Table 2.2-3: RTP Summary Forecasts

Assumed Land Uses and Roadway Improvements

The land use assumptions for the 2034 RVMPO travel demand model are from the RTP and generally reflect existing land development patterns in the study area.

The transportation network used in the future baseline analysis is the financially-constrained RTP system. This network includes the completion of the new Interchange 27 improvements, which are currently under construction and, therefore, not part of the existing conditions analysis. There are also five projects on I-5 in the RTP. The most expensive project in the 2034 RTP is the improvements to Interchange 24. See Appendix A in the RTP for a map and list of the year 2034 RTP projects. More detailed information about the RVMPO RTP can be found at the project website: http://www.rvmpo.org/SectionIndex.asp?SectionID=10.

2050 Regional Problem Solving Model

Early in 2000, Jackson County and the cities of the Greater Bear Creek Valley were awarded a grant under the authority of Oregon's Regional Problem Solving (RPS) Statute (Oregon Revised Statute [ORS] 197.652-658). The intent of the RPS grant was to conduct a coordinated effort that examines the long-term needs for additional lands for urban development to accommodate a doubling of the region's population. In support of this effort, ODOT's Transportation Planning and Analysis Unit (TPAU) developed various land use scenarios for the region that would accommodate the forecasted doubling of population. Total employment was developed from a ratio of employment to household workers in the region. Eventually, 30 future land use scenarios for existing and proposed urban growth areas were developed, and ODOT established a time horizon of 2050 for modeling and analysis purposes. Subsequent analysis focused on transportation system improvements needed to address the forecasted demands of the different land use scenarios.

Assumed Land Uses and Roadway Improvements

With the travel demand modeling and other elements of the RPS study, the draft *2008 Bear Creek Valley Regional Problem Solving Project – Planning Report* was developed. The plan identifies urban reserves and community buffers as well as standards and processes for further planning and refinement of these areas. For the Corridor Plan, the RPS model assumes that the region accommodates growth through the adoption of a “Regional Attractor” scenario, which represents a land use pattern where employment growth in the region is concentrated in defined regional centers.

The 2050 baseline analysis assumes the same RTP-based roadway improvements as the 2034 analysis but with the addition of a two-lane limited access OR 62 bypass road from north of Poplar Drive to north of Vilas Road.

I-5 Traffic Volumes

Forecasted traffic volumes for the 2034 RTP and 2050 RPS scenarios were calculated using the ODOT Analysis Procedures Manual (APM) guidelines. The 2009, 2034, and 2050 RVMP travel demand models are used as the basis of the calculations, with existing traffic count corrections per APM guidelines.

Both the forecasted 2034 and 2050 traffic volumes reveal similar volumes trends compared to the existing counts, with traffic volumes varying across the Corridor Plan area. For example, the lowest volumes occur at the southern end of the area, while the highest volumes currently occur and are forecasted to continue to occur to the north in the Medford area. Figure 3-2 and Figure 3-3 summarize the daily traffic volumes and PM peak hour traffic volumes on I-5 for 2034 and 2050, respectively. Details of the volume calculations are provided in Appendix A (available upon request).

I-5 Trip Distribution

The travel demand model was used to estimate the distribution of trips along I-5 within the Corridor Plan area for both the 2034 RTP and 2050 RPS scenarios. The 2034 northbound and southbound trip distributions, displayed in Figure 3-4 and Figure 3-5**,** respectively, compare closely with the 2050 trip distributions forecasted for the northbound and southbound directions displayed in Figure 3-6 and Figure 3-7, respectively. Both the 2034 and 2050 scenarios indicate that over half (54 percent for both 2034 and 2050) of the trips on I-5 are entering and exiting the freeway within the study area and thus, are trips local to the Rogue Valley area. The second largest user group on I-5 is southbound trips originating north of the Corridor Plan area that exit somewhere within the Corridor Plan area (31 percent for both 2034 and 2050) and northbound trips that originate within the Corridor Plan area and leave the Corridor Plan area to the north (28 percent for both 2034 and 2050). Through traffic, that never gets on or off I-5 in the Corridor Plan area, ranges between 10 and 12 percent for both scenarios. A small portion of the total traffic volume on I-5 enters from the south and stays somewhere within the Corridor Plan area or originates within the Corridor Plan area and leaves via I-5 to the south. As I-5 becomes increasingly congested over time, some of these local trips are likely to shift to parallel roadways such as OR 99.

I-5 and OR 99 Volume Distribution

With over half of the traffic on I-5 being local traffic that stays within the study area, there is a high potential for I-5 users to shift to adjacent parallel routes, such as OR 99, when there is congestion on I-5. Table 3-2 summarizes the PM peak hour volume on I-5 and OR 99 in the 2034 and 2050 RVMPO travel demand model. The location of screenlines used for Table 3-2 is displayed in Figure 3-8**.** Although a comparison of the split, or relative share, of traffic on I-5 and OR 99 recorded in 2009 and estimated in 2034 reveals minimal change, the proportion of traffic using OR 99 compared to I-5 is expected to increase in 2050 relative to 2034. However, the majority of total traffic volume using both corridors would still favor I-5 in 2050 at all screenline locations.

Table 3-2. I-5 and OR 99 PM Peak Hour Volume Comparison

Screenline No. and Position	2034			2050		
	I-5	OR 99	Split I-5/OR 99	I-5	OR 99	Split I-5/OR 99
1: South of IC 35	4,543	957	83%/17%	5,541	1,356	80%/20%
2: IC 30 to IC 33	5,369	2,733	66%/34%	6,302	3,377	65%/35%
3: IC 27 to IC 30	6,026	2,453	71%/29%	7,215	3,382	68%/32%
4: IC 24 to IC 27	5,866	1,724	77%/23%	7,933	3,311	71%/29%
5: IC 21 to IC 24	5,721	1,167	83%/17%	6,639	2,431	73%/27%
6: IC 19 to IC 21	5,175	969	84%/16%	5,956	1,357	81%/19%
7: IC 14 to IC 19	3,681	2,307	61%/39%	4,409	2,575	63%/37%
8: IC 11 to IC 14	2,075	85	96%/4%	2,438	102	96%/4%

IC = Interchange

Source: RVMPO travel demand model combined northbound and southbound volumes at screenline locations (see Figure 3-8)

I-5 Traffic Operations

Transportation professionals have established various operating standards for measuring traffic capacity of roadways and at intersections. Each standard is associated with a particular level of service (LOS). The LOS concept requires consideration of factors such as travel speed, delay, frequency of traffic flow interruptions, relative freedom for traffic maneuvers, driving comfort, convenience, and operating cost. Six standards have been established, ranging from LOS A (where traffic is relatively free flowing) to LOS F (where the street system is totally saturated with traffic and movement is very difficult).

A comparison of traffic volume demand to capacity is another method of evaluating how well a roadway segment or intersection is operating. This comparison is presented as a volume-to-capacity (v/c) ratio. A v/c ratio between 0.0 and 1.0 indicates that recorded volume is less than the maximum volume capacity of the roadway. When the v/c ratio is low, traffic conditions are generally free flowing, with minimal congestion and low delays for most roadway segments and intersection movements. As the v/c ratio approaches 1.0, traffic becomes more congested and unstable, with longer delays. Should an incident occur, such as a stall or crash, very long delays and queues would result. If the v/c ratio is over 1.0, the traffic volume demand is considered to be greater than capacity and vehicles would experience stop and go congestion. The resulting congestion would likely affect roadway segments in subsequent hours.

Freeway Analysis Methodology

Freeway LOS is typically analyzed using the 2000 Highway Capacity Manual (HCM) procedures, which use vehicle density as the basis for determining LOS. Table 3-3 summarizes the LOS criteria for freeway operations based on the manual's criteria.

Table 3-3. Level of Service Criteria for Freeway Segments

	Density (passenger cars per mile per lane- pc/mi/ln)		
Level of Service	**Basic Freeway Segment**	**Weaving Segment**	**Ramp Merge and Diverge Areas**
A	≤ 11	≤ 10	≤ 10
B	> 11 and ≤ 18	> 10 and ≤ 20	> 10 and ≤ 20
C	> 18 and ≤ 26	> 20 and ≤ 28	> 20 and ≤ 28
D	> 26 and ≤ 35	> 28 and ≤ 35	> 28 and ≤ 35
E	> 35 and ≤ 45	> 35 and ≤ 43	> 35
F	> 45	> 43	Demand exceeds capacity

Source: Transportation Research Board, Highway Capacity Manual, 2000, p. 23-3 for basic freeway segments, p. 24-3 for weaving segments, and p. 25-5 for ramp merge and diverge areas.

The HCM Freeway Facilities Methodology was used to analyze freeway operations using the Highway Capacity Software (HCS). The methodology isolates a freeway system into a succession of freeway sections (i.e., basic, weaving, and ramp). Operations in each freeway section are compared to the adjacent sections, and adjustments are made to account for the interaction between freeway sections. This methodology is not as robust as microsimulation, but it does produce reasonable results for uncongested conditions, as were observed on I-5 under existing conditions within the Corridor Plan area.

Traffic Performance Thresholds

Traffic operational standards are used by agencies to ensure satisfactory traffic mobility within their respective jurisdictions. The ODOT 1999 Oregon Highway Plan (OHP) contains several policies for maintaining highway mobility. The OHP's Highway Mobility Standards (Policy 1F) establish maximum v/c ratio standards for peak hour operating conditions for all highways in Oregon. The 2006 amendment to the OHP provides v/c ratios that are to be used for existing conditions and no-build planning purposes. I-5 is designated as a state and federal freight route on the national highway system. Table 4.5 of the OHP indicates that the operational standard for existing and no-build conditions on I-5 should have a maximum v/c ratio of 0.80.

Freeway Operational Findings

Using the HCS Freeway Facilities Methodology, the Base PM Peak hour operations for 2034 and 2050 were analyzed and compared. Detailed operational results are in Appendix B (available upon request).

2034 Regional Transportation Plan Scenario

The findings displayed in Figure 3-9, with the 2034 RTP scenario assumptions, indicate a freeway system that would generally operate with relatively free flow operations during the PM peak hour. The northbound lanes of I-5 would operate with a v/c ratio of 0.80 and LOS of D or better, except between Interchanges 27 and 33 in Medford, where the off-ramp to Interchange 27 would operate at a v/c ratio of 0.84 and LOS F and the off-ramp to Interchange 33 would operate at a v/c ratio of 0.79 and LOS F. The southbound direction of I-5 would operate with a v/c ratio at or below 0.80 and LOS D or better, except between Interchanges 27 and 30 in Medford, where the off-ramp to Interchange 27 would operate at a v/c ratio of 0.80 and LOS E. Hence, without additional improvements, both directions of I-5 between Interchange 27 and 30 could experience some congestion during the PM peak hour in 2034.

2050 Regional Problem Solving Scenario

As displayed in Figure 3-10, operations along the freeway system with the 2050 scenario assumptions begins to show some stress during the PM peak hour. Northbound I-5 would operate at LOS D or better south of Interchange 21 in Phoenix and north of Interchange 33 in Central Point, but the section of freeway between Interchanges 21 and 33 would operate at LOS F with v/c ratios between 0.81 and 0.97. The v/c ratio on I-5 in the northbound direction would exceed the OHP operational threshold of 0.80 on the majority of freeway segments from the Interchange 21 on-ramp to the Interchange 33 off-ramp.

In the southbound direction, I-5 would operate similarly to the northbound direction, with LOS D or better operations south of Interchange 19, north of Ashland and north of Interchange 30 in Medford. From Interchange 30 to Interchange 19, the freeway would operate at LOS F. The v/c ratio in the 2050 base model would exceed the OHP operational threshold of 0.80 on the majority of freeway segments from the Interchange 30 on-ramp to the Interchange 21 off-ramp. The v/c ratios for the southbound freeway segments expected to exceed the operational threshold range from 0.88 to 1.00. In this area, both directions of I-5 are likely to experience congestion in 2050 without additional improvements. Detailed operational results are in Appendix B.

RVMPO Roadway Capacity

Although operational analysis for the Corridor Plan is limited to I-5, in order to understand how changes on I-5 impact the Rogue Valley transportation system, the demand-to-capacity (d/c) ratio on all the roadways in the RVMPO travel demand model were calculated. The d/c ratio is the ratio of the total demand for the analysis period divided by the total capacity for the period.

Analysis of the transportation network within the urbanized Rogue Valley region for the 2034 scenario suggests that most of the system will not be over capacity. As displayed in Figure 3-11, the majority of roadways show a d/c ratio for the 2034 baseline PM peak hour of under 1.0. Exceptions include portions of OR 62, Delta Water Road, Bernard Road, Phoenix Road, Valley View Road, and OR 99 where the d/c ratio is greater than 1.0, suggesting overcapacity. Advancing to the 2050 scenario, conditions along these roadway sections predictably worsen during the PM peak hour and extend beyond what was displayed for the 2034 scenario (see Figure 3-12). Still, much of the network is forecasted to continue to operate within capacity.

The Highway Economic Requirements System (HERS)

The Highway Economic Requirements System – State Version (HERS-ST) was created for use as an engineering decision-making tool. By evaluating how construction economically affects the traveling public, the user can conduct a “needs” analysis based on specific settings and parameters. The output of the analysis varies depending on what the user chooses to report. HERS-ST can be useful in estimating the future investment requirements for pavement preservation and system expansion. Depending on what analysis is run, the user is able to estimate how and when a roadway section should be improved to maintain certain standards and conditions.

For this project, data was provided by ODOT from the RVMPO. TPAU translated the RVMPO data into HERS-ST, with all of the parameters set by TPAU. The only parameters that were changed from the TPAU HERS-ST settings were the analysis type, funding periods and v/c threshold. Though there are various ways to run an analysis with HERS-ST, the benefit/cost analysis was chosen for this project, with added parameters in place to warrant analysis of improvements if the v/c ratio exceeded 0.80. It should be understood that HERS-ST was not created as a traffic analysis program, but as an economic decision-making tool to be used in conjunction with traffic analysis for traffic planning.

The Benefit Cost analysis involved the comparison of expected benefits, over the life of the improvement, with the cost of implementing the project. If the benefit/cost ratio exceeded 1, and the v/c ratio surpassed 0.80, then HERS-ST suggested one of six improvement ”types” to improve conditions. The improvement types involve pavement, widening, and/or alignment corrections at either normal cost or high cost. If HERS-ST selected an improvement that exceeded what the State had coded for the section, then it was assigned as a high cost improvement.

HERS-ST analyzes and summarizes results based on Funding Periods. Funding Periods are user-defined time periods (from 3 to 7 years) that constitute an analysis period. HERS-ST analyzes, summarizes, and reports results based on funding periods. For this project, the analysis periods are 2008 – 2034 and 2008 – 2050, and the funding periods are 5 years long. Due to the length of the analysis period and the constraints on how long funding periods can be, the funding periods do not always match up exactly with the analysis period. The analysis was run from 2008 – 2053 using the post-processed 2050 volumes.

Table 3-4 describes a summary of the suggested improvements with a benefit-cost ratio greater than or equal to 1 that result in a v/c ratio of less than 0.80. As the table suggests, HERS-ST recommends improvements during eight of the nine funding periods, occurring between 2018 and 2050. With the v/c ratio deficiency level set at the 0.80 operation threshold for I-5, HERS-ST suggested two types of improvements: resurfacing with lanes added at the normal cost (RSNC) and resurfacing with lanes added at a high cost (RSHC). The “high cost” resurfacing is labeled as such due to the cost associated with construction. The majority of the areas where a RSHC is suggested are on the mainline and interchanges between Interchange 24 and Interchange 33. The rest of the improvements are RSNC and are on either on- or off-ramps between Interchange 19 and Interchange 35. All mainline analysis results will be verified with HCM analysis.

Table 3-4. Recommended Improvements from HERS-ST

Year & Location	Milepost	Unimproved Conditions v/c Ratio	Recommended Improvement	Benefit/ Cost Ratio	Improved Conditions v/c Ratio
2018					
IC 19 SB I-5 Off-Ramp	18.92-19.26	1.20	Resurface, Add 1 lane, Normal cost	1.01	0.65
IC 30 SB I-5 On-Ramp (loop)	30.11-30.42	0.85	Resurface, Add 1 lane, Normal cost	1.43	0.32
2023					
IC 30 SB I-5 Off-Ramp	30.23-30.56	1.44	Resurface, Add 2 lanes, High cost	1.64	0.55
IC 33 NB I-5 Off-Ramp	32.49-32.70	1.56	Resurface, Add 2 lanes, High cost	2.54	0.61
2028					
IC 21 SB I-5 Off-Ramp	21.27-21.40	1.16	Resurface, Add 1 lane, Normal cost	2.92	0.61
IC 24 NB I-5 On-Ramp	24.32-24.62	0.80	Resurface, Add 1 lane, Normal cost	1.21	0.30
IC 24 SB I-5 Off-Ramp	24.41-24.62	1.42	Resurface, Add 2 lanes, High cost	1.90	0.53
IC 33 SB I-5 Off-Ramp	32.90-33.05	1.00	Resurface, Add 1 lane, Normal cost	1.65	0.53
IC 35 NB I-5 On-Ramp	35.49-35.81	1.06	Resurface, Add 1 lane, Normal cost	2.16	0.56
2033					
NB Mainline	27.58-29.98	0.80	Resurface, Add 1 lane, High cost	1.11	0.57
SB Mainline	36.99-38.07	0.86	Resurface, Add 1 lane, Normal cost	1.78	0.58
IC 19 NB I-5 On-Ramp	19.26-19.49	0.81	Resurface, Add 1 lane, Normal cost	2.24	0.30
IC 24 NB I-5 Off-Ramp	24.17-24.40	0.99	Resurface, Add 1 lane, Normal cost	2.12	0.53
2038					
NB Mainline	30.75-32.5	0.84	Resurface, Add 1 lane, High cost	1.32	0.59
SB Mainline	23.82-24.05	0.93	Resurface, Add 1 lane, High cost	1.26	0.64
SB Mainline	27.58-29.84	0.87	Resurface, Add 1 lane, High cost	1.18	0.61

Table 3-4. Recommended Improvements from HERS-ST

Year & Location	Milepost	Unimproved Conditions v/c Ratio	Recommended Improvement	Benefit/ Cost Ratio	Improved Conditions v/c Ratio
2043					
NB Mainline	23.19-24.17	0.88	Resurface, Add 1 lane, High cost	1.61	0.62
SB Mainline	30.29-32.15	0.88	Resurface, Add 1 lane, High cost	1.20	0.60
2048					
SB Mainline	30.84-31.82	0.93	Resurface, Add 1 lane, High cost	1.01	0.64
SB Mainline	32.15-32.5	0.93	Resurface, Add 1 lane, High cost	1.02	0.64
IC 24 SB I-5 On-Ramp	24.05-24.38	0.91	Resurface, Add 1 lane, High cost	1.18	0.63
IC 30 SB I-5 Off-Ramp	29.84-30.11	0.89	Resurface, Add 1 lane, High cost	1.31	0.62
IC 30 NB I-5 Off-Ramp	29.98-30.36	1.44	Resurface, Add 2 lanes, High cost	1.48	0.55
2053					
SB Mainline	19.1-19.26	0.90	Resurface, Add 1 lane, High cost	1.17	0.63
SB Mainline	21.2-21.4	0.90	Resurface, Add 1 lane, High cost	1.17	0.62
SB Mainline	24.4-24.62	0.90	Resurface, Add 1 lane, High cost	1.01	0.62
IC 21 SB I-5 On-Ramp	20.96-21.2	0.90	Resurface, Add 1 lane, High cost	1.16	0.63
IC 21 SB I-5 Off-Ramp	21.4-23.82	0.88	Resurface, Add 1 lane, High cost	1.09	0.62
IC 33 NB I-5 Off-Ramp	32.49-32.70	1.21	Resurface, Add 2 lanes, High cost	1.10	0.77

Future Safety Deficiencies

Much of the crash data analyzed and incidents summarized previously in Technical Memorandum #2: Data Collection and Review of Existing Plan could be exacerbated by the higher traffic volumes forecasted and described in this technical memorandum. For example, it is likely that the cross weaving traffic associated with the placement of the northbound Port of Entry in proximity to the Interchange 19 off-ramp would intensify, leading to continued public insistence on finding a solution.

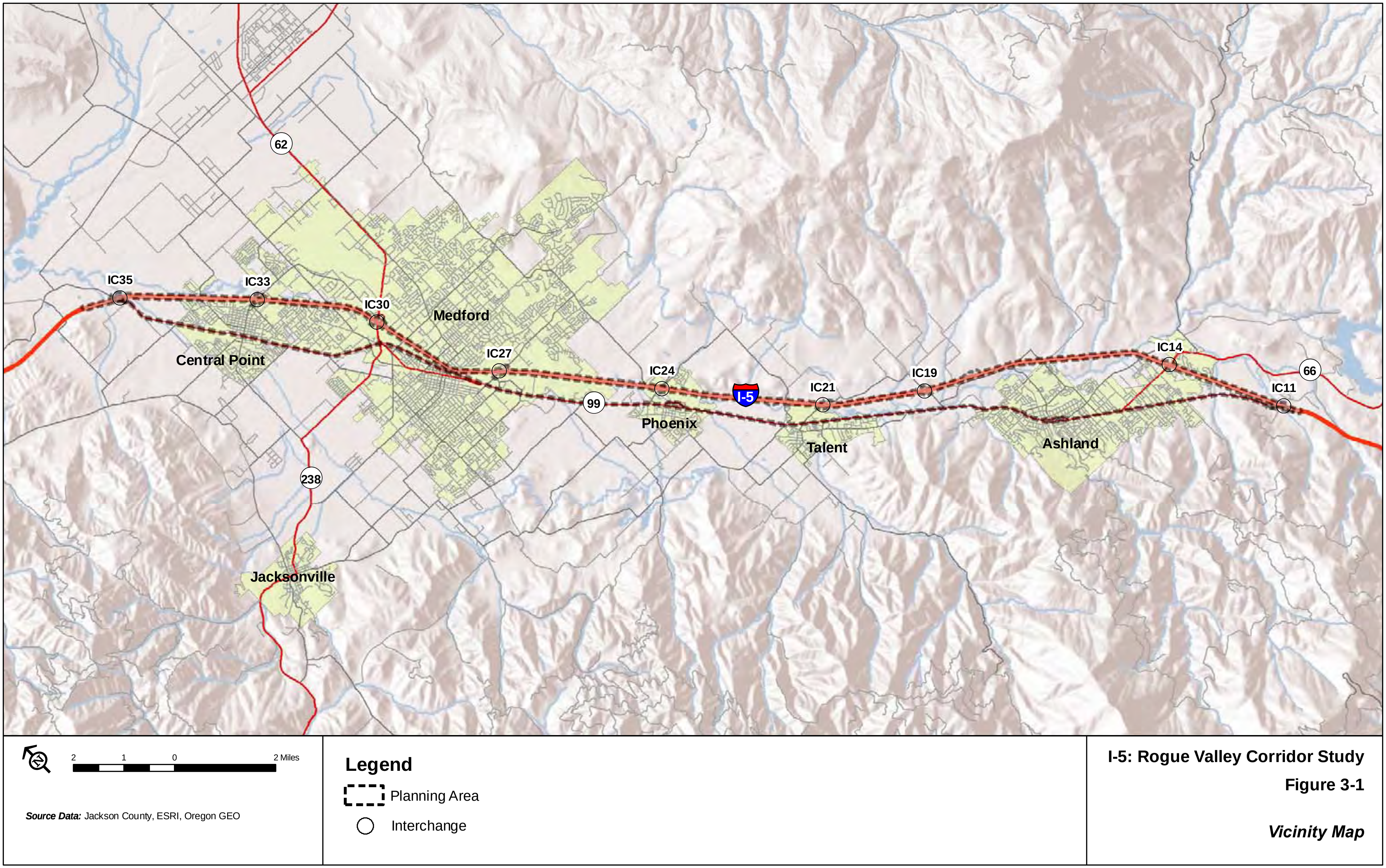
Next Steps

Technical Memorandum #4 will identify and assess potential projects and strategies, develop the future year traffic volume forecasts to analyze how the transportation system would be expected to function under 2034 and 2050 conditions, and conclude with a preferred set conceptual solutions and a recommended timeline for their implementation.

Attachments:

Figure 3-1. Vicinity Map
Figure 3-2. 2034 Daily Volume and PM Peak Hour Volume
Figure 3-3. 2050 Daily Volume and PM Peak Hour Volume
Figure 3-4. 2034 Northbound I-5 Trip Distribution
Figure 3-5. 2034 Southbound I-5 Trip Distribution
Figure 3-6. 2050 Northbound I-5 Trip Distribution
Figure 3-7. 2050 Southbound I-5 Trip Distribution
Figure 3-8. Screenline Positions
Figure 3-9. 2034 I-5 Operations
Figure 3-10. 2050 I-5 Operations
Figure 3-11. 2034 Demand-to-Capacity Ratios
Figure 3-12. 2050 Demand-to-Capacity Ratios

Appendix A. Future Traffic Volume Development (available upon request)
Appendix B. Synchro Output Worksheets (available upon request)



I-5: Rogue Valley Corridor Study

Figure 3-1

Vicinity Map

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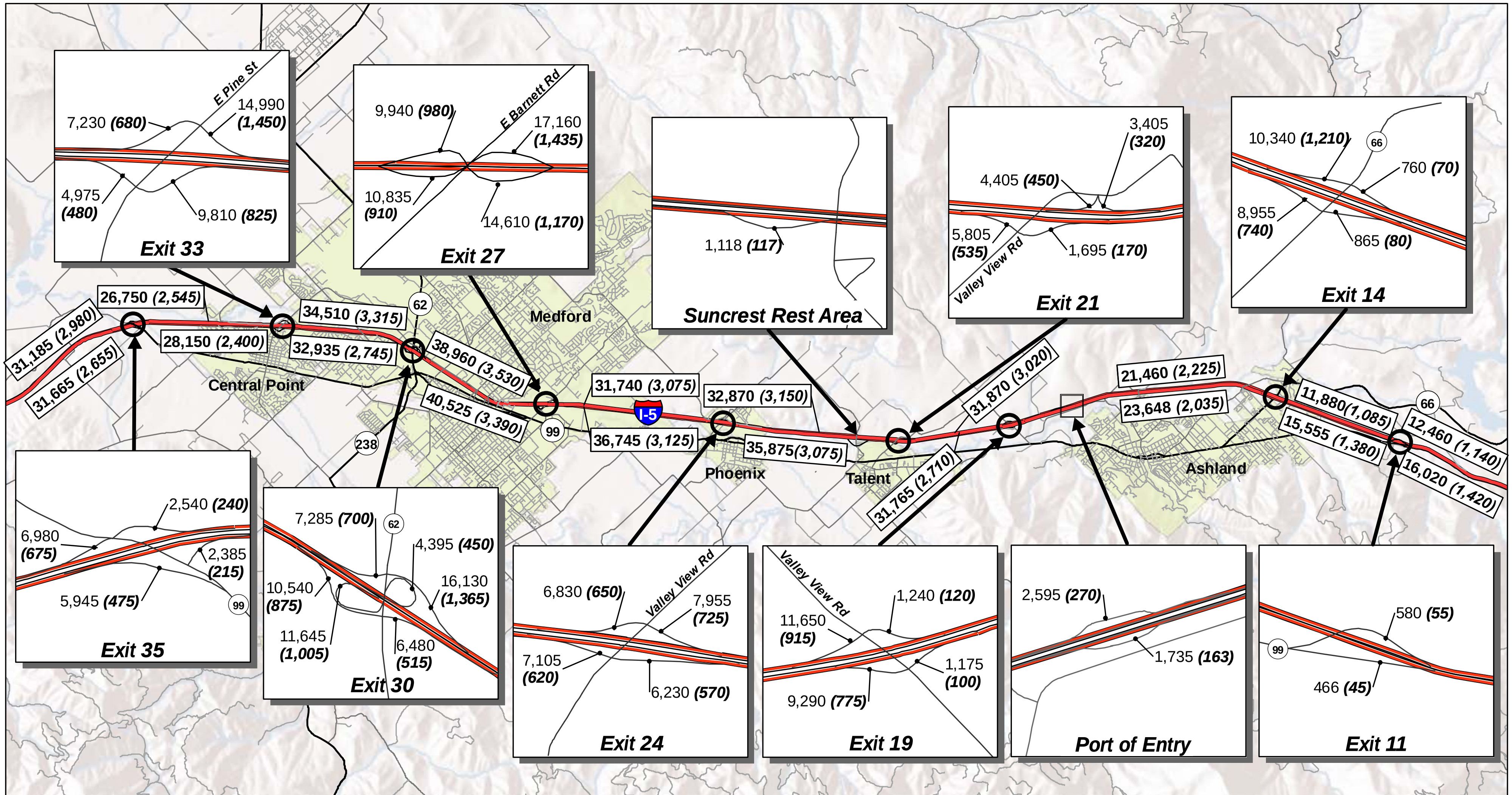

2 1 0 2 Miles

Source Data: Jackson County, ESRI, ODOT, Oregon GEO

Legend

- Interchange
- Port of Entry

10,000 ***(1,000)*** Mainline I-5 Daily Traffic ***(PM Peak Hour Volume)***

5,000 ***(500)*** I-5 Ramp Daily Traffic ***(PM Peak Hour Volume)***

I-5: Rogue Valley Corridor Study

Figure 3-2

2034 Daily Traffic and PM Peak Hour Volume

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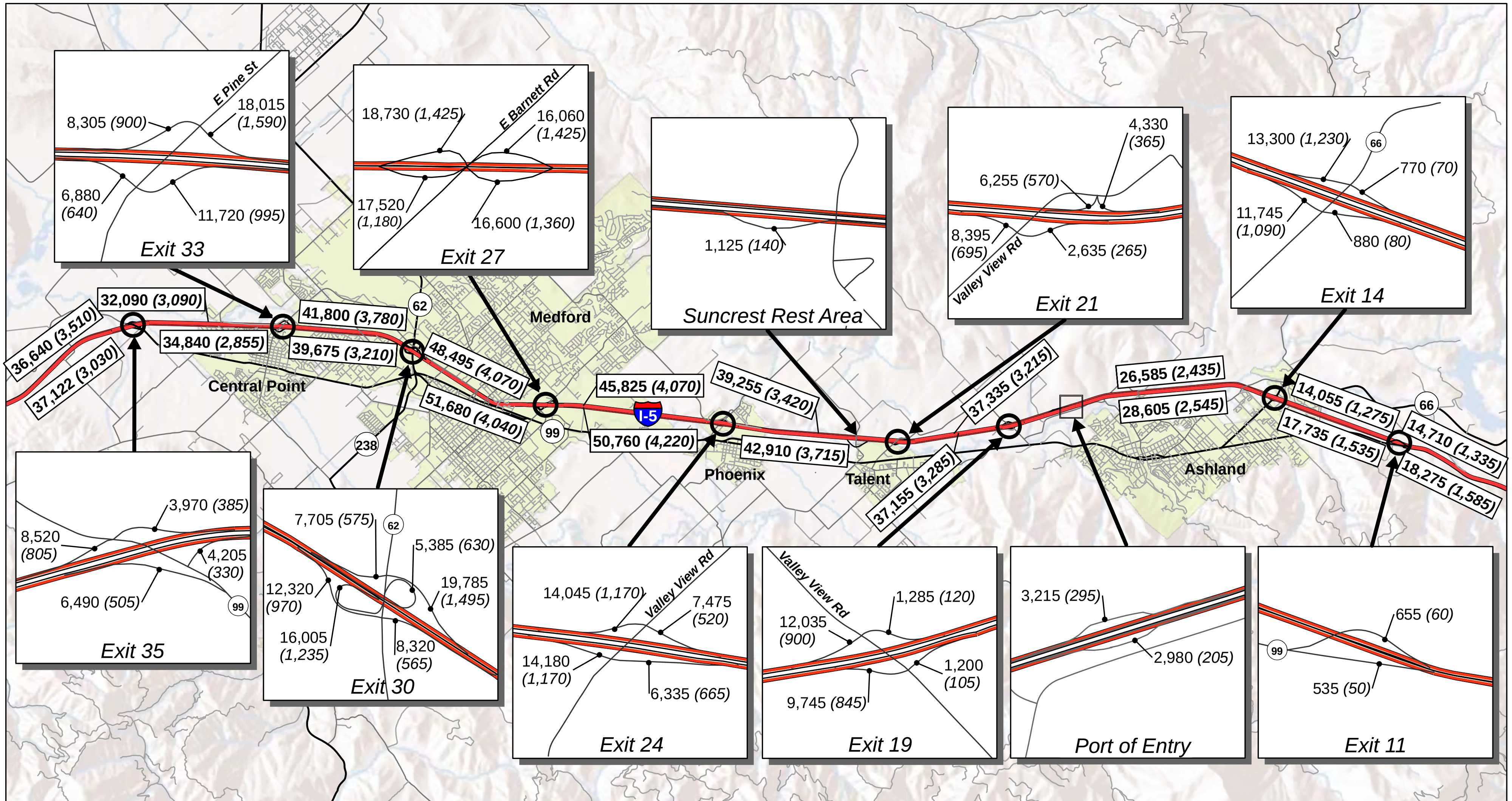

Source Data: Jackson County, ESRI, ODOT, Oregon GEO

I-5: Rogue Valley Corridor Study

Figure 3-3

2050 Daily Traffic and PM Peak Hour Volume

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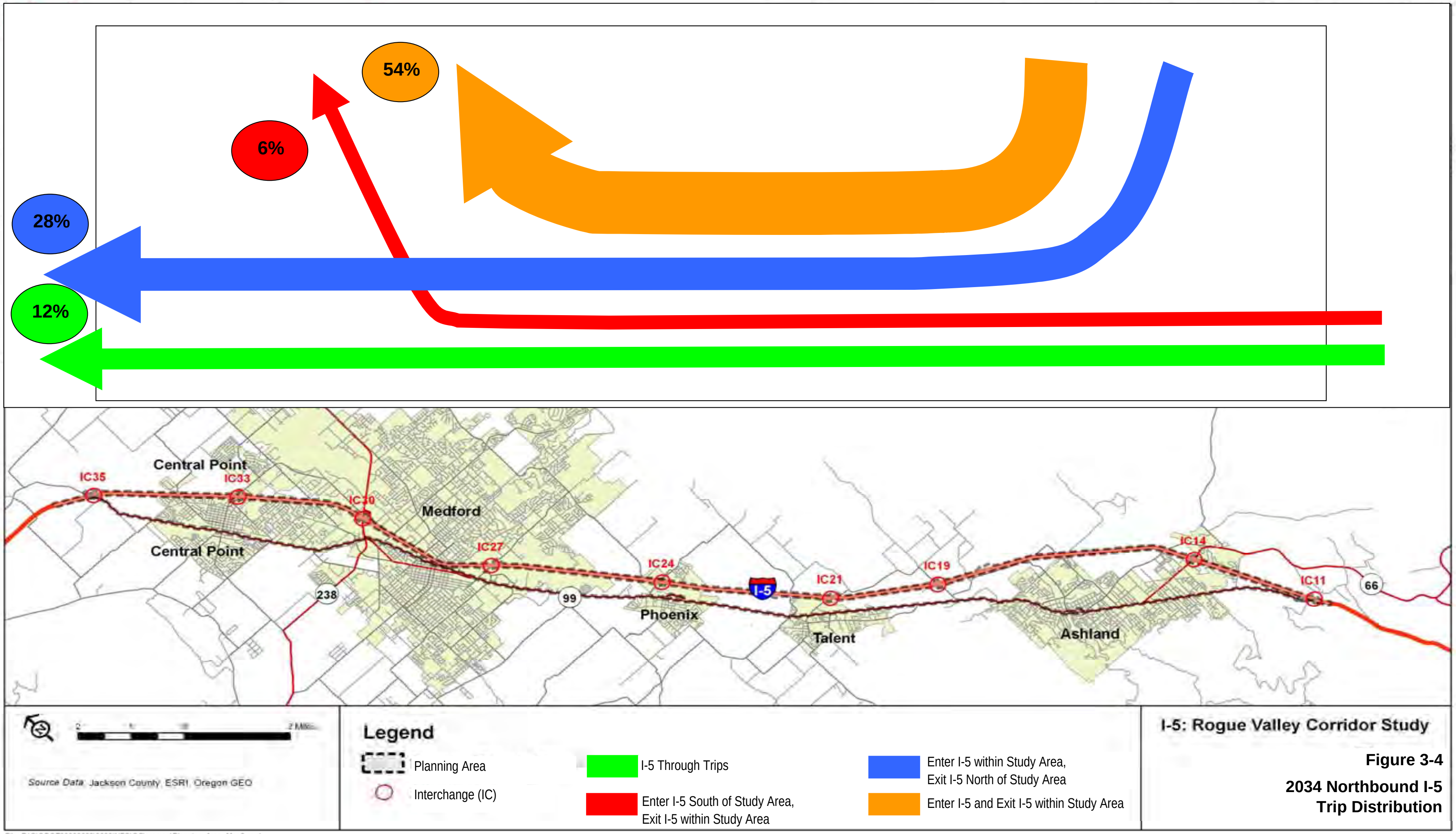
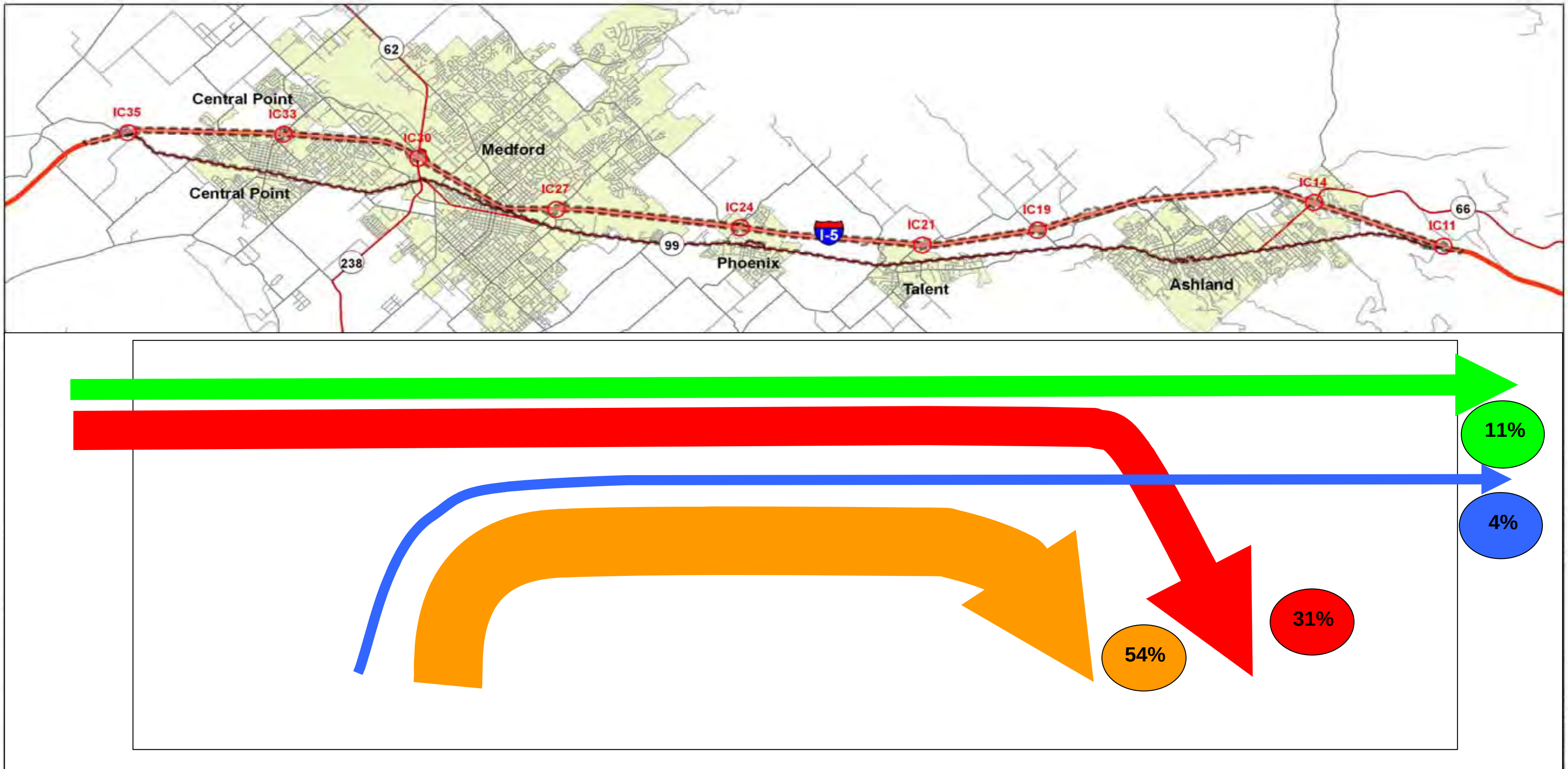
Date: 8/6/2009 3:51 PM



54%
6%
28%
12%
Central Point
Central Point
Medford
Phoenix
Talent
Ashland
IC35
IC33
IC30
IC27
IC24
IC21
IC19
IC14
IC11
238
99
I-5
66
Source Data: Jackson County, ESRI, Oregon GEO
Legend
Planning Area
Interchange (IC)
I-5 Through Trips
Enter I-5 South of Study Area, Exit I-5 within Study Area
Enter I-5 within Study Area, Exit I-5 North of Study Area
Enter I-5 and Exit I-5 within Study Area
I-5: Rogue Valley Corridor Study
Figure 3-4
2034 Northbound I-5 Trip Distribution



Source Data: Jackson County, ESRI, Oregon GEO

Legend

- Planning Area
- Interchange (IC)
- I-5 Through Trips
- Enter I-5 North of Study Area, Exit I-5 within Study Area
- Enter I-5 within Study Area, Exit I-5 South of Study Area
- Enter I-5 and Exit I-5 within Study Area

I-5: Rogue Valley Corridor Study

Figure 3-5

2034 Southbound I-5 Trip Distribution

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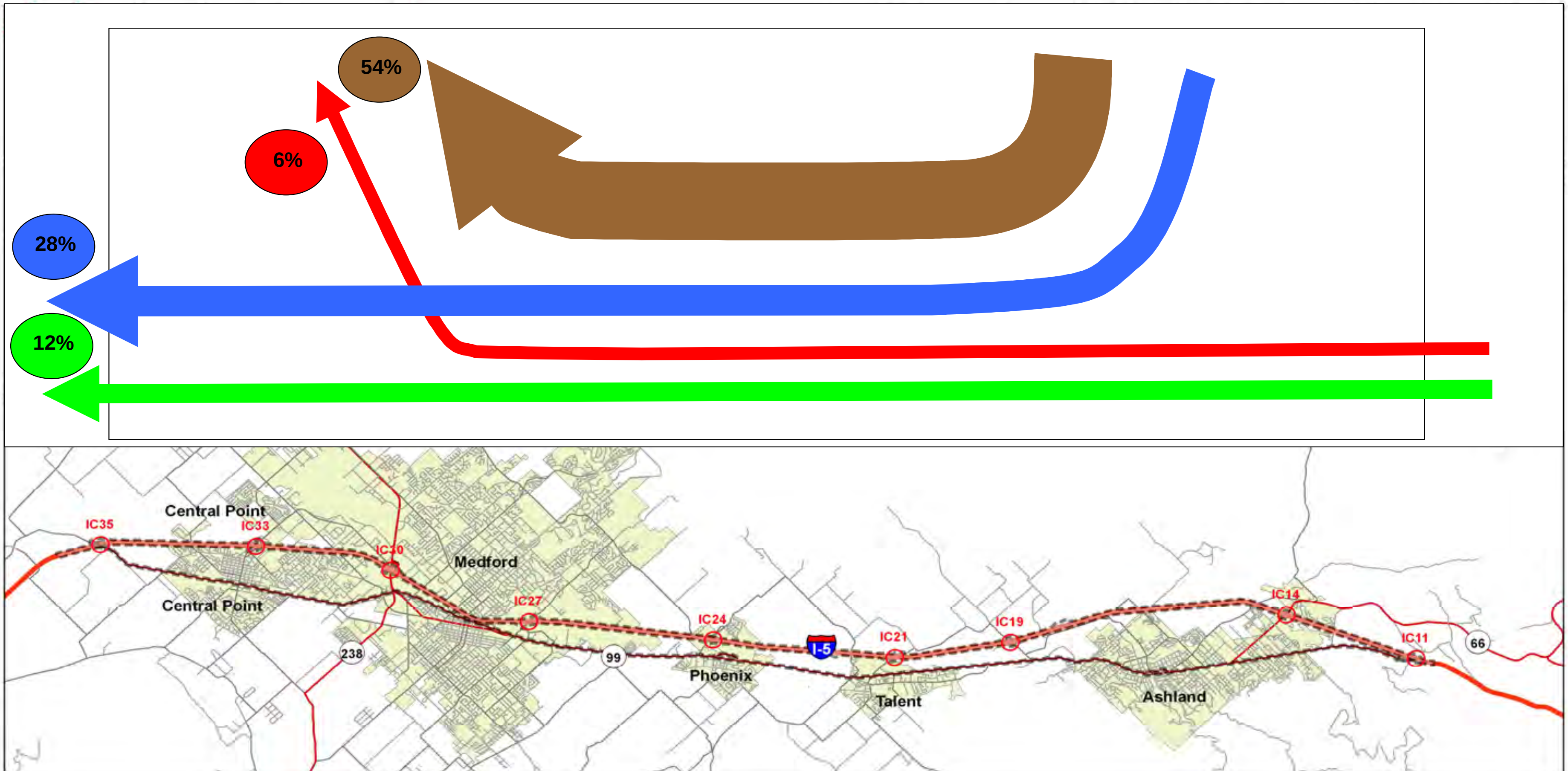


Source Data: Jackson County, ESRI, Oregon GEO

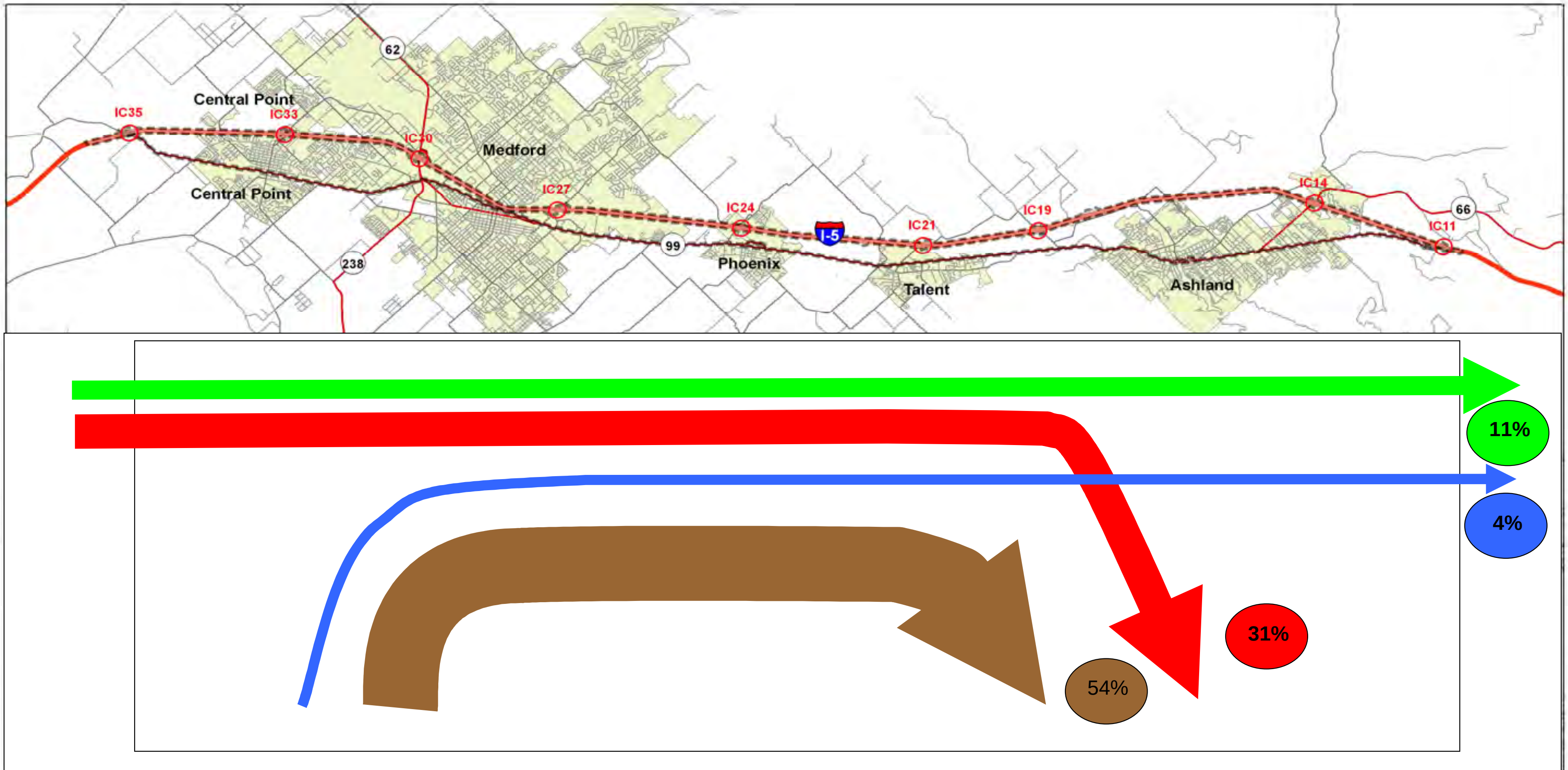
Legend

- Planning Area
- Interchange (IC)
- I-5 Through Trips
- Enter I-5 South of Study Area, Exit I-5 within Study Area
- Enter I-5 within Study Area, Exit I-5 North of Study Area
- Enter I-5 and Exit I-5 within Study Area

I-5: Rogue Valley Corridor Study

Figure 3-6

2050 I-5 Northbound Trip Distribution



Source Data: Jackson County, ESRI, Oregon GEO

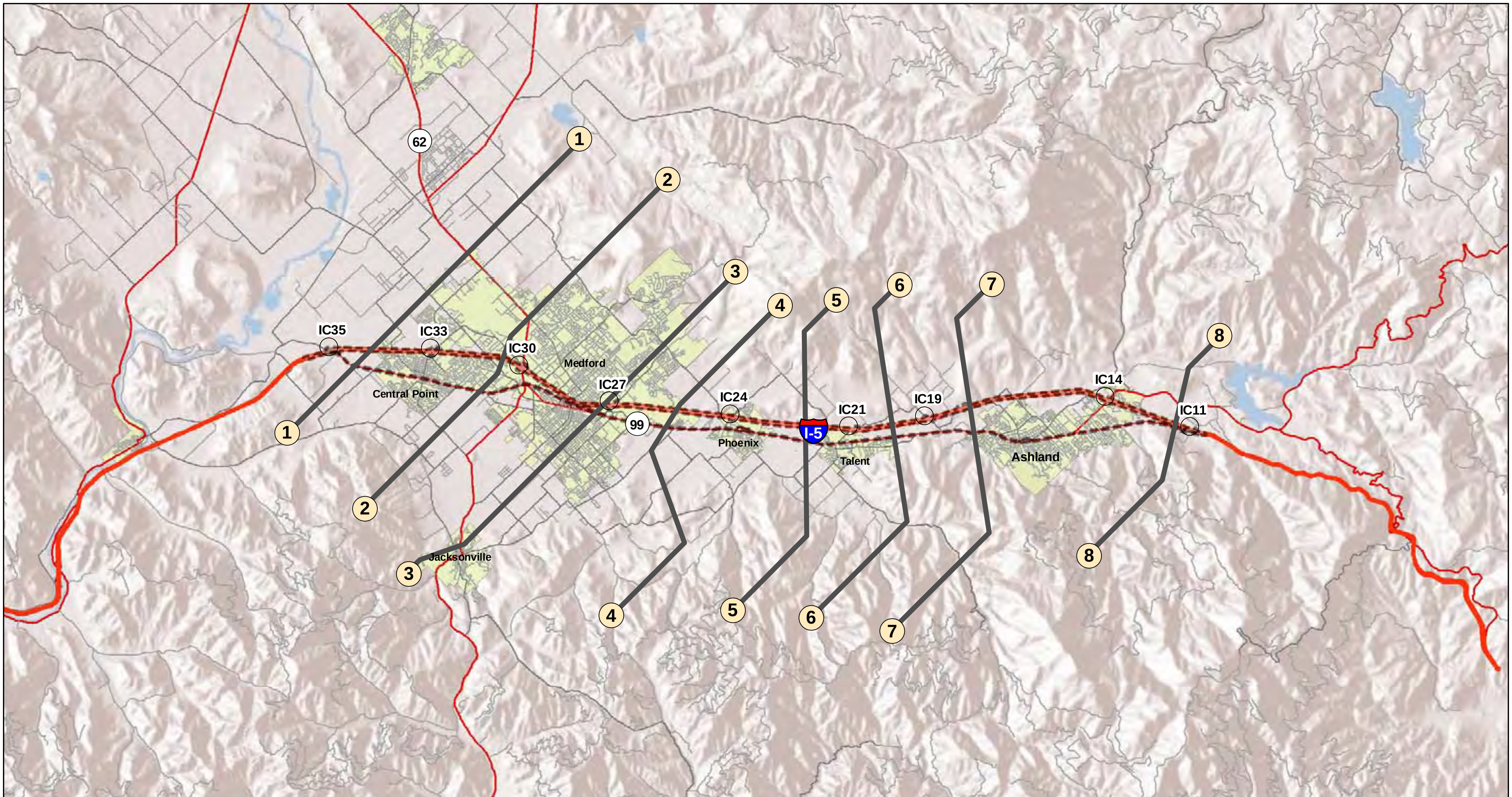
Legend

- Planning Area
- Interchange (IC)
- I-5 Through Trips
- Enter I-5 North of Study Area, Exit I-5 within Study Area
- Enter I-5 within Study Area, Exit I-5 South of Study Area
- Enter I-5 and Exit I-5 within Study Area

I-5: Rogue Valley Corridor Study

Figure 3-7

2050 Southbound I-5 Trip Distribution



Source Data: Jackson County, ESRI, Oregon GEO

Legend

Screenlines

Interchange

I-5: Rogue Valley Corridor Study

Figure 3-8

Screenlines

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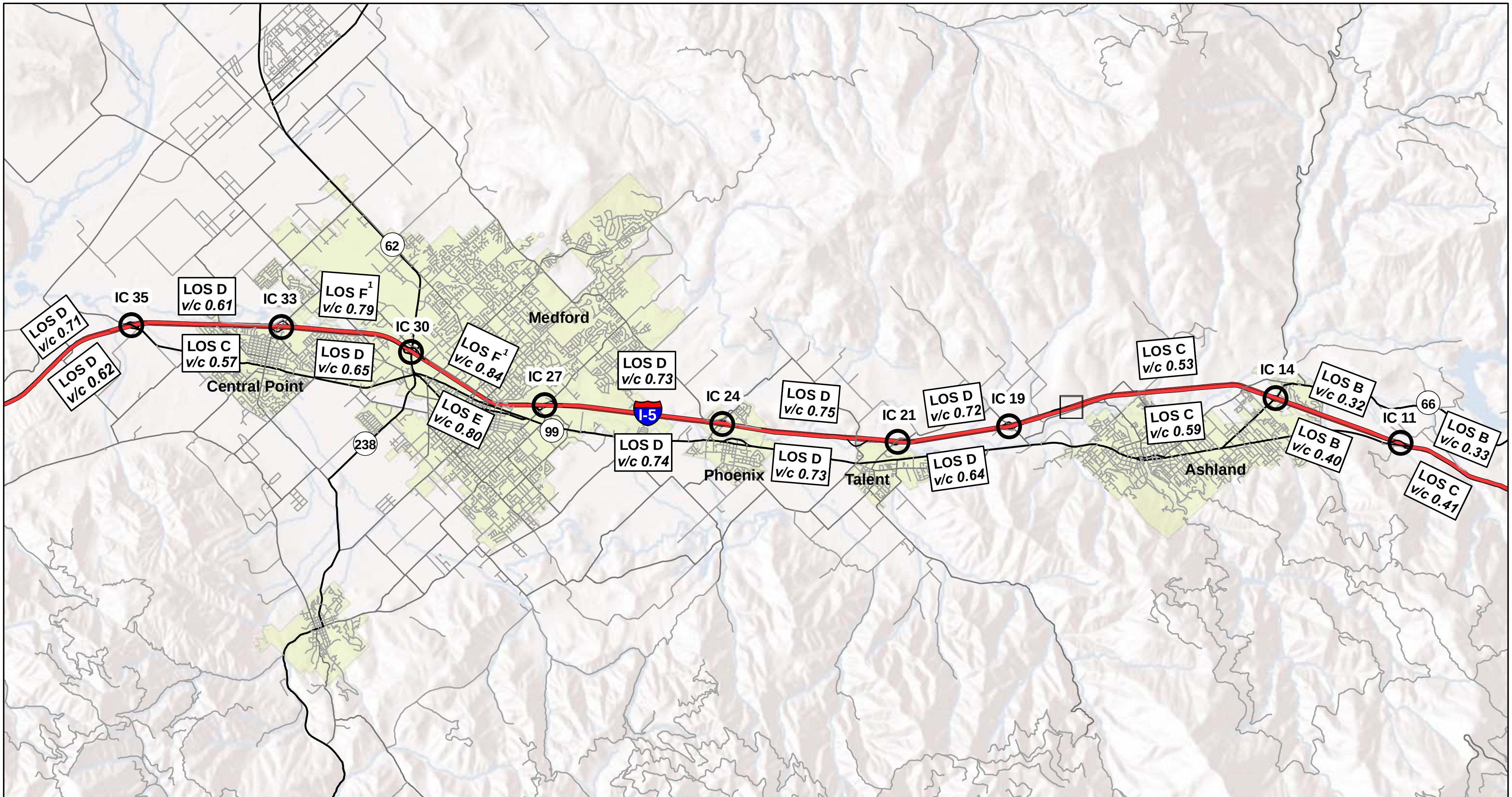

Source Data: Jackson County, ESRI, ODOT, Oregon GEO

Legend

- ○ Interchange
- □ Port of Entry
- LOS / v/c — Level of Service / ***Volume/Capacity Ratio***
- LOS F[1] — LOS F @ Off-Ramp Influence Area

I-5: Rogue Valley Corridor Study

Figure 3-9

2034 Operations

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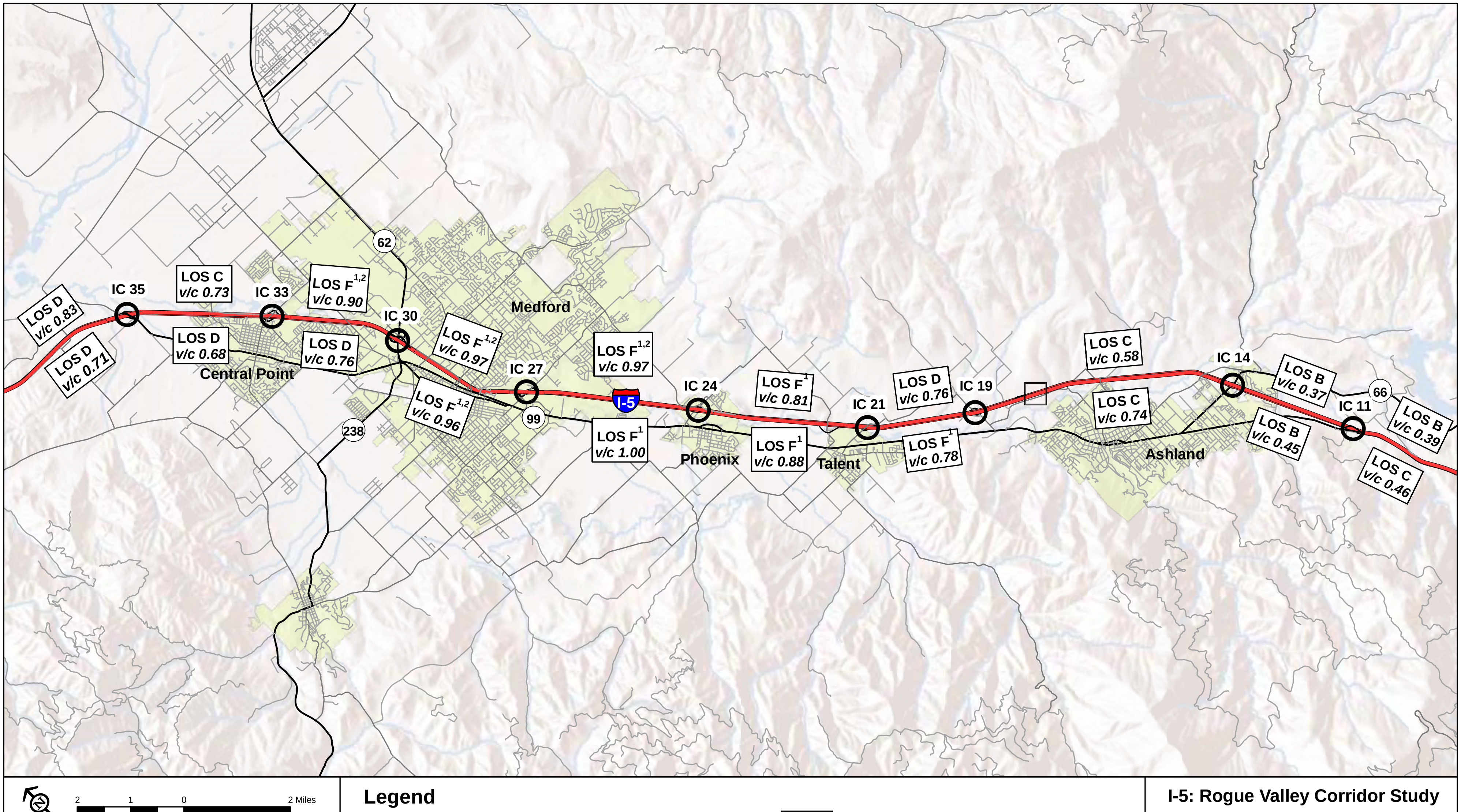

Source Data: Jackson County, ESRI, ODOT, Oregon GEO

Legend

- Interchange
- Port of Entry
- LOS v/c — Level of Service *Volume/Capacity Ratio*
- LOS F[1] — LOS F @ Off-Ramp Influence Area
- LOS F[2] — LOS F @ On-Ramp Influence Area

I-5: Rogue Valley Corridor Study

Figure 3-10

2050 Operations

File: P:\O\ODOT00000629\0600INFO\GS\arcmap\TM2\Volumes-revised.mxd
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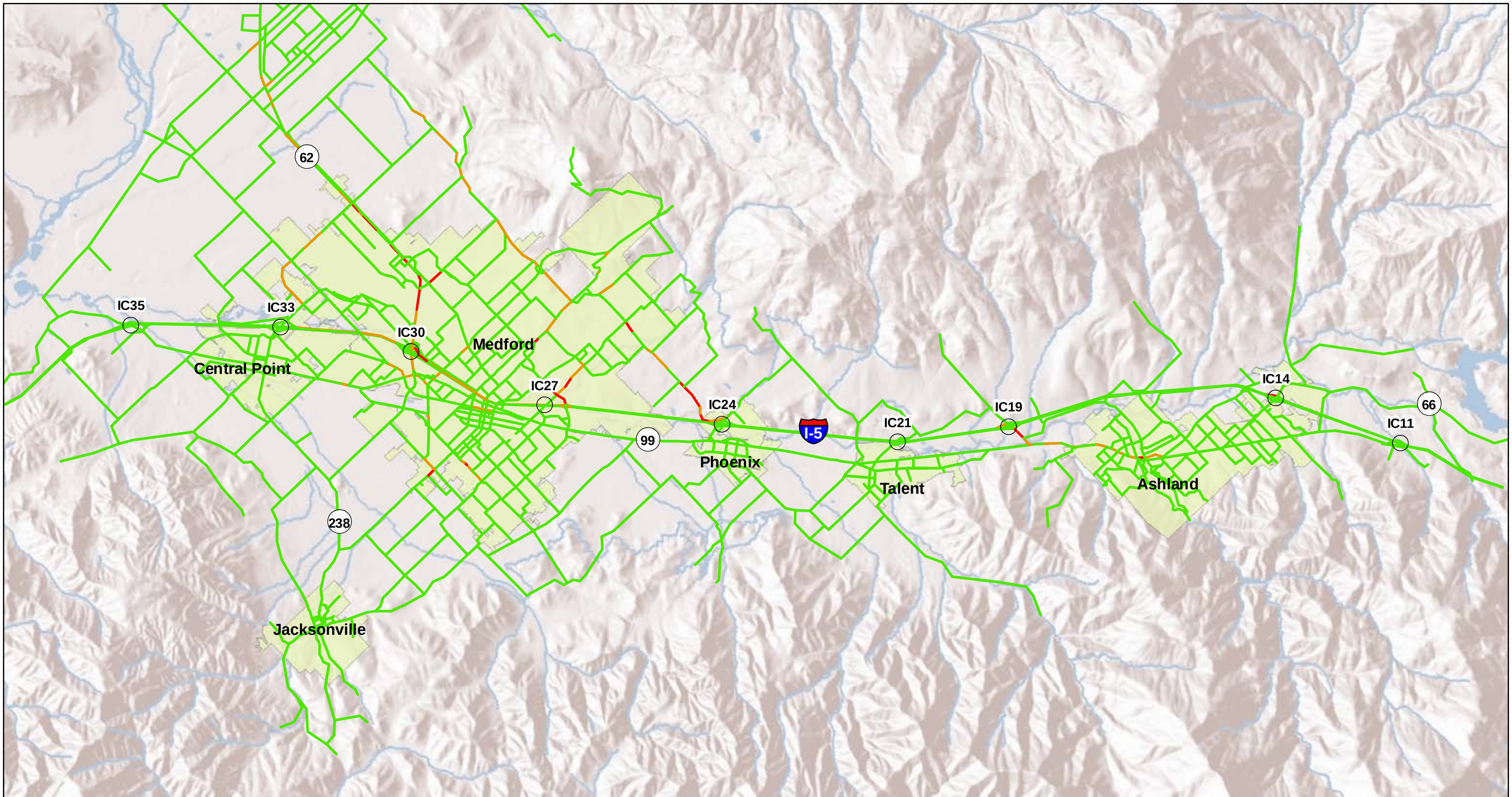

2 1 0 2 Miles

Source Data: Jackson County, ESRI, Oregon GEO

Legend

Interchange

2034 Demand to Capacity Ratio

Greater Than 0.99

0.80 to 0.99

Less Than 0.80

I-5: Rogue Valley Corridor Study

Figure 3-11

2034 Demand-to-Capacity Ratio

File: P:\O\ODOT00000629\0600INFO\GS\arcmap\2034dcr.mxd
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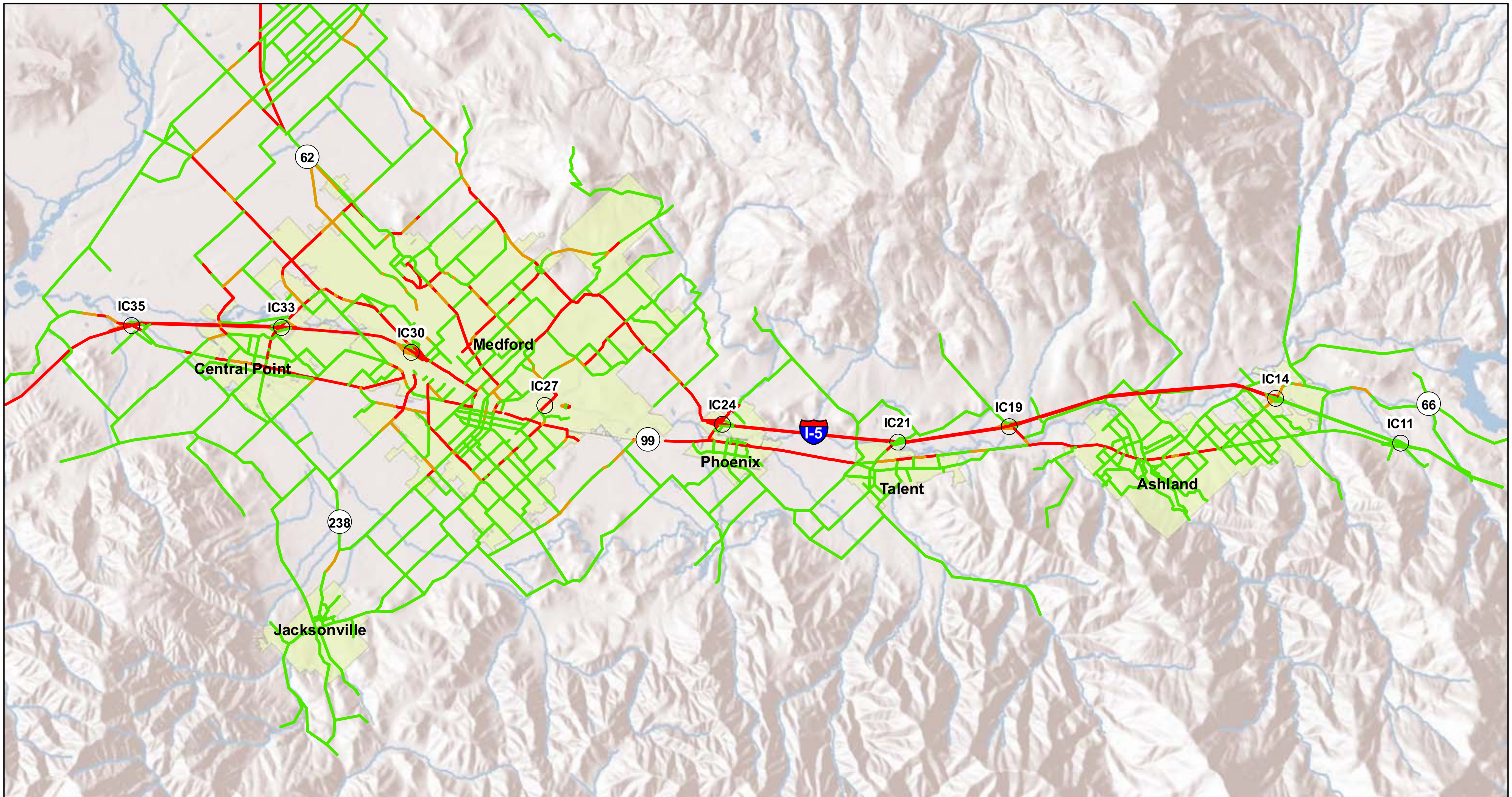

Source Data: Jackson County, ESRI, Oregon GEO

Legend

◯ Interchange

DCR

- Greater Than 0.99
- 0.80 to 0.99
- Less Than 0.80

I-5: Rogue Valley Corridor Study

Figure 3-12

2050 Demand-to-Capacity Ratio

File: P:\O\ODOT00000629\0600INFO\GS\arcmap\2034dcr.mxd
Date: 10/14/2009 4:19 PM

I-5 Rogue Valley Corridor Plan

DRAFT
Technical Memorandum #4: Alternative Corridor Concept Analysis

Prepared by:

DAVID EVANS AND ASSOCIATES INC.

Prepared for:

Oregon Department of Transportation

I-5 Rogue Valley Corridor Plan

DRAFT
Technical Memorandum #4:
Alternative Corridor Concept Analysis

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March 2011

Table of Contents

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1. OVERVIEW

This technical memorandum is the fourth in a series of memoranda that will be prepared for the *I-5 Rogue Valley Corridor Plan* (Corridor Plan). Technical Memorandum #4 builds on the finding of the first three memorandums and identifies concepts and corridor alternatives to improve future traffic operation and safety deficiencies on I-5.

As discussed in Technical Memorandum #1, the Corridor Plan was initiated by the Oregon Department of Transportation (ODOT) to assess existing and future transportation conditions along the Interstate 5 (I-5) and Oregon Highway 99 (OR 99) corridors from Interchange 11 south of Ashland to Interchange 35 north of Central Point.

Technical Memorandum #2 documented existing plans and policies, identified environmental and land use constraints, assessed existing traffic operations and crash history, discussed rail service, and inventoried the existing Intelligent Transportation Systems (ITS) infrastructure along the Corridor Plan area.

Technical Memorandum #3 summarized the future baseline traffic conditions along the Corridor Plan area for the years 2034 and 2050. The 2034 baseline scenario uses the Rogue Valley Metropolitan Planning Organization (RVMPO) financially constrained Regional Transportation Plan (RTP) land use and roadway assumptions. The 2050 baseline scenario also uses the RTP roadway network but with estimated year 2050 land use derived from the RVMPO Regional Problem Solving (RPS) concept. The future baseline scenarios serve as the basis for comparison to future concepts and alternative corridor concepts identified in this technical memorandum.

The purpose of Technical Memorandum #4 is to identify a preferred alternative corridor concept for I-5. The methodology to identify the preferred concept uses the following five steps.

1. Identify concept selection criteria
2. Identify potential improvement concepts
3. Evaluate concept impacts
4. Identify high performing concepts
5. Evaluate corridor concepts using the evaluation criteria

This draft memorandum encompasses steps 1-4, identifying the high performing concepts. The draft will be used to identify a preferred corridor concept in the final version of Technical Memorandum #4.

2. CONCEPT DEVELOPMENT

Concepts for the analysis were developed based on the goals and objectives of the concept as identified in Technical Memorandum #1 and the results of the existing conditions and future year analysis. With these findings in hand, concepts were discussed with the Project Management Team (PMT) and government staff. Through these discussions, several issues and objectives rose to the top as priorities to be addressed in the concept analysis. These include:

- Explore options to mitigate impacts caused by delays at the Siskiyou Pass summit (e.g., delays caused by winter weather conditions).
- Explore options to improve alternate north-south connections east of I-5.
- Improve efficiency of the existing transportation system through Transportation Demand Management (TDM) strategies, Transportation System Management (TSM) measures, and Intelligent Transportation System (ITS) technology.
- Identify potential improvements to the Medford viaduct that incorporate incident management and other measures to maximize efficiency.
- Coordinate with the Rogue Valley Metropolitan Planning Organization (RVMPO) efforts to assess the OR 99 corridor and develop strategies that reduce vehicular congestion and support economic development.
- Maintain efficient operations of the I-5 mainline through interchanges by identifying capacity constraints and implementing physical improvements.
- Explore improvement options for the southbound weigh station and northbound Port of Entry ramps.
- Limit the impacts of arterial system on I-5 mainline operations.
- Identify truck layover areas and implement improvements to enable staging of freight trucks during Siskiyou Pass closures.
- Develop expedited methods of informing truck operators of pending roadway changes ahead, such as construction or the closure of, or delays on, the Siskiyou Pass due to inclement weather.

Based on these priorities, 20 concepts were identified for the I-5 corridor under five concept categories.

- Safety Enhancement Measures
- Transportation System Management (TSM) Measures
- Capacity Enhancement Measures
- Least Cost Planning Solutions
- Transportation Demand Management (TDM) Measures

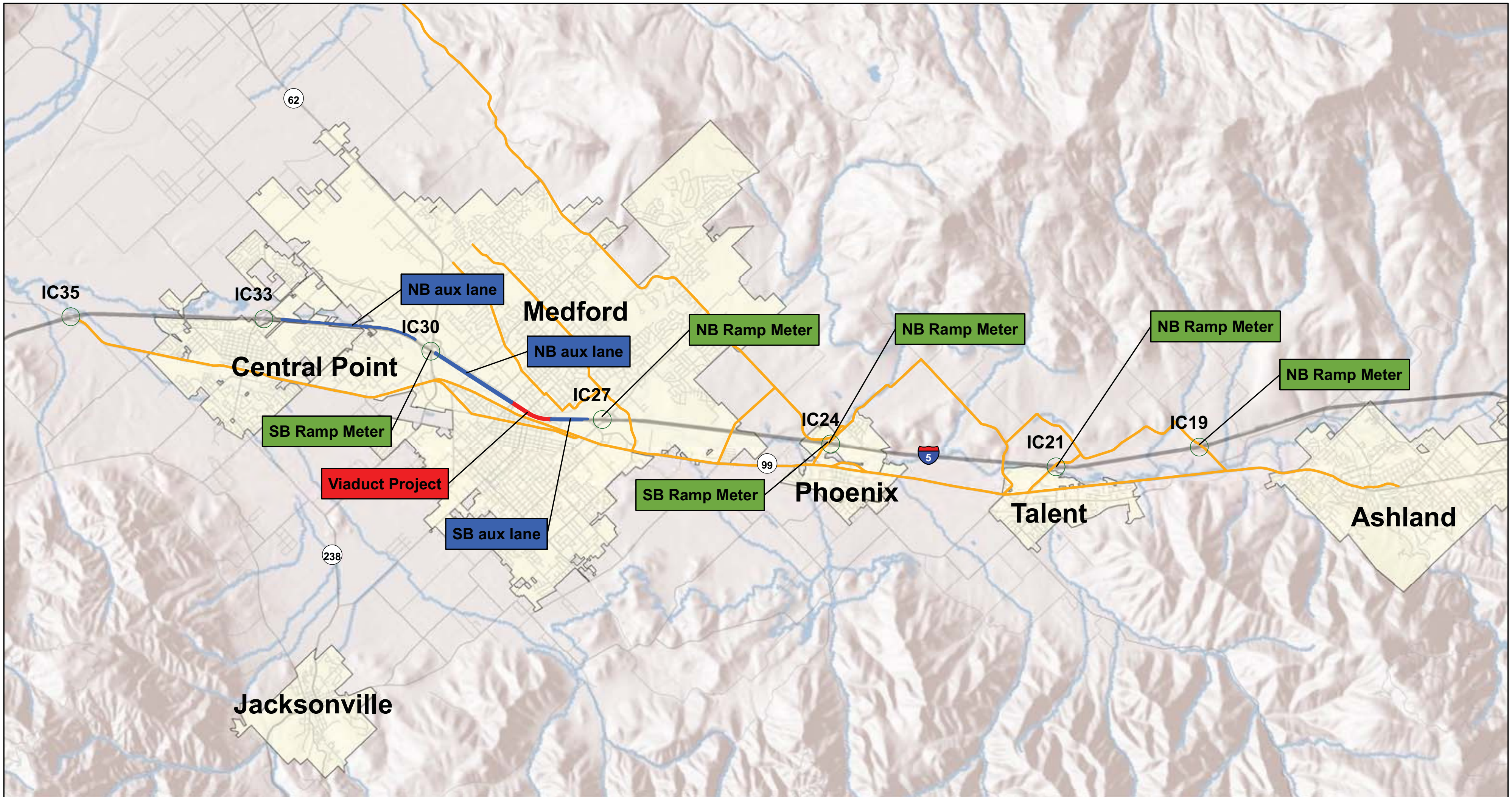
3. CONCEPT ANALYSIS

A general description of each concept and an overview of concept strengths and weaknesses are presented in this section of the document. Many of the concepts could only be evaluated qualitatively because the tools or level of detail was not sufficient to develop the information needed to complete a more technical analysis. The other concepts were evaluated quantitatively for traffic performance, physical impacts, and environmental consequences as well as potential cost. These findings are summarized in this section and the details of the quantitative analysis are included in Appendix A.

Table 3-1 provides a list of the proposed concepts and the level of evaluation for each concept. The locations of each physical improvement are shown graphically in Figure 3-1 for 2034 and Figure 3-2 for 2050.

Table 3-1. Corridor Concepts and Level of Analysis

Corridor Concept	Analysis Level of Detail
Safety Enhancement Measures	
Port of Entry	Quantitative
Southbound Weigh Station	Quantitative
Temporary Overnight Truck Facilities	Qualitative
Emergency Turn-Around	Qualitative
Medford Viaduct Shoulder	Quantitative
Incident Response	Qualitative
Transportation System Management (TSM) Measures	
Designated Alternate Truck Route	Qualitative
OR 99 Corridor Coordinated Traffic Signal System	Qualitative
Ramp Metering	Quantitative
Capacity Enhancement Measures	
Additional Mainline Travel Lane	Quantitative
Auxiliary Travel Lanes	Quantitative
Enhanced Local Arterial/Collector Connections	Quantitative
Expanded Medford Viaduct	Quantitative
Directional High Occupancy Vehicle Lane	Qualitative
Least Cost Planning Solutions	
Peak Hour Shoulder Use	Qualitative
Variable Speed Limits	Qualitative
Transportation Demand Management	
Intermodal Freight Hub	Qualitative
Transit Service Improvements	Qualitative
Commuter Rail	Qualitative
Bus Rapid Transit	Qualitative



Source Data: Jackson County, ESRI, Oregon GEO

Legend

Interchange

Enhanced Local Street Alternatives

Auxiliary Lane Concepts

Viaduct Concepts

DRAFT

I-5: Rogue Valley Corridor Study

Figure 3-1

2034 Potential Concepts

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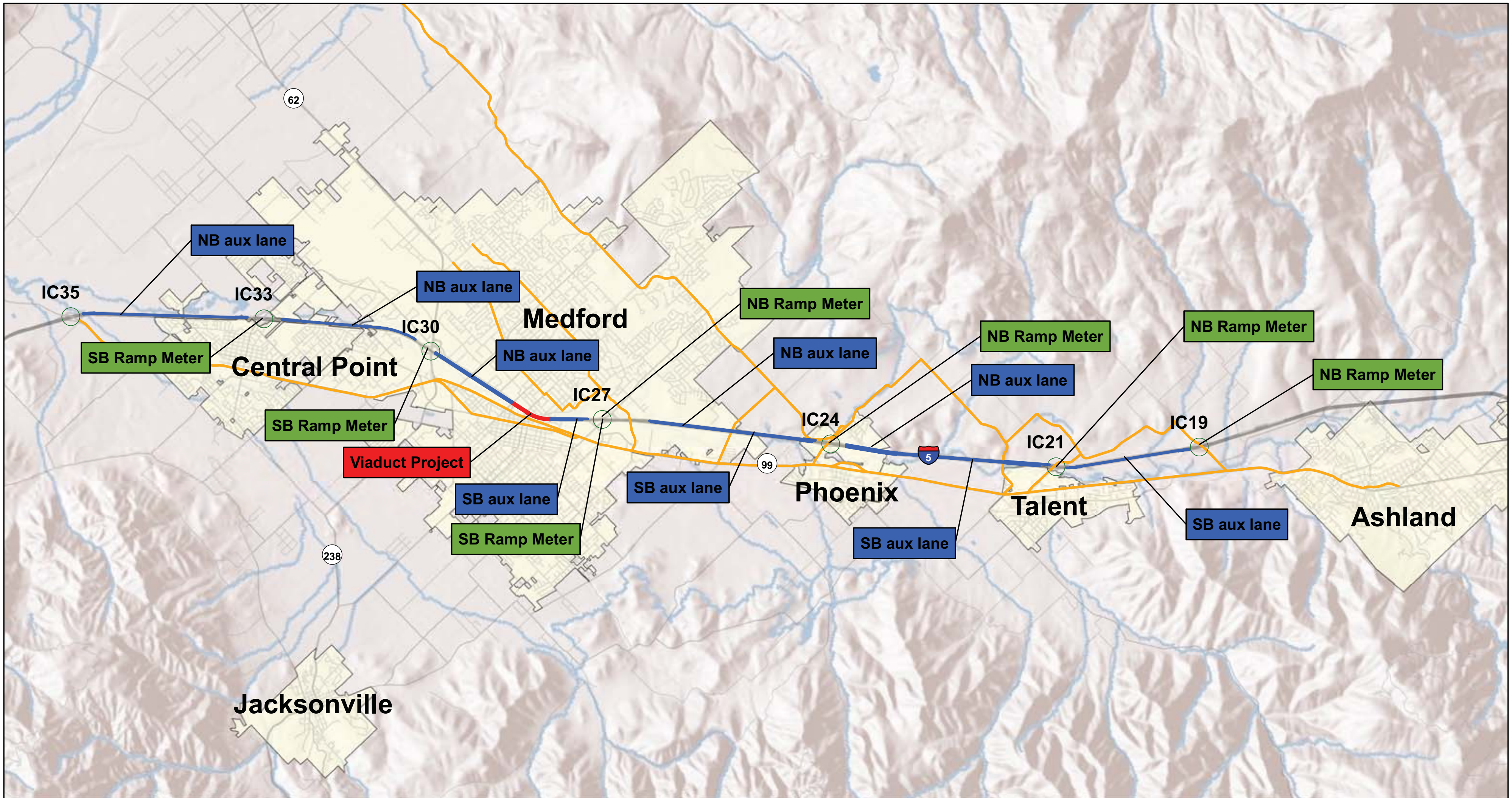

0 0.5 1 2 Miles

Source Data: Jackson County, ESRI, Oregon GEO

Legend

- Interchange
- Enhanced Local Street Alternative
- Auxilliary Lane Concepts
- Viaduct Concepts

DRAFT

I-5: Rogue Valley Corridor Study
Figure 3-2

2050 Potential Concepts

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Safety Enhancement Measures

Addressing safety concerns is always a high priority when managing any part of the transportation system. Four concepts targeted at specific safety concerns on the freeway were developed:

- Port of Entry
- Southbound Weigh Station
- Temporary Overnight Truck Facilities
- Medford Viaduct Shoulder

Port of Entry

Two alternatives were evaluated to address the safety concerns[1] associated with the substandard distance between the northbound on-ramp from the Port of Entry weigh-station and the northbound off-ramp at Interchange 19. One of these options includes an auxiliary land between the on- and off-ramps. The other option reconfigures the weigh station to begin the on-ramp further south on the site to allow from a longer acceleration distance before entering the freeway. Both are discussed below.

Auxiliary Lane Option

This option adds an auxiliary lane between the on-ramp of the northbound weigh station (Port of Entry) facility and the northbound off-ramp at Interchange 19. The existing on-ramp does not provide enough acceleration distance for heavy trucks to reach freeway speeds before having to merge with through traffic, which disturbs traffic flow on the freeway reducing freeway capacity and increasing the potential for crashes. The auxiliary lane would provide additional room for trucks to accelerate up to freeway speeds before having to merge into the mainline travel lanes. The auxiliary lane would further lengthen the acceleration lane and enable safer merging for trucks entering the mainline travel lanes.

Adding the auxiliary lane northbound would require widening and shifting through lanes to the median side for most of the length to allow the widening under the Butler Creek Road Bridge, as shown in Figure 3-3. Constructing the widened pavement in the median would also avoid any potential lengthening for the Butler Creek box culvert, and any potential right-of-way impacts would likely be limited to the exit ramp area where the widening shifts to the outside to align with the existing ramp. Shifting through lanes to the inside would require installation of substantial median barrier and guardrail terminals to protect the closer through lanes from opposing traffic and the median bridge pier.

[1] As noted in Technical Memorandum #2: Data Collection and Review of Existing Plans, the approximate 2,500-foot distance between the weigh station on-ramp and the off-ramp to Interchange 19 is well below recommended interchange spacing standards, which—combined with the inadequate acceleration length on the weigh station on-ramp—results in poor weaving and merging operations at this location.

0 165 330 Feet

Source Data: Jackson County, ESRI, Oregon GEO

Legend

New Pavement

DRAFT

I-5: Rogue Valley Corridor Study

Figure 3-3

Modified Port of Entry
Auxiliary Lane Option

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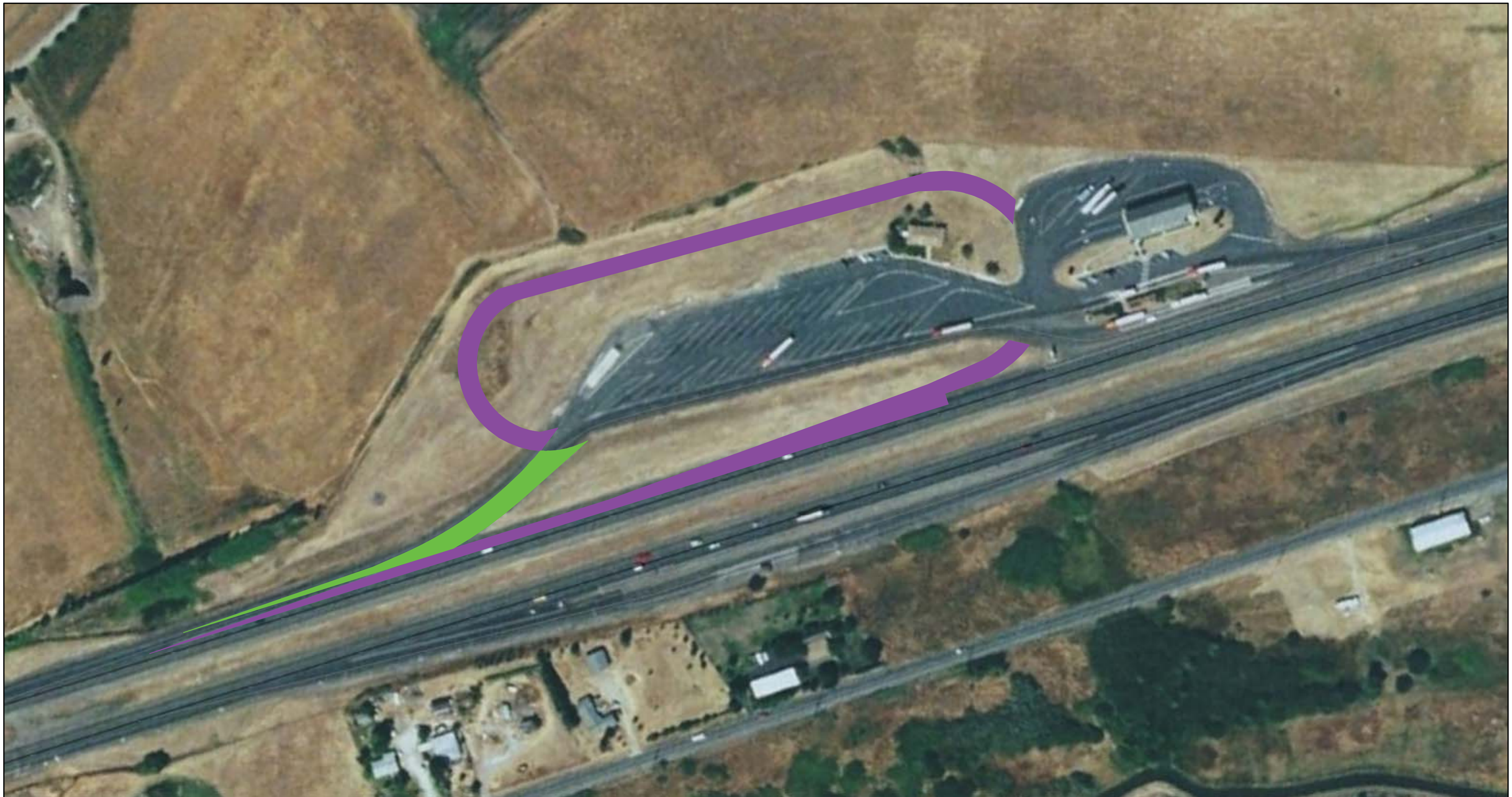
Date 11/10/2010 7:56 AM



Legend

- New Pavement
- Remove Existing Pavement

DRAFT

I-5: Rogue Valley Corridor Study

Figure 3-4

Modified Port of Entry On-ramp

File: P:\O\ODOT00000629\0600INFO\GS\arcmap\TM4\LU and Env Impacts\project_concepts-port_of_entry.mxd
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Strengths

The addition of an auxiliary lane between the northbound on-ramp for the Port of Entry facility and the northbound off-ramp at Interchange 19 would immediately improve safety on the freeway and would provide additional freeway capacity to accommodate future growth in northbound traffic approaching Interchange 19. Constructing the widened pavement in the median should also avoid any potential lengthening for the Butler Creek box culvert, and any potential right-of-way impacts should be limited to the exit ramp area where the widening shifts to the outside to align with the existing ramp. The identified land use and environmental impacts would be minor for this concept.

Weaknesses

This concept maintains the existing on-ramp, which has horizontal and vertical curves that impact the ability of heavy trucks to accelerate. Shifting through lanes to the inside would require installation of substantial median barrier and guardrail terminals to protect the closer through lanes from opposing traffic and the median bridge pier. There is minor potential for land use and environmental impacts identified for this concept. There may be impacts to the Butler Creek 100-year floodplain which intersects the Interstate and then flows into Bear Creek just before it reaches OR 99. The concept would also add 1.2 acres of impervious surface to the concept area, increasing stormwater runoff. Finally, an archaeological site has been identified within 200 feet of MP 17.28-17.45. Therefore, a survey for archaeological resources is recommended prior to construction.

Achieves Corridor Plan Goals and Objectives

The Auxiliary Lane Option (northbound) at the Port of Entry achieves all 4 established project goals and was specifically created to directly meet Objective 2.A. The Auxiliary Lane Option would meet Objective 1.C because it could be considered a TSM measure by improving the operations of I-5 and its related facilities between the Port of Entry and Interchange 19 improving traveling conditions and enhancing system capacity, reliability, and safety. The Option would also meet Objective 2.B as the Option will improve safety for this section of the freeway by allowing additional distance for trucks to accelerate and gain the necessary speed to merge fluidly with traffic. The Option meets Objective 3.A because during the IAMP 19 Planning process, the conflict between passenger vehicles and trucks due to the proximity of the interchange and the Ashland Port of Entry entrance ramp was identified as a deficiency for the interchange. The Auxiliary Lane Option eases this conflict by allowing more room for trucks and passenger vehicles to merge. The Option would generally meet Objective 4.E by improving the operations of the Port of Entry facility by making it easier for trucks to enter back into the freeway flow and Objective 4.F by providing for more capacity near the Interchange 19 north-bound exit ramp. Although the Auxiliary Lane Option does not apply to all the objectives identified for each goal, it also is not in conflict with any of the objectives.

Cost Opinion

The Auxiliary Lane Option would have an estimated cost of between $1 to 2 million to complete.

Modified On-Ramp Option

This option would relocate the Port of Entry on-ramp approximately 1,000 feet to the south of its current location, thus creating a longer acceleration lane which would enable safer merging of trucks onto the freeway. Shifting the on-ramp to the south would require changing the internal circulation at the Port of Entry to allow trucks in the parking area to circle back around to the new on-ramp location, which would be just north of the truck scales, as shown in Figure 3-4. Extending the ramp at the merge point on the freeway is not an option because of the Butler Creek Road Bridge, which prohibits widening the freeway to the outside. Shifting the through lanes to the median side would allow lengthening the acceleration lane, but the impacts and cost would be similar to a full auxiliary lane.

Strengths

Shifting the on-ramp for the Port of Entry facility farther to the south would immediately improve safety on the freeway and would improve the poor horizontal and vertical curvature of the existing ramp for trucks not using the parking facilities. Constructing the widened pavement in the median should also avoid any potential lengthening for the Butler Creek box culvert, and any potential right-of-way impacts should be limited to the exit ramp area where the widening shifts to the outside to align with the existing ramp. The Modified On-Ramp Option would avoid the potential floodplain impacts of the Auxiliary Lane Option.

Weaknesses

The modified on-ramp option would add traffic on the north side of the scale house, which may not be desirable for the site operations. Trucks using the parking facility would need to loop around and backtrack to re-enter the freeway. With this option, a loop ramp would be required from the truck parking area back to the south, which could potentially require some right-of-way. Minor potential for land use and environmental impacts has been identified for this concept. The concept would also add 1.8 acres of impervious surface to the concept area, increasing stormwater runoff. Finally, an archaeological site has been identified within 200 feet of MP 17.28-17.45. Therefore, a survey for archaeological resources is recommended prior to construction.

Achieves Corridor Plan Goals and Objectives

The Modified On-Ramp Option at the Port of Entry achieves Goals 1, 2, 3. The concept was created to meet Objective 2.A. Besides fulfilling Objective 2.A, the Modified On-Ramp Option generally meets Objectives1.C, 2.B, and 3.A, similar to the Auxiliary Lane Option. Yet, the Modified On-Ramp Option does not provide additional capacity (on freeway) to the extent of the Auxiliary Lane Option as its intended use is only for freight exiting the Port of Entry Facility. The Modified On-Ramp Option also, because it focuses solely on providing ramp space for the freight trucks to gain speed, does not improve safety in the area of the freeway to the extent of the Auxiliary Lane Option. The Modified On-Ramp Option at the Port of Entry will generally achieve Goal 4 by improving freight operations for trucks leaving the facility; however, the internal reconfigurations may hinder the facility operations therefore potentially negating any benefit of freight operations from the options design.

Cost Opinion

The Modified On-Ramp Option would have the same estimated cost of between $1 to 2 million to complete.

Southbound Weigh Station

This concept would add an auxiliary lane between the southbound on-ramp at Interchange 19 and the southbound off-ramp at the weigh station. Installation of the auxiliary lane is intended to mitigate the cross-weaving traffic movement caused by vehicles merging onto the I-5 southbound mainline while trucks are positioned in the same section of the right travel lane in preparation to exit at the weigh station. The auxiliary lane would further lengthen the acceleration lane and enable safer merging for vehicles entering the mainline travel lanes.

Strengths

The addition of an auxiliary lane between the southbound on-ramp at Interchange 19 and the southbound off-ramp for the weight station facility would immediately improve safety on the freeway and would provide additional freeway capacity to accommodate future growth in southbound traffic approaching the weigh station. Adding the auxiliary lane southbound would require widening and shifting through lanes to the median side for most of the length, similarly to the northbound side. This will allow the widening under the Butler Creek Road bridge and should also avoid any potential lengthening for the Butler Creek box culvert, and any potential right-of-way impacts should be limited to the entrance ramp area where the widening shifts to the outside to align with the existing ramp. The identified land use and environmental impacts would be minor for this concept.

Weaknesses

Shifting through lanes to the inside would require installation of substantial median barrier and guardrail terminals to protect the closer through lanes from opposing traffic and the median bridge pier. There is minor potential for land use and environmental impacts identified for this concept. There may be impacts to the Butler Creek 100-year floodplain which intersects the Interstate and then flows into Bear Creek just before it reaches OR 99. The concept would also add 0.77 acres of impervious surface to the concept area, increasing stormwater runoff. An archaeological site has been identified within 200 feet of MP 17.28-17.45; therefore, a survey for archaeological resources is recommended prior to construction. Finally, there may be noise impacts associated with bringing the interstate closer to sensitive noise receivers.

Achieves Corridor Plan Goals and Objectives

The Southbound Weigh Station Concept achieves all 4 established project goals. The Concept generally meets the same Objectives as the Auxiliary Lane Option and was also created to meet Objective 2.A. Although the Concept does not apply to all the objectives identified for each goal, it also is not in conflict with any of the objectives.

Cost Opinion

Constructing an auxiliary lane between Interchange 19 and the weigh station to its south would cost an estimated $1 to 2 million to complete. The scope and costs of this project are similar to the northbound auxiliary lane from the Port of Entry, but the southbound side is likely to have a higher cost because of the probable need to construct a new weigh-in-motion scale for the additional lane.

Temporary Overnight Truck Facilities

When the I-5 Siskiyou Pass closes, turmoil results from numerous trucks parked along the I-5 shoulder, ramp terminals, and nearby local streets. The safety concerns arising from the parked vehicles could partially be alleviated by temporarily diverting the trucks to the Jackson County Fairgrounds, distribution centers, industrial parks, and other public and private properties that have ample space for staging large vehicles. Led by RVCOG, implementing this measure would require identifying the key locations in the vicinity of the corridor that could accommodate large trucks and negotiating an agreement among the various property owners, businesses, and/or institutions to coordinate efforts to provide staging grounds. ODOT currently has an informal arrangement with Jackson County to use the Fairgrounds. Directional signage and use of VMS along I-5 would alert drivers of the pending road closure and direct them to available staging areas where they could safely wait for reopening of the summit.

This concept was not evaluated quantitatively since it would only be effective intermittently and for variable durations, depending on the severity of weather conditions.

Strengths

No considerable land use and/or environmental impacts are anticipated for this concept because physical improvements would be limited to the installation of signage, which have a relatively small footprint, within existing, disturbed right-of-way. The overnight parking facilities could be in locations already equipped to accommodate large trucks and could be located to avoid impacts such as noise. Facilities designated to serve trucks could be equipped with amenities (electrical hookups) that would reduce the number of idling diesel engines, and therefore greatly decreasing emissions and wasted fuel. Furthermore, locating many or all trucks in one or two areas, while concentrating emissions due to idling vehicles, could reduce the overall impact area created by having trucks along several miles of I-5. In addition, some trucks opt to use a longer alternative route rather than park overnight on the shoulder, ramp terminals, or local streets. The temporary overnight truck facilities would provide an attractive alternative to alternate routes, thereby reducing VMT.

Weaknesses

This concept requires substantial coordination by RVCOG and the cooperation needed to negotiate an agreement among the various property owners, businesses, and/or institutions to coordinate efforts to provide staging grounds. Because the temporary facilities would only be needed intermittently due to inclement weather and pass closures, potential conflicts in usage could arise. Providing one or more locations to serve trucks during inclement weather events may increase VMT over what occurs today, where trucks merely pull over to the side of the highway.

Achieves Corridor Plan Goals and Objectives

The Temporary Overnight Truck Facilities Concept directly achieves Goals 1, 2 and 4. The Concept was specifically created to address Objectives 1.A and 4.H. The Concept also meets Objective 2.C. The Temporary Overnight Truck Facilities does not specifically apply to or fulfill any of Goal 3 Objectives, but may indirectly meet the Goals intent by providing a safe place, off of I-5 facilities, for trucks to wait out inclement weather putting less stress on interchanges.

Cost Opinion

None calculated.

Emergency Turn-around

There is one designated emergency vehicle turnout in the corridor at mile point 16.7 near the North Mountain Avenue overpass. Expanding this turnaround to accommodate trucks also would provide a turnaround location when the I-5 Siskiyou Pass is closed due to weather conditions. The turnaround mainly would be used by southbound trucks.

This concept was not evaluated quantitatively since it would only be effective during Siskyiou Pass closure.

Strengths

The expanded turnaround area would potentially enable law enforcement or ODOT to signal trucks to turn off I-5 southbound and move out of the flow of traffic in the event of pass closure, which has both operational and safety benefits.

Weaknesses

Trucks can turn around at any interchange, and do not need a specific turnaround area.

Achieves Corridor Plan Goals and Objectives

The Emergency Turn-around Concept meets Goal 1 and was specifically developed to fulfill Objective 1.A. The Concept also generally meets Objective 1.C by providing a TSM measure to improve freeway operations. The Emergency Turn-around Concept marginally achieves Goals 2, 3, and 4 by providing an additional area outside of the I-5 traffic flow for trucks to turnaround which could improve freight mobility and safety as well as alleviate additional freight traffic interchanges during inclement weather although it does not specifically fulfill any of the objectives.

Cost Opinion

Expanding the existing turnaround would cost an estimated $100,000-$300,000.

Medford Viaduct Shoulder

The existing Medford Viaduct contains no shoulder resulting in diminished operation efficiency, particularly when incidents, such as a vehicle break-down or collision, close one or both travel lanes. Adding a 12-foot right side shoulder would require reconstruction and widening of the existing viaduct structure to accommodate the shoulder. Roadway geometry at both ends of the viaduct currently incorporate right side shoulders; therefore, adding a shoulder to the viaduct would provide a continuous shoulder along most of I-5 through the Rogue Valley.

Strengths

The shoulder would potentially enable a vehicle to move out of the flow of traffic in the event of an emergency or breakdown, which has both operational and safety benefits. It would also allow some extra flexibility should a motorist need to take evasive action, as it serves as a buffer area between the main thoroughfare and the edge of the road. Emergency vehicles such as ambulances and police cars may also use the shoulder to bypass traffic congestion.

Weaknesses

Adding a 12-foot right side shoulder would not measurably change the capacity of the viaduct or improve traffic operations under normal free flow conditions.

Any reconstruction of the viaduct structure would be highly expensive. This construction would include footings, columns and crossbeams, in addition to the widened deck and replacement of the bridge rail. There are several additional issues with this widening, which further add to the complexity and cost of implementing this concept.

Furthermore, improvements that widen the existing structure will encroach upon adjacent residential and commercial properties. Additional environmental impacts would include impacts to Bear Creek Park and Bear Creek Greenway, floodplain impacts (1 acre), additional impervious surface (1.6 acre), which would increase runoff to Bear Creek unless mitigated. Impacts associated with widening the viaduct are described further in the appendix. There is a potential for socioeconomic and environmental justice impacts due to the high percentage of minority and persons living below the poverty in the immediate area of the viaduct. Displacements due to the need for additional right-of-way are possible with this project. Because the Medford downtown Historic District abuts some of the viaduct right-of-way, there is a high potential for historical and cultural impacts.

Given the likely high cost and impacts associated with proposing major improvements to the facility, the benefits of adding a shoulder weighed against the cost may not be as attractive as adding an additional travel lane.

Achieves Corridor Plan Goals and Objectives

The Medford Viaduct Shoulder Concept achieves Goal 2. The Concept fulfills Objective 2.C by allowing emergency vehicles access should an accident occur on the viaduct. The Concept only measurably fulfills the full intent of Goal 1, specifically Objective 1.D, because it does not substantially maximize efficiency of the viaduct and would be considered a considerable physical improvement. The Concept does not meet Goals 3 and 4 although it also does not conflict with their intent or objectives.

Cost Opinion

Adding a 12-foot right side shoulder to the Medford Viaduct would require reconstruction and widening of the existing viaduct structure to accommodate the shoulder at an estimated cost of $30 to 40 million to complete.

Incident Response Vehicles

Incident response vehicles are equipped with flat tire repair gear, gasoline, jumper cables, water, traffic control devices, portable dynamic message signs, and other essentials for assisting motorists and responding to incidents. Vehicles are equipped with automated vehicle locators. Deploying an incident response vehicle could reduce incident response time and improve operations on I-5 during incidents. Additional evaluation would be needed to determine optimum times of day, based on time of day crash analysis. In addition, potential to expand the existing Traffic Operations Center would need to be evaluated. Currently located within a shared facility with the Oregon Police Dispatch in Central Point, the Traffic Operations Center is utilized to manage and coordinate response to incidents and to dispatch ODOT personnel throughout south central Oregon. Dispatchers in the center are responsible for posting messages on the dynamic message signs located throughout the Rogue Valley region.

This concept was not evaluated quantitatively since it would only be effective intermittently and for variable durations, depending on the severity of the incident.

Strengths

Deploying an incident response vehicle to patrol I-5 during peak crash periods would increase response time and improve flow of traffic in the event of an incident, which has both operational and safety benefits.

Weaknesses

In order to be functional, incident response vehicles need a point of dispatch that can detect incidents along the entire corridor. ODOT would need to increase the number of closed circuit television cameras to cover the entire corridor. Also, the existing Traffic Operations Center would need to be expanded and upgraded, and receive data from the City of Medford cameras to be able to better monitor the transportation system.

Achieves Corridor Plan Goals and Objectives

The Incident Response Vehicles Concept meets Goal 1 and Goal 2. The Concept was purposefully created to meet Objective 2.C by providing a measure to improve incident response time and simultaneously meets Objective 1.C by providing a TSM measure to improve efficiency of existing facilities. The Concept may indirectly improve I-5 operations at interchanges (Goal 3) and improve Freight Mobility (Goal 4) in the event of an incident but does not specifically fill any of the Goal 3 or 4 Objectives.

Cost Opinion

Deploying an incident response vehicle, including adding cameras and Traffic Operations Center expansion, would cost an estimated $60,000-$150,000 per vehicle depending on the level of support equipment carried by each vehicle, plus operating costs, which will depend on the number of vehicles per day and the hours per day the vehicles would be deployed.

Transportation System Management Measures

Transportation system management measures (TSM) focus on improving operations by changing the way the system is managed rather than adding capacity to the system. Three TSM concepts using Intelligent Transportation Systems (ITS) technology were developed for the corridor analysis:

- Designated Alternate Truck Route
- OR 99 Corridor Coordinated Traffic Signal System
- Ramp Metering

Designated Alternate Truck Route

This concept is intended to mitigate disruptions caused by closures of the Siskiyou Pass due to inclement weather. Variable message signs (VMS) located along I-5 throughout the Willamette Valley would alert southbound traffic to pending pass closures due to weather conditions in the Siskiyou Mountain Range and advise an alternate route onto OR 58 from Interchange 188 to U.S. 97 south past Klamath Falls, into California where the route reconnects to I-5 southbound at the interchange to Week, California. Northbound traffic would detour along the same route and be alerted via VMS as far south as the Redding-Red Bluff vicinity.

Strengths

Although the specific effects cannot easily be quantified, the potential benefits can be articulated. These include potential improvements in safety and operations during storm events where the I-5 Siskiyou Pass is closed as well as potential economic benefits.

The intention of this concept would be to reduce the number of trucks impacted by closure of the I-5 Siskiyou Pass through the usage of signage directing them to an alternative route. If fewer trucks are trapped in the southern Oregon by a pass closures, then impacts of trucks parking along the I-5 shoulder, interchange ramps, and local arterials and collectors would likely be reduced. Consequently, the operations of both the freeway and local system and the safety of their users could be improved.

The economic benefits would stem from reduced delays and less out-of-direction travel for trucks. Lost time can affect productivity, longer travel distances cost truckers money, and delays can impact other parts of a supply chain. The implementation of VMS and alternate truck route could reduce the number of trucks impacted by closure of the Siskiyou Pass.

The OR 58/U.S. 97 route would not add a substantial amount of vehicle miles traveled when compared with the I-5 route because they are almost exactly the same length.

Weaknesses

Although the OR 58-U.S. 97 corridor is already used as an alternate route to I-5 to some degree, most of the corridor is limited to a single lane of traffic in each direction. Furthermore OR 58 comprises numerous tight curves and narrow lanes as it crosses the Cascade Range summit. Substantial upgrades would be needed in order for the corridor to serve as a viable designated alternate route to I-5. Upgrades to OR 58-U.S. 97 could result in considerable environmental and land use impacts along the alternate route depending on the type, extent, and location of the upgrades. I-5 allows for faster and more constant travel speeds. Vehicle emissions are generally lower at higher speeds that are constant for a longer duration.

Achieves Corridor Plan Goals and Objectives

The Designated Alternate Truck Route Concept purposefully meets Objective 1.A and 1.B. Yet, it is probable that implementing the Concept would require substantial physical improvements therefore conflicting with part of the overall intent of Goal 1 to improve efficiency through limited physical improvements. The Concept could generally achieve Goals 2, 3, and 4. As described above, the Concept would, during storm events, improve the operations and safety of both the freeway and local system by alleviating the problem of trucks parking along the I-5 shoulder, interchange ramps, and local arterials and collectors during closure of the Siskiyou Pass. This could also improve freight mobility in the area during the winter months. However, the Concept does not directly fulfill any Goals 2, 3, and 4 Objectives.

Cost Opinion

None calculated.

OR 99 Corridor Coordinated Traffic Signal System

The normal function of traffic signals requires sophisticated control and coordination to ensure that traffic moves as smoothly and safely as possible and that pedestrians are protected when they cross the roads. Control systems used to accomplish this range from simple clockwork mechanisms to sophisticated computerized control and coordination systems that self-adjust to minimize delay to people using the road.

Implementing a more comprehensive coordinated and adaptive traffic signal system through urbanized areas of OR 99 between Interchanges 11 and 35 would potentially improve traffic flow by enabling groups of cars traveling on the highway to proceed through multiple intersections without stopping.

This concept was not evaluated quantitatively since it was not anticipated to result in a substantial shift in traffic demand from I-5. To gain an understanding of how capacity enhancements on the arterial and collector system can quantitatively affect freeway operations, see the findings for Capacity Enhancement Measures - Enhanced Local Arterial/Collector Connections concept.

Strengths

A well coordinated signal system can enhance traffic flow, reduce delay and minimize pollution and the benefits would be immediate. Improved traffic flow could improve OR 99 as a viable alternative for local traffic in place of using I-5. Because this measure would not require physical improvements, no considerable land use or environmental impacts are anticipated. Synchronizing traffic signals would have the benefit of improving travel speeds, reducing vehicle stops and idling time. All these benefits would result in a decrease in vehicle emissions.

Weaknesses

It is not always possible to retain progression throughout a network of signals. It is also difficult to maintain signal progression on two-way streets where congestion during rush hours can interfere with any coordination. Analysis of other concepts with more extensive enhancements to the capacity of the local arterial and collector system showed little affect on traffic demand on I-5. Improved travel speeds along OR 99 may encourage travelers to use this route for trips rather than I-5, which may increase VMT and emission slightly over similar trips taken on free-flowing I-5.

Achieves Corridor Plan Goals and Objectives

The OR 99 Corridor Coordinated Traffic Signal System Concept achieves Goals 1 and 3. Specifically, it fulfills Objectives 1.C by using ITS Systems to improve the efficiency of OR 99 and Objective 3.C by improving traffic flow on OR 99 the major local arterial. The Concept may marginally improve freight operations (Goal 4) by providing an option for local traffic therefore easing congestion and enhancing traffic flow on I-5 and OR 99 for freight traffic but does not fulfill any of the Goal 4 objectives. The OR 99 Corridor Coordinated Traffic Signal System is not anticipated to have any effect on the safety conditions of the corridor facilities (Goal 2) and does not meet any of the Goal 2 objectives.

Cost Opinion

None calculated.

Ramp Metering

Ramp meters are installed to restrict the total flow of traffic entering the freeway, temporarily storing it on the ramps and thus regulating traffic flow along the mainline. Ramp meters may be used to maintain a higher level of service along the freeway or to keep the interstate from exceeding capacity. They can be employed only at certain locations and at certain times of day.

Ramp meter signals activate depending on current traffic conditions as monitored by detectors imbedded into the roadway of both the ramp and the mainline that measure and calculate traffic flow, speed, and occupancy levels. The processed information is then used to alter the number of vehicles that can leave the ramp. The more congested the interstate mainline, the fewer vehicles are allowed to leave the ramp, thus increasing delay for vehicles waiting to enter the freeway.

To determine where ramp meters could be most effectively implemented, volumes on the freeway on-ramps were adjusted until all of the freeway segments were able to achieve acceptable operations with the resulting peak hour freeway demand. Based on this evaluation, ramp metering at the locations summarized in Table 3-2 could offset the need to add freeway capacity in the future. Future ramp meter rates (as shown in Table 3-2 in the 2050 column) are lower than in 2034 because long distance trips increase in 2050. In order to maintain freeway operations, the volume of short distance trips is reduced by metering local ramps.

Table 3-2. Potential Ramp Meter Locations

Interchange Number[1]	Ramp Direction	2034 Ramp Meter Rate (vph)	2050 Ramp Meter Rate (vph)
Northbound Direction of Travel on I-5			
19	NB On-Ramp	860	650
21	NB On-Ramp	600	600
24	NB On-Ramp	600	600
27	NB On-Ramp	1200	1160
Southbound Direction of Travel on I-5			
33	SB On-Ramp	--	620
30	WB to SB On-Ramp	795	600
30	EB to SB On-Ramp	600	600
27	EB to SB On-Ramp	--	600
24	SB On-Ramp	700[2]	--

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

Notes:

1. The interchange locations and directions in this table are based on a PM peak hour analysis; additional location and directions may be needed in the AM peak hour.
2. Interchange 24 shows a need for ramp metering to meet demand in 2034 but shifts in traffic patterns under the 2050 RPS scenario resulted in no metering need at this location.

The analysis performed for the corridor plan focuses on the PM peak hour conditions. Because the peak travel patterns may differ during the AM peak hour, analysis to develop recommendations for a ramp meter program to address morning congestion is recommended.

Strengths

Ramp meters increase the effective freeway capacity by eliminating multiple, closely spaced cars from entering the freeway as a dense group, which can impact mainline traffic flow. Ramp metering would improve operations on the I-5 mainline by increasing travel speeds, decreasing travel times, and improving traffic flow. All of these benefits would result in a decrease in vehicle emissions, which would reduce pollutant emissions along mainline I-5. Through the implementation ramp meters at targeted locations, future mainline traffic speeds and operations can be maintained without adding additional capacity. Furthermore, the delay caused by the ramp meter waiting period may cause some drivers to choose other routes thereby reducing demand for the freeway.

Although minor widening of existing on-ramps would be required to create adequate space for queuing, this widening can generally be accommodated within existing right-of-way. Other physical improvements would be limited to the installation of the meters, which have a relatively small footprint, within existing, disturbed right-of-way.

Compared to concepts that require roadway widening, the ramp metering concepts have limited environmental impacts. Individually, none of the ramp metering concepts would result in wetland or floodplain impacts, or would add more than 0.25 acre of impervious surface to the concept area.

Weaknesses

The ramp metering rates would reduce the volumes traveling the freeway facility and improve operations on the freeway. However, the decreased capacity of the ramps would create queuing on the ramps that could extend onto the local street system. Potential queuing impacts were identified for the northbound Interchange 21 and 27 on-ramps and the southbound Interchange 30 and 33 on-ramps. Drivers diverting to local routes could have some impacts to operations on other parts of the roadway system. Ramp metering would force vehicles to stop before they entered and merged onto the highway; these stops would offset any air quality benefits gained to a certain extent. Providing ramp metering in conjunction with the enhanced parallel routes options would decrease corridor-wide VMT approximately two to three percent.

The new entrance ramps at Interchange 27 would likely include some widening of bridge structures to provide the design storage.

Minor widening of existing on-ramps would be required to create adequate space for queuing which will create additional impervious surface, causing new sources of stormwater runoff.

Achieves Corridor Plan Goals and Objectives

The Ramp Metering Concept achieves Goal 1. Specifically, it fulfills Objectives 1.C by using ITS Systems to improve the efficiency of I-5 traffic flow. The Concept could achieve Goal 3 by improving operations of I-5 through management of the interchanges but would also create capacity issues for the interchanges and may conflict with prepared and pending IAMPs. The Concept may indirectly meet Goal 2 by improving traffic flow by not having cars enter the facility in dense groups during high traffic times and Goal 4 by increasing travel speeds, decreasing travel times, and improving traffic flow therefore improving freight operations. However, the Ramp Metering Concept does not directly fulfill any of the Goal 2, 3, or 4 Objectives.

Cost Opinion

Table 3-3 summarizes the cost opinions for each of the ramp metering projects identified above. For the majority of the proposed ramp meters, estimated costs would range between $150,000 and $400,000. For the ramp meter at Interchange 27 northbound, costs would range between $1 and 4 million. This higher cost is due to widening of the elevated ramp structures that would be required to accommodate the project and the associated vehicle queuing.

Table 3-3. Cost Opinion, Ramp Metering Projects

Interchange & Ramp Direction	Cost Opinion Range (2010 $)
Northbound Direction of Travel on I-5	
Interchange 19 On-Ramp	$200,000-400,000
Interchange 21 On-Ramp	$150,000-300,000
Interchange 24 On-Ramp	$150,000-300,000
Interchange 27 On-Ramp	$1,000,000-4,000,000
Southbound Direction of Travel on I-5	
Interchange 33 On-Ramp	$150,000-300,000
Interchange 30 WB to SB On-Ramp	$250,000-400,000
Interchange 30 EB to SB On-Ramp	$150,000-300,000
Interchange 27 On-Ramp	$1,000,000-4,000,000
Interchange 24 On-Ramp	$200,000-400,000

Capacity Enhancement Measures

Five concepts developed around enhance the capacity of the transportation system were developed for the corridor analysis:

- Additional Mainline Travel Lane
- Auxiliary Travel Lanes
- Enhanced Local Arterial/Collector Connections
- Expanded Medford Viaduct
- Directional High Occupancy Vehicle Lanes

Additional Mainline Travel Lane

This concept would add a continuous third travel lane in both directions between interchanges 21 (Talent) and 33 (Central Point). Implementation would entail widening of the Medford viaduct to accommodate the additional travel lane plus potential reconfiguration of five interchanges (21, 24, 27, 30, and 33), multiple structures, one I-5 bridge underpass, and four I-5 stream crossing bridges.

Strengths

With the additional travel lane on I-5, the analysis indicates the freeway system would operate with free flow operations during the PM peak hour under both 2034 and 2050 scenarios.

Weaknesses

Physical, land use, and environmental impacts were not evaluated for this concept because other concepts under consideration could effectively address operational needs in the freeway corridor with far fewer anticipated impacts. It can be assumed that the impacts would be substantial due to the extent of the concept which would include widening the viaduct. Through lanes would require widening through the interchange areas, which are likely to include substantial bridge impacts and could require new retaining walls. In the short term, VMT and emissions likely would not change as trips would be shifted from local roadways to the freeway. However, in the long term, VMT and emissions likely would increase. The impacts would be similar to those described for the auxiliary lanes between MP 19 to 35, below.

Achieves Corridor Plan Goals and Objectives

Due to the breadth of the physical improvement of the Additional Mainline Travel Lane Concept, it would, most likely, generally achieve Goals 1, 2, 3, and 4; however, it does not purposefully fulfill any single objective of the goals. The Concept would also be considered a major physical improvement project and therefore conflict with the intent of Goal 1 to improve efficiency through limited physical projects.

Cost Opinion

No cost calculated.

Auxiliary Travel Lanes

Auxiliary lanes as they relate to the I-5 Rogue Valley Corridor are travel lanes of limited duration that feed traffic onto and off of the mainline from the on ramp of one interchange to the off ramp of the next successive interchange. The potential locations for auxiliary lanes were identified based on whether or not a current four-lane freeway between two interchanges would meet ODOT mobility standards in the future or whether additional capacity would be needed. The potential locations are summarized in Table 3-4.

Table 3-4. Potential Auxiliary Lane Locations

Location	2034 Auxiliary Lane Need	2050 Auxiliary Lane Need
Northbound Direction of Travel on I-5		
Interchange 21 to 24	No	Yes
Interchange 24 to 27	No	Yes
Interchanges 27 to 30	Yes	Yes
Interchanges 30 to 33	Yes	Yes
Interchanges 33 to 35	No	Yes
Southbound Direction of Travel on I-5		
Interchanges 30 to 27	Yes	Yes
Interchanges 27 to 24	No	Yes
Interchanges 24 to 21	No	Yes
Interchanges 21 to 19	No	Yes

Strengths

Because the *Auxiliary Travel Lanes* concept targets improvements at segments that are expected to exceed ODOT's mobility standards, the impacts are far more limited with similar benefits to the *Additional Mainline Travel Lane* concept. At the same time, operations can still meet the mobility standards in the future with relatively free flow operations.

Another strength of this concept is that auxiliary lanes can be added in response to need and need not all be implemented as a single project. This ultimately means much more flexibility to fund improvements.

Weaknesses

While the impacts of constructing auxiliary lanes would be less extensive than widening the highway for a fixed distance, each auxiliary lane would require widening of the roadway and would need to address constraints at each site. Issues that arise with the various elements include substantial structural work, median barriers, retaining walls, viaduct construction, and right-of-way acquisition. These physical impacts are described further in the appendix.

There would be substantial environmental and land use impacts as a result of this project. Bear Creek traverses I-5 for most of the project area and crosses under I-5 several times. Bear Creek supports endangered fish species, and the additional impervious surface associated with the project would have potential to harm these species. The additional impervious surface ranges from 4.4 to 7.1 acres, depending on the segment. The project would also have impacts on the floodplain of Bear Creek (all but one segment has impacts ranging from 0.1 to 1.8 acre). Additionally, there are potential cultural resource impacts due to proximity of the adjacent Medford downtown Historic District. Finally, several archeological sites have been identified within 200 feet of I-5 where the travel lanes would be located, and further investigation is required. These environmental impacts are described further in the appendix.

Achieves Corridor Plan Goals and Objectives

The Auxiliary Travel Lanes Concept would achieve the project Goals similar to the Additional Mainline Travel Lane. However, it would not conflict with Goal 1 to the extent of the Additional Mainline Travel Lane because it could be implemented in phased, limited improvements as necessary.

Cost Opinion

Table 3-5 provides cost opinions for each of the auxiliary travel lane projects identified above. Adding auxiliary travel lanes between interchanges would cost between $4 and 15 million for most segments identified above; the exception is the viaduct segments. Most of the variability in cost is associated with the differing number of bridges in each section, as well as probable costs for retaining walls or roadside barriers. For example, adding auxiliary lanes for the Interchanges between miles 27 and 30 would cost over $40 million for either the northbound or southbound project. The majority of the cost variation for the viaduct relates to the widening of the viaduct itself. Adding an auxiliary lane with full shoulders would be the safest, but most expensive option.

Table 3-5. Cost Opinion, Auxiliary Travel Lane Projects

Auxiliary Lane Location	Cost Opinion Range (2010 $)
Northbound Direction of Travel on I-5	
Interchange 21 to 24	$10-15 million
Interchange 24 to 27	$8-10 million
Interchanges 27 to 30	$27-64 million[1]
Interchanges 30 to 33	$8-10 million
Interchanges 33 to 35	$5-7 million
Southbound Direction of Travel on I-5	
Interchanges 30 to 27	$26-63 million [2]
Interchanges 27 to 24	$7-9 million
Interchanges 24 to 21	$10-15 million
Interchanges 21 to 19	$4-6 million

Notes:

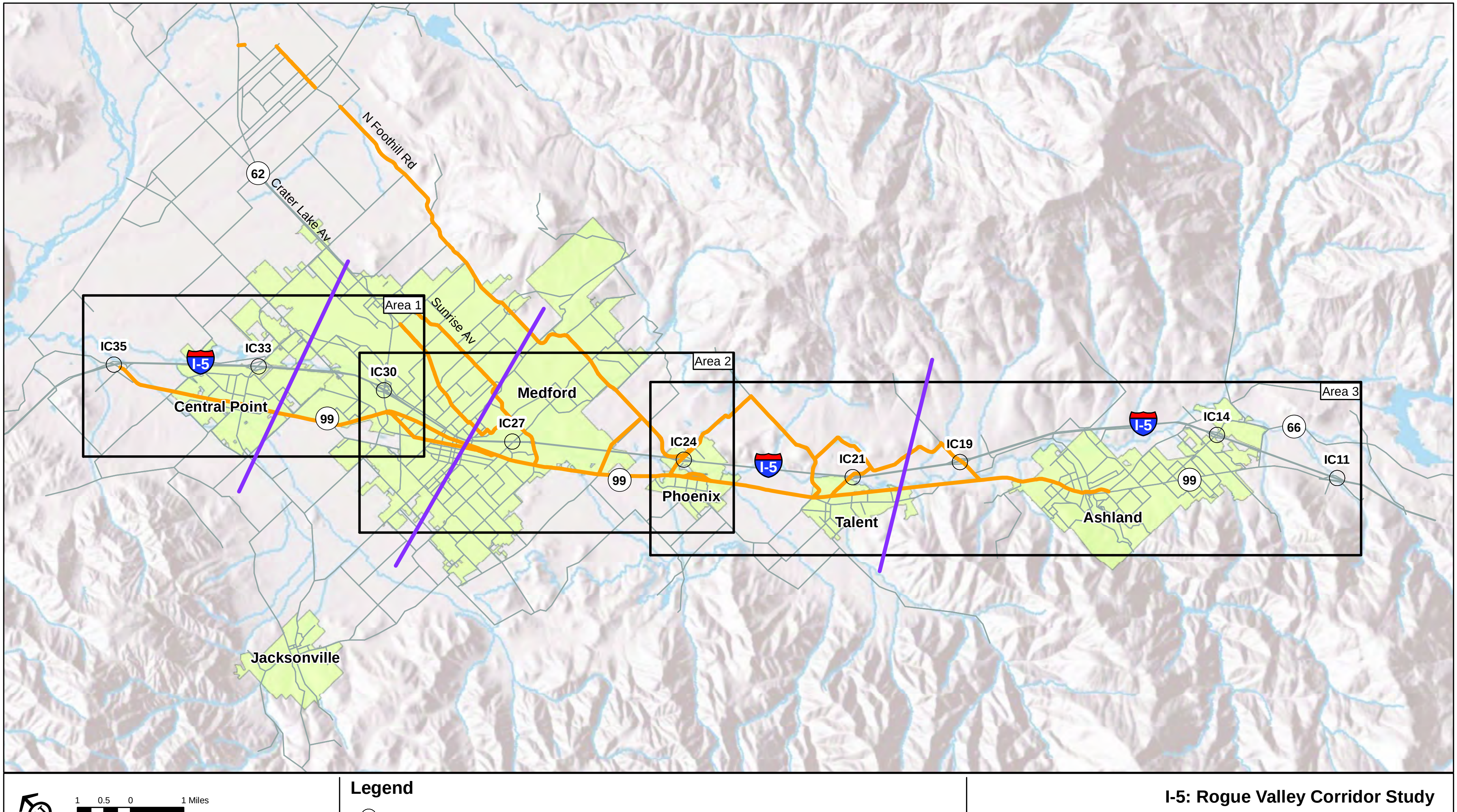
1. Total cost depends on type of Viaduct improvements. At grade northbound auxiliary lane segments would cost 7 to 9 million.
2. Total cost depends on type of Viaduct improvements. At grade southbound auxiliary lane segments would cost 6 to 8 million.

Enhanced Local Arterial/Collector Connections

With this concept, the region would enhance and/or extend key existing roadways that could provide viable alternatives to using I-5 for local trips. The primary alternate route to I-5 within the RVCP area is OR 99, which parallels I-5 west of the interstate. Potential enhancements of this corridor include widening to accommodate three continuous travel lanes in each direction. An additional improvement to better coordinate the traffic signals could enable more free flowing traffic along OR 99 as described under the TSM improvements. East of the interstate, three potential future connectors, all discussed in the Medford TSP, could potentially lure local traffic off of I-5.

Figure 3-5 is a map of the study area with the enhanced local arterial/collector connections. The three boxes demarcate subareas used to describe the localized effects of the various alternatives. When evaluating the potential enhanced local connectors' operational benefits to I-5 on a corridor-wide level, the displacement and environmental effects mask the benefits to I-5 operations in some segments. It was apparent that the operational benefits versus impacts needed to be evaluated on a smaller scale. In the Medford area, the traffic analysis of enhancing local connectors shows a movement of traffic off I-5 to use of the local roadways, a benefit to I-5 operations. In the areas north and south of Medford, analysis shows a mixed or negative effect to I-5, or that more vehicles would use the local roads to access I-5 and add traffic to the highway. Based on the results of the analysis and the population centers, the I-5 corridor was divided into three segments:

- Central Point and North Medford—interchange 30 to interchange 35
- Medford— interchange 24 to interchange 30
- Phoenix to Ashland— interchange 11 to interchange 24



Source Data: Jackson County, ESRI, Oregon GEO

Legend

- Interchange
- Local Arterial or Collector with increased capacity and/or speed
- Analysis Subarea
- Screenline Location

DRAFT

I-5: Rogue Valley Corridor Study

Figure 3-5
Enhanced Local Arterial / Collector Connections
Analysis Subareas and Screenline Locations

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The segments overlap so that the traffic analysis could include operations on entire interchanges, instead of attempting to divide operations on ramps into different segments.

Area 1: Central Point and North Medford – Interchanges 30 - 35

The only road proposed in this area for enhancement is OR 99.

Strengths

In addition to the overall strengths described below, OR 99 connecting Medford and Central Point would carry additional traffic in 2034 and 2050. Other roads that would be expected to carry additional traffic are Crater Lake Avenue/OR-62 and Sunrise Avenue.

Weaknesses

In addition to the overall weaknesses described below, I-5 would experience very little change or a decrease in traffic volume between interchanges 30 and 35 for the peak and daily periods. The expansion of OR 99 to provide more capacity would have environmental and property impacts.

Achieves Corridor Plan Goals and Objectives

The Enhanced Local Arterial/Collector Connections Concept, Area 1 Option may achieve Goal 1 by marginally increasing efficiency of traffic operations through the Corridor. However, it does not specifically fulfill any of Goal 1 Objectives and would require substantial physical improvements therefore conflicting with the intent of Goal 1 to improve efficiency through limited physical projects. The Option would most likely, indirectly, achieve Goals 2, 3, and 4 by taking pressure off the I-5 facility including its interchanges and providing ease of freight movement in the Corridor but would not fulfill any specific objectives of those goals.

Cost Opinion

Not calculated.

Area 2: Medford to Phoenix – Interchanges 24 - 30

Three main roads in this section have proposed improvements under the enhanced local arterials/collector connections concept: N. Phoenix Road/N. Foothills Road, Crater Lake Avenue, and Highland Drive/Sunrise Avenue/Springbrook Road. These roadways are described below.

N. Phoenix Road/N. Foothills Road

The southern end of the corridor, designated as N. Phoenix Road, connects to Fern Valley Road east of Interchange 24 and tracks north, traversing eastern sections of the Medford Urban Growth Boundary (UGB). Transitioning into N. Foothills Road north of Hillcrest Road, the corridor continues north toward White City where it currently truncates at Corey Road. From Corey Road, N. Foothills Road would be extended north to Atlantic Avenue through White City as described in the Jackson County TSP. Where Atlantic Avenue currently truncates at Avenue

H, the roadway would cross and extend northwestward to E. Dutton Road where it would connect with OR 62 (Crater Lake Highway).

Crater Lake Avenue

Mostly a four-lane arterial from E Main Street north to Delta Waters Road, Crater Lake Avenue links Medford's central, eastern, and northeastern neighborhoods plus a direct connection to OR 62 (Crater Lake Highway). The existing corridor truncates at E Main Street, which provides good connections to downtown Medford and eastern neighborhoods. However, direct access to I-5 and south Medford would require an extension of the corridor south. The Corridor Plan assumes the route of this corridor extension would follow E Main Street south on Willamette Avenue, then east onto Siskiyou Boulevard to Highland Drive, then south on Highland Drive to Interchange 27.

Highland Drive/Sunrise Avenue/Springbrook Road

This two- to three-lane collector north-south corridor cuts a path through the east neighborhoods of Medford between the Crater Lake and Phoenix-Foothills corridors. The southern end of the corridor originates at Interchange 27, north on Highland Drive, forks right onto S Barneburg Road to Sunrise Avenue, eventually transitioning into Springbrook Road to Delta Waters Road. North beyond Delta Waters Road, the corridor could eventually continue to Coker Butte Road.

Strengths

With ramp meters, I-5 would experience a decrease in traffic volume through Medford and the viaduct area between interchanges 27 and 33 for the peak and daily periods. Without ramp meters, I-5 would experience a decrease in traffic volumes beginning further south at interchange 24 when compared to the ramp metering alternative. This is likely due to the improved freeway operations in the ramp metering alternative that attract additional longer distance trips while the shorter trips shift to the local street system. Also, in 2050, OR 99 through parts of downtown Medford would experience a decrease in traffic volumes.

Weaknesses

In 2034 and 2050, a number of arterials and collectors would experience an increase in traffic. The expansion of the arterials and collectors to provide additional capacity would have environmental and property impacts.

Achieves Corridor Plan Goals and Objectives

The Enhanced Local Arterial/Collector Connections Concept, Area 2 Option would meet Goal 4 and fulfill Objective 4.G by providing more direct freight travel routes and overall improving traffic flow on I-5. The Option would achieve Goal 1 by increasing efficiency of traffic operations through the corridor, and fulfill Objective 1.B by improving north-south connections east of I-5. However, the Option would require substantial physical improvements and therefore not meet the full intent of Goal 1. The Option would most likely, indirectly meet Goals 2 and 3 by taking pressure off the I-5 facility including its interchanges during high traffic times but not fulfill any specific Objectives of Goals 2 and 3.

Cost Opinion

Not calculated.

Area 3: Phoenix to Ashland – Interchanges 11 - 24

The potential for enhanced connectors south of Medford, besides OR 99, consist largely of rural roads that crisscross along the east side of the I-5 corridor between Phoenix and north Ashland. Existing roads that can potentially serve as connectors include South Valley View Road, West Valley View Road, Suncrest Road, Payne Road, and Fern Valley Road. A planned extension of S. Stage Road east of OR 99 and over/under I-5 to N. Phoenix Road recommended in the Medford and Jackson County TSPs would provide a new connection between Interchanges 24 and 27.

Strengths

In 2050, OR 99 through Talent and Phoenix would experience a decrease in traffic volumes.

Weaknesses

With and without ramp meters, I-5 would experience additional traffic volume between interchanges 19 and 24 during the peak and daily period. These volume changes are likely because the enhancements to local roads allow drivers to quickly reach I-5, their desired route. OR 99 between interchange 19 and downtown Ashland would carry additional traffic in 2034 and 2050. The expansion of the arterials and collectors to provide additional capacity would have environmental and property impacts.

Achieves Corridor Plan Goals and Objectives

The Enhanced Local Arterial/Collector Connections Concept, Area 3 Option would achieve the same goals and meet the same objectives similar to the Area 2 Option.

Cost Opinion

Not calculated.

Overall

Strengths

Enhancing the local arterial/collector network is expected to have benefits to the improved roadways and potentially other nearby facilities. Similar to the findings for the OR 99 Corridor Coordinated Traffic Signal System concept, this concept may enhance traffic flow within the system, reduce delay in many areas, and minimize overall pollution.

Weaknesses

The analysis shows that the *Enhanced Local Arterial/Collector Connections* concept alone provides little benefit to relieving traffic demand on I-5. Therefore, operations of the freeway would not be substantially improved with only this concept.

For any of the local system enhancements, there could be substantial environmental and land use impacts associated with construction and operation of the roadway improvements. For example, Goal 5 impacts would be likely as numerous creeks with associated 100-year floodplain are in the area of the concepts including Bear Creek which comes in close proximity to OR 99 in several areas. There are also historical resources and districts in close proximity of the concepts making historical impacts likely. Displacements associated with widening and road network improvements could adversely impact environmental justice communities in the concept area. Noise impacts are likely due to extending roads into new areas and widening roads bringing them closer to sensitive noise receivers. Extending roads which are at the edge of the Urban Growth Boundary could have overall environmental impacts associated with taking previously rural land and changing the use of the land to transportation use, an urbanized use.

Achieves Corridor Plan Goals and Objectives

Overall, the Enhanced Local Arterial/Collector Connections Concept would achieve Goal 4 and fulfill Objective 4.G by providing a more direct freight travel routes and overall improving traffic flow on I-5 in specific areas. The Concept would achieve Goal 1 and fulfill Objective 1.B by increasing efficiency of traffic operations through the corridor, and improve north-south connections east of I-5. However, it would require substantial physical improvements and therefore not meet the full intent of Goal 1. The Concept could, indirectly, meet Goals 2 and 3 by taking pressure off the I-5 facility including its interchanges during high traffic times but does not directly fulfill any of Goal 2 or 3 Objectives.

Cost Opinion

Not calculated. The traffic analysis shows that VMT would increase much faster on the enhanced arterial and collector road network than it would on I-5 without the enhanced connections.

Expanded Medford Viaduct

The Medford Viaduct is a 3,229-foot long steel beam and girder bridge that carries the I-5 corridor over Bear Creek then parallel to its north bank opposite downtown Medford. The geographic, physical, and built features surrounding the viaduct pose challenging constraints for any effort to expand capacity at the existing corridor site. In acknowledgement of these constraints, this concept explores the possibility of expanding or replacing the existing viaduct structure to accommodate six lanes of through traffic – three lanes northbound and three lanes southbound – plus provide for the ODOT standard roadway shoulders. Two structural possibilities were explored for construction. One possibility would provide a new viaduct that is essentially double the width of the existing structure while the other option would provide for the same highway capacity but stack the opposing travel lanes (i.e. northbound travel lanes stacked directly over the southbound travel lanes).

Strengths

As discussed in the *Auxiliary Travel Lanes c*oncept, expanding the Viaduct to provide an auxiliary lane would allow the freeway section between Interchange 27 and Interchange 30 to meet ODOT operational standards in 2034 and 2050. The resulting smoother traffic flow with less stop-and-go travel would result in lower emissions. If full shoulders are provided, the safety of the viaduct would also be improved.

Weaknesses

Adding a third lane while retaining the current 3-foot non-standard shoulders would require a widening of about 13.5 feet, so the impacts would be similar to those for widening the outside shoulders. If the viaduct is widened for three lanes plus standard shoulders on both the outside and median, the list of issues is similar, but the likely impact is far more substantial because the widening would be about 31.5 feet on each side and would likely require more substructure work.

Any reconstruction of the viaduct structure would be highly expensive. Furthermore, improvements that widen the existing structure will encroach upon adjacent residential and commercial properties. Additional environmental impacts would include impacts to Bear Creek Park (0.1 to 0.5 acre) and Bear Creek Greenway (crossings and routings under and adjacent to I-5 may require relocation), floodplain impacts (1.2 to 2.6 acres), and the addition of new impervious surface (2.0 to 4.7 acres), which would increase runoff to Bear Creek unless mitigated. The scale of impacts would be smaller for adding a third lane while retaining the existing 3-ft shoulders compared to the option of adding the third lane with standard 12-ft shoulders. Impacts associated with widening the viaduct are described further in the appendix.

Achieves Corridor Plan Goals and Objectives

The Expanded Medford Viaduct Concept provides a potential improvement both for operations and safety on the Medford Viaduct and therefore achieves Goal 1 and fulfills Objective B. However, it would require substantial physical improvements due to the need to expand the viaduct and therefore not meet the full intent of Goal 1. The improved flow of traffic on the viaduct would overall meet Goals 2, 3 and 4 by improving the safety of the viaduct to the benefit of freight operations, and ease traffic at the interchanges but does not fulfill any of Goals 2, 3 or 4 Objectives.

Cost Opinion

For planning purposes only, as detailed below, the proposed widening of the Medford Viaduct would range between $40 and 110 million, depending on the amount of widening required. Adding a third lane while retaining the current 3-foot non-standard shoulders would require a widening of about 13.5 feet at an estimated cost of $40 to 50 million to complete. Widening the viaduct for three lanes plus standard shoulders on both the outside and median would require approximately 31.5 feet of width at an estimated cost of $90 to 110 million to complete.

Creating a stacked viaduct is assumed to be prohibitively expensive and cost opinions were not prepared.

Directional High Occupancy Vehicle Lanes

Sometimes referred to as reversible lanes, directional high occupancy vehicle (HOV) lanes are typically incorporated into a highway system for traffic flow in one direction during the morning rush hour, then reversed in the afternoon and evening. Overhead traffic lights and lighted street signs notify drivers which lanes are open or closed to driving or turning. Typically, there is a 30- to 60-minute transition period between reversals intended to prohibit traffic of any kind in the reversing lane and thus prevent collisions.

Strengths

The HOV lane would result in some operational improvements on the freeway as additional capacity would be provided in the peak direction during peak hours. The benefits would be more limited than adding a traditional mainline travel lane because the capacity would only be available in one direction of travel at a time and the added capacity would be limited to certain users.

One reason for installing HOV lanes is to encourage carpooling and transit modes. There could be some reductions in single-occupancy vehicle mode share that would result from this option. Transit routes using the freeway might benefit as well.

The addition of a directional HOV lanes through the I-5 corridor would add capacity and improve operations. The additional capacity would be expected to increase VMT. This would likely be more than offset by the reduction in single-occupancy vehicle trips and increased transit use. Operationally, the HOV lanes generally have higher average speeds than general purpose lane in the same corridor, and emissions decrease at higher vehicle operating speeds.

Weaknesses

While HOV lanes do provide operational benefits, the additional lane tends to be underutilized compared to the adjacent travel lanes because of the limited number of potential users.

As with other concepts that require widening the freeway, the impacts of constructing the HOV lane would be considerable although they could be less extensive than widening the highway to provide additional travel lanes in each direction. Issues to consider include substantial structural work, median barriers, retaining walls, viaduct construction, and right-of-way acquisition.

Widening would occur to accommodate the HOV lane, which could result in substantial land use and environmental impacts including 4(f) and 6(f) impacts to Bear Creek, Goal 5 impacts because of impacts to Bear Creek's floodplain and associated wetland impacts, increases in impervious surface and attendant runoff, and potential environmental justice impacts particularly in Medford's downtown area. Most of the concept area does not have full-width shoulders that could be used for a HOV lane, so some widening would be required. However, much of the area has a wide median, which could generally be used to create the new travel lane. An exception would be in the viaduct area, or across bridges.

Achieves Corridor Plan Goals and Objectives

The Directional High Occupancy Vehicle Lanes Concept would improve the efficiency of the existing transportation system through a TDM measure meeting Goal 1 and fulfilling Objective C. However, the Concept would also require substantial widening and therefore physical improvements in many areas. The Concept may indirectly achieve Goals 2 and 4 by improving the safety in the Corridor and freight operations during high traffic times; however, it would not specifically fulfill any of the objectives associated with these goals. The Concept would not likely have any substantial negative or beneficial impacts to operations at interchanges (Goal 3).

Cost Opinion

No cost calculated.

Least Cost Planning Solutions

Successfully used in electrical power planning, implementation of least cost planning measures can potentially help solve complex transportation problems as well. With the aim of developing transportation plans that are socially optimal, least cost planning is a process of comparing direct and indirect costs of demand and supply options to meet transportation goals and/or policies where the intent of the process is to identify the most cost effective mix of options. Apply the practice to managing freeway congestion could mitigate the need to build more travel lanes to add capacity, opting instead to better manage the existing freeway so that it operates more efficiently. No cost opinions were calculated for the these concepts.

Peak Hour Shoulder Use

Widely used throughout Europe and increasingly being explored in the United States, the flexible use of hard shoulders as auxiliary travel lanes is an option for providing temporary highway capacity while minimizing the need for acquiring right-of-way or major reconstruction. The interval placement of interchanges along the I-5 corridor would limit the use of hard shoulders exclusively to temporary auxiliary lanes. Dynamic message signs (DMS) would provide motorists with an early warning of queues or incidents ahead and inform motorists of the availability of the hard shoulder for travel. The DMS could also trigger activation of the hard shoulder for travel when detected speeds at typical congestion points drop below a set level. Emergency turnouts are typically placed at regular intervals in order to facilitate efficient operation while maintaining safety.

Strengths

By using the shoulders as an additional travel lane during periods of peak demand, capacity can be added to the freeway on a targeted, as needed basis. The additional capacity could improve travel flow in a similar way to adding mainline travel lanes although perhaps slightly less effectively because utilization may not be as high and incidents, such as crashes or stalls, would have a greater impact without a shoulder.

This option could potentially be accomplished with minimal construction, which would result in fewer environmental impacts than other identified capacity enhancement measures.

Opening the shoulder for peak hour usage would reduce congestion and increase travel speeds, therefore reducing vehicle emissions. VMT increase is unlikely as shoulder use would be limited to peak times and likely only over a short segment of the system because of the difficulties operating on- and off-ramps with a temporary shoulder lane.

Weaknesses

Most of the corridor does not have continuous 12-foot outside shoulders, which would be required for their use as a peak-hour travel lane. Because of this, many locations would require widening, and the impacts would be similar to those associated with the auxiliary lane and viaduct concepts.

Although the use of parking lanes as peak-hour travel lanes is common on some urban roadways, there are many additional considerations that would be required to design a similar facility on a freeway. A shoulder through-lane would encroach on the entrance and exit ramp lengths and gore striping. Vehicle break downs in the shoulders would need to be closely monitored and removed immediately to avoid the potential for high speed crashes. The addition of ITS systems to control and warn traffic about changes to traffic patterns should be carefully considered as part of this concept alternative.

If roadway widening would occur to accommodate an improved shoulder or emergency turnout area, particularly if the widening was outside the median, there could be land use and environmental impacts including 4(f) and 6(f) impacts to Bear Creek, Goal 5 impacts because of impacts to Bear Creek's floodplain and associated wetland impacts, and environmental justice impacts particularly in Medford's downtown area. Presumably, some of these impacts could be avoided by strategically placing the emergency turnout areas in areas with fewer environmental resources.

Oregon Revised Statute 801.477 (2) establishes failure to drive within a lane as a serious traffic violation, and Section 811.370 establishes failure to drive within a lane as a Class B traffic violation. Although the ORS does not define "lane" or "travel lane", it does define a roadway as being exclusive of the shoulder in Section 801.450. The Legislature would need to add an exception to failure to drive within a lane in Section 801.370 and redefine "shoulder" in Section 801.480 to include use of hard shoulders as temporary auxiliary lanes.

Achieves Corridor Plan Goals and Objectives

The Peak Hour Shoulder Use Concept would improve the efficiency of the existing transportation system through a TDM measure meeting Goal 1 and fulfilling Objective C.

However, the Concept would also require substantial widening and therefore physical improvements in many areas. The Concept may indirectly achieve Goals 2 and 4 by improving the safety in the Corridor and freight operations during high traffic times; however, it would not specifically fulfill any of the objectives associated with these goals. The Concept would not likely have any negative or beneficial impacts to operations at interchanges (Goal 3).

Variable Speed Limits

Variable speed limits (VSL) are speed limits that change based on road, traffic, and weather conditions. Variable speed limits can both improve capacity by maintaining smooth traffic flow during congested time periods or improve safety by restricting speeds during adverse conditions. Digital signage is used to display posted speeds. When congestion starts building along a stretch of the freeway, the posted speed is then modified to indicate a travel speed that can more safely and effective accommodate the freeway demand. Speed limits might range from current posted speeds of 55 or 65 mph during extremely light traffic to as low as 40 mph during extreme congestion. This would also include congestion due to crashes along I-5.

Strengths

Variable speed limits can enhance traffic flow, reduce delay, and minimize pollution by maintaining smooth traffic flow during congested time periods or improve safety by restricting speeds during adverse conditions. The benefits could be recognized immediately.

This concept could have positive impacts on localized air quality if the variable speed limits help traffic flow more smoothly. Because this measure would not require physical improvements, no considerable land use or environmental impacts are anticipated.

Variable speed limits have the potential to reduce traffic congestion by actively managing vehicle flows - speed limits are dynamically changed based upon traffic conditions. The results are smoother, more consistent traffic flows, a longer period of free flow conditions before congestion occurs, and an overall decrease in the duration of congestion before free flow conditions return. A net effect of variable speed limits is to reduce emissions caused by slow moving or gridlocked vehicles. There would not likely be a change in VMT, as vehicles would still be taking the same routes.

Weaknesses

Although VSL has been widely implemented in Europe, projects in the United States have been more limited and not all transportation departments have rated the implementation to be highly successful. In a limited number of cases, more congestion was reported with the VSL than without.

Achieves Corridor Plan Goals and Objectives

The Variable Speed Limits Concept would achieve Goal 1; specifically Objective 1.C. The Concept would also generally achieve Goals 2 and 4 by improving the safety in the Corridor by restricting speeds during adverse conditions and improving freight operations by reducing congestion however, it would not specifically fulfill any of the objectives associated with these goals. The Concept would not likely have any substantial negative or beneficial impacts to operations at interchanges (Goal 3).

Transportation Demand Management Measures

Transportation demand management measures (TDM) focus on improving operations by reducing the vehicular demand on the roadway system. Four TDM concepts were developed for the corridor analysis:

- Intermodal Freight Hub
- Transit Service Improvements
- Commuter Rail
- Bus Rapid Transit

No cost opinions were calculated for the measures.

Intermodal Freight Hub

Intermodal freight transportation is defined as a system that carries freight from origin to destination by using two or more transportation modes. In this system, hubs are one of the key elements that function as transferring points of freight between different modes. The location of hubs is one of the most crucial success factors in intermodal freight transportation and needs to be considered very carefully as it has direct and indirect impacts on different stakeholders including investors, policy makers, infrastructure providers, hub operators, hub users, and the community.

An intermodal approach to freight mobility means shippers will have a choice of cost-effective shipping options, which reduces their reliance on any single mode of transport. By more closely matching each trip purpose to the optimal mode, we can reduce freight’s environmental and community footprints as well.

Interchange 35 has been identified as a strategic transportation hub where the Central Oregon & Pacific Railroad (CORP) and three state highways (OR 99, OR 140, and Interstate 5) converge. The Central Point Comprehensive Plan cites proximity to the interchange as an opportunity to develop transportation-dependent uses in the area. The area has long been recognized as an Area of Mutual Planning Interest for the City of Central Point and for Jackson County. The Erickson Air Crane manufacturing facility has operated at the interchange for a decade and there is presently a City-County effort underway to create a truck-train freight transfer site on the north side of Seven Oaks.

Strengths

The establishment of an intermodal freight hub at Interchange 35 could provide economic benefits to the region. Rail freight has a much lower rate of emissions on a per ton basis than trucks, and there would be a reduction in regional emissions if trucks were able to transfer a noteable amount of their loads onto rail - this would also have the effect of reducing overall truck VMT and overall emissions in the corridor.

Weaknesses

The main north-south rail route through Oregon is located east of the Cascades. West of the Cascades, a variety of barriers from travel speeds and terrain issues to a patchwork of ownership have limited the use of rail through the Rogue Valley. Currently, no rail traffic travels south of the City of Ashland. Therefore, all railroad traffic north of Ashland must go through Eugene. As a result, Oregon freight shipments destined to go south into California via rail must go north through Eugene and then divert onto the UP line.

If the intermodal hub were to be implemented, container truck traffic on I-5 though the Rogue Valley could increase as containers are moved southward through Oregon on rail and then transferred to truck to continue in to California.

The freight hub may increase local truck trips, which would create additional local VMT and vehicle emissions. The freight hub itself would be a source of emissions - there would be trucks, trains and other equipment operating and idling, and there would likely be an increase in total vehicle trips to and from the facility.

Achieves Corridor Plan Goals and Objectives

The Intermodal Freight Hub Concept achieves Goal 4 and most purposefully Objective 4.D. Overall, the Concept may conflict with Goals 1, 2, and 3 by adding more freight traffic on I-5 and through the Corridor impacting the safety and capacity of the roadway network and facilities including interchanges.

Bus Service Improvements

Improving bus service through reduced headways, expanded coverage and hours of service, and new routes to destinations not currently served can help improve operations of the transportation system by reducing vehicular demand on roadway facilities. The RVMPO is conducting a study intended to develop a long-term multimodal concept plan for the OR 99 Corridor Area as an alternative to I-5 north-south travel from Crowson Road in Ashland to Interchange 35 north of Central Point. The plan will include strategies that reduce vehicular traffic congestion, greenhouse gases, and support economic development along the north-south corridor and beyond the study area. In recognition of the strong influence of land use and multimodal transportation on peak-hour travel, the study will determine the appropriate population density and land use patterns necessary to support transit alternatives such as enhanced commuter transit, bus rapid transit, and commuter rail. The study will also identify transportation options and ITS strategies to reduce vehicle trips and improvements needed to improve bicycle and pedestrian connectivity. The study will develop and evaluate various alternatives to improve mobility of all modes within the study area.

Strengths

Improving bus service through reduced headways, expanded coverage and span of service, and new routes to destinations not currently served could help improve operations of the transportation system by reducing vehicular demand on roadway facilities. Improved transit service (excluding bus rapid transit and commuter rail) generally would not result in negative environmental or land use impacts since most improvements would not require new infrastructure or construction. If the shortened headways result in higher transit use, local air quality could be improved.

Improvements in bus headways, service hours, routes and other variables have the potential to attract trips away from automobiles. According to Technical Memorandum #3 of the RVMPO North-South Travel Demand Study, transit demand is not currently met within the corridor. Route 10 (Ashland) runs along Highway 99 serving Ashland, Talent, Phoenix, and Medford. This route was shown to operate over capacity (passengers exceeded seating) in 2007-2008, suggesting there may be latent demand for transit that would benefit from more frequent service in the corridor. Depending on the quality and quantity of service proposed, VMT and vehicle emissions would be expected to decrease, offset by any pollution or VMT generated from the transit vehicles themselves.

Weaknesses

A large percentage of trips in the I-5 corridor begin or end outside of the transit service area. Consequently, local transit cannot serve these trips, limiting its ability to shift travel demand off of I-5 and into an alternative mode of travel to the automobile. In addition, freight trips cannot shift to transit trips and truck traffic will remain on the highway.

Transit ridership is affected by land use patterns (mix of uses, residential density, and employment density), parking availability and cost at the destination end, and travel time. Typically, transit is not supported in an area where the housing density is less than seven dwelling units per acre. In the City of Medford, half of the eight residential zoning designations are for fewer than seven units per acre. The portion of the city that is designated for more than seven residential units per acre is relatively small. Job density is also a major factor in increasing transit ridership. In particular, dense downtowns generate riders, and employment densities in the corridor are fairly low. Parking in the corridor is free and abundant except in a few locations in Medford and Ashland. Finally, with limited congestion on the freeway, travel times for automobiles would remain faster than most transit trips.

Therefore, transit service improvement will have a limited ability to shift traffic off of I-5 and is unlikely to improve freeway operations.

Achieves Corridor Plan Goals and Objectives

Improving bus service frequency and coverage supports Goal 1, and most purposefully Objective 1.E., by increasing capacity (person capacity) on OR 99 and improving circulation and access within the corridor. It would also support the local economy by improving job access for people without personal automobiles and makes use of the existing transportation system. However, it is not anticipated to substantially improve operations on I-5 and therefore will not meet the full intent of Goal 1 or fulfill any of the other Goals and Objectives.

Commuter Rail

As communities seek ways to enhance their transit services and attract more riders, many are considering whether commuter rail may be a viable option. The CORP rail line in the Rogue Valley from Ashland to Central Point has been the focus on different concepts over the years. In early 2006, the RVMPO evaluated a new commuter rail operation between Central Point and Ashland over the rails of the CORP Railroad using self-propelled diesel multiple units (DMUs) owned by the Rail Division of ODOT. The idea was to develop a limited-duration “demonstration” project to assess costs and ridership levels that would require low capital and operating costs. No project has moved forward but, as noted under the *Transit Service Improvements* concept, the RVMPO is conducting a study intended to develop a long-term multimodal concept plan for the OR 99 Corridor Area, which includes examination of commuter rail.

Strengths

The strengths of this option are similar to those described for the *Transit Service Improvements* concept but perhaps more limited to the north-south travel corridor. Some minor improvements in operations of the transportation system might result from reduced vehicular demand on roadway facilities. In addition, commuter rail riders would benefit from reliable travel times not impacted by congestion on the roadways.

Unless it includes park-and-ride facilities, this concept would not result in negative environmental or land use impacts; the commuter rail would be placed within existing railroad right-of-way. If the commuter rail could attract consistent ridership, local air quality could be improved. Given the existing and projected levels of congestion on I-5, commuter rail has some potential (though less than transit service generally) to reduce VMT and emissions in the corridor.

Weaknesses

Travel speeds on the track are already low and, with stops along the route, travel times between destinations may be considerably longer than using auto or even other transit modes.

While the commuter rail would be placed within existing railroad right-of-way, track upgrades and the development of commuter rail stations are likely to have very high costs per rider. If rail stations are developed, right-of-way may need to be acquired and rail crossing issues by both pedestrians and vehicles will need to be considered. Pedestrian environments adjacent to rail right-of-ways are usually poor with buildings facing away from the rail line and lower density industrial uses nearby. Pedestrian connections are a major consideration for transit riders. Commuter rail ridership is usually highest when there is a high density downtown employment center and park-and-ride facilities. The job densities of Medford and Ashland are much lower than those typically served with commuter rail systems.

A park-and-ride facility would likely require the acquisition of property, can have environmental impacts, and can generate its own traffic issues.

Achieves Corridor Plan Goals and Objectives

A commuter rail system would support Goal 1, and most purposefully Objective 1.E., by increasing person capacity and by adding auto capacity (shifting riders off of OR 99 and I-5 and onto the rail). The Concept would also support the local economy by improving job access for people without personal automobiles, although it would provide less access than bus service which can cover more area. The Concept also takes advantage of existing infrastructure that is not being used as part of the transportation system. However, it is not anticipated to substantially improve operations on I-5 and therefore will not meet the full intent of Goal 1 or fulfill any of the other Goals and Objectives.

Bus Rapid Transit

Like commuter rail, Bus Rapid Transit (BRT) is often considered by communities as a way to enhance their transit services and attract more riders. BRT systems come in a variety of forms but the one under consideration with this concept is a dedicated bus lane that allows the bus to operate separately, without interference from other modes of traffic. The *BRT* concept would create a dedicate bus lane(s) on portions of OR 99 from Ashland to Central Point. The dedicated lane(s) would be installed in areas where roadway congestion impacts operations so that buses could travel with limited traffic delay. Signal prioritization in those areas would also improve travel times. There may be some more rural segments of OR 99 where the BRT buses could share the road with other vehicles.

Strengths

The strengths of this option are similar to those described for the *Commuter Rail* concept. However, BRT would likely have higher ridership, since buses can cover a wide area then converge on the dedicated lanes for part of their trip to avoid congestion. Some minor improvements in operations of the transportation system might result from reduced vehicular demand on roadway facilities.

If the BRT could attract consistent ridership, local air quality could be improved. Bus rapid transit has some potential (more than commuter rail, most likely similar to general bus service improvements) to reduce VMT and emissions in the corridor. The quality and quantity of service would make a big difference in evaluating the ability of BRT to attract trips (thus reducing VMT) and reduce emissions (related to usage, travel speeds and other factors).

Weaknesses

Weaknesses of this option are similar to bus service improvements discussed above. However, due to more reliable service and better travel times relative to the automobile, the corridor ridership would likely be higher than with improvements to regular bus service.

In addition, if the BRT would require widening of existing roadways to add the dedicated bus lane, there would be environmental impacts associated with increased impervious surface, stormwater runoff, and potential other impacts (e.g., displacements, cultural resource disturbance, etc.). Since the additional lanes would be needed in the most urbanized areas, these impacts and the costs are likely to be high. A BRT may also include park-and-ride lots which could result in similar environmental impacts.

Achieves Corridor Plan Goals and Objectives

The Bus Rapid Transit Concept would help achieve Goal 1, and most purposefully Objective 1.E., by improving efficiency of traffic operations through added person capacity and vehicular (bus) capacity on OR 99. It could shift some automobile traffic off of I-5, but due to existing and future travel patterns, land use, travel times, and parking conditions, the shift would likely be small. However, it is not anticipated to substantially improve operations on I-5 and therefore will not meet the full intent of Goal 1 or fulfill any of the other Goals and Objectives.

4. NEXT STEPS

Three additional components of this memo will be developed following the Project Management Team meeting scheduled for November 18, 2010. These components include:

- A matrix comparing the alternatives and rates their effectiveness. This matrix will be completed at the meeting in order to incorporate input from the PMT.
- A description of the selection process and why some concepts are recommended and other dropped from further consideration.
- A description of the “preferred alternative” which shall consist of a combination of the concepts that have been identified. The components of the preferred alternative will be combined and a quantitative analysis prepared.