Highway 138 Corridor Solutions Study
Roseburg, Oregon

Technical Memorandum #2:
Existing Conditions and Review of Existing Plans

REVISED DRAFT

Prepared for

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ACRONYMS

ADT	Average Daily Traffic
AMP	Access Management Plan
API	Area of Potential Impact
BIA	Bureau of Indian Affairs
CBD	Central Business District
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CORP	Central Oregon & Pacific Railroad
DEQ	Oregon Department of Environmental Quality
EB	Eastbound
ECSIS	Environmental Cleanup Site Information System
ERNS	Emergency Response Notification System
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
HCM	Highway Capacity Manual
HCM	Highway Design Manual
LOS	Level of Service
LUST	Leaking Underground Storage Tank
MP	Mile Point
NAAQS	National Ambient Air Quality Standards
NB	Northbound
NOAA	National Oceanic & Atmospheric Administration
NRHP	National Register of Historic Places

NPL	National Priority List
OAR	Oregon Administrative Rule
ODOT	Oregon Department of Transportation
OED	Oregon Employment Department
OHP	Oregon Highway Plan
ONHIC	Oregon National Heritage Information Center
OSFM	Oregon State Fire Marshall
RCRA	Resource Conservation and Recovery Act
SB	Southbound
SHPO	State Historic Preservation Office
SPIS	Safety Priority Index System
TPAU	Transportation Planning Analysis Unit
TPR	Transportation Planning Rule
TSP	Transportation System Plan
UGA	Urban Growth Area
UGB	Urban Growth Boundary
URCOG	Umpqua Regional Council of Governments
UST	Underground Storage Tanks
V/C (v/c)	Volume to Capacity
WB	Westbound

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Introduction

This memo addresses base data collection for the Highway 138 Corridor Solutions Study. This effort includes an existing plans and policies review, environmental reconnaissance, land use and community facility summary, existing traffic operations analysis, and safety analysis.

Review of Transportation and Land Use Plans and Policies

The plan and policy review section of this memorandum summarizes the relevant transportation and land use plans, policies, and regulations, and identifies how they influence planning for the Highway 138 Corridor Solutions Study management area (see Figure 1. Vicinity Map). The purpose of this review is to help ensure consistency with applicable plans and regulations so that the Corridor Study meets applicable state and community policies and goals for the area. This section reviews the following transportation and land use plans and regulations:

- Oregon Highway Plan (OHP) (1999, with amendments)
- Highway Design Manual (HDM) (2003)
- Oregon Administrative Rule 660 Division 12 (Transportation Planning Rule [TPR])
- Douglas County Transportation System Plan (TSP) (2001)
- City of Roseburg Transportation System Plan (TSP) (2006)
- City of Roseburg Comprehensive Plan (1982)
- City of Roseburg Zoning Ordinance
- OR 138E Access Management Plan
- Oregon Rail Plan (2001)
- City of Roseburg Downtown Master Plan
- Draft City of Roseburg Waterfront Concept Plan (2006)

Oregon Highway Plan (1999, with amendments)

The Oregon Highway Plan (OHP) establishes policies and investment strategies for Oregon's state highway system over a 20-year period and refines the goals and policies found in the Oregon Transportation Plan. 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.

Under Goal 1: System Definition, the following policies are applicable:

> Policy 1A (State Highway Classification System), which states the management objective of Regional Highways is to provide safe and efficient, high-speed, continuous-flow operation in rural areas and moderate to high-speed operations in urban and urbanizing areas;

Policy 1B (Land Use and Transportation), which recognizes the need for coordination between state and local jurisdictions;

Policy 1C (State Highway Freight System), which states the need to balance the movement of goods and services with other uses;

Policy 1F (Highway Mobility Standards), which sets mobility standards for ensuring a reliable and acceptable level of mobility on the highway system by identifying necessary improvements that would allow the interchange and corridor area to function in a manner consistent with OHP mobility standards; and

Policy 1G (Major Improvements), which requires maintaining performance and improving safety by improving efficiency and management before adding capacity.

Under Goal 2: System Management, the following policies are applicable:

Policy 2B (Off–System Improvements), which helps local jurisdictions adopt land use and access management policies; and

Policy 2F (Traffic Safety), which improves the safety of the highway system.

The OHP describes I-5 as having interstate significance, serving as the primary north and south through route for traffic traveling through the area. Highway 138 is classified by the OHP as having regional significance. It connects to Highway 38 at Elkton and is a primary connection to the southwest coastal region and to I-5, as well as to the Cascade Range and US 97 to the east.

Highway Design Manual (2003)

The 2003 Highway Design Manual 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 Highway Design Manual and must be used to guide any planning, development and construction projects recommended for Interstate 5 (I-5) and OR 138.

Transortation Planning Rule (TPR) - Statewide Planning Goal 12 (Transportation) and OAR 660, Division 12

Goal 12, Transportation, requires cities, counties, metropolitan planning organizations, and ODOT to provide and encourage a safe, convenient and economic transportation system. Goal 12 is implemented through Oregon Administrative Rule (OAR) 660, Division 12, the Transportation Planning Rule (TPR). The stated purpose of the TPR is to "…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 assure that planned land uses are supported by and consistent with planned transportation facilities and improvements.

The TPR contains numerous requirements governing transportation planning and project development, several of which warrant comment in this report.

The TPR requires local governments to adopt land use regulations consistent with state and federal requirements "to protect transportation facilities, corridors and sites for their identified functions (OAR 660-012-0045(2))." This policy is achieved through a variety of measures, including:

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

Regulations assuring that amendments to land use designations, densities and design standards are consistent with the functions, capacities and performance standards of facilities identified in the TSP. See also OAR 660-012-0060.

The Land Conservation and Development Commission adopted amendments to the TPR. These include amendments to OAR 660-012-0060 (plan and land use regulation amendments). The primary focus of this rule is keeping land use and transportation in balance. When a plan or zoning amendment would result in levels of traffic that exceed the highway performance standards for a roadway, it is deemed to have a significant effect on the roadway. The current amendments include new provisions that pay particular attention to proposed plan amendment 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.

The State Land Conservation and Development Committee's rules implementing Goal 12 do not regulate access management. ODOT adopted OAR Chapter 734, Division 51 to address access management and it is expected that ODOT, as part of this project, will engage in access management consistent with its Access Management Rule.

Douglas County Transportation System Plan (2004)

The Douglas County Transportation Systems Plan (TSP) fulfills the requirement of Oregon's Transportation Planning Rule (TPR), containing compiled Transportation and Land Use elements from its Comprehensive Plan as well as other supporting documents. The Transportation Element of the TSP provides volume to capacity (V/C) standards for county

roads. The Land Use Element addresses transportation issues for the unincorporated areas of Gardiner, Glide, Green, Tri-City, and Winchester Bay.

The Douglas County TSP classifies State Highway 138 as a Principal Highway. The TSP defers management of Principal Highways to ODOT as outlined in the Oregon Highway Plan (OHP).

City of Roseburg Transportation System Plan (2006)

The City of Roseburg Transportation System Plan (TSP) provides guidance and regulatory tools to develop its transportation system and also identifies planned transportation facilities and services needed to support planned land uses identified in the Comprehensive Plan. Goals and objectives in the TSP relevant to the Highway 138 Corridor Solutions Study include:

> Goal 1. Overall Transportation System - Provide a transportation system for the Roseburg planning area that is safe, efficient, and accessible.
>
> Goal 2. Enhanced Livability
>
> *Objective D.* Manage the transportation system for adequate and efficient operations.
>
> Goal. 4. Street System
>
> *Objective B.* Design the street system to safely and efficiently accommodate multiple travel modes within public rights-of-way.
>
> Goal 5. Balanced Transportation System
>
> *Objective A.* Develop a safe, complete, attractive, efficient, and accessible system of pedestrian way and bicycle ways including bike lanes, shared roadways, multi-use paths, and sidewalks.
>
> *Objective B.* Provide connectivity to each area of the City for convenient multimodal access. Ensure pedestrian, bicycle, transit and vehicle access to schools, parks, employment, and recreational areas, and the Roseburg core city area by identifying and developing improvements that address connectivity needs.

The TSP includes a Street Functional Classification System which differs from ODOT's and Douglas County's roadway classifications as displayed in Table 1.

Table 1. Comparison of Functional Classification Systems

City of Roseburg	Douglas County[1]	ODOT[2]
Freeway	Principal Arterial	Interstate Highway
Arterial	Minor Arterial	Urban Principal Arterial
Collector	Collector	Urban Minor Arterial
Minor Collector	Local Access	Urban Collector
Local Street		Urban Local Street
Cul-de-sac Street		

Notes:
(1) Urban Area Classifications
(2) Urban=areas with over 5,000 people

Source: City of Roseburg TSP (2006).

The TSP classifies I-5 as a Freeway and Highway 138/Diamond Lake Boulevard as an Arterial. The TSP lists both I-5 and Highway 138 as roads maintained by the State of Oregon. I-5 is described as "a well-maintained, four-lane divided highway with a posted speed of 65 miles per hour (mph) within the Roseburg Urban Growth Boundary (UGB)." Pavement conditions are generally "good", according to the *I-5 State of the Interstate* report.

Please refer to the Existing Traffic section for further information on roadway names, jurisdictional authorities, functional classifications, posted speeds (if available), number of lanes, bike lanes, sidewalks, and school zones for the study area roadways.

City of Roseburg Comprehensive Plan (1982 – Amended 1993)

The Roseburg Urban Area Comprehensive Plan was adopted in 1982. The Comprehensive Plan contains major policies and proposals concerning desirable growth over the 20-year period following its adoption.

Goals and objectives in the Comprehensive Plan relevant to the Highway 138 Corridor Solutions Study include:

> Goal 12 - To develop and maintain a safe, convenient and economic transportation system which minimizes community disruption and promotes the timely, orderly and energy efficient movement of people and goods around and through the urban area.
>
> Objective 3 - Maximize the efficiency and safety of existing transportation facilities and services for the movement of people and goods.

Roseburg Urban Area Land Use and Development Ordinance

The Roseburg Urban Area Land Use and Development Ordinance (Development Ordinance) is designed to provide and coordinate regulations in the Roseburg Urban Area governing the development and use of lands, and to implement the Roseburg Urban Area Comprehensive Plan. Identified Purposes of the Ordinance relevant to the Corridor Study include:

7. Guarantee the ultimate development and arrangement of efficient public services and facilities within the Roseburg urban area.

8. Provide for and encourage a safe, convenient, and economic transportation system within the Roseburg urban area.

The Development Ordinance establishes zoning classifications for all incorporated and unincorporated lands within the Roseburg Urban Growth Boundary (see Section 2. Existing Land Use Summary of this memorandum for information on zoning and land uses in the Study Area).

Chapter 4, Section 4.150 of the Development Ordinance establishes platting and mapping standards for streets and roads in the Roseburg Urban Area. Section 4.150 (1)(a) states:

The approving authority may require right-of-way for adequate and proper streets, including arterials, collector streets, local streets, and other streets, to be dedicated to the public by the applicant of such design and in such location as are necessary to facilitate provision for the transportation and access needs of the community and the subject area in accordance with the purpose of this Ordinance.

Diamond Lake Blvd. Access Management Plan (2003)

The Diamond Lake Boulevard Access Management Plan (AMP) includes access management recommendations that balance the City of Roseburg's land use, local street, and economic development goals with State access management requirements for safe and efficient highway operations. The goal of the AMP is to "move toward the access spacing standards identified in the OAR 734, Division 51 and the Oregon Highway Plan at the time development, redevelopment, a 'change of use', or a construction project occurs." The AMP contains a comprehensive inventory of all public and private approaches along the section of Diamond Lake Blvd. (OR 138E) from Stephens Street at mile point (MP) 0.00 east to Sunshine Park (MP 3.35) with all rights of access between the adjoining properties and the state highway listed, including reservations and grants of access.

Within the City of Roseburg, access has historically been uncontrolled and most development has occurred without any approach permits. Consequently a significant number of approaches are currently constructed within the city limits, many in close proximity to one another. In early 2003, ODOT and a local property owner transferred property to one another and in the process acquired access control for the section of Highway 138 on the north side of the highway between Casper and Fulton. Adjoining property owners for all other property along the reminder of Diamond Lake Boulevard within the City Limits have a common law right to access (ODOT and City of Roseburg, 2003). From Stephens Street to near Rifle Range Road (located approximately one-half mile east of the Study Area boundary), Highway 138 contains more than 60 driveways per mile.

Any future planned improvements for Highway 138 within the Study Area must be consistent with the strategies identified in the AMP. These strategies include recommendations for the closure, consolidation and/or relocation of existing accesses.

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 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 the Roseburg area is the Central Oregon & Pacific Railroad (CORP), whose main line runs south of Eugene through Roseburg and on to Medford. While the railroad operates through service between Medford and Roseburg, most traffic either heads north out of Roseburg or south out of Medford. The nearest passenger rail service is AMTRAK located in Eugene. The Plan states that the improvements necessary to provide a competitive passenger rail service along the existing 205-mile rail line between Eugene and Medford would require major reconstruction.

City of Roseburg Downtown Master Plan (1999)

The Downtown Roseburg Master Plan was developed by a team of City officials, City staff, urban planning and design consultants, downtown merchants, local property owners and Roseburg residents to develop a framework for Downtown Roseburg development. The Plan contains findings from public workshops and downtown option surveys. One finding cited the desire to "(c)reate an emphasized linkage via Douglas Avenue from Jackson and Main Streets to the South Umpqua River." The Master Plan also recommends the need for improved bicycle and pedestrian facilities. Another finding recommended that Jackson Street, Main Street, Pine Street, Stephens Street, Oak Avenue and Washington Street all remain one-way.

The Master Plan contains specific guidelines for the Central Business District (CBD) and general design guidelines for the areas zoned General Commercial. The CBD is located within the Study Area and is bounded by SE Douglas Avenue on the north, SE Lane Avenue on the south, SE Rose Street on the west and SE Kane Street on the east. The length of Stephens Street and Pine Street within the Study Area is zoned General Commercial (please refer to Figure 5).

Environmental Reconnaissance

This section summarizes existing environmental conditions and potential constraints found within the Study Area. The information is primarily taken from published documents and maps, GIS data, and conversations with appropriate professional contacts. The purpose of this section is to identify "red flag" areas judged to have considerable potential for conflict.

Goal 5 Resources

Statewide Planning goal 5 requires local jurisdictions to inventory riparian corridors, wetlands, wildlife habitat, scenic waterways and other natural resources. The Natural Resources Element of the City of Roseburg Urban Area Comprehensive Plan Technical Support Document (1982) describes natural resources. The South Umpqua River traverses the Study Area and is cited as "provid(ing) ideal habitat for a wide variety of wildlife; offering sufficient food, water and cover." The South and North Umpqua Rivers and Deer Creek are identified as "major

waterways that are scenic, recreational and natural resources of the community…(which are) to be protected, preserved and maintained for their primary function as drainage courses first." These waterways "shall be regulated to control alteration, excavation, filling, realignment, clearing and all other actions that could affect their function or natural resource value."

FEMA Floodplain/Floodway

The Federal Emergency Management Agency (FEMA), acting through the local planning authority, regulates development within floodplains. FEMA printed one Flood Insurance Rate Map panel for the City of Roseburg, Oregon (Community-Panel No. 410067 0005 E, 1999). FEMA designated flood areas within the corridor study area are displayed in Table 2.

Table 2. Flood Areas

Zone	Description
AE	Base flood elevations determined
X	Areas of 500 year flood; areas of 100 year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

Source: FEMA, 1999

According to FEMA, the Study Area traverses the 100 year floodplain of the South Umpqua River and Deer Creek. Any recommended improvement projects as a result of this Study must not result in a rise of the floodplain elevation. Roseburg's land use development ordinances specify a need for riparian setbacks for significant waterways from their respective top of bank. The City has designated a 50' riparian buffer for the South Umpqua River and a 25' or 50' buffer depending on zoning/development plans for Deer Creek (ODOT, 2006).

Threatened and Endangered Species

National Oceanic and Atmospheric Administration (NOAA) Fisheries is responsible for conducting Endangerd Species Act (ESA) status reviews for marine and anadromous fishes. There are no species under the jurisdiction of NOAA Fisheries that are listed under the ESA as threatened or endangered, nor are there species that are either proposed or candidates for listing along the corridor.

Oregon Natural Heritage Information Center

The Oregon Natural Heritage Information Center (ONHIC) database was queried for documented or potential occurrences of federally listed, threatened, or endangered species, or species proposed or candidate for listing in the corridor area (ONHIC 2006). ONHIC reports are based on reported sightings within a two-mile radius from the corridor. ONHIC reported several known sightings of listed threatened or endangered, or species proposed, or candidates for listing within a two-mile radius of the corridor. Results of the ONHIC list of threatened or endangered species likely to occur in the corridor is provided in Table 3.

A species is listed under the federal ESA as endangered if it is in danger of extinction throughout all or a significant portion of its range (US Fish and Wildlife Service and National Marine

Fisheries Service 1998). A species is listed as threatened if it is likely to become endangered within the foreseeable future. Critical habitat for the species is defined as presently occupied and historically occupied areas that are determined to be essential to conservation of the species at the time of listing. Candidate species are those for which there is sufficient information to support a listing proposal, but the issuance of a proposed rule is precluded by higher priority listing actions. Candidate species have no protection under the ESA but could be proposed or listed during the project planning period.

The Oregon Natural Heritage Program (ONHP) database indicates that Franklin's bumblebee (*Bombus franklini*) has been documented in the proposed project area. Franklin's bumblebee is a federal Species of Concern.

Table 3. ONHIC Identified Listed Threatened or Endangered, Proposed, and Candidates for Listing under the ESA Species that May Occur in the Area

Common Name	Scientific Name	Status
Reptiles		
Northwestern pond turtle	*Clemmys marmorata marmorata*	Sensitive - Candidate
Fishes		
Coastal cutthroat trout	*Oncorhynchis clarki clarki*	Sensitive - Vulnerable
Chinook salmon	*Oncorhynchus tshawytscha*	-
Steelhead	*Oncorhynchus mykiss*	Sensitive - Vulnerable
Plants		
Slender meadow-foam	*Limnathes gracilis gracilis*	Candidate
Marigold navarretia	*Navarretia tagetina*	-
Coffee fern	*Pellaea andromedifolia*	Candidate
Red root yampa	*Perideridia arythrorhiza*	Candidate
Spring phacelia	*Phacelia verna*	-

Source: ONHIC, 2006

Historic and Archaeological Resources

National Register of Historic Places

Under Section 106 of the National Historic Preservation Act of 1966 (Public Law 89-665) 16 U.S.C. 470-470m, and under federal regulations governing the protection of historic and cultural resources (36 Code of Federal Regulations [CFR] 800), federal agencies, and the state and local agencies to which the federal agency has delegated responsibility, are directed to avoid undertakings that adversely affect properties that are included in or are eligible for inclusion in the National Register of Historic Places (NRHP). The NRHP identifies and documents (in partnership with state, federal, and tribal preservation programs) districts, sites, buildings, structures, and objects that are significant in American history, architecture, archaeology, engineering, and culture. This section identifies nearby NRHP resources, as well as other historic, prehistoric, and cultural resources.

The State Historic Preservation Office (SHPO) lists the following properties on the Oregon National Register List which are located within or near the Study Area:

- First Presbyterian Church of Roseburg – 823 SE Lane Street
- Creed Floed House (aka Joseph Lane House) – 544 SE Douglas Avenue
- Judge J.W. Hamilton House – 759 SE Kane Street
- Howell-Kohlhagen House – 848 SE Jackson Street
- George Kohlhagen Building – 630 SE Jackson Street
- Methodist Episcopal Church South – 809 SE Main Street
- Moses Parrott House – SE Jackson Street
- Napolean Rice House – 709 Kane Street
- Roseburg Oregon National Guard Armory – 1034 SE Oak Street
- United States Post Office – 704 SE Cass Avenue
- Judge William R. Willis House – 744 SE Rose Street

In addition to the SHPO list of properties above, sites considered eligible for inclusion in the NRHP, based on an assessment by an ODOT cultural resource specialist, are listed in Table 4.

Table 4: National Register of Historic Places (NRHP) Eligibility Status

Property	Status *
256 SE Stephens Street	Eligible
236 SE Stephens Street	Eligible
340 SE Pine Street	Eligible
320 SE Pine Street	Potentially Eligible
270 SE Pine Street	Probably Eligible
534 SE Spruce Street	Probably Eligible
Douglas County Health Department	Potentially Eligible
616 SE Flint Street	Potentially Eligible
645 SE Flint Street	Potentially Eligible
643 SE Flint Street	Potentially Eligible
636 SE Flint Street	Potentially Eligible

*In the context of the table, "potentially eligible" is equated to a greater likelihood that "probably eligible".
Source: ODOT

Roseburg also contains three districts on the SHPO National Register. A historic district is an area or neighborhood that has a concentration of buildings and associated landscape and streetscape features (50 years or older) that retains a high degree of historic character and integrity, and represents an important aspect of the city´s history. The three historic districts listed are the Roseburg Downtown Historic District, the Laurelwood Neighborhood District and the Mill-Pine Neighborhood District (Oregon Parks and Recreation Department, 2007).

Eligible sites along with sites considered eligible for inclusion on NRHP plus the three historic districts are displayed in Figure 2.

Archaeological Resources

SHPO Archaeological Services maintains a statewide archaeological inventory database with over 37,000 prehistoric and historic-period archaeological sites and over 19,000 archaeological reports. ODOT's Cultural Resource Specialist for the region Tobin Bottman was contacted for determination of existing or potential archeological sites within the Study Area. Mr. Bottman indicated that there is one archeological site found in the SHPO database within the Study Area, however, no archeological surveys have been conducted within the Study Area boundary.

Air Quality

There is not enough data to determine the Roseburg area as an attainment or non-attainment area. DEQ currently has no plans to gather data which could be used to designate it as non-attainment. Currently, DEQ only monitors for visibility which is used to estimate PM2.5 for the Air Quality Index health rating. However, per communication with the Ambient Air Quality Coordinator, Roseburg is in attainment for National Ambient Air Quality Standards (NAAQS), adopted by DEQ (DEQ 2004).

The City of Roseburg and Douglas County does not regulate short- or long-term air quality impacts. Table 5 shows the NAAQS and summary of particulate and carbon monoxide counts for Roseburg from the last available survey taken in 2004.

Table 5. Ambient Air Quality Standards and Data Summaries for Roseburg, 2004

	Federal (NAAQS) Standard	**Roseburg, 2004**
$PM_{2.5}$ Particulate Matter—Maximum 24-Hour Average	65 μg/m^3	16 μg/m^{3*}
PM_{10} Particulate Matter—Maximum 24-Hour Average; less than one day in a three-year period with a 24-hour average concentration	150 μg/m^3	65 μg/m^3
Carbon Monoxide—Maximum 1-hour average not to be exceeded more than once per year	35 ppm	7.4 ppm
Carbon Monoxide—Maximum 8-hour average not to be exceeded more than once per year	9 ppm	5.3 ppm

$PM_{2.5}$: Solid particles or liquid droplets less than 2.5 microns in diameter
PM_{10}: Solid particles or liquid droplets less than 10 microns in diameter
μg/m^3: micrograms of pollutant per cubic meter of air
ppm: parts per million
Source: DEQ, 2004

Socioeconomic and Environmental Justice Data

Population and Community

The population of Douglas County was 100,399 in 2000, a 6.08 percent increase from the 1990 population. Roseburg, the largest city in Douglas County, had a population of 20,017 in 2000, a 17.5% increase from the 1990 population (U.S. Census Bureau 2000, 1990). The most recent

available population data gives the July 2006 estimated total population for Douglas County as 103,815 and the population for Roseburg as 21,050 (Population Research Center, Portland State University, 2006).

Table 6 lists the 1990 and 2000 populations within Douglas County, Census Tract 800, 1200, 1300, and 1400. Census Tract boundaries are displayed in Figure 3. The census tracts within the project area account for approximately one quarter of the county's total population. The project area includes the following block groups per census tract.

Table 6. Population in Douglas County and Roseburg, 1990-2000

Geographic Area	1990 Population	2000 Population	1990-2000 percent change
Douglas County	94,649	100,399	+6.08%
Census Tract 800	5,711	6,610	+15.74%
Census Tract 1200	7,169	6,758	-5.73%
Census Tract 1300	4,958	5,338	+7.66%
Census Tract 1400	4,732	5,081	+7.38%

Source: U.S. Census Bureau, Census 2000 Summary File 1 and Census 1990 Summary Tape File 1

Recent data compiled by the Oregon Employment Department (OED) suggests Douglas County is the ninth most populated county in Oregon. Roughly 43% of Douglas County residents live in close proximity to the I-5 corridor. In the 2005 census, Douglas County's age structure is significantly different than the statewide distribution. Douglas County was below average for younger age groups and above average for middle aged age groups compared to the state. The 25-to-54 age categories (25 to 34, 35 to 44, and 45 to 54) comprise roughly 37.5 percent of the total population in the county and 43 percent in the state (Portland State University, Population Research Center, 2005). Age categories 45 to 54 are the only age categories that comprise more than 7.5 percent of the population of the county (Ibid.). The 65-plus age group accounted for 60 percent of all net in-migration and 46 percent or total growth between 1990 and 1997 (Ibid.).

Douglas County's populations should continue to increase, but at a slower and lesser rate than that of the state. According to the Oregon Department of Administrative Services and the Office of Economic Analysis, Douglas County's population between 2005 and 2025 is projected to grow by 20,383 people, or a 20 percent increase while statewide growth is expected to be 28 percent.

Income and Employment

Per capita income in Douglas County was $18,720 in 2005. The per capita income in the county was within $5,000 of the state as a whole in 2005. Douglas County's median family income is $43,481, approximately $10,000 lower than that of the states.

In 2001, the average annual unemployment rate in the county was almost 2 percent more than the state, overall. The county rate varied from 8.3 percent in 2001 to 8.1 percent in 2005. The higher unemployment rates compared to the state are most likely caused by the losses in manufacturing jobs in the 1990's (OED 2005).

Table 7 lists the non-farm payroll employment in Douglas County for the years 2001 and 2005. Although lumber and wood products jobs declined by roughly 4.5 percent in the last four years, other sectors such as non-lumber and wood durable goods manufacturing; construction, finance, retail trade, and education and health services grew. The tremendous growth in construction was due to residential and commercial construction to support the rapid increase in population (OED 2001). Trade and services were the largest industries as of 2001. Growth in construction, because of increased population, was the employment increase in 2001 (OED 2001).

Businesses

Today Roseburg has more than 20,000 residents and has established itself as a community of several recreation opportunities and wineries.

Table 7. Non-Farm Payroll Employment in Douglas County by industry, 1990-2000

Industry	2001	2005	Percent Change
Total nonfarm employment	38,010	39,220	
Total private	28,870	30,410	5.33%
Natural resources and mining	1,150	1,120	-2.61%
Construction	1,320	1,880	42.42%
Manufacturing	6,250	6,320	1.12%
Durable goods	5,880	6,020	2.38%
Wood product manufacturing	4,470	4,270	-4.47%
Nondurable goods	370	300	-18.92%
Trade, transportation, and utilities	7,150	7,330	2.52%
Wholesale Trade	760	690	-9.21%
Retail trade	4,460	4,820	8.07%
Food and beverage stores	1,110	1,130	1.80%
General merchandise stores	1,010	890	-11.88%
Transportation, warehousing, and utilities	1,930	1,820	-5.70%
Information	430	400	-6.98%
Financial activities	1,310	1,600	22.14%
Professional and business services	2,730	2,880	5.49%
Educational and health services	3,980	4,390	10.30%
Leisure and hospitality	3,350	3,370	0.60%
Food services and drinking places	2,560	2,630	2.73%
Other services	1,210	1,120	-7.44%
Government	9,140	8,810	-3.61%
Federal government	1,650	1,480	-10.30%
State government	1,250	1,290	3.20%
Local government	6,250	6,040	-3.36%
Indian tribal	-	1,190	
Local education	3,250	2,960	-8.92%
Local government excluding education and Indian	-	1,900	
Local government excluding educational services	3,000		-100.00%

Note: Non-farm payroll employment is by place of work (numbers of jobs provided by employers in the county, regardless of where the employers' workers live) and excludes farm workers, domestic household workers, persons involved in labor-management disputes, and unpaid family workers

Source: OED, 2005

Minorities

The census tract is shown as the units of geographic analysis, in comparison with Douglas County as a whole.

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. The number of people in each of the racial groups was combined to calculate the percentage of all minority races. Table 8 indicates the percentage of minority residents in Douglas County and Roseburg, and project census tract per the 2000 Decennial Census (U.S. Census Bureau 2000).

Table 8. Racial Composition by Area, 2000

Geographic Area	% Black or African American	% American Indian and Alaska Native	% Asian	% Native Hawaiian and Other Pacific Islander	% Other Race	% Two or More Races	% All Minority Races(1)	% Hispanic Origin of any Race(2)
Douglas County	0.2	1.5	0.6	0.1	1.0	2.7	3.4	3.3
Roseburg	0.3	1.3	1.0	0.1	1.3	2.5	4.0	3.7
Census Tract 800	.2	.7	1.2	.09	1.0	2.4	5.9	2.6
Census Tract 1200	.4	1.5	.9	.1	1.0	2.3	6.3	4.6
Census Tract 1300	.3	1.3	1.0	.1	1.6	2.6	6.8	3.4
Census Tract 1400	.3	1.4	.9	.09	1.1	2.3	6.0	2.2

Notes:

(1) Sum of Black or African American; American Indian and Alaska Native; Asian; Native Hawaiian and Other Pacific Islander; other race; and two or more races.

(2) Persons of Hispanic origin may be of any race.

Source: US Census Bureau, Census 2000

The minority population in all of the categories, including all minority races combined, is not above 50 percent in the project block group, census tract, city, or the county. The project census tracts have higher proportions of minorities than the city and county.

The closest Indian reservation is the Cow Creek Indian Reservation, approximately 25 miles south of the project area. Ownership was officially negotiated with the US government in 1853 to the Umpqua Indians. More locally, several tribal properties held in trust are situated in the downtown vicinity of Roseburg with a significant concentration near the riverfront (see Figure 4). These properties will require consent of the Tribe and Bureau of Indian Affairs (BIA) for easements. BIA also requires a National Environmental Protection Act (NEPA) document for easements on trust lands.

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. The percentage of the population in the project census tract, Douglas County, and Oregon with an income below the federal poverty level is shown in Table 9.

The block group and census tract containing the project area have higher poverty rates than Douglas County and the state as a whole.

Table 9. Poverty Status in the Corridor, 1999(1)

Geographic Area	% Below Poverty Level(2)
Oregon	11.6%
Douglas County	13%
Census Tract 800	7.2%
Census Tract 1200	15.7%
Census Tract 1300	18%
Census Tract 1400	15.1%

Notes:
(1) Poverty Status in 1999 by Age [17].
(2) Poverty status was determined for all persons except institutionalized persons, persons in group quarters and in college dormitories, and unrelated individuals under 15.

Source: US Census Bureau, Census 2000, Summary File 3, Sample Data, P87.

Hazardous Materials

In November 2006 ODOT Region 3 Hazardous Materials Group performed a Corridor Study Assessment to identify potential sources of contamination that could impact the study area. Potential 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, Water Wells, Monitoring Wells, 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). Federally listed sites are summarized in Table 10.

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 USTs. Table 11 summarizes the state listed sites.

Table 10. Summary of Federally Listed Hazardous Waste Sites

Database Record	Site Name & Location	Status
NPL	None	No listed sites w/in 1 mile of Project site
CERCLIS	Roseburg New Review	Site is unlikely to impact the Project site
RCRA Generators	Circle K Store 30076-334 W Harvard St., Roseburg	Conditionally Exempt Small Generator (CEG)
RCRA Generators	Formally Yours Tuxedos Inc.-519 SE Jackson St., Roseburg	(CEG)
RCRA Generators	Hansen Motors-606 SE Stephens St., Roseburg	(CEG)
RCRA Generators	Hansen Motors-750 SE Stephens St., Roseburg	(CEG)
RCRA Generators	Ricketts Music Inc.-444 SE Stephens St., Roseburg	(CEG)
ERNS	None	No listed sites in the Corridor Study Area

Source: ODOT, 2006.

Table 11. Summary of State Listed Hazardous Waste Sites

Database Record	Site Name & Location	Status
ECSIS	Central Oregon & Pacific RR Yard, Roseburg	Confirmed Release List
OSFM	None	No listed sites w/in .5 mile of Project site.
Solid Waste Landfill	Douglas County Landfill-McClain Ave., Roseburg	Site would not affect Project.
LUST	Bettis Property-SE Stephens St., Roseburg	Cleanup Completed
LUST	Chevron USA, Inc.-666 SE Pine St., Roseburg	Cleanup Completed
LUST	Clifford, Bill-353 W Madrone St., Roseburg	Cleanup Completed
LUST	Clint Newell Motors, Inc.-504 SE Rose St., Roseburg	Cleanup Completed
LUST	Douglas County Courthouse-1036 SE Douglas Ave., Roseburg	Cleanup Completed
LUST	Fireball Gas-345 W. Harvard, Roseburg	Cleanup Completed
LUST	Former Chevron Station-519 SE Jackson St., Roseburg	Active Cleanup
LUST	Hansen Motor Co.-606 SE Jackson St., Roseburg	Cleanup Completed
LUST	Hansen Motors Co.-750 SE Jackson St., Roseburg	Cleanup Completed
LUST	Kohlhagen Building-640 SE Jackson St., Roseburg	Cleanup Completed
LUST	Mobil #230-334 W. Harvard Ave., Roseburg	Cleanup Completed
LUST	Rose-Lane Auto Repair-725 Lane St., Roseburg	Cleanup Completed
LUST	Ruth Leonnig-266 SE Stephens St., Roseburg	Cleanup Completed
LUST	Southern Pacific RR Station-706 SE Sheridan St., Roseburg	Cleanup Completed

Source: ODOT, 2006.

Wetlands

A local wetland inventory has not been completed for Roseburg. Roseburg's planning department will require adherence to applicable state and federal regulations prior to authorizing any joint removal fill and/or conditional use permit (ODOT, 2006). For this memorandum, National Wetland Inventory Maps/classifications, aerial photographs, and United States Geologic Survey (USGS) Quadrangle Maps were reviewed to provide baseline wetlands and water resources information.

The Area of Potential Impact (API) traverses a portion of the City Center of Roseburg in Douglas County, Oregon. As Figure 5 indicates, two major water resources, the South Umpqua River and Deer Creek, are within the API. Riparian wetlands are identified adjacent to the South Umpqua River.

The South Umpqua River mainstem is riverine, upper perennial, rocky shore, permanently flooded (R3RSH). The South Umpqua River also contains a recurring seasonal channel classified as riverin, upper perennial, rocky shore, seasonally flooded (R3RSC) within the API. When flooded, the South Umpqua becomes a bifurcated channel divided by Elk Island. This seasonal channel provides valuable fish and wildlife habitat. The confluence of Deer Creek with the South Umpqua River is located within the API. Deer Creek is riverine, upper perennial, unconsolidated bottom, permanently flooded (R3UBH). Both water resources are designated Essential Salmonid Habitat (ESH) by the Oregon Department of State Lands (DSL).

The riparian wetlands are classified as palustrine, emergent, seasonally flooded (PEMC); palustrine, scrub-shrub, temporarily flooded (PSSA); and palustrine, forested, temporarily flooded (PFOA). Riparian and wetland vegetation identified within the API includes black cottonwood, red alder, incense cedar, Douglas fir, Oregon ash, various willows, red osier dogwood, Douglas spiraea, Armenian blackberry, snowberry, reed canary grass, blue wild rye, and English ivy.

The functional capacity of the wetlands and water resources identified within the API is impaired by roadway, ditches, and urban land uses. The negative impacts of urban development and growth on these wetland areas such as habitat fragmentation, loss of channel connectivity, alteration of natural hydroperiods, etc has caused decreased wildlife habitat function and migration corridors. However, various waterfowl were observed resting and feeding within the riverine wetlands which also support anadromous fish habitat.

Existing Land Use Summary

This section summarizes existing land use conditions and potential design constraints found within the Study Area. The information is primarily taken from published documents, maps, GIS data, the City of Roseburg website and other Internet websites.

Existing Land Uses

Figure 6 shows the existing City of Roseburg zoning designations and the Urban Growth Boundary. Land uses surrounding Highway 138/Diamond Lake Boulevard are primarily commercial and industrial. Most of this land has been developed or is being held for commercial and industrial expansion. It is anticipated that as the Diamond Lake Boulevard is further developed, the industrial properties will request zone changes to Mixed Use (MU) to permit a greater range of uses when marketing them for redevelopment (ODOT and City of Roseburg, 2003). Land uses surrounding the I-5 portion of the Study Area are primarily Public Reserve (PR), with Single and Multi-Family Residential parcels fronting the southern bank of the South Umpqua River. The Public Reserve classification is intended to "establish districts within which a variety of public service activities may be conducted without interference from inappropriate levels of residential, commercial, or industrial activities."

The Umpqua Regional Council of Governments (URCOG) has found that most of the level land within the Roseburg Urban Growth Area (UGA) has been developed or is being held for needed commercial and industrial expansion. URCOG is conducting a study which contains a Buildable Lands Inventory and assessment of needs for housing within the UGA. The study found that the City will need to add about 1,000 acres of land to its net buildable residential land inventory to meet the needs of its projected population to the year 2024. The City is considering strategies to address the housing shortage, which include creating higher densities within the UGB.

Potential impacts to future residential buildout of any recommended improvements carried forward in the Highway 138 Corridor Solutions Study will need to be addressed.

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 the 11 stuctures listed on page 10 and all bicycle paths. In addition, structures eligible or potentially eligible for inclusion on the NRHP within the API but not yet identified are potential candidates for Seciton 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 City of Roseburg Park system is responsible for 20 developed parks comprising 428 acres of passive and active recreation areas. The City also provides recreational facilities for organized youth soccer, baseball, and softball teams. Parks located within the study area, displayed in Figure 7, are described below:

- Gaddis Park (19 acres) – located at the south end of Highland Street and bounded on the north by the South Umpqua River.
- Riverside Park (3.25 acres) – located on Spruce Street, between Douglas Avenue and Oak Street.
- Templin Beach Park (5 acres) – located at the corner of Templin Street and Arizona Street, along the east bank of the South Umpqua River.
- Deer Creek Park (0.64 acres) – located along the south side of the creek where it empties into the South Umpqua River west of the Central Oregon Pacific Railroad. The City also owns and maintains property along the South Umpqua River to the north as a multi-use path, natural viewing area, and fishing area.

Community Features

Community features located within or near the Study Area include:

- Roseburg Senior High School – located at 400 West Harvard Avenue, between the I-5/Harvard Interchange and the South Umpqua River
- Mercy Medical Center – located west of the Study Area at 2700 Stewart Parkway.
- City of Roseburg Fire Department – 774 SE Rose Street
- Roseburg Police Department – 205 SE Jackson Street

Existing Traffic Analysis

The following section details the analysis of the existing transportation operations and facilities within the study area.

Study Area and Facilities

The primary roadways addressed in this study include:

- Harvard Avenue
- Madrone Street
- Washington Avenue
- Oak Avenue
- Pine Street
- Stephens Street
- Jackson Street
- Winchester Street
- Diamond Lake Boulevard

Table 12 provides roadway names, jurisdictional authorities, functional classifications, posted speeds (if available), number of lanes, bike lanes, sidewalks, and school zones for the study area roadways. This information was collected through a site visit and review of the 1999 Oregon Highway Plan and the City of Roseburg Transportation System Plans. Roadway functional classification is illustrated in Figure 8.

Sixteen study area intersections were analyzed for this study:

1. Stephens Street at Winchester Street (STOP controlled)
2. Stephens Street at Diamond Lake Boulevard (signalized)
3. Diamond Lake Boulevard at Winchester Street (signalized)
4. Diamond Lake Boulevard at Fulton Street (STOP controlled)
5. Douglas Avenue at Stephens Street (signalized)
6. Douglas Avenue at Jackson Street (STOP controlled)
7. Washington Avenue at Spruce Street (STOP controlled)
8. Washington Avenue at Pine Street (signalized)
9. Washington Avenue at Stephens Street (signalized)
10. Washington Avenue at Jackson Street (STOP controlled)
11. I-5 Southbound (SB) Ramps/High School access at Harvard Avenue (signalized)
12. Harvard Avenue at Madrone Street (signalized)
13. Oak Avenue at Spruce Street (STOP controlled)
14. Oak Avenue at Pine Street (signalized)
15. Oak Avenue at Stephens Street (signalized)
16. Oak Avenue at Jackson Street (STOP controlled)

Figure 9 illustrates the intersections with existing lane configurations and traffic control at these 16 intersections.

Table 12. Analysis Area Roadway Inventory

Roadway/Highway Name	From	To	ODOT Classification	City/Douglas County Classification	Posted Speed	Vehicle Lanes	Bike Lane[1]	Onstreet Parking	Sidewalks	School Zone
Harvard	Bellows	Madrone	Urban Principal Arterial-other[(2)]	Arterial[(3)] / Minor Arterial[(4)]	30	5	1	No	Yes	Yes
Washington Avenue	Jackson	Rose	-	Local[(1)]	-	2-WB	0	Yes	Yes	No
Washington Avenue	Rose	Stephens	-	Local[(1)]	-	2-WB	0	No	Yes	No
Washington Avenue	Stephens	Pine	Urban Principal Arterial-other[(2)]	Arterial[(3)] / Minor Arterial[(4)]	-	3-WB	0	No	Yes	No
Washington Avenue	Pine	Spruce	Urban Principal Arterial-other[(2)]	Arterial[(3)] / Minor Arterial[(4)]	-	3-WB	0	No	Yes	No
Washington Avenue	Spruce	Madrone	Urban Principal Arterial-other[(2)]	Arterial[(3)] / Minor Arterial[(4)]	30	2-WB	1	No	Yes	No
Oak Avenue	Madrone	Parrott	Urban Principal Arterial-other[(2)]	Arterial[(3)] / Minor Arterial[(4)]	-	2-EB	1	No	Yes	No
Oak Avenue	Parrott	Stephens	Urban Principal Arterial-other[(2)]	Arterial[(3)] / Minor Arterial[(4)]	-	3-EB	1	No	Yes	No
Oak Avenue	Stephens	Jackson	-	Local[(3)]	-	2-EB	0	Yes	Yes	No
Douglas Avenue	Stephens	Jackson	-	Collector[(3)] / Collector[(4)]	-	2-WB 1-EB	0	No	Yes	No
Dianond Lake Blvd	Stephens	Fulton	Urban Principal Arterial-other[(2)]	Arterial[(3)] / Minor Arterial[(4)]	35	4	2	Yo	Yes	No
Winchester Street	Diamond Lake	Nash	-	Collector[(3)] / Collector[(4)]	35	2	1	No	Yes	No
Jackson Street	Diamond Lake	Douglas	-	Local[(3)]	-	2	0	Yes	Yes	No
Jackson Street	Douglas	Washington	-	Local[(3)]	-	2-SB	0	Yes	Yes	No
Jackson Street	Washington	Oak	-	Local[(3)]	-	2-SB	0	No	Yes	No
Jackson Street	Oak	Cass	-	Local[(3)]	-	2-SB	0	Yes	Yes	No
Stephens Street	Wright	Diamond Lake	-	Arterial[(3)] / Minor Arterial[(4)]	35	5	0	No	Yes	No
Stephens Street	Cass	Oak	Urban Principal Arterial-other[(2)]	Arterial[(3)] / Minor Arterial[(4)]	-	3-NB	0	Yes	Yes	No
Stephens Street	Oak	Washginton	Urban Principal Arterial-other[(2)]	Arterial[(3)] / Minor Arterial[(4)]	-	3-NB	0	East side only	Yes	No
Stephens Street	Washington	Douglas	Urban Principal Arterial-other[(2)]	Arterial[(3)] / Minor Arterial[(4)]	-	2-NB	0	No	Yes	No

Table 12. Analysis Area Roadway Inventory

Roadway/Highway Name	From	To	ODOT Classification	City/Douglas County Classification	Posted Speed	Vehicle Lanes	Bike Lane[1]	Onstreet Parking	Sidewalks	School Zone
Stephens Street	Douglas	Diamond Lake Blvd	Urban Principal Arterial-other[(2)]	Arterial[(3)] / Minor Arterial[(4)]	-	2-NB 3-SB	0	No	Yes	No
Stephens Street	Diamond Lake	Wright	-	Arterial[(3)] / Minor Arterial[(4)]	35	5	0	No	Yes	No
Pine Street	Douglas	Washington	Urban Principal Arterial-other[(2)]	Arterial[(3)] / Minor Arterial[(4)]	-	3-SB	0	No	Yes	No
Pine Street	Washington	Oak	Urban Principal Arterial-other[(2)]	Arterial[(3)] / Minor Arterial[(4)]	-	2-SB	0	No	Yes	No
Pine Street	Oak	Cass	-	Arterial[(3)] / Minor Arterial[(4)]	-	2-SB	0	No	Yes	No
Pine Street	Douglas	Washington	Urban Principal Arterial-other[(2)]	Arterial[(3)] / Minor Arterial[(4)]	-	3-SB	0	No	Yes	No
Spruce Street	Washington	Oak	-	Local[(3)]	-	2	0	Yes	Yes	No
Madrone Street	Harvard	Laurelwood	-	Local[(3)]	-	2	0	No	Yes	No

Notes:
(1) 0=none, 1=lane, 2=shoulder, 3=path. From site visit and Roseburg TSP Appendix A
(2) Source: Roseburg TSP Figure 3-1.
(3) Source: ODOT's 2002 Statewide Functional Class Review.
(4) Source: Douglas County

Local Transit

Transit facilities within the study area are fairly limited. Umpqua Transit operates two major routes in the area: the Roseburg Route and the Commuter Route. The Roseburg Route Starts at Umpqua Community College on College Road north of the study area, winds around Stewart Parkway and Garden Valley Boulevard, heads south on Stephens until turning onto Winchester Street and heading into the historic downtown area. From there it heads west along Washington and Harvard Streets toward Stewart Parkway. While in the study area, it makes two scheduled stops: the Library at Fowler Street and the City Hall on Douglas Street. The Roseburg route begins at 6:50 AM and has its last stop at 6:32 PM.

The Commuter Route serves Sutherlin to Winston, following the Roseburg route while in Roseburg. Transfers between the routes are possible. The commuter route operates from 6:20 – 9:20 AM and 4:00 – 7:30 PM with one mid-day trip from Roseburg City hall to Winston and back.

Traffic Volumes

Traffic data collection included turning movement counts and a license plate study of traffic traveling through downtown and along Highway 138.

Traffic Counts

ODOT provided traffic counts that were conducted on May 25, 2006. The counts consisted of 14-hour and 3-hour AM and PM peak period counts at analysis area intersections. The 14-hour classification counts included full Federal Highway Administration (FHWA) 13-class vehicle classifications. Raw traffic data at all count locations are provided in Appendix A. Table 13 below provides a list of all intersection count locations including the count type.

These data were summarized and compared with data collected for other area studies. The common PM peak hour for the study area occurred from 4:15 to 5:15 PM with very distinct peaking during this period compared to the adjacent hours.

Table 13. Intersection Turning Movement Count Locations and Types

Location	Type of Count
Stephens Street at Winchester Street	3-hour AM and PM
Stephens Street at Diamond Lake Boulevard	3-hour AM and PM
Diamond Lake Boulevard at Winchester Street	3-hour AM and PM
Diamond Lake Boulevard at Fulton Street	3-hour AM and PM
Douglas Avenue at Stephens Street	3-hour AM and PM
Douglas Avenue at Jackson Street	3-hour AM and PM
Washington Avenue at Spruce Street	3-hour AM and PM
Washington Avenue at Pine Street	3-hour AM and PM
Washington Avenue at Stephens Street	3-hour AM and PM
Washington Avenue at Jackson Street	3-hour AM and PM
I-5 Southbound (SB) Ramps/High School access at Harvard Avenue	3-hour AM and PM
Harvard Avenue at Madrone Street	3-hour AM and PM
Oak Avenue at Spruce Street	3-hour AM and PM
Oak Avenue at Pine Street t	3-hour AM and PM
Oak Avenue at Stephens Street	3-hour AM and PM
Oak Avenue at Jackson Street	3-hour AM and PM
Fulton Street @ Diamond Lake Boulevard	16-hour (6 AM – 10 PM)
Winchester Street @ Diamond Lake Boulevard	16-hour (6 AM – 10 PM)
Stephens Street @ Diamond Lake Boulevard	16-hour (6 AM – 10 PM)
Stephens Street @ Washington Avenue	16-hour (6 AM – 10 PM)
Stephens Street @ Oak Avenue	16-hour (6 AM – 10 PM)
Pine Street @ Washington Avenue	16-hour (6 AM – 10 PM)
Pine Street @ Oak Avenue	16-hour (6 AM – 10 PM)
Harvard Avenue @ Madrone Street	16-hour (6 AM – 10 PM)

Origin-Destination Study

As part of this study, an origin-destination analysis was conducted on December 5, 2006 from 2:15 to 5:15 PM and utilized vehicle's license plates as the method of determining driving patterns through the study area.

After evaluation of the data collected and consideration of other factors (school release, available daylight, etc.), the analysis was performed for a period from 3:15 PM to 5:00 PM. Trips were identified trying to match license plates from two or more stations. Three types of trips were observed:

- Vehicles passing through the study area (entering at one station and exiting at another)
- Vehicles entering the study area with no recorded exit (entering at one station and either remaining downtown or exiting at an unrecorded location)
- Vehicles exiting the study area with no recorded entrance (entering at an unrecorded location or starting downtown and exiting at a station)

The license plate data was then used to calculate a distribution pattern for traffic on the Oak and Washington Avenue bridges on Highway 138. The resulting patterns are illustrated in Figure 10.

These patterns are shown assuming that between 10 and 20 percent of the traffic crossing the bridges was either destined for or originating from the downtown area while 90 to 80 percent of the traffic is passing through the license plate study area.

Oak Avenue Bridge

The three largest destinations for eastbound traffic crossing the Oak Avenue Bridge were Pine Street south of Oak Avenue (22 to 25 percent), Oak Avenue east of Stephens Street (19 to 21 percent), and Stephens Street north of Diamond Lake Boulevard (18 to 20 percent). Comparison with existing turning movement supports these patterns.

Currently Diamond Lake Boulevard attracts 11 to 12 percent of the traffic crossing the bridge. Again, this is consistent with existing turning movement patterns and reflects the level of development in this corridor. This percentage is likely higher during summer months and on weekends when recreational traffic using Highway 138 is higher.

Washington Avenue Bridge

The distribution patterns for the westbound traffic crossing the Washington Avenue Bridge are very similar to those for the Oak Avenue Bridge but in the reverse direction. The three largest origins were Stephens Street south of Oak Avenue (25 to 27 percent), Washington Avenue east of Stephens Street (16 to 18 percent), and Stephens Street north of Diamond Lake Boulevard (15 to 17 percent). The traffic originating from the Diamond Lake Boulevard corridor accounted for 13 to 15 percent of the traffic on the bridge.

Developing Design Hourly Volumes

The ODOT Transportation Planning Analysis Unit (TPAU) has developed procedures for calculating current year design hourly traffic volumes (DHVs) which are intended to represent the 30th highest hour of the year. These procedures are outlined in the TPAU Analysis Procedures Manual. The DHVs typically occur during the peak month of the year and are calculated by applying a seasonal factor to the peak hour volumes. Typically the DHVs occur during the PM peak hour. Occasionally, unique directional distribution or extremely high tourist/recreational traffic can result in a condition where the 30th highest hour occurs during the AM peak hour or on a weekend.

After reviewing the TPAU methodologies for determination of seasonal factors and through discussions with TPAU staff, it was determined that use of the TPAU Seasonal Trend Table would be the most appropriate. The Seasonal Trend Table averages statewide seasonal trends according to highway type.

Table 14 below provides selected data from the table for three seasonal trend types: Interstate, Summer and Commuter. The values provided in the 'May 15' column represent the inverse of the decimal percent of average daily traffic (ADT). For example, interstate volumes collected during mid-May are 98% (1/1.0200) of average. The values provided in the 'Peak SF' column represent the inverse of the decimal percent of ADT during the peak month of the year. To determine a seasonal factor, the seasonal trend factor for the applicable time of year (May 15 column) is divided by the peak seasonal trend factor. The calculated seasonal factors resulting

from the Interstate and Summer seasonal trends were 1.18 and 1.17, respectively; the seasonal factor resulting from the Commuter seasonal trend was 1.04.

Table 14. Seasonal Factors From Seasonal Trend Table Data

Seasonal Trend	May 15†	Peak SF†	Calculated SF
Interstate	1.0200	0.8669	1.18
Summer	0.9776	0.8378	1.17
Commuter	0.9366	0.9000	1.04

†*Source: 2005 Seasonal Trend Table*

Because some traffic volumes may increase more during the summer season than others, the commuter factor was used for the overall adjustment in the area but some consideration was given to using a summer adjustment factor for traffic between I-5 and Highway 138 on Diamond Lake Boulevard. Using the percentages from the license plate survey, a factor of 1.13 was applied to the through traffic movement approximated between I-5 and Diamond Lake Boulevard. This factor was derived from the Automatic Traffic Recorder #24-005 on the North Santiam Highway near Salem, which according to TPAU methodologies, qualifies as a similar type of facility to Highway 138.

These factors were applied to the traffic and volumes were balanced and adjusted for some consistency with other area transportation planning efforts. The resulting DHVs are shown in Figure 11. A table showing raw and adjusted traffic volumes for the common peak hour is provided in Appendix B.

Traffic Operations Standards and Procedures

Once developed, the DHVs were evaluated and compared with state and city mobility standards.

Volume-to-Capacity Ratio

Transportation engineers have established various standards for measuring traffic capacity and quality of service of roadways at intersections. A comparison of traffic volume demand to intersection capacity is one method of evaluating how well an intersection, roadway segment, or merge/diverge segment is operating. This comparison is presented as a volume-to-capacity (v/c) ratio. A v/c ratio of less than 1.0 indicates that the volume is less than capacity. When it is closer to 0.0, traffic conditions are generally good with little congestion and low delays for most intersection movements. As the v/c ratio approaches 1.0, traffic becomes more congested and unstable with longer delays.

ODOT applies two sets of operational standards (mobility standards) to different types of projects. For planning and project analysis of existing conditions and no-build conditions the applicable mobility standards are found in Table 6 of the *1999 Oregon Highway Plan* (OHP). For planning and project analysis of build alternatives, the applicable mobility standards are specified in Table 10-1 of the *2003 Highway Design Manual* (HDM). Mobility standards are dependent on the roadway classification and area type and apply during peak operating

conditions through the planning horizon year, which is year 2030. Both are presented in terms of v/c ratios, and they are shown in Table 15.

Level of Service

Another standard for measuring traffic capacity and quality of service of roadways at intersections is level of service (LOS). At both stop-controlled and signalized intersections, LOS is a function of control delay, which includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. Six standards have been established ranging from LOS A where there is little or no delay, to LOS F, where there is delay of more than 50 seconds at unsignalized intersections, or more than 80 seconds at signalized intersections.

It should be noted that, although delays can sometimes be long for some movements at a stop-controlled intersection, the v/c ratio may indicate that there is adequate capacity to process the demand for that movement. Similarly at signalized intersections, some movements, particularly side street approaches or left turns onto side streets, may experience longer delays because they receive only a small portion of the green time during a signal cycle but their v/c ratio may be relatively low. For these reasons it is important to examine both v/c ratio and LOS when evaluating overall intersection operations. Both are evaluated in the analyses that follow. It should be noted that all of the roadway jurisdictions use v/c, not LOS, as a measure of performance.

Traffic Operations Analysis Procedures

All of the intersection operations were evaluated using the methodology outlined in the *2000 Highway Capacity Manual* (HCM). The Synchro/SimTraffic analysis software was selected to perform the analysis since it can provide the v/c ratio output of an HCM analysis and consider the systematic interaction of the intersections with regard to queuing and delays.

Synchro is a macroscopic model similar to the Highway Capacity Software (HCS), and like the HCS, is based on the *2000 Highway Capacity Model*. The Synchro model explicitly evaluates traffic operations under coordinated and uncoordinated systems of signalized and unsignalized intersections. Synchro calculates traffic arrival types, calculates right-turn-on-red capacity, and determines queue lengths. It also calculates delays, LOS, and v/c ratios based on the methodology in the *2000 Highway Capacity Manual*. The v/c ratios presented in this report are based on the Synchro model output.

SimTraffic animates traffic flow based on input volumes and signal timing and allows viewing of traffic flow under saturated traffic conditions where traffic may spill over from one intersection to another. Different arrival patterns can be used to determine how sensitive the traffic operations are to subtle variations in traffic flows. SimTraffic is particularly effective at evaluating closely spaced intersections.

The LOS calculations presented in this document are based on the average delays calculated from the SimTraffic model. The model was run five times for both the AM and PM peak hour conditions assuming slightly different arrival patterns in the study area each time. The delays from each of the five model runs were averaged to reflect how minor variations in traffic patterns affect the operations in the corridor.

SimTraffic was used to generate the 95th percentile queue lengths because as a microsimulation model, SimTraffic is capable of calculating the effects of traffic flow under saturated traffic conditions where traffic may spill out of left-turn storage bays or spill over from one intersection to another. Models such as Synchro are not capable of calculating the effects of saturated traffic flow conditions; therefore, the Synchro calculated queue lengths are not used in this report. As with the LOS calculations, 95th percentile queues were calculated from the averaged results of five model runs.

All Synchro and SimTraffic output sheets can be found in Appendix C.

Existing Traffic Operations

Table 15 and Figure 12 summarize the results for all analysis area intersections and the table also presents agency operational standards to enable comparison with intersection results. Critical movements at unsignalized intersections are typically the minor street left turns or, in the case of single-lane approaches, the minor street approaches. These movements are required to yield to all other movements at the intersection and thus are subject to the longest delays and have least capacity. Left turns from the major street are also subject to delays since motorists making these maneuvers must also yield to on-coming major street traffic. Bold numbers in the tables represent v/c ratios that exceed the mobility standards. Only one location, the westbound right turn from Winchester to Stephens, has a v/c ratio that exceeds the standard but both field observations and the simulation indicate this movement is not congested as implied by the v/c.

Table 15. Existing (Year 2006) 30th Highest Hour Traffic Operations Analysis Results

Intersection	Critical Movement	V/C Ratio	LOS	OHP Std.(1)	City V/C. Std.(2)	City LOS Std.(2)
Stephens @ Winchester	WB Right	1.21	A	-	0.85	≤ E
Stephens St @ Diamond Lake Blvd	n/a(3)	0.66	C	0.85	.85	≤ D
Diamond Lake Blvd @ Winchester St	n/a(3)	0.65	C	0.85	.85	≤ D
Diamond Lake Blvd @ Fulton St	SB Approach	0.38	C	0.85	.85	≤ E
Douglas Ave @ Stephens St	n/a(3)	0.60	B	0.85	.85	≤ D
Douglas Ave @ Jackson St	n/a(3)	0.45	A	-	0.95	≤ E
Washington Ave @ Spruce St	NB Approach	0.82	D	0.85	.85	≤ E
Washington Ave @ Pine St	n/a(3)	0.72	B	0.85	.85	≤ D
Washington Ave @ Stephens St	n/a(3)	0.50	B	0.85	.85	≤ D
Washington Ave @ Jackson St	n/a(3)	0.25	A	-	0.95	≤ E
I-5 NB ramps/High School @ Harvard Ave	n/a(3)	0.72	B	0.85	.85	≤ D
Harvard Ave @ Madrone St	n/a(3)	0.58	A	0.85	.85	≤ D
Oak Ave @ Spruce St	NB Approach	0.14	B	0.85	.85	≤ E
Oak Ave @ Pine St	n/a(3)	0.56	B	0.85	.85	≤ D
Oak Ave @ Stephens St	n/a(3)	0.48	B	0.85	.85	≤ D
Oak Ave @ Jackson St	n/a(3)	0.25	A	-	0.95	≤ E

Notes:
(1) 1999 Oregon Highway Plan Mobility Standards (Table 6)
(2) V/C and LOS operational standards for Roseburg (Source: Roseburg Transportation System Plan)
(3) Signalized or All-way stop control intersection. LOS and v/c are for overall intersection.

Source: David Evans and Associates, Inc.

Figure 12 also illustrates the 95th percentile queuing for the stopped movements of the study area intersections. Existing queues do not consistently extend from one intersection to the next. The only location where the 95th percentile queue was shown to spill back into the upstream intersection was Washington Avenue at Pine Street, where the distance to Stephens Street is shorter than other locations because this is where the Highway 138 couplet begins at the north end of downtown.

Safety Analysis

A safety analysis was conducted to determine if there were any significant documented safety issues within the analysis area and to recommend measures at specific locations or general strategies for improving overall safety.

The safety analysis included a review of crash history data supplied by the ODOT Crash Analysis and Reporting Unit for the period between January 1, 2002 and December 31, 2004, which are the three most recent full years for which crash data is available. It should be noted that the crashes listed are only the crashes reported. The analysis also examined ODOT Safety Priority Index System (SPIS) data.

The process for analyzing the safety data provided was to determine the location and frequency of crashes occurring in the study area. Crashes were totaled by intersection. Crash rates for each intersection influence area were calculated and compared to statewide averages.

Calculation of Crash Rates

The crash rates were calculated from ODOT-provided crash data. For a crash to be considered associated with an intersection, it must occur within 0.05 miles (265 feet) of the intersection. It should be noted that this analysis only accounts for those 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 (prior to December 31, 2003) or $1,500 (after January 1, 2004).

Intersection crash rates were calculated using the following equations.

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

$Rate_{int}$ = Crash rate per Million Entering Vehicles (MEV)
Crashes = Number of crashes during the time segment
Years = Number of years being studied
ADT = Average Daily Traffic volume

The number of crashes was determined from ODOT crash data. At intersections, the sum of all To obtain an estimated ADT, the sum of the PM peak hour entering volumes from each leg were multiplied by ten. Crash rates were then calculated for the entire five-year study period.

Table 16 presents a summary of crashes in the analysis area, sorted by location, crash type, and severity (i.e., injury or property damage only).

Table 16. Summary of Crash History (2002-2004)

Intersection	Rear End	Sideswipe / Overtaking	Turning	Angle	Fixed Object	Pedestrian	Bike	Other	Total Crashes	% by Location	PDO Crashes	Injury Crashes	5-Year Crash Rate
Oak @ Pine	7	1	6	42	0	0	1	0	57	25%	26	30	1.91
Oak @ Stephens	2	1	14	13	1	1	0	0	32	14%	20	11	1.00
Harvard @ I-5 SB Exit	14	1	10	0	0	0	1	1	27	11%	15	11	0.31
Douglas Ave @ Stephens	2	0	13	9	0	0	2	0	26	11%	14	10	0.46
Washington @ Spruce	5	2	9	10	0	0	0	0	26	11%	19	7	1.00
Diamond Lake @ Winchester	1	0	17	5	0	0	2	0	25	10%	13	10	0.50
Washington @ Pine	2	3	1	6	0	0	0	0	12	5%	7	5	0.33
Harvard @ Madrone	5	0	2	1	0	1	0	0	9	4%	7	1	0.18
Diamond Lake @ Fowler	0	0	5	0	0	0	1	0	6	2%	2	3	n/a
Oak @ Spruce	0	0	5	0	1	0	0	0	6	3%	5	1	0.31
Washington @ Stephens	0	1	1	2	0	0	0	0	4	2%	3	1	0.12
Stephens @ Diamond Lake	3	0	0	0	0	0	0	0	3	1%	2	1	0.06
Douglas @ Jackson	0	0	1	0	0	0	0	1	2	1%	2	0	0.11
Oak @ Jackson	0	0	1	0	0	0	0	1	2	1%	2	0	0.23
Totals	41	9	85	88	2	2	7	3	237		137	91	
% Total Crashes by Type	18%	4%	37%	39%	1%	1%	3%	1%			60%	40%	

Source: Oregon Department of Transportation

The crash history shows a high number of crashes in the analysis area. Over three quarters of the crashes are angle type or turning type. The third most common crash type is rear-end. Although Table 16 does not show injury severity, most people involved in injury crashes suffered relatively minor injuries, and there were no fatalities.

As a rule of thumb, intersections with crash rates of 1.0 or above are potentially problematic and are candidates for further investigation. As Table 16 shows, crash rates are at or above 1.0 at Washington St. at Spruce St., Oak Ave. at Pine St., and Oak Ave. at Stephens St. A quarter of the crashes occurred at the intersection of Oak Ave. and Pine St. This intersection also had the highest crash rate at 1.91.

SPIS Data

The Safety Priority Index System (SPIS) 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 to determine a SPIS score for a specific location. 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. ODOT produces a list of the sites with the top 10% SPIS scores each year. For the latest database (2003 through 2005), the SPIS scores at or above 44.49 are in the top 10%.

One segment of Hwy 138/N Umpqua, between MP -0.045 and MP -0.027, is in the top 10% of SPIS sites. The intersection of N Umpqua and Stephens St. lies within this segment.

Crash Analysis Conclusions

Angle and turning type crashes form the majority of the crashes, with rear-end crashes making up most of the remaining crashes. Almost 60 percent of the total crashes were property damage only, and most of the injury crashes involved relatively minor injuries.

Three intersections reported crash rates at or above 1.0 and an accumulation of 25 or more crashes during the five-year study period: Oak Avenue at Pine Street Oak Avenue at Stephens Street and Washington Street at Spruce Street.

Fifty-six crashes were reported at the intersection of Oak Avenue and Pine Street. The majority of the crashes were angle type crashes. Over half of the crashes at this intersection resulted in injuries and roughly 15% of the injuries were severe. Oak Avenue and Pine Street are both one-way streets, and all of the angle type crashes had southeast bound and southwest bound traffic colliding.

At Oak Avenue and Stephens Street, the majority of the 31 reported crashes were turning (14) or angle type (13). Most of the turning type crashes included the eastbound left turn movement, either with another eastbound left turning vehicle or a northbound through vehicle. No pattern could be discerned from the angle type crashes. The majority of the crashes resulted in property damage only, and all injuries were minor.

Of the 26 reported crashes at Washington Street and Spruce Street, a third were turning type and more than another third were angle type crashes. This intersection is stop-controlled with the stop controls on Spruce Street. The third highest crash type was rear-end. Almost three quarters of the crashes resulted in property damage only. All injuries were minor. Of the 10 angle type crashes, 6 were from northwest bound and northeast bound vehicles intersecting. Two thirds of the turning type crashes resulted from northwest bound through and northwest bound left turn traveling vehicles. All but one included a northwest-bound through traveling vehicle.

Some of the remaining intersections, while not having high crash rates, had large concentrations of crashes of one type. Seventeen turning type crashes occurred at Diamond Lake Boulevard OR 138) and Winchester Street, almost half of which were collisions between northbound through and southbound left turn movements. In all of these cases, the southbound vehicle turned left in front of oncoming traffic. All crashes at Diamond Lake Boulevard and Fowler Street were the result of a turning vehicle disregarding the stop sign or red signal. At Oak Avenue and Spruce Street, all crashes were of the turning type. No pattern could be discerned based on the nature of the crashes.

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