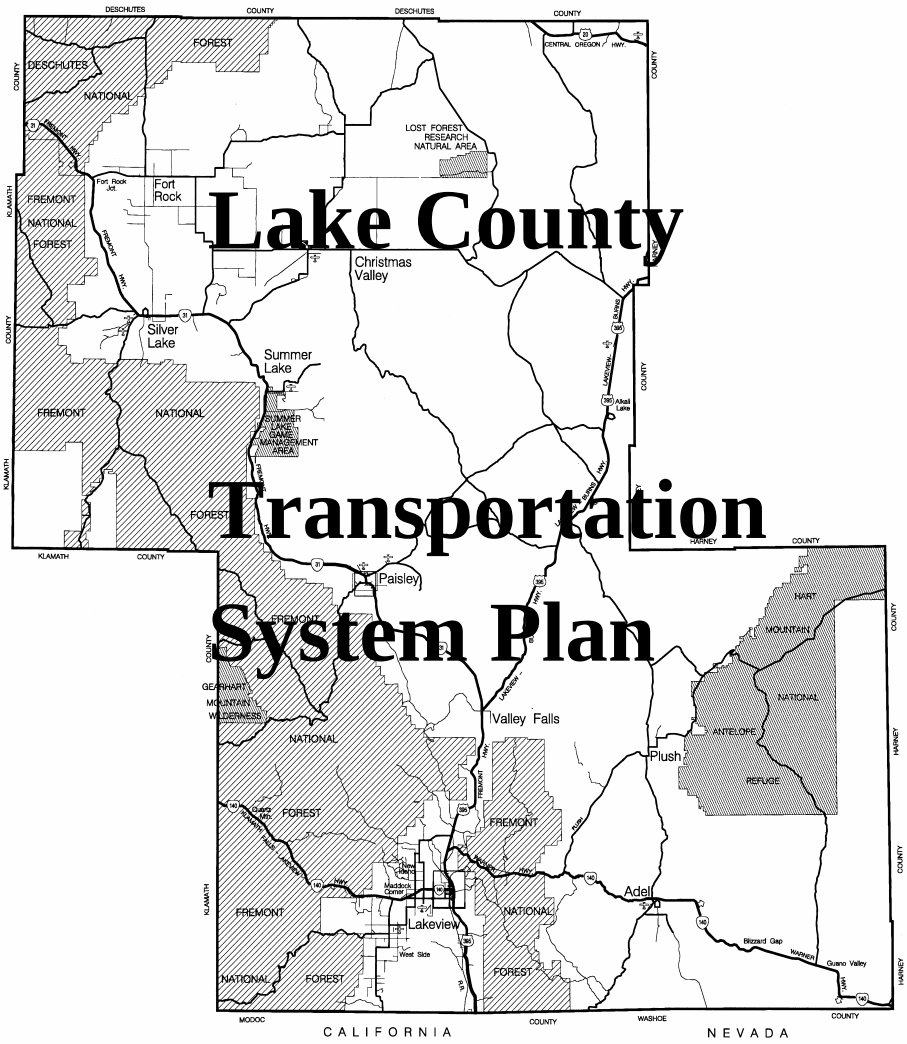

Lake County Transportation System Plan

December 2002

Prepared by

DAVID EVANS AND ASSOCIATES INC.

Photos by Ryan LeProwse and Erika Lasater at www.oregonsoutback.com

LAKE COUNTY

TRANSPORTATION SYSTEM PLAN

Prepared for:

Lake County, Oregon
and
Oregon Department of Transportation

Prepared by:

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December 2002

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EXECUTIVE SUMMARY

The Lake County Transportation System Plan (TSP) guides the management of existing transportation facilities and the design and implementation of future facilities for the next 20 years. This Transportation System Plan constitutes the transportation element of the County's Comprehensive Plan and satisfies the requirements of the Oregon Transportation Planning Rule established by the Department of Land Conservation and Development. It identifies and prioritizes transportation projects for inclusion in the Oregon Department of Transportation's (ODOT's) Statewide Transportation Improvement Program (STIP) and the Lake County Capital Improvement Program (CIP).

The Lake County TSP was developed through a series of technical analyses combined with systematic input and review by the Transportation Advisory Committee (TAC), a local stakeholder group, ODOT, and the public. The TAC consisted of staff, elected and appointed officials, residents, and business people from the county. Key elements of the process include:

- Involving the Lake County community (Chapter 1; Appendix I);
- Defining goals and objectives (Chapter 2);
- Reviewing existing plans and transportation conditions (Chapters 3 and 4; Appendices A, B, C, and D);
- Developing population, employment, and travel forecasts (Chapter 5; Appendix E and F);
- Developing and evaluating potential transportation system improvements (Chapter 6; Appendix G);
- Developing the Transportation System Plan (Chapter 7; Appendix H);
- Developing a Financing Plan (Chapter 8); and
- Developing policies and ordinances (Chapter 9).

The TSP addresses the provision of a safe, convenient, and economic transportation system for all users. The plan includes an assessment of the existing transportation system, an evaluation of the impacts of growth on the transportation system, an identification of transportation system improvement projects, a transportation financing plan, transportation and land use policies that will assist Lake County in implementing the TSP, and a description of the plan's compliance with the Transportation Planning Rule.

The most common understanding of transportation is of roadways carrying cars and trucks. Most transportation dollars are devoted to building, maintaining, or planning roads to carry automobiles and trucks. The mobility provided by the personal automobile has resulted in greater reliance on this form of transportation. Likewise, the ability of trucks to carry freight to nearly any destination has greatly increased their use.

Encouraging the use of cars and trucks must be balanced against costs, livability factors, the ability to accommodate other modes of transportation, and negative impacts on adjacent land uses; however, the basis of transportation in all American cities is the roadway system. This trend is clearly seen in the existing Lake County transportation system, which consists predominantly of roadway facilities for cars and trucks. The street system will most likely continue to be the basis of the transportation system for at least the 20-year planning period; therefore, the emphasis of this plan is on improving the existing street system for all users.

To safely and efficiently accommodate future vehicular travel in Lake County, a number of projects were developed to address specific deficiencies, safety issues, or access concerns. These projects include safety improvements along state highways and at intersections, as well as bicycle and pedestrian system improvements. The table located at the end of this **Executive Summary** lists the transportation improvements and assigns the costs to the Federal Government, ODOT, and Lake County. The total estimated cost for the improvements is $81.3 million over a 20-year planning period. Lake County's share of these costs is $5.1 million, ODOT's share of these costs is $74.5 million, and $1.7 million of these costs were assigned to the federal government.

In preparing the TSP's financial plan, the current transportation funding levels and resources are not adequate to meet the identified needs of the community. There are a number of possible new funding resources that can be utilized, including local gasoline taxes, local vehicle registration fees, and federal timber receipts.

The TSP contains text amendments to the county's transportation element of the Comprehensive Plan and the Zoning Ordinance. These changes will bring the Comprehensive Plan and the Zoning Ordinance into compliance with the Transportation Planning Rule.

PRIORITIZED 20-YEAR TRANSPORTATION PROJECT LIST

		Estimated Cost Allocation			
Project Number/Description		**Federal**	**State**	**County**	**Total[2]**
High Priority (2002-2006)					
1	Safety improvements along OR 140 east at Deep Creek, Greaser Canyon, and Doherty Slide		$36,700,000		$36,700,000
4	Intersection improvements at US 395 and OR 140 east		$75,000		$75,000
5	Intersection improvements at OR 31 and US 395		$200,000		$200,000
7	Improve directional signing to US 97 along OR 31 at Bear Flat Road		$1,500		$1,500
12	Install bike lanes along County roads - high priority locations			$94,900	$94,900
14	Pavement preservation projects along US 395		$5,000,000		$5,000,000
16	Intersection improvements (larger STOP signs, STOP AHEAD signs, double arrow signs)		$10,000		$10,000
20	Replace dial-a-ride transit fleet - high priority			$40,800	$40,800
21	Upgrade substandard bridges - high priority		$7,600,000	$3,425,000	$11,025,000
STIP[1]	Curve corrections along OR 140 east from mileposts 17.0 - 28.0 **{Key #11179}**		$2,900,000		$2,900,000
STIP[1]	Pavement preservation along OR 31 from mileposts 86.0 - 100.0 **{Key #10284}**		$2,900,000		$2,900,000
STIP[1]	Pavement preservation along OR 140 east from mileposts 20.0 - 28.0 **{Key #12410}**		$1,200,000		$1,200,000
STIP[1]	Pavement preservation along OR 140 east from mileposts 40.0 - 45.0 **{Key #12414}**		$650,000		$650,000
STIP[1]	Pavement preservation along US 395 from mileposts 128.5 - 142.6 **{Key #09537}**		$3,900,000		$3,900,000
STIP[1]	Pavement preservation along US 395 from mileposts 144.1 - 152.0 **{Key #12520}**		$1,200,000		$1,200,000
STIP[1]	Replace Muddy Creek Bridge (02680) and Cottonwood Creek Bridge (02679) **{Key #10710}**		$916,000		$916,000
STIP[1]	Replace Silver Creek Bridge (03908) **{Key #09668}**		$1,200,000		$1,200,000
STIP[1]	Purchase of a bus for Lake County **{Key #12093}**		$62,000		$62,000
	Oregon Scenic Byway - high priority projects		NA		NA
	Lake County Airport - high priority projects (refer to Table 7-11)	$595,656	$66,184[3]		$661,840
Medium Priority (2007-2012)					
6	Enhance existing chain-up area at Drews Valley and allow school bus turnaround		$100,000		$100,000
11	Localized shoulder improvements along US 395 and OR 140 west		$375,000		$375,000
12	Install bike lanes along County roads - medium priority locations			$108,800	$108,800
16	Intersection improvements (travel lane rumble strips)			$10,000	$10,000
17	Install pedestrian facilities in the City of Paisley and the rural community of Silver Lake		$113,500		$113,500
19	Safety improvements along OR 31 near Picture Rock Pass (addressing rock fall issues, shoulder widening, adding guardrail, and curve flattening near milepost 63.5)		$3,000,000		$3,000,000
20	Replace dial-a-ride transit fleet - medium priority			$226,500	$226,500
21	Upgrade substandard bridges - medium priority		$2,126,000		$2,126,000
Low Priority (2013-2022)					
2	Safety improvements along OR 140 west near Antelope Canyon		$3,500,000		$3,500,000
12	Install bike lanes along County roads - low priority locations			$751,500	$751,500
13	Minor improvements to s-curve along County Road #5-14 (3-5 miles west of town)			$37,500	$37,500
16	Intersection improvements (flashing lights)		$20,000		$20,000
18	Improve 4 existing rest areas/waysides near Lakeview		$270,000[4]		$270,000
20	Replace dial-a-ride transit fleet - low priority			$344,100	$344,100
22	Install chain-up and chain-down areas at two locations along OR 31		$100,000		$100,000
	Oregon Scenic Byway - low priority projects		NA		NA
	Lake County Airport - low priority projects (refer to Table 7-11)	$1,088,754	$360,973[3]		$1,449,727
23	Flatten Nevada Curve along OR 431 near milepost 65.2 (HARNEY COUNTY)		NA		NA
Subtotal High Priority Projects		**$595,656**	**$64,580,684**	**$3,560,700**	**$68,737,040**
Subtotal Medium Priority Projects		**$0**	**$5,714,500**	**$345,300**	**$6,059,800**
Subtotal Low Priority Projects		**$1,088,754**	**$4,250,973**	**$1,133,100**	**$6,472,827**
LAKE COUNTY TOTAL		**$1,684,410**	**$74,546,157**	**$5,039,100**	**$81,269,667**

Notes

1. Funded as part of final 2002-2005 STIP project.
2. The higher cost estimate has been illustrated; the ranges are shown in Chapter 6.
3. Projects will be funded by either state or local agencies.
4. Oregon State Parks.

Source: TAC recommendations based on Chapter 6, Lake County TSP.

CHAPTER 1: INTRODUCTION

The Lake County Transportation System Plan (TSP) guides the management of existing transportation facilities and the design and implementation of future facilities for the next 20 years. This Transportation System Plan constitutes the transportation element of the County's Comprehensive Plan and satisfies the requirements of the Oregon Transportation Planning Rule established by the Department of Land Conservation and Development. It identifies and prioritizes transportation projects for inclusion in the Oregon Department of Transportation's (ODOT's) Statewide Transportation Improvement Program (STIP).

LAND USE AND TRANSPORTATION CONNECTION

The Lake County TSP needs to meet the requirements of Statewide Planning Goal 12 and its implementing division, the Transportation Planning Rule (OAR Chapter 660, Division 12). Goal 12 affects all levels of government, and requires that transportation plans be coordinated among all jurisdictions. For Lake County this would principally include coordination with the Oregon Department of Transportation (ODOT) and the Town of Lakeview. For example, the Lake County plan must be coordinated with statewide transportation plans. The elements of the plans for these jurisdictions that pertain to Lake County are delineated in this chapter.

Goal 12

In the mid-1970s, Oregon adopted 19 Statewide Planning Goals to be implemented in comprehensive plans. The aim of Goal 12, Transportation is "to provide and encourage a safe, convenient, and economic transportation system."

Each community, region, and metropolitan area updated the transportation element of their comprehensive plans according to the following guidelines set forth in Goal 12.

> "A transportation plan shall (1) consider all modes of transportation including mass transit, air, water, pipeline, rail, highway, bicycle and pedestrian; (2) be based upon an inventory of local, regional and state transportation needs; (3) consider the differences in social consequences that would result from utilizing differing combinations of transportation modes: (4) avoid principal reliance upon any one mode of transportation; (5) minimize adverse social, economic and environmental impacts and costs; (6) conserve energy; (7) meet the needs of the transportation disadvantaged by improving transportation services; (8) facilitate the flow of goods and services so as to strengthen the local and regional economy; and (9) conform with local and regional comprehensive land use plans."

The comprehensive plan for Lake County includes land use policies corresponding to the Transportation Planning Rule.

The Transportation Planning Rule

The Department of Land Conservation and Development (DLCD) and ODOT developed the Transportation Planning Rule (TPR). It was adopted in April 1991, and has been revised several times since then. The TPR implements Goal 12.

Overview

The Transportation Planning Rule requires that cities, counties, Metropolitan Planning Organizations (MPOs), and state agencies prepare and adopt TSPs. A TSP is "a plan for one or more transportation facilities that are planned, developed, operated, and maintained in a coordinated manner to supply continuity of movement between modes, and within and between geographic and jurisdictional areas."

The ultimate aim of the rule is to encourage a multi-modal transportation network throughout the state. A network that will reduce our reliance on the automobile and ensure that local, state, and regional transportation systems "support a pattern of travel and land use in urban areas, which will avoid the air pollution, traffic, and livability problems faced by other areas of the country."

The following plan elements are required in order to satisfy the TPR.

1. Identification of transportation needs;
2. A street system plan for a network of arterial and collector roadways;
3. Bicycle and pedestrian plans;
4. A public transportation plan;
5. Air, rail, water, and pipeline plans;
6. Policies and land use regulations for implementing the TSP; and
7. A transportation financing program.

Oregon Transportation Plan

The Oregon Transportation Plan (OTP) was completed and adopted by the Oregon Transportation Commission in September 1992. Several alternative approaches to developing the transportation plan were evaluated as part of the OTP planning process. The preferred plan presented in the OTP followed the Livability Approach, which "depends heavily on the concept of minimum levels of service within each transportation mode to assure appropriate transportation alternatives to all areas of the state."

PLANNING AREA

The Lake County TSP covers the area within Lake County, excepting the area within the Town of Lakeview Urban Growth Boundary (UGB). Lake County is located in the south-central portion of Oregon and encompasses 8,359 square miles. It is bordered on the west by Klamath County, Deschutes County to the north, Harney County to the east, and California and Nevada to the south. According to the 2000 Census, Lake County has a population of 7,422, which represents an increase of 3.3 percent since 1990. Lakeview is the largest city in Lake County, is the county seat, and has a population of 2,600.

Lake County has two north-south trending highways and one highway for east-west travel. The Fremont Highway (OR 31/US 395) and the Lakeview-Burns Highway (US 395) provide for north-south travel and the Klamath Falls-Lakeview Highway (OR 140) and the Warner Highway (OR 140) traverse the southern portion of the county and provide for east-west travel. Central Oregon Highway (US 20) also provides an east-west link at Lake County's northern boundary. These

highways comprise the county's arterials, and the primary connections to Bend and Burns to the north, California to the south, and Klamath Falls to the west.

Historically, Lake County has relied upon livestock, forest products, agriculture, and recreation for its livelihood. With the changing economy in Oregon and the effects it has had on the timber industry, the county has looked forward to new developments for economic growth. One development currently in the planning process is the construction of a new Department of Corrections Work Camp Facility just north of the Town of Lakeview Urban Growth Boundary.

The Lake County planning area is shown in **Figure 1-1**.

PLANNING PROCESS

The Lake County TSP was developed through a series of technical analyses combined with systematic input and review by the Transportation Advisory Committee (TAC), a local stakeholder group, ODOT, and the public. The TAC consisted of staff, elected and appointed officials, residents, and business people from the county. Key elements of the process include:

- Involving the Lake County community (Chapter 1; Appendix I);
- Defining goals and objectives (Chapter 2);
- Reviewing existing plans and transportation conditions (Chapters 3 and 4; Appendices A, B, C, and D);
- Developing population, employment, and travel forecasts (Chapter 5; Appendices E and F);
- Developing and evaluating potential transportation system improvements (Chapter 6; Appendix G);
- Developing the Transportation System Plan (Chapter 7; Appendix H);
- Developing a Financing Plan (Chapter 8); and
- Developing policies and ordinances (Chapter 9).

Once approved by Lake County and acknowledged by the Land Conservation and Development Commission, the TSP will bring the county into compliance with the TPR. The TSP will include the necessary comprehensive plan amendments and supporting ordinances to implement the TSP. This will help Lake County to more effectively focus future growth by establishing a consistent planning framework in alignment with community and state goals and policies.

Community Involvement

Community involvement is an integral component in the development of a TSP. Several different techniques were utilized to involve the local jurisdiction, ODOT, and the general public.

A Transportation Advisory Committee (TAC) provided guidance on technical issues and direction regarding policy issues to the consultant team. Staff members from the local jurisdiction and ODOT served on this committee. This group met six times during the course of the project.

A group of local stakeholders, over 25 representatives from businesses, the public, and agencies, also provided input via phone interviews. This group was contacted at the beginning of the project to discuss transportation needs and issues facing Lake County.

Appendix I summarizes the community involvement effort. This appendix includes the names of those individuals who served on the Transportation Advisory Committee and the stakeholders who were interviewed by telephone. This appendix also contains a summary of the stakeholders' transportation issues and meeting summaries from the TAC and public meetings.

Another part of the community involvement effort consisted of community meetings within Lake County. The first set of public open houses was held on August 6, 2002 in Lakeview and August 7, 2002 in Christmas Valley. The general public was invited to learn about the TSP planning process and provide input on transportation issues and concerns. A second public open house was held on October 1, 2002 in Lakeview. The public was notified of the public meetings through public announcements in the local newspapers, on the local radio stations, and on the local cable television station.

Finally, a series of public hearings was held before the Lake County Planning Commission and the Lake County Commissioners. The public hearing before the Lake County Planning Commission was held on November 6, 2002. The first public hearing before the Lake County Commissioners was held on December 4, 2002. The second public hearing before the Lake County Commissioners was held on December 18, 2002.

Goals and Objectives

Based on input from the TAC and stakeholders, goals and objectives were defined for the TSP. These goals and objectives were used to make decisions about various potential improvement projects. They are described in Chapter 2.

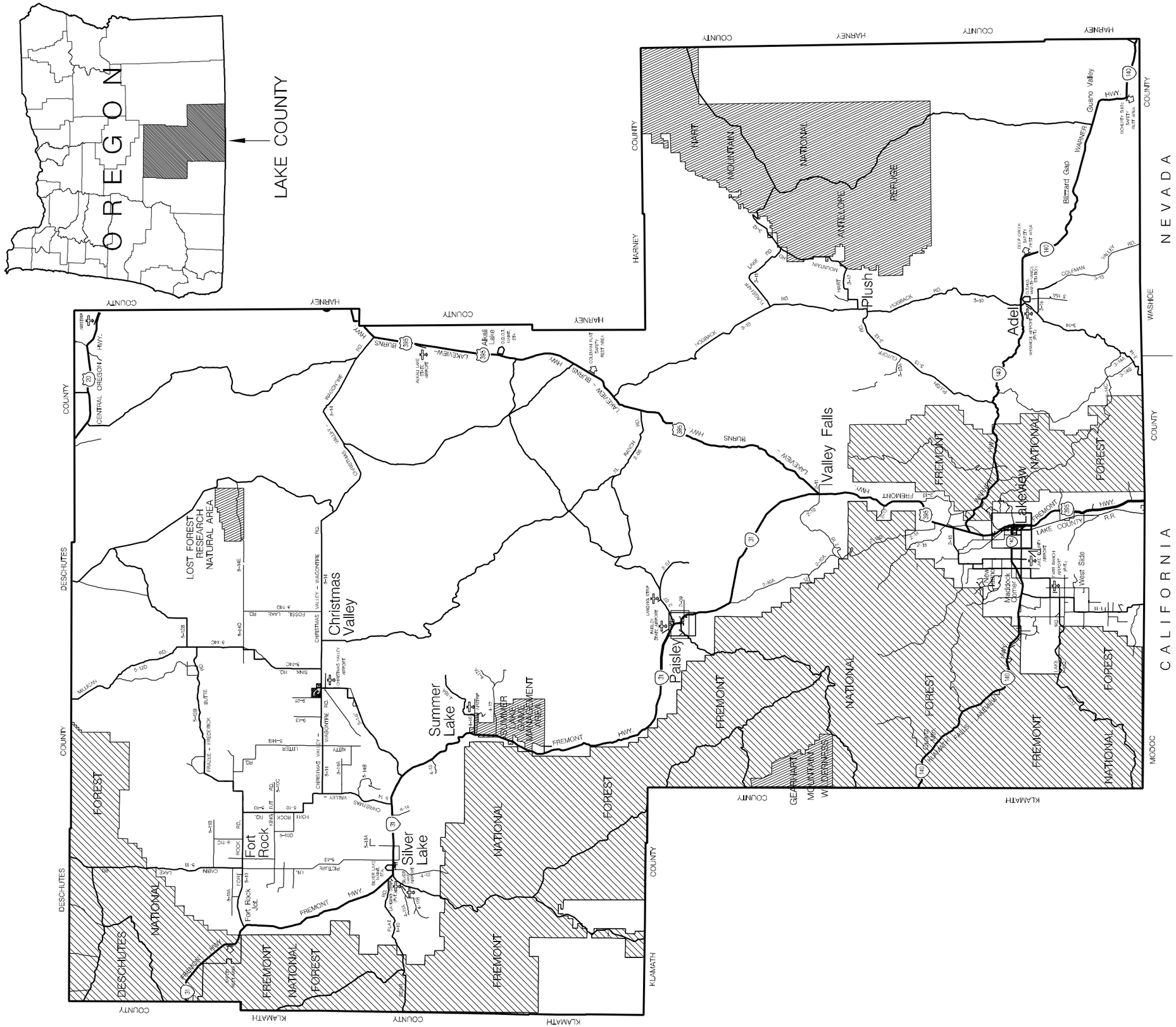
Review and Inventory of Existing Plans, Policies, and Public Facilities

To begin the planning process, all applicable Lake County transportation and land use plans and policies were reviewed and an inventory of public facilities was conducted. The purpose of these efforts was to understand the history of transportation planning in the county, including the street system improvements planned and implemented in the past, and how the county is currently managing its ongoing development. Existing plans and policies are described in **Appendix A** of this report.

The inventory of existing facilities catalogs the current transportation system. The results of the inventory are described in Chapter 3, while Chapter 4 describes how the system operates. **Appendix B** summarizes the inventory of the existing highway and road systems. **Appendix C** describes the level-of-service (LOS) criteria for unsignalized intersections and two-lane rural highway sections. **Appendix D** contains the level-of-service and volume-to-capacity calculation summary sheets for the existing conditions.

Future Transportation System Demands

The Transportation Planning Rule requires the Transportation System Plan to address a 20-year forecasting period. Future traffic volumes for the existing plus committed transportation systems were projected using ODOT's *Level 1 -- Trending Analysis* methodology. The overall travel demand forecasting process is described in Chapter 5. **Appendix E** contains detailed population and employment forecasts for Lake County. **Appendix F** contains the level-of-service and volume-to-capacity calculation summary sheets for the future conditions.



LEGEND:

FIGURE 1-1

Lake County Planning Area

LAKE COUNTY TSP

ODOT0386/fig1-1.dgn/RSLP/12-12-02

Transportation System Potential Improvements

Once the travel forecasts were developed, it was possible to evaluate a series of potential transportation system improvements. The evaluation of the potential transportation improvements was based on a qualitative review of safety, environmental, socioeconomic, and land use impacts, as well as estimated cost. These improvements were developed with the help of the TAC, and they attempt to address the concerns specified in the goals and objectives (Chapter 2). After evaluating the results of the potential improvements analysis, a series of transportation system improvements were selected. The recommended improvements are described in Chapter 6. **Appendix G** contains the Federal Transit Authority vehicle description and useful life standards.

Transportation System Plan

The Transportation System Plan addresses each mode of transportation and provides an overall implementation program. The street system plan was developed from the forecasting and potential improvement evaluation described above. The bicycle and pedestrian plans were developed based on current usage, land use patterns, and the requirements set forth by the Transportation Planning Rule. The public transportation, air, water, rail, and pipeline plans were developed based on discussions with the owners and operators of those facilities. Chapter 7 details the plan elements for each mode. **Appendix H** contains the Lake County Road Department 5-year Working Pavement Management Plan.

Funding Options

Lake County will need to work with ODOT to finance new transportation projects over the 20-year planning period. An overview of funding and financing options that might be available to the county is described in Chapter 8.

Policies and Ordinances

Comprehensive Plan policies and zoning and subdivision ordinances are included in Chapter 9. These policies and ordinances are intended to support the TSP and satisfy the requirements of the TPR.

RELATED DOCUMENTS

The Lake County TSP addresses the regional and rural transportation needs in the county. There are several other documents that address specific transportation elements in Lake County.

Inventories and Plans

- Lake County Comprehensive Land Use Plan (May 1980)
- Lake County Airport – Airport Layout Plan Report (March 2001)
- Lake County Atlas: A Comprehensive Plan Supplement (March 1979)
- Lake County Zoning Ordinance
- South Central Oregon Regional Investment Plan (February 2000)

- Lake County Department of Corrections Facility Impact Assessment Report (Final Report June 30, 1999)
- Town of Lakeview Transportation System Plan (June 2001)
- Town of Lakeview Public Facilities Plan Draft (February 2001)
- Transportation Corridor Analysis of Highway 140 East of Klamath Falls to the Nevada Border (July 2001)
- Corridor Strategy – US Highway 395 South (Pendelton – California Border)
- US Highway 20 Corridor Strategy (Bend – Vale) (June 1996)
- Oregon's Outback Scenic Byway Management and Marketing Plan for State Highways 31 and 395 Corridor (Draft November 1996)

Other State Plans

Coordination with the following state plans is required:

- Oregon Transportation Plan
- Oregon Highway Plan
- Oregon Bicycle and Pedestrian Plan

CHAPTER 2: GOALS AND OBJECTIVES

The purpose of the TSP is to provide a guide for Lake County to meet its transportation goals and objectives. The following goals and objectives were developed from information contained in the Lake County Comprehensive Plan, the Town of Lakeview TSP, the South Central Oregon Regional Investment Plan, and public concerns as expressed during public meetings. An overall goal was drawn from the plans, along with more specific goals and objectives. Throughout the planning process, each element of the plan was evaluated against these parameters.

OVERALL TRANSPORTATION GOAL

To provide and encourage a safe, convenient and economic transportation system.

Goal 1

Comply with the Transportation Planning Rule.

Objectives

A. Identify transportation needs relevant to the planning area and the scale of the transportation network.

B. Develop a street system plan for a network of arterial, collector, and local roadways.

C. Develop a pedestrian plan.

D. Develop a bicycle plan.

E. Develop a public transportation plan.

F. Develop air and pipeline plans.

G. Adopt policies and land use regulations for implementing the Transportation System Plan.

H. Develop a transportation funding and financing program.

Goal 2

Preserve the function, capacity, level of service, and safety of the state highways by identifying and addressing transportation needs relevant to the planning area and scale of the transportation network.

Objectives

A. Develop access management standards that will meet the requirements of the Transportation Planning Rule and also consider the needs of the community.

B. Promote alternative modes of transportation for local trips.

C. Promote transportation demand management programs (e.g., rideshare and park-and-ride).

D. Promote transportation system management (e.g., cost-sharing partnerships and off-system improvements).

E. Continue federal, state, and local efforts to establish long-haul trucking capacity on Highways 140, 395, and 31.

F. Support coordinated land use and transportation planning for the Highway 140 corridor.

Goal 3

Improve and enhance safety and traffic circulation and preserve the level of service on local street systems.

Objectives

A. Develop an efficient road network that will maintain a level of service D or better.

B. Improve and maintain existing roadways.

C. Ensure planning coordination between the Town of Lakeview, the county, and the state.

D. Identify local problem spots and recommend solutions.

Goal 4

Identify the 20-year roadway system needs to accommodate developing or undeveloped areas within Lake County.

Objectives

A. Continue to develop the road system as the principal mode of transportation both for access to and within the county.

B. Coordinate with the Town of Lakeview in encouraging development of the Industrial Park south of town limits, and the industrial area north of town.

C. Address the needs of the community and impacts that the placement of the Department of Corrections Work Camp Facility will have on the local transportation system.

D. Develop street standards that address street width, connectivity, spacing and access management, having first considered safety, use, and economics.

E. Consider alternative funding sources for future road developments such as System Development Charges.

CHAPTER 3: EXISTING TRANSPORTATION SYSTEM INVENTORY

As part of the planning process, David Evans and Associates, Inc. (DEA) conducted an inventory of the existing transportation system in Lake County. This inventory covered the street system as well as the pedestrian, bikeway, public transportation, rail, air, water, and pipeline systems as they apply to Lake County.

ROADWAY SYSTEM

The most common understanding of transportation is of roadways carrying cars and trucks. Most transportation dollars are devoted to building, maintaining, or planning roads to carry automobiles and trucks. The mobility provided by the personal automobile has resulted in a great reliance on this form of transportation. Likewise, the ability of trucks to carry freight to nearly any destination has greatly increased their use.

Encouraging the use of cars and trucks must be balanced against costs, livability factors, the ability to accommodate other modes of transportation, and negative impacts on adjacent land uses; however, the basis of transportation in all American cities is the roadway system. This trend is clearly seen in the existing Lake County transportation system, which consists predominantly of roadway facilities for cars and trucks. The street system will most likely continue to be the basis of the transportation system for at least the 20-year planning period; therefore, the emphasis of this plan is on improving the existing street system for all users.

The existing road system inventory was reviewed for all highways (arterials) and county roadways within Lake County that are included in the TSP planning area. **Appendix B** lists the complete inventory for state highways and county roads prepared by DEA. DEA did not conduct inventories of the county road system. All county road information described herein was provided by Lake County staff.

The roads in the unincorporated or rural areas of Lake County fall under four jurisdictions: county, state, US Forest Service (USFS), and Bureau of Land Management (BLM). The state highways generally function as arterials throughout the county. The county roads generally function as collectors and local roads. The USFS and BLM roads are broken down in five "maintenance levels" based on their function, physical condition, and use. **Figure 3-1** shows the functional classification of the state and county road system.

County Roads

Although the state highway system forms the backbone of the roadway system in Lake County, county roads are a vital part of the circulation system. Often times, County roads provide a more direct connection to destinations.

Description

Lake County has 239 roads under its jurisdiction covering approximately 757 miles. Of these roadway miles, approximately 366 miles (48 percent) are paved, another 337 miles (45 percent) are gravel, and the remaining 54 miles (7 percent) are dirt roads.

These roadways are an integral part of the transportation system. In addition to providing alternate and in some cases more direct routes than the state highways, they also serve rural areas, connecting them with state highways, recreational areas, other rural areas, and cities. The Lake County Roadmaster identified 16 county roads as being particularly critical due to their function of providing connectivity and agricultural farm-to-

market access, as well as access to recreational areas. These county roads (see **Appendix B**) are estimated to carry the highest volume of daily traffic of all county roads and include the following:

- Sink Road;
- Stock Drive Road;
- Westside Road;
- Dog Lake Road;
- Tunnel Hill Road;
- Thomas Creek Road;
- Roberta Road (w/in the Lakeview UGB);
- Plush-Adel Road/Hogback;
- Hart Mountain Road;
- Plush Cutoff Road;
- Twentymile Road;
- Bear Flat Road;
- Christmas Valley-Wagontire Road;
- Millican Road;
- Fort Rock Road; and
- Arrow Gap Road.

Road Conditions

Lake County has established a pavement condition index (PCI) with corresponding categories to rate all county roads. These categories do not correlate to ODOT pavement condition standards discussed later in this chapter under the state highway section. The four pavement condition categories include: Good (PCI 70-100), Satisfactory (PCI 50-69) Fair (PCI 25-49), and Poor (PCI 0-24). A brief definition of the pavement condition categories used to rate Lake County roads is provided.

Good - Pavement surface shows little or no traffic load wear or environmental condition wear.

Satisfactory- Pavement shows some form of distress caused by traffic load related activity or wear that requires an overlay.

Fair- Pavement often exhibits major forms of distress such as potholes and/or extensive cracking, which to repair requires thick overlay or reconstruction.

Poor- This pavement is usually beyond all rehabilitative procedures, and must be reconstructed, the pavement is at a point that it will not deteriorate any further.

Of the nearly 366 miles of paved county roads in Lake County approximately 72 percent (266 miles) are in good condition, approximately 14 percent (50 miles) are in satisfactory condition, and the remaining 14 percent (50 miles) are estimated to be in fair condition. Currently, none of the paved county roads are classified as being in poor condition.

NORTH

0 5 mi 10 mi

LEGEND:

ARTERIAL

COLLECTOR

LOCAL COUNTY ROAD

FIGURE 3-1

Existing Roadway Classification

LAKE COUNTY TSP

ODOT0386/fig3-1.dgn/RSLP/12-12-02

Maintenance

Lake County has not adopted a formalized county roadway maintenance program. Typical of larger primarily rural counties in Oregon with limited budgets and personnel, the county has worked to develop maintenance processes that make sense and are manageable for the size of the county and its associated road system. The county primarily addresses roadway maintenance on an "as needed" basis, with the help of a pavement management system.

The Lake County Roadmaster develops a work plan of prioritized projects each year. Projects are identified through roadway inspection by maintenance crews and through the help of citizens that inform the county of maintenance needs, especially in rural areas not routinely traveled by maintenance personnel. The work plan is reviewed by the Lake County Road Advisory Committee and is revised based on their recommendations. Like many counties, Lake County's maintenance department is responsible for all aspects of road maintenance including, but not limited to, pavement rehabilitation, roadway signing and lighting needs, ditch and culvert clearing, pavement markings, and more. The county plows snow each year.

The Lake County maintenance department consists of a working Roadmaster and 19 additional employees. Three of these employees are based in the North End of the county, one employee in the middle of the county which can go north or south, and the remaining crew is located in Lakeview. The Lake County Roadmaster described the following typical maintenance practices within the county:

- Paved Roads - The county has not been paving new roads and is not likely to in the near future, primarily due to budget constraints. The county approaches maintenance of paved roads on an "as needed" basis without any formal routine or preventive maintenance plan, but plans to use the pavement management system in the future to help prioritize projects. Maintenance activities range from filling potholes to overlays. The county tries to overlay about 15 miles per year and chip seal about 35 miles per year.
- Gravel Roads - Gravel roads in Lake County are "bladed" three to four times a year, and in residential areas are oiled for dust control once a year.
- Dirt Roads - Dirt roads in Lake County are "bladed" once each year.

The county additionally provides services to the city of Paisley and the rural communities including Adel, Christmas Valley, Fort Rock, Plush, Silver Lake, and Summer Lake. The county performs roadway maintenance such as ditch and culvert clearing, patching and chip sealing roads, hauling gravel for site preparations, and more.

Funding

Historically, timber receipts from logging in the national forests have funded the county road department. In recent years, timber harvests have decreased and receipts have fallen off dramatically. The County Payments bill which passed in Congress in 2001 has brought funding levels back to the averages from prior timber harvesting years, however it is due to sunset in 2006. As this new funding is not considered "permanent" the long-term maintenance plan is to keep the county road pavement in the "good" condition, and not let the current system deteriorate any further.

Existing Rural Roadway Standards

Roadway standards relate the cross sectional design of a roadway to its function. The function is determined by operational characteristics such as traffic volume, operating speed, safety, and capacity. Roadway standards are

necessary to provide a community with roadways, which are relatively safe, aesthetic, and easy to administer when new roadways are planned or constructed. The current agreed upon roadway standards in Lake County are out dated. In the past, roads were built to guidelines provided by the Lake County Roadmaster or Lake County Commissioners. The county's existing roads are generally two lanes wide. Paved and chip sealed roads are generally 24 feet wide with shoulders, and gravel roads are generally 26 feet wide with about 2 foot shoulders. The existing right-of-way along county roads is a total of 60 feet with 30 feet on each side of centerline.

New county road standards will be prepared as part of the roadway modal plan presented in Chapter 7.

State Highways

State highways often function as arterial streets, forming the primary roadway network within and through a region. They provide a continuous road system that distributes traffic between cities. Generally, arterial streets are high capacity roadways that carry high traffic volumes with minimal localized activity. In Lake County, the state highways arterial streets often serve statewide, regional, and local traffic demands.

Discussion of the Lake County street system must include the state highways that traverse the planning area. Although Lake County has no direct control over the state highways, the highways heavily influence adjacent development as well as traffic patterns. Lake County is served by the five state highways listed below. These highways serve as the major routes through the county with commercial and industrial development focused along the corridors. **Table 3-1** lists the highways within Lake County.

TABLE 3-1
STATE HIGHWAYS

Highway Route (Mileposts)	Highway Name	ODOT Highway Number	Classification
US 20 (MP 69.3 - 83.8)	Central Oregon Highway	7	Statewide
OR 31 (MP 18.2 - 120.7) US 395 (MP 120.7 - 157.7)	Fremont Highway	19	Regional Statewide
OR 140 (MP 63.4 - 96.4)	Klamath Falls-Lakeview Highway	20	Statewide
US 395 (MP 35.7 - 90)	Lakeview-Burns Highway	49	Statewide
OR 140 (MP 0.0 - 62.7)	Warner Highway	431	District

Source: ODOT Traffic Volume Table-2000

State Highway Classification System

The *1999 Oregon Highway Plan* (OHP) classifies the state highway system into five categories based on function: interstate, statewide, regional, district, and local interest roads. Lake County highway classifications are listed in **Table 3-1**.

According to the OHP, the primary function of a statewide highway is to "provide inter-urban and inter-regional mobility and provide connections to larger urban areas, ports, and major recreation areas that are not directly served by Interstate Highways." Providing connections for intra-urban and intra-regional trips is a secondary function. The management objective for statewide highways is to "provide safe and efficient, high-speed, continuous-flow operation."

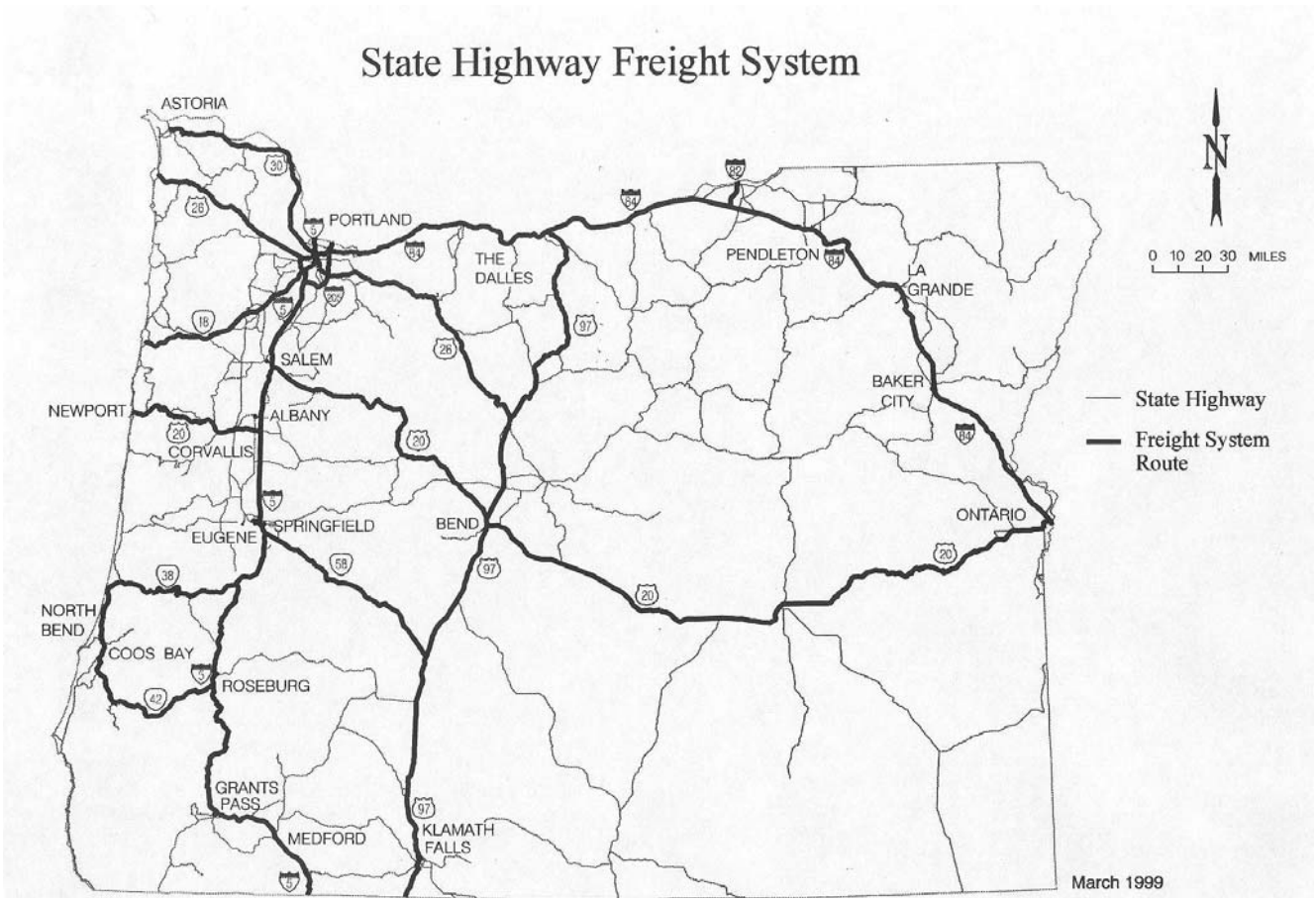
The primary function of a regional highway is to "provide connections and links to regional centers, Statewide or Interstate Highways, or economic or activity centers of regional significance." Serving land uses to the surrounding areas of these highways is a secondary function. The management objective for 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."

The OHP states that district highways are facilities of county-wide significance and function largely as county and city arterials or collectors. The primary function of a district highway is to "provide connections and links between small urbanized areas, rural centers and urban hubs, and also serve local access and traffic." The management objective for a district highway is to "provide safe and efficient, moderate to high-speed continuous-flow operation in rural areas reflecting the surrounding environment and moderate to low-speed operation in urban and urbanizing areas for traffic flow and for pedestrian and bicycle movements.

Special Purpose Classification System

In addition to the state highway classification system, the OHP established four special purpose classifications: land use, statewide freight route, scenic byways, and lifeline routes. These were established to address the special expectations and demands placed on segments of the highway system by land uses, the movement of trucks, the Scenic Byway designation, and significance as a lifeline or emergency response route. Both the highway classification system and the special purpose classifications were developed to guide management, needs analysis, and investment decisions regarding state highway facilities.

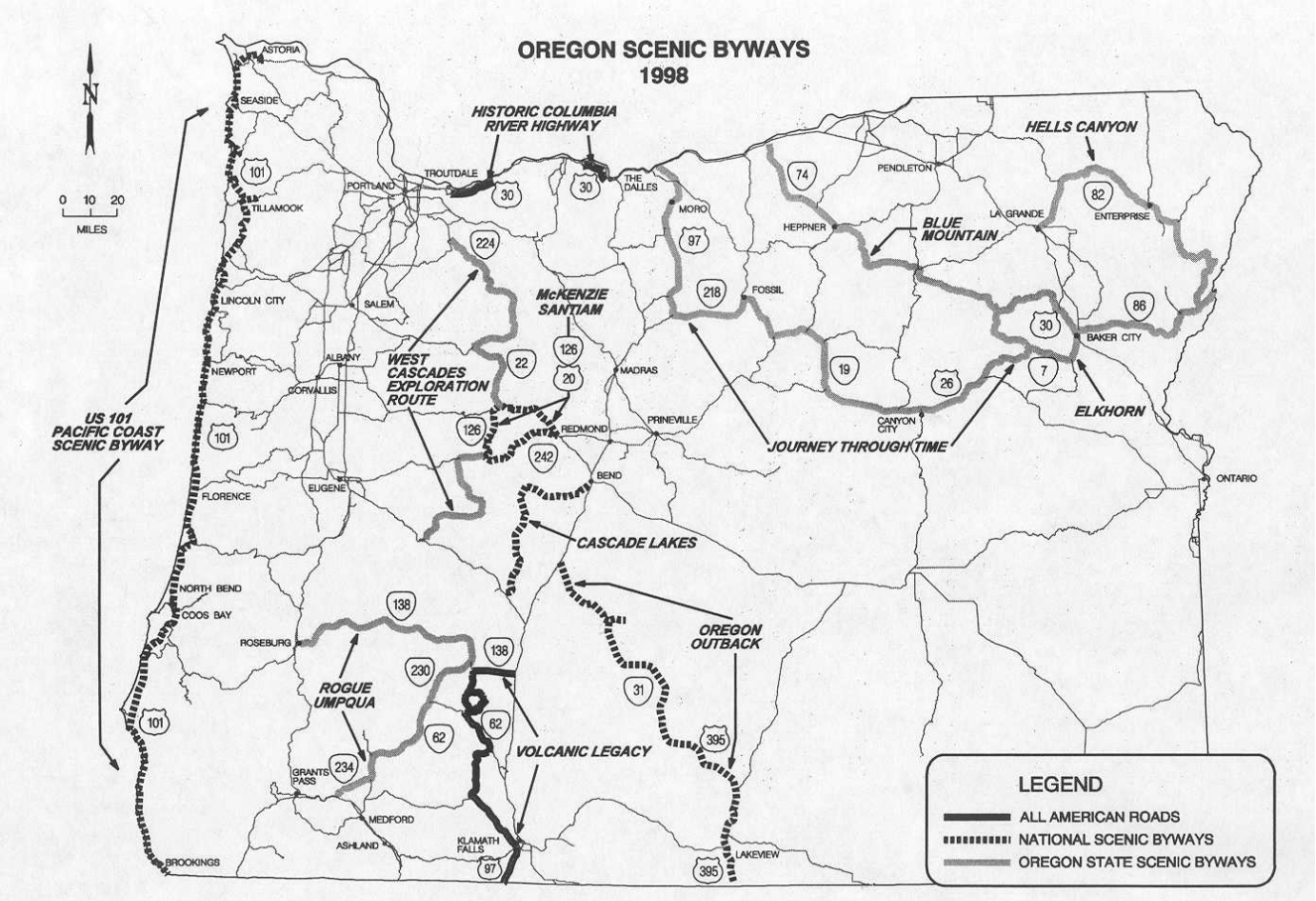
The two special purpose classifications which apply to Lake County are statewide freight route and scenic byways. Using key criteria including freight volume, tonnage, connectivity, and linkages to the National Highway System the OHP designated a state highway freight system. The only highway traveling through Lake County included in the state highway freight system is US 20 (Central Oregon Highway). To ensure freight is able to move efficiently across Oregon, special management strategies for the state highway freight system have been developed including higher highway mobility standards. Freight systems may be treated as Expressways outside of urban growth boundaries. **Figure 3-2** illustrates the State Highway Freight System.



Source: 1999 Oregon Highway Plan (pp. 65).

Figure 3-2. State Highway Freight System

The Oregon Transportation Commission has designated twelve scenic byways throughout the state on federal, state, and local roads with the “Oregon Outback” scenic byway traveling through Lake County. The "Oregon Outback" scenic byway starts in Deschutes County near La Pine. The "Oregon Outback" scenic byway lies on OR 31 (Fremont Highway) in Klamath County before entering Lake County. After passing Fort Rock State Monument the scenic byway continues south passing through Silver Lake, Summer Lake, Paisley, Valley Falls, and Lakeview before ending at the Oregon-California border town of New Pine Creek. **Figure 3-3** illustrates the locations of Oregon scenic byways.



Source: 1999 Oregon Highway Plan (pp. 68).

Figure 3-3. Oregon Scenic Byways

To protect the scenic assets of the "Oregon Outback" scenic byway, ODOT will establish guidelines for aesthetic and design elements within the public right-of-way that are suitable to Scenic Byways. These guidelines will be established to preserve and enhance the scenic value of this area while accommodating critical safety and performance needs.

US 20 (Central Oregon Highway)

US Highway 20 (Central Oregon Highway) is a highway of statewide importance. Beginning in Bend at the junction of US 97, the highway travels southeast to Burns, then turns northeast to Vale, and then continues east into Idaho. US Highway 20 is one of the main east-west highways through central Oregon. Within Lake County, the highway is a two-lane roadway with a posted speed of 55 mph. The highway has shoulders on both sides that are typically one to two feet wide and partially paved. The shoulders are not adequately designed to accommodate bicycle use.

OR 31 (Fremont Highway)

OR Highway 31 (Fremont Highway) is a highway of regional importance. OR 31 enters Lake County in the northwest corner from Klamath County and runs south through Paisley before terminating at US 395 in Valley Falls. US 395 then continues south through Lakeview to the California state line. ODOT has designated OR

31/US 395 between US 97 near La Pine and the California state line as a Scenic Byway. OR 31 serves as the main street through Silver Lake, Summer Lake and Paisley, forming the main business area for each.

The highway is a two-lane roadway with a posted speed of 55 mph except within the city of Paisley and the rural communities of Silver Lake and Summer Lake where speeds are reduced to 25 mph. The route is comprised of numerous curves and moderate grade changes resulting in localized rural speed reductions ranging from 25 to 45 mph. Although the highway traverses moderate intermittent upgrades in both directions, there are no passing lanes along the highway within Lake County. The highway has shoulders on both sides of the roadway that are typically zero to two feet wide comprised of asphalt or a combination of asphalt and gravel. Due to minimal shoulder widths and the presence of loose gravel, the shoulders are not adequately designed to accommodate bicycle use.

OR 140 (Klamath Falls-Lakeview Highway)

OR Highway 140 (Klamath Falls-Lakeview Highway) is a highway of statewide importance. OR 140 enters Lake County from Klamath County and runs east to Lakeview. Within Lake County, the highway is a two-lane roadway with a posted speed of 55 mph. There is a 2.5-mile passing lane between milepost 64.5 and Quartz Mountain Pass and a 1.0-mile passing lane between milepost 70.5 and Drews Creek. The route is comprised of numerous curves and moderate grade changes resulting in localized rural speed reductions. The highway has shoulders on both sides of the roadway that are typically three to four feet wide comprised of asphalt or a combination of asphalt and gravel. Due to minimal shoulder widths and the presence of loose gravel the shoulders are not adequately designed to accommodate bicycle use.

US 395 (Lakeview-Burns Highway)

US Highway 395 (Lakeview-Burns Highway) is a highway of statewide importance. The highway enters Lake County from Harney County and runs south through Valley Falls and Lakeview continuing to the California state line. US 395 is one of the main north-south highways through central/eastern Oregon. The highway is a two-lane roadway with a posted speed of 55 mph except within the city limits of Lakeview where speeds are reduced to 25 mph. The route is comprised of numerous curves and moderate grade changes resulting in localized rural speed reductions. Although the highway traverses moderate intermittent upgrades, there are no passing lanes along the highway within Lake County. The highway has shoulders on both sides of the roadway that are typically zero to four feet wide comprised of loose gravel or a combination of asphalt and gravel. Due to minimal shoulder widths and the presence of loose gravel the shoulders are not adequately designed to accommodate bicycle use.

OR 140 (Warner Highway)

OR Highway 140 (Warner Highway) is a highway of district importance. OR 140 begins at the connection to US 395 north of Lakeview and runs east-west to Harney County before entering Nevada. The highway is a two-lane roadway with a posted speed of 55 mph. The route is comprised of numerous curves and severe grade changes resulting in localized rural speed reductions. The three highest mountain passes along state highways in Oregon are located along OR 140 (Warner Mountain, Blizzard Gap, and Doherty Rim). Although the highway traverses steep intermittent upgrades in both directions, there are no passing lanes along the highway. The highway has shoulders on both sides of the roadway that are typically zero to two feet wide comprised of loose gravel or a combination of asphalt and gravel. Due to minimal pavement and the presence of loose gravel the shoulders are not adequately designed to accommodate bicycle use.

Pavement Conditions

Oregon state highways are surveyed and assessed annually by ODOT staff to determine current pavement conditions. The most recent available data is from 2001. The five pavement condition categories used include: Very Good, Good, Fair, Poor, and Very Poor. A brief definition of the pavement condition categories used by ODOT for both asphalt and Portland cement concrete pavements is provided.

Very Good

Asphalt pavements in this category are stable, display no cracking, patching or deformation and provide excellent riding qualities. Nothing would improve the roadway at this time. Concrete pavements in this category provide good ride quality, display original surface texture, and show no signs of faulting (vertical displacement of one slab in relation to another). Jointed, reinforced pavements display no mid-slab cracks and continuously reinforced pavements may have tight transverse cracks with no evidence of spalling (or chipping away).

Good

Asphalt pavements in this category are stable and may display minor cracking (generally hairline and hard to detect), minor patching, and possibly some minor deformation. These pavements appear dry or light colored, provide good ride quality, and display rutting less than 1/2 inch deep.

Concrete pavements in this category provide good ride quality. Original surface texture is worn in wheel tracks exposing coarse aggregate. Jointed, reinforced pavements may display tight mid-slab transverse cracks, and continuously reinforced pavements may show evidence of minor spalling. Pavements may have an occasional longitudinal crack but no faulting is evident.

Fair

Asphalt pavements in this category are generally stable while displaying minor areas of structural weakness. Cracking is easier to detect, patching is more evident (although not excessive), and deformation is more pronounced and easily noticed. Ride quality is good to acceptable.

Concrete pavements in this category provide good ride quality. Jointed, reinforced pavements may display some spalling at cracks and joint edges with longitudinal cracks appearing at less than 20 percent of the joints. A few areas may require a minor level of repair. Continuously reinforced pavements may show evidence of spalling with longitudinal cracks appearing in the wheel paths on less than 20 percent of the rated section. Shoulder joints may show evidence of deterioration and loss of slab support and faulting may be evident.

Poor

Asphalt pavements in this category are marked by areas of instability, structural deficiency, large crack patterns (alligatoring), heavy and numerous patches, and visible deformation. Ride quality ranges from acceptable to poor.

Concrete pavements in this category may continue to provide acceptable ride quality. Both jointed and continually reinforced pavements display cracking patterns with longitudinal cracks connecting joints and transverse cracks occurring more frequently. Occasional punchout (or pothole) repair is evident. Some joints and cracks show loss of base support.

Very Poor

Asphalt pavements in this category are in extremely deteriorated condition marked by numerous areas of instability and structural deficiency. Ride quality is unacceptable. Concrete pavements in this category display a rate of deterioration that is rapidly accelerating.

Pavement conditions along the five state highway segments within Lake County vary in both the rural and urban areas. There are nearly 305 miles of state highway in Lake County. Approximately 40 percent of the highway mileage in Lake County is in Good or Very Good pavement condition while almost 28 percent is in Fair condition. Therefore, approximately 68 percent of all highway mileage meets ODOT's standard of "fair or better" pavement condition. Approximately 27 percent (80 miles) of highway mileage in Lake County is in Poor pavement condition. The remaining 5 percent of highway mileage was under construction during 2001.

Roughly seven percent of the Poor condition state highway pavement is located along US 20 between the Deschutes County line and milepost 75. Approximately 37 percent is located along OR 31 between milepost 31 and milepost 43, between milepost 58 and Drury Lane, and between Harvey Ranch and milepost 95. Another 49 percent is located along US 395 between the Harney County line and Lake Abert and between Lake Abert Road and OR 31. The remaining seven percent is located along OR 140 (Warner Highway) between Drake Creek and milepost 24 and between milepost 40 and Blizzard Gap. **Table 3-2** summarizes the state highway pavement conditions as of 2001.

TABLE 3-2
2001 STATE HIGHWAY PAVEMENT CONDITIONS

Highway	Milepost	Section Description	2001 Pavement Condition
US 20	69.3 – 75.0	Deschutes Co. line to Glass Buttes	Poor
(Central Oregon Highway)	75.0 – 83.8	Glass Buttes to Harney Co. line	Very Good
OR 31	18.2 - 30.5	Lake Co. line to MP 30.5	Fair
(Fremont Highway)	30.5 - 42.7	MP 30.5 to MP 42.7	Poor
	42.7 - 48.1	MP 42.7 to Foster Flat Road	Fair
	48.1 - 56.2	Foster Flat Road to MP 56.2	Good
	56.2 - 58.0	MP 56.2 to MP 58.0	Under Construction
	58.0 - 67.8	MP 58.0 to Drury Lane	Poor
	67.8 - 86.9	Drury Lane to Harvey Ranch	Good
	86.9 - 95.0	Harvey Ranch to MP 95.0	Poor
	95.0 - 104.4	MP 95.0 to Clover Flat Road	Fair
	104.4 - 106.2	Clover Flat Road to Moss Creek	Good
	106.2 - 120.7	Moss Creek to Valley Falls	Fair
OR 140 West	63.4 - 71.8	Klamath Co. line to Drews Creek	Good
(Klamath Falls-Lakeview	71.8 - 82.1	Drews Creek to Drews Gap Road	Very Good
Highway)	82.1 - 91.7	Drews Gap Road to West Side/Pike Road	Fair
	91.7 - 96.4	West Side/Pike Road to US 395	Under Construction
US 395	35.7 - 73.7	Harney Co. line to Lake Abert	Poor
(Lakeview-Burns Highway &	73.7 - 87.7	Lake Abert to Lake Abert Road	Good
portion of the Fremont	87.7 - 90.0	Lake Abert Road to OR 31	Poor
Highway)	120.7 - 140.8	Valley Falls to Hunters Lodge	Good
	140.8 - 142.6	Hunters Lodge to N. 10th Street	Fair
	142.6 - 144.1	N. 10th Street to Lakeview city limits	Under Construction
	144.1 - 157.7	Lakeview city limits to California state line	Very Good
OR 140 East	0.0 - 7.5	US 395 to Squaw Butte Creek	Very Good
(Warner Highway)	7.5 - 21.3	Squaw Butte Creek to Drake Creek	Good
	21.3 - 24.0	Drake Creek to MP 24.0	Poor
	24.0 - 40.0	MP 24.0 to MP 40.0	Fair
	40.0 - 43.7	MP 40.0 to Blizzard Gap	Poor
	43.7 - 54.9	Blizzard Gap to MP 54.9	Fair
	54.9 - 62.7	MP 54.9 to Harney Co. line	Under Construction

Source: 2001 Pavement Condition Report – Oregon Department of Transportation Pavements Unit

The current Intelligent Transportation System (ITS) features located within Lake County are the following:

- Two weather (RWIS) sites located in Paisley along OR 31 and at Quartz Mtn. Pass along OR 140; and
- Four roadway cameras located in Paisley (OR 31), Quartz Mountain (OR 140), Warner Mt. Summit (OR 140), and Lakeview (US 395).

Access to the RWIS sites and roadway cameras is at www.tripcheck.com/RoadCams/roadcamsindex.htm.

US Forest Service Roads

The US Forest Service currently has jurisdiction over approximately 7,000 miles of roads in Lake County. Most of them are located in the Fremont and Deschutes National Forests and are made of gravel and natural surfaces. Approximately 240-250 miles of the Forest Service roads are asphalt paved (chip sealed, hot-mix, and cold mix). The primary function of these roads is to provide access to logging trucks and recreational vehicles to all the different parts of the forest lands.

The US Forest Service is not a public road agency; therefore, responsibilities and liabilities are not the same as those of the county and the state. Road closures in some areas may be imminent with continuing reductions in federal budgets. Priority routes are determined by recreational and commercial uses.

Maintenance Levels

The US Forest Service utilizes five different maintenance levels which are operational and objective in nature. These levels are identified as follows:

- Maintenance Level 1 - Assigned to intermittent service roads during the time they are closed to vehicular traffic. The closure period must exceed one year. Basic custodial maintenance is performed to keep damage to adjacent resources to an acceptable level and to perpetuate the road to facilitate future management activities. Emphasis is normally given to maintaining drainage facilities and runoff patterns. Planned road deterioration may occur at this level. Appropriate traffic management strategies are "prohibit" and "eliminate".

- Maintenance Level 2 - Assigned to roads for use by high clearance vehicles. Passenger car traffic is not a consideration. Traffic is normally minor, usually consisting of one or a combination of administrative, permitted, dispersed recreation, or other specified uses. Log haul may occur at this level. Appropriate traffic management strategies are either to (1) discourage or prohibit passenger cars or (2) accept or discourage high clearance vehicles.

- Maintenance Level 3 - Assigned to roads open and maintained for travel by a prudent driver in a standard passenger car. User comfort and convenience are not considered priorities. Roads in this maintenance level are typically low speed, single lane with turnouts and spot surfacing. Some roads may be fully surfaced with either native or processed material. Appropriate traffic management strategies are either "encourage" or "accept". "Discourage" or "prohibit" strategies may be employed for certain classes of vehicles or users.

- Maintenance Level 4 - Assigned to roads that provide a moderate degree of user comfort and convenience at moderate travel speeds. Most roads are double lane and aggregate surfaced. However, some roads may be single lane. Some roads may be paved and / or dust abated. The most appropriate traffic management strategy is "encourage". However, the "prohibit" strategy may apply to specific classes of vehicles or users at certain times.

- Maintenance Level 5 - Assigned to roads that provide a high degree of user comfort and convenience. These roads are normally double lane, paved facilities. Some may be aggregate surfaces and dust abated. The appropriate traffic management strategy is "encourage".

The distinction between Forest Service maintenance levels is not always sharply defined. Some parameters overlap two or more different maintenance levels. Maintenance levels are based on the best overall fit of the parameters for the road in question. In the situations where the parameters do not indicate a definite

selection, the desired level of user comfort and convenience is used as the overriding criteria to determine the maintenance level. Forest Service road maintenance includes a variety of work activities including either detailed and site specific, or broad and general.

Bureau of Land Management Roads

The Bureau of Land Management currently has jurisdiction over approximately 2,500 miles of roads in Lake County. They are located throughout the county with the majority located along the east side of Lake County. All of the roads are made of gravel or natural surfaces. The primary function of these roads is to provide access to logging trucks and recreational vehicles to all the different parts of the BLM lands.

Similar to the US Forest Service, the BLM is not a public road agency. Therefore, their responsibilities and liabilities are not the same as those of the county and the state. Road closures in some areas may be imminent with continuing reductions in federal budgets. Priority routes are determined by recreational and commercial uses.

Maintenance Levels

The BLM utilizes five different maintenance levels which reflect the appropriate maintenance that best fits the Transportation Objectives for planned management activities. Roads will be prioritized for maintenance needs or may be maintained at lower levels depending upon funding. These levels are identified as follows:

- Maintenance Level 1 - Assigned to roads where minimum maintenance is required to protect adjacent lands and resource values. These roads are no longer needed and are closed to traffic. The objective is to remove these roads from the transportation system. Emphasis is given to maintaining drainage and runoff patterns as needed to protect adjacent lands. Grading, brushing, or slide removal is not performed unless roadbed drainage is being adversely affected, causing erosion. Closure and traffic restrictive devices are maintained.

- Maintenance Level 2 - Assigned to roads where the management objectives require the road to be opened for limited administrative traffic. Typically, these roads are passable by high clearance vehicles. Drainage structures are to be inspected within a 3-year period and maintained as needed. Grading is conducted as necessary to correct drainage problems. Brushing is conducted as needed to allow administrative access. Slides may be left in place provided they do not adversely affect drainage.

- Maintenance Level 3 - Assigned to roads where management objectives require the road to be open seasonally or year-round for commercial, recreation, or high volume administrative access. Typically, these roads are natural or aggregate surfaced, but may include low use bituminous surfaced roads. These roads have defined cross section with drainage structures (e.g., rolling dips, culverts, or ditches). These roads may be negotiated by passenger cares traveling at prudent speeds. User comfort and convenience are not considered a high priority. Drainage structures are to be inspected at least annually and maintained as needed. Grading is conducted to provide a reasonable level of riding comfort at prudent speeds for the road conditions. Brushing is conducted as needed to improve sight distance. Slides adversely affecting drainage would receive high priority for removal, otherwise they will be removed on a scheduled basis.

- Maintenance Level 4 - Assigned to roads where management objectives require the road to be open all year (except may be closed or have limited access due to snow conditions) and to connect major administrative features (recreation sites, local road systems, administrative sites, etc.) to County, State,

or Federal roads. Typically, these roads are single or double lane, aggregate, or bituminous surface, with a higher volume of commercial and recreational traffic than administrative traffic. The entire roadway is maintained at least annually, although a preventative maintenance program may be established. Problems are repaired as discovered.

- Maintenance Level 5 - Assigned to roads where management objectives require the road to be open all year and are the highest traffic volume roads of the transportation system. The entire roadway is maintained at least annually and a preventative maintenance program is established. Problems are repaired as discovered. These roads may be closed or have limited access due to snow conditions.

Traffic Signals

No traffic signals are currently located on State or County facilities within Lake County, excluding the Lakeview UGB.

Bridges

Lake County bridge inventory data from May 2002 was obtained from ODOT's Bridge Maintenance Section and reviewed. Two mutually exclusive elements are used to rate bridge conditions: structural deficiency and functional obsolescence. Structural deficiency is determined based on the condition rating for the deck, superstructure, substructure, or culvert and retaining walls. It may also be based on the appraisal rating of the structural condition or waterway adequacy. Functional obsolescence is determined based on the appraisal rating for the bridge deck geometry, underclearances, and approach roadway alignment. It may also be based on the appraisal rating of the structural condition or waterway adequacy.

The third element used to evaluate bridge conditions is the sufficiency rating, which is a complex formula that takes into account four separate factors to obtain a numeric value rating the ability of a bridge to service demand. The scale ranges from zero to 100 with higher ratings indicating optimal conditions and lower ratings indicating insufficiency. The sufficiency rating is not applied until a bridge is already either structurally deficient or functionally obsolete. Once identified as either structurally deficient or functionally obsolete any bridge with a rating of 80 or less requires rehabilitation and any bridge with a rating of 55 or less requires replacement.

County Bridges

Lake County owns and maintains 36 bridges, which are included in the state bridge inspection inventory. The 36 county-owned bridges are located throughout Lake County. Currently, one county-owned bridge is identified as being structurally deficient. The bridge (ODOT Bridge No. 37C043) which spans Crooked Creek is located along Dicks Creek Road (County Road No. 2-12) approximately 1 mile west of US 395. In addition to being identified as structurally deficient ODOT Bridge No. 37C043 has a sufficiency rating below 55. None of the county-owned bridges were identified as being functionally obsolete. Two other bridges, ODOT Bridge Nos. 37C030 and 37C041 have been identified as needing rehabilitation or replacement within the 20-year planning horizon. Bridge No. 37C030 spans Drews Creek (County Road No. 1-11) approximately six miles south of OR 140 (west). Bridge No. 37C041 spans Deep Creek (County Road No. 3-14) approximately one mile south of OR 140 (east).

State Bridges

The state owns and maintains 57 bridges located on state highways in both rural and urban Lake County. There are 27 bridges located on OR 31 (Fremont Highway), 16 bridges located on OR 140 (Klamath Falls-Lakeview

Highway), 13 bridges on OR 140 (Warner Highway), and one bridge on US 395 (Lakeview-Burns Highway). There are no bridges on US 20 (Central Oregon Highway) within Lake County.

ODOT Region 4 bridge section staff have identified eleven state-owned bridges are currently substandard or are estimated to become substandard within the 20-year planning horizon. The following eleven state-owned bridges will require some form of rehabilitation or replacement within the next 20 years:

- Bridge No. 03908 on OR 31 (Fremont Highway), Silver Creek Bridge at Milepost 46.75;
- Bridge No. 00571A on OR 31 (Fremont Highway), Chewaucan River at Milepost 116.50;
- Bridge No. 02680 on OR 140 (Klamath Falls-Lakeview Hwy), Muddy Creek Bridge at Milepost 88.24;
- Bridge No. 02679 on OR 140 (Klamath Falls-Lakeview Hwy), Cottonwood Creek Bridge at Milepost 89.38;
- Bridge No. 03915 on US 395 (Fremont Highway), Crooked Creek Bridge at Milepost 126.92;
- Bridge No. 03937A on OR 140 (Warner Highway), Drake Creek at Milepost 21.25;
- Bridge No. 06667A on OR 140 (Warner Highway), Parsnip Creek at Milepost 18.24;
- Bridge No. 08848A on OR 140 (Warner Highway), Deep Creek at Milepost 29.65;
- Bridge No. 08849 on OR 140 (Warner Highway), Irrigation Canal at Milepost 31.40;
- Bridge No. 08850 on OR 140 (Warner Highway), Irrigation Canal at Milepost 30.67; and
- Bridge No. 09538 on OR 140 (Warner Highway), Twentymile Creek at Milepost 32.78.

ODOT bridge staff estimates that ODOT Bridge Nos. 03908, 02680, 02679, and 03915 will need to be replaced within the 20-year planning horizon. Bridge Nos. 08849 and 08850 are estimated to need rail replacement within the 20-year planning horizon. The remaining five identified state-owned bridges require rail retrofit over the next 20-years but this may lead to bridge replacement depending on the condition of the material. Bridge Nos. 02680 and 02679 are scheduled for replacement in 2003 under ODOT's 2000-2003 Statewide Transportation Improvement Program (STIP) and Bridge No. 03908 is also scheduled for replacement in 2003 under ODOT's Draft 2002-2005 STIP.

Weight Restricted Bridges

Many of Oregon's bridges are deteriorating under the effects of time and stress of heavier loads. Currently half of the county owned bridges in Lake County have weight restrictions limiting the use of these bridges. **Table 3-3** summarizes weight restricted bridges in Lake County including the weight restrictions by axle for each bridge.

TABLE 3-3
2001 LAKE COUNTY WEIGHT RESTRICTED BRIDGES

Bridge #	Roadway	Crossing	Approximate Location	Weight Restriction
37C001	County Road #3-12	Dry Stream	1 mile east of Junction Road 3-10	46,000 on 3 axles 88,000 on 5 axles 96,500 on 6 axles
37C007	County Road #3-12	Hart Lake Overflow	5.3 miles east of Road 3-10 and 3-12	40,000 on 3 axles 80,000 on 5 axles 88,000 on 6 axles
37C008	County Road #3-10	Honey Creek	1 mile north of Plush	43,000 on 3 axles 80,000 on 5 axles 88,000 on 6 axles
37C009	County Road #1-11	Dry Creek	11.75 miles south of OR 140	46,000 on 3 axles 80,000 on 5 axles 96,500 on 6 axles
37C014	County Road #1-10	Goose Lake Swale Ditch	2.32 miles west of Lakeview	53,000 on 3 axles 80,000 on 5 axles 80,500 on 6 axles
37C016	County Road #2-19	New Idaho Loop Ditch	2.92 miles north of OR 140	43,000 on 3 axles 80,000 on 5 axles 90,500 on 6 axles
37C017	County Road #1-11F	Drews Creek	1.4 miles north of Road 1-11	53,000 on 3 axles 80,000 on 5 axles 90,500 on 6 axles
37C021	County Road #2-19	New Idaho Loop Ditch	1.7 miles north of OR 140	44,000 on 3 axles 80,000 on 5 axles 90,500 on 6 axles
37C024	County Road #2-19	New Idaho Loop Ditch	1.8 miles north of OR 140	43,000 on 3 axles 80,000 on 5 axles 88,000 on 6 axles
37C030	County Road #1-11	Drews Creek	7.6 miles south of OR 140	46,000 on 3 axles 80,000 on 5 axles 93,500 on 6 axles
37C031	County Road #3-14	Twenty Mile Creek	11.3 miles south of OR 140	46,000 on 3 axles 80,000 on 5 axles 90,500 on 6 axles
37C040	County Road #3-15	Beatty Slough	5.6 miles south of OR 140	46,000 on 3 axles 80,000 on 5 axles 90,500 on 6 axles
37C041	County Road #3-14	Deep Creek	0.3 miles south of OR 140	46,000 on 3 axles 80,000 on 5 axles 90,500 on 6 axles
37C043	County Road #2-12	Crooked Creek	0.1 mile west of US 395	40,000 on 3 axles 60,000 on 5 axles 70,000 on 6 axles
37C047	County Road #3-16	Camas Creek	0.1 mile south of OR 140	46,000 on 3 axles 80,000 on 5 axles 90,500 on 6 axles
37C056	County Road #3-11	Flagstaff Lake Inlet	2.6 miles west of Road 3-12	46,000 on 3 axles 80,000 on 5 axles 90,500 on 6 axles
37C057	County Road #4-10	Buck Creek	10.35 miles east of County line	46,000 on 3 axles 80,000 on 5 axles 90,500 on 6 axles
37C059	County Road #3-10	Rabbit Creek	13.1 miles south of US 395	46,000 on 3 axles 80,000 on 5 axles 90,500 on 6 axles

Source: ODOT Motor Carrier Transportation Division, Truck Route Restrictions List By County

PEDESTRIAN SYSTEM

The most basic transportation option is walking. Walking is one of, if not the most popular forms of exercise in the United States and can be performed by people of all ages and all income levels. However, it is not often considered a means of travel. This is mainly because pedestrian facilities such as sidewalks, multi-use paths, and adequate roadway shoulders are generally an afterthought and not planned as an essential component of the transportation system. In times of limited funding, pedestrian improvement projects are often the first to be cut from capital improvement programs at all levels.

The level of pedestrian travel along most county roads and state highways within the rural areas of Lake County is considered negligible. This is largely due to the fact that distances between homes and most activities such as recreation and work in rural Lake County exceed the average pedestrian trip length of 1/2 mile. The shorter trips that most people are willing to make by walking supports the fact that the majority of pedestrian facilities in Lake County are focused within the Cities and rural communities of Christmas Valley, Lakeview, Paisley, Silver Lake, and Summer Lake. These consist of typically short segments in front of businesses.

Most state highway shoulders in rural Lake County are at least two feet wide, but don't adequately and safely serve pedestrian needs.

BIKEWAY SYSTEM

Like pedestrians, bicyclists are often overlooked when considering transportation facilities. Bicycles take up little space on the road or parked, do not contribute to air or noise pollution, and offer relatively higher speeds than walking. The only dedicated bicycle facility along county roads in Lake County is along Roberta Avenue within the Lakeview Urban Growth Boundary (UGB). The total length of the bike path is approximately one mile. Paved county roads where paved shoulders are less than four feet wide constitute a shared roadway facility where motor vehicle traffic and bicyclists share the roadway. Based on the relatively low traffic volumes, it is reasonable to expect bicyclists and motor vehicles to safely share the roadway. It is unlikely that lack of bike lanes reduces bicycle use along the county roads. However, bicycle amenities such as bike parking and storage facilities may have some impact. Bicycle travel along unpaved county roads would be expected to be negligible.

Along state highways, bicyclists can be adequately served with sufficient shoulders. The *1995 Oregon Bicycle and Pedestrian Plan* recommends shoulder bikeways be paved to a minimum of 4-foot width. Four to eight-foot shoulders typically allow bicyclists to ride far enough from the edge of pavement to avoid debris and avoid conflict with passing vehicles. However, the Plan goes on to say that shoulder design practices outlined in the ODOT Highway Design Manual specifying shoulder widths as narrow as 2 feet along low volume rural collector and local roadways are adequate to serve bicyclists. Highways with shoulders less than four feet wide do not serve as shoulder bikeways; rather they serve as shared roadway facilities with bicyclists and motor vehicles expected to safely share the roadway.

As described earlier, the majority of state highway miles in Lake County have paved shoulders less than 4 feet wide meaning that they do not serve as shoulder bikeways. This does not make them inadequate for bicycle use, but generally requires bicyclists to share the roadway with motor vehicles.

PUBLIC TRANSPORTATION

Residents of Lake County have access to several types of public transportation services provided within the county including demand responsive transit services, scheduled regional bus service, and county-wide school bus service. A brief discussion of each follows.

Demand Responsive Transit Service

There are four agencies which provide demand responsive (or dial-a-ride) transit services throughout Lake County. Three out of the four are public agencies which share ODOT Special Transportation Fund (STF) dollars and donations to service the transportation disadvantaged.

The Lake County Activity Center provides demand responsive (or dial-a-ride) transit services for seniors located in south Lake County. Currently the Lake County Activity Center has one 7-person mini-van and one 14-person small bus. Both the mini-van and bus are wheelchair accessible with the mini-van able to serve one and the bus able to serve two wheelchairs. Regular service is provided on Monday, Wednesday, and Friday with destinations such as doctor appointments, hairdresser, and shopping. Service is provided on Tuesday, Thursday, Weekends, and Holidays if needed. The service is door-to-door picking up and dropping off riders at the locations of their choosing. In addition to providing demand responsive transit services, the Lake County Activity Center provides meals on wheels, grocery/prescription delivery, and trips of interest. The center will try to plan one trip a month to interesting destinations such as a nearby casino, fishing excursion, wild flower field trip, etc.

Requests for service are typically placed to the Lake County Activity Center program coordinator 24 hours in advance of a trip although the program coordinator will attempt to fill "late" requests but cannot guarantee them. This non-profit service is primarily funded by ODOT Special Transportation Fund (STF) dollars and donations. People using the service may pay a donation fee of $1.00 if they would like but no riders are turned away because they are unable to pay. The Lake County Activity Center will assist in coordination of travel to destinations outside of the county. Lake County replaces their vehicle fleet consistent with ODOT Transit Division recommendations. According to the Director of the Lake County Activity Center the 1994 mini-van is currently in fair condition and the 2001 bus is in excellent condition. Service requests can be placed through the Lake County Activity Center located in Lakeview by calling (541) 947-4966.

The Inter Court Family Center provides once a week transit services for seniors located in Paisley and Summer Lake. The transit service typically takes seniors once a week, usually on Wednesdays, into Lakeview or other locations for shopping, doctor appointments, etc. If the number of passengers is small (1-2 passengers) the service will be provided in private vehicles otherwise the Inter Court Family Center uses a 12-passenger van. The van which is provided by the Assembly of the God Church is not wheelchair accessible. The condition of the 1978 van is estimated to be fair-to-poor. In addition to the weekly service the family center provides a trip to Bend or Klamath Falls once a month. The Inter Court Family Center also coordinates with the Lake County Activity Center on the trips of interest destinations. Requests for service are typically placed to the family center by Monday evening, 36 hours in advance of normal Wednesday service. This service is provided free of charge, thanks to volunteers. Service requests can be placed through the Inter Court Family Center by calling (541) 943-3551.

The North Lake Wellness Center provides once a month transit service for seniors located in Fort Rock, Christmas Valley, Silver Lake, and Summer Lake. The center will contract with the local school district to rent a bus for the once a month outing. Some of the destinations include doctor appointments, shopping in nearby towns, and fun destinations similar to those provided by the Lake County Activity Center. The service uses volunteer drivers. The North Lake Wellness Center has received a grant for a small bus. Once they receive the

vehicle, their services are expected to increase. Service requests can be placed through the North Lake Wellness Center by calling (541) 576-2115.

The Lakeview Assisted Living Facility provides scheduled services for the seniors living in the facility as part of the overall services. They currently operate one mini-van and have adequate capacity for the services they provide. The destinations for the passengers are primarily within the Town of Lakeview, but occasionally they travel outside the community for activities and doctor appointments with specialists in Klamath Falls. The Lakeview Assisted Living Facility is open for discussion on expanding their transportation services to other senior citizens within the community.

Regional Bus Service

The Red Ball Stage Line provides regional bus service between Lakeview and Klamath Falls. Intermediate stops in the towns of Olene, Dairy, Beatty, and Bly are available if needed. Services are available Monday through Saturday with two trips per day. The Red Ball Stage Line primarily serves freight, and passenger service availability is limited. Residents traveling roundtrip between Lakeview and Klamath Falls pay $31.75 while one-way passengers pay $16.70.

Service requests can be placed through the Red Ball Stage Line office located in Lakeview by calling (541) 947-2255.

School Bus Service

School bus service represents a substantial level of transit use in Lake County. The five school districts in Lake County are Lakeview, Paisley, North Lake, Adel, and Plush. Four out of the five school districts which provide their own school bus service also own and maintain their own buses. The only school district that does not provide school bus service is the Plush School District.

Currently there are no Park and Ride facilities, employer-based commute programs, or carpool/vanpool services provided within Lake County. There are no intermodal connections or facilities located within Lake County.

TRANSPORTATION DISADVANTAGED

The transportation disadvantaged are generally those people that either due to age, economic status, or physical or mobility impairment do not have access to mainstream transportation modes such as automobiles, bicycles, or walking. Young children for instance are generally dependent upon parents to serve their transportation needs. Many elderly people that can no longer drive are dependent on other transportation sources including demand responsive or “dial-a-ride” transportation. It is important for communities to understand what segment of the population is considered transportation disadvantaged and to take steps to plan service to these people.

Populations with Specific Transportation Needs

Certain populations have been identified as having more intensive transportation needs than the general population. These populations include people under the legal driving age, those below the poverty level and those with mobility limitations.

The U.S. Census disaggregates the County’s total population into several different age groups. The U.S. Census Bureau reported the total population for Lake County at 7,422 residents in 2000 with approximately 25 percent of the total population under the age of 18 which is lower than 1990 Census data indicating that about 28

percent of Lake County residents were under 18 years of age. To determine the number of people with specific transportation needs, DEA used the most recent Census age information to estimate that in 2000, 1,593 residents—or about 21 percent of the population—are under the age of 16, the legal driving age in Lake County. This is a slightly lower percentage than reported in the 1990 Census, which counted 1816 Lake County residents, or about 25 percent of the total population as 16 years or younger.

According to the 2000 Census for Lake County, 1,184 people, or about 16 percent of Lake County's population are below the poverty level. The Department of Agriculture determines poverty levels based on the availability of nutritionally adequate food plans and the size of the family unit. The distribution of the population below the poverty level shows that a larger proportion of younger persons (11 years and younger) than older persons live in poverty in Lake County, as shown in **Table 3-4**.

TABLE 3-4
LAKE COUNTY POVERTY STATUS - 2000 CENSUS RESULTS

Age	People Below Poverty Level	Total Age Group Population	Percent of Total Age Group Population Below Poverty
11 and under	237	1,095	22%
12 to 17	142	736	19%
18 and older	805	5,591	14%
Total	**1,184**	**7,422**	**16%**

Source: US Bureau of the Census, 2000

Economic status has traditionally been linked with auto ownership. People living below the poverty line are less likely to be able to afford ever-increasing ownership and operating costs associated with auto use. Lack of access to an automobile has also traditionally been linked with inability to access better paying jobs above the poverty line since many poor people do not live within walking or biking distance to these jobs.

Mobility impairments can affect a person's access to destinations outside of the home unless specially equipped transportation is available. As mentioned previously, Lake County does provide handicapped access to residents on a countywide basis through dial-a-ride transit services. Provision of specialty services to more rural residents may need to be addressed by the county. The US Bureau of the Census reports that 3.5 percent of the Lake County population over 16 years old had a mobility limitation in 1990 with the majority of impacts to those 65 and older. Persons were identified as having a mobility limitation if they had a health condition (physical and/or mental) that lasted for six or more months and which made it difficult to go outside the home alone. A temporary health problem, such as a broken bone that was expected to heal normally, was not considered a health condition. **Table 3-5** summarizes the mobility status of Lake County residents as reported in the 1990 Census (mobility information from the 2000 Census will not be available until late 2002 or early 2003).

TABLE 3-5
LAKE COUNTY MOBILITY STATUS - 1990 CENSUS RESULTS

Age	Mobility Limitation			Total Population in Age Groups	Percent of Total Age Group Population with Mobility Limitation
	Male	Female	Total		
16 to 64	11	21	32	4337	0.7%
65 and over	41	113	154	1033	14.9%
Total	52	134	186	5370	3.5%

Source: US Bureau of the Census, 1990

Determining the total number of people with specific transportation needs required using 1990 and 2000 Census data. Because mobility data will not be available for some time, DEA used 1990 Census data to estimate the number of people with mobility limitations. 2000 Census data were used for determining the number of people between five and 15 years of age, and to determine the number of residents 16 or older living in poverty. Children younger than five were not included because parents would most likely provide transportation.

Table 3-6 indicates that about 40 percent of Lake County's population may have specific transportation needs. Younger residents (those younger than 15) likely rely on parents, family, or friends 16 years old or older for transportation. As stated earlier, residents already living in poverty may have access to transportation, but are less likely to be able to afford a car or live too far from employment centers to walk or ride a bike. Other populations with mobility limitations may have health problems or other limitations preventing them from using available transportation.

There is likely to be some overlap between the 3.5 percent of the population with mobility limitations and the 15.0 percent of residents over 16 living in poverty; the sum of the figures may slightly overstate the proportion of the population with specific transportation needs.

Another segment of the population with specific transportation needs is the elderly, which are no longer able to drive. Specific data regarding the portion of elderly residents no longer driving was not available for review, but conversations with the Lake County Transportation Service coordinator indicate that a large segment of dial-a-ride users within the county are elderly. Some portion of these elderly riders likely no longer drive. As county residents continue to age, it is conceivable that Lake County will need to increase specialty transit service within the county over the 20 year planning horizon.

TABLE 3-6
ESTIMATED LAKE COUNTY POPULATION WITH SPECIFIC TRANSPORTATION NEEDS

Demographic Group	Percent of Total County Population	Estimated Number
Persons between the ages of 5 and 15[1]	21.5%	1,593
Persons 16 and older living in Poverty [1]	15.0%	949
Persons 16 and older with Mobility Limitations[2]	3.5%	186
Total Specific Transportation Needs Populations	40.0%	2,728

Source: [1]*US Bureau of the Census, 2000*

[2]*US Bureau of the Census, 1990*

LAND USE

Lake County is located in the south-central portion of Oregon and encompasses 8,359 square miles. Lake County has two north-south trending highways and one highway for east-west travel. Land adjacent to the state highways is generally rural in agricultural and Forest uses. Historically, Lake County has relied upon livestock, forest products, agriculture, and recreation for its livelihood. With the changing economy in Oregon and the effects it has had on the timber industry, the county has looked forward to new developments for economic growth. The major activity centers are focused within the Cities and rural communities of Christmas Valley, Lakeview, Paisley, Silver Lake, and Summer Lake.

RAIL SERVICE

The only railroad service serving Lake County is the Lake County Railroad, which is classified as a Shortline Railroad. Lake County owns the Lake County Railroad as well as the 55 miles of right-of-way. The Lake County Railroad, which is limited to freight service only, runs between Lakeview, OR and Alturus, CA once a week. The train which travels parallel to US 395 crosses three county roads between Lakeview and the Oregon/California state line. The train typically maintains a travel speed of 25 mph. The two main shipping supplies are wood products and mineral/ore products. The railroad averages about 80 rail cars a month (25 cars - wood products, and 55 cars - mineral/ore products). Lake County representatives estimated that it takes approximately 4 trucks for every freight car. Based on the average of 80 freight cars per month the impact to the roads would be an additional 320 truck trips per month. The potential exists for rail banking if the Lake County Railroad service is terminated.

The nearest access to passenger rail service via Amtrak is located in Klamath Falls. The Coast Starlight Train traveling between Seattle and Los Angeles stops in Klamath Falls twice a day, once northbound and once southbound. In addition to trains, Amtrak coordinates with a number of charter bus services to provide transportation to train stations. These services are called Thruway services which are a convenient way to reach many cities where Amtrak trains do not stop. The two Thruway Motor Coach services traveling between Coos Bay and Ontario and between Portland and Ontario traverse through Lake County on US 20.

There are no intermodal connections or facilities located within Lake County.

AIR SERVICE

Lake County has nine operational air service facilities registered with the Oregon State Aviation Department including eight airstrips and a helicopter pad operated by the Lake District Hospital. The Table Rock Airport is privately owned by Dennis Koch and is located 8 miles southwest of Christmas Valley at an elevation of 4,320 feet. The dirt runway measures 3,300 feet long by 80 feet wide. The airport is not lit, precluding nighttime operations.

Silver Lake US Forest Service Landing Strip is owned by the US Forest Service and is open to the public. The airport is not staffed and consists of a gravel runway measuring 3,000 feet long by 55 feet wide. The landing strip located 3 miles southwest of Silver Lake at an elevation of 4,492 feet is not lit which prohibits nighttime operations.

The state owned Alkali Lake State Airport located 8 miles north of Alkali Lake is open to the public. The airport is not staffed and consists of a gravel runway measuring 6,100 feet long by 150 feet wide. The elevation of the airport is 4,312 feet.

The Christmas Valley Parks and Recreation Department owns the Christmas Valley Airport. This open to the public airport located at Christmas Valley is at an elevation of 4,317 feet. The asphalt runway measures 5,200 feet long by 60 feet wide and is equipped with runway lighting, supporting nighttime operations.

The Farr Ranch Airport is privately owned by Samuel Farr and is located 8 miles southwest of Lakeview at an elevation of 4,775 feet. The grass runway measures 2,500 feet long by 35 feet wide. The airport is not lit, precluding nighttime operations.

The Lake County Airport is owned by Lake County and is open to the public. The airport is staffed and consists of an asphalt runway measuring 5,306 feet long by 100 feet wide. The airport is located 3 miles southwest of Lakeview. The runway located at an elevation of 4,733 feet is equipped with runway lighting, supporting nighttime operations. The Lake County Airport Layout Plan (March 2001) identifies current and future facility needs and the improvements necessary to maintain a safe, efficient, economical, and environmentally acceptable air

transportation facility. The report contains 20 recommendations, culminating in a 20-year Airport Capital Improvement Program containing 12 short-term projects and 18 long-term projects totaling $2,111,567.

The Paisley Airport located 3 miles northwest of Paisley is also owned by Lake County. This open to the public airport is at an elevation of 4,395 feet. The asphalt runway measures 4,300 feet long by 60 feet wide and is equipped with runway lighting, supporting nighttime operations.

The Saxon Sycan Airport is privately owned by Cecil Saxon and is located 21 miles south of Silver Lake at an elevation of 4,990 feet. The cinder rock runway measures 2,800 feet long by 75 feet wide. The airport is not lit, precluding nighttime operations.

The Lake District Hospital maintains a helicopter pad located southwest of Lakeview at an elevation of 4,750 feet. The concrete pad measures 40 feet by 40 feet.

The nearest passenger-use airport is located in Klamath Falls. The Klamath Falls Airport-Kingsley Field in Klamath Falls is a tower controlled airport which offers commercial air service as well as full general aviation services and is the home to the Oregon Air National Guard 173rd Fighter Wing. The airport has two asphalt/concrete runways at an elevation of 4,092 feet. The main runway #14/32 is 10,301 feet long and 150 feet wide and the second runway #7/25 is 5,260 feet long by 100 feet wide. Horizon Airlines is currently the only commercial airline that services the Klamath Falls Airport, with nine scheduled flights per day to/from Portland. Additional flight information can be found by contacting Horizon Air at 1-800-547-9308 or www.horizonair.com.

Air Life of Oregon, a medically urgent air transportation service based in Bend, OR, serves medical emergencies in Lake County. Air Life flies people who were in an accident or have a medical emergency to the nearest appropriate medical facility. Air Life of Oregon has one helicopter and three Pilatus PC-12 airplanes (fixed-wing), although one of the fixed-wing airplanes supports the Air Life base in La Grande. The three agencies within Lake County that request Air Life of Oregon support are the Lake District Hospital, the Lakeview Disaster Unit, and the Lakeview Fire Department. **Table 3-7** summarizes the Air Life flight statistics over the last 4 years for Lake County.

TABLE 3-7
AIR LIFE SERVICE LEVELS IN LAKE COUNTY

Requesting Agency	1998	1999	2000	2001
Fixed Wing Service				
Lake District Hospital	19	28	30	37
Helicopter Service				
Lake District Hospital	11	13	11	11
Lakeview Disaster Unit	5	3	2	0
Lakeview Fire Department	10	2	1	9
Lake County Total	45	46	44	57

Source: Conversation with Air Life of Oregon Staff Member, April 2002

Air Life transports medical emergencies in Lake County to the nearest appropriate medical facility. The nearest medical centers to Lake County are the St. Charles Medical Center in Bend, the Merle West Medical Center in Klamath Falls, and the Rogue Valley Medical Center in South Medford. The St. Charles Medical Center located in Bend, OR is the only Level II trauma center in the state east of the Cascade Mountains.

There are no intermodal connections or facilities located within Lake County.

PIPELINE SERVICE

Although not often considered as transportation facilities, pipelines carry liquids and gases very efficiently. The use of pipelines can greatly reduce the number of trucks and rail cars carrying fluids such as natural gas, oil, and gasoline.

There are currently no pipelines in Lake County used for the commercial transfer of oil, natural gas, or other products. The nearest pipelines, which are natural gas pipelines, travel north-south along the US 97 corridor through Klamath County.

FIBER OPTIC CABLE

Century Tel currently owns fiber optic cable along OR 140 (Klamath Falls-Lakeview Hwy) between Klamath Falls and Lakeview. The one-inch glass cable/pipe, which is three feet deep, is located along the north and south sides of the highway depending upon the location. The fiber optic cable runs along the entire length of the highway within Lake County (e.g. between mileposts 63.4 and 96.4). Final detail information about the fiber optic line can be obtained from Century Tel representatives.

WATER TRANSPORTATION

The TSP process evaluates only the commercial use of water systems to move goods and services. Recreational water use is not evaluated. There is currently no commercial water movement of goods and services in Lake County.

SUMMARY OF IDENTIFIED NEEDS

The following needs were identified from the existing transportation system inventory:

- Develop roadway standards for the county roads.
- Sections of US 20, US 395, OR 31, and OR 140 have been identified as having poor pavement conditions.
- Sections of US 20, US 395, OR 31, and OR 140 have been identified as having insufficient shoulders.
- Repair or replace one bridge on the county road system and eleven bridges on the state highway system which were identified as being structurally deficient, functionally obsolete, or having sufficiency ratings less than 55.

CHAPTER 4: CURRENT TRANSPORTATION CONDITIONS

As part of the planning process, the current operating conditions for the transportation system were evaluated. This evaluation focused primarily on street system operating conditions since the automobile is by far the dominant mode of transportation in Lake County. Census data were examined to determine travel mode distributions.

TRAFFIC VOLUMES

ODOT reports traffic count data on the state highways (rural and urban sections) every year at the same locations. The most current volumes available, and the ones reported in this TSP, are from 2001. ODOT annually counts one-third of the state highway system, meaning Lake County highways are counted once every three years. Lake County Traffic volumes for locations not physically counted during a certain year are estimated based on nearby regional traffic volume growth trends. The most recent actual counts along state highways in Lake County were conducted in 2000 and 2001. All of the traffic volume data was obtained from the *ODOT Daily Traffic Volume Tables.*

Average Daily Traffic

Average Daily Traffic (ADT) represents the typical average volume of traffic in all lanes passing a given roadway location in both directions over a 24-hour period. The ADT is measured for some period of time greater than one day and less than one year and provides a snapshot of the magnitude of use along a particular roadway.

County Roads

Lake County has not typically collected or maintained traffic count information along county roads. Typical ADT volumes experienced in other largely rural Oregon counties of similar population provide a reasonable guideline for expected volumes in Lake County. It is expected that the 13 county roads identified as being critical in Chapter 3 and roads classified as collectors in Lake County generally carry ADT volumes in the range of 100 to 200 ADT. The remaining residential/local roads generally carry less than 100 ADT. If Lake County roads are susceptible to seasonal variations, the traffic volumes could be expected to increase between 5 and 40 percent during other times throughout the year. Tourism and recreational uses are possible reasons for traffic volume fluctuations.

State Highways

The 2001 ADT volumes on US 20 (Central Oregon Highway), OR 31 (Fremont Highway), OR 140 (Klamath Falls-Lakeview Highway), US 395 (Lakeview-Burns Highway), and OR 140 (Warner Highway) in Lake County are shown in **Figure 4-1**. Traffic volumes are highest in the cities and drop off in the rural sections.

The volumes shown in **Figure 4-1** are average volumes for the year. Summertime is the season when volumes are highest. ADT data from Automatic Traffic Recorder (ATR) stations within and near Lake County indicated that during the summer season, volumes are about 10 to 40 percent higher than average volumes. Rural highway sections in Lake County are assumed to follow the same pattern, with smaller increases in the urban areas. The summertime variations are due, in part, to increases in freight movement related to agricultural harvesting and recreational and tourism uses in Lake County.

US 20 (Central Oregon Highway)

Traffic volumes on the rural section of US Highway 20 in Lake County range from 1,300 ADT near the Deschutes/Lake County line to 1,400 ADT near the Lake/Harney County line.

OR 31

Traffic volumes on OR Highway 31 range from 440 ADT near Summer Lake to 910 ADT near the Klamath/Lake County line and within Paisley.

OR 140 (Klamath Falls-Lakeview Highway)

OR Highway 140 carries rural traffic levels ranging from 800 ADT near the Klamath/Lake County line to 2600 ADT near the Lakeview UGB.

US 395

Traffic volumes on US 395 range from 220 ADT near Hogback Road to 2,900 ADT near the Lakeview urban area and decrease to 950 ADT at the California border.

OR 140 (Warner Highway)

OR Highway 140 carries traffic volumes ranging from 140 ADT near the Lake/Harney County line to 400 ADT near the junction with US 395.

Design Hour Volumes

The design hourly volume (DHV) is the hourly volume that is used for design. For any roadway, it represents the 30th highest hourly traffic volume recorded along the roadway segment throughout the year. For example, if the total number of vehicles in both directions is counted at a specific roadway location for every hour throughout the year and then the hourly volumes are ranked from highest to lowest, the 30th highest hourly volume of the year would represent the DHV. Past examples have shown that the 30th highest hourly volume as a percentage of ADT fluctuates minimally each year, even in cases of significant ADT variations. Typical values for the 30th highest hourly volumes range from approximately 10 to 20 percent of the ADT.

The only locations along state highways in Oregon where hourly roadway volumes are counted on a daily basis throughout the year are at ODOT's ATR stations. Information regarding ADT, 30th highest hourly volume, vehicle classification, seasonal variations, and more are available. Following guidelines established by the ODOT Transportation Planning and Analysis Unit (TPAU), DEA averaged three out of the last five years worth of data to determine representative 30th highest hour percentages. The high and low percentages were eliminated to account for construction activity, which may have occurred near the ATR site. **Table 4-1** lists the ATR locations, representative truck percentages, truck volumes, representative 30th highest hour percentages, and DHVs to be used in calculating DHVs along the state highways throughout Lake County.

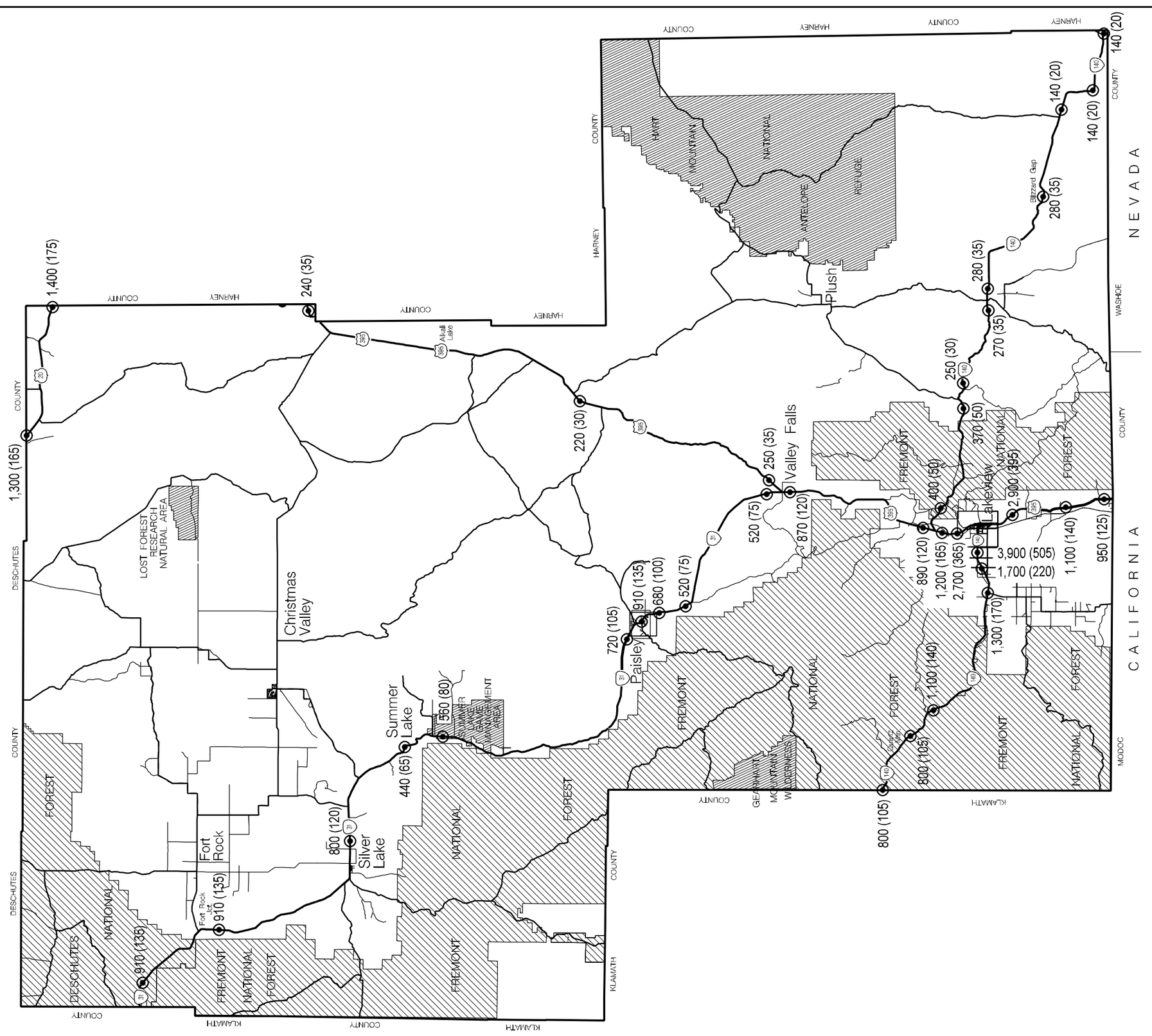


FIGURE 4-1

2001 Average Daily Traffic Volumes and (DHV) Design Hour Volumes along State Highways

LAKE COUNTY TSP

ODOT0386/fig4-1.dgn/RSLP/12-12-02

TABLE 4-1
RELATIONSHIP BETWEEN ADT AND DHV FROM ATR SITES WITHIN AND NEAR LAKE COUNTY

ATR		3-Year Average				
ATR	**Location**	**ADT**	**Truck %**	**Truck Vol.**	**Design Hour %**	**Design Hour Vol.**
13-003	US 20, 2.1 miles south of Hines	2,335	20.2%	472	12.6%	298
18-017	OR 140, 4.2 miles east of Beatty	1,140	14.8%	169	12.9%	147
19-004	US 395, 0.3 miles south of OR 31 junction	875	19.8%	173	13.6%	119
19-008	US 395, 0.3 miles north of OR/CA State line	980	16.6%	163	12.9%	126
19-010	OR 31, 2.3 miles east of Silver Lake	770	16.4%	126	14.7%	113

Source: 1994-2001 Oregon Department of Transportation Daily Traffic Volume Tables

Using the representative design hour percentages the DHV's along state highways in Lake County where ODOT maintains ADT records were calculated according to the following:

- ATR 13-003 - US 20 (Central Oregon Highway)
- ATR 18-017 - OR 140 (Klamath Falls-Lakeview Highway) and OR 140 (Warner Highway)
- ATR 19-004 - US 395 (Fremont Highway) between Lakeview and Lake/Harney Co line.
- ATR 19-008 - US 395 (Fremont Highway) between Lakeview and Oregon/California State line
- ATR 19-010 - OR 31 (Fremont Highway) between Klamath/Lake Co. line and junction with US 395

The resulting DHVs along with ADT volumes are reported on **Figure 4-1**.

CAPACITY ANALYSIS

ODOT Highway Mobility Standards

ODOT has established several policies in the Oregon Highway Plan (OHP) that enforce general objectives and approaches for maintaining highway mobility. Of these policies, the Highway Mobility Standards (Policy 1F) establish maximum volume-to-capacity (V/C) ratio standards for peak hour operating conditions for all highways in Oregon. The V/C ratio represents the ratio of measured traffic demand (volume) on a highway section divided by the maximum volume that the highway section can process under prevailing roadway and traffic conditions (capacity).

The V/C standards apply to the state highways in Lake County and the OHP policy specifies that the V/C standards be maintained for ODOT facilities through a 20-year horizon.

The OHP Highway Mobility Standards that apply to the highways located in Lake County are as follows:

- Where there are no intersections along the highway, the V/C ratio shall not exceed 0.70 along US 20, OR 31, OR 140 (Klamath Falls-Lakeview Highway) and US 395, and 0.75 along OR 140 (Warner Highway).
- At unsignalized intersections and road approaches where the highway approaches are not stopped, the V/C ratio shall not exceed 0.70 for US 20, OR 31, OR 140 (Klamath Falls-Lakeview Highway) and US

395, and 0.75 for OR 140 (Warner Highway). An exception to these standards is where an approach must stop or yield the right-of-way (such as the termination point of a highway, a county road approach to a state highway or at the intersection of state highways). The V/C ratio in this case shall not exceed 0.80.

Capacity and Level-of-Service Criteria

Although the OHP Highway Mobility Standards are the overriding operations standard for Oregon Highways, level of service (LOS) is a widely recognized and accepted measure and descriptor of traffic operations and is therefore also presented. Transportation engineers have established various standards for measuring traffic operations of roadways and intersections. Each standard is associated with a particular Level-of-service (LOS) and/or the Volume-to-Capacity (V/C) ratio. Both the LOS and V/C ratio concepts require consideration of factors that include traffic demand, capacity of the intersection or roadway, delay, frequency of interruptions in traffic flow, relative freedom for traffic maneuvers, driving comfort, convenience, and operating cost.

Six standards have been established to define LOS. They range from LOS "A" where traffic flow is relatively free flowing to LOS "F" where the highway or intersection is totally saturated with traffic and movement is very difficult. V/C ratios range from 0.0 to greater than 1.0. When the V/C ratio is near 0.0, traffic conditions are generally good with free flow travel conditions present on the roadway segments. As the V/C ratio approaches 1.0, traffic becomes more congested along roadways and "platoons" of traffic are formed, while at intersections traffic conditions become more unstable with longer delays. **Appendix C** provides a qualitative description of LOS and V/C for two-lane rural highways and intersections.

Lake County shall adopt a performance standard of LOS D. This standard shall apply to County Roads and at County Road intersections.

Capacities along the roadway segments in Lake County were evaluated in two different ways: two-lane highway operations and traffic operations at major intersections. The sections of the highways (not within the city of Lakeview) with the highest volumes were evaluated as part of the rural roadway operations analysis. The highest volume intersections along the state highways were evaluated as part of the intersection operations analysis.

Two-lane Highway Operations

Two-lane highway LOS operations were determined using procedures outlined in the *2000 Highway Capacity Manual*, Special Report 209, published by the Transportation Research Board. Analysis of rural two-lane highway sections takes into account several variables including the magnitude, type, and directional distribution of traffic as well as roadway features such as the percentage of no-passing zones, general terrain, and lane and shoulder widths. Each of these variables affects the capacity of the rural highway. The theoretical capacity of a two-lane highway with level terrain, sufficient passing zones, wide lanes and shoulders and sufficient speed is 3,200 passenger cars per hour (pcph) and the directional capacity is 1,700 passenger cars per hour per lane (pcphpl). Although roadway capacity is largely fixed by roadway features, it does vary based on the composition of traffic. The presence of large trucks increases the passenger car equivalent values due to their size and performance characteristics, especially along upgrades. Therefore, the passenger car equivalent values presented in **Table 4-2** are unique to the geometric and prevailing traffic conditions in 2001. Future calculation of V/C ratios should include recalculation of passenger car equivalent values to account for potential changes in roadway features or traffic composition.

For each of the eleven rural highway segments in Lake County, two-lane highway operations were analyzed under forecast two-way design hour volumes. The two-lane highway design speed was assumed to be 60 mph

and the directional traffic split was assumed to be 60/40 meaning that 60 percent of the total two-way highway volume is assumed to travel in the peak direction during the design hour. The remaining variables differed by location for each rural highway segment. Since all rural segments have multiple ADT volumes reported, a worst case analysis was performed using the highest reported volume for each segment.

Two-lane highways are categorized into two classes for analysis. Class I highways are two-lane highways on which travelers expect to travel at relatively high speeds, while Class II highways are two-lane highways on which motorists accept lower travel speeds (i.e. recreational routes, access routes to Class I highways, or rugged terrain routes). The LOS for Class I highways is defined in terms of both percent time-spent-following and average speed. On Class II highways the LOS is defined only in terms of percent time-spent-following. The average percentage of travel time that vehicles must travel in platoons behind slower vehicles due to the inability to pass is the definition of percent time-spent-following.

The resulting V/C ratio and LOS for each Lake County two-lane highway segment is shown in **Table 4-2**. All two-lane highway segments currently operate well within V/C ratio standards outlined in the 1999 OHP and operate under generally free flowing conditions at LOS A or B. The two-lane highway analysis worksheets for existing conditions can be found in **Appendix D**.

TABLE 4-2
SUMMARY OF OPERATIONS ON TWO-LANE HIGHWAYS - 2001

Location	Design Hour Volume[1] (vph)	Passenger-car Equivalent Volume[2] (vph)	Two-way Capacity (vph)	V/C[3]	Percent Time Spent Following	LOS
US 20 - Near Lake/Harney Co. line	175	340	3,200	0.11	40%	B
OR 31 - Between Klamath/Lake Co. line and Fort Rock	135	262	3,200	0.08	35%	B
OR 31 - Between Fort Rock and Silver Lake	120	150	3,200	0.05	13%	B
OR 31 - Between Silver Lake and Paisley	80	155	3,200	0.05	14%	B
OR 31 - Paisley	135	168	3,200	0.05	28%	B
OR 31 - Between Paisley and Valley Falls	75	146	3,200	0.05	27%	B
OR 140 (KFalls-Lakeview Hwy) - west of Lakeview	170	330	3,200	0.10	39%	B
US 395 - near Valley Falls	35	68	3,200	0.02	22%	A
US 395 - Between Valley Falls and Lakeview	120	233	3,200	0.07	33%	B
US 395 - Between Lakeview and California State line	140	272	3,200	0.09	36%	B
OR 140 (Warner Hwy) - east of Lakeview	50	97	3,200	0.03	24%	A

1. Values rounded up to the nearest 5.
2. The passenger-car equivalent volumes are adjusted for PHF, for grade, and heavy vehicles.
3. The volume used to compute V/C ratio is the calculated passenger-car equivalent flow rate as described in Chapter 20 of the *2000 Highway Capacity Manual.*
4. LOS is defined in terms of both % time-spent-following and average travel speed for Class I two-lane highways and percent time-spent-following for Class II two-lane highways.

Source: David Evans and Associates, Inc.

Considering the highest volume county roads have traffic volumes similar to the state highways in Lake County, all county roads are estimated to currently operate under generally free flowing conditions (LOS A or B).

Intersection Operations

Traffic operations at select intersections within Lake County were evaluated using procedures outlined in the *2000 Highway Capacity Manual* for unsignalized intersections. The highest volume intersection locations in the county were selected to provide a worst case analysis.

The highest traffic volumes in Lake County occur along the highways in the urban areas of Lakeview and Paisley as well as the intersections of state highways. At each of the intersections, minor street approaches to the main highway are controlled by STOP signs. Eight intersections located throughout Lake County were analyzed to determine existing intersection operations. The intersections analyzed include:

- US 20 and County Road - near Lake/Harney Co. line;
- OR 31 and Christmas Valley-Wagontire Road near Silver Lake;
- OR 31 and River Road in Paisley;
- OR 31 and US 395 near Valley Falls;
- OR 140 (Klamath Falls-Lakeview Highway) and Westside Road near Lakeview;
- US 395 and Hogback Road;
- US 395 (Fremont Highway) and OR 140 (Warner Highway) just north of Lakeview; and
- OR 140 (Warner Highway) and Hogback Road in Adel.

To support the planning level evaluation of each intersection, traffic operations were analyzed using two-way design hour volumes for each highway. The design hour volumes were adjusted to reflect a 60/40-peak directional traffic split. To provide a conservative analysis, volumes on the minor streets approaching the highways were assumed to equal one-half the corresponding highway volume. This applied to all minor approaches except at the intersection of two highways where the appropriate two-way design hour volume was used for the stopped highway approach. The results of the unsignalized intersection analysis are shown in **Table 4-3**.

TABLE 4-3
SUMMARY OF OPERATIONS AT REPRESENTATIVE INTERSECTIONS
(30TH HIGHEST HOUR, YEAR 2001)

Intersection	Movement	Reserve Capacity[1] (vehicles per hour)	V/C	LOS
US 20 and County Road - near Harney Co. line	Westbound left, through	1385	0.02	A
	Northbound left, right	770	0.08	A
OR 31 and Christmas Valley-Wagontire Road	Southbound left, through	1443	0.01	A
	Eastbound left, right	876	0.05	A
OR 31 and River Road in Paisley	Northbound left, through, right	1493	0.01	A
	Southbound left, through, right	1453	0.01	A
	Westbound left, through, right	715	0.07	B
	Eastbound left, through, right	719	0.07	B
OR 31 and US 395 near Valley Falls	Southbound left, through	1438	0.01	A
	Westbound left, right	793	0.04	A
OR 140 (Kfalls-Lakeview Hwy) and Westside Road	Eastbound left, through, right	1429	0.02	A
	Westbound left, through, right	1382	0.01	A
	Northbound left, through, right	563	0.12	B
	Southbound left, through, right	567	0.12	B
US 395 and Hogback Road	Westbound left, through	1547	0.01	A
	Northbound left, right	996	0.02	A
US 395 (Fremont Hwy) and OR 140 (Warner Hwy)	Southbound left, through	1435	0.02	A
	Westbound left, right	796	0.04	A
OR 140 (Warner Hwy) and Hogback Road	Eastbound left, through, right	1542	0.01	A
	Westbound left, through, right	1554	0.01	A
	Northbound left, through, right	949	0.02	A
	Southbound left, through, right	897	0.01	A

1. Reserve capacity calculated by subtracting flow rate from overall movement capacity.
2. LOS is based on control delay.

Source: David Evans and Associates, Inc.

As shown in **Table 4-3**, the eight analyzed intersections operate well within ODOT's mobility standards outlined in the 1999 OHP under design (30th highest) hour conditions. All of the intersections operate under generally free flowing conditions at LOS A or B. This indicates that all other lower-volume intersections or driveways accessing any rural or urban portion of the highways are operating at LOS A or B as well. The intersection analysis worksheets for existing conditions can be found in **Appendix D**.

TRANSPORTATION DEMAND MANAGEMENT MEASURES

Transportation Demand Management (TDM) measures consists of efforts taken to reduce the demand on an area's transportation system. TDM measures include such things as alternative work schedules, carpooling, and telecommuting.

Alternative Work Schedules

One way to maximize the use of the existing transportation system is to spread peak traffic demand over several hours instead of a single hour. Statistics from the 2000 US Census, shown in **Table 4-4,** illustrate the spread of departure to work times over a 24-hour period (workers who indicated they worked at home are not included).

Over 34 percent of employees depart for work between 7:00 and 8:00 a.m., and about 34 percent depart in either the hour before or the hour after the morning peak hour.

Assuming an average nine-hour workday, the corresponding afternoon peak can be determined for work trips. Using this methodology, the peak work travel hour would occur between 4:00 and 5:00 p.m., which corresponds with the peak hour of activity measured for traffic volumes.

TABLE 4-4
LAKE COUNTY DEPARTURE TO WORK DISTRIBUTION

	2000 Census	
Departure Time	**Trips**	**Percent**
12:00 a.m. to 4:59 a.m.	137	4.9
5:00 a.m. to 5:59 a.m.	266	9.4
6:00 a.m. to 6:59 a.m.	483	17.2
7:00 a.m. to 7:59 a.m.	975	34.6
8:00 a.m. to 8:59 a.m.	468	16.6
9:00 a.m. to 9:59 a.m.	113	4.0
10:00 a.m. to 10:59 a.m.	61	2.1
11:00 a.m. to 11:59 a.m.	13	.5
12:00 p.m. to 3:59 p.m.	197	7.0
4:00 p.m. to 11:59 p.m.	102	3.7
Total	**2815**	**100.0**

Source: US Bureau of Census, 2000 Census

Travel Mode Distribution

US Census data include statistics on how Lake County residents commute to work, shown in Table **4-5.** Lake County residents use automobiles for their primary mode of travel to work; approximately 83 percent of all trips to work were in private vehicles. Trips in single-occupancy vehicles accounted for approximately 69 percent of all private vehicle trips, and carpooling accounted for about 14 percent of trips to work. The current transportation system is almost exclusively auto reliant, except in more populated areas where walking or riding a bike is an option.

TABLE 4-5
LAKE COUNTY JOURNEY TO WORK TRIPS

	1990 Census	
Trip Type	**Trips**	**Percent**
Private Vehicle	2488	83.0
Drove Alone	*2066*	*68.9*
Carpooled	*422*	*14.1*
Public Transportation	4	0.1
Motorcycle	0	0.0
Bicycle	13	0.4
Walk	287	9.7
Other	23	0.7
Work at Home	182	6.1
Total	**2997**	**100.0**

Source: US Bureau of Census, 2000 Census

Table 4-6 presents 2000 Census data on commute trip times. Use of the automobile for commuting is the dominant travel choice even for those who commute less than five minutes, since a five minute automobile trip could cover a number of miles while a five minute walking trip will likely cover about one-quarter to one-half mile. The 22 percent of work trips in Lake County taking less than five minutes represent the trips that could potentially be made by walking. In 2000, walking accounted for nearly 10 percent of all home-to-work trips in Lake County, far above the statewide average for walking of 4.2 percent. As of 2000, 655 home-to-work trips took less than five minutes and 287 occurred by walking, although it is not known exactly how many trips met both criteria.

TABLE 4-6
LAKE COUNTY TRAVEL TIME TO WORK DISTRIBUTION

	1990 Census	
Departure Time	**Trips**	**Percent**
Less than 5 minutes	655	21.9
5 to 9 minutes	954	31.8
10 to 14 minutes	338	11.3
15 to 19 minutes	272	9.1
20 to 29 minutes	254	8.5
30 to 39 minutes	127	4.2
40 to 59 minutes	57	1.9
60 to 89 minutes	53	1.9
More than 90 minutes	105	3.5
Worked at home	182	6.2
Total	**2997**	**100.0**

Source: US Bureau of Census, 2000 Census

A commonly used threshold for acceptable walking distances is one-quarter mile. At a reasonable walking pace of 240 feet per minute, an average person can walk one-quarter mile in 5.5 minutes. Therefore, the opportunity for increased walking appears to exist in the county. However, for walking to occur safely and efficiently, there needs to be acceptable infrastructure (e.g., sidewalks, roadway shoulders) in place to support it. Since most pedestrian facilities, although fragmented, exist in the more urban areas, the most likely places to incur increased pedestrian usage are in Paisley, Christmas Valley and Silver Lake.

Aside from walking, about 1.5 percent of Lake County residents bicycled to work. Since the Census data do not include trips to school or other non-work activities, overall bicycle usage may be higher. In addition to bicycle lanes, bicycle parking, showers, and locker facilities can help to encourage bicycle commuting.

CRASH ANALYSIS

DEA reviewed crash data along the state highways within Lake County to identify high crash locations, potential crash patterns, and any potential safety concerns at these locations. The two sources of crash data reviewed included:

- Crash summaries generated by ODOT's Transportation Development Branch for the three-year period from January 1, 1998 to December 31, 2000.

- Crash summaries generated from the ODOT Crash Summary Database for locations along the state highways in Lake County.

ODOT's Crash Summary Database calculates two useful factors for comparison with statewide statistics based on crash information over the three-year period studied. The first factor is a computed average three-year crash rate, which compares the number of crashes with the ADT volume and the length of the segment analyzed. The crash rate for a stretch of roadway is typically calculated as the number of crashes per million vehicle miles

(crash/mvm) traveled along that segment of roadway. The second factor is the Safety Priority Index System (SPIS) value. This factor evaluates crash frequency, severity, and traffic volumes to create an index for prioritizing state highway locations with safety concerns.

Additionally, ODOT produces detailed crash reports along all state highways. The detailed crash reports include the number of fatalities and injuries, property damage only versus injury crashes, roadway surface conditions, time of day, and cause of crash. The detailed reports also indicate the overall crash frequencies and rates for sections of each highway.

Historic

Table 4-7 presents the crash rates for state highways in Lake County and the Oregon statewide average crash rates for rural and urban non-freeway primary and secondary state highways from January 1, 1998 to December 31, 2000.

During the three-year analysis period the crash rates along US 20 (Central Oregon Highway) and OR 31 are below the statewide averages for rural non-freeway primary highways.

The crash rates for the rural segments of US 395 during the three years analyzed are lower than the statewide averages for similar highways except in 1999 when the highway segment between Lakeview and the California State line slightly exceeded the statewide average.

Similar to US 20 (Central Oregon Highway) and OR 31, the crash rates for the three-year analysis period along OR 140 (Klamath Falls-Lakeview Highway) and OR 140 (Warner Highway) are all below statewide averages for similar highways.

TABLE 4-7
HISTORIC CRASH RATES FOR STATE HIGHWAYS
(Crashes per Million Vehicle Miles Traveled)

Highway	2000	1999	1998
Primary State Highways			
US 20 (Central Oregon Highway)			
Rural: Deschutes/Lake Co. line to Lake/Harney Co. line	0.84	0.00	0.53
OR 31			
Rural: Klamath/Lake Co. line to Paisley	0.64	0.23	0.70
Urban: Paisley	na	na	na
Rural: Paisley to Valley Falls	0.57	0.38	0.19
OR 140 (Klamath Falls-Lakeview Highway)			
Rural: Klamath/Lake Co. line to Lakeview	0.44	0.30	0.45
US 395			
Rural: Harney/Lake Co. line to OR 31 (Fremont Hwy)	0.08	0.26	0.18
Rural: Valley Falls (OR 31) to Lakeview	0.97	0.64	0.89
Rural: Lakeview to California State line	0.37	***1.29***	0.74
Secondary State Highways			
OR 140 (Warner Highway)			
Rural: US 395 to Lake/Harney Co. line	0.85	0.58	0.60
Average for all **Rural** Non-freeway **Primary** State Highways	**0.89**	**0.88**	**0.85**
Average for all **Rural** Non-freeway **Secondary** State Highways	**1.14**	**1.11**	**1.17**

Source: 1998-2000 Oregon Department of Transportation State Highway Crash Rate Tables

Table 4-8 contains detailed crash information on US 20, OR 31, OR 140 (Klamath Falls-Lakeview Highway), US 395, and OR 140 (Warner Highway) in Lake County from January 1, 1998 to December 31, 2000. It shows the number of fatalities and injuries, property damage only crashes, the total number of crashes, and the overall crash frequencies and rates for the segments of these roadways in Lake County.

TABLE 4-8
RURAL HIGHWAY CRASH SUMMARIES
(January 1, 1998 to December 31, 2000)

Location	Fatalities	Injuries	PDO[1]	Total Crashes	Crash Rate (crash/mvm^2)	High SPIS Value
US 20 (Central Oregon *Hwy*)						
Deschutes Co. to Harney Co. (MP 69.25 - 83.79)	2	4	3	8	0.36	26.16
OR 31						
Klamath Co. to Paisley (MP 18.28 - 98.22)	5	37	19	34	0.49	**50.41**
Paisley (MP 98.22 - 98.89)	0	0	0	0	0.00	0.00
Paisley to Valley Falls (MP 98.89 - 120.57)	1	10	3	6	0.38	30.67
OR 140 (Klamath Falls-*Lakeview Hwy*)						
Klamath Co. to Lakeview (MP 63.39 - 95.91)	0	13	9	16	0.32	0.00
US 395						
Harney Co. to Valley Falls (MP 30.95 - 90.02)	1	0	3	4	0.16	34.21
Valley Falls to Lakeview NCL(MP 120.57 – 142.64)	1	14	15	23	0.69	31.52
Lakeview SCL to California (MP 144.05 - 157.73)	2	10	6	13	0.76	27.39
OR 140 (Warner *Hwy*)						
Fremont Hwy to Harney Co. (MP 0.00 - 62.72)	2	8	7	14	0.62	38.24
2001 SPIS Cutoff for Top 10%						**46.24**

1. PDO: Property Damage Only Crash.
2. Acc/mvm represents crashes per million vehicle miles traveled
Source: Oregon Department of Transportation Crash Summary Database 1998-2000; information compiled by DEA.

US 20 (Central Oregon Highway)

Within Lake County during the three-year period analyzed, there were eight ODOT-reported crashes along US 20. Nearly half of the crashes (3) resulted in property damage only. The eight crashes resulted in two fatalities, one severe injury, three moderate injuries, and zero minor injuries. Over half of the crashes (5) occurred during daylight hours under dry conditions. None of the crashes occurred at intersections or involved trucks. The most common type of crash involved non-collision crashes (5). The crashes were scattered along the highway and there were no particular locations that showed a consistent crash pattern.

The two locations where fatality crashes occurred along US 20, mileposts 74.5 and 75.9, received SPIS values in 2000:

US 20 at Milepost 74.5 (Near Buck Creek Road)
The one crash reported at this location resulted in one fatality. The crash was caused by excessive speed, which resulted in the vehicle overturning and ending up in the ditch. This location received a SPIS value of 26.16, well below the state's 2001 cutoff value for the top ten percent of 46.24.

US 20 at Milepost 75.9 (Near Buck Creek Road)
The one crash reported at this location resulted in one fatality. The crash was caused when the driver lost control of the vehicle. This location received a SPIS value of 26.16, well below the state's 2001 cutoff value for the top ten percent of 46.24.

Crash rate information for 1998 to 2000 shows that US 20 between the Deschutes County line and the Harney County line has a three-year crash rate of (0.36) which is well below the 2000 statewide average for similar highways (0.89).

OR 31

There were 40 ODOT reported crashes along OR 31 in Lake County during the three-year period analyzed resulting in six fatalities, six severe injuries, 27 moderate injuries and 14 minor injuries. Over half of the crashes (22) resulted in property damage only. Nearly half of the crashes (18) occurred during daylight hours and seven crashes occurred during wet or icy conditions. None of the crashes occurred at intersections and eight of the crashes involved trucks. The most common types of crashes involved vehicles hitting miscellaneous objects such as livestock or deer/elk (16), hitting fixed objects (11), and non-collision crashes (8).

The 16 crashes involving deer/elk occurred between the Klamath/Lake County line and Valley Falls. Some of the possible mitigation measures identified for reducing deer-vehicle crashes include:

- **Active Signage** - Roadside or on-board warning devices that activate only when animals are in the right-of-way, warning motorists of imminent danger.

- **At-Grade Crossings** - These tools are designed to funnel the animal traffic to particular at-grade roadway crossing locations by means of fencing or other structures. A deer cross-walk then employs dirt paths approaching the road surrounded by stone cobble, visual cues and one-way gates to control, not prevent deer crossings. Paint is used to delineate crosswalks on the actual road surface.

- **Crossing Structures** - The two most common forms of crossing structures include overpasses and underpasses. Overpasses are usually open-bridge style crossings with a deer friendly vegetative cover. Underpasses make use of large culverts or tunnels to afford deer a way to safely cross highways. Overpasses and underpasses must take account of traditional game trails and make use of fencing to channel animals to the structures.

- **Fencing** - Properly maintained “deer-proof” fences have been shown to be effective at preventing deer from accessing a highway right-of-way. Fencing of proper strength and dimension, and in some cases employing electrification, is installed longitudinally to the roadway, at the edge of the maintained right-of-way, on either one or both sides.

- **Reflectors** - Reflectors and specialized mirrors have been placed along roadway shoulders at headlamp level and used as an alternative to fencing to reduce deer-vehicle collisions. Unlike fencing, reflectors, in theory, provide a “barrier” only when vehicles are present, thus allowing normal deer movement and dispersals at other times. Manufacturers assert that the reflected light can freeze, or frighten away, deer.

- **Scent Barriers** - Scent Barriers and chemical repellants have been used in Europe and Canada as deterrents to deer at roadsides. Scent Barriers, consisting of microencapsulated chemical compounds or natural predator scents, are positioned or sprayed along shoulders with some method of time release.

- **Static Signage** - Deer crossing signs are the most common method of warning motorists of high deer-crossing zones. Signs are highly visible and indicate the expected length of roadway exhibiting frequent crashes.

For more information from the sources on reducing deer-vehicle collisions please refer to www.deercrash.com and www.iastate.edu/~codi/Deer/litreview2.htm - "A Literature Review for Assessing the Status of Current Methods of Reducing Deer-Vehicle Collision".

Of the crash locations, only one location, milepost 87.0 near Harvey Road experienced multiple crashes. The remaining crashes were scattered along the highway and there were no particular locations that showed a consistent crash pattern. In addition to milepost 87.0 a number of other locations received SPIS values based on the severity of the crashes.

The following locations along OR 31 received SPIS values in 2000:

OR 31 at Milepost 20.1 (Near Big Hole Butte Road)
The one crash reported at this location resulted in one fatality, two severe injuries, one moderate injury, and three minor injuries. The crash was caused by trying to avoid deer/elk. This location received a SPIS value of 27.92, well below the state's 2001 cutoff value for the top ten percent of 46.24.

OR 31 at Milepost 64.5 (Near Rim Road)
The one crash reported at this location resulted in one fatality. The crash was caused by the driver being asleep. This location received a SPIS value of 30.36, below the state's 2001 cutoff value for the top ten percent of 46.24.

OR 31 at Milepost 76.5 (Near Hunter Hill)
The four-car crash reported at this location resulted in three fatalities, one severe injury, six moderate injuries, and one property damage only injury. The crash was caused by the driver being asleep. This location received a SPIS value of 31.24, below the state's 2001 cutoff value for the top ten percent of 46.24.

OR 31 at Milepost 87.0 (Near Harvey Road)
This location experienced multiple crashes during the three-year period analyzed. The four crashes resulted in one severe injury, one moderate injury, one minor injury, and two property damage only injuries. The events that caused the crashes included deer/elk, driver lost control of the vehicle, excessive speed, and driver being asleep. The high number of crashes relative to the low ADT volumes at this location resulted in a SPIS value of 50.41 which exceeds the 2001 SPIS cutoff of 46.24. This designation places this crash location in the top ten percent of serious crash locations in the state over the three-year analysis period. Although this site is above the state's 2001 cutoff, the four crashes do not indicate a particular pattern.

OR 31 at Milepost 101.41 (Near Bagley Ditch)
The one crash reported at this location resulted in one fatality, three moderate injuries, and one property damage only injury. The crash occurred when the driver fell asleep. This location received a SPIS value of 30.67, below the state's 2001 cutoff value for the top ten percent of 46.24.

Crash rate information for 1998-2000 shows that the rural sections of OR 31 have three-year crash rates ranging between (0.38 - 0.49), which is below the statewide average for similar highways (0.89). There were no reported crashes in the urban section of Paisley along OR 31.

OR 140 (Klamath Falls-Lakeview Highway)

Within Lake County during the three-year period analyzed, there were eighteen ODOT-reported crashes along OR 140 (Klamath Falls-Lakeview Highway). Over half of the crashes (10) resulted in property damage only. The eighteen crashes resulted in zero fatalities, one severe injury, nine moderate injuries, and four minor injuries. Most crashes (10) occurred during daylight hours and nearly 45 percent involved wet or icy pavement conditions. The most common types of crashes involved vehicles hitting fixed objects (9) and miscellaneous

collisions involving deer/elk (4). Seven of the crashes involving vehicles that hit fixed objects occurred under wet or icy pavement conditions. The four crashes involving deer/elk occurred between mileposts 91.5 and 95.5. Possible mitigation measures for deer/elk crashes were identified above. The remaining crashes were scattered along the highway and there were no particular locations that showed a consistent crash pattern. There are no identified SPIS sites along OR 140 (Klamath Falls-Lakeview Highway). Crash rate information from 1998 to 2000 shows that the rural section of OR 140 (Klamath Falls-Lakeview Highway) between the Klamath County line and Lakeview has a three-year crash rate of (0.32). This crash rate is below the 2000 statewide average for similar highways (0.89).

US 395

There were 40 ODOT reported crashes along US 395 in Lake County during the three-year period analyzed resulting in four fatalities, one severe injuries, 14 moderate injuries and nine minor injuries. Over half of the crashes (24) resulted in property damage only. Thirteen crashes occurred during wet or icy conditions and over half of the crashes (23) occurred during daylight hours. None of the crashes occurred at intersections and eight of the crashes involved trucks. The most common types of crashes involved vehicles hitting fixed objects (12), vehicles hitting miscellaneous objects such as livestock or deer/elk (10), and non-collision crashes (7).

Of the 40 reported crashes, three locations experienced multiple crashes. The locations were at mileposts 126.6 near the Chandler State Wayside southern boundary, 141.62 near N. 10th Street (Lakeview), and 144.2 near G Street S. (Lakeview). Each of these locations experienced two crashes. The remaining crashes were scattered along the highway. A number of other locations received SPIS values based on the severity of the crashes.

The following locations along US 395 received SPIS values in 2000:

US 395 (Lakeview-Burns Highway) at Milepost 70.3
The one crash reported at this location resulted in one fatality. The crash was caused by excessive speeding. In addition, alcohol was also involved in the crash. This location received a SPIS value of 34.21, below the state's 2001 cutoff value for the top ten percent of 46.24.

US 395 (Fremont Highway) at Milepost 141.61 (Near County Road 2-18C)
The two-car crash involving one passenger vehicle car and one truck reported at this location resulted in one fatality and one moderate injury. The crash was caused when the passenger vehicle turned in front of the truck. Alcohol was also involved in the crash. This location received a SPIS value of 31.52, below the state's 2001 cutoff value for the top ten percent of 46.24.

US 395 (Fremont Highway) at Milepost 146.8 (1.5 mile south of Kadmas Road)
The three-car crash reported at this location resulted in two fatalities, one severe injury, and two property damage only injuries. The rear-end crash was caused by the rear vehicles not slowing for the front vehicle. This location received a SPIS value of 27.39, well below the state's 2001 cutoff value for the top ten percent of 46.24.

Crash rate information for 1998-2000 shows that the rural section of US 395 (Lakeview-Burns Highway) has a three-year crash rate of (0.16), which is well below the statewide average for similar highways (0.89). The crash rate information for 1998-2000 shows that the rural sections of US 395 (Fremont Highway) has three-year crash rates ranging between (0.69 - 0.76) which is below the statewide average for similar highways (0.89).

An additional location which has experienced three fatalities within the last six months (July 2002 – December 2002) is near Dicks Creek Road (Milepost 127.8). Considering ODOT compiles and reports data yearly, the crashes, which resulted in three fatalities, were not included in the statistics reported above which covered 1998-

2000. ODOT representatives indicated that they received approval in early November 2002 to place Truck Tipping Signs near Dicks Creek Road. ODOT will continue to study this location and if crashes continue then further mitigation options should be identified.

OR 140 (Warner Highway)

Within Lake County during the three-year period analyzed, there were fourteen ODOT-reported crashes along OR 140 (Warner Highway). Half of the crashes resulted in property damage only. The fourteen crashes resulted in two fatalities, three severe injuries, four moderate injuries, and one minor injury. Half of the crashes occurred during daylight hours and only two crashes involved wet/icy pavement conditions. None of the crashes occurred at intersections although trucks were involved in four. The most common types of crashes involved vehicles hitting fixed objects (5), miscellaneous collisions involving livestock or deer/elk (4), and non-collision crashes (3). The crashes were scattered along the highway and there were no particular locations that showed a consistent crash pattern.

The location of the fatality crash along OR 140, milepost 45.0, received a SPIS value in 2000:

OR 140 (Warner Highway) at Milepost 45.0 (Near Blizzard Gap)
The one crash reported at this location resulted in two fatalities and one severe injury. The crash was caused by excessive speed, which resulted in the driver losing control of the vehicle. This location received a SPIS value of 38.24, below the state's 2001 cutoff value for the top ten percent of 46.24.

Crash rate information for 1998 to 2000 shows that OR 140 (Warner Highway) between OR 31 and the Harney County line has a three-year crash rate of (0.62) which is well below the 2000 statewide average for similar highways (1.14).

Crash data along roads maintained by County, US Forest Service, and BLM is not available.

SUMMARY OF IDENTIFIED NEEDS

The following needs were identified from the current transportation conditions inventory:

- No capacity deficiencies were identified on the two-lane rural highways segments.
- No capacity deficiencies were identified at the unsignalized intersections on the state highways and county roads.
- The addition of shoulders or bike lanes on sections of US 20, US 395, OR 31, and OR 140 may promote walking and bicycling for trips less than one mile in length.
- The review of crash data did not reveal any specific patterns of crashes on the state highways, excluding deer/elk crashes concentrated in some areas.

CHAPTER 5: TRAVEL FORECASTS

The traffic volume forecasts for Lake County are based on historic growth on the state highway system. The forecasts were prepared using ODOT's Level 1-Trending Forecast analysis methodology, as described in later sections of this chapter. Traffic forecasts were prepared for rural sections of each state highway and for the urban section in Paisley. Because of the link between transportation growth and population trends, both historic and projected Lake County population growth trends are presented for comparison to historic and projected traffic growth trends.

LAND USE

Land use and population growth are accounted for in the historic traffic volume trends used to forecast future traffic levels on state highways. Population forecasts were developed for comparison to forecast traffic volumes and to better determine the potential locations of future transportation needs. The amount of population growth, and where it occurs, has the potential to affect traffic and transportation facilities in the study area.

The State of Oregon Office of Economic Analysis (OEA) bases population projections in Lake County on historic growth rates and forecasts. Factors that will affect the future population growth rate in Lake County include employment opportunities, available land area for development, and community efforts to manage growth.

A detailed description of existing and future land use projections, including the methodology and data sources used, is contained in the Population and Employment Forecasts located in **Appendix E**. As the primary population centers in the county, the analysis also includes population estimates for the census county divisions (CCD), and the incorporated cities of Lakeview and Paisley.

Historic Population Trends

Historic and current population estimates were derived from the U.S. Census Bureau data. **Table 5-1** presents historic and current population levels for Lake County, the cities of Lakeview and Paisley, CCDs, and the State of Oregon.

TABLE 5-1
LAKE COUNTY HISTORIC POPULATION GROWTH TRENDS

						Growth		
						Number	Rate (AAGR[1])	
	1960	1970	1980	1990	2000	1960-2000	1960-2000	1990-2000
Lake County	7,158	6,343	7,532	7,186	7,422	264	0.09%	0.32%
Lakeview CCD	5,751	4,831	5,356	5,088	5,064	(687)	-0.32%	-0.05%
Lakeview	3,260	2,705	2,770	2,526	2,474	(786)	-0.69%	-0.21%
Silver Lake-Fort Rock CCD	404	617	1,227	1,162	1,583	1,179	3.47%	3.14%
Summer Lake CCD	620	572	655	620	513	(107)	-0.47%	-1.88%
Paisley	219	260	343	350	247	28	0.30%	-3.43%
Warner Valley CCD	383	323	294	316	262	(121)	-0.94%	-1.86%
State of Oregon	1,768,687	2,091,385	2,633,105	2,842,321	3,421,399	1,652,712	1.66%	1.87%

1. Average Annual Growth Rate (compounded).

Source: U.S. Census Bureau (County historic data)

Overall, Lake County has grown at a much slower pace than the state as a whole. Lake County's population declined in the 1960s, grew in the 1970s, declined in the 1980s, and finally began increasing again in the 1990s.

Towns like Lakeview and Paisley have declined in population where more rural areas have seen gradual increases in the number of new residents. The Silver Lake-Fort Rock CCD, which encompasses northern Lake County, grew by over three percent annually in the 1990's, and accounted for the majority of new residents in the county. As a whole, Lake County's population has grown by just 0.3 percent annually since 1990 to 7,422 people in 2000, and is still less than its high of 7,532 people in 1980. With the exception of northern Lake County, the rest of the County has declined in population in the last ten years, with most areas seeing gradual declines since 1960.

Projected Population Trends

Population and employment projections (2005 through 2022) are based on the State of Oregon OEA projections. The OEA's projections were developed in January 1997 and include long-term (through year 2040) state population forecasts disaggregated by county. Employment information was developed from OEA's county-level employment forecasts (also completed in January 1997), which were based on covered employment payrolls reported by the Oregon Employment Department. Year 2022 employment and population projections were estimated using OEA's population and employment projections through 2025.

The OEA used business-cycle trends (as reflected by the Employment Department's employment forecasts) as the primary driver of population and employment for the short-term projections. Long-term forecasts shifted to a population-driven model, which emphasized demographics of the resident population, including age and gender of the population, with assumptions regarding life expectancy, fertility rate, and immigration.

David Evans and Associates, Inc. (DEA) used a similar methodology based on the OEA's county-distribution methodology to develop population and employment forecasts for each of the census county divisions and cities in Lake County. DEA calculated a weighted average growth rate for each jurisdiction (weighting recent growth more heavily than past growth) and combined that average growth rate with the projected countywide growth rate. This methodology assumes that growth rates will be similar over time. Often the physical constraints of any area limit its ability to sustain growth rates beyond the state or county average for long periods of time. Such constraints include availability of land and housing, congestion, and other infrastructure limitations.

Population and employment forecasts are shown in **Table 5-2**. OEA's population and employment estimates show Lake County experiencing small population gains for the next 20 years, and as new job opportunities in northern and southwestern Lake County grow, employment gains will at least partially replace past losses in lost timber and wood products employment. However, like much of eastern Oregon, Lake County also has a number of seasonal employers, generally in agriculture, timber, and wood products. There are also a number of the seasonal government positions, primarily related to the timber and wood products sectors, and with the decline in the timber industry, government seasonal jobs are also harder to find. Due to the high number of seasonal positions in the County, long-term population and employment trends are difficult to predict, and are not likely to be as stable as the forecasts imply.

TABLE 5-2
LAKE COUNTY POPULATION AND EMPLOYMENT FORECAST, 2000-2022 (Lake County and Oregon)

	2000	2005	2010	2015	2020	2022	2000-2022 Change Number	2000-2022 Change AAGR[1]

Lake County								
Population	7,422	7,982	8,171	8,354	8,600	8,884	1,462	0.82%
Non-Agricultural Employment	2,290	2,746	2,799	2,805	2,806	2,810	520	0.93%
State of Oregon								
Population	3,421,399	3,631,000	3,857,000	4,091,000	4,326,000	4,418,000	996,601	1.17%
Non-Agricultural Employment	1,601,718	1,718,659	1,814,276	1,882,653	1,947,702	1,974,361	372,643	0.96%

1. Average Annual Growth Rate (compounded)

Source: June 2002 Employment. "Oregon Economic Review and Forecast" (2000 state employment forecast); 2000 C data. 2002 Regional Economic Profile, Region 11 (2000 county employment forecast);State of Oregon Office of (2005-2020 employment and population forecasts); David Evans and Associates, Inc.(2022 employment and po disaggregated from Office of Economic Analysis state and county projections)

Using this methodology explained above, **Table 5-3** illustrates the population forecasts. Lake County is expected to experience a population gain of nearly 1,500 people during the next 20 years. This represents an increase of almost 20 percent from 2000 to 2022. The majority of Lake County's forecast population growth between 2000 and 2022 is expected to occur within the Lakeview CCD and the Silver Lake-Fort Rock CCD. Of the total 1,462-person growth forecast, nearly 75 percent of the growth is expected to occur in the Lakeview CCD while the Silver Lake-Fort Rock CCD is nearly 20 percent of the growth.

TABLE 5-3
LAKE COUNTY FORECAST POPULATION GROWTH

	2000	2005	2010	2015	2020	2022	2000-2022 Change		
							Number	Total Growth	AAGR[1]
Lake County	7,422	7,982	8,171	8,354	8,600	8,884	1,462	19.7%	0.82%
Lakeview CCD	5,064	5,500	5,630	5,756	5,926	6,122	1,058	20.9%	0.87%
Lakeview	2,474	2,687	2,751	2,812	2,895	2,991	517	20.9%	0.87%
Silver Lake-Fort Rock CCD	1,583	1,666	1,712	1,750	1,802	1,861	278	17.6%	0.74%
Summer Lake CCD	513	540	553	565	582	601	88	17.2%	0.72%
Paisley	247	260	265	271	279	288	41	16.6%	0.70%
Warner Valley CCD	262	276	276	282	290	300	38	14.5%	0.62%

1. Average Annual Growth Rate (compounded).

Source: US Census Bureau; State Of Oregon Office of Economic Analysis (county forecasts); and David Evans and Associates, Inc. (disaggregation of county forecast to CCDs and cities).

TRAFFIC VOLUMES

The traffic volume forecasts for Lake County are based on historic growth on the state highway system. The forecasts were prepared using ODOT's Level 1-Trending Forecast analysis methodology, as described in the section titled Forecasting Methodology.

Historic

Before projecting future traffic growth, it is important to examine past growth trends on the Lake County roadway system. Historic data are only available for the state highway system in Lake County; however, these roadways carry far more traffic than any other roadways in the county.

ODOT reports traffic count data on the state highways (rural and urban sections) every year at the same locations. The most current volumes available, and the ones reported in this TSP, are from 2001. ODOT annually counts one-third of the state highway system, meaning Lake County highways are counted once every three years. Traffic volumes for locations not physically counted during a certain year are estimated based on nearby regional traffic volume growth trends. The most recent actual counts along state highways in Lake County were conducted in 2000 and 2001.

Historical growth trends on the state highways in Lake County were established using the Average Daily Traffic (ADT) volume information presented in the ODOT Traffic Volume Tables for the years 1980 through 2001. The ADT volumes were obtained for each of these years at several locations along each highway. Average traffic growth rates were determined along rural and urban highway segments as presented in **Table 5-4**.

TABLE 5-4
HISTORIC TRAFFIC GROWTH RATES ON STATE HIGHWAYS

Highway Section	Milepost	Historic ADT Volumes[1] 1980	Historic ADT Volumes[1] 2001	Estimated Average Annual Linear Growth Rate[1] 1980-2001	Total Growth 1980-2001
US 20					
Rural- Deschutes/Lake Co. line to Lake/Harney Co. line	69.3 - 83.8	935	1,350[2]	2.22%[2]	44.4%[2]
OR 31					
Rural- Klamath/Lake Co. line to Silver Lake	18.2 - 49.6	550	910	3.12%	65.5%
Rural- Silver Lake to Summer Lake	49.6 - 69.1	445	620	1.87%	39.3%
Rural- Summer Lake to Paisley	69.1 - 98.2	380	560	2.26%	47.4%
Urban- Paisley	98.2 - 104.3	805	790	-0.11%	-2.2%
Rural- Paisley to Valley Falls	104.3 - 120.4	415	520	1.20%	25.3%
OR 140 (Klamath Falls-Lakeview Highway)					
Rural- Klamath/Lake Co. line to Drews Gap Summit	63.4 - 89.0	665	900	1.67%	35.0%
Rural- Drews Gap Summit to Maddock Corner	89.0 - 92.4	1,165	1,235	0.27%	5.7%
Rural- Maddock Corner to Lakeview	92.4 - 95.9	2,390	2,560	0.34%	7.1%
US 395					
Rural- Harney/Lake Co. line to OR 19 (Fremont Hwy)	35.7 - 90.0	250	235	-0.25%	-5.3%
Rural- Valley Falls to Lakeview	120.4 - 142.6	1,390	1,625	0.82%	17.2%
Rural- Lakeview to California State line	144.2 - 157.7	1,270	1,560	1.10%	23.0%
OR 140 (Warner Highway)					
Rural- OR 19 (Fremont Hwy) to Adel	0.0 - 28.3	340	355	0.22%	4.6%
Rural- Adel to Lake/Harney Co. line	28.3 - 62.7	165	195	0.95%	20.0%

1. ADT volumes along highway segments defined by beginning and ending mileposts.
2. Volume was counted in 2000.

Note: Volumes were rounded to nearest 5.
Source: ODOT TPAU 2019 Traffic Forecast; information compiled by David Evans and Associates, Inc.

Over the past 20 years, traffic levels have grown throughout most of Lake County. The average annual linear growth rate along highway segments in Lake County is approximately 1 to 1.5 percent. The two highway segments experiencing negative growth over the historical 20-year period include the urban section along OR 31 near Paisley and the rural section along US 395 between the Harney/Lake County line and OR 31.

In general, historic linear average annual traffic volume growth on the rural sections of the state highways exceeded the 20-year compound historic population growth in Lake County. Although Lake County has

experienced population gains during this decade (0.32 percent per year since 1990), during the 20-year period between 1980 and 2000, Lake County population decreased by 110 people or 0.07 percent per year. Over the same 20-year period, rural traffic volumes increased reflecting the modern trend toward an increase in per capita vehicle miles traveled and the increase in commercial and tourist traffic.

Forecasting Methodology

Future traffic volume forecasts along state highways in Lake County were developed by ODOT's Transportation Planning and Analysis Unit (TPAU). The TPAU forecasts are based on a *Level 1 - Trending Forecast*[1] analysis methodology based on available existing and historical traffic data. This level trending analysis was completed due to Lake County having less than 15,000 population and the lack of existing information. This methodology assumes that traffic demand on the state highways will grow over the 20-year planning period according to the linear 20-year historical traffic growth trendline rate. TPAU developed a comprehensive summary of statewide traffic growth trendlines to support development of the 1999 Oregon Highway Plan (OHP). They intend to update the trendlines every few years and, for consistency, want statewide transportation analysis to be based on their growth rates.

TPAU develops historical traffic growth trendlines by plotting the ADT volumes for each reported highway location in the years where actual ODOT counts were taken. They also investigate suspect count information and adjust volumes as needed. Using a linear regression process, the linear trendline that best fits the volume data points is determined. This historical trendline is then used to forecast future traffic volumes over the 20-year planning horizon. As new data is added to TPAU's database, the trendlines are refined.

State highway locations that have displayed increasing 20-year historical traffic growth are assumed to continue to grow according to the 20-year historical linear trendline growth rate. Locations displaying negative historical traffic growth are assumed to remain unchanged, displaying neither increased or decreased traffic volume growth. This supports TPAU's belief that negative traffic volume growth is not sustained over long periods of time. DEA forecast 2022 traffic volumes based on TPAU provided 2019 volumes.

Trendline Comparisons

Table 5-5 summarizes the forecast 2022 traffic volumes and resulting 20-year traffic volume growth rates. State highway volumes throughout Lake County are expected to grow over the next 20 years. Comparisons between forecast linear growth rates in **Table 5-5** and historical linear growth rates from **Table 5-4** indicate that annual and total linear growth rates are expected to increase throughout the county by 2022. With the exception of the rural segment along OR 31 between the Klamath/Lake County line and Silver Lake, all of the highway segments are forecast to experience a larger net traffic volume increase over the next 20 years than they experienced over the last 20 years.

TABLE 5-5
FUTURE FORECAST TRAFFIC GROWTH RATES ON STATE HIGHWAYS

Highway Location	Milepost	2001 ADT	2019[1] ADT	2022[2] ADT	Estimated Average Annual Growth Rate[3] 2001-2022	Total Growth[3] 2001-2022

[1] ODOT *Transportation System Planning Guidelines*, May 2001, p. 29.

US 20						
Rural- Deschutes/Lake Co. line to Lake/Harney Co. line	69.3 - 83.8	1,350[4]	1,900	1,985	2.14%[4]	47.2%[4]
OR 31						
Rural- Klamath/Lake Co. line to Silver Lake	18.2 - 49.6	910	1,200	1,245	1.68%	36.9%
Rural- Silver Lake to Summer Lake	49.6 - 69.1	620	1,150	1,235	4.50%	99.0 %
Rural- Summer Lake to Paisley	69.1 - 98.2	560	850	895	2.73%	60.0%
Urban- Paisley	98.2 - 104.3	790	1,120	1,170	2.20%	48.5%
Rural- Paisley to Valley Falls	104.3 - 120.4	520	1,100	1,190	5.87%	129.1%
OR 140 (Klamath Falls-Lakeview Highway)						
Rural- Klamath/Lake Co. line to Drews Gap Summit	63.4 - 89.0	900	1,265	1,325	2.14%	47.2%
Rural- Drews Gap Summit to Maddock Corner	89.0 - 92.4	1,235	1,500	1,540	1.14%	25.0%
Rural- Maddock Corner to Lakeview	92.4 - 95.9	2,560	2,960	3,025	0.82%	18.1%
US 395						
Rural- Harney/Lake Co. line to OR 19 (Fremont Hwy)	35.7 - 90.0	235	435	465	4.37%	96.2%
Rural- Valley Falls to Lakeview	120.4 - 142.6	1,625	2,835	3,025	3.90%	85.9%
Rural- Lakeview to California State line	144.2 - 157.7	1,560	1,800	1,840	0.81%	17.8%
OR 140 (Warner Highway)						
Rural- OR 19 (Fremont Hwy) to Adel	0.0 - 28.3	355	520	545	2.40%	52.9%
Rural- Adel to Lake/Harney Co. line	28.3 - 62.7	195	400	430	5.48%	120.5%

1. 2019 Volumes were estimated by TPAU.
2. 2022 Volumes were estimated by DEA.
3. Average traffic volumes along highway segments defined by beginning and ending mileposts.
4. Volume was counted in 2000.

Note: Volumes were rounded to nearest 5.
Source: Information compiled by David Evans and Associates, Inc.

Future Traffic Volumes

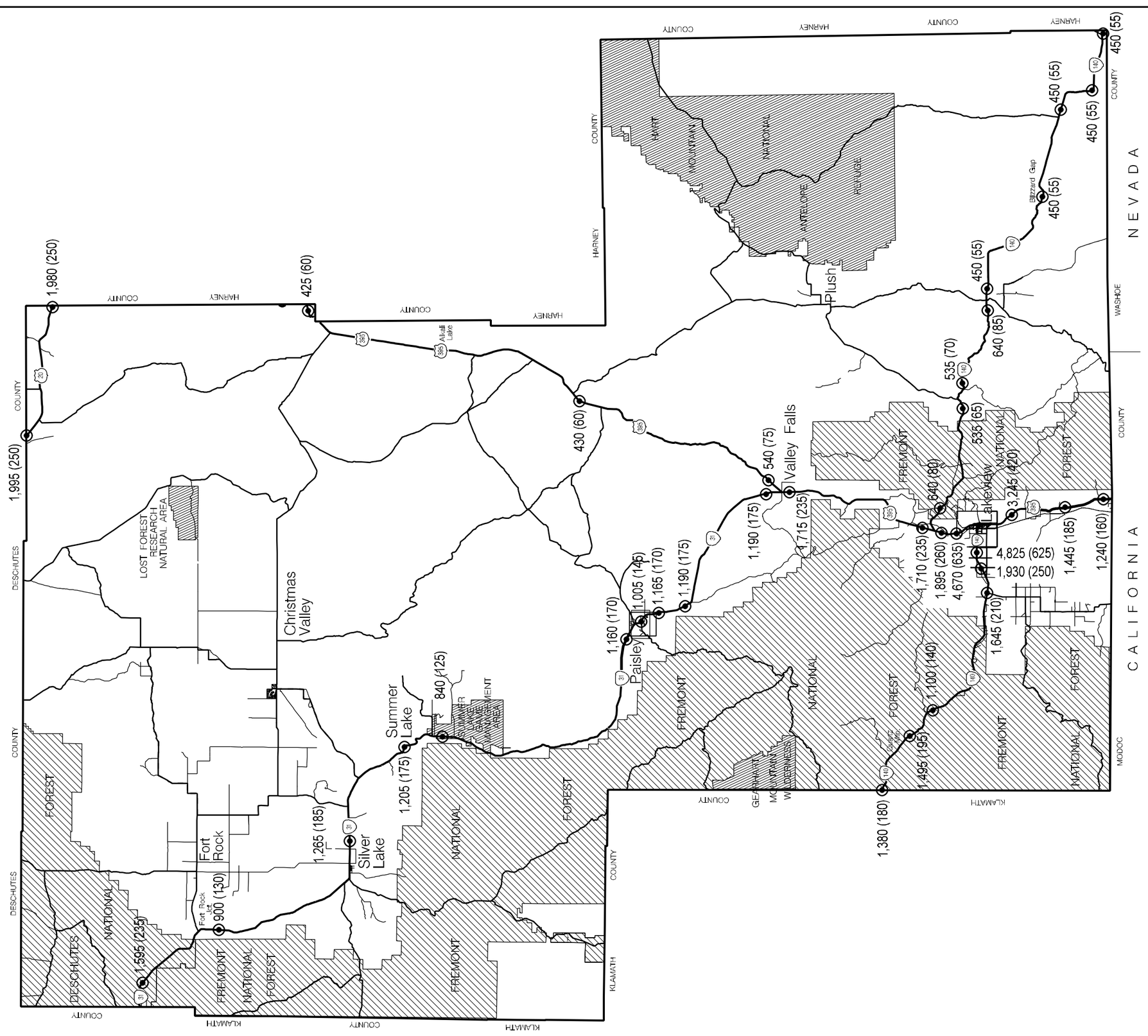
Table 5-5 summarizes the average forecast 2022 traffic volumes along rural and urban state highway sections in Lake County. Future 2022 ADT and DHV volumes at all locations reported by ODOT are shown in **Figure 5-1**. Rural highway traffic volumes are expected to range in total growth from 17.8 percent along US 395 between Lakeview and the California State line to 129.1 percent along OR 31 between Paisley and Valley Falls. The total growth for the urban section through Paisley is expected to increase by approximately 50 percent.

HIGHWAY SYSTEM CAPACITY

The future year design hour volumes were generated in accordance with the forecasting procedures outlined in Chapter 4. Analyses were conducted for the same two-lane highway segments and intersection locations as well as in the same manner as outlined in Chapter 4 (*Current Transportation Conditions*).

Two-lane Highway Operations

Two-lane highway Level-of-Service (LOS) operations were determined using procedures outlined in the *2000 Highway Capacity Manual*, Special Report 209, published by the Transportation Research Board. Future two-lane highway segment analysis was conducted using forecast 2022 design hour volumes. Evaluation was conducted at the same locations and in the same manner as described in Chapter 4. No changes in roadway features or traffic composition (e.g. large truck percentage) for individual rural highway sections were assumed for 2022.



LEGEND:

2022 ADT VOLUMES
(2022 DESIGN HOUR VOLUMES)

FIGURE 5-1

2022 Average Daily Traffic Volumes and (DHV) Design Hour Volumes along State Highways

LAKE COUNTY TSP

ODOT0386/fig5-1.dgn/RSLP/12-12-02

Two-lane highways are categorized into two classes for analysis. Class I highways are two-lane highways on which travelers expect to travel at relatively high speeds, while Class II highways are two-lane highways on which motorists accept lower travel speeds (i.e. recreational routes, access routes to Class I highways, or rugged terrain routes). The LOS for Class I highways is defined in terms of both percent time-spent-following and average speed. On Class II highways the LOS is defined only in terms of percent time-spent-following. The average percentage of travel time that vehicles must travel in platoons behind slower vehicles due to the inability to pass is the definition of percent time-spent-following.

The resulting future forecast 2022 Design Hour Volume, V/C ratio, percent time-spent-following, and LOS for each Lake County highway segment are shown in **Table 5-6**. All segments of the state highways currently operate well within V/C ratio standards outlined in the 1999 OHP and operate under generally free flowing conditions at LOS A, B or C. The county roads, which typically serve 50 to 500 ADT, are not expected to experience any capacity deficiencies during the 20-year planning period, even in the urban areas of the county. The two-lane highway operations analysis worksheets for 2022 future conditions can be found in **Appendix F**.

TABLE 5-6
SUMMARY OF OPERATIONS ON TWO-LANE HIGHWAYS - 2022

Location	Design Hour Volume[1] (vph)	Passenger-car Equivalent Volume[2] (vph)	Two-way Capacity (vph)	V/C[3]	Percent Time Spent Following	LOS
US 20 - Near Lake/Harney Co. line	250	486	3,200	0.15	49%	C
OR 31 - Between Klamath/Lake Co. line and Fort Rock	235	457	3,200	0.14	46%	C
OR 31 - Between Fort Rock and Silver Lake	185	231	3,200	0.07	19%	B
OR 31 - Between Silver Lake and Paisley	125	243	3,200	0.08	34%	B
OR 31 - Paisley	145	181	3,200	0.06	15%	B
OR 31 - Between Paisley and Valley Falls	175	340	3,200	0.11	40%	B
OR 140 (KFalls-Lakeview Hwy) - west of Lakeview	210	408	3,200	0.13	43%	C
US 395 - near Valley Falls	75	88	3,200	0.05	27%	A
US 395 - Between Valley Falls and Lakeview	260	505	3,200	0.16	50%	C
US 395 - Between Lakeview and California State line	185	359	3,200	0.11	41%	C
OR 140 (Warner Hwy) - east of Lakeview	80	155	3,200	0.05	28%	A

1. Values rounded up to the nearest 5.
2. The passenger-car equivalent volumes are adjusted for Peak Hour Factor (PHF), for grade, and heavy vehicles.
3. The volume used to compute V/C ratio is the calculated passenger-car equivalent flow rate as described in Chapter 20 of the *2000 Highway Capacity Manual.*
4. LOS is defined in terms of both % time-spent-following and average travel speed for Class I two-lane highways and percent time-spent-following for Class II two-lane highways.

Source: David Evans and Associates, Inc.

Operations at Intersections

Traffic operations at select intersections within Lake County were evaluated under forecast 2022 DHV using procedures outlined in the *2000 Highway Capacity Manual* for unsignalized intersections. The evaluation was conducted at the same eight intersections and in the same manner as described in Chapter 4. No changes in intersection configuration or traffic control were assumed for 2022. The eight intersections evaluated included:

- US 20 and County Road - near Lake/Harney Co. line;
- OR 31 and Christmas Valley-Wagontire Road near Silver Lake;
- OR 31 and River Road in Paisley;
- OR 31 and US 395 near Valley Falls;
- OR 140 (Klamath Falls-Lakeview Highway) and Westside Road near Lakeview;
- US 395 and Hogback Road;
- US 395 (Fremont Highway) and OR 140 (Warner Highway) just north of Lakeview; and
- OR 140 (Warner Highway) and Hogback Road in Adel.

The results of the unsignalized intersection analysis are shown in **Table 5-7**.

TABLE 5-7
SUMMARY OF OPERATIONS AT REPRESENTATIVE INTERSECTIONS
(30TH HIGHEST HOUR, YEAR 2022)

Intersection	Movement	Reserve Capacity[1] (vehicles per hour)	V/C	LOS[2]
US 20 and County Road - near Harney Co. line	Westbound left, through	1369	0.03	A
	Northbound left, right	665	0.12	B
OR 31 and Christmas Valley-Wagontire Road	Southbound left, through	1377	0.02	A
	Eastbound left, right	782	0.08	A
OR 31 and River Road in Paisley	Northbound left, through, right	1454	0.01	A
	Southbound left, through, right	1494	0.01	A
	Westbound left, through, right	746	0.07	B
	Eastbound left, through, right	743	0.07	B
OR 31 and US 395 near Valley Falls	Southbound left, through	1318	0.01	A
	Westbound left, right	683	0.11	B
OR 140 (Kfalls-Lakeview Hwy) and Westside Road	Eastbound left, through, right	1438	0.02	A
	Westbound left, through, right	1375	0.01	A
	Northbound left, through, right	609	0.15	B
	Southbound left, through, right	612	0.15	B
US 395 and Hogback Road	Westbound left, through	1534	0.01	A
	Northbound left, right	977	0.02	A
US 395 (Fremont Hwy) and OR 140 (Warner Hwy)	Southbound left, through	1409	0.03	A
	Westbound left, right	730	0.08	B
OR 140 (Warner Hwy) and Hogback Road	Eastbound left, through, right	1507	0.01	A
	Westbound left, through, right	1526	0.01	A
	Northbound left, through, right	886	0.06	A
	Southbound left, through, right	795	0.02	A

1. Reserve capacity calculated by subtracting flow rate from overall movement capacity.
2. LOS is based on control delay.

Source: David Evans and Associates, Inc.

As shown in **Table 5-7**, the eight analyzed intersections operate well within ODOT's mobility standards outlined in the 1999 OHP under design (30th highest) hour conditions. All of the intersections operate under generally free flowing conditions at LOS A or B. This indicates that all other lower-volume intersections or driveways accessing any rural or urban portion of the highways are operating at LOS A or B as well. The intersection analysis worksheets for 2022 future conditions can be found in **Appendix F**.

Capacity Issues

Overall two-lane highway operations and unsignalized intersection operations in Lake County are expected to continue to operate at LOS A or B under worst-case future 2022 design hour volumes. This indicates that there are no identified capacity constraints or issues within the county including the city of Paisley or the rural communities of Silver Lake, Christmas Valley, and Plush.

CHAPTER 6: TRANSPORTATION IMPROVEMENT OPTIONS ANALYSIS

As required by the Oregon Transportation Planning Rule, transportation alternatives were formulated and evaluated for the Lake County Transportation System Plan. These potential improvements were developed to address the concerns identified in the goals and objectives (Chapter 2), the inventory (Chapter 3), evaluation of the existing operating conditions (Chapter 4), traffic forecasts (Chapter 5), and meetings with the Lake County Transportation Advisory Committee and the public.

IMPROVEMENT PROJECTS

Each of the potential transportation system projects was developed to address specific deficiencies, safety issues, or access concerns. Projects were not limited to roadway issues, although most projects are roadway-related. Projects are primarily located along state highways. The potential projects identified in this chapter are above and beyond any other projects that have been identified for implementation in Lake County either through ODOT's Statewide Transportation Improvement Program (STIP), the county's road maintenance program, or any other program; however, those other projects are included in Chapter 7 of this plan (which includes the comprehensive Transportation System Plan and Capital Improvement Program).

The potential project list includes a total of 23 projects. Each project includes a brief overview, discussion of potential impacts, planning level cost estimate, recommendation to include or remove the project from further consideration, and priority for the project (High: 0-5 years, Medium: 6-10 years, or Low: 11-20 years). **Figure 6-1** indicates the general location of each project within the county. Detailed locations are described under each project and some projects are accompanied by specific project figures depicting the projects in greater detail.

EVALUATION CRITERIA

As discussed in the remaining sections of this chapter, not all of the evaluated improvement projects were recommended for implementation. These recommendations were based on available standards, warrants, need, costs and benefits relative to traffic operations, the transportation system, and community livability.

Each improvement option was evaluated with regard to applicable impacts including impacts to traffic operations including speed, delay, and congestion; safety; and socioeconomic and land use impacts, such as right-of-way requirements. Consideration of potential environmental impacts were not accounted for in this evaluation. Additionally, costs based on preliminary alignments (estimated in year 2002 dollars) were factored into the evaluation of each potential transportation improvement project. Costs were estimated for construction using a typical unit cost, such as per linear foot, and do not include purchase of right-of-way, design, or other contingencies. Final review of each project resulted in a recommendation of whether the project should be implemented.

The project evaluations and cost estimates provided in this chapter are for planning purposes only. Any project ultimately implemented would require a more detailed study of site-specific issues that may affect final design, location, and cost.

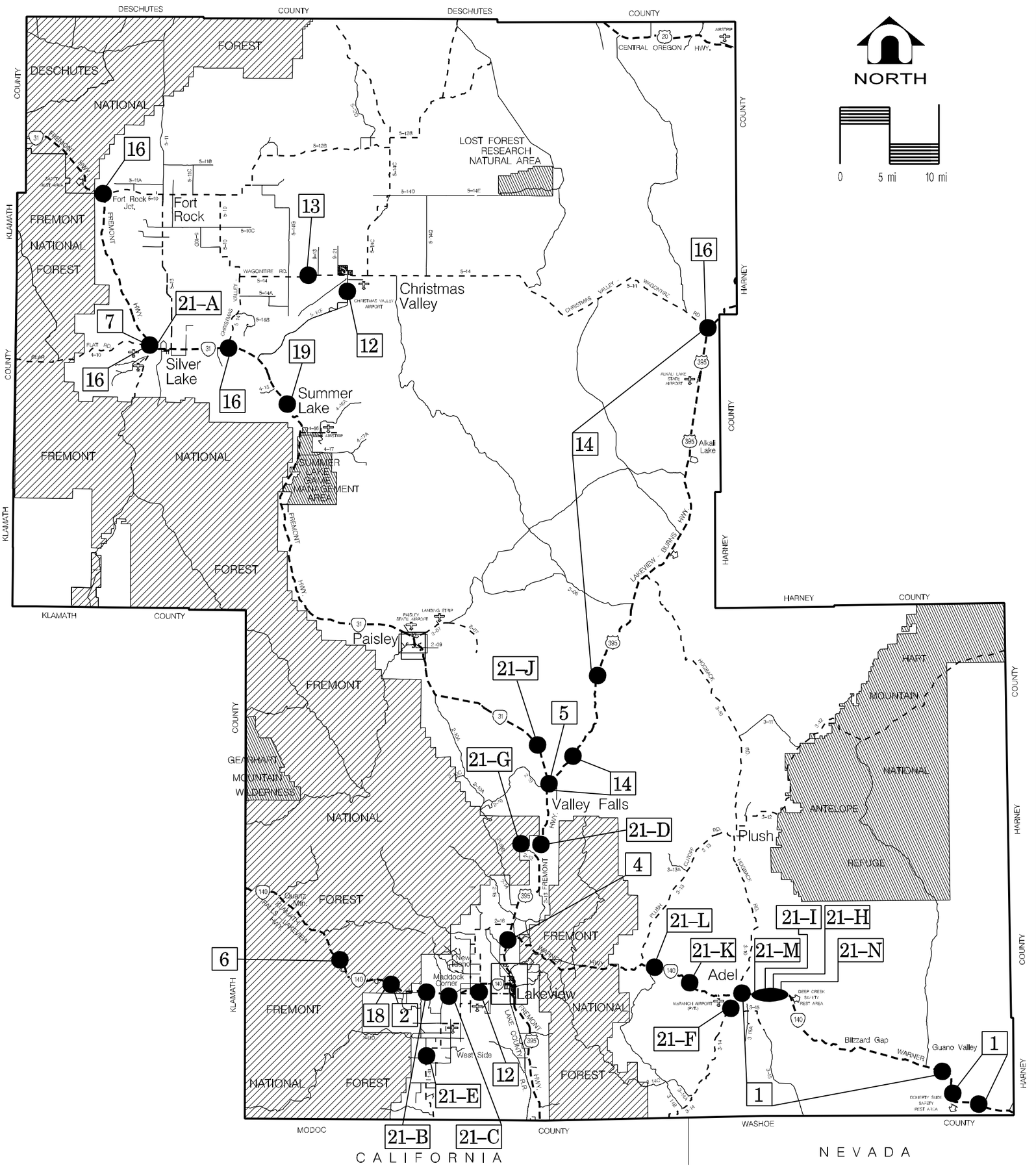
EVALUATION OF LAKE COUNTY POTENTIAL IMPROVEMENT PROJECTS

Through the transportation analysis conducted and input provided from the public involvement program, several potential improvement projects were identified within Lake County ranging from safety improvements along OR 140 east and west of Lakeview to adding bike lanes along county roads.

The evaluation of each potential improvement project addresses the following five categories: (1) Overview, (2) Impacts, (3) Cost, (4) Recommendation, and (5) Priority.

The 23 projects identified within Lake County include:

1. Safety improvements along OR 140 (Warner Highway);
2. Safety improvements along OR 140 (Klamath Falls-Lakeview Highway);
3. Ongoing pavement replacement;
4. Intersection improvements for the intersection of US 395 and OR 140 (Warner Highway);
5. Intersection improvements for the intersection of OR 31 and US 395 (Lakeview-Burns Highway);
6. Enhance existing chain-up area along OR 140 (Klamath Falls-Lakeview Highway) at Drews Valley and allow for School Bus Turnaround;
7. Improve directional signing to US 97 along Bear Flat Road;
8. Improve directional signing throughout Lake County;
9. Install exclusive left-turn lanes to the Lake County Department of Correction Facility from US 395, north of Lakeview;
10. Upgrade substandard shoulders along state highways;
11. Localized shoulder improvements along state highways;
12. Add bike lanes along county roads;
13. Investigate options to address s-curve on County Road #5-14 in Christmas Valley;
14. Pavement preservation projects along US 395 (Lakeview-Burns Highway);
15. Increase passing lane opportunities along OR 31/US 395 (Fremont Highway);
16. Intersection improvements including signing and striping changes for four intersections;
17. Improve sidewalk connectivity in the City of Paisley and the rural community of Silver Lake;
18. Provide a rest area near Lakeview;
19. Address rock fall issues, add shoulders and guardrail, curve flattening near milepost (MP) 63.5, and investigate potential climbing lane near Picture Rock Pass along OR 31;
20. Replace dial-a-ride transit fleet;
21. Upgrade substandard bridges;
22. Identify chain-up and chain-down areas within Lake County; and
23. Bank flattening through Nevada curve along OR 140 (Warner Highway) near milepost 65.2.



LAKE COUNTY POTENTIAL IMPROVEMENT PROJECTS

ROADWAY PROJECTS

MAP LOCATOR	ROAD NUMBER	PROJECT DESCRIPTION
1	OR 140 (EAST)	SAFETY IMPROVEMENTS ALONG OR 140 (EAST)
2	OR 140 (WEST)	SAFETY IMPROVEMENTS ALONG OR 140 (WEST)
3	VARIOUS	PAVEMENT REPLACEMENT PROJECTS (SEE REPORT)
4	US 395 & OR 140	INTERSECTION IMPROVEMENTS @ US 395 & OR 140
5	OR 31 & US 395	INTERSECTION IMPROVEMENTS @ OR 31 & US 395
6	OR 140 (WEST)	ENHANCE CHAIN-UP AREA and ADD SCHOOL BUS TURNAROUND
7	OR 31	IMPROVE DIRECTIONAL SIGNING TO US 97
8	VARIOUS	IMPROVE SIGNING THROUGHOUT LAKE CO. (SEE REPORT)
9	US 395	INSTALL EXCLUSIVE LEFT-TURN LANE (SEE REPORT)
10	VARIOUS	UPGRADE SUBSTANDARD SHOULDERS (SEE REPORT)
11	VARIOUS	LOCALIZED SHOULDER IMPROVEMENTS (SEE REPORT)

MAP LOCATOR	ROAD NUMBER	PROJECT DESCRIPTION
12	COUNTY ROADS	ADD BIKE LANES ALONG COUNTY ROADS (SEE REPORT)
13	#5-14	ADDRESS S-CURVE ON COUNTY ROAD #5-14
14	US 395	PAVEMENT PRESERVATION PROJECTS ALONG US 395
15	FREMONT HWY	INCREASE PASSING LANE OPPORTUNITIES
16	VARIOUS	INTERSECTION IMPROVEMENTS (SEE REPORT)
17	CITY STREETS	SIDEWALK ISSUES IN PAISLEY & CHRISTMAS VALLEY
18	VARIOUS	IMPROVE 4 EXISTING REST AREAS NEAR LAKEVIEW
19	OR 31	SAFETY ISSUES NEAR PICTURE ROCK PASS
20		REPLACE DIAL-A-RIDE FLEET (SEE REPORT)
21	VARIOUS	UPGRADE SUBSTANDARD BRIDGES
22	OR 31/VARIOUS	PROVIDE CHAIN-UP & CHAIN-DOWN AREAS

LEGEND:

- GENERAL ROADWAY LOCATION
- 6 — PROJECT NUMBER
- 21–C — BRIDGE PROJECT NUMBER
- 1 — GENERAL PROJECT LIMITS

FIGURE 6-1

Potential Improvement Projects

LAKE COUNTY TSP

Project 1. Safety Improvements along OR 140 (Warner Highway)

Overview: ODOT and the South Central Oregon Regional Partnership members have identified several areas for improvement along Warner Highway. OR 140 (Warner Highway) includes areas with relatively sharp curves, relatively narrow lanes, limited shoulders, and locations without guardrail. Currently, OR 140 is not passable for most long-haul trucks due to length restrictions imposed by ODOT. These length restrictions have been imposed based on long haul trucks off-tracking behavior. Off-tracking is when the rear wheels do not follow the same path as the front wheels; instead the rear wheels tend to cut inside the turns. Off-tracking on narrow highways is especially dangerous when a trailer crosses the centerline forcing oncoming traffic off the road.

This project would involve localized curve improvements at three locations along OR 140. They have been identified in order to remove truck length restrictions imposed by ODOT. The approximate locations for curve improvements are Deep Creek Canyon (mileposts 15-28), Greaser Canyon (mileposts 28.3-53), and Doherty Slide (milepost 53-57). In addition to curve improvements, Doherty Slide warrants installation of guardrail. The posted speed along the district level highway (OR 140) is 55 mph.

The 2002-2005 Statewide Transportation Improvement Program (STIP), the state's transportation capital improvement program, lists the schedule of transportation projects for the four-year period from 2002 to 2005. The Final 2002-2005 STIP identifies curve corrections along OR 140 for Deep Creek Canyon to be completed in fiscal year 2005. Since the Deep Creek project is included in the 2002-2005 STIP, the Deep Creek Canyon project will not be analyzed as part of this project, but will be listed in the TSP as a high priority project. The analysis undertaken by ODOT and reflected in the *Transportation Corridor Analysis of Highway 140 East of Klamath Falls to the Nevada Border*, will suffice for inclusion in the TSP.

Impacts: The proposed curve improvements near Deep Creek Canyon, Greaser Canyon, and Doherty Slide will result in removal of the truck length restrictions along OR 140. In addition to allowing trucks to use the highway these curve improvements should increase safety and overall driver comfort experienced during travel along this highway.

Cost: Planning level costs were determined for the three projects as part of the *Transportation Corridor Analysis of Highway 140 East of Klamath Falls to the Nevada Border*. The project costs are shown below. Two levels of improvements were calculated:

- Base improvements required to remove truck restrictions along OR 140; and
- Additional improvements to substandard locations which would improve safety along OR 140 (unrestricted truck usage).

The costs for both levels of improvement as well as the total are summarized in **Table 6-1**.

TABLE 6-1
PLANNING LEVEL COST FOR CURVE IMPROVEMENTS ALONG OR 140

Location	Project Description **M**.-Minimum **A**.-Additional	Mileposts	Minimum Improvements Necessary to Remove Truck Length Restrictions ($ Millions)	Additional Improvements to Safely Accommodate Unrestricted Truck Traffic ($ Millions)	Total Minimum Improvements and Safety Improvements ($ Millions)
Deep Creek (Warner Canyon)	**M**. - Straighten out hairpin turns to acceptable geometric standards. **A**. - Optimally, correct entire alignment.	15 - 28	$12.0	$10.5	$22.5
Greaser Canyon - Blizzard Gap[1]	**M**.- Curve realignment. **A**.-Straighten out curves to acceptable geometric standards.	28.3 - 53	$2.0	$6.5	$8.5
Doherty Slide	**M**. - Straighten out 44 relatively sharp curves to acceptable geometric standards and add guardrail.	53 - 57	$8.6	-	$8.6
Total			**$22.6**	**$17.0**	**$39.6**

1. Costs may increase significantly due to location is in a wilderness study area, harbors a potentially endangered species, and is a Native American archeological site.

Source: ODOT- Transportation Corridor Analysis of Highway 140 East of Klamath Falls to the Nevada Border, page 31

Recommendation: The minimum curve improvements at Deep Creek, Greaser Canyon and Doherty Slide would remove truck length restrictions, while the additional improvements would allow these two locations to safely accommodate unrestricted truck traffic.

Priority: High.

Project 2. Safety Improvements along OR 140 (Klamath Falls-Lakeview Highway)

Overview: ODOT and the South Central Oregon Regional Partnership members have identified three areas for improvement along OR 140 within Klamath County. The three locations include Dairy Curves, Beatty Curves, and Bly Mountain. Similar to the locations identified in Project 1, these locations are comprised of relatively sharp curves, limited shoulders, relatively narrow lanes, and limited guardrail. These three identified areas for improvement are not addressed in this document because they are located in Klamath County.

TAC members as well as Lake County residents (stakeholders) indicated that one location along OR 140 within Lake County had similar characteristics. This location, Antelope Canyon located between mileposts 83 - 84.7, is comprised of relatively sharp curves, relatively narrow lanes, and limited shoulders. The posted speed along the statewide level highway (OR 140) is 55 mph. This project would involve moving the road away from the river to allow for shoulder widening and adding guardrail. Additionally, localized curve improvements will be included with this project.

ODOT's crash database indicates that within the two-mile length of Antelope Canyon, OR 140 had just three reported crashes within the five-year period from 1996 through 2000. All three of the crashes occurred on the curve section near MP 84 and involved eastbound traffic. Two of the crashes occurred under ice/snow conditions. Two of the crashes were a result of excessive speed and the other crash was a rear-end crash caused by following too close on ice.

Impacts: The proposed improvements through Antelope Canyon should improve sight distance, safety, and overall driver comfort experienced during travel along OR 140 (Klamath Falls-Lakeview Highway).

Cost: The estimated cost to move the road, add shoulders and guardrail, and localized curve improvements through Antelope Canyon was estimated by ODOT representatives to cost between $2,500,000 and $3,500,000.

Recommendation: Although this stretch of highway has a low crash rate and does not have a serious crash history as evidenced by only three crashes over a five-year period, the highway geometry and local concern merit the improvements through Antelope Canyon. ODOT should strive to complete the proposed improvements through Antelope Canyon described herein within the 20-year planning horizon, phasing in the improvements incrementally by ODOT maintenance forces as possible.

Priority: Low.

Project 3. Ongoing Pavement Replacement

Overview: ODOT monitors the condition of its pavements on a biennial basis by conducting pavement condition surveys. The information obtained from the condition surveys provides ODOT with a measure of the current health of the state highway system. The pavement condition data also enables ODOT to track pavement performance and determine rehabilitation and funding needs on a system-wide basis. As summarized in Chapter 3, of the nearly 305 miles of state highways in Lake County, approximately 68 percent of all highway mileage meets ODOT's standard of "fair or better." With 5 percent of the highway mileage under construction during 2001, the remaining 27 percent (80 miles) of highway mileage in Lake County were classified as being in poor condition.

TAC members have identified implementing an ongoing pavement replacement plan to cover the 20-year planning horizon rather than identifying specific locations for pavement replacement. Location identification as well as pavement replacement will be conducted by ODOT staff.

Impacts: This project would improve community livability and driver safety for the residents of Lake County.

Cost: Based on discussions with ODOT Region 4 staff, the unit cost to simply overlay an existing road is approximately $110,000 per lane mile assuming a 2-inch hot mix asphalt concrete overlay. A 12-foot wide lane that is one-mile long represents one lane-mile.

The total cost to complete pavement replacement was not calculated since the ongoing pavement replacement projects will be completed within the 20-year planning period. Final project scoping will be completed by ODOT. This project will be funded through ODOT's STIP.

Recommendation: ODOT should strive to complete pavement replacement projects within the 20-year planning horizon. Currently, approximately 27 percent (80 miles) of highway mileage in Lake County is in poor condition. The eight sections of state highways currently rated in poor condition are summarized below:

- US 20 between Deschutes County line (MP 69.25) and MP 75;
- OR 31 (Fremont Hwy) between MP 30.5 and MP 42.7;
- OR 31 (Fremont Hwy) between MP 58.0 and Drury Lane (MP 67.8);
- OR 31 (Fremont Hwy) between Harvey Ranch (MP 86.9) and MP 95;
- US 395 between Harney County line (MP 35.7) and Lake Abert (MP 73.7);

- US 395 between Lake Abert Road (MP 87.7) and OR 31 (Fremont Highway);
- OR 140 (Warner Hwy) between Drake Creek (MP 21.3) and MP 24; and
- OR 140 (Warner Hwy) between MP 40 and Blizzard Gap (MP 43.7).

Priority: This project will be completed by ODOT maintenance staff periodically within the 20-year planning period.

Project 4. Intersection Improvements for the intersection of US 395 (Fremont Highway) and OR 140 (Warner Highway)

Overview: The project was identified by TAC members to improve intersection safety for the intersection of US 395 (Fremont Highway) and OR 140 (Warner Highway). The intersection is located at milepost 138.32 along US 395. Recent work has been completed to improve intersection safety and operations for this intersection. This work included oversized STOP signs and placing a flashing light on STOP AHEAD signs. Additional safety improvements could include travel lane rumble strips, painted traffic islands or delineators to direct traffic, and possibly add left-turn and right-turn lanes along US 395 (Fremont Highway). **Figure 6-2** provides an existing view of the intersection.

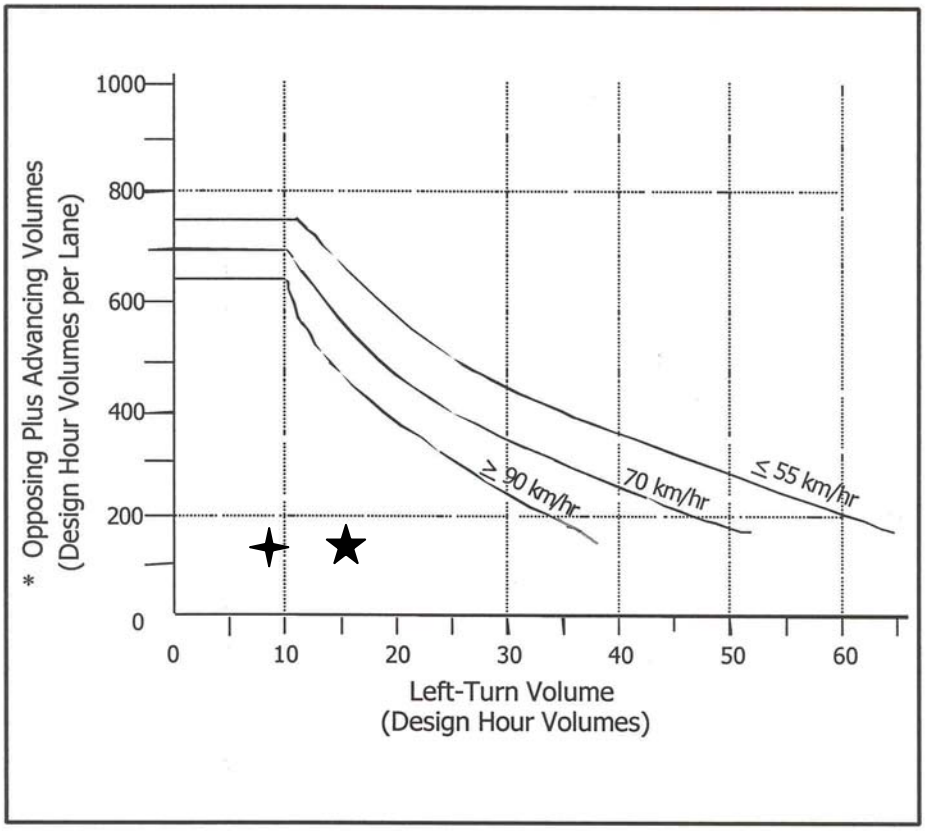
Figure 6-2. Existing Layout for Intersection of US 395 and OR 140 (looking west from OR 140)

ODOT's left-turn lane criteria were evaluated to determine if a southbound left-turn lane is warranted along US 395. The criteria state that a left-turn lane should be installed if one of the following criteria is met:

- **Volumes** - this criterion is intended for application where the combined opposing and advancing traffic volume is the principal reason for considering a left-turn lane. **Figure 6-3** illustrates the left-turn volume curves from ODOT's Design Manual. At the location in question, the existing two-way design hour volume is currently 165 vehicles per hour (vph) and forecast to be 270 vph in 2022. Using the

guidelines from the figure, the opposing plus advancing volume is 83 vph today and forecast to be 135 in the future. Using a 60/40 split for the approaches to the intersection the estimated number of southbound left-turns is approximately 15 vph during the future 2022 design hour. Entering **Figure 6-3** with these two values (135 opposing and advancing traffic volume and 15 left-turns) indicates that for the posted speed of 55 mph the volume criterion is not currently met nor expected to be met in 2022.

- **Crash History** - the left-turn criterion requires a minimum of five ODOT reported crashes of a type amenable to correction by a left-turn lane. Considering there were no ODOT reported crashes at this location over the three-year period from 1998 to 2000, the crash history criterion is not met.
- **Special needs -** the most applicable special need may be geometric/safety needs based on sight distance, alignment, operating speeds, nearby access movements, and other safety-related concerns. A special need has not been demonstrated.



* (Advancing volume + opposing volume)/(2 x number of through lanes in each direction)

★ **- Project 4**

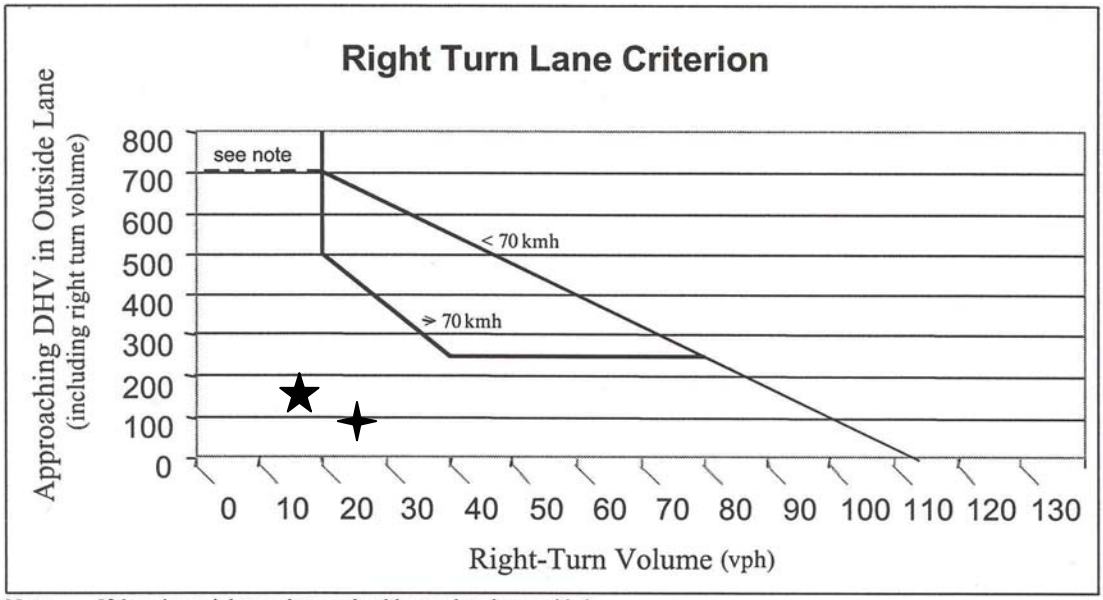
✦ **- Project 5**

Figure 6-3. ODOT Left-Turn Lane Criteria Curve

ODOT states that an exclusive left-turn lane should be considered when it is demonstrated that overall safety and/or operations of the intersection and/or roadway will be improved. Based on this intersection not meeting volume, crash history, or special needs warrants, adding a southbound left-turn lane along US 395 (Fremont Highway) is not recommended at this time.

ODOT's right-turn lane criteria were evaluated to determine if a northbound right-turn lane is warranted along US 395. The criteria state that a right-turn lane should be installed if one of the following criteria is met:

- **Volumes** - this criterion is intended for application where the approaching traffic volume is the principal reason for considering a right-turn lane. **Figure 6-4** illustrates the right-turn volume curves from ODOT's Design Manual. At the location in question, the existing two-way design hour volume is currently 165 vehicles per hour (vph) and forecast to be 270 vph in 2022. Using a 60/40 split and the guidelines from the figure, the approaching volume including right-turns is 100 vph today and forecast to be 165 in the future. At this traffic volume level (165 approaching and 17 right-turns), and with an existing posted speed of 55 mph, over 80 northbound right-turn movements would be required to meet the volume criterion. This criterion is not currently met nor expected to be met in 2022.
- **Crash History** - similar to the left-turn lane criterion, the right-turn crash history criterion requires a minimum of five ODOT reported crashes of a type amenable to correction by a right-turn lane. Again, considering there were no ODOT reported crashes at this intersection over the three-year period from 1998 to 2000, the crash history criterion is not met.
- **Special needs** - the most applicable special need may be geometric/safety needs based on sight distance, alignment, operating speeds, nearby access movements, and other safety-related concerns. A special need has not been demonstrated.



Note: If there is no right turn lane, a shoulder needs to be provided.
If this intersection is in a rural area and is a connection to a public street, a right turn lane is needed.

★ **- Project 4**

✦ **- Project 5**

Figure 6-4. ODOT Right-Turn Lane Criteria Curve

ODOT states that an exclusive right-turn lane should be considered when it is demonstrated that overall safety and/or operations of the intersection and/or roadway will be improved. Based on this intersection not meeting volume, crash history, or special needs warrants, adding a northbound right-turn lane along US 395 (Fremont Highway) is not recommended at this time.

Impacts: Safety improvements including adding travel lane rumble strips, painted traffic islands and/or delineators will improve driver awareness of the approaching intersection.

Cost: Adding rumble strips and traffic islands to the intersection of US 395 and OR 140 (Warner Highway) is estimated to cost between $50,000 and $75,000 by ODOT representatives.

Recommendation: Although the intersection of US 395 and OR 140 (Warner Highway) had zero ODOT reported crashes within the three-year analysis period, the intersection geometry and unreported crash knowledge merits the proposed intersection safety improvements. The proposed project includes adding travel lane rumble strips, painted traffic islands and/or delineators to improve traffic operations and safety through this intersection.

Priority: High.

Project 5. Intersection Improvements for the intersection of OR 31 (Fremont Highway) and US 395 (Lakeview-Burns Highway)

Overview: This project was identified by TAC members as well as ODOT representatives. ODOT's Region 4 operations needs lists identify the need to T-up the intersection of OR 31 (Fremont Highway) and US 395 (Lakeview-Burns Highway) with US 395 T-ing into OR 31. Additionally, TAC members would like to improve intersection safety and operations by adding travel lane rumble strips and possibly adding left-turn and right-turn lanes along OR 31 (Fremont Highway). The intersection is located at milepost 120.57 along OR 31.

ODOT's left-turn lane criteria were evaluated to determine if a southbound left-turn lane is warranted along OR 31. The criteria state that a left-turn lane should be installed if one of the following criteria is met:

- **Volumes** - this criterion is intended for application where the combined opposing and advancing traffic volume is the principal reason for considering a left-turn lane. **Figure 6-3** illustrates the left-turn volume curves from ODOT's Design Manual. At the location in question, the existing two-way design hour volume is currently 120 vph and forecast to be 240 vph in 2022. Using the guidelines from the figure, the opposing plus advancing volume is 60 vph today and forecast to be 120 in the future. Using a 60/40 split for the approaches to the intersection the estimated number of southbound left-turns is less then 10 vph during the future 2022 design hour. Entering **Figure 6-3** with these two values (120 opposing and advancing traffic volume and less than 10 left-turns) indicates that for the posted speed of 55 mph the volume criterion is not currently met nor expected to be met in 2022.
- **Crash History** - there were two ODOT reported crashes over the three-year period from 1998 to 2000. The left-turn criterion requires a minimum of five crashes of a type amenable to correction by a left-turn lane. Besides not meeting the minimum number of crashes, the two crashes that did occur were caused by a driver being asleep and a truck improperly backing into a passenger vehicle. Neither crash would have been prevented had there been a left-turn lane. Therefore, the crash history criterion is not met.
- **Special needs -** the most applicable special need may be geometric/safety needs based on sight distance, alignment, operating speeds, nearby access movements, and other safety-related concerns. A special need has not been demonstrated.

ODOT states that an exclusive left-turn lane should be considered when it is demonstrated that overall safety and/or operations of the intersection and/or roadway will be improved. Based on this intersection not meeting volume, crash history, or special needs warrants, adding a southbound left-turn lane along OR 31 (Fremont Highway) is not recommended at this time.

ODOT's right-turn lane criteria were evaluated to determine if a northbound right-turn lane is warranted along OR 31. The criteria state that a right-turn lane should be installed if one of the following criteria is met:

- **Volumes** - this criterion is intended for application where the approaching traffic volume is the principal reason for considering a right-turn lane. **Figure 6-4** illustrates the right-turn volume curves from ODOT's Design Manual. At the location in question, the existing two-way design hour volume is currently 120 vehicles per hour (vph) and forecast to be 240 vph in 2022. Using a 60/40 split and the guidelines from the figure, the approaching volume including right-turns is 48 vph today and forecast to be 96 in the future with approximately 25 right turns. At this traffic volume level, and with an existing posted speed of 55 mph, over 80 northbound right-turn movements would be required to meet the volume criterion. This criterion is not currently met nor expected to be met in 2022.
- **Crash History** - there were two ODOT reported crashes over the three-year period from 1998 to 2000. As discussed under the left-turn lane criteria, the right-turn crash history criterion requires a minimum of five crashes of a type amenable to correction by a right-turn lane. Besides not meeting the minimum number of crashes, the two crashes that did occur were caused by a driver being asleep and a truck improperly backing into a passenger vehicle. Neither crash would have been prevented had there been a right-turn lane. Therefore, the crash history criterion is not met.
- **Special needs** - the most applicable special need may be geometric/safety needs based on sight distance, alignment, operating speeds, nearby access movements, and other safety-related concerns. A special need has not been demonstrated.

ODOT states that an exclusive right-turn lane should be considered when it is demonstrated that overall safety and/or operations of the intersection and/or roadway will be improved. Based on this intersection not meeting volume, crash history, or special needs warrants, adding a northbound right-turn lane along OR 31 (Fremont Highway) is not recommended at this time.

Figure 6-5 illustrates the existing and proposed intersection configurations for the intersection of OR 31 (Fremont Highway) and US 395 (Lakeview-Burns Highway) near Valley Falls. The proposed intersection configuration does not include an exclusive left-turn lane or right-turn lane based on the intersection not meeting ODOT left-turn and right-turn lane warrants.

Impacts: Safety improvements including T-ing the intersection and adding travel lane rumble strips will improve intersection safety and operations.

Cost: ODOT representatives estimate the cost to T-up US 395 into OR 31 as well as add travel lane rumble strips is approximately $150,000 to $200,000.

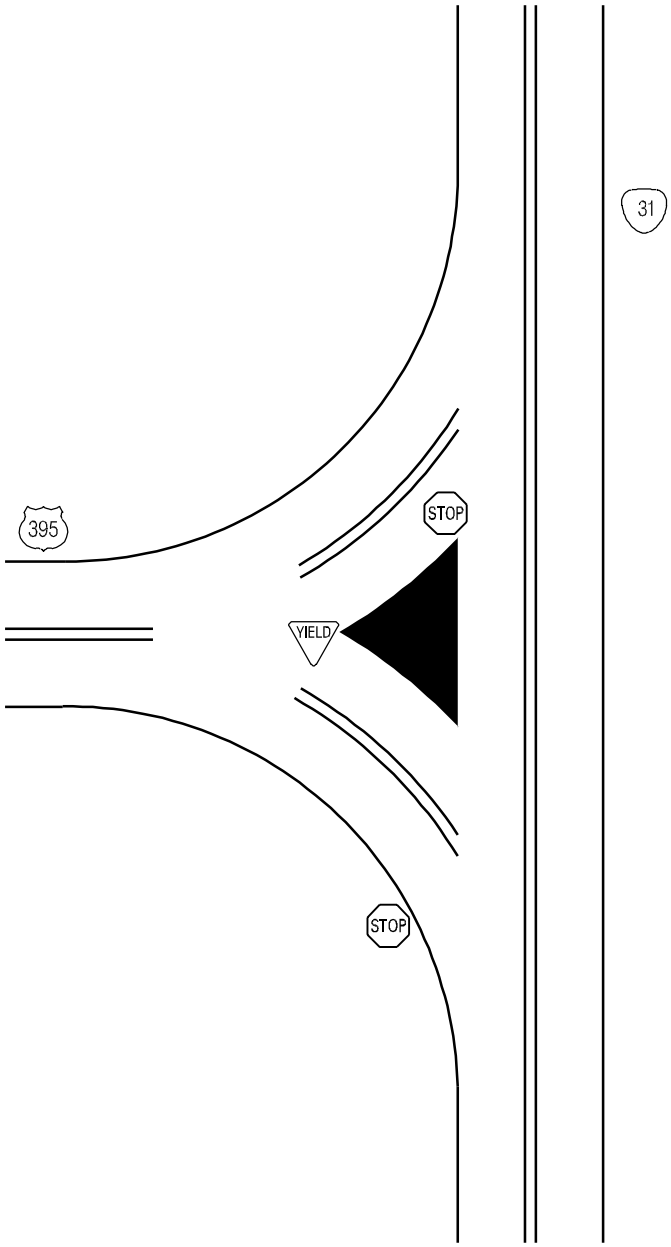
Recommendation: Although the intersection of OR 31 (Fremont Highway) and US 395 (Lakeview-Burns Highway) has a low crash rate and does not have a serious crash history as evidenced by only two crashes over the three-year analysis period, the intersection geometry and local crash knowledge merits the proposed intersection safety improvements. The proposed safety improvements including T-ing the intersection and adding travel lane rumble strips will improve intersection operations and safety by reducing the number of conflict points for the intersection of OR 31 (Fremont Highway) and US 395 (Lakeview-Burns Highway).

Priority: High.

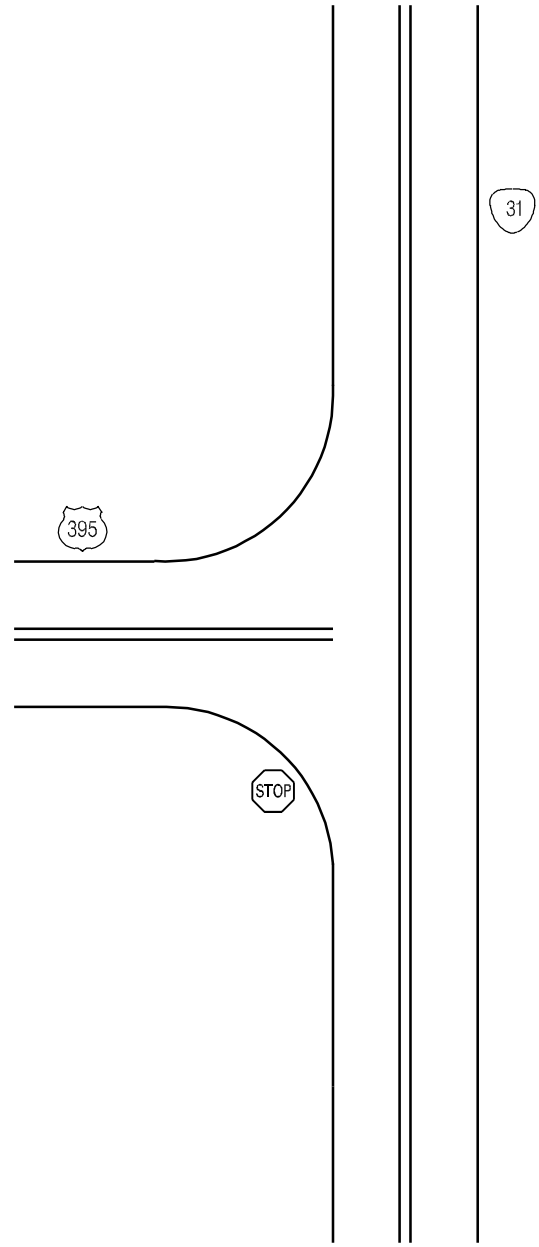
LEGEND:

The final design shall be in accordance with ODOT standards.

EXISTING T-INTERSECTION



PROPOSED T-INTERSECTION



NORTH

(not to scale)

FIGURE 6-5

T-Intersection Design

Lake County TSP

Project 6. Enhance existing chain-up area along OR 140 (Klamath Falls-Lakeview Highway) at Drews Valley and allow for School Bus Turnaround

Overview: TAC members have identified the need for a school bus turnaround near Tracy Loop Road, approximately 20 miles west of Lakeview on OR 140 (Klamath Falls-Lakeview Highway). Tracy Loop Road is a loop road that travels out of direction on dirt roads before returning to Lakeview from the southwest near West Side. Currently, the school bus either performs a three-point turn at Tracy Loop Road or turns around in existing homeowners' driveways. Providing a bus turnaround will increase safety for the school bus as well as traffic along the highway. Another factor affecting this project is the winter weather conditions. ODOT snowplows first travel eastbound from Lakeview along OR 140 before returning to Lakeview and plowing westbound along OR 140. With the current locations of the school bus turnarounds (south side of OR 140), the school bus has trouble during winter weather conditions.

Considering the needs of the school bus may vary year to year depending upon school enrollment the TAC has modified this project to combine the school bus turnaround with the enhancement of the existing chain-up area at Drews Valley. The existing chain-up area along OR 140 at Drews Valley is located approximately 23 miles west of Lakeview at milepost 72.8. Although combining the turnaround with the existing chain-up area at Drews Valley will require more out of direction travel for the school bus, the project will enhance the existing chain-up area as well as allow the school bus to turnaround on site throughout the year including during winter weather conditions considering ODOT will plow the site on the way out of Lakeview. The enhanced chain-up area including a school bus turnaround is shown in **Figure 6-6**.

Impacts: Enhancing the chain-up area will increase the safety for vehicles by allowing more vehicles a place to chain-up along OR 140 (Klamath Falls-Lakeview Hwy) at Drews Valley. In addition, providing a bus turnaround will increase safety for the school bus as well as traffic along the highway. The proposed bus turnaround will eliminate the need for the school bus to execute a three-point turn along the highway.

Cost: ODOT representatives estimated the cost to enhance the existing chain-up area along OR 140 at Drews Valley which will include enough room for the school bus turnaround would be approximately $100,000. The final cost will depend on final design, right-of-way costs, and if the project can be included with a project nearby.

Recommendation: Based on increased safety, the enhancement of the existing chain-up area along OR 140 at Drews Valley which will allow the school bus turnaround should be provided.

Priority: Medium.

Project 7. Improve Directional Signing to US 97 along Bear Flat Road

Overview: TAC members identified the need to improve directional signing to US 97 along Bear Flat Road. Travelers tend to mistake other roads in the area for Bear Flat Road which accesses US 97. This is especially problematic for freight trucks that take the incorrect road and must be towed out. Bear Flat Road is currently signed for US 97, as shown in **Figure 6-7**.

Figure 6-7. Existing signing for Bear Flat Road

Direction signing to US 97 can be improved by adding a route sign including directional arrow. An example of a route sign including a directional is shown in **Figure 6-8**. This type of sign identifies understandable directions to the traveling public. The final design and placement of the signs shall follow the *Manual on Uniform Traffic Control Devices (MUTCD) and the Oregon Supplements*. In addition, advance signs such as US 97 52 miles ahead could improve directional signing to US 97.

Figure 6-8. Example of Route Designation Sign and Directional Arrow Sign

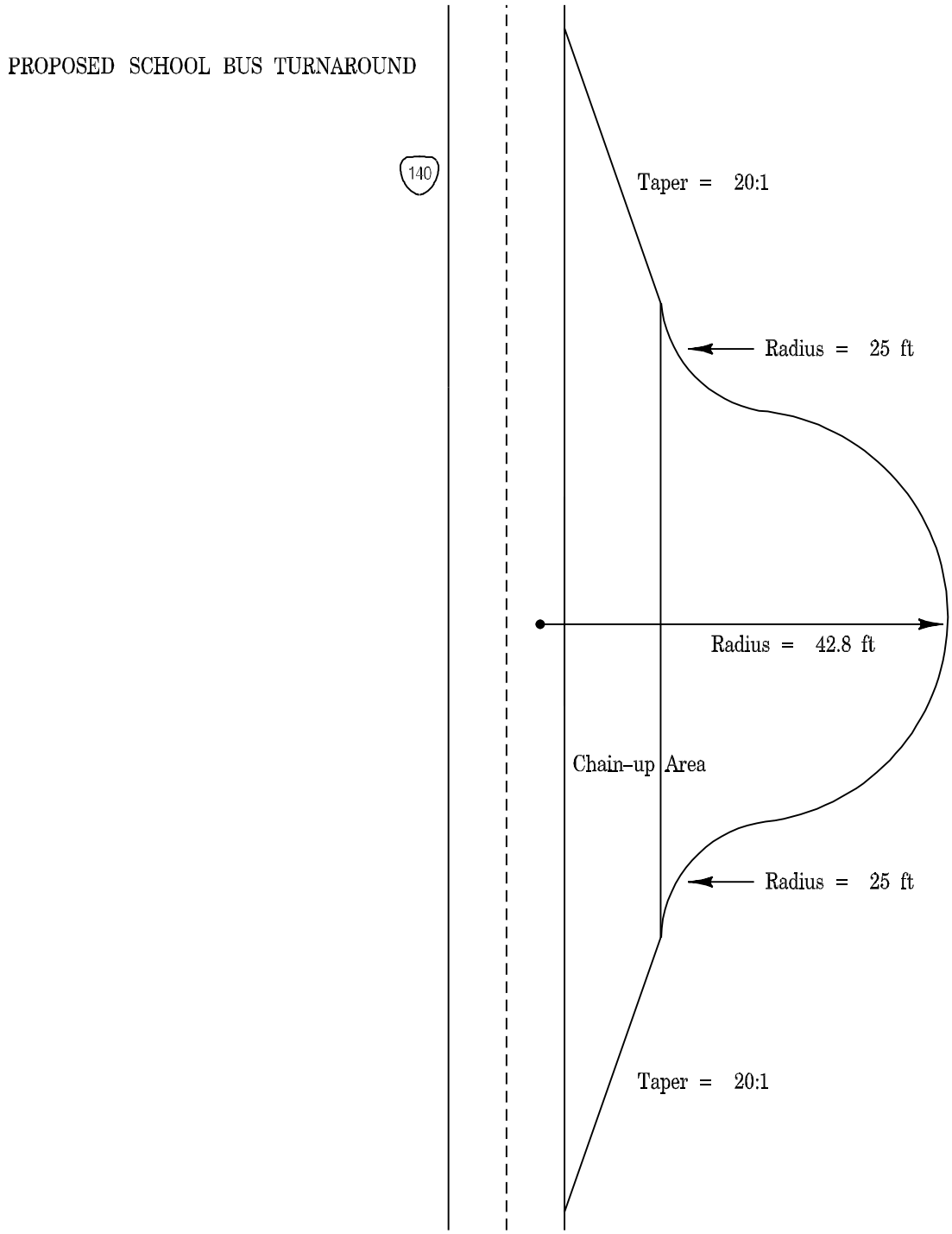
Impacts: Installing advance signs as well as modifying existing route designation signs to increase importance will improve driver recognition.

Cost: Installation of US 97 route designation signs is estimated to cost between $1,000 and $1,500.

Recommendation: It is recommended that ODOT install the recommended advance signs as well as modify existing route designation to US 97. Final placement shall be determined by ODOT in accordance with the *MUTCD and the Oregon Supplements*.

Priority: High.

LEGEND:



*Used AASHTO minimum turning path for a Large School Bus (S–BUS–40). The bus can hold 84 passengers.

**The final design shall be in accordance with ODOT standards.

NORTH
(not to scale)

FIGURE 6–6

Enhance Existing Chain–up Area and Add School Bus Turnaround at Drews Valley

Lake County TSP

Project 8. Improve Directional Signing throughout Lake County

Overview: TAC members as well as local residents (stakeholders) identified the need to improve signing throughout Lake County on state highways, county roads, BLM roads, and US Forest Service roads. An example of appropriate directional signing indicating distance and direction to specific locations is shown in **Figure 6-9**.

Figure 6-9. Example of Directional Signing identifying Distance and Direction to Specific Locations

Impacts: Directional signing throughout Lake County will improve driver recognition and safety.

Cost: The estimated cost to install signs throughout Lake County could range between $500 and $1,500 per sign.

Recommendation: ODOT, Lake County, BLM, and US Forest Service should make a conscious effort to improve signing throughout Lake County to improve driver recognition and safety. Each jurisdiction could budget $5,000 to $10,000 per year to improve signing throughout Lake County. Final sign placement shall be in accordance with the *MUTCD and the Oregon Supplements*.

Priority: This project should be completed through routine maintenance by each of the agencies within the 20-year planning period.

Project 9. Install Exclusive Left-turn Lanes to the Lake County Department of Correction Facility from US 395, north of Lakeview

Overview: The Oregon Department of Corrections (DOC) has received approval to build a minimum security correctional institution housing approximately 400 beds. The proposed work camp facility will be located about three miles north of Lakeview on the west side of County Road 2-18, about one-half mile west of US 395. Access to the DOC facility will be provided via a new access road that connects with County Road 2-18. Construction of the DOC facility began in 2002 with full build-out anticipated by the year 2004.

The proposed DOC facility can be accessed from the state highways from three locations including:

- County Road 2-17, connects US 395 to County Road 2-18 just south of the site;

- County Road 2-18A connects US 395 to County Road 2-18 further south of the site; and
- County Road 2-18 connects to Missouri Avenue, then south along Roberta Avenue to OR 140 (Klamath Falls-Lakeview Hwy). - This intersection is located within the Lakeview Urban Growth Boundary (UGB) and will therefore not be addressed in the Lake County TSP.

Please refer to **Figure 6-10** for a schematic of the proposed DOC facility and state highway accesses.

The Lakeview Minimum Security Work Camp Traffic Impact Analysis (TIA) was completed in January 2002. The TIA addressed the following:

- Year 2001 existing transportation system conditions;
- Planned developments and transportation improvements within the site vicinity;
- Forecast year 2004 background traffic conditions;
- DOC trip generation and trip distribution;
- Forecast year 2004 total traffic conditions including the DOC minimum security facility;
- Left-turn lane warrant analysis and deceleration lane analysis; and
- Conclusions and recommendations.

Operational analysis was performed at the three state highway accesses mentioned above as well as four other intersections based on input from ODOT, Lake County, and the Town of Lakeview representatives. Under current, background, and total traffic conditions, all of the study intersections are forecast to operate within acceptable operating standards during both a.m. and p.m. peak hours. The left-turn lane warrant analysis prepared for the intersections of US 395 and County Road 2-17 and US 395 and County Road 2-18A indicated that neither of these intersections warranted a left-turn lane upon full build-out. Additionally, right-turn lane deceleration warrants were analyzed and found to not be warranted at the same two state highway intersections located outside of the Lakeview UGB. Please refer to the Lakeview Minimum Security Work Camp TIA for additional information.

Impacts: Adding exclusive left-turn lanes at the two proposed intersections could improve safety by reducing the speed differential between through and turning traffic by providing a waiting area for turning traffic until an acceptable gap occurs in the opposing traffic stream. This can result in a reduction in rear-end and other crashes.

Cost: The 1999 Oregon Highway Plan (OHP) estimated the cost to construct an exclusive left-turn lane on a two-lane highway is $150,000.

Recommendation: Based on the Department of Corrections TIA performed by Kittelson and Associates, exclusive left-turn lanes are not warranted at the following two intersections:

- US 395 and County Road 2-17 (MP 139.72); and
- US 395 and County Road 2-18A (MP 140.73).

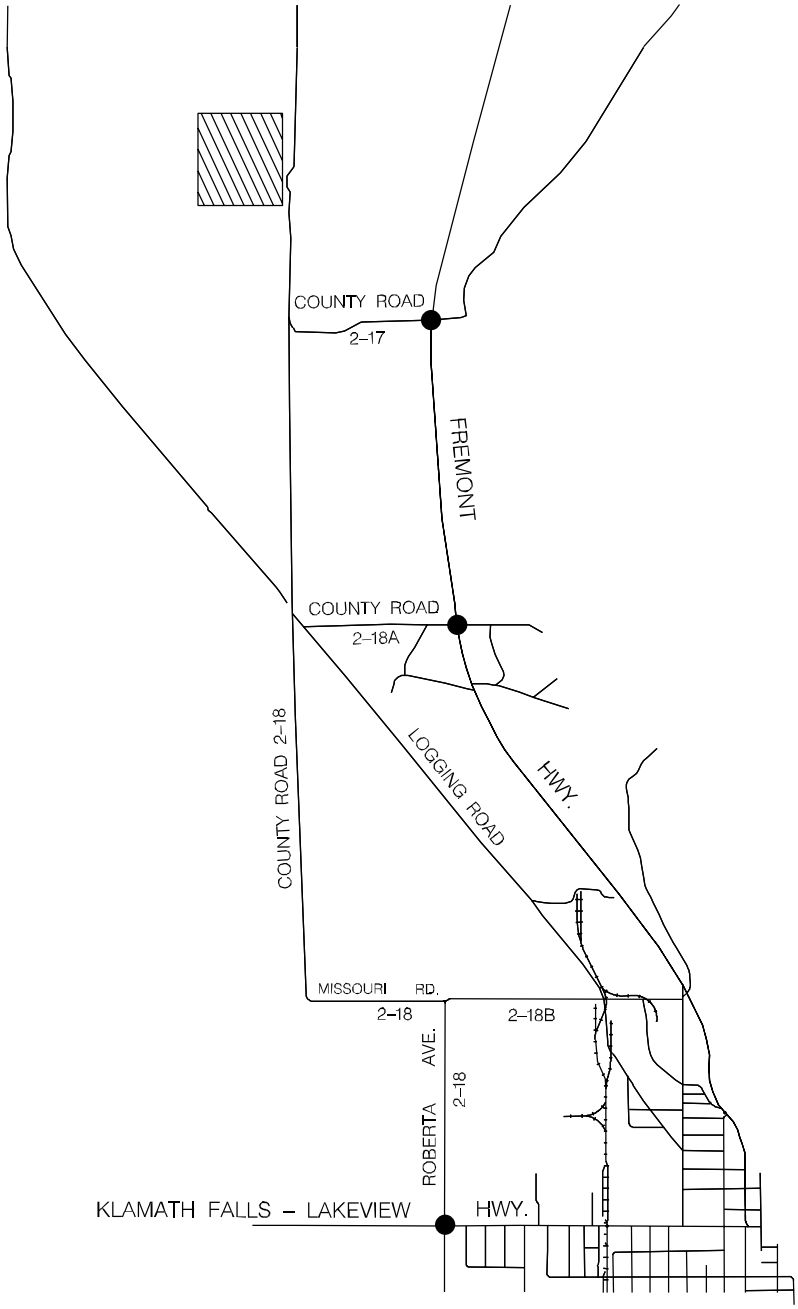
Exclusive left-turn lanes at the proposed highway accesses should be re-analyzed once the DOC facility opens.

Priority: None.

LEGEND:

Department of Corrections Facility

State Highway Intersections Accessing DOC Facility



NORTH
(not to scale)

FIGURE 6–10

DOC Site Access

Lake County TSP

Project 10. Upgrade Substandard Shoulders along State Highways

Overview: This project was identified to upgrade substandard shoulders along the state highways in Lake County. Based on existing and forecast traffic volumes, a minimum of four-foot directional paved shoulders are recommended along all state highways within Lake County according to ODOT Highway Design Standards.

The justification for this improvement is to bring shoulder widths up to the current design standard. Wider shoulders improve safety for motorized vehicles by providing a recovery area for drivers who stray outside the travel lanes and by providing improved sight distance and clear zones. Wider shoulders improve safety for bicyclists and pedestrians by reducing conflict points with motorized vehicles.

Based on review of ODOT's Highway Performance Management System (HPMS), ODOT's Highway Design Manual, and the *1997 Oregon Bicycling Guide Map*, the majority of state highway miles in Lake County have shoulders measuring less than four feet wide meaning that they do not meet ODOT design standards nor do they serve as shoulder bikeways. This does not necessarily make them inadequate for bicycle use, but generally requires bicyclists to share the roadway with motor vehicles. Where shoulders meet the recommended widths in the 1995 Oregon Bicycle and Pedestrian Plan, they will serve as shoulders bikeways.

Recommended shoulder widths follow guidelines outlined in the ODOT Highway Design Manual and the *1995 Oregon Bicycle and Pedestrian Plan* as summarized in **Table 6-2**.

TABLE 6-2
RECOMMENDED PAVED SHOULDER WIDTHS ON RURAL HIGHWAYS

Traffic Volumes	(Highways)
ADT under 250	4 ft
ADT 250-400	4 ft
ADT over 400 and DHV* under 100	6 ft
DHV 100-200	6 ft
DHV 200-400	8 ft
DHV over 400	8 ft

* DHV (Design Hour Volume) is the expected two-way traffic volume in the peak design hour (usually at commuter times), usually 10 to 20% of ADT.

Source: ODOT Highway Design Manual, Table 4-5(r); Oregon Pedestrian and Bicycle Plan, page 67

Where highway shoulders do not meet ODOT Highway Design Manual guidelines, appropriately wide paved shoulders should be added to each side of the highway as routine maintenance and/or rehabilitation projects occur.

Impacts: The addition of appropriately wide shoulders will improve safety for bicyclists, pedestrians, and motorists along state highways and improve pavement stability near the travel lanes.

Cost: The estimated cost to install 4- to 8-foot paved shoulders along both sides of the state highways in Lake County could range from $200,000 to $250,000 per mile. The $200,000 per mile cost assumes that narrow gravel shoulders exist today and require limited shoulder preparation prior to paving with 4-inches of asphalt. The $250,000 per linear foot cost assumes the shoulders do not exist today and would need to be constructed with 9-inches of aggregate and 4-inches of asphalt.

Based on review of available data, approximately 90 percent of the 305 state highway centerline miles (or 275 centerline miles) will require some level of shoulder widening over the next 20 years to meet established ODOT design standards. Assuming an average cost of $225,000 per mile to account for various degrees of needed construction, shoulder widening could conceivably cost $62 million in 2002 dollars. Costs may be reduced if ODOT deviates from established design standards and builds only 4-foot shoulders. Costs may increase depending on special construction requirements. It should be noted that shoulder widening as part of a larger roadway project can be substantially more economical to construct.

Recommendation: Appropriately wide shoulders should be added to both sides of the highway as routine maintenance and/or rehabilitation projects occur.

Priority: This project will be completed as routine maintenance and/or rehabilitation projects occur.

Project 11. Localized Shoulder Improvements along State Highways

Overview: This project differs from Project 10 in that it identifies priority localized shoulder widening projects along state highways in Lake County to be completed prior to routine maintenance or rehabilitation projects. Standard shoulders are typically added to state highways when the roadway (paved surface) is widened. The justification for this improvement is to improve safety for bicyclists and pedestrians by reducing conflict points with motorized vehicles.

TAC members and stakeholders have identified primary locations to receive localized shoulder widening as illustrated in **Figure 6-11** and described below:

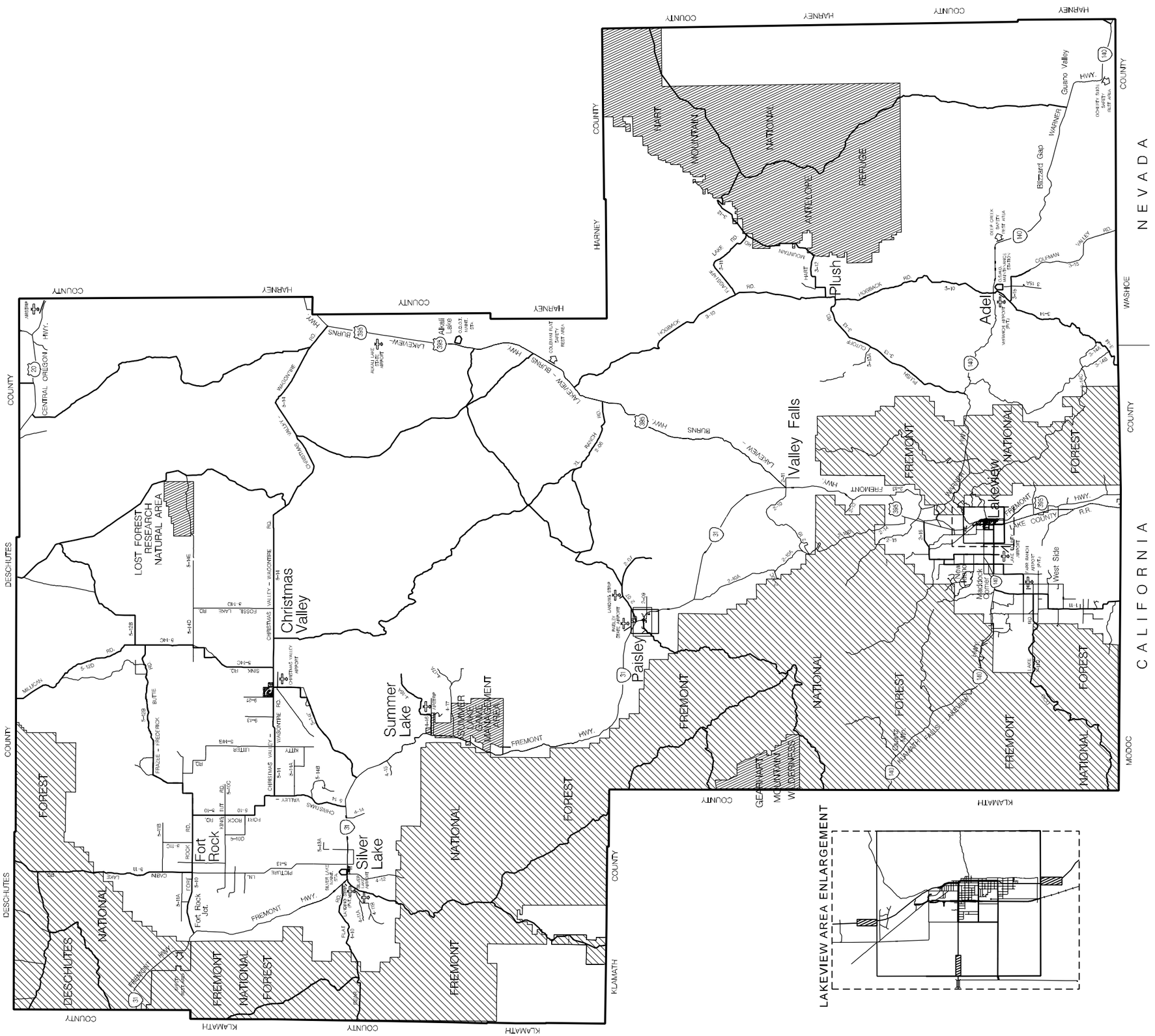
- Priority one locations: each side of state highways for a distance of ½ mile beyond the Lakeview UGB in each direction. (These areas generally have higher bike and pedestrian usage than other more remote parts of the county road system.)

Impacts: The addition of appropriately wide shoulders will improve safety for bicyclists, pedestrians, and motorists along state highways.

Cost: A detailed cost estimate was calculated for the localized shoulder improvement projects within Lake County. **Table 6-3** summarizes the localized projects shoulder cost estimate. The estimated cost to install 8-foot paved shoulders along both sides of the state highways in Lake County could cost between $200,000 and $250,000 per mile. Costs may increase depending on special construction requirements. It should be noted that shoulder widening as part of a larger roadway project can be substantially more economical to construct.

TABLE 6-3
LOCALIZED PROJECT SHOULDER COST ESTIMATE

Highway (Location)	Action	Side of Highway	Total Length (miles)	Unit Cost per Mile	Total Cost
Priority 1					
US 395 - north of Lakeview UGB (MP 140.73 - 140.23)	Add 8' paved shoulders	Both	0.5	$250,000	$125,000
US 395 - south of Lakeview UGB (MP 145.1 - 145.6)	Add 8' paved shoulders	Both	0.5	$250,000	$125,000
OR 140 - west of Lakeview UGB (MP 94.5 - 94.0)	Add 8' paved shoulders	Both	0.5	$250,000	$125,000
	Total		**1.5**		**$375,000**



LEGEND:

LOCALIZED SHOULDER IMPROVEMENTS -

PRIORITY 1

FIGURE 6-11

Lake County Shoulder Improvements along State Highways

LAKE COUNTY TSP

ODOT0386/fig6-11.dgn/RSLP/12-12-02

Source: ODOT provided cost estimates and needed widths, DEA computed overall costs.

Recommendation: Lake County should strive to complete the localized shoulder widening projects described herein within the 20-year planning horizon.

Priority: Medium

Project 12. Add Bike Lanes along County Roads

Overview: This project identifies specific locations for bike lanes to be added along County Roads. State highways and paved county roads with shoulders less than four feet wide constitute a shared roadway facility where motor vehicle traffic and bicyclists share the roadway. Four- to eight-foot paved shoulders typically allow bicyclists to ride far enough from the edge of pavement to avoid debris and avoid conflict with passing vehicles.

The only dedicated bicycle facility in Lake County is along Roberta Avenue within the Lakeview Urban Growth Boundary (UGB). The total length of the bike lane is approximately one mile. TAC members identified the following locations for bike lanes:

- ½ mile long bike lane on Old Lake Road (5-14F) between Christmas Valley-Wagontire Road (5-14) and proposed Christmas Valley Park;
- 800 ft. long bike lane on Christmas Tree Lane (9-15) between Christmas Valley-Wagontire Road (5-14) and the Library;
- 3000 ft. long bike lane on Christmas Valley-Wagontire Road (5-14) between Old Lake Road (5-14F) and the Post Office;
- 3.5 mile bike lane along Stock Drive (1-10) between Lakeview UGB and Westside Road; and
- 1 mile bike lane along Lakeridge Road (2-16) between OR 140 and Stock Drive.

Considering that adding bike lanes to Stock Drive as proposed would require widening four bridges the bicycle lanes should be dropped at the bridges.

Impacts: The addition of bike lanes will improve safety for bicyclists.

Cost: The estimated cost to overlay the road and install five-foot bike lanes along both sides of the road for 1 mile is $167,000. This cost includes labor, equipment, and material costs for fill and paving. The total cost would be reduced if the shoulders (i.e., subbase) required less fill material.

Therefore, the estimated costs for each of the five proposed bike lane projects are:

- ½ mile long bike lane along Old Lake Road (5-14F)- $83,500
- 800 ft long bike lane along Christmas Tree Lane (9-15) - $25,300
- 3000 ft long bike lane along Christmas Valley-Wagontire Road (5-14) - $94,900
- 3.5 mile bike lane along Stock Drive (1-10)- $584,500
- 1 mile bike lane along Lakeridge Road (2-16) - $ 167,000

Recommendation: Lake County should strive to complete the proposed bike lane projects described herein to promote bicycle usage within the 20-year planning horizon.

Priority: Bike lane projects were prioritized by the TAC individually rather than grouped together.

- ½ mile long bike lane along Old Lake Road (5-14F) - Medium Priority
- 800 ft long bike lane along Christmas Tree Lane (9-15) - Medium Priority
- 3000 ft long bike lane along Christmas Valley-Wagontire Road (5-14) - High Priority
- 3.5 mile bike lane along Stock Drive (1-10) - Low Priority
- 1 mile bike lane along Lakeridge Road (2-16) - Low Priority

Project 13. Investigate Options to address S-Curve on County Road #5-14 in Christmas Valley

Overview: County staff and public representatives (stakeholders) identified the need to address the s-curve located along County Road #5-14 (Christmas Valley-Wagontire Road) approximately three to five miles west of Christmas Valley. This location has had a number of crashes over the years including some fatalities. Typically, the crashes involved locals rather than drivers unfamiliar with the road. Lake County is currently obtaining more right-of-way near the s-curve, but due to the development in the area, the County will not be able to straighten County Road #5-14. The s-curve has a posted advisory speed of 35-mph through the curves. Possible minor modifications include increasing shoulder widths and/or adding guardrail.

Impacts: The addition of appropriately wide shoulders will improve safety for motorists as well as bicyclists, and pedestrians along Christmas Valley-Wagontire Road. Besides allowing more recovery zone, wider shoulders will improve pavement stability near the travel lanes.

Guardrails are used to shield motorists from obstacles or slopes located along either side of the roadway. Guardrails are not warranted considering the area near the s-curve is generally clear, unobstructed, and flat.

Cost: The estimated cost to add 10 feet of shoulders, five feet on both sides or possibly three feet on the inside shoulder and seven feet on the outside shoulder, would range between $50,000 - $75,000 per mile. Considering the s-curve section is less then ½ mile the project cost would be between $25,000 and $37,500.

Recommendation: The road should be overlayed and shoulders widened along both sides of Christmas Valley-Wagontire Road through the s-curve within the 20-year planning horizon.

Priority: Low.

Project 14. Pavement Preservation Projects along US 395 (Lakeview-Burns Highway)

Overview: TAC members and ODOT representatives identified this project to address pavement preservation projects along low ADT highways. ODOT monitors the condition of its pavements on a biennial basis by conducting the pavement condition surveys. The information obtained from the condition surveys provides ODOT with a measure of the current health of the state highway system. The pavement condition data also enables ODOT to track pavement performance and determine rehabilitation and funding needs on a network-wide basis. As summarized in Chapter 3, the pavement sections between MP 36 and MP 74 and between MP 88 and MP 90 are currently rated in poor condition.

Impacts: This project would improve community livability and driver safety along US 395 (Lakeview-Burns Highway).

Cost: Based on discussions with ODOT Region 4 representatives, the unit cost for two-inch cold mix with chip seal ranges between $80,000 to $90,000 per lane mile. A 12-foot wide lane that is one-mile long represents one

lane-mile. It was estimated that approximately 20 miles of US 395 (Lakeview-Burns Highway) requires four inches of cold mix, which costs approximately $160,000 per mile.

The cost for adding four inches of cold mix to the 20-mile section of pavement is approximately $3,200,000. The estimated cost to overlay the remaining 20 miles with two inches of cold mix ranges between $1,600,000 and $1,800,000. Therefore, the total cost to cold mix and chip seal the poor pavement sections along US 395 (Lakeview-Burns Highway) ranges between $4,800,000 and $5,000,000.

Recommendation: ODOT should strive to complete the identified pavement preservation projects along the low ADT highway within the 20-year planning horizon.

Priority: High.

Project 15. Increase Passing Lane Opportunities along OR 31/US 395 (Fremont Highway)

Overview: ODOT Region 4 staff identified the potential need to increase passing lane opportunities along OR 31/US 395 (Fremont Highway). As indicated in Chapter 3 under the state highway section, there are no passing lanes currently located along the 140 miles of Fremont Highway within Lake County. Passing lanes are typically used where there are inadequate passing opportunities either because of sight distance limitation or as traffic volumes begin to approach capacity. Passing lanes tend to reduce unsafe passing maneuvers and may aid in reduction of head-on and sideswipe crashes. The addition of passing lanes can break up the formation of queues for a limited distance.

Impacts: The addition of passing lanes can improve traffic operations along highways and enhance safety by separating faster and slower moving traffic and by allowing better visibility and safety during passing.

Cost: Based on information provided in 1999 OHP, the unit cost to develop a typical passing lane is estimated to cost $650,000 (one direction). Overall project cost would be dependent upon the final design of the project.

Recommendation: Although there are no passing lanes provided along Fremont Highway within Lake County, there are numerous passing locations provided. The terrain is generally flat, the sight distance is substantial, the ADT and percent time-spent-following are low, and the Level of Service is A or B. Based on this information, TAC recommendations, and the expected high project cost, implementation of adding passing lanes along OR 31/US 395 (Fremont Highway) is not recommended at this time.

Priority: None.

Project 16. Intersection Improvements including Signing and Striping Changes for Four Intersections

Overview: TAC members have identified four intersections, in addition to the state highway intersections identified as projects 4 and 5, that require some form of intersection improvements due to crash history. Typically not reported, most of the crashes are caused by vehicles not stopping and as a result the vehicles are traveling across the state highway and running off the road. The four intersections include:

- OR 31 (Fremont Highway) at Fort Rock Road (MP 29.26);
- OR 31 (Fremont Highway) at Bear Flat Road (MP 45.87);
- OR 31 (Fremont Highway) at Christmas Valley-Wagontire Road (MP 53.97); and
- US 395 (Lakeview-Burns Highway) at Christmas Valley-Wagontire Road (MP 37.39).

Intersection improvements could include adding larger STOP signs, STOP AHEAD signs, double arrow signs, travel lane rumble strips, and flashing lights to identify the stop ahead. TAC representatives have identified a stepped approach to the recommended improvements:

- High Priority - larger STOP signs, STOP AHEAD signs, and double arrow signs (ODOT responsibility)
- Medium Priority - travel lane rumble strips (County responsibility)
- Low Priority - flashing lights (ODOT responsibility)

The stepped approach involves first trying the high priority improvements to see if those will lower the crash rates. If those do not lower the crash rates the next step involves trying the medium priority improvements. Similarly, if those improvements do not lower the crash rate then the next step involves trying the low priority improvements.

Impacts: The intersection improvements discussed above would improve the overall safety of the intersection and would likely decrease crash frequency at the four identified intersections.

Cost: ODOT representatives estimate the cost to add larger STOP signs, STOP AHEAD signs, and double arrow signs is approximately $2,500 per intersection. The cost to add travel lane rumble strips is estimated to cost $2,500 per intersection, while the cost to add flashing lights was estimated to cost $5,000 per intersection. Considering the stepped approach to intersection improvements the total cost could range between $2,500 and $10,000 per intersection. Therefore, the estimated total cost for the proposed intersection improvements at the four intersections ranges between $10,000 and $40,000.

Recommendation: The stepped approach to intersection improvements, which should improve the overall safety of the four intersections described herein, should be completed within the next 20-year planning horizon.

Priority: Follow the TAC recommended stepped approach to lower the crash rates at each of the four identified intersections.

Project 17. Improve Sidewalk Connectivity in the City of Paisley and Rural Community of Silver Lake

Overview: The most basic transportation option is walking. However, it is not often considered as a means of travel. The presence of sidewalks is generally lacking in the City of Paisley and the rural community of Silver Lake. On low volume, primarily residential, local roadways, pedestrians and autos can generally both safely share the roadway. On higher pedestrian use routes, sidewalks can help provide pedestrians with a stronger sense of safety since they are physically separated from the traveled roadway.

Local representatives from Paisley have identified primary locations to receive sidewalks. The two locations are between the Assembly of God Church (MP 98.28) and the Saloon (MP 98.46) on the west side of OR 31 and between the Saloon (MP 98.46) and the Paisley Ranger Station (MP 98.69) on the south side of OR 31.

For the rural community of Silver Lake, sidewalks are suggested between 1st Street at milepost 47.35 and 10th Street at milepost 47.8.

While some may argue that pedestrian use between certain areas does not support development of sidewalks, others may argue that pedestrian use between these areas is not very high because sidewalks don't exist; and that use would increase upon development of the sidewalk system.

Impacts: The addition of sidewalks along the sections identified would improve connectivity of residential, school, and commercial downtown land uses.

Cost Estimate: The estimated cost to install new sidewalks on one side of an existing street is around $25 per linear foot. This includes a five foot wide sidewalk composed of 4 inches of concrete over 2 inches of aggregate. **Table 6-4** summarizes the pedestrian facility cost estimate.

TABLE 6-4
PEDESTRIAN FACILITIES COST ESTIMATE

Street (Area)	Action	Sidewalk Location	Total Length	Unit Cost per Foot	Total Cost
City of Paisley					
OR 31 - (MP 98.28 - 98.46) Assembly of God Church to Saloon	Construct new sidewalks	West side	950 ft	$25	$23,750
OR 31 - (MP 98.46 - 98.69) Saloon to Paisley Ranger Station	Construct new sidewalks	West side	1215 ft	$25	$30,375
Rural Community of Silver Lake					
OR 31 - (MP 47.35 - 47.8) 1st Street to 10th Street	Construct new sidewalks	West side	2375 ft	$25	$59,375
Total					**$113,500**

Source: City of Paisley representatives and TAC members; overall costs computed by DEA.

Recommendation: Paisley and Silver Lake residents would benefit from improved sidewalk connectivity. A sidewalk system supports and promotes pedestrian travel, which may lead to slightly decreased auto use. Sidewalks also improve pedestrian safety, while maintaining vehicle mobility, by separating pedestrians from the travel way. Sidewalk expansion is recommended in Paisley and Silver Lake.

Priority: Medium.

Project 18. Provide a Rest Area near Lakeview

Overview: Members of the community identified the need for a rest area near Lakeview. The proposed site is along OR 140 (Klamath Falls-Lakeview Highway) near Antelope Canyon, approximately 12-13 miles west of Lakeview. Rest stops provide safe stopping locations for travelers. In addition to using rest areas for a rest room, rest areas are used to rest, to sleep, to eat (picnic-type meal), change clothes, and as information centers (i.e. directions, maps, road conditions, and weather information).

Currently, one year-round and three seasonal (i.e. weather permitting months) rest areas/waysides exist near Lakeview. The four rest areas/waysides are:

- Booth State Park Rest Area- located approximately 12 miles west of Lakeview along OR 140 (Klamath Falls-Lakeview Hwy) at milepost 83.1- Seasonal;
- Chandler Wayside State Park - located 17 miles north of Lakeview on US 395 (Fremont Hwy) at milepost 126- Seasonal;
- Goose Lake State Park - located on Goose Lake near the California State line. To access the facility patrons must exit US 395 (Fremont Hwy) near the California State line and then travel along a county road to Goose Lake (approximately 2-3 miles) - Seasonal; and

- Quartz Mountain Rest Area - located approximately 30 miles west of Lakeview along OR 140 (Klamath Falls-Lakeview Hwy) - Year-round.

Impacts: Rest areas provide safe stopping locations for travelers to use the rest room, to rest, to eat, change clothes, and gather information.

Cost: ODOT representatives have estimated the cost to improve the four existing facilities from seasonal to year round are:

- Booth State Park Rest Area- $50,000
- Chandler Wayside State Park - $100,000
- Goose Lake State Park - $100,000
- Quartz Mountain Rest Area - $20,000

Therefore, the total cost to improve all four existing rest areas/waysides is approximately $270,000. This cost does not include the costs to maintain the facilities. These projects should be funded through Oregon State Parks.

Recommendation: Considering the three existing rest areas and one wayside are located near Lakeview, the TAC recommended improving existing facilities instead of adding a new year-round facility. The TAC recommended modifying the existing seasonal facilities (Booth State Park Rest Area, Chandler Wayside State Park, and Goose Lake State Park) to year-round facilities.

Priority: Low.

Project 19. Address Rockfall Issues, add Shoulders and Guardrail, Curve Flattening near MP 63.5, and Investigate Potential Climbing Lane near Picture Rock Pass along OR 31

Overview: ODOT representatives identified the need to address rockfall issues, add shoulders and guardrail, curve flattening near milepost 63.5, and investigate potential climbing lanes along OR 31 (Fremont Highway) near Picture Rock Pass. These projects have been identified in ODOT's Region 4 operations needs list as high priority.

The rockfall project involves attaching screening/netting along the cliffs that overlook OR 31 (Fremont Highway) to prevent rocks from falling onto the highway. In addition to addressing rockfall issues, this project involves shoulder widening and adding guardrails. Identified in Chapter 3, this section of OR 31 has minimal shoulders and guardrail. ODOT representatives have also indicated that curve corrections including curve flattening is recommended in the curves near milepost 63.5.

In addition to the other identified issues, ODOT Region 4 staff identified the potential need to increase climbing lane capacity for traffic along southbound OR 31 between milepost 62.0 and the 4,830-foot summit of the Picture Rock Pass (milepost 63.0). Increased climbing lane capacity can improve traffic operations along highways and enhance safety by separating faster and slower moving traffic and by allowing better visibility and safety during passing.

ODOT follows the American Association of State Highway and Transportation Officials (AASHTO) climbing lane criteria specifying that the three criteria should be satisfied to justify a climbing lane. AASHTO further states that a climbing lane should be installed if each of the following three criteria are met:

1. **Upgrade traffic flow rate exceeds 200 vehicles per hour (vph)** - the two-way design hour volume near the area in question is 65 vph today and forecast to be 180 vph in 2022. Considering a directional traffic flow split of 60/40, the total upgrade traffic is currently 40 vph and forecast to be 110 vph in 2022. Therefore, this criterion is not met today nor expected to be met even under forecast 2022 traffic volumes.
2. **Upgrade truck flow rate exceeds 20 vph** - the existing truck percentage is approximately 16.5 percent of the total traffic based on ODOT ATR data at nearby locations along OR 31. The existing upgrade truck flow rate was calculated by multiplying the design hour volume (65 vph today and 180 vph in 2022) by the 60/40 directional split and then multiplying by 16.5 percent, resulting in 6 upgrade trucks during the design hour today. In 2022 the truck flow rate is estimated to equal eighteen upgrade trucks. Therefore this criterion is not satisfied today and is not expected to be met in 2022.
3. **One of the following conditions exists**
   - **a.** A 10-mph or greater speed reduction is expected for a typical heavy truck.
   - **b.** Level of Service of E or F exists on the grade.
   - **c.** A reduction of two or more levels of service is experienced when moving from the approach segment to the grade.

This criterion is satisfied considering the typical heavy truck is expected to experience a speed reduction of at least 10-mph between milepost 62.0 and the summit of Picture Rock Pass based on AASHTO truck speed charts.

There were no reported crashes along OR 31 between mileposts 62.0 and 63.0 from 1998 through 2000. In terms of traffic operations, existing and future operations are expected to operate well-within capacity taking into account expected truck and RV usage.

Impacts: The identified projects including the rockfall protection project, shoulder widening, adding guardrail, local curve improvements, and adding a climbing lane could improve traffic operations and safety along OR 31 near Picture Rock Pass.

Cost: Identified in ODOT's operations needs list, the estimated cost to address rockfall issues is $1,100,000. ODOT representatives estimate the cost to widen shoulders and add guardrail is approximately $1,000,000. The curve flattening near milepost 63.5 is estimated to cost between $700,000 and $900,000. ODOT estimates the unit cost to develop a climbing lane is approximately $500,000 per mile.

The addition of a climbing lane through Picture Rock Pass would be difficult to justify considering the limited number of crashes between milepost 62.0 and 63.0, that existing and future operations are expected to operate well-within capacity, and that the climbing lane fails to meet two of the three AASHTO climbing lane criteria under existing and future 2022 traffic volumes. Therefore, the overall project costs were calculated with and without the climbing lane. The estimated total project cost including the climbing lane is between $3,300,000 - $3,500,000 and without the climbing lane is between $2,800,000 - $3,000,000.

Recommendation: The proposed projects including addressing rockfall issues, shoulder widening, adding guardrail, curve flattening, and adding a climbing lane would improve traffic operations and safety through the Picture Rock Pass area. Based the low crash history, good operations, failure to meet two AASHTO climbing lane criteria and expected high costs, adding a climbing lane is not recommended at this time. Increased climbing lane capacity should be pursued if and when all three AASHTO climbing lane criteria are met. The other proposed projects should be implemented within the 20-year planning horizon.

Priority: Medium

Project 20. Replace Dial-a-Ride Transit Fleet

Overview: Three out of the four agencies that provide demand responsive (or dial-a-ride) transit services in Lake County are public agencies. These three agencies share ODOT Special Transportation Fund (STF) dollars and donations to service the transportation disadvantaged. The Federal Transit Administration (FTA) maintains standards specifying vehicle replacement intervals based on age and mileage (see **Appendix G**).

The Lake County Activity Center currently operates one 1994 7-person mini-van and one 2001 14-person small bus. Both the mini-van and bus are wheelchair accessible, with the mini-van able to serve one and the bus able to serve two wheelchairs. The Activity Center's mini-van requires replacement every four years or 100,000 miles and the center's small bus requires replacement every seven years or 200,000 miles.

The Inter Court Family Center currently operates once a week service into Lakeview. If the number of passengers is small (1-2 passengers) the service will be provided by private vehicles otherwise the Inter Court Family Center uses a 12-passenger van. The 1978 van is provided by the Assembly of the God Church and is not wheelchair accessible. The condition of the van is estimated to be fair-to-poor. The 1978 van does not follow ODOT replacement schedules because it is provided by the Assembly of God Church.

The North Lake Family Center provides once-a-month transit service for seniors located in Fort Rock, Christmas Valley, Silver Lake, and Summer Lake. The center contracts with the local school district to rent a bus for the once-a-month outing. The North Lake Family Center has received a grant and is scheduled to receive a small bus in 2003. The small bus will require replacement every seven years or 200,000 miles.

The Lakeview Assisted Living Facility provides scheduled services for the seniors living in the facility as part of the overall services. They currently operate one mini-van and have adequate capacity for the services they provide. The facility, which does not receive state funded dollars, is open for discussion on expanding their transportation services to other senior citizens within the community.

Impacts: Failing to replace transit vehicles as needed may result in loss of dial-a-ride transit service in Lake County. This would substantially impact a large segment of the county population that depends on the service to provide mobility.

Cost: Based on the vehicle replacement intervals identified above, the three agencies which receive ODOT STF funding will need to replace all of their dial-a-ride transit vehicles a number of times of the 20-year planning horizon. **Table 6-5** summarizes the estimated replacement cycle. Vehicle costs were assumed to grow at a compound annual growth rate of two percent per year.

TABLE 6-5
ESTIMATED COST TO REPLACE DIAL-A-RIDE TRANSIT VEHICLES THROUGH 2022

Vehicle	2002 cost	Assumed Replacement Year Based on Age[1]					Estimated 20-year Cost
1994 mini-van	$40,000	2003	2007	2011	2015	2019	$240,500
2001 small bus	$55,000		2008		2015	2022	$214,800
2003 small bus	$62,000			2010	2017		$156,100
Total							**$611,400**

1. Replacement cycles may vary depending on actual miles driven.

Source: Federal Transit Administration Replacement Schedule; Cost information provided by ODOT Transit planning; overall costs computed by DEA.

Lake County receives 89.73 percent funding for their transit program from ODOT/Federal Transit Assistance (FTA) grants and provides the other 10.27 percent of funding from county resources. This funding system is assumed to continue over the next 20 years.

Recommendation: The three public agencies that provide dial-a-ride transit services within Lake County should continue to apply for funding to replace their transit vehicle fleet as needed during the next 20 years.

Priority: Medium.

Project 21. Upgrade Substandard Bridges

Overview: Based on the inventory in Chapter 3 and discussions with staff from the ODOT Region 4 bridge section and Lake County Road Department representatives, 14 of the 93 bridges in Lake County are either currently substandard or are estimated to become substandard within the 20-year planning horizon for a variety of reasons ranging from age to increased traffic demands. Of the 14 bridges identified, three are under county ownership. The following 14 bridges will require some form of rehabilitation or replacement within the next 20 years.

- Bridge No. 03908 on OR 31 (Fremont Highway), Silver Creek Bridge at Milepost 46.75 (State);
- Bridge No. 00571A on OR 31 (Fremont Highway), Chewaucan River at Milepost 116.50 (State);
- Bridge No. 02680 on OR 140 (Klamath Falls-Lakeview Hwy), Muddy Creek Bridge at Milepost 88.24 (State);
- Bridge No. 02679 on OR 140 (Klamath Falls-Lakeview Hwy), Cottonwood Creek Bridge at Milepost 89.38 (State);
- Bridge No. 03915 on US 395 (Fremont Highway), Crooked Creek Bridge at Milepost 126.92 (State);
- Bridge No. 03937A on OR 140 (Warner Highway), Drake Creek at Milepost 21.25 (State);
- Bridge No. 06667A on OR 140 (Warner Highway), Parsnip Creek at Milepost 18.24 (State);
- Bridge No. 08848A on OR 140 (Warner Highway), Deep Creek at Milepost 29.65 (State);
- Bridge No. 08849 on OR 140 (Warner Highway), Irrigation Canal at Milepost 31.40 (State);
- Bridge No. 08850 on OR 140 (Warner Highway), Irrigation Canal at Milepost 30.67 (State);
- Bridge No. 09538 on OR 140 (Warner Highway), Twentymile Creek at Milepost 32.78 (State);
- Bridge No. 37C030, which spans Drews Creek, is located on Westside Road (County);
- Bridge No. 37C041, which spans Deep Creek, is located on Twentymile Road (County); and
- Bridge No. 37C043, which spans Crooked Creek, is located on Dicks Creek Road (County).

ODOT bridge staff estimates that ODOT Bridge Nos. 03908, 02680, 02679, and 03915 will need to be replaced within the 20-year planning horizon. Bridge Nos. 08849 and 08850 are estimated to need rail replacement within the 20-year planning horizon. The remaining five identified state-owned bridges require rail retrofit over the next 20-years, but this may lead to bridge replacement depending on the condition of the material. ODOT's Final 2002-2005 Statewide Transportation Improvement Program (STIP) identifies that Bridge Nos. 02680 and 02679 are scheduled for replacement in 2003 and Bridge No. 03908 is scheduled for replacement in 2005. The three county bridges, Nos. 37C030, 37C041, and 37C043 are estimated to need to be replaced within the 20-year planning horizon. ODOT and Lake County will continue to monitor bridges through biennial inspections to determine potential replacement needs.

Safety: Many of Oregon's bridges are deteriorating under the effects of time and stress of heavier loads. In addition to the 14 bridges identified above which require some form of rehabilitation or replacement, currently half of the county owned bridges in Lake County have weight restrictions limiting the use of these bridges.

Impacts: If the bridges are not repaired or replaced, limitations on usage may affect users of the facilities. This could include long routes to divert traffic off bridges that cannot safely service demand. Limitations on bridge use could affect the economy of some of the resource-based industries in the area.

Cost: **Table 6-6** summarizes the estimated project cost to upgrade substandard bridges throughout Lake County. These estimates are based on 2002-2005 STIP costs, Association of Oregon Counties costs, and information provided by ODOT Region 4 staff. These estimated project costs are in year 2002 dollars.

TABLE 6-6
CONSTRUCTION COSTS FOR UPGRADING SUBSTANDARD BRIDGES

Map Identifier	Substandard Bridges	Jurisdiction	Priority[1] H - (0-5 yr.) M - (6-10 yr.) L - (11-20 yr.)	Estimated Project Cost[1] (000)
Bridge Replacement				
21-A	Bridge No. 03908 on OR 31, Silver Creek Bridge at MP 46.75	State	High	$1,200[2]
21-B	Bridge No. 02680 on OR 140, Muddy Creek Bridge at MP 88.24	State	High	$916[2,3]
21-C	Bridge No. 02679 on OR 140, Cottonwood Creek Bridge at MP 89.38	State		
21-D	Bridge No. 03915 on US 395, Crooked Creek Bridge at MP 126.92	State	Medium	$1,500
21-E	Bridge No. 37C030 on Westside Road, 6 miles south of OR 140 (west)	County	Low	$1,225[4]
21-F	Bridge No. 37C041 on Twentymile Road, 1 mile south of OR 140 (east)	County	Low	$1,875[4]
21-G	Bridge No. 37C043 on Dicks Creek Road, 1 mile west of US 395	County	High	$325[4]
Rail Replacement				
21-H	Bridge No. 08849 on OR 140, Irrigation Canal at MP 31.4	State	High	$300
21-I	Bridge No. 08850 on OR 140, Irrigation Canal at MP 30.67	State	High	$300
Rail Retrofit				
21-J	Bridge No. 00571A on OR 31, Chewaucan River at MP 116.5	State	Low	$2,500
21-K	Bridge No. 03937A on OR 140, Drake Creek at MP 21.25	State	Low	$500
21-L	Bridge No. 06667A on OR 140, Parsnip Creek at MP 18.24	State	Medium	$626
21-M	Bridge No. 08848A on OR 140, Deep Creek at MP 29.65	State	Low	$1,500
21-N	Bridge No. 09538 on OR 140, Twentymile Creek at MP 32.78	State	Low	$2,500
			Total	**$15,267**

1. ODOT Region 4 staff estimated priority and costs.
2. Estimated project cost is from 2002-2005 Final STIP.
3. Two Bridges are grouped into one project and the cost is to replace both bridges.
4. Cost estimates were provided to Lake County by the Association of Oregon Counties (AOC).

Source: ODOT Region 4 Bridge Section staff and Final 2002-2005 STIP

Recommendation: Existing substandard bridges and those expected to become substandard in the next 20 years should be rehabilitated per guidance provided by ODOT. Priority for bridge improvements will be a function of several factors including severity of deficiency, demand for the facility, and availability of funding.

Priority: Varies.

Project 22. Identify chain-up and chain-down areas within Lake County

Overview: ODOT representatives identified the need for chain-up and chain-down areas within Lake County. The two locations identified are along OR 31 (Fremont Highway). The first location is for southbound traffic near Horse Ranch Hill (near Milepost 29) and second location is for southbound traffic near Picture Rock Pass (Milepost 63).

Impacts: Providing chain-up and chain-down areas increase safety by allowing vehicles a place to chain-up and chain-down versus having them stop on the highway due to limited shoulders along OR 31 (Fremont Highway).

Cost: Based on the similar characteristics between chain-up and chain-down areas and scenic pullouts or slow vehicle turnouts, the estimated cost to provide chain-up or chain-down areas is $25,000 per location. Therefore, the total cost to provide two chain-up and two chain-down areas near Horse Ranch Hill and Picture Rock Pass is $100,000.

Recommendation: Based on increased safety, the proposed chain-up and chain-down areas along OR 31 near Horse Ranch Hill and Picture Rock Pass should be provided.

Priority: Low

Project 23. Bank Flattening through Nevada Curve along OR 140 (Warner Highway) near milepost 65.2

Overview: ODOT representatives identified the need for bank flattening through Nevada Curve along OR 140 (Warner Highway) near milepost 65.2. The Nevada Curve improvement project is located in Harney County so it will not be analyzed as part of the Lake County TSP.

NO BUILD ALTERNATIVE

Overview: The No Build Alternative consists of no change to Lake County's existing transportation system. The purpose of a No Build Alternative is to examine future conditions without improvements to the system. The No Build Alternative would have no construction or right-of-way costs since it is based on the assumption that no new roadway construction would occur.

Impacts: The No Build Alternative, like the improvement alternatives would have several pros and cons. The pros associated with the No Build Alternative are no construction costs and no right-of-way acquisition. The cons associated with the No Build Alternative are increased traffic congestion and decreased safety. The No Build Alternative could also result in adverse economic impacts if bridges and highways are not upgraded and vehicle length and/or weight restrictions are placed on them.

Today, all of the highways in Lake County meet ODOT's mobility standards. With the expected growth in through and local traffic over the 20-year planning horizon, all of the highways will continue to meet ODOT's mobility standards. Therefore, none of the improvement options evaluated in this chapter were intended to increase capacity on the existing system. Instead, most improvement options evaluated improve safety by realigning skewed intersections, straightening roadway curves, widening roadway shoulders, replacing pavement rated in poor condition, and repairing or replacing structurally deficient bridges. Foregoing these improvements would likely result in decreased safety for all travelers throughout the county.

Cost: There are no costs associated with a No Build Alternative.

Recommendation: The No Build Alternative is not recommended because it would result in unacceptable safety hazards and economic impacts. The No Build Alternative does not comply with the goals of the TSP, which include preserving the function, capacity, level of service, and safety of the street system.

Priority: None.

TRANSIT SYSTEM ALTERNATIVE

Overview: The Transit System Alternative would provide transit service where none currently exists or increase routes and/or frequencies where a transit system does exist.

The Oregon Transportation Plan indicates that intercity passenger service should be available for an incorporated city or group of cities within five miles of one another having a combined population of over 2,500 and located 20 miles or more from the nearest Oregon city with a larger population and economy. Services should allow a round trip to be made within a day.

Lake County does not meet these requirements nor does it appear needed or economically feasible to provide intercity transit within the county. However, if in the future Lake County identifies a need or desire to begin such service, state support is usually necessary to get this kind of service started. For regular intercity service to have a chance of success, it must attract riders from the general public, not just the elderly. Ideally it should connect with Greyhound service. Further, it must run at regularly scheduled times so that people may depend on the service.

Impacts: The Transit System Alternative, like the improvement alternatives and the No Build Alternative would have several pros and cons. The pros associated with the Transit System Alternative are improved mobility for people who lack access to automobile travel, and fewer single-occupant vehicle trips and fewer vehicle miles traveled, which result in less congestion on the roadways. The cons associated with the Transit System Alternative are the relatively high cost to operate a fixed route transit system and the inefficiency of such a system in a large, sparsely populated area.

Cost: The costs to implement a Transit System Alternative were not estimated.

Recommendation: The Transit System Alternative is not recommended because it is impractical in a large, sparsely populated area. In rural areas where fixed route service is not practical, dial-a-ride may be the only practical form of public transportation. In Lake County there are four agencies which provide demand responsive (or dial-a-ride) transit services. There is no identified need to expand the dial-a-ride program within Lake County within the next 20 years.

Priority: None.

TRANSPORTATION DEMAND MANAGEMENT ALTERNATIVE

Overview: The Transportation Demand Management (TDM) Alternative would help manage demands on the system by reducing single occupant vehicle traffic, moving traffic away from the peak period and improving traffic flow. TDM projects that help make the transportation system operate more efficiently through better management of traffic demand include rideshare services including carpool and vanpool ridematching, development of employer site-based commuter projects, alternative work schedules, public transit, improved bicycle and pedestrian facilities, telecommuting, park and ride facilities, and High Occupancy Vehicle (HOV) lanes.

Impacts: In Lake County, where traffic volumes are low and the population and employment is small, implementing TDM strategies is not practical in most cases. However, the pedestrian and bicycle improvements recommended earlier in this chapter are considered TDM strategies. By providing these facilities, Lake County is encouraging people to travel by other modes than the automobile. In rural communities, TDM strategies include providing mobility options.

Cost: The costs to implement a TDM Alternative were not estimated.

Recommendation: Except for the pedestrian and bicycle improvements recommended earlier in this chapter, the TDM Alternative is not recommended because it is impractical in a large, sparsely populated area where the distances between residential areas and employment centers is great and traffic volumes are very low. Intercity commuting may be a factor in Lake County where residents live in one city and work in other cities. Where this occurs, people should be encouraged to carpool with a fellow coworker or someone who works in the same area. The TDM Alternative can be encouraged through ordinance and policy.

Priority: None.

TRANSPORTATION SYSTEM MANAGEMENT ALTERNATIVE

Overview: The Transportation System Management (TSM) Alternative would maximize the existing system efficiency by managing traffic through the use of traffic control devises such as ramp meters, median barriers, traffic signal synchronization, turn lanes, and access management controls closing accesses to properties along congested corridors and re-routing traffic to other facilities.

Impacts: In Lake County, where traffic volumes are low and all of the highways meet ODOT's mobility standards, there is little benefit to implementing TSM strategies.

Cost: The costs to implement a TSM Alternative were not estimated.

Recommendation: The TSM Alternative is not recommended because it is impractical in a large, sparsely populated area where the traffic volumes are very low.

Priority: None.

LAND USE ALTERNATIVE

Overview: The Land Use Alternative would reduce automobile trip generation, shorten trip lengths, change mode choices and potentially reduce the level of automobile ownership while enhancing community livability. The diversity of land uses within walking or bicycling distance and the design of the built environment may influence mode choice and trip length. In this context, mode choice refers to the ability and willingness of travelers to make trips using non-motorized modes, thus reducing the number of trips on local streets and arterials. Design refers to the directness, attractiveness and sense of safety and security afforded pedestrians and bicyclists, and the orientation of buildings toward the street and toward transit stops. Additionally, the connectivity of the local street system and associated sidewalks and bicycle lanes can play an important role in changing travel choice.

Impacts: In Lake County, where there is a small population spread over a vast area and there has been little to no growth over the last 40 years (except for the Christmas Valley area), there is little benefit to implementing the Land Use Alternative.

Cost: There are no costs associated with a Land Use Alternative.

Recommendation: The Land Use Alternative is not recommended because it is impractical in a large, sparsely populated area with little to no population or employment growth.

Priority: None.

SUMMARY

Table 6-7 summarizes the recommendations of the street system modal plan based on the evaluation process described in this chapter. Chapter 7 discusses how these improvement options fit into the modal plans for the Lake County area.

TABLE 6-7
TRANSPORTATION IMPROVEMENT OPTIONS: RECOMMENDATION SUMMARY

Option	Recommendation
Lake County Improvement Options	
1. Safety improvements along OR 140 (Warner Highway)	• Implement
2. Safety improvements along OR 140 (Klamath Falls-Lakeview Highway)	• Implement
3. Ongoing pavement replacement.	• Project will be completed by ODOT maintenance section.
4. Intersection improvements for the intersection of US 395 (Fremont Highway) and OR 140 (Warner Highway)	• Implement intersection improvements except for left-turn and right-turn lanes, which are not warranted.
5. Intersection improvements for the intersection of OR 31 (Fremont Highway) and US 395 (Lakeview-Burns Hwy)	• Implement intersection improvements except for left-turn and right-turn lanes, which are not warranted.
6. Enhance existing chain-up area along OR 140 west at Drews Valley and allow school bus turnaround.	• Implement
7. Improve directional signing to US 97 along Bear Flat Road.	• Implement
8. Improve directional signing throughout Lake County.	• Project will be completed through routine maintenance by each agency.
9. Install exclusive left-turn lanes to Lake County DOC from US 395 - north of Lakeview.	• Not recommended at this time.
10. Upgrade substandard shoulders along state highways.	• Implement as routine maintenance and/or rehabilitation projects occur.
11. Localized shoulder improvements along state highways.	• Implement
12. Add bike lanes along county roads.	• Implement
13. Investigate options to address s-curve on County Road #5-14 in Christmas Valley.	• Implement
14. Pavement preservation projects along US 395 (Lakeview-Burns Highway).	• Implement
15. Increase passing lane opportunities along OR 31/US 395 (Fremont Highway).	• Not recommended at this time.
16. Intersection improvements including signing and striping changes for 4 intersections.	• Implement
17. Improve sidewalk connectivity in the City of Paisley and rural community of Silver Lake.	• Implement
18. Provide a rest area near Lakeview	• Improve 4 existing rest areas/waysides instead of adding a new rest area.
19. Address rock fall issues, add shoulders and guardrail, curve flattening near MP 63.5, and investigate potential climbing lane near Picture Rock Pass along OR 31.	• Implement all projects except for the climbing lane, which is not warranted at this time.
20. Replace dial-a-ride transit fleet.	• Implement
21. Upgrade substandard bridges.	• Implement
22. Identify chain-up and chain-down areas.	• Implement
23. Bank flattening through Nevada curve along OR 140 (Warner Highway) near MP 65.2.	• Project is located in Harney County.

Source: TAC and management team recommendations

CHAPTER 7: TRANSPORTATION SYSTEM PLAN

The purpose of this chapter is to provide a detailed transportation system plan that will achieve the goals and objectives set forth by the Lake County community. Components of the TSP include rural roadway standards, access management guidelines, transportation demand management measures, modal plans, and a system plan implementation program. Under the modal plans, this chapter addresses improvements or strategies to meet the needs of all transportation modes appropriate for Lake County. It is expected that Lake County will ultimately adopt this TSP as the transportation component of their Comprehensive Plan.

RURAL ROADWAY STANDARDS

Development of the Lake County TSP provides the County, the City of Paisley, and the rural communities of Christmas Valley, Silver Lake, and Summer Lake with an opportunity to review and revise roadway design standards to more closely fit with the functional roadway classification, and the goals and objectives of the TSP.

Lake County Rural Road Standards

Roadway standards relate the cross sectional design of a roadway to its function. The function is determined by operational characteristics such as traffic volume, operating speed, safety, and capacity. Roadway standards are necessary to provide a community with roadways, which are relatively safe, aesthetic, and easy to administer when new roadways are planned or constructed. The current roadway standards in Lake County are outdated. In the past, roads were built to guidelines provided by the Lake County Roadmaster or Lake County Commissioners. The County's existing roads are generally two lanes wide. Paved and chip sealed roads are generally 24 feet wide with shoulders, and gravel roads are generally 26 feet wide with about 2 foot shoulders. The existing right-of-way along County roads is a total of 60 feet with 30 feet on each side of centerline.

Road standards for arterials (state highways), paved county roads (Collectors or Local), and gravel county roads (Collectors or Local) are shown graphically in **Figure 7-1** and summarized in **Table 7-1**. At their discretion, Lake County may choose to deviate from the adopted design standards for those roadways under County control.

Lake County recognizes that some existing roads do not meet these standards. Therefore these standards shall be applied to newly constructed or reconstructed County roads. All new County roads shall not have a grade greater than six percent. Currently Lake County is not accepting any new roads and is only maintaining the existing inventory. All public roads, except state highways, not owned by Lake County must be maintained by private property owners along the road.

TABLE 7-1
STREET DESIGN STANDARDS - LAKE COUNTY

		Street		Shoulder	
Classification	**Right-of-Way Width**	**Width**	**Surface**	**Width**	**Surface**
Arterial (State Highways)[1]	80 - 120 ft	24 ft	Paved	4-8 ft [2]	Paved
Paved County Roads (Collector or Local)	60 ft	24 ft	Paved	3 ft	Gravel
Gravel County Roads (Collector or Local)	60 ft	26 ft	Gravel	0 ft	

1. State highway standards are adopted and regulated by the Oregon Transportation Commission and are outlined in the ODOT Highway Design Manual.
2. Recommended paved shoulder widths follow guidelines outlined in the ODOT Highway Design Manual, Table 4-5(R). Values are based on ADT.

Source: David Evans and Associates, Inc.

Arterials (State Highways)

Arterials (State Highways) connect cities and other major traffic generators. They serve both through traffic and trips of moderate length, and access is usually controlled. Arterials are high-volume roadways due to the combination of local and through traffic. Depending on adjacent land uses, speeds range between 25 and 55 mph.

Figure 7-1 displays a cross section with an 80- to 120-foot right-of-way and a 32- to 40-foot paved width consisting of one 12-foot travel lane per direction and four- to eight-foot directional shoulders. The overall roadway width is determined in part by shoulder requirements. The only arterials in Lake County are the state highways under the jurisdiction of ODOT. As shown in **Table 6-2**, roadway shoulder widths vary depending upon the level of roadway and existing or forecast traffic volumes.

Collector Roadways

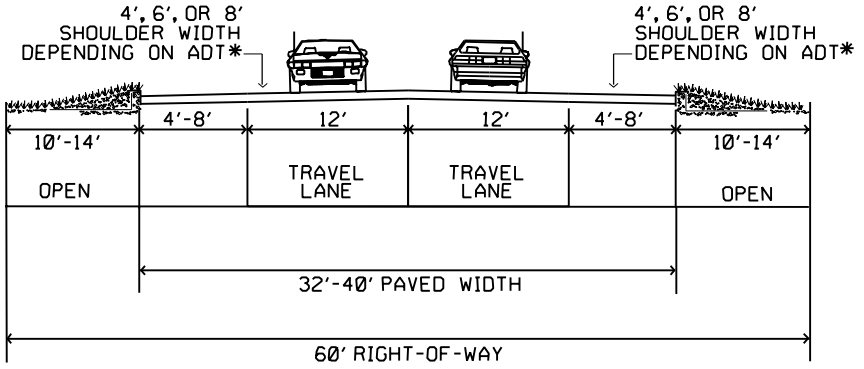
Collector roadways connect residential neighborhoods with the arterial system. Property access is generally a higher priority for the collector roads than arterials, and through traffic is served as a lower priority. The collector roadways are intended to carry local traffic, including limited through traffic. Collector roadways are intended to provide higher capacity than local roadways resulting in service of greater traffic volumes. The roadway surface for collector roads may be either paved or gravel.

Figure 7-1 illustrates the paved county roadway cross section with 60-foot right-of-way and a 30-foot paved/ gravel roadway surface. This road standard consists of one 12-foot travel lane in each direction and 3-foot directional shoulders. The 24-foot roadway surface will be paved and the 3-foot directional shoulders will be gravel.

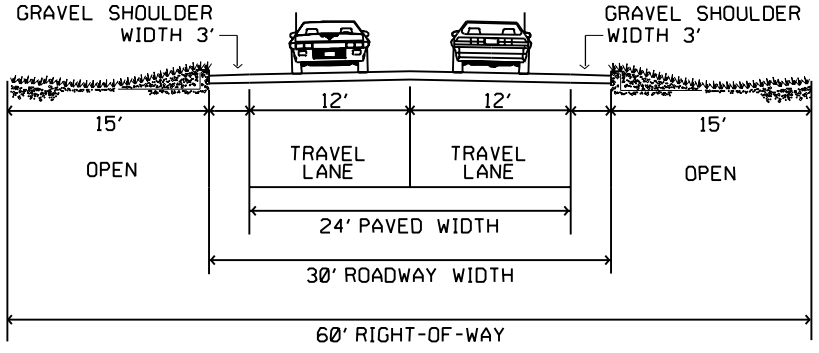
The gravel county roadway standard specifies 26-foot gravel roadways within a 60-foot right-of-way, as shown in **Figure 7-1**. The gravel county roadway consists of 13-foot travel lanes in each direction.

Local Roadways

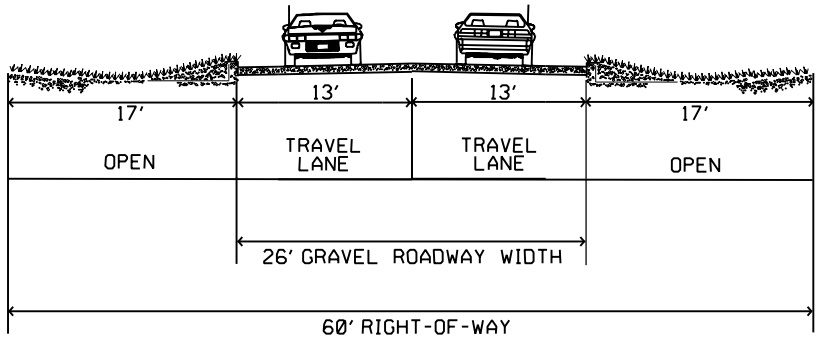
Local roadways have property access as their main priority and through traffic movement is not encouraged. The design of the local roadways affects their operation, as well as the safety and livability of the area that road serves. Local roadways are designed to carry very small volumes of traffic at relatively slow speeds. The emphasis is to keep speeds lower by narrowing the street widths. The roadway surface for local roads may be either paved or gravel.



Arterials (State Highways)



Paved County Roads (Collector or Local)



Gravel County Roads (Collector or Local)

*Recommended shoulder widths follow guidelines outlined in the ODOT Highway Design Manual, Table 4-5(r). Please refer to Table 6-2 for specifics.

FIGURE 7-1

Street Standards – State Highways, Paved County Roads, and Gravel County Roads

Figure 7-1 illustrates the paved county roadway cross section with 60-foot right-of-way and a 30-foot paved/ gravel roadway surface. This road standard consists of one 12-foot travel lane in each direction and 3-foot directional shoulders. The 24-foot roadway surface will be paved and the 3-foot directional shoulders will be gravel.

The gravel county roadway standard specifies 26-foot gravel roadways within a 60-foot right-of-way, as shown in **Figure 7-1**. The gravel county roadway consists of 13-foot travel lanes in each direction.

Pavement Design

Unlike the roadway design standards presented in **Figure 7-1** which illustrates the cross-section design of future roads, pavement design standards address the material type and depth of the various roadway layers (e.g., pavement surface, base rock, etc.). Pavement design is sensitive to key design parameters such as heavy truck volumes, environmental conditions, and soil conditions. Pavement designs may differ based on many variables including the types of materials used, the design truck volumes to be served, and the desired pavement design life. Because of greater traffic volumes, and specifically truck volumes, state highways (e.g. arterials) would be expected to have a thicker section than paved or gravel county roadways.

As a planning document, the development of detailed pavement design standards is outside the scope of this TSP. Development of such standards constitutes a separate and detailed evaluation. However, experience in other rural eastern Oregon counties indicates that past pavement performance has been well served by designing asphalt pavements with a minimum of 15-inches of base rock and 3-inches of asphalt concrete.

Gravel roads are typically built with a minimum of 15-inches of base rock placed and compacted in four-inch lifts. Base rock is finished with a three to four-inch layer of surface gravel. Surface gravel is replaced during routine maintenance.

These minimum guidelines should be followed in future asphalt or gravel pavement designs unless the results of a pavement design warrant changes. Detailed pavement designs may follow procedures outlined in the *1993 AASHTO Guide for Design of Pavement Structures* published by the American Association of State Highway Transportation Officials or the *1998 Asphalt Paving Design Guide* published by the Asphalt Pavement Association of Oregon.

ACCESS MANAGEMENT

Access management along a roadway corridor incorporates planning, design, and implementation of land use and transportation policies and strategies that control the flow of traffic between the roadway and the surrounding land. Access management policies and strategies apply to driveways and other roadways and are designed to achieve a balance between the need to provide safe and efficient travel with the ability to access individual destinations. Implementation of appropriate roadway access management measures can provide substantial benefits to a community, including:

- Protecting the functional operation of a roadway, thus delaying or preventing costly roadway improvements;
- Improving safety conditions along roadways for all users, including pedestrians and bicyclists;
- Facilitating a more constant traffic flow, thus reducing congestion, delays, overall vehicle miles of travel (VMT), fuel consumption and air pollution; and
- Promoting more desirable compact land development patterns.
- Developing and adopting local ordinances that require inter-parcel circulation so traffic can go from lot to lot without traveling on the state highway system.

Access management is an important tool for promoting safe and efficient travel for both local and long distance users along a roadway. Research has clearly shown a direct correlation between the number of access points and collision rates. Typically, as the number of access points increases, so do collision rates. Experience throughout the United States has also shown that a well-managed access plan for a street system can minimize local cost for transportation improvements needed to provide additional capacity and/or access improvements along unmanaged roadways. Therefore, it is essential that all levels of government maintain the efficiency of existing roadways through better access management. One objective of the Lake County TSP is to develop an access management policy that maintains and enhances the integrity (safety and capacity) of state highways and county roads in Lake County.

Access Management Techniques

Access management can be accomplished through a number of strategies and specific techniques that differ in large urban areas versus rural areas. Based on existing and forecast levels of traffic and development in Lake County, the most suitable access management strategy would appear to be management of the number of access points and their spacing. The following techniques describe how the number of access points to a road can be restricted or reduced.

- Restrictions on spacing between access points (driveways) and public/private roads based on the type of development and the speed along the road;
- Sharing of access points between adjacent properties;
- Providing driveway access via collector or local roadways where possible;
- Constructing frontage roads to separate local traffic from through-traffic;
- Offsetting driveways at proper distances to produce T-intersections that minimize the number of conflict points between traffic using the driveways and through traffic;
- Installing median barriers to control conflicts associated with left-turn movements (in or out of driveway or roadway); and
- Installing barriers to the property along the arterial to restrict access width to a minimum.

Access Management Requirements for State Highways

In Oregon, state laws and policies guide planning and management of the State Highway System including access management of highway segments within both urban and rural areas. Division 51 (OAR 734-051) is the leading document on access management on state highways.

Statewide Planning Goal 12 serves as the State's general transportation policy and the Transportation Planning Rule (TPR) guides state, regional and local implementation of Goal 12. The TPR requires ODOT and local governments to prepare Transportation System Plans (TSPs) that identify facility and service improvements adequate to meet identified needs over a 20-year planning period. All local TSPs must be consistent with the state TSP and associated modal and facility plans.

The Oregon Transportation Plan (OTP) is the State's TSP and the Oregon Highway Plan (OHP) is the highway-specific modal element of the OTP. The OHP describes goals, policies, and strategies designed to meet the transportation goals outlined in the state's TSP. The TPR also requires that local TSPs consider new connections to arterials and state highways that are consistent with designated access management categories (OAR 660-12-020(2)(b)). The current OHP, adopted by the Oregon Transportation Commission (OTC) in July 1999, contains an access management goal (Goal 3) and several policies that provide guidance for access management along various types of state highway segments.

Access Management Standards for State Highways

Access management along all state highways in Oregon is regulated by an administrative rule specifically drafted to implement the access management policies adopted in the 1999 Oregon Highway Plan (OHP). The OHP specifies an access management classification system for state facilities and establishes standards and guidelines to be applied when making access management assignments for highways based upon their classification.

As identified in Chapter 3 and summarized again in **Table 7-2**, Lake County has one Regional highway, four Statewide highways, and one District highway. The access spacing standards for each level of highway are summarized in the following sections.

TABLE 7-2
STATE HIGHWAYS

Highway Route (Mileposts)	Highway Name	ODOT Highway Number	Highway Classification
US 20 (MP 69.3 - 83.8)	Central Oregon Highway	7	Statewide
OR 31 (MP 18.2 - 120.7) US 395 (MP 120.7 - 157.7)	Fremont Highway	19	Regional Statewide
OR 140 (MP 63.4 - 96.4)	Klamath Falls-Lakeview Highway	20	Statewide
US 395 (MP 35.7 - 90)	Lakeview-Burns Highway	49	Statewide
OR 140 (MP 0.0 - 62.7)	Warner Highway	431	District

Source: ODOT Traffic Volume Table-2000

General Highway Access Spacing Standard

The 1999 OHP maintains access management standards that vary for the Statewide, Regional, and District level highways within Lake County. The standards further vary based on a number of other criteria including:

- Posted highway speed;
- Highway location in rural or urban areas;
- Whether adjacent accesses are streets only with no driveways between or where driveway-to-driveway or driveway-to-street accesses are being considered; and
- Urban areas where the highway passes through a designated Urban Business Area (UBA) or Special Transportation Area (STA).

Table 7-3 summarizes the ODOT access spacing standards for highways in Lake County. The table clearly indicates that spacing increases as the highway classification and posted speed increase. Spacing also increases within rural areas where the need for access generally decreases and where the public expects to encounter fewer accesses. These standards apply to both streets and driveway approaches and are measured from the center of one access to the center of the next access on the same side of the road. They generally apply to unsignalized access points.

The urban section of OR 31 (Regional Highway) through Paisley where the posted speed is 35 mph requires minimum access spacing of 750 feet between two adjacent streets with no driveways in between. Similar to Paisley, the area through Silver Lake where the posted speed is 40 mph requires 750 feet between two adjacent streets with no driveways in between. The remaining sections of OR 31 require 990 feet between adjacent driveways or between streets and driveways.

Along the Statewide highways of US 20, OR 140 (Klamath Falls-Lakeview Highway), and US 395 (Lakeview-Burns Highway) the minimum access spacing required is 1,320 feet between adjacent driveways or between streets and driveways.

Excluding the section of US 395 (Fremont Highway) through Pine Creek, the Statewide highway requires minimum access spacing of 1,320 feet between adjacent streets or between adjacent driveways. The section through Pine Creek near the California border where the posted speed is 40 mph requires minimum access spacing of 990 feet between two adjacent streets with no driveways in between.

Standards for the District highway, OR 140 (Warner Highway), require 700 feet between adjacent driveways or between streets and driveways.

Deviations to Access Spacing Standards

Under some circumstances, deviations to the general access spacing standard are allowed. The two types of deviations are minor and major. The minor deviation limits to the access spacing standards are shown in **Table 7-3**. A permit for an access under a minor deviation is allowed per the review of the district highway engineer. Any request for an access at less than the minor deviation spacing standard shall be considered a major deviation. Although there are no spacing standards for a major deviation, the process for state approval is lengthy and thorough. To process a major deviation application, a technical group must be established to assist the regional highway engineer with the review. Rejected applications for an access permit under a major and minor deviation can be appealed through a formal appeals process.

Special Circumstances

In some cases, access will be allowed to a property at less than the designated spacing standards, but only where a right of access exists, that property does not have reasonable access, and the designated spacing cannot be accomplished. Other options such as joint access should be considered before allowing accesses at less than the designated standards. Additionally, ODOT may be required to purchase property, which becomes landlocked meaning that no reasonable access exists.

TABLE 7-3
1999 OREGON HIGHWAY PLAN
RURAL AND URBAN ACCESS SPACING STANDARDS FOR STATE HIGHWAYS

Street-to-Street Access Spacing Standards (No Driveways between Streets)			
Highway	**Posted Speed**	**Rural & Urban Spacing [1]**	**Rural/Urban Street Deviation [2]**
Statewide	≥55 mph	1,320 ft	1,150/1,000 ft
	50 mph	1,100 ft	900/810 ft
	40 & 45 mph	990 ft	810/740 ft
	30 & 35 mph	770 ft	675/600 ft
	≤25 mph	550 ft	525/400 ft
Regional	≥55 mph	990 ft	870/870 ft
	50 mph	830 ft	640/640 ft
	40 & 45 mph	750 ft	550/550 ft
	30 & 35 mph	600 ft	375/375 ft
	≤25 mph	450 ft	350/350 ft
District	≥55 mph	700 ft	660/660 ft
	50 mph	550 ft	525/525 ft
	40 & 45 mph	500 ft	475/475 ft
	30 & 35 mph	400 ft	325/325 ft
	≤25 mph	400 ft	245/245 ft
Driveway-to-Driveway or Driveway-to-Street Access Spacing Standards			
Highway	**Posted Speed**	**Rural & Urban Spacing [1]**	**Rural/Urban Driveway Deviation [2]**
Statewide	≥55 mph	1,320 ft	950/870 ft
	50 mph	1,100 ft	700/640 ft
	40 & 45 mph	990 ft	560/530 ft
	30 & 35 mph	770 ft	400/350 ft
	≤25 mph	550 ft	280/250 ft
Regional	≥55 mph	990 ft	700/700 ft
	50 mph	830 ft	540/540 ft
	40 & 45 mph	750 ft	460/460 ft
	30 & 35 mph	600 ft	300/300 ft
	≤25 mph	450 ft	220/220 ft
District	≥55 mph	700 ft	650/650 ft
	50 mph	550 ft	475/475 ft
	40 & 45 mph	500 ft	400/400 ft
	30 & 35 mph	400 ft	275/275 ft
	≤25 mph	400 ft	200/200 ft

[1] Spacing standards apply to rural and urban non-expressways.
[2] Minor deviation standards.
Source: 1999 OHP- Appendix C

Application

The existing ***legal*** driveway connections, public street intersections, and other accesses to the state highway system are not required to meet the spacing standards of the assigned category immediately upon adoption of this access management plan. However, existing permitted connections not conforming to the design goals and objectives of the roadway classification shall be upgraded as circumstances permit and during redevelopment. At any time, an approach road may need to be modified due to a safety problem or a capacity issue that exists or becomes apparent. By statute, ODOT is required to ensure all safety and capacity issues on the highway are addressed.

An approach road permit may be issued by ODOT for a single connection to a property that cannot be accessed in a manner that is consistent with the spacing standards (shown in **Table 7-3**). Approach road permits are issued with conditions. These conditions typically apply to properties that either have no reasonable access or cannot obtain reasonable alternative access to the public road system. The permit shall carry a condition that the access may be closed at such time that reasonable alternative access becomes available to a local public street. In addition, approval of an approach road permit might require ODOT-approved turning movement design standards to ensure safety and managed access. Under special circumstances, ODOT may be required to purchase property in order to prevent safety conflicts.

Access Control Rights

Historically, owners of property abutting public roadways have enjoyed a common law abutter's right of access to the roadway. However, in order to provide for a transportation system that will accommodate changing public needs, legislation has been passed to modify rights of access. Oregon Revised Statutes specify that the right of access can be purchased or condemned as deemed necessary for right-of-way. ODOT has purchased access control rights from many properties along state highways.

Once the state has acquired access rights to a property, road approach permits can only be issued at locations on the property where the right of access has been reserved. A reservation of access gives the property owner the right to apply for a permit of access to the state highway only at specific locations and they must be clearly identified in the deed where the property owner sold the right-of-way to the state. If the owner wants to gain additional access rights to the highway, they must apply for a grant of access.

There may be local street connections shown in this TSP that will require modifying the existing access rights or gaining additional access rights to the state highway system. Review of this TSP by ODOT does not imply tacit approval to modify or grant additional access rights. This must be accomplished by applying to ODOT for such modification or grant.

An "Indenture of Access" is used to modify existing access rights such as moving or widening the reservation or lifting other restrictions that may have been placed on it. A "Grant of Access" is required to gain an additional access point to the highway, and, depending on circumstances, may require payment to the state for the market value of the grant. Application for both the Indenture and Grant of Access is made to the local ODOT District Office.

Special Transportation Areas (STAs)

The 1999 Oregon Highway Plan allows for the designation of "Special Transportation Areas" (STAs) as a means to "foster compact development patterns in communities." The STA designation is also ODOT's way of recognizing that the function of the state highway is different along a "main street" or in a downtown where convenient local circulation for pedestrians and vehicles is critical to the vitality and economic success of downtown.

The primary objective of managing highway facilities in an STA is to provide access to community activities, businesses, and residences and to accommodate pedestrian movement along and across the highway in downtown, business districts, and community centers. Direct street connections and shared on-street parking are encouraged. Direct property access is very limited in an STA. Local auto, pedestrian, bicycle and transit movements to the business district or community center are generally as important as the through movement of traffic. Traffic speeds are slow, generally 25 mph or less.

As defined by the Highway Plan, Action 1B.9, an STA has the following attributes:

- Mixed uses (commercial, office, residential);
- Buildings spaced close together or with continuous storefronts, located at the street with little or no setback from the sidewalk;
- Sidewalks with ample width (at least 10 feet), located next to the highway and the buildings;
- Interconnected local street network to facilitate local vehicle and pedestrian circulation; and
- On-street parking and shared off-street parking lots located behind or to the side of buildings.

The STA designation is intended primarily for downtown areas, central business districts and similar areas where the state highway is also the local main street, such as in the City of Paisley. The STA is a section of highway where major highway improvements to add capacity are not feasible or appropriate because of the cost, the inconsistency with community goals, and potential negative impacts on the adjoining business district.

Outside an area designated as an STA, the state highway access management spacing standards shown in **Table 7-3** shall be enforced. Where necessary (as determined by ODOT), access management spacing standards that are even more restrictive than those shown in **Table 7-3** may be needed to maintain a highway's mobility standard and recoup travel time lost in an STA. ODOT shall work with the communities of Lake County to maintain the highway mobility standards on the state highways by limiting the expansion of development along the highways through the following means:

- Developing an adequate local network of arterials, collectors, and local streets to limit the use of the state highway or interchanges for local trips;
- Reducing access to the state highways by use of shared accesses, access from side or back roads, and frontage roads and by development of local street networks as redevelopment along state highways occurs;
- Clustering development off of state highways in compact development patterns; and
- Avoiding the expansion of urban growth boundaries along the Statewide Highways and around interchanges unless ODOT and Lake County agree to an interchange management plan to protect interchange operations or an access management plan for the highways.

Benefits of the STA Designation

The STA designation is a way for communities to get clear agreement from ODOT to manage the state highway as a main street. These features can include wider sidewalks, adding or retaining on-street parking, adding curb extensions, adding street trees, and other measures. There are several reasons for pursuing an STA designation:

- It gets ODOT approval about how the highway should be managed up front. Without a plan, approval of main street elements will require case-by-case review and approval. The STA designation sends the message to everyone involved that "the primary objective of managing highway facilities in the STA is to provide access to community activities, businesses, and residences, and to accommodate pedestrian movement along and across the highway." (1999 Oregon Highway Plan)
- It prescribes greater flexibility for state highway standards.
- It changes ODOT mobility and access management standards applied to that segment of the state highway.
- It may help a community's main street projects qualify for funding, like Immediate Opportunity Funds, Local Street Funding, Oregon Community Development funding, and Federal Transportation Enhancement Funding. State funding programs are emphasizing downtown redevelopment.

- It provides certainty for property owners and local officials about how the highway will be managed. It allows businesses and local governments to make planning and investment decisions along main street, knowing that any future highway improvements will support, not detract from main street development.

Steps to Implement an STA

- Task 1 – Jurisdiction requests an STA.
- Task 2 – Define the STA Boundaries.
- Task 3 – Prepare an STA Impact Analysis.
- Task 4 – Develop a Management Plan.
- Task 5 – Develop an intergovernmental agreement or memorandum of understanding between ODOT and the local jurisdiction designating the STA and adopting the Management Plan.
- Task 6 – Complete designation of the STA by adopting the Management Plan into the local TSP an/or corridor plan.

The proposed limits for an STA in the City of Paisley are along OR 31 from milepost 98.22 near the Chewaucan River Bridge in the north to milepost 98.69 near the Paisley Ranger Station in the south.

The planning cost for developing the STA Management Plan is estimated at $50,000. These costs may be shared between ODOT and the local jurisdiction.

Access Management Implementation

Access management guidelines are generally not intended to eliminate existing intersections or driveways. Rather, they should be applied as new development occurs. Over time, as land is developed and redeveloped, access to roadways will need to meet appropriate access guidelines. However, where there is a recognized problem, such as an unusual number of collisions, access management techniques and standards can be applied to retrofit existing roadways.

To summarize, access management strategies consist of managing the number of access points and providing traffic and facility improvements. The solution is a balanced, comprehensive program that provides reasonable access while maintaining the safety and efficiency of traffic movement.

Access Management Standards for County Roads

Lake County currently has no established access management and access spacing standards. By law, Lake County has authority to prescribe access management standards. According to Oregon Revised Statute (ORS) 374.425, "In connection with the acquisition of real property for right-of-way for a throughway described in ORS 374.420, the county court or board of county commissioners may prescribe the location, width, nature and extent of any right of access that pertains to such real property." [Amended by 1965 c.364 s.2].

This plan includes access management standards that shall be implemented as new development occurs or as redevelopment occurs. Access standards shall be reviewed and applied during the County's development review process before building permits are issued. When developing access management standards to be applied to new development or redevelopment, the County shall address access spacing relative to existing driveways and public roads based on the level of County road, access design, intersection and roadway sight

distance, signing, illumination, and coordination of design with other utilities. Other factors may also be applied. The County shall publish these standards as part of their land development ordinance so that developers clearly understand what is expected of them when preparing development plans.

The access spacing standard for public street intersections on County roads, both collectors and local roads shall be 500 feet. The access spacing standard for private driveway intersections on collector roads shall be 200 feet and on local roads shall be 50 feet. Where this standard can not be met, access shall be provided to every lot.

MODAL PLANS

The Lake County modal plans have been formulated using information collected and analyzed through a physical inventory, forecasts, goals and objectives, and input from the TAC and area residents. The plans consider transportation system needs for Lake County during the next 20 years assuming the growth projections discussed in Chapter 5. The changes in land use patterns and growth of the population will guide the timing for individual improvements in future years. Specific projects and improvement schedules may need to be adjusted depending on how rapidly and where growth occurs within Lake County.

Roadway System Plan

The Lake County roadway system plan encompasses all of the roadway and bridge projects identified to date by Lake County and ODOT over the 20-year planning horizon. It provides a consolidated list of the many projects that have been identified by various sources. The four primary sources of identified roadway and bridge projects include:

- Lake County's five-year working pavement, gravel road, and bridge maintenance plans;
- ODOT's final 2002-2005 Statewide Transportation Improvement Program (STIP);
- Oregon's Outback Scenic Byway Management and Marketing Plan for State Highways 31 and 395 Corridor; and
- Input from the Lake County TSP public involvement process.

Projects identified in Lake County's five-year working pavement, gravel road, and bridge maintenance plans are considered necessary routine maintenance needs based on field observations by County staff; therefore, they were not evaluated through the TSP public involvement process for implementation. Projects identified under ODOT's STIP are already state funded and scheduled to take place over the next four-year planning horizon, and are included in the 20-year transportation project list.

Projects identified through the TSP public involvement process were evaluated in Chapter 6 (Potential Improvement Option Analysis). Some of the projects were recommended for implementation and inclusion in the County's 20-year transportation project list.

The TSP projects are prioritized for short-term (0-5 years), intermediate-term (6-10 years), or long-term (11-20 years) implementation. The following sections outline the identified projects under the four sources listed above. Where available, planning level cost estimates are provided.

Lake County Five-Year Working Pavement, Gravel Road, and Bridge Maintenance Plans

Lake County has developed five-year working pavement, gravel road, and bridge maintenance plans to identify priority projects that the County would like to accomplish from 2002-2006. These projects represent Lake County's routine maintenance needs, and were not evaluated through the TSP public involvement process for

implementation. The County clearly understands the impact that available funding and resources may have on accomplishing these projects. Inclusion of a project in this list does not guarantee completion within the five-year planning horizon. Based on periodic review, the County may add or delete projects from their "working plans", as they deem necessary. Key components of the Lake County five-year working pavement, gravel road and bridge maintenance plans are flexibility. The road department routinely adapts its work schedule to changing priorities. Therefore, estimated completion dates for particular projects may be modified throughout the planning horizon.

The Lake County Five-Year Working Pavement Management Plan includes pavement rehabilitation projects for the next five years separated by year. The types of projects include crack seal, chip and crack seal, 4-inch overlay, and reconstruction. The estimated cost for fiscal years 2002 through 2006 are:

- Fiscal Year 2002 - $1,795,000
- Fiscal Year 2003 - $4,000,500
- Fiscal Year 2004 - $2,035,600
- Fiscal Year 2005 - $1,132,900
- Fiscal Year 2006 - $4,095,300

Appendix H summarizes the identified pavement rehabilitation maintenance projects with a short project description, project location, and cost estimate. The projects are not listed in any particular order.

The Lake County Five-Year Gravel Road and Bridge Maintenance Plans include pavement rehabilitation and bridge maintenance projects. **Table 7-4** summarizes the identified gravel road and bridge maintenance projects with a short project description, project location, and cost estimate. The projects are not listed in any particular order nor is a completion date estimated.

Projects in Lake County's 5-year working pavement, gravel road, and bridge maintenance plans do not constitute capital improvement projects, which require funds to be raised. The projects are funded by Lake County's annual budget for roadway improvements and are therefore not included in the County's 20-year transportation project list presented later in this chapter. Lake County Road Department representatives estimated project costs.

TABLE 7-4
LAKE COUNTY FIVE-YEAR GRAVEL ROAD AND BRIDGE MAINTENANCE PLANS

Road/ Bridge #	Road/Bridge Name	Project Description	Estimated Cost
Gravel Road Maintenance Projects			
2-10	Clover Flat Road	Fix grade and straighten	$160,000
1-11A	Buck Road	Build and drain	$23,045
2-18	Rabitt Hills Road	Rebuild and drain	$121,700
3-14	Twenty Mile Road	Rebuild and straighten	$57,650
4-12	East Bay Road	Shoulders	$75,000
5-12B	Fredericks Butte Road	Rebuild and drain	$365,100
Additional Rock Maintenance Projects			
2-10	Clover Flat Road		$573,600
1-11F	Fenimore Road		$47,800
3-10	Hog Back Road		$143,400
3-11	Flagstaff Road		$95,600
4-17	Thousand Spring Road		$71,700
5-11B	Soto Road		$95,600
5-13	Picture Lane		$382,400
Bridge Maintenance Projects			
37C041	Deep Creek	Patching cracks	$75,000
37C030	Drews Creek	Patching cracks	$75,000
TOTAL			**$2,362,595**

Source: Lake County Road Department

Statewide Transportation Improvement Program (STIP) Projects

The 2002-2005 Statewide Transportation Improvement Program (STIP) is the state's transportation capital improvement program, listing the schedule of transportation projects for the four-year period from 2002 to 2005. Projects in the STIP are funded mainly through federal and state gas tax revenues, but also include local government funding and other state and federal funding sources. The STIP includes projects on the state, city, and county transportation systems as well as projects in the National Parks, National Forests, and Indian Reservations. This program is updated every two years. The STIP lists specific projects, the counties in which they are located, their construction year, and estimated cost.

The current 2002-2005 STIP identifies nine projects within Lake County. These projects are identified in **Figure 7-2** and **Figure 7-3**.

- **Warner Highway Curve Corrections (Deep Creek) {Key #11179}** - This planned improvement scheduled for fiscal year 2005 includes curve corrections between Twelve Mile Ridge Road and Adel. The estimated cost for the 11-mile project along OR 140 east between mileposts 17.0 and 28.0 is $2.9 million.

- **Fremont Highway Pavement Preservation {Key #10284**} - The 14-mile segment of OR 31 between mileposts 86.0 near Harvey Creek and 100.0 near Lover's Lane is planned for pavement preservation. Construction is scheduled to begin in fiscal year 2002 at an estimated cost of $2.9 million. This project is financed with funds allocated prior to fiscal year 2002 so it does not impact the Final 2002-2005 STIP fiscal funding.

- **Warner Highway Pavement Preservation {Key #12410}** - The project involves pavement preservation along OR 140 east between mileposts 20.0 near Drake Creek and 28.0 near Adel. In addition to overlaying the roadway surface the project also includes adding aggregate for shoulders to improve the condition of the roadway. Construction of the 8-mile project is scheduled to begin in federal fiscal year 2002 at an estimated cost of $1.2 million.

- **Warner Highway Pavement Preservation (Greaser Canyon) {Key #12414}** - The project involves pavement preservation along OR 140 east within Greaser Canyon between mileposts 40.0 and 45.0. In addition to overlaying the roadway surface the project also includes adding aggregate for shoulders to improve the condition of the roadway. Construction of the 5-mile project is scheduled to begin in federal fiscal year 2002 at an estimated cost of $650,000.

- **Fremont Highway Pavement Preservation {Key #09537}** - The 14-mile segment of US 395 between mileposts 128.5 near Dicks Creek Road and 142.64 near the northern town limit of Lakeview is planned for pavement preservation. Construction is scheduled to begin in fiscal year 2005 at an estimated cost of $3.9 million.

- **Fremont Highway Pavement Preservation {Key #12520}** - The 8-mile segment of US 395 between mileposts 144.1 near the southern town limit of Lakeview and 152.0 near Cogswell Creek Bridge is planned for pavement preservation (grind out and inlay). Construction is scheduled to begin in fiscal year 2002 at an estimated cost of $1.2 million.

- **Muddy Creek Bridge and Cottonwood Creek Bridge {Key #10710}** - Bridges #02680 (Muddy Creek Bridge) and #02679 (Cottonwood Creek Bridge) are scheduled for bridge and rail replacement. The two bridges are located near Tunnel Hill Summit on the Klamath Falls-Lakeview Highway (OR 140) between mileposts 88.0 and 90.0. Construction is scheduled to begin in fiscal year 2003 at an estimated cost of $916,000.

- **Silver Creek Bridge {Key #09668}** - Bridge #03908 (Silver Creek Bridge), located along OR 31 is scheduled for replacement. Construction on the bridge, which is north of Silver Lake at milepost 46.75, is scheduled to begin in fiscal year 2005 at an estimated cost of $1.2 million.

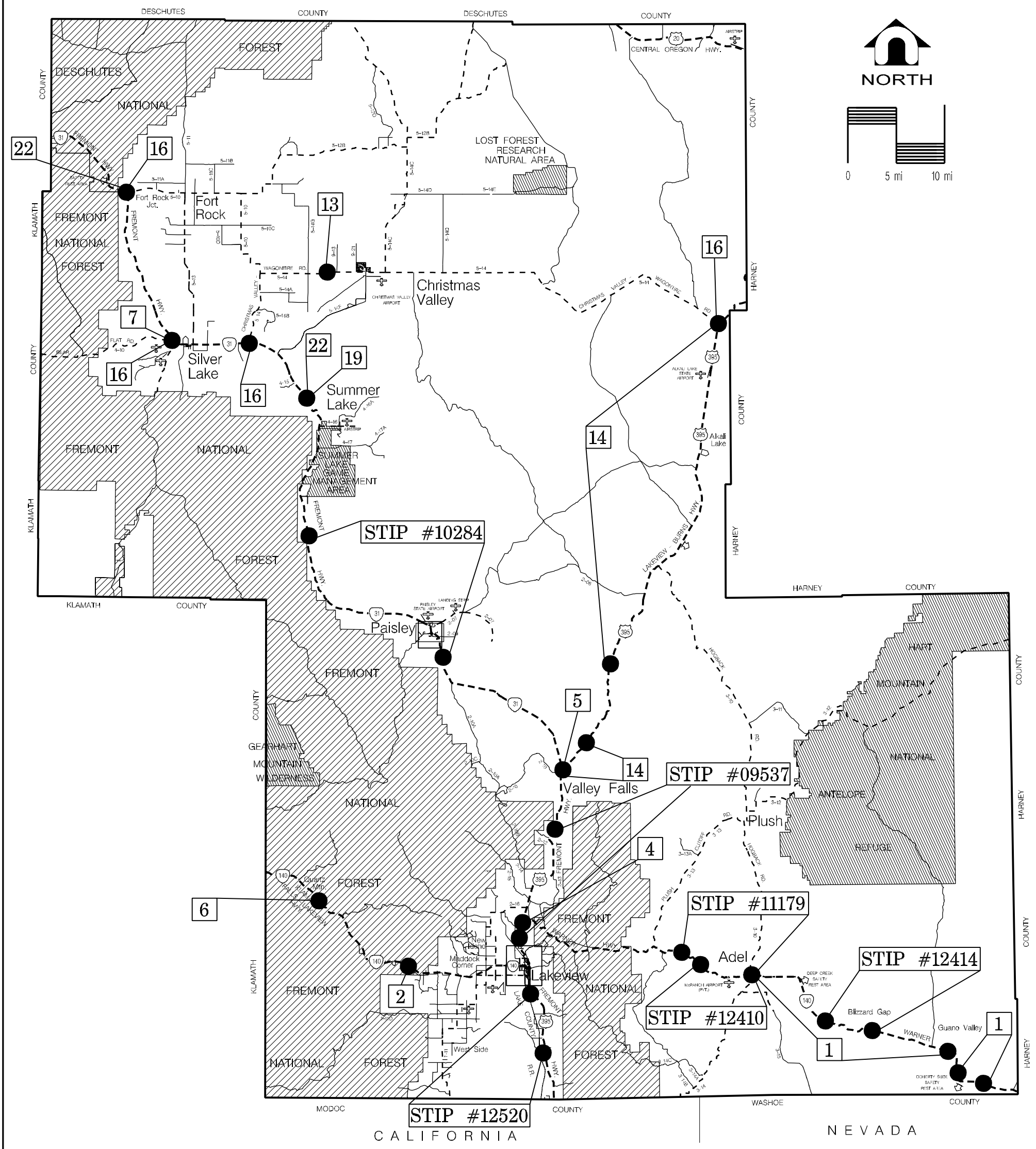
- **Lakeview Buses {Key #12093}** - This project involves the purchase of a bus for the demand responsive transit service provided within Lake County. The grant will occur in fiscal year 2003.

Oregon's Outback Scenic Byway Management and Marketing Plan for State Highways 31 and 395 Corridor

Oregon's Outback scenic byway runs between the junctions of OR 31 and US 97, just south of LaPine to the Oregon/California state line on US 395, near New Pine Creek. The total mileage of Oregon's Outback scenic byway is 158 miles of which all but the most westerly 18 miles are in Lake County. As part of the management and marketing plan which was completed in 1996 the following list of construction needs which were identified are still needed in Lake County:

<u>Short Term</u>

- Work with the City of Lakeview to locate and build a byway kiosk.



LAKE COUNTY STREET IMPROVEMENT PROJECTS

ROADWAY PROJECTS

MAP LOCATOR	ROAD NUMBER	PROJECT DESCRIPTION
1	OR 140 (East)	Safety Improvements along OR 140 (East)
2	OR 140 (West)	Safety Improvements along OR 140 (West)
4	US 395 & OR 140	Intersection Improvements @ US 395 & OR 140 (East)
5	OR 31 & US 395	Intersection Improvements @ OR 31 & US 395
6	OR 140 (West)	Enhance Chain-up Area and add School Bus Turnaround
7	OR 31	Improve Directional Signing to US 97
11	Various	Localized Shoulder Improvements (See Table 7-8)
12	County Roads	Add Bike Lanes along County Roads (See Table 7-9)
13	#5-14	Address S-curve on County Road #5-14
14	US 395	Pavement Preservation Projects along US 395
16	Various	Intersection Improvements (4 Intersections)
18	Various	Improve 4 Existing Rest Areas near Lakeview
19	OR 31	Safety Issues near Picture Rock Pass
22	OR 31	Provide 2 Chain-up & Chain-down Areas
STIP #11179	OR 140 (East)	Deep Creek Curve Corrections (MP 17 - MP 28)
STIP #10284	OR 31	Fremont Hwy Pavement Preservation (MP 86 -MP 100)
STIP #12410	OR 140 (East)	Warner Hwy Pavement Preservation (MP 20 - MP 28)
STIP #12414	OR 140 (East)	Warner Hwy Pavement Preservation (MP 40 - MP 45)
STIP #09537	US 395	Fremont Hwy Pavement Preservation (MP 128.5 - MP 142.6)
STIP #12520	US 395	Fremont Hwy Pavement Preservation (MP 144.1 - MP 152)

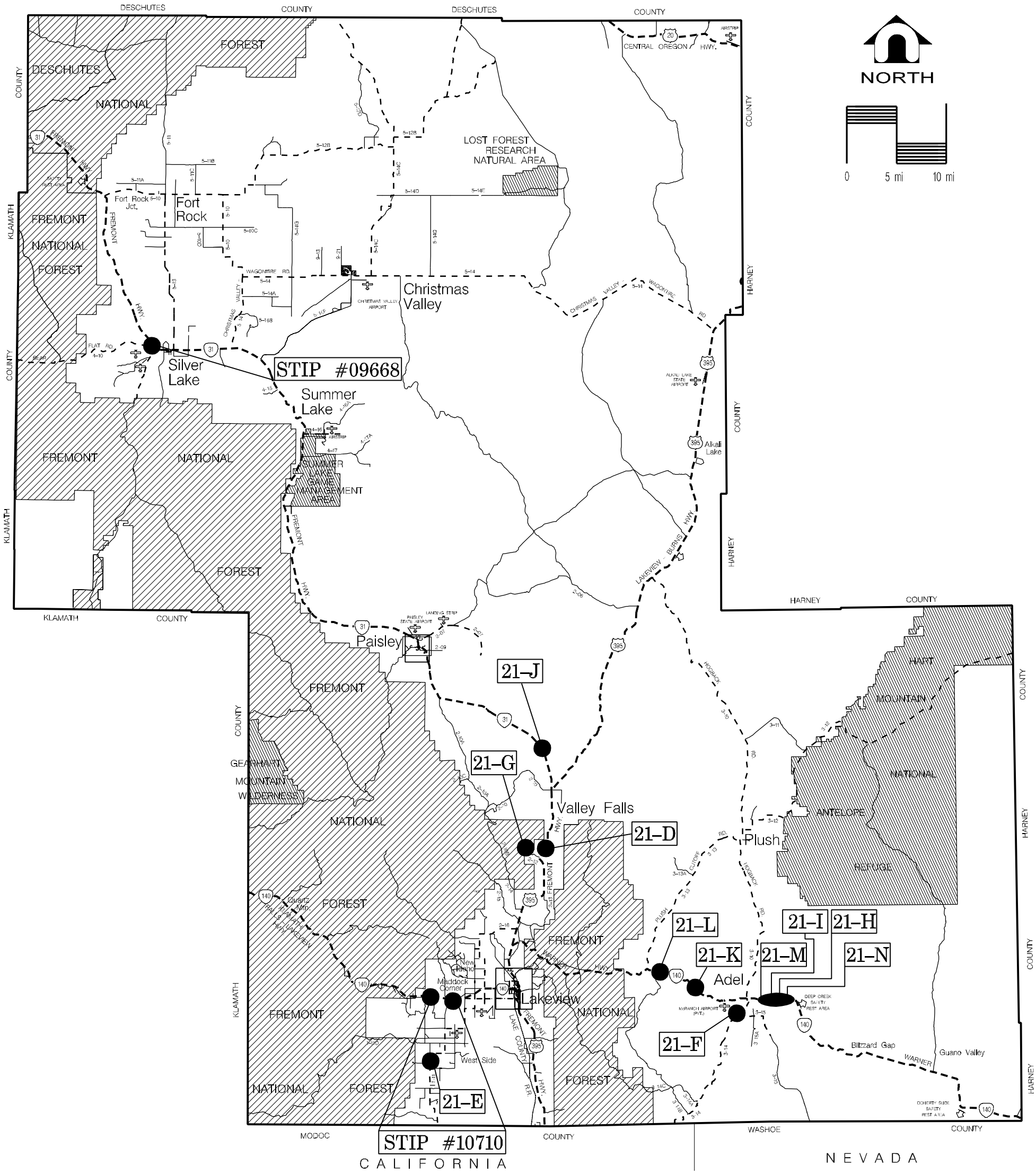
LEGEND:

- GENERAL ROADWAY LOCATION
- 6 — PROJECT NUMBER
- STIP #12520 — STIP PROJECT NUMBER
- 1 — GENERAL PROJECT LIMITS

FIGURE 7-2

Street Improvement Projects

LAKE COUNTY TSP



ROADWAY PROJECTS

LAKE COUNTY BRIDGE IMPROVEMENT PROJECTS

MAP LOCATOR	ROAD NUMBER	PROJECT DESCRIPTION	MAP LOCATOR	ROAD NUMBER	PROJECT DESCRIPTION
#09668	OR 31	Replace Bridge #03908 at MP 46.75	21-H	OR 140 (West)	Replace Rails on Bridge #08849, Irrigation Canal at MP 31.4
#10710	OR 140 (West)	Replace Bridge #02680 at MP 88.24	21-I	OR 140 (West)	Replace Rails on Bridge #08850, Irrigation Canal at MP 30.67
#10710	OR 140 (West)	Replace Bridge #02679 at MP 89.38	21-J	OR 31	Rail Retrofit for Bridge #00571A, Chewaucan River at MP 116.5
21-D	US 395	Replace Bridge #03915 at MP 126.92	21-K	OR 140 (West)	Rail Retrofit for Bridge #03937A, Drake Creek at MP 21.25
21-E	Westside Road	Replace County Bridge #37C030, 6 Miles South of OR 140 (West)	21-L	OR 140 (West)	Rail Retrofit for Bridge #06667A, Parsnip Creek at MP 18.24
21-F	Twentymile Road	Replace County Bridge #37C041, 1 Mile South of OR140 (East)	21-M	OR 140 (West)	Rail Retrofit for Bridge #08848A, Deep Creek at MP 29.65
21-G	Dicks Creek Road	Replace County Bridge #37C043, 1 Mile West of US 395	21-N	OR 140 (West)	Rail Retrofit for Bridge #09538, Twentymile Creek at MP 32.78

LEGEND:

- ● GENERAL ROADWAY LOCATION
- 21–C BRIDGE PROJECT NUMBER
- STIP #10710 STIP PROJECT KEY #

FIGURE 7-3

Bridge Improvement Projects

- Work with ODOT, Region 4 to install additional warning signs that inform visitors about the Open Range Policy. Signs are needed along the Fremont Highway (OR 31/US 395) near Fort Rock Junction at milepost 29.2, north and south of Valley Falls, north of Lakeview, and north of New Pine Creek.

- Work with ODOT, Region 4 to install additional warning signs at deer crossing locations.

Long Term

- Work with appropriate agencies to develop Visitor Kiosks at:

    1. Lakeview
    2. New Pine Creek

- Work with State Parks Department on Rest Area improvements at Chandler State Park.

- Work with ODOT, District 11 on wayside improvements at:

    1. Widen the existing Chandler State wayside at the Historical Marker just south of Valley Falls near milepost 126.
    2. Add new wayside pull-off along OR 31 south of Paisley.

- Locate and construct RV sewage dump stations at Silver Lake, Summer Lake, and Paisley.

- Work with appropriate agencies to improve:

    1. Special visitor service facility signs, such as, RV sewage dump station locations, recreation sites, environmental education sites, hiking, and horse trails, etc.
    2. Signs which point to as well as name major features along the Fremont Highway (OR 31/US 395) horizon, such as, Table Mountain near milepost 49.6, Fremont Point near milepost 69.0, Slide Mountain near milepost 89.0, Abert Rim near milepost 119.8, and Tague's Butte near milepost 122.0.
    3. Signs which identify what services are available ahead, one mile north and south of the communities of Silver Lake, Summer Lake, Valley Falls, and New Pine Creek.
    4. Information sign showing there is an existing interpretive kiosk one block east, at the junction of the road leading east to the Paisley Post Office.

- Work with appropriate agencies to improve interpretive panels at:

    1. Historical Marker just east of the Horse Ranch on the geology of Fort Rock needs to be rehabilitated.
    2. The watchable wildlife wayside north of Paulina Marsh on the interstate deer herd.
    3. OR 31 and the Christmas Valley Road. At the existing BLM kiosk add interpretation on Native American culture, geology of Table Mountain and Silver Lake, ranching, and wildlife.
    4. Summer Lake rest stop on history, fishery, geology, springs at Anna reservoir and ranching.
    5. South of Paisley to inform visitors on the ranches and agriculture visible along the road and the reclamation project.
    6. At the existing Historical Marker just north of Valley Falls on the geology of Abert Rim. Add interpretation on the old lake geology, and the wildlife, waterfowl, shore birds, photography and hunting in the area. The Historical Marker needs to be rehabilitated.
    7. Town of Lakeview (downtown or on US 395 at Hunter's Resort) that tell about the hang gliding in the area and the thermals that make Lakeview the "Hang Gliding Capital of the West."

8. New Pine Creek on the California National Historic Trail (Applegate Trail crossing the south end of Goose Lake), the Fremont National Forest opportunities, the history of New Pine Creek (oldest community in Lake County) and on Goose Lake Ferry.

Other Roadway and Bridge Improvement Projects

In addition to projects in Lake County's five-year plan, ODOT's 2002-2005 STIP and the Oregon Outback Scenic Byway Plan projects identified above, 14 roadway projects and 14 bridge projects were identified for implementation within Lake County. The roadway and bridge projects are located throughout the County in both rural and urban areas. These roadway and bridge projects were identified through the Lake County public involvement process and project evaluation presented in Chapter 6. The 14 street improvement projects are illustrated in **Figure 7-2** and the 14 bridge improvement projects are illustrated in **Figure 7-3**.

Table 7-5 summarizes the identified roadway improvement projects to be implemented within the 20-year planning horizon along with a short description of project location, project description, and estimated cost.

TABLE 7-5
ROADWAY SYSTEM IMPROVEMENT PROJECTS

Project No.	Road	Project Description	Estimated Cost (x $1000)
High Priority			
1	OR 140 east	Safety improvements at Deep Creek, Greaser Canyon, and Doherty Slide	$19,700 - $36,700[1]
4	US 395 and OR 140 east	Intersection improvements	$50 - $75
5	OR 31 and US 395	Intersection improvements	$150 - $200
7	OR 31	Improve directional signing to US 97 near Bear Flat Road	$1 - $1.5
14	US 395	Pavement preservation projects (MP 36-74 and MP 88-90)	$4,800 - $5,000
16	4 Intersections w/ State Hwys	Intersection improvements including larger STOP signs, STOP AHEAD signs, and double arrow signs	$10
		Subtotal High Priority Projects	$24,711 - $41,987
Medium Priority			
6	OR 140 west	Enhance existing chain-up area at Drews Valley and allow bus turnaround	$100
11	US 395 and OR 140 west	Localized shoulder improvements	$375
16	4 Intersections w/ State Hwys	Intersection improvements including travel lane rumble strips	$0 - $10
19	OR 31	Safety improvements including addressing rock fall issues, shoulder widening, adding guardrail, and curve flattening near MP 63.5	$2,800 -$3,000
		Subtotal Medium Priority Projects	$3,275 - $3,485
Low Priority			
2	OR 140 west	Safety improvements near Antelope Canyon	$2,500 - $3,500
13	County Road #5-14	Minor improvements to s-curve approximately 3 to 5 mile west of town	$25 - $37.5
16	4 Intersections w/ State Hwys	Intersection improvements including flashing lights	$0 - $20
18	Along Various Highways	Improve 4 existing rest area/waysides	$270
22	OR 31	Install chain-up and chain-down areas at two locations	$100
23	OR 431	Flatten Nevada Curve near milepost 65.2 (Harney County)	NA
		Subtotal Low Priority Projects	$2,895 - $3,928
		LAKE COUNTY TOTAL	**$30,881- $49,399**

1. Project Costs were reduced by $2.9 million based on STIP project (Key #11179).

Source: Chapter 6, Lake County TSP

Table 7-6 summarizes the identified bridge projects to be implemented within the 20-year planning horizon along with a brief description of project location and cost estimate for project rehabilitation/replacement.

TABLE 7-6
BRIDGE IMPROVEMENT PROJECTS

Project No.	Substandard Bridges	Jurisdiction	Priority[1] H - (0-5 yr.) M - (6-10 yr.) L - (11-20 yr.)	Estimated Project Cost[1] (x $1000)
Bridge Replacement				
21-A	Bridge No. 03908 on OR 31, Silver Creek Bridge at MP 46.75	State	High	$1,200[2]
21-B	Bridge No. 02680 on OR 140, Muddy Creek Bridge at MP 88.24	State	High	$916[2,3]
21-C	Bridge No. 02679 on OR 140, Cottonwood Creek Bridge at MP 89.38	State		
21-D	Bridge No. 03915 on US 395, Crooked Creek Bridge at MP 126.92	State	Medium	$1,500
21-E	Bridge No. 37C030 on Westside Road, 6 miles south of OR 140 (west)	County	High	$1,225[4]
21-F	Bridge No. 37C041 on Twentymile Road, 1 mile south of OR 140 (east)	County	High	$1,875[4]
21-G	Bridge No. 37C043 on Dicks Creek Road, 1 mile west of US 395	County	High	$325[4]
Rail Replacement				
21-H	Bridge No. 08849 on OR 140, Irrigation Canal at MP 31.4	State	Low	$300
21-I	Bridge No. 08850 on OR 140, Irrigation Canal at MP 30.67	State	Low	$300
Rail Retrofit				
21-J	Bridge No. 00571A on OR 31, Chewaucan River at MP 116.5	State	Low	$2,500
21-K	Bridge No. 03937A on OR 140, Drake Creek at MP 21.25	State	Low	$500
21-L	Bridge No. 06667A on OR 140, Parsnip Creek at MP 18.24	State	Medium	$626
21-M	Bridge No. 08848A on OR 140, Deep Creek at MP 29.65	State	Low	$1,500
21-N	Bridge No. 09538 on OR 140, Twentymile Creek at MP 32.78	State	Low	$2,500
			Total	**$15,267**

1. ODOT Region 4 staff estimated priority and costs.
2. Estimated project cost is from 2002-2005 Final STIP.
3. Two Bridges are grouped into one project and the cost is to replace both bridges.
4. The Association of Oregon Counties (AOC) provided cost estimates to Lake County.

Source: Chapter 6, Lake County TSP

Pedestrian System Plan

The pedestrian system plan addresses pedestrian facility needs within the City of Paisley and the rural community of Silver Lake. The shorter trips that most people are willing to make by walking supports the fact that the majority of pedestrian traffic in Lake County is focused within the cities and the rural communities. The majority of pedestrian facilities including sidewalks and paths, although limited, are also located within these cities and rural communities. Where sidewalks are present within Lake County, they are generally fragmented and often not on both sides of a street. The sidewalks are primarily located in the vicinity of community resources, such as schools, shops, and churches, which generate higher levels of pedestrian traffic. Pedestrian facilities should be implemented in the City of Paisley and the rural community of Silver Lake when feasible.

The primary goal of establishing a pedestrian system is to improve pedestrian safety; however, an effective sidewalk system has several qualitative benefits as well. Providing adequate pedestrian facilities increases the livability of a city. When pedestrians can walk on a sidewalk, separated from vehicular street traffic, it makes the walking experience more enjoyable and may encourage walking, rather than driving, for short trips. Sidewalks enliven a downtown and encourage leisurely strolling and window shopping in commercial areas. This "Main Street" effect improves business for downtown merchants and provides opportunities for friendly interaction among residents. It may also have an appeal to tourists as an inviting place to stop and walk around.

In Chapter 6, project 17 identified primary locations to improve sidewalk connectivity within the City of Paisley and the rural community of Silver Lake. **Table 7-7** summarizes the locations including priority and estimated

costs. All new sidewalks and curbs must be constructed to meet ODOT standards. All new sidewalk and curbs on County or City facilities should also be constructed to ODOT standards. Additionally, all new facilities must be in compliance with the Americans with Disabilities Act (ADA).

TABLE 7-7
PEDESTRIAN SYSTEM PROJECTS

Street	Description	Local Priority	Cost
Paisley Pedestrian Facilities			
OR 31 (MP 98.28 - 98.46)	Construct sidewalk along west side between Assembly of God Church and Saloon	Medium	$23,750
OR 31 (MP 98.46 - 98.69)	Construct sidewalk along west side between Saloon and Paisley Ranger Station	Medium	$30,375
	Total Paisley Pedestrian Projects		**$54,125**
Silver Lake Pedestrian Facilities			
OR 31 (MP 47.35 - 47.8)	Construct sidewalk along west side between 1st Street and 10th Street	Medium	$59,375
	Total Silver Lake Pedestrian Projects		**$59,375**
	Total		**$113,500**

Note: Unit costs of $25 per linear foot used to determine project costs. The cost may be lower based on final sidewalk design and whether Lake County Road Department performs part or all of the construction.

Source: Chapter 6, Lake County TSP; City representatives and TAC members indicated priority

Bicycle System Plan

The bicycle system plan addresses bicycle facility needs within Lake County along state highways and county roads.

State Highways

Based on forecast traffic volumes, all state highways within Lake County require a minimum of 4-foot directional paved shoulders according to ODOT Highway Design Standards. Based on review of ODOT's Highway Performance Management System (HPMS), ODOT's Highway Design Manual, and the *1997 Oregon Bicycling Guide Map*, the majority of state highway miles in Lake County have shoulders measuring less than four feet wide meaning that they do not meet ODOT design standards nor do they serve as shoulder bikeways. This does not necessarily make them inadequate for bicycle use, but generally requires bicyclists to share the roadway with motor vehicles. Where highway shoulders are not currently in accordance with published ODOT standards, appropriately wide paved shoulders should be added to each side of the highway as routine maintenance and/or rehabilitation projects occur.

In addition to adding appropriately wide paved shoulders during routine maintenance and/or rehabilitation projects, localized shoulder improvements have been recommended along each side of the state highways for a distance of ½ mile beyond the Lakeview UGB in each direction. The estimated cost to install 8-foot paved shoulders along both sides of the state highways beyond the Lakeview UGB for ½ mile is summarized in **Table 7-8**.

TABLE 7-8
LOCALIZED PROJECT SHOULDER COST ESTIMATE

Highway (Location)	Action	Side of Highway	Total Length (miles)	Unit Cost per Mile	Total Cost
Priority 1					
US 395 - north of Lakeview UGB (MP 140.73 - 140.23)	Add 8' paved shoulders	Both	0.5	$250,000	$125,000
US 395 - south of Lakeview UGB (MP 145.1 - 145.6)	Add 8' paved shoulders	Both	0.5	$250,000	$125,000
OR 140 - west of Lakeview UGB (MP 94.5 - 94.0)	Add 8' paved shoulders	Both	0.5	$250,000	$125,000
	Total		**1.5**		**$375,000**

Source: ODOT provided cost estimates and needed widths, DEA computed overall costs.

County Roads

Currently, the only dedicated bicycle facility in Lake County is the one-mile bike lane along Roberta Avenue within the Lakeview Urban Growth Boundary (UGB). The following locations have been identified for bike lanes:

- ½ mile long bike lane on Old Lake Road (5-14F) between Christmas Valley-Wagontire Road (5-14) and proposed Christmas Valley Park;
- 800 ft. long bike lane on Christmas Tree Lane (9-15) between Christmas Valley-Wagontire Road (5-14) and the Library;
- 3000 ft. long bike lane on Christmas Valley-Wagontire Road (5-14) between Old Lake Road (5-14F) and the Post Office;
- 3.5 mile bike lane along Stock Drive (1-10) between Lakeview UGB and Westside Road; and
- 1 mile bike lane along Lakeridge Road (2-16) between OR 140 and Stock Drive.

Considering that adding bike lanes to Stock Drive as proposed would require widening four bridges, the bicycle lanes should be dropped at the bridges.

The cost to overlay the road and install five-foot bike lanes along both sides of the road for 1 mile is $167,000. This cost includes labor, equipment, and material costs for fill and paving. The total cost would be reduced if the shoulders (i.e., subbase) required less fill material. The estimated cost and priority for each of the five proposed bike lanes are summarized in **Table 7-9**.

TABLE 7-9
COUNTY ROAD BICYCLE FACILITIES

Street	Description	Priority	Cost
Bicycle Lane Facilities			
Old Lake Road (5-14F)	Construct ½ mile long bike lane	Medium	$83,500
Christmas Tree Lane (9-15)	Construct 800 ft long bike lane	Medium	$25,300
Christmas Valley-Wagontire Road (5-14)	Construct 3000 ft long bike lane	High	$94,900
Stock Drive (1-10)	Construct 3.5 mile long bike lane	Low	$584,500
Lakeridge Road (2-16)	Construct 1 mile long bike lane	Low	$167,000
		TOTAL	**$955,200**

Source: Chapter 6, Lake County TSP; Lake County Road Department provided costs and priority

Transportation Demand Management Plan

Through transportation demand management (TDM), peak travel demands can be reduced or spread to more efficiently use the transportation system, rather than building new or wider roadways. Techniques, which have been successful and could be initiated to help alleviate some traffic congestion, include carpooling and vanpooling, alternative work schedules, bicycle and pedestrian facilities, and programs focused on high-density employment areas.

In Lake County, where traffic volumes are low and the population and employment is small, implementing TDM strategies is not practical in most cases. However, the pedestrian and bicycle improvements recommended earlier in this chapter are also considered TDM strategies. By providing these facilities, Lake County is encouraging people to travel by other modes than the automobile. In rural communities, TDM strategies include providing mobility options.

Intercity commuting may be a factor in Lake County where residents live in one city and work in other cities. Where this occurs, people should be encouraged to carpool with a fellow coworker or someone who works in the same area. Lake County should consider creating a rideshare program, which could further boost carpooling ridership.

No costs have been estimated for the TDM plan. Grants may be available to set up programs; other aspects of Transportation Demand Management can be encouraged through ordinance and policy.

Public Transportation Plan

The Oregon Transportation Plan indicates that intercity passenger service should be available for an incorporated city or group of cities within five miles of one another having a combined population of over 2,500 and located 20 miles or more from the nearest Oregon city with a larger population and economy. Services should allow a round trip to be made within a day.

Lake County does not meet these requirements nor does it appear needed or economically feasible to provide intercity transit within the County. However, if in the future Lake County identifies a need or desire to begin such service, state support is usually necessary to get this kind of service started. For regular intercity service to have a chance of success, it must attract riders from the general public, not just the elderly. Ideally it should connect with Greyhound service. Further, it must run at regularly scheduled times so that people may depend on the service.

In Lake County there are four agencies which provide demand responsive (or dial-a-ride) transit services. Three out of the four are public agencies which share ODOT Special Transportation Fund (STF) dollars and donations to service the transportation disadvantaged.

The Lake County Activity Center provides demand responsive transit services for seniors and people with disabilities located in south Lake County. In addition to demand responsive transit services, the Center provides meals on wheels, grocery/prescription delivery, and trips of interest. The Center currently operates one 1994 7-person mini-van and one 2001 14-person small bus. Both the mini-van and bus are wheelchair accessible with the mini-van able to serve one and the bus able to serve two wheelchairs.

The Inter Court Family Center provides once-a-week transit services for seniors and people with disabilities located in Paisley and Summer Lake. The transit service typically takes seniors once-a-week, usually on Wednesdays, into Lakeview or other locations for shopping, doctor appointments, etc. If the number of passengers is small (1-2 passengers) the service will be provided in private vehicles, otherwise the Inter Court Family Center uses a 12-passenger van. The 1978 van is provided by the Assembly of God Church and is not wheelchair accessible. The condition of the van is estimated to be fair-to-poor. The 1978 van does not follow ODOT replacement schedules because it is provided by the Assembly of God Church.

The North Lake Family Center provides once-a-month transit service for seniors and people with disabilities located in Fort Rock, Christmas Valley, Silver Lake, and Summer Lake. The center contracts with the local school district to rent a bus for the once-a-month outing. The North Lake Family Center has received a grant and is scheduled to receive a small bus in 2003 via ODOT 2002-2005 STIP.

The public agencies that provide demand responsive transit services will continue to replace their transit vehicle fleet as needed during the next 20 years based on established vehicle replacement standards from ODOT (refer to **Table 6-5**). The mini-van requires replacement every four years or 100,000 miles and the small buses require replacement every seven years or 200,000 miles. Failure to replace the transit vehicles based on ODOT's vehicle replacement intervals may result in a loss of demand responsive (dial-a-ride) transit service for the public providers within Lake County.

The Lakeview Assisted Living Facility provides scheduled services for the seniors and people with disabilities living in the facility as part of the overall services. They currently operate one mini-van and have adequate capacity for the services they provide. The facility, which does not receive state funded dollars, is open for discussion on expanding their transportation services to other senior citizens within the community.

The Red Ball Stage Line provides regional bus service between Lakeview and Klamath Falls. Intermediate stops in the towns of Olene, Dairy, Beatty, and Bly are available if needed. The Red Ball Stage Line primarily serves freight, and passenger service availability is limited.

The five school districts in Lake County are Lakeview, Paisley, North Lake, Adel, and Plush. Other than the Plush School District, each of the school districts provides, owns, and maintains their own buses. Expansion of the school bus services is not required at this time.

There is no identified need to expand the dial-a-ride program or Red Ball Stage Line services within Lake County within the next 20 years. However, Lake County shall continue to monitor usage and demand levels over the years and investigate service expansion as the need arises.

Rail Service Plan

The only railroad service serving Lake County is the Lake County Railroad, which is classified as a Shortline Railroad. The Lake County Railroad, which is limited to freight service only, runs between Lakeview, OR and

Alturus, CA once a week. No plans are being recommended at this time to expand services to passengers. The nearest passenger rail service via Amtrak is located in Klamath Falls approximately 95 miles west of Lakeview.

Air Service Plan

Lake County has nine operational air service facilities registered with the Oregon State Aviation Department including eight airstrips and a helicopter pad operated by the Lake District Hospital. The three privately-owned airstrips are the Table Rock Airport, the Farr Ranch Airport, and the Saxon Sycan Airport. The other five airports are open to the public. The US Forest Service owns the Silver Lake US Forest Service Landing Strip. The state of Oregon owns the Alkali Lake State Airport. The Christmas Valley Airport is owned by the Christmas Valley Parks and Recreation Department. Lake County owns the two remaining airports, the Lake County Airport and the Paisley Airport.

The Lake County Airport has recently completed an Airport Layout Plan (March 2001). The plan identifies current and future facility needs and the improvements necessary to maintain a safe, efficient, economical, and environmentally acceptable air transportation facility. The Airport Capital Improvement Program, containing 12 short-term projects and 18 long-term projects totaling $2,111,567, is summarized in **Table 7-10**.

TABLE 7-10
LAKE COUNTY AIRPORT
20-YEAR CAPITAL IMPROVEMENT PROGRAM

Project	Total Cost [1]	FAA Eligible	Local/State
Short Term Projects			
Reconstruct Fuel Apron (100' x 200')	$31,200	$28,080	$3,120
Resurface Main Apron (2" AC)	$40,200	$36,180	$4,020
Construct AC Holding Areas on Taxiways	$48,000	$43,200	$4,800
Slurry Seal Access Taxiways (A & B)	$87,140	$78,426	$8,714
Slurry Seal Tiedown Apron	$8,800	$7,920	$880
Replace MIRL (Runway 16-34)	$185,500	$166,950	$18,550
Taxiway Reflectors (Access Taxiways & Connectors)	$25,800	$23,220	$2,580
PAPI (replace existing VASI)	$50,000	$45,000	$5,000
REIL - Runway 16 & 34	$30,000	$27,000	$3,000
Apron Flood Lighting	$24,000	$21,600	$2,400
Slurry Seal Main Apron	$13,400	$12,060	$1,340
Slurry Seal Runway	$117,800	$106,020	$11,780
Total Short Term Projects	**$661,840**	**$595,656**	**$66,184**
Long Term Projects			
Sewer Holding Tanks & Hook Ups (Terminal Area)	$30,000	$0	$30,000
Terminal Area & Hanger Security Fencing	$30,000	$27,000	$3,000
Reconstruct/Resurface East Hangar Access Road	$22,500	$20,250	$2,250
Replace Existing Fencing (Obstruction Removal)	$129,000	$116,100	$12,900
East Hangar Apron Frontage (40' x 250')	$26,667	$24,000	$2,667
Slurry Seal Access Taxiways	$87,140	$78,426	$8,714
Slurry Seal Main Apron	$13,400	$12,060	$1,340
Slurry Seal Tiedown Apron	$8,800	$7,920	$880
T-Hanger Access Taxiway	$26,400	$23,760	$2,640
Replace/Extend Water to Hanger Areas	$60,000	$0	$60,000
Water Storage Tank (180,000 gal.)	$150,000	$0	$150,000
Slurry Seal Runway	$117,800	$106,020	$11,780
Resurface Tiedown Apron (2" AC)	$26,400	$23,760	$2,640
Ag Lease Area Access Road	$26,400	$23,760	$2,640
Ag Aircraft Apron & Taxiway	$50,400	$45,360	$5,040
Ag Loading Pad w/ containment (6" PCC)	$30,000	$27,000	$3,000
Resurface Access Taxiways (2" AC)	$261,420	$235,278	$26,142
Resurface Runway (2" AC)	$353,400	$318,060	$35,340
Total Long Term Projects	**$1,449,727**	**$1,088,754**	**$360,973**
TOTAL SHORT & LONG TERM PROJECTS	**$2,111,567**	**$1,684,410**	**$427,157**

1. Project costs include 30% engineering and contingency.
Source: Lake County Airport - Airport Layout Plan Report

The nearest passenger-use airport is located in Klamath Falls. The Klamath Falls Airport-Kingsley Field in Klamath Falls is a tower-controlled airport which offers commercial air service as well as full general aviation services and is the home to the Oregon Air National Guard 173rd Fighter Wing. The airport has two asphalt/concrete runways at an elevation of 4,092 feet. The main runway #14/32 is 10,301 feet long and 150 feet wide and the second runway #7/25 is 5,260 feet long by 100 feet wide. Horizon Airlines is currently the only commercial airline that services the Klamath Falls Airport, with nine scheduled flights per day to/from Portland. Additional flight information can be found by contacting Horizon Air at 1-800-547-9308 or www.horizonair.com.

Air Life of Oregon, a medically urgent air transportation service based in Bend, OR, serves medical emergencies in Lake County. Air Life of Oregon has one helicopter and three Pilatus PC-12 airplanes (fixed-wing), although one of the fixed-wing airplanes supports the Air Life base in La Grande. The three agencies within Lake County that request Air Life of Oregon support are the Lake District Hospital, the Lakeview Disaster Unit, and the Lakeview Fire Department. Air Life transports medical emergencies in Lake County to the nearest appropriate medical facility. The nearest medical centers to Lake County are the St. Charles Medical Center in Bend, the Merle West Medical Center in Klamath Falls, and the Rogue Valley Medical Center in South Medford.

Pipeline Service Plan

There is no existing pipeline infrastructure within Lake County and development is not identified to occur within the next 20 years.

Water Transportation Plan

The TSP process evaluates only the commercial use of water systems within Lake County to move goods and services. Recreational water use is not evaluated. There is no identified plan to develop commercial movement of goods and services in Lake County by water within the next 20 years.

TRANSPORTATION SYSTEM PLAN IMPLEMENTATION PROGRAM

Implementation of the Lake County Transportation System Plan will require changes to the County Comprehensive Plan, Land Development Ordinances, and Zoning Code. It also involves preparation of a Capital Improvement Program (CIP). These actions will enable Lake County to address both existing and emerging transportation issues throughout the County in a timely and cost effective manner. This implementation program is focused on providing Lake County with the tools to amend the Comprehensive Plan, Land Development Ordinance and Zoning Ordinance to conform with the Oregon Transportation Planning Rule and to fund and schedule transportation system improvements.

One part of the implementation program is the formulation of a 20-year transportation project list. The purpose of the project list is to detail the identified transportation system improvements needed as Lake County grows and to provide a process to fund and schedule the identified transportation system improvements. It is expected that the 20-year transportation project list can be integrated into the existing County CIP and the ODOT STIP. This integration is important since the Transportation System Plan proposes that county, city, and state governmental agencies fund all or portions of the transportation improvement projects.

Model policy and ordinance language that conforms with the requirements of the Transportation Planning Rule is included in Chapter 9. The proposed ordinance amendments will require approval by the Lake County Commissioners.

20-Year Transportation Project List

The 20-year transportation project list is presented in **Table 7-11** and consists of the potential projects reviewed in Chapter 6 of the TSP that were recommended for implementation within the next 20 years. For consistency, projects maintain their original project number for ease of reference between Chapters 6 and 7 of this report. Projects are listed by the following priorities:

- High Priority (next 0 to 5 years)
- Medium Priority (6 to 10 years)
- Low Priority (11 to 20 years)

These priorities are based on current need, the relationship between transportation service needs and the expected growth of the County, and a reasonable balance of near and long-term expenditures. The following schedule indicates priorities and may be modified to reflect the availability of finances or the actual growth in population and employment.

Estimated year 2002 project costs are associated with the jurisdiction responsible for coordinating funding. For example, the City of Paisley has the responsibility to coordinate funding for local sidewalk improvements. The city may do this by paying for improvements themselves or by applying for a state or federal grant to fund the project. Estimated project costs include design, construction, and some contingency costs. They are preliminary estimates and do not include right-of-way acquisition, water or sewer facilities, or detailed intersection design.

Lake County has identified 38 projects in its 20-year transportation project list with a total cost of about $81.3 million. Twenty high priority projects have been identified with an approximate cost of $68.7 million. Eight medium priority projects have been identified with an approximate cost of $6.1 million. Ten low priority projects have been identified with an approximate cost of $6.5 million.

TABLE 7-11
PRIORITIZED 20-YEAR TRANSPORTATION PROJECT LIST

		Estimated Cost Allocation			
Project Number/Description		**Federal**	**State**	**County**	**Total[2]**
High Priority (2002-2006)					
1	Safety improvements along OR 140 east at Deep Creek, Greaser Canyon, and Doherty Slide		$36,700,000		$36,700,000
4	Intersection improvements at US 395 and OR 140 east		$75,000		$75,000
5	Intersection improvements at OR 31 and US 395		$200,000		$200,000
7	Improve directional signing to US 97 along OR 31 at Bear Flat Road		$1,500		$1,500
12	Install bike lanes along County roads - high priority locations			$94,900	$94,900
14	Pavement preservation projects along US 395		$5,000,000		$5,000,000
16	Intersection improvements (larger STOP signs, STOP AHEAD signs, double arrow signs)		$10,000		$10,000
20	Replace dial-a-ride transit fleet - high priority			$40,800	$40,800
21	Upgrade substandard bridges - high priority		$7,600,000	$3,425,000	$11,025,000
STIP[1]	Curve corrections along OR 140 east from mileposts 17.0 - 28.0 **{Key #11179}**		$2,900,000		$2,900,000
STIP[1]	Pavement preservation along OR 31 from mileposts 86.0 - 100.0 **{Key #10284}**		$2,900,000		$2,900,000
STIP[1]	Pavement preservation along OR 140 east from mileposts 20.0 - 28.0 **{Key #12410}**		$1,200,000		$1,200,000
STIP[1]	Pavement preservation along OR 140 east from mileposts 40.0 - 45.0 **{Key #12414}**		$650,000		$650,000
STIP[1]	Pavement preservation along US 395 from mileposts 128.5 - 142.6 **{Key #09537}**		$3,900,000		$3,900,000
STIP[1]	Pavement preservation along US 395 from mileposts 144.1 - 152.0 **{Key #12520}**		$1,200,000		$1,200,000
STIP[1]	Replace Muddy Creek Bridge (02680) and Cottonwood Creek Bridge (02679) **{Key #10710}**		$916,000		$916,000
STIP[1]	Replace Silver Creek Bridge (03908) **{Key #09668}**		$1,200,000		$1,200,000
STIP[1]	Purchase of a bus for Lake County **{Key #12093}**		$62,000		$62,000
	Oregon Scenic Byway - high priority projects		NA		NA
	Lake County Airport - high priority projects (refer to Table 7-11)	$595,656	$66,184[3]		$661,840
Medium Priority (2007-2012)					
6	Enhance existing chain-up area at Drews Valley and allow school bus turnaround		$100,000		$100,000
11	Localized shoulder improvements along US 395 and OR 140 west		$375,000		$375,000
12	Install bike lanes along County roads - medium priority locations			$108,800	$108,800
16	Intersection improvements (travel lane rumble strips)			$10,000	$10,000
17	Install pedestrian facilities in the City of Paisley and the rural community of Silver Lake		$113,500		$113,500
19	Safety improvements along OR 31 near Picture Rock Pass (addressing rock fall issues, shoulder widening, adding guardrail, and curve flattening near milepost 63.5)		$3,000,000		$3,000,000
20	Replace dial-a-ride transit fleet - medium priority			$226,500	$226,500
21	Upgrade substandard bridges - medium priority		$2,126,000		$2,126,000
Low Priority (2013-2022)					
2	Safety improvements along OR 140 west near Antelope Canyon		$3,500,000		$3,500,000
12	Install bike lanes along County roads - low priority locations			$751,500	$751,500
13	Minor improvements to s-curve along County Road #5-14 (3-5 miles west of town)			$37,500	$37,500
16	Intersection improvements (flashing lights)		$20,000		$20,000
18	Improve 4 existing rest areas/waysides near Lakeview		$270,000[4]		$270,000
20	Replace dial-a-ride transit fleet - low priority			$344,100	$344,100
22	Install chain-up and chain-down areas at two locations along OR 31		$100,000		$100,000
	Oregon Scenic Byway - low priority projects		NA		NA
	Lake County Airport - low priority projects (refer to Table 7-11)	$1,088,754	$360,973[3]		$1,449,727
23	Flatten Nevada Curve along OR 431 near milepost 65.2 (HARNEY COUNTY)		NA		NA
Subtotal High Priority Projects		**$595,656**	**$64,580,684**	**$3,560,700**	**$68,737,040**
Subtotal Medium Priority Projects		**$0**	**$5,714,500**	**$345,300**	**$6,059,800**
Subtotal Low Priority Projects		**$1,088,754**	**$4,250,973**	**$1,133,100**	**$6,472,827**
LAKE COUNTY TOTAL		**$1,684,410**	**$74,546,157**	**$5,039,100**	**$81,269,667**

Notes
1. Funded as part of final 2002-2005 STIP project.
2. The higher cost estimate has been illustrated; the ranges are shown in Chapter 6.
3. Projects will be funded by either state or local agencies.
4. Oregon State Parks

Source: TAC recommendations based on Chapter 6, Lake County TSP.

CHAPTER 8: FUNDING OPTIONS AND FINANCIAL PLAN

The Transportation Planning Rule requires TSPs to include an evaluation of the funding environment for improvements. This evaluation must include a listing of all transportation improvement projects, estimated costs to implement those improvements, and a review of potential funding mechanisms. Lake County's TSP identifies 38 specific capital improvement projects over the next 20 years. This section of this TSP provides an overview of some funding and financing options that may be available to Lake County and local jurisdictions to fund these improvements.

While many parts of Oregon are experiencing increased development pressure, many of the transportation projects needed to support the resulting increases in population and traffic remain unfunded. Lake County will need to work with its incorporated cities and ODOT to secure and allocate the necessary funds for any proposed new transportation projects over the 20-year planning horizon, which will be determined by the rate of population and employment growth experienced by the community. This TSP assumes Lake County will grow at the rate forecast by the State of Oregon Office of Economic Analysis over the next 20 years. If population growth exceeds this rate, the improvements may need to be accelerated. Slower than expected growth will relax the improvement schedule.

HISTORICAL STREET IMPROVEMENT FUNDING SOURCES

In Oregon, state, county, and city jurisdictions work together to coordinate transportation improvements. **Table 8-1** shows the distribution of road revenues for the different levels of government within the state by jurisdiction level. Although these numbers were collected and tallied in 1991, ODOT estimates that these figures accurately represent the current revenue structure for transportation-related needs.

TABLE 8-1
SOURCES OF ROAD REVENUES BY JURISDICTION LEVEL

	Jurisdiction Level			Statewide
Revenue Source	**State**	**County**	**City**	**Total**
State Road Trust	58%	38%	41%	48%
Local	0%	22%	55%	17%
Federal Road	34%	40%	4%	30%
Other	8%	0%	0%	5%

Source: ODOT 1993 Oregon Road Finance Study

At the statewide level, nearly half (48 percent in Fiscal Year 1991) of all road-related revenues are allocated from the State Highway Fund, which includes funds from fuel taxes, weight-mile taxes on trucks, and vehicle registration fees. As shown in **Table 8-1**, the State Road Trust is a considerable source of revenue for all levels of government. Federal sources (generally the Federal Highway Trust account and Federal Forest Revenues) comprise another 30 percent of all road-related revenue. The remaining sources of road-related revenues are generated locally and include property taxes, Local Improvement Districts (LID), bonds, traffic impact fees, road user taxes, general fund transfers, receipts from other local governments, and other miscellaneous sources.

The State of Oregon generates 94 percent of its highway revenues from user fees, compared to an average of 78 percent among all other states. This fee system, including fuel taxes, weight distance charges, and registration fees, is regarded as equitable because it places the greatest financial burden upon those who create the greatest need for road maintenance and improvements. Unlike many states that have indexed user fees to inflation, Oregon has static road-revenue sources. For example, rather than assessing fuel taxes as a percentage of price per gallon, Oregon's fuel tax is a fixed amount (currently 24 cents) per gallon.

This chapter describes existing sources of transportation funding in Lake County, the outlook for revenue from those funding sources, and potential sources of additional transportation revenue.

Transportation Funding in Lake County

Historically, sources of road revenue for Lake County has included federal forest fees, state highway fund revenue, federal grants, interest earnings from the investment of the fund balance, and other sources. Transportation revenues and expenditures for Lake County are shown in **Table 8-2** and **Table 8-3**.

TABLE 8-2
LAKE COUNTY TRANSPORTATION-RELATED REVENUES

	1999-2000 Actual	2000-2001 Actual	2001-2002 Adopted	2002-2003 Adopted
Beginning Fund Balance	**$2,025,280**	**$1,510,730**	**$1,500,000**	**$2,000,000**
Local Revenue				
Miscellaneous Resources	$3,470	$3,890	$2,500	$2,500
Interest	$92,950	$61,590	$125,000	$65,000
Prepaid Admin Fees	$0	$0	$0	$0
Materials & Service Fees	$90,060	$79,950	$310,000	$310,700
SAIF Refund	$27,490	$10,410	$0	$0
Equipment Rental	$125	$0	$100	$0
Total Local Revenue	**$214,095**	**$155,840**	**$437,600**	**$378,210**
State Revenue				
STP Income	$108,280	$121,270	$110,000	$131,000
Vehicle Registration & Gas Tax	$482,220	$494,860	$500,000	$437,000
Total State Revenue	**$590,500**	**$616,130**	**$610,000**	**$568,000**
Federal Revenue				
BLM Receipts	$13,540	$1,870	$2,500	$100
Forest Receipts	$718,080	$716,190	$3,351,750	$3,430,030
Total Federal Revenue	**$731,620**	**$718,060**	**$3,354,250**	**$3,430,130**
Transfer from Other Funds				
Total Revenue from Other Funds	**$445,950**	**$1,127,520**	**$469,280**	**$47,385**
Total Revenue including Beginning Fund Balance	**$4,007,445**	**$4,128,290**	**$6,371,130**	**$6,423,725**

Source: Lake County Fiscal Year 2002/2003 Budget.

As shown in **Table 8-2**, revenues have been increasing since 1999. The actual revenue in the 1999-2000 budget was $4,007,445 compared to the adopted 2002-2003 budget that expects $6,453,725. The major increase in Lake County revenue comes from federal forest receipts.

Lake County's primary income source has been federal forest receipts, which has increased significantly over the last few years from $700,000 in 1999-2000 (18% of total budget) to $3,500,000 in 2002-2003 (55% of total budget). The increase in federal timber receipts was caused by new federal regulations to divert more money to counties that lost revenue when timber receipts declined; however, this legislation is going to "sunset" in 2006. Other significant sources of revenue are the State Motor Vehicle Fund (Lake County's most stable at approximately $500,000 per year) and local material and service fees.

Transportation-related expenditures are shown in **Table 8-3**. The proposed 2002-2003 budget distributes Lake County expenditures as follows:

- Salary & Benefits (22% of proposed budget). This line item has increased from $1.1 million in 1999-00 to $1.4 million in 2002-03.
- Accounts Payable (30% of proposed budget). This line item has increased from $1.3 million in 1999-00 to $1.9 million in 2002-03.
- Capital Outlay (0% of proposed budget). Capital improvements have fluctuated between $0 in 2002-03 to $22,400 in 2001-02.
- Contingency (4% of proposed budget). This line item has increased from $0 in 1999-00 to $ 280,000 in 2001-02.
- Transfer to Other Funds (13% of proposed budget). This line item has increased from $100,000 in 1999-00 to $800,000 in 2002-03.
- Ending Fund Balance (31% of proposed budget). This line item has increased from $0 in 1999-00 to $2 million in 2002-03.

TABLE 8-3
LAKE COUNTY TRANSPORTATION-RELATED EXPENDITURES

	1999-2000 Actual	2000-2001 Actual	2001-2002 Adopted	2002-2003 Adopted
Salary & Benefits	$1,086,680	$1,174,405	$1,278,685	$1,398,700
Accounts Payable	$1,310,030	$1,348,645	$1,955,765	$1,944,275
Capital Outlay	$0	$3,230	$22,400	$0[1]
Contingency	$0	$0	$281,860	$269,660
Transfer to Other Funds	$100,000	$98,650	$832,420	$811,090
Ending Fund Balance	$0	$0	$2,000,000	$2,000,000
Total Expenditures including Ending Fund Balance	**$2,496,710**	**$2,624,930**	**$6,371,130**	**$6,423,725**

Notes:

[1] Capital Outlay, as shown in the Road Fund Budget, is only for operations and maintenance. Major expenses, such as new equipment purchases, are drawn from the Capital Improvement Fund.

Source: Lake County Fiscal Year 2002/2003 Budget.

Transportation Revenue Outlook in Lake County

ODOT's policy section recommends certain assumptions in the preparation of transportation plans. In its Financial Assumptions document prepared in May 1998, ODOT projected the revenue of the State Highway Fund through year 2020. The estimates are based on not only the political climate, but also the economic structure and conditions, population and demographics, and land use patterns. The latter is particularly important for state-imposed fees because one of the goals of Oregon's Transportation Planning Rule (TPR) requires a ten-percent reduction in per-capita vehicle miles of travel (VMT) in Metropolitan Planning Organizations (MPO) planning areas by 2015, and a 20-percent reduction by 2025. This requirement will affect the 20-year forecast for fuel tax revenue. ODOT recommends the following assumptions:

- Fuel tax will increase by one cent per gallon per year (beginning in year 2002), with an additional one cent per gallon every fourth year;
- Vehicle registration fees would be increased by $10 per year in 2002, and by $15 per year in year 2012;
- Revenues will fall halfway between the revenue-level generated without the TPR and the revenue level if TPR goals were fully met; and

- The revenues will be shared among the state, counties, and cities on a "50-30-20 percent" basis rather than the previous "60-24-16 percent" basis;
- Inflation occurs at an average annual rate of 3.6 percent (as assumed by ODOT).

Figure 8-1 shows a 1998 forecast from ODOT in both current-dollar (shown in 2000 dollars) and inflation-adjusted constant (2000) dollars. As highlighted by the constant-dollar data, the highway fund is expected to grow more slowly than inflation early in the planning horizon until fuel-tax and vehicle-registration fee increases occur in year 2002, then increase somewhat faster than inflation through year 2015, then (again) more slowly than inflation.

Lake County is highly susceptible to changes in the State Highway Fund because it is expected to remain a significant source of funding for the county. The amount actually received from the State Highway Fund will depend on a number of factors, including the amount of revenue generated by state gasoline taxes, vehicle registration fees, and other sources. It will also depend on population growth in Lake County because the distribution of state highway funds is based on an allocation formula that includes population as a variable.

Criteria for Choosing Potential Funding Sources

Transportation improvements are funded by a wide variety of programs and sources at the State and local levels. Potential funding sources are evaluated by two primary criteria: *financial capacity* (can the source pay for the improvements?) and *political acceptability* (is the source politically acceptable to the citizens of Lake County?). A critical issue for political acceptability is who pays for the funding sources. In general, citizens of Lake County will prefer Federal and State funding for improvements over local sources. If local sources must be used, a basic principle of public finance is that the people should pay based on either the costs they impose or the benefits they receive, unless they belong to some group that deserves special treatment. The public is much more likely to support programs such as System Development Charges or assessments that place the financial burden on those who benefit most from an improvement. If charging people who benefit from an improvement is not feasible or the benefits are widespread, funding sources that spread the cost out among a large number of people may be acceptable because of the low cost to individuals.

The standard criteria for evaluating potential funding sources also include legal authority, stability, and administrative costs. The legal authority and administrative feasibility criteria are addressed by considering only funding sources currently used in Oregon, and assessing the *financial capacity* of funding sources in this section.

Given the consideration of who pays and the perspective of citizens in Lake County, the County should pursue funding sources for transportation improvements in the following order:

- Use Federal and State funds first. Try to get more projects or funds from ODOT (which distributes State and Federal funds), or tie what might otherwise be local projects (e.g. sidewalks and bike paths) to Federal or State highway projects.
- For the remaining projects that primarily benefit specific areas, charge property owners (through local improvement districts or special assessments) or new development (through land use requirements and System Development Charges) where possible and appropriate.
- For remaining projects that do not directly benefit property owners or new development that is willing to pay for the project, make sure that they are needed and that the design options have considered lower-cost alternatives.
- Pay for remaining projects out of existing revenue sources if possible.

- If additional revenue is needed beyond existing revenue sources, implement new funding mechanisms, based on a consideration of financial capacity, who pays, and the other criteria described above. Some new fees or taxes (such as tolls, vehicle registration fees, street utility fees, and fuel taxes) are based on use of the transportation system, while others (such as property taxes) charge residents regardless of their use of the transportation system. Some funding sources (such as tolls and fuel taxes) spread some of the cost to non-residents. Many new funding mechanisms need voter approval.
- If raising additional revenue is not politically acceptable, scale back or eliminate the proposed improvements.

REVENUE SOURCES

Financing the transportation system improvements requires expenditure of capital resources, so it is necessary to consider a range of funding sources. A number of potential revenue sources are described in this section. Not all revenue sources may be appropriate for Lake County, but is provided to illustrate the range of options currently available to finance transportation improvements during the next 20 years. Specific matches between projects and revenue sources are made in a later section of this chapter.

Property Taxes

Property taxes have historically been the primary revenue source for local governments. Most counties and cities in Oregon avoid using general property tax revenues to fund transportation maintenance, but occasionally use property tax revenue to fund capital improvements for transportation. This limitation, in addition to the passage of Ballot Measures 5 and 47 that significantly reduced property tax revenue have forced jurisdictions to search for alternative funding sources. The dependence of local governments on this revenue source is partly due to the fact that property taxes are easy to implement and enforce. Property taxes are based on real property (i.e., land and buildings) which has a predictable value and appreciation. In contrast, income and sales taxes can fluctuate with economic trends or unforeseen events.

Property taxes can be levied through: 1) tax base levies, 2) serial levies, and 3) bond levies. The most common method uses tax base levies that do not expire and are allowed to increase by six percent per annum, whereas serial levies are limited to a fixed amount of money and time period. Bond levies are designated for specific projects and are limited by time based on the debt load of the local government or the project.

The historic dependence on property taxes has changed with the passage of Ballot Measure 5 in 1990. Ballot Measure 5 amended the Oregon Constitution to limit the property tax rate for purposes other than payment of certain voter-approved general obligation debts. Under full implementation, the tax rate for all local taxing authorities is limited to $15 per $1,000 of assessed valuation. As a group, all non-school taxing authorities are limited to $10 per $1,000 of assessed valuation. All tax base, serial, and special levies are subject to the tax rate limitation. Ballot Measure 5 requires that all non-school taxing district's property tax rate be reduced if together they exceed $10 per $1,000 per assessed valuation by the county. If the non-debt tax rate exceeds the constitutional limit of $10 per $1,000 of assessed valuation, then all of the taxing districts' tax rates are reduced on a proportional basis. The proportional reduction in the tax rate is commonly referred to as compression of the tax rate.

Oregon voters passed Ballot Measure 47, an initiative petition, in November 1996, which is a constitutional amendment that reduces and limits property taxes and limits local revenue and replacement fees. The measure limits 1997-98 property taxes to the lesser of the 1995-96 tax minus 10 percent, or the 1994-95 tax. It limits future annual property tax increases to three percent, with some exceptions. Local governments' lost revenue

may be replaced only with state income tax, unless voters approve replacement fees or charges. Tax levy approvals in certain elections require 50 percent voter participation.

The state legislature created Ballot Measure 50, which retains the tax relief of Measure 47 but clarifies some legal issues. Voters approved this revised tax measure in May 1997.

The League of Oregon Cities (LOC) estimated that direct revenue losses to local governments, including school districts, totaled $467 million in fiscal year 1998, $553 million in 1999, and increasing thereafter, although the actual revenue losses to local governments depends on actions of the Oregon Legislature. LOC also estimates that the state had revenue gains of $23 million in 1998, $27 million in 1999, and increasing thereafter because of increased personal and corporate tax receipts due to lower property tax deduction.

These measures have a direct impact on the ability of cities to pay for transportation improvements out of general funds or other funds created through property taxes. In addition, it may affect cities' abilities to create alternative funding sources if those sources are perceived to be in replacement of property tax revenue.

Franchise Fees

These are annual fees paid by TV cable, electricity, and telephone utilities for the use of the City right-of-way. Ashland is an example of a city that imposes these fees; in Ashland, they total approximately $350,000 annually.

Utility Fees

A street utility fee would charge businesses and residences in Lake County a fee for use of streets, based on the amount of use typically generated by each type of land use. This fee is similar to those charged for water and sewer utility service, and it would not be subject to the limits of Measure 5. Cities in Oregon that charge a street utility fee include Ashland and Medford, and a typical fee is $2/month for a single-family residence. Revenue from this source can only be used for maintenance of streets, but this would free up other funds to use for capital improvements such as the projects in the TSP.

System Development Charges

System Development Charges (SDCs) are becoming increasingly popular for funding public works infrastructure needed for new local development. Generally, the purpose of a SDC is to allocate portions of the costs associated with capital improvements on the developments that increase demands on transportation, sewer or other infrastructure systems.

Local governments have the legal authority to charge property owners and/or developers fees for improving local public works infrastructure to meet the projected demand resulting from their developments. Charges are most often targeted toward improving community water, sewer, or transportation systems. To collect SDCs, cities and counties must have specific infrastructure plans in place that comply with state guidelines.

Typically, an SDC is collected when new building permits are issued that help fund the construction of transportation facilities necessitated by new development. This is calculated three separate ways depending on the type of development:

- Transportation SDCs are based on trip generation of the proposed development.

- Residential calculations are based on the assumption that a typical household will generate a given number of vehicle trips per day.
- Nonresidential use calculations are typically based on square footage and number of employees for the type of business or industrial uses.

A key legislative requirement for charging SDCs is the link between the need for the improvements and the developments being charged.

Some economists have criticized the prevalent SDC methodology, which charges property owners rather than road users. The road users, the argument goes, are the ones who receive the benefit of traveling by road and therefore ought to be the ones who pay for the roads, rather than the property owners whose activities generate or attract traffic.

State Gas Taxes, License Fees, and Vehicle Weight/ Mile Taxes

The State of Oregon allocates gas tax revenue to cities and counties for road construction and maintenance projects. The state collects gas taxes, vehicle registration fees, overweight/overheight fines and weight/mile taxes and then distributes a portion of the revenue to incorporated cities and counties through an allocation formula that is based on population. Oregon's vehicle registration fee, at $30 every two years, is a relatively minor source of revenue for highways and roads, generating less than 10 percent of the total highway user tax and fee revenue. In 1990, vehicle registration fees were increased by 50 percent, the first increase in 40 years. Compared to other states, Oregon's registration fee is low; registration fees in other states range from a low of $8.00 annually in Arizona to $125 annually in Minnesota. Like other Oregon counties, Lake County uses its State Gas Tax allocation to fund street construction and maintenance.

Local Gas Taxes

The Oregon Constitution permits counties and incorporated cities to levy additional local gas taxes with the stipulation that the money generated from the taxes will be dedicated to street-related improvements and maintenance within the jurisdiction. At present, only a few local governments (including the cities of Woodburn and The Dalles and Multnomah and Washington Counties) levy a local gas tax. Lake County may consider raising its local gas tax as a way to generate additional street improvement funds. However, with relatively few jurisdictions exercising this tax, an increase in the cost differential between gas purchased in Lake County and gas purchased in neighboring counties may encourage drivers to seek less expensive fuel elsewhere. Any action will need to be supported by careful analysis to minimize the unintended consequences of such an action. Local option gas taxes are often strongly opposed by area gasoline retailers who fear the tax will reduce sales. Voter approval is required for gas taxes approval, and for the most part voters have not approved the proposed local option gas taxes.

Local gas taxes typically range from $0.01 to $0.03 per gallon (compared to $0.183 per gallon Federal and $0.24 per gallon State). Revenues from a gas tax are typically substantial and relatively stable. A $0.01 tax in the City of Woodburn generates over $97,000 per year. Non-residents passing through pay a portion of this funding.

Vehicle Registration Fees

Oregon Revised Statues (ORS) grant counties and special districts the right to establish registration fees for vehicles, although cities currently do not have the legislative authority to impose local registration fees. Counties and districts are limited to a maximum of $30 for a two-year period on allowed classes of motor

vehicles. To establish an ordinance imposing the fee, the county must first obtain the approval of the county electors. The ordinance must be filed with the Department of Transportation. The governing body of the county must enter into an intergovernmental agreement with the department outlining the rules for administration of laws authorizing county and district registration fees and for the collection of the fees. The owner of any vehicles subject to multiple fees is allowed a credit or credits with respect to such fees so that the total of such fees does not exceed $30.

Although vehicle registration fees have not yet been imposed by any local jurisdictions in the state, Lake County could impose a registration fee for all passenger cars and other specified classes of vehicles licensed within the county. The county must pay at least 40 percent of the money to cities within the county unless a different distribution is agreed to between the county and the cities within the jurisdiction of the county. The funds may be used for any purpose for which the money for registration fees may be used.

Local Improvement Districts

The Oregon Revised Statutes allow local governments to form Local Improvement Districts (LIDs) to construct public improvements. LIDs are most often used by cities to construct localized projects such as streets, sidewalks or bikeways. The statutes allow formation of a district by either the local government or property owners. Cities that use LIDs are required to have a local LID ordinance that provides a process for district formation and payback provisions. Through the LID process, the costs of local improvements are generally spread out among a group of property owners within a specified area. The costs can be allocated based on property frontage or other methods such as trip generation. The types of allocation methods are only limited by the Local Improvement Ordinance. The cost of LID participation is considered an assessment against the property which is a lien equivalent to a tax lien. Individual property owners typically have the option of paying the assessment in cash or applying for assessment financing through the local government. Since the passage of Ballot Measure 5, cities have most often funded local improvement districts through the sale of special assessment bonds.

Federal Timber Receipts

On October 30, 2000, President Clinton signed the Secure Rural Schools and Community Self-Determination Act. This legislation is expected to stabilize, and in some cases significantly increase, federal timber sale payments to state and county governments. This law replaces the previous system that tied annual timber receipts to how much money was allocated to counties. The new plan is expected to distribute funds based on the amount counties received during the three peak years of public timber harvests between 1986 and 1999, which will also include cost of living adjustments. As a result of this legislation, Lake County has received approximately $4.5 million from this plan for school and road projects historically linked to timber receipt money. This was an increase of over $2.6 million from 2000 for the road department.

Of the 4.5 million, 15 percent (about $675,000) is allocated to projects that affect federal lands. These types of projects include forest road construction, stream enhancement, forest thinning etc., which will be selected by a Resource Advisory Committee comprised of public and private interests. The remainder of the money will be split between the school district, which will receive 25 percent of the funding, and the County Road Fund that will receive the remainder to be used for road repair and improvements. Funding through this program will be available through September 2006, when the program terminates and any remaining money is returned to the U.S. Treasury.

For more information, contact the Oregon Association of Counties at (503) 585-8351.

Public Lands Highway Discretionary Program

The Public Lands Highways Program was originally established in 1930 by the Amendment Relative to Construction of Roads through Public Lands and Federal Reservations. Funding was provided from the General Fund of the Treasury. The intent of the program is to improve access to and within the Federal lands of the nation. The Federal-Aid Highway Act of 1970 changed the funding source for the program from the General Fund to the Highway Trust Fund, effective in fiscal year (FY) 1972. The program has been continued with each highway or transportation act since then, and the latest transportation act, the Transportation Equity Act for the 21st Century (TEA-21, Public Law 105-178), has continued the program through FY 2003.

Any kind of transportation project eligible for assistance under Title 23, U.S.C., that is within, adjacent to, or provides access to Federal public land areas is eligible for this program. No local match required.

For more information, contact Larry Beidel at the FHWA Public Lands Highway Division at (202) 366-4653.

Federal Lands Highway Funds

The Federal Lands Highway Program covers highway programs in cooperation with Federal land managing agencies (Forest Service, Bureau of Land Management etc.). It provides transportation engineering services for planning, design, construction, and rehabilitation of the highways and bridges providing access to federally-owned lands. The Federal Lands Highway organization also provides training, technology, deployment, engineering services, and products.

The FHWA, through cooperative agreements with Federal land managing agencies such as the National Park Service, Forest Service, Military Traffic Management Command, Fish and Wildlife Service, and the Bureau of Indian Affairs, administers a coordinated Federal lands program consisting of forest highways, public lands highways, park roads and parkways, refuge roads, and Indian reservation roads. This program provides funding for more than 90,000 miles of federally-owned and public authority-owned roads which serve Federal lands. The Agency's Federal Lands Highway Office provides program coordination, administration and design, and construction engineering assistance and directs the conduct of transportation planning and engineering studies.

For more information, contact the Western Lands Highway Division at (360) 396-7922.

Forest Highway Program

Forest Highways are Forest roads under the jurisdiction of, and maintained by, a public authority and open to public travel. These highways provide access to national forests and their resources for the benefit of communities in or near National Forests. The Federal Highway Administration (FHWA) administers the forest highway program in cooperation with the Forest Service and the ODOT. Under this program, Federal funds are made available for the construction and improvement of forest highways. When National Forest lands are involved, public lands highway funds are also available, but it depends on the FHWA's determination of need for the project, which is based on consultations with ODOT and the Forest Service.

For more information, contact the Western Lands Highway Division at (360) 396-7922.

Grants and Loans

There are a variety of grant and loan programs available, most with specific requirements related to economic development or specific transportation issues, rather than for the general construction of new streets. Many

programs require a match from the local jurisdiction as a condition of approval. Because grant and loan programs are subject to change as well as statewide competition, they should not be considered a secure long-term funding source for Lake County. Most of the programs available for transportation projects are funded and administered through ODOT and/or the Oregon Economic and Community Development Department (OECDD). Some programs that may be appropriate for Lake County are described below.

Public Transportation Discretionary Grant Program

The Discretionary Grant Program combines multiple sources of public transportation-related funding into a single application process. Funding sources include capital funds in the Federal Transit Administration (FTA) Section 5310 program (Elderly and Disabled Capital Assistance), FTA Section 5311 program (Small City General Public), Oregon's Special Transportation Fund (STF) program for elderly and disabled residents, and federal Surface Transportation Program. All funding is awarded on a project by project basis with matching funds from the applicant often required. Funds are added to the program as they are available. ODOT Region 4 has received about $930,000 in discretionary grant funding for the 2002 fiscal year.

Projects are selected for funding through a process that includes community involvement via advisory committees. This helps ensure projects have strong community support. All projects selected for funding are included in Oregon's Statewide Transportation Improvement Program. Lake County could be eligible for these funds if public transportation systems are implemented. The existing Dial-A-Ride program would be eligible for funding through this program.

For more information, contact ODOT's Public Transit Division at (503) 986-3885.

Bike-Pedestrian Grants

By law (ORS 366.514), all road street or highway construction or reconstruction projects must include facilities for pedestrians and bicyclists, with some exceptions. ODOT's Bike and Pedestrian Program administers two programs to assist in the development of walking and bicycling improvements: local grants, and Small-Scale Urban Projects. Cities and counties with projects on local streets are eligible for local grant funds. An 80 percent state/20 percent local match ratio is required. Eligible projects include curb extensions, pedestrian crossings and intersection improvements, shoulder widening and restriping existing roads for bike lanes. Projects on urban state highways with little or no right-of-way taking and few environmental impacts are eligible for Small-Scale Urban Project Funds. Both programs are limited to projects costing up to $100,000. Projects that cost more than $100,000, require ROW acquisition, or generate environmental impacts should be submitted to ODOT for inclusion in the STIP.

For more information, contact ODOT's Bicycle and Pedestrian Program at (503) 986-3555.

Transportation Enhancement Program

This federally-funded program earmarks 10% of state Surface Transportation Program (STP) funds, up to $8 million annually in Oregon, for projects that relate to 12 categories in the Transportation Equity Act for the 21st Century (TEA-21). Projects must demonstrate a link to the intermodal transportation system, compatibility with approved plans, and local financial support. A 10 percent local match is required for eligibility. Each proposed project is evaluated against all other proposed projects in its region. Within the five Oregon regions, the funds are distributed on a formula based on population, vehicle miles traveled, number of vehicles registered and other transportation-related criteria.

For more information, contact ODOT's TEA-21 Enhancement Program at (503) 986-3528.

Highway Bridge Rehabilitation or Replacement Program

The Highway Bridge Rehabilitation or Replacement Program (HBRR) provides federal funding for the replacement and rehabilitation of bridges of all functional classifications. A portion of the HBRR funding is allocated for the improvement of bridges under local jurisdiction. A quantitative ranking system is applied to the proposed projects based on their sufficiency rating, cost factor, and load capacity. They are ranked against other projects statewide, and require state and local matches of 10 percent each. The HBRR includes the Local Bridge Inspection Program and the Bridge Load Rating Program.

For more information, contact ODOT's Highway Bridge Rehabilitation or Replacement Program at (503) 986-3344.

Transportation Safety Grant Program

Managed by ODOT's Transportation Safety Section (TSS), this program's objective is to reduce the number of transportation-related accidents and fatalities by coordinating a number of statewide programs. These funds are intended to be used as seed money, funding a program for three years. Eligible programs include those relating to impaired driving, occupant protection, youth, pedestrians, speed, enforcement, and bicycle and motorcycle safety. Capital construction is not considered for funding.

Every year, TSS produces a Highway Safety Plan that identifies the major safety programs, suggests countermeasures, and lists successful projects selected for funding, rather than granting funds through an application process. The program totals $6 million annually, and requires a sliding scale local match.

For more information, contact ODOT's Transportation Safety Grant Program at (503) 986-4192.

Special Transportation Fund

The Special Transportation Fund (STF) awards funds to maintain, develop, and improve transportation services for people with disabilities and people over 60 years of age. Financed by a two-cent tax on each pack of cigarettes sold in the state, the annual distribution of funds is approximately $5 million. Three-quarters of these funds are distributed to mass transit districts, transportation districts, and, where no such districts exist, to counties, on a per-capita formula. The remaining funds are distributed on a discretionary basis.

For more information, contact ODOT's Special Transportation Fund at (503) 986-3885.

County Allotment Program

The County Allotment Program distributes funds to counties on an annual basis; the funds distributed in this program are in addition to the regular disbursement of State Highway Fund resources. The program determines the amount of total revenue available for roads in each county and the number of centerline road miles (not lane miles) of collectors and arterials under each county's jurisdiction. Using these two benchmarks, a "resource-per-equivalent" ratio is calculated for each county. Resources from the $750,000 program are provided to the county with the lowest resource-per-equivalent road-mile ratio until they are funded to the level of the next-lowest county. The next-lowest county is then provided resources until they are funded to the level of the third-lowest county, and so on, until the fund is exhausted.

For more information, contact ODOT's County Allotment Program at (503) 986-3893.

Surface Transportation (STP) Funds

TEA-21, the Federal Transportation Efficiency Act for the 21st Century, funds programs for highways and transit, and permits surface transportation program funding flexibility between modes. This gives the state more latitude in selecting the modal alternatives that would best address local congestion problems. STP funds are generally limited to capital projects with a few exceptions. In non-urbanized areas ODOT has the responsibility of allocating these funds.

For more information, contact ODOT Long Range Capital Planning at (503) 986-3300.

Immediate Opportunity Grant Program

The Oregon Economic and Community Development Department (OECDD) and ODOT collaborate to administer a grant program designed to assist local and regional economic development efforts. The program is funded to a level of approximately $7 million per year through state gas tax revenues. The following are primary factors in determining eligible projects:

- Improvement of public roads;
- Inclusion of an economic development-related project of regional significance;
- Creation or retention of primary employment; and
- Ability to provide local funds (50/50) to match grant.

The maximum amount of any grant under the program is $500,000. Local governments that have received grants under the program include Washington County, Multnomah County, Douglas County, the City of Hermiston, Port of St. Helens, and the City of Newport.

For more information, contact ODOT's Immediate Opportunity Grant Program at (503) 986-3463.

Oregon Special Public Works Fund

The Special Public Works Fund (SPWF) program was created by the 1995 State Legislature as one of several programs for the distribution of funds from the Oregon Lottery to economic development projects in communities throughout the State. The program provides grant and loan assistance to eligible municipalities primarily for the construction of public infrastructure that supports commercial and industrial development and results in permanent job creation or job retention. To be awarded funds, each infrastructure project must support businesses wishing to locate, expand, or remain in Oregon. The SPWF funds can be used for improvement, expansion, and new construction of public sewage treatment plants, water supply works, public roads, and transportation facilities.

While SPWF program assistance is provided in the form of both loans and grants, the program emphasizes loans in order to assure that funds will return to the State over time for reinvestment in local economic development infrastructure projects. Jurisdictions that have received SPWF funding for projects that include some type of transportation-related improvement include the Cities of Baker City, Bend, Cornelius, Forest Grove, Madras, Portland, Redmond, Reedsport, Toledo, Wilsonville, Woodburn, and Douglas County.

The state legislature has recently added a new component to this program, which allows loans for "community facility projects." The criteria are less stringent, and projects that are not necessarily economic development-related may be awarded loans.

For more information, contact ODOT's Oregon Special Public Works Fund at (503) 986-0136.

Oregon Transportation Infrastructure Bank

The Oregon Transportation Infrastructure Bank (OTIB) program is a revolving loan fund administered by ODOT to provide loans to local jurisdictions, including cities, counties, special districts, transit districts, tribal governments, ports, and state agencies. Eligible projects include construction of federal-aid highways, bridges, roads, streets, bikeways, pedestrian accesses, and right-of-way costs for all federal-aid (Title 23) projects (major collector or higher roads). Capital outlays such as buses, light-rail cars and lines, maintenance yards, and passenger facilities (under Title 49) are also eligible. This funding source may not be available in the future, as this program is being phased out.

For more information, contact ODOT's Oregon Transportation Infrastructure Bank at (503) 986-3922.

National Scenic Byway Program

The National Scenic Byway Program was established by the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), and continued as part of the Transportation Equity Act for the 21st Century (TEA-21). The purpose of the program is to recognize and enhance roads, which have outstanding scenic, historic, cultural, natural, recreational, and archaeological qualities, and support State scenic byway initiatives. Portions of Highway 31 and Highway 395 are designated as the Outback Scenic Byway.

National Scenic Byways discretionary funds are available to undertake eligible projects. TEA-21 authorized $26.5 nationally million in FY 2003 for grants and technical assistance related to designated scenic byways.

For more information, contact FHWA's National Scenic Byways Program at (304) 594-9768.

ODOT Statewide Transportation Improvement Program Funding Options

The State of Oregon provides funding for all highway related transportation projects through the Statewide Transportation Improvement Program (STIP) administered by ODOT. The STIP outlines the schedule for ODOT projects throughout the state. The STIP, which identifies projects for a four-year funding cycle, is updated each biennium. In developing this funding program, ODOT must verify that the identified projects comply with the Oregon Transportation Plan (OTP), ODOT Modal Plans, Corridor Plans, local comprehensive plans, local Transportation System Plans (TSP), and TEA-21 Planning Requirements. The STIP must fulfill TEA-21 planning requirements for a staged, multi-year, statewide, intermodal program of transportation projects. Specific transportation projects are prioritized based on a review of the TEA-21 planning requirements and the different state plans. ODOT consults with local jurisdictions before highway related projects are added to the STIP.

The highway-related projects identified in Lake County's TSP will be considered for future inclusion on the STIP. The timing of including specific projects will be determined by ODOT based on an analysis of all the project needs within ODOT Region 4. Lake County and ODOT will need to communicate on a biennium basis to review the status of the STIP and the prioritization of individual projects within the project area. Ongoing communication will be important for the city, county, and ODOT to coordinate the construction of both local and state transportation projects.

ODOT also implements some highway improvements as part of its ongoing highway maintenance program. Types of road construction projects that can be included within the ODOT maintenance programs are

intersection realignments, additional turn lanes, shoulder widening, and striping for bike lanes. Maintenance related construction projects are usually conducted by ODOT field crews using state equipment. The maintenance crews do not have the staff or specialized road equipment needed for large construction projects.

An important change that occurred with the passage of ISTEA and TEA-21 was the widening of criteria for federal funding. ODOT now has the authority and ability to use federal dollars for transportation projects that are located outside the boundaries of the highway corridors. Many programs can now be used to fund local system improvements that reduce traffic on state highways or reduce the number of access points for future development along state highways.

FINANCING TOOLS

In addition to funding options, the improvements listed in this plan may be completed using a variety of financing options. Although often used interchangeably, the words financing and funding are not the same. Funding is the actual generation of revenue by which a jurisdiction pays for improvements. Some examples of funding include the sources discussed above (e.g. property taxes, SDCs, fuel taxes, vehicle registration fees, LIDs, and various grant programs). In contrast, financing refers to the collecting of funds through debt obligations.

There are a number of debt financing options available to Lake County. The use of debt to finance capital improvements must be balanced with the ability to make future debt service payments and to deal with the impact on its overall debt capacity and underlying credit rating. Again, debt financing should be viewed not as a source of funding, but as a time shifting of funds. The use of debt to finance these transportation-system improvements is appropriate since the benefits from the transportation improvements will extend over a period of years. If such improvements were to be tax financed immediately, a large short-term increase in the tax rate would be required. By utilizing debt financing, local governments spread the burden of the costs of these improvements to more of the people who are likely to benefit from the improvements and lower immediate payments.

General Obligation Bonds

General obligation (GO) bonds are voter-approved bond issues, which represent the least expensive borrowing mechanism available to municipalities. General obligation bonds are typically supported by a separate property tax levy specifically approved for the purposes of retiring debt. The levy does not terminate until all debt is paid off. The property tax levy is distributed equally throughout the taxing jurisdiction according to assessed value of property. General obligation debts are typically used to make public improvement projects that will benefit the entire community.

State statutes require that the general obligation indebtedness of a jurisdiction not exceed three percent of the real market value of all taxable property in its boundary. Since general obligation bonds would be issued subsequent to voter approval, they would not be restricted to the limitations set forth in Ballot Measures 5, 47, and 50. Although each new bond must be voter approved, Ballot Measure 47 and 50 provisions are not applicable to outstanding bonds, unissued voter-approved bonds, or refunding bonds.

Ballot Measure 50, approved in 1997 by Oregon voters, allows local taxing districts to seek voter approval of a local option property tax levy that exceeds the district's permanent limit but is within the limits of Measure 5. Except in general elections in even-numbered years, approval of a local option property tax levy would require a "double majority": 50% of registered voters participating in the election, and a majority of those who vote approving the levy.

Limited Tax Bonds

Limited tax general obligation bonds (LTGOs) are similar to general obligation bonds in that they represent an obligation of the municipality. However, a municipality's obligation is limited to its current revenue sources and is not secured by the public entity's ability to raise taxes. As a result, LTGOs do not require voter approval. However, since the LTGOs are not secured by the full taxing power of the issuer, the limited tax bond represents a higher borrowing cost than general obligation bonds. The municipality must pledge to levy the maximum amount under constitutional and statutory limits, but not the unlimited taxing authority pledged with GO bonds. Because LTGOs are not voter approved, they are subject to the limitations of Ballot Measures 5, 47, and 50.

Bancroft Bonds

Under Oregon Statute, municipalities are allowed to issue Bancroft bonds, which pledge the city's full faith and credit to assessment bonds. The bonds become general obligations of the city but are paid with assessments. Historically, these bonds provided cities with the ability to pledge their full faith and credit in order to obtain a lower borrowing cost without requiring voter approval. However, since Bancroft bonds are not voter approved, taxes levied to pay debt service on them are subject to the limitations of Ballot Measures 5, 47, and 50. As a result, since 1991, Bancroft bonds have not been used by municipalities that are required to compress their tax rates.

FUNDING REQUIREMENTS

Lake County's TSP identifies capital improvements for the next 20 years to address safety and access problems and to expand the transportation system to support a growing population and economy. This TSP identifies 39 projects in both urban and rural areas, classified into three implementation phases:

- High Priority: between 2002 to 2006;
- Medium Priority: between 2007 and 2011; and
- Low Priority: after 2011.

Estimated costs summarized by project and by implementation phase are shown in **Table 8-4**. Project costs are estimated by what it would cost to construct them this year, so the project costs are in 2002 dollars. The overall estimated project costs associated with Lake County's 20-year transportation project list is $81,269,667.

TABLE 8-4
SUMMARY OF PROJECT COSTS IN THE LAKE COUNTY TSP (2002 DOLLARS)

Project Priority	Federal Costs	State Costs	County Costs	Total (Year 2002)
High Priority	$595,656	$64,580,684	$3,560,700	$68,737,040
Medium Priority	$0	$5,714,500	$345,300	$6,059,800
Low Priority	$1,088,754	$4,250,973	$1,133,100	$6,472,827
Total	**$1,684,410**	**$74,546,157**	**$5,039,100**	**$81,269,667**

Source: Chapter 7 Lake County TSP.

MATCHING LAKE COUNTY PROJECTS WITH FUNDING SOURCES

Table 8-5 is a list of prioritized capital improvement programs for Lake County as established in the TSP, matched with potential funding sources. The projects may or may not be eligible for all sources listed, and further research will need to be conducted by Lake County to seek the most appropriate funding.

TABLE 8-5
PRIORITIZED CAPITAL IMPROVEMENT PROJECTS AND POTENTIAL FUNDING SOURCES

Project Number/Description		Total Cost (Year 2002) [1]	Potential Sources of Funding
High Priority (2002-2006)			
1	Safety improvements along OR 140 east at Deep Creek, Greaser Canyon, and Doherty Slide	$36,700,000	• STIP • Federal Forest/Public Lands
4	Intersection improvements at US 395 and OR 140 east	$75,000	• Transp. Safety Grant Program
5	Intersection improvements at OR 31 and US 395	$200,000	• Transp. Safety Grant Program
7	Improve directional signing to US 97 along OR 31 at Bear Flat Road	$1,500	• Federal Timber Receipts
12	Install bike lanes along county roads - high priority locations	$94,900	• Bike – Pedestrian Grants
14	Pavement preservation projects along US 395	$5,000,000	• STIP
16	Intersection improvements (larger STOP signs, STOP AHEAD signs, double arrow signs)	$10,000	• Transp. Safety Grant Program
20	Replace dial-a-ride transit fleet - high priority	$40,800	• Special Transportation Fund
21	Upgrade substandard bridges - high priority	$11,025,000	• Hwy Brdg Rehab. Program
STIP[1]	Curve corrections along OR 140 east from mileposts 17.0 - 28.0 **{Key #11179}**	$2,900,000	• STIP (Final 2002-2005)
STIP[1]	Pavement preservation along OR 31 from mileposts 86.0 - 100.0 **{Key #10284}**	$2,900,000	• STIP (Final 2002-2005)
STIP[1]	Pavement preservation along OR 140 east from mileposts 20.0 - 28.0 **{Key #12410}**	$1,200,000	• STIP (Final 2002-2005)
STIP[1]	Pavement preservation along OR 140 east from mileposts 40.0 - 45.0 **{Key #12414}**	$650,000	• STIP (Final 2002-2005)
STIP[1]	Pavement preservation along US 395 from mileposts 128.5 - 142.6 **{Key #09537}**	$3,900,000	• STIP (Final 2002-2005)
STIP[1]	Pavement preservation along US 395 from mileposts 144.1 - 152.0 **{Key #12520}**	$1,200,000	• STIP (Final 2002-2005)
STIP[1]	Replace Muddy Creek Bridge (02680) and Cottonwood Creek Bridge (02679) **{Key #10710}**	$916,000	• STIP (Final 2002-2005)
STIP[1]	Replace Silver Creek Bridge (03908) **{Key #09668}**	$1,200,000	• STIP (Final 2002-2005)
STIP[1]	Purchase of a bus for Lake County **{Key #12093}**	$62,000	• STIP (Final 2002-2005)
	Oregon Scenic Byway - high priority projects	NA	• National Scenic Byway Program
	Lake County Airport - high priority projects (refer to Table 7-11)	$661,840	• FAA or Oregon Department of Aviation Funding
Total High Priority Projects		**$68,737,040**	
Medium Priority (2007-2012)			
6	Enhance existing chain-up area at Drews Valley and allow school bus turnaround	$100,000	• Transp. Safety Grant Program
11	Localized shoulder improvements along US 395 and OR 140 west	$375,000	• STIP
12	Install bike lanes along county roads - medium priority locations	$108,800	• Bike – Pedestrian Grants
16	Intersection improvements (travel lane rumble strips)	$10,000	• Transp. Safety Grant Program
17	Install pedestrian facilities in the City of Paisley and the rural community of Silver Lake	$113,500	• Bike - Pedestrian Grants
19	Safety improvements along OR 31 near Picture Rock Pass	$3,000,000	• STIP
20	Replace dial-a-ride transit fleet - medium priority	$226,500	• Special Transportation Fund
21	Upgrade substandard bridges - medium priority	$2,126,000	• Hwy Brdg Rehab. Program
Total Medium Priority Projects		**$6,059,800**	
Low Priority (2013-2022)			
2	Safety improvements along OR 140 west near Antelope Canyon	$3,500,000	• STIP
12	Install bike lanes along county roads - low priority locations	$751,500	• Bike - Pedestrian Grants
13	Minor improvements to s-curve along County Road #5-14 (3-5 miles west of town)	$37,500	• County Allotment Program
16	Intersection improvements (flashing lights)	$20,000	• Transp. Safety Grant Program
18	Improve 4 existing rest areas/waysides near Lakeview	$270,000	• Immediate Opportunity Grant Program
20	Replace dial-a-ride transit fleet - low priority	$344,100	• Special Transportation Fund
22	Install chain-up and chain-down areas at two locations along OR 31	$100,000	• STIP
	Oregon Scenic Byway - low priority projects	NA	• National Scenic Byway Program
	Lake County Airport - low priority projects (refer to Table 7-11)	$1,449,727	• FAA or Oregon Department of Aviation Funding
23	Flatten Nevada Curve along OR 140 near milepost 65.2 (HARNEY COUNTY)	NA	• STIP
Total Low Priority Projects		**$6,472,827**	
TOTAL OF ALL PROJECTS		**$81,269,667**	

Notes
1. The higher cost estimate has been illustrated; the ranges are shown in Chapter 6.

Source: Chapter 7, Lake County TSP.

CHAPTER 9: IMPLEMENTATION OF TRANSPORTATION SYSTEM PLAN

Implementation of the Lake County Transportation System Plan (TSP) will require both changes to the county comprehensive plan and zoning code and preparation of a 20-year Capital Improvement Plan. These actions will enable Lake County to address both existing and emerging transportation issues throughout the county in a timely and cost-effective manner. This implementation program is geared towards providing Lake County with the tools to amend the comprehensive plan and zoning ordinance to conform with the Oregon Transportation Planning Rule and to fund and schedule transportation system improvements. Lake County shall take the following actions to adopt and implement the TSP.

- Amend findings and policies of the Lake County Comprehensive Plan as detailed in this chapter.
- Amend the Lake County Zoning Ordinance as detailed in this chapter.
- Amend the Lake County Land Development Ordinance as detailed in this chapter.
- Incorporate the prioritized capital improvement plan, detailed in Chapter 7, into the existing Lake County Capital Improvement and Public Facilities Plans.

ELEMENTS REQUIRED BY THE TRANSPORTATION PLANNING RULE

In 1991, the Oregon Transportation Planning Rule was adopted to implement State Planning Goal 12 ─ Transportation (amended in May and September 1995). The Transportation Planning Rule requires counties and cities to complete a TSP that includes policies and ordinances to implement the TSP. A sample ordinance has been developed that establishes the policies and implementing measures that are typically required to make comprehensive plans, land development ordinances and street standards ordinances consistent with TSPs. Lake County's Comprehensive Plan, subdivision ordinance and street standards were reviewed to determine where the language or standards should be amended to implement the policies and standards contained in the TSP. The changes to each document are outlined below, preceded by a brief paragraph discussing the intent of the language. Information in square brackets indicates where in the document the language should be inserted or amended.

The applicable portion of the Transportation Planning Rule is found in Section 660-12-045─*Implementation of the Transportation System Plan*. In summary, the Transportation Planning Rule requires that local governments revise their land use regulations to implement the TSP in the following manner:

- Amend land use regulations to reflect and implement the Transportation System Plan.
- Clearly identify which transportation facilities, services, and improvements are allowed outright, and which will be conditionally permitted or permitted through other procedures.
- Adopt land use or subdivision ordinance measures, consistent with applicable federal and state requirements, to protect transportation facilities, corridors and sites for their identified functions, to include the following topics:
    - access management and control;
    - protection of public use airports;

- coordinated review of land use decisions potentially affecting transportation facilities;
- conditions to minimize development impacts to transportation facilities;
- regulations to provide notice to public agencies providing transportation facilities and services of land use applications that potentially affect transportation facilities;
- regulations assuring that amendments to land use applications, densities, and design standards are consistent with the Transportation System Plan.

- Adopt land use or subdivision regulations for urban areas and rural communities to provide safe and convenient pedestrian and bicycle circulation, and to ensure that new development provides on-site roads and accessways that provide reasonably direct routes for pedestrian and bicycle travel.

- Establish road standards that minimize pavement width and total right-of-way.

In addition, state regulations in ORS 836.600 to 836.630 and OAR 660-013 encourage and support the continued operation of Oregon's airports by mandating planning for and recognition of airports consistent with their function in the state airport system. The regulations require local governments with jurisdiction over airports to amend their comprehensive plans and zoning regulations to:

- Create an Aviation System Plan;

- Identify and classify airports in their jurisdictions;

- Acknowledge permitted uses on public use airports; and

- Implement land use compatibility and safety requirements.

COMPREHENSIVE PLAN AMENDMENTS

Additions underlined, deletions in ~~strikeout~~, and questions in [CAPS].

Amend Section XII: TRANSPORTATION as follows:

B. Plan Policies

1. ~~That the~~ The Lake County Transportation System Plan shall be ~~is~~ the Transportation Element of the Lake County Comprehensive Plan.

2. ~~That the~~ The Lake County/Lakeview Airport Master Plan and the Christmas Valley Airport Improvement Plan shall ~~will~~ be recognized as supplements to the Transportation System Plan.

~~3. The publicly designated airports at Lakeview, Christmas Valley and Paisley shall be protected through the application of Airport Approach Zones as recommended and approved by the State Department of Aeronautics.~~

3. The function of airports shall be protected through the application of appropriate land use designations to assure that future land uses are compatible with the continued operation of the airport.

4. That a partitioning or subdividing will be authorized only where road improvements capable of meeting present or future access needs are provided for, or made available, and that meet state and county access management requirements.

~~5. That physical, social and economic considerations will become an integral part of all transportation planning.~~

5. That roads created by partitioning and subdividing ~~will~~ shall be designated to tie into existing or anticipated road systems consistent with state and county access management requirements. ~~and that roads (and adjacent curbs and sidewalks) proposed within a UGB may be required to be constructed to the standards required by that city within the urban growth area.~~

~~7.~~6. That subdivision and major partitioning activity ~~will~~ shall be approved only in those areas where roads meet minimum standards and winter road maintenance can be provided for all-weather vehicular access.

~~8.~~7. That transportation improvements ~~will~~ shall avoid dividing existing economic farm units, unless no feasible alternative exists.

~~9. That air and rail facilities will be protected from encroaching incompatible uses that may have a limiting effect on their future use.~~

8. The function of rail facilities shall be protected through the application of appropriate land use designations to assure that future land uses are compatible with the continued operation of the rail facility.

~~10. That the transportation facilities will be centralized to the extent practical.~~

~~11.~~9. ~~That road~~ Road or street rights-of-way and other public lands will generally not be vacated; but shall be considered for park, open space, utilities and all other possible public use should vacations be contemplated.

~~12.~~10. ~~That development~~ Development requiring access to arterials ~~will~~ shall be approved only if consistent with state and county access management standards and after consideration is given to proposed land use(s) and traffic patterns in the area, not just the specific site. Area-wide needs as identified in the Lake County Transportation System Plan shall supersede site-specific needs. ~~Frontage roads and access collection points shall be provided wherever needed.~~ Access control techniques ~~will~~ shall be used to coordinate traffic and land use patterns~~, and to help minimize possible negative impacts of growth~~.

~~13.~~11. ~~That the~~ The number of access points to arterials ~~will~~ shall be kept to a minimum and cluster development of commercial and industrial activities encouraged. All accesses must be in conformance with State and county access management standards.

~~14.~~12. ~~That the~~ The cities and County shall support feasible programs to improve conditions for the transportation disadvantaged, and recognize potential pedestrian and bicycle demands in planning related decisions.

~~15.~~13. The County shall coordinate and cooperate with the ~~Highway Division~~ State Department of Transportation in the implementation of those projects applicable to the County in the ~~in the periodic Six Year Highway Improvement Plans~~ Statewide Transportation Improvement Programs (STIP).

~~16. The handbooks published by the State Department of Transportation entitled "Highway Compatibility Guidelines" and "Guidebook for Access Management" shall be utilized as guidelines in the implementation of relevant land use regulations.~~

14. Lake County shall provide safe and convenient pedestrian and bicycle circulation through the unincorporated portions of the County through the following actions:

- Provision of at least 2-foot wide paved shoulders on **existing** County roads as they are paved, re-paved or reconstructed as described and prioritized in the Lake County Transportation System Plan.
- Provision of at least 4-foot paved shoulders on all **new** arterials and collectors within the unincorporated areas of Lake County.
- Bikeways and walkways shall be designed and constructed following the guidelines of most recent edition of the Oregon Bicycle and Pedestrian Plan.
- Bicycle parking facilities should be provided at all new residential multifamily developments of four units or more, commercial, industrial, recreational, and institutional facilities.

15. Lake County shall provide safe and convenient pedestrian and bicycle circulation through the rural service centers of the County (Fort Rock, Christmas Valley, Silver Lake, Summer Lake, and Adel) through the following actions:

- Bikeways (generally shoulders on rural facilities, but does also include bike lanes or separated pathways) shall be included on all new collectors and arterials.

16. Lake County shall provide a clear and objective process for the approval of transportation projects.

17. The Lake County Transportation System Plan is an element of the Lake County Comprehensive Plan. As such, it identifies the general location of transportation improvements and allows the following actions without land use review:

- Changes in the specific alignment of proposed public road and highway projects are permitted without plan amendment if the new alignment falls within a transportation corridor identified in the Transportation System Plan.

- Operation, maintenance, repair, and preservation of existing transportation facilities without land use review, except where specifically regulated.

- Dedication of right-of-way, authorization of construction and the construction of facilities and improvements, for improvements designated in the Transportation System Plan, the classification of the roadway and approved road standards without land use review.

18. Draft Environmental Impact Studies (EIS) or Environmental Assessments (EA) will serve as the documentation for State projects that require local land use review, if required, in the following circumstances:

    - Where the project is consistent with the Transportation System Plan, formal review of the draft EIS or EA and concurrent or subsequent compliance with applicable development standards or conditions;

    - Where the project is not consistent with the Transportation System Plan, formal review of the draft EIS or EA and concurrent completion of necessary goal exceptions or plan amendments.

19. Lake County will protect the operation of existing and future transportation facilities as identified in the Transportation System Plan through the use of one or more of the following actions:

    - Consider the impact of all land use decisions on existing or planned transportation facilities.

    - Protect the function of existing or planned transportation corridors through appropriate land use regulations.

    - The County will notify affected cities and the public transportation provider of proposed changes to this TSP.

    - Consider the potential to establish or maintain accessways, paths, or trails prior to the vacation of any public easement or right-of-way.

    - Preserve right-of-way for planned transportation facilities through exactions, voluntary dedication, or setbacks.

20. Lake County will provide coordinated review of land use decisions affecting transportation through the use of one or more of the following actions:

    - Coordinate with ODOT to implement the highway improvements listed in the STIP that are consistent with the Transportation System Plan and comprehensive plan.

    - Consider the findings of ODOT's draft Environmental Impact Statements and Environmental Assessments as integral parts of the land use decision-making procedures.

- Notify ODOT of land use actions that require public hearings or that would directly access or abut a state highway. This would include site plan reviews, subdivision and partition applications, conditional use permits, rezones and comprehensive plan amendments.

Amend Section C: Recommendations, as follows:

~~1. That a detailed street plan be developed for the Lakeview area, and that zoning ordinance revisions be made to require specific setbacks from centerlines of streets designated as arterials, collectors, and secondary routes.~~

1. The County Commissioners must approve all new roads before they can be accepted into the County Road System.

Amend Appendix H: Transportation Goal Findings, as follows:

1. The Transportation Planning Rule (660-12-045(3)) requires that jurisdictions plan for bicycling and walking as part of the overall transportation system.

2. Section 660-12-045(1) of the Transportation Planning Rule requires that cities and counties amend their land use regulations to conform with the jurisdiction's adopted Transportation System Plan. This section of the Transportation Planning Rule is intended to clarify the approval process for transportation-related projects. The approval process for different types of projects should be clear.

3. Section 60-12-045(2) of the Transportation Planning Rule requires that jurisdictions protect future operation of transportation corridors. In addition, the proposed function of a future roadway and other transportation facilities, such as airports, must be protected from incompatible land uses.

4. Section 660-12-045(2)(d) of the Transportation Planning Rule requires that jurisdictions develop a process for the coordinated review of land use decisions affecting transportation facilities.

    ~~1. All feasible modes of transportation were considered. Needs of rail, air, highway/roadway, bicycle and pedestrian modes were recognized in the Plan decision making. In addition to the recommendations contained in the Comprehensive Plan, a County Transportation Plan was prepared and adopted, and an Airport Master Plan is being prepared for the Lakeview Airport.~~

5. Both the Comprehensive Plan and Transportation System Plan were based upon local, regional and State transportation needs and inventory information.

6. Both the Comprehensive Plan and Transportation System Plan have attempted to minimize any adverse social, economic or environmental impacts and costs, and to conserve energy.

7. Both the Comprehensive Plan and Transportation System Plan have attempted to recognize the needs of the transportation disadvantaged and to improve services for such, and to facilitate the flow of goods and services so as to strengthen the local and regional economies.

8. The Transportation System Plan is cross-referenced with the Comprehensive Plan and conforms therewith.

9. The Lakeview ~~Public Facilities Plan of 1987~~, Transportation System Plan, as adopted by the Town of Lakeview in 2001, contains information on Transportation facilities in the Lakeview Urban Area in which the County has certain planning responsibilities. Therefore, said Plan is hereby referenced and coordinated with this Plan.

10. It is in the public interest that the County coordinate and cooperate with the State ~~highway Division~~ Department of Transportation in the preparation and implementation of the ~~Division's Six Year~~ State Transportation ~~Highway~~ Improvement ~~Plans and~~ Program.

~~10. A number of provisions related to certain highway improvement actions are set forth in State Statutes and are designed to minimize review processes related thereto and potential delays related to such review processes. It is in the public interest that such provisions be incorporated into local land use ordinances as much as possible~~

11. State Statutes and implementing administrative rules contain a number of provisions governing certain uses and actions related to public highways, particularly those designated as "Scenic"; it is in the public interest that similar provisions be included within local ordinances to ensure maximum coordination with said State provisions.

12. It is important that Transportation System Plan be updated periodically to reflect changing conditions and needs.

ADDITIONS TO THE ZONING ORDINANCES

Add the following to Section 1.03 Definitions:

Access connection: Any driveway, street, turnout or other means of providing for the movement of vehicles to or from the public roadway system.

Access management: The process of providing and managing access to land development while preserving the regional flow of traffic in terms of safety, capacity, and speed.

Accessway: A walkway that provides pedestrian and bicycle passage either between streets or from a street to a building or other destination such as a school, park, or transit stop. Accessways generally include a walkway and additional land on either side of the walkway, often in the form of an easement or right-of-way, to provide clearance and separation between the walkway and adjacent uses. Accessways through parking lots are generally physically separated from adjacent vehicle parking or parallel vehicle traffic by curbs or similar devices and include landscaping, trees, and lighting. Where accessways cross driveways, they are generally raised, paved, or marked in a manner that provides convenient access for pedestrians.

Bicycle: A vehicle designed to operate on the ground on wheels, propelled solely by human power, upon which any person or persons may ride, and with two tandem wheels at least 14 inches in diameter. An adult tricycle is considered a bicycle.

Bicycle facilities. A general term denoting improvements and provisions made to accommodate or encourage bicycling, including parking facilities and all bikeways.

Bikeway: Any road, path, or way that is some manner specifically open to bicycle travel, regardless of whether such facilities are designated for the exclusive use of bicycles or are shared with other transportation modes. The five types of bikeways are:

1) Multi-use path: A paved 10- to 12-foot wide way that is physically separated from motorized vehicular traffic; typically shared with pedestrians, skaters, and other non-motorized users.

2) Bike lane: A 4- to 6-foot wide portion of the roadway that has been designated by permanent striping and pavement markings for the exclusive use of bicycles.

3) Shoulder bikeway: The paved shoulder of a roadway that is 4 feet or wider, typically shared with pedestrians in rural areas.

4) Shared roadway: A travel lane that is shared by bicyclists and motor vehicles.

5) Trail: An unpaved path that accommodates all-terrain bicycles; typically shared with pedestrians.

Cross access: A service drive providing vehicular access between two or more contiguous sites so the driver need not enter the public street system.

Frontage road. A public or private drive which generally parallels a public street between the right-of-way and the front building setback line. The frontage road provides access to private properties while separating them from the arterial street.

Functional classification: A system used to group public roadways into classes according to their purpose in moving vehicles and providing access.

Joint access: A driveway connecting two or more contiguous sites to the public street system.

Lot, flag: A lot not meeting minimum frontage requirements and where access to the public road is by a narrow, private right-of-way line.

Pedestrian facilities. A general term denoting improvements and provisions made to accommodate or encourage walking, including walkways, accessways, crosswalks, ramps, paths, and trails.

Place of Public Assembly. Structure of place which the public may enter for such purposes as deliberation, education, worship, shopping, entertainment, amusement, awaiting transportation, or similar activity.

Public Assembly Uses: A structure or outdoor facility where concentrations of people gather for purposes such as deliberation, education, worship, shopping, business, entertainment, amusement, sporting events or similar activities, excluding airshows. Public “Assembly Uses” does not include places where people congregate for short periods of time such as parking lots and bus stops or uses approved by the FAA in an adopted airport master plan.

Reasonable access: The minimum number of access connections, direct or indirect, necessary to provide safe access to and from the roadway, as consistent with the purpose and intent of this ordinance and any applicable plans and policies of Lake County.

Reasonably direct: A route that does not deviate unnecessarily from a straight line or a route that does not involve a significant amount of out-of-direction travel for likely users.

Safe and convenient. Routes that are reasonably free from hazards, and provide a reasonably direct route of travel between destinations, considering that the optimum travel distance is one-half mile for pedestrians and three miles for bicyclists.

Stub-out (stub-street): A portion of a street or cross access drive used as an extension to an abutting property that may be developed in the future.

Walkway: A hard-surfaced area intended and suitable for pedestrians, including sidewalks and the surfaced portions of accessways.

Delete Article 13: Airport Approach Combining Zone: A-A (page 50) and replace with the following:

The Airport Overlay Zone is intended to be applied as an overlay on properties within the air approaches to the Lake County Airport. This overlay district creates certain zones that include all of the land lying beneath the Airport Imaginary Surfaces as they apply to the Lake County Airport. This overlay zone is intended to prevent the establishment of airspace obstructions in airport approaches and surrounding areas through height restrictions and other land use controls as deemed essential to protect the health, safety, and welfare of the residents of Lake County.

Definitions:

Aircraft: Helicopters and airplanes, but not hot air balloons or ultralights.

~~Airport or Aircraft Landing Facility. Any land area, runway, landing pad or other facility designed, used or intended to be used by aircraft, including helicopters and including all necessary taxi-ways, hangars and other necessary buildings and open spaces.~~

Airport: The strip of land used for taking off and landing aircraft, together with all adjacent land used in connection with the aircraft landing or taking off from the strip of land, including but not limited to land used for existing commercial and recreational airport uses.

Airport Approach Safety Zone: The land that underlies the approach surface, excluding the RPZ.

Airport Hazard: Any structure, tree, or use of land which exceeds height limits established by the Airport Imaginary Surfaces.

Airport Imaginary Surfaces: Those imaginary areas in space which are defined by the Approach Surface, Transitional Surface, Horizontal Surface, and Conical Surface and in which any object extending above these imaginary surfaces is an obstruction.

Approach Surface. A surface longitudinally centered on the extended runway centerline and extending outward and upward from each end of the Primary Surface. The inner edge of the approach surface is the same width as the Primary Surface and extends to a width of: 1,250 feet for utility runway having only visual approaches; 1,500 feet for a runway other than a utility runway having only visual approaches; 2,000 feet for a utility runway having a nonprecision instrument approach; 3,500 feet for a nonprecision instrument runway other than utility, having visibility minimums greater than three-fourths of a statute mile; 4,000 feet for a nonprecision instrument runway having visibility minimums as low as three-fourths statute mile; and 16,000 feet for precision instrument runways. The Approach Surface extends for a horizontal distance of 5,000 feet at a slope of 20 feet outward to each foot upward (20:1) for all utility and visual runways; 10,000 feet at a slope of 34 feet outward for each foot upward (34:1) for all nonprecision instrument runways other than utility; and for all precision instrument runways extends for a horizontal distance of 10,000 feet at a slope of 50 feet outward for each foot upward (50:1); thence slopes upward 40 feet outward for each foot upward (40:1) an additional distance of 40,000 feet.

Commercial and Recreational Airport Uses: Those uses described in OAR 660-013-0100.

Conical Surface. Extends 20 feet outward for each one foot upward (20:1) for 4,000 feet beginning at the edge of the horizontal surface (5,000 feet from the center of each end of the Primary Surface of each visual and utility runway or 10,000 feet for all nonprecision instrument runways other than utility at 150 feet above the airport elevation) and upward extending to a height of 350 feet above the airport elevation.

Horizontal Surface. A horizontal plane 150 feet above the established airport elevation, the perimeter of which is constructed by swinging runways 5,000 feet from the center of each end of the Primary Surface of each visual or utility runway and 10,000 feet from the center of each end of the Primary Surface of all other runways and connecting the adjacent arcs by lines tangent to those arcs.

Noise Sensitive Area. Within 1,500 feet of an airport or within established noise contour boundaries exceeding 55 Ldn.

Non-Towered Airport: An airport without an existing or approved control tower on June 5, 1995.

Primary Surface. A surface longitudinally centered on a runway. When the runway has a specially prepared hard surface, the Primary Surface extends 200 feet beyond each end of that runway. When the runway has no specially prepared hard surface, or planned hard surface, the Primary Surface ends at each end of that runway. The width of the primary Surface is 250 feet for utility runways having only visual approaches, 500 feet for utility runways having nonprecision instrument approaches, 500 feet for other than utility runways having only visual approaches or nonprecision instrument approaches with visibility minimums greater than three-fourths of a mile and 1,000 feet for nonprecision instrument runways with visibility minimums of three-fourths of a mile or less and for precision instrument runways.

Runway Protection Zone (RPZ). An area off the runway end (formerly the clear zone) used to enhance the protection of people and property on the ground. The RPZ is trapezoidal in shape and centered about the extended runway centerline. It begins 200 feet (60 m) beyond the end of the arcs usable for takeoff or landing. The RPZ dimensions are functions of the type of aircraft and operations to be conducted on the runway.

Transitional Surface. Extend seven feet outward for each one foot upward (7:1) beginning on each side of the Primary Surface which point is the same elevation as the runway surface, and form the sides of the approach surfaces thence extending upward to a height of 150 feet above the airport elevation (Horizontal Surface).

Utility Runway. A runway that is constructed for and intended to be used by propeller driven aircraft of 12,500 pounds maximum gross weight or less.

Visual Runway. A runway that is intended solely for the operation of aircraft using visual approach procedures for which no instrument approach procedures have been approved, or planned, or indicated on an FAA or state planning document or military service airport planning document.

1. Airport Approach Overlay Zone. The following regulations shall apply to land within the Airport Approach Overlay Zone. Wherever there is a conflict between the regulations of the underlying zone and the Airport Approach Overlay Zone, the most stringent restrictions shall govern.

2. Permitted uses within the Runway Protection Zone (RPZ). While it is desirable to clear all objects from the RPZ, some uses are permitted, provided they do not attract wildlife, are below the approach surface and do not interfere with navigational aids.

   A. Agricultural operations (other than forestry or livestock farms).

   B. Golf courses (but not club houses).

   C. Automobile parking facilities.

3. Permitted uses within the Airport Approach Safety Zone.

   A. Farm use, excluding the raising and feeding of animals which would be adversely affected by aircraft passing overhead.

   B. Landscape nursery, cemetery, or recreation areas which do not include buildings or structures.

   C. Roadways, parking areas, and storage yards located in such a manner that vehicle lights will not make it difficult for pilots to distinguish between landing lights and vehicle lights or result in glare, or in any way impair visibility in the vicinity of the landing approach. Approach surfaces must clear these by a minimum of 15 feet.

   D. Pipeline.

   E. Underground utility wire.

4. Conditional uses within the Airport Approach Safety Zone.

   A. A structure or building accessory to a permitted use.

   B. Single family dwellings, mobile homes, duplexes, and multifamily dwellings, when allowed by the underlying zone, provided the landowner signs and records in the deed and mortgage records of Lake County a Hold Harmless Agreement and Aviation and Hazard Easement and submits them to the airport sponsor and the City Planning Departments.

   C. Commercial and industrial uses, when allowed by the underlying zone, provided the use does not result in:

      a. Creating electrical interference with navigational signals or radio communication between the airport and aircraft.

      b. Making it difficult for pilots to distinguish between airport lights and lighting from nearby land uses.

      c. Impairing visibility.

      d. Creating bird strike or other wildlife hazards.

      e. Endangering or interfering with the landing, taking off or maneuvering of aircraft intending to use airport.

f. Attracting a large number of people

g. Buildings and uses of public works, public service, or public utility nature.

5. Procedures. An applicant seeking a conditional use shall include the following information:

A. Property boundary lines as they relate to the Airport Imaginary Surfaces.

B. Location and height of all existing and proposed buildings, structures, utility lines, and roads.

6. Comment. In accordance with OAR Chapter 738 Division 100, City or County Planning Authority shall notify the owner of the airport and Oregon Aeronautics Division about land use permits or zone changes within 5,000 feet of a visual and 10,000 feet of instrument airport so as to provide Oregon Aeronautics Section an opportunity to review and comment.

7. Limitations. To meet the standards established in FAA Regulations, Part 77 and LCDC 660-013-0070, Exhibit 1, no structure shall penetrate into the Airport Imaginary Surfaces as defined above.

A. No place of public assembly shall be permitted in the Airport Approach Safety Zone or RPZ.

B. No structure or building shall be allowed within the RPZ.

C. Whenever there is a conflict in height limitations prescribed by this overlay zone and the primary zoning district, the lowest height limitation fixed shall govern; provided, however, that the height limitations here imposed shall not apply to such structures customarily employed for aeronautical purposes.

D. No glare producing materials shall be used on the exterior of any structure located within the Airport Approach Safety Zone.

E. In noise sensitive areas (within 1,500 feet of an airport or within established noise contour boundaries of 55 Ldn and above for identified airports) where noise levels are a concern, a declaration of anticipated noise levels shall be attached to any building permit, land division appeal, deed, and mortgage records. In areas where the noise level is anticipated to be 55 Ldn and above, prior to issuance of a building permit for construction of noise sensitive land use (real property normally used for sleeping or normally used as schools, churches, hospitals, or public libraries) the permit applicant shall be required to demonstrate that a noise abatement strategy will be incorporated into the building design which will achieve an indoor noise level equal to or less than 55 Ldn. The planning and building department will review building permits or noise sensitive developments.

F. No development that attracts or sustains hazardous bird movements from feeding, watering, or roosting across the runways and/or approach and departure patterns of aircraft. Planning authority shall notify Oregon Aeronautics of such development (e.g., waste disposal sites, open water impoundments, and wetland enhancements) within the airport overlay zone so as to provide Oregon Aeronautics Section an opportunity to review and comment on the site in accordance with FAA AC 150/5200-33.

G. Siting of new industrial uses and the expansion of existing industrial uses is prohibited where either, as part of regular operations, would cause emissions of smoke, dust or steam that would obscure visibility within airport approach corridors.

H. Outdoor lighting for new industrial, commercial or recreational uses or the expansion of such uses is limited to prevent light from projecting directly onto an existing runway or taxiway or into existing airport approach corridors except where necessary for safe and convenient air travel.

I. The establishment of new water impoundments larger than one-quarter acre in size within the airport boundary and RPZ is prohibited. Wetland mitigation required for projects located within the airport boundary or RPZ may be authorized within the airport boundary where it is impractical to provide mitigation off-site. Seaplane landing areas are exempt from this prohibition.

J. The establishment of new landfills near airports, consistent with Department of Environmental Quality (DEQ) rules is prohibited.

K. Land use regulations and standards for land use decisions regarding land use compatibility and other requirements of this code shall consider the effects of mitigation measures or conditions which could reduce the potential for safety risk or incompatibility.

8. Permitted Commercial and Recreational Airport Uses at Non-Towered Airports. Within airport boundaries established pursuant to Land Conservation and Development Commission rules, Lake County's land use regulations must authorize the following uses and activities:

A. Customary and usual aviation-related activities including but not limited to takeoffs, landings, aircraft hangars, tie-downs, construction and maintenance of airport facilities, fixed-base operator facilities and other activities incidental to the normal operation of an airport;

B. Emergency medical flight services;

C. Law enforcement and fire-fighting activities;

D. Flight instruction;

E. Aircraft service, maintenance and training;

F. Crop dusting and other agricultural activities;

G. Air passenger and air freight services at levels consistent with the classification and needs identified in the State Aviation System Plan;

H. Aircraft rental;

I. Aircraft sales and sale of aeronautic equipment and supplies; and

J. Aeronautic recreational and sporting activities.

Insert the following new sections into Article 20 Supplementary Provisions:

Section 20.16 Setbacks and Frontage Requirements

The minimum frontage of a lot on a public or private road shall be 50 feet.

Section 20.17 Transportation Improvements.

A. Uses Permitted Outright. Except where otherwise specifically regulated by this ordinance, the following improvements are permitted outright:

1. Normal operation, maintenance, repair, and preservation activities of existing transportation facilities.

2. Installation of culverts, pathways, medians, fencing, guardrails, lighting, and similar types of improvements within the existing right-of-way.

3. Projects specifically identified in the Transportation System Plan as not requiring further land use regulation.

4. Landscaping as part of a transportation facility.

5. Emergency measures necessary for the safety and protection of property.

6. Acquisition of right-of-way for public roads, highways, and other transportation improvements designated in the Transportation System Plan except for those that are located in exclusive farm use or forest zones.

7. Construction of a street or road as part of an approved subdivision or land partition consistent with the applicable land division ordinance.

2. Transportation Uses Subject to Approval

A. Construction, reconstruction, or widening of highways, roads, bridges or other transportation projects that are: (1) not improvements designated in the Transportation System Plan or (2) not designed and constructed as part of a subdivision or planned development subject to conditional use permit review, which shall comply with the Transportation System Plan and applicable standards, and shall address the following criteria. For State projects that require an Environmental Impact Statement (EIS) or EA (Environmental Assessment), the draft EIS or EA shall be reviewed and used as the basis for findings to comply with the following criteria:

   1. The project is designed to be compatible with existing land use patterns, including noise, safety, and zoning.

   2. The project is designed to minimize avoidable environmental impacts to identified wetlands, wildlife habitat, air and water quality, cultural resources, and scenic qualities.

   3. The project preserves or improves the safety and function of the facility through access management, traffic calming, or other design features.

   4. Project includes provision for bicycle and pedestrian circulation as consistent with the comprehensive plan and other requirements of this ordinance.

B. If review under this Section indicates that the use or activity is inconsistent with the Transportation System Plan, the procedure for a plan amendment shall be undertaken prior to or in conjunction with the conditional permit review.

Insert the following section into Article 20:

Section 20.18 Access Management and Street Connectivity

A. Purpose. The purpose of this ordinance is to manage access to land development while preserving the movement of people and goods in terms of safety, capacity, functional classification, and performance standards as categorized in the Transportation System Plan. This ordinance shall apply to all arterials and collectors within Lake County and to all properties that abut these roadways.

B. Joint Use Driveways and Cross Access.

   1. Adjacent commercial or office properties classified as major traffic generators (i.e. shopping plazas, office parks), shall provide a cross access drive and pedestrian access to allow circulation between sites.

   2. A system of joint use driveways and cross access easements shall be established wherever feasible and shall incorporate the following:

      a) A continuous service drive or cross access corridor extending the entire length of each block served to provide for driveway separation consistent with the access management classification system and standards.

b) A design speed of 10 mph and a maximum width of 22 feet to accommodate two-way travel aisles designated to accommodate automobiles, service vehicles, and loading vehicles;

c) Stub-outs and other design features to make it visually obvious that the abutting properties may be tied in to provide cross-access via a service drive;

d) A unified access and circulation system plan for coordinated or shared parking areas.

e) Shared parking areas shall be permitted a reduction in required parking spaces if peak demands do not occur at the same time periods.

f) Pursuant to this section, property owners shall:

i. Record an easement with the deed allowing cross access to and from other properties served by the joint use driveways and cross access or service drive;

ii. Record an agreement with the deed that remaining access rights along the roadway will be dedicated to Lake County and pre-existing driveways will be closed and eliminated after construction of the joint-use driveway;

iii. Record a joint maintenance agreement with the deed defining maintenance responsibilities of property owners.

iv. Lake County may modify or waive the requirements of this section where the characteristics or layout of abutting properties would make the development of a unified or shared access and circulation system impractical.

C. Access Connection and Driveway Design. Driveways shall meet the following standards:

1. If the driveway is a one-way in or one-way out drive, then the driveway shall be a minimum width of 10 feet and shall have appropriate signage designating the driveway as a one-way connection.

2. For two-way access, each lane shall have a minimum width of 10 feet and a maximum width of 12 feet.

3. Driveway approaches must be designed and located to provide an exiting vehicle with an unobstructed view. Construction of driveways along acceleration or deceleration lanes and tapers shall be avoided due to the potential for vehicular weaving conflicts.

4. The length of driveways shall be designed in accordance with the anticipated storage length for entering and exiting vehicles to prevent vehicles from backing into the flow of traffic on the public street or causing unsafe conflicts with on-site circulation.

D. Nonconforming Access Features. Legal access connections in place as of December 18, 2002 that do not conform with the standards herein are considered nonconforming features and shall be brought into compliance with applicable standards under the following conditions:

1. When new access connection permits are requested;

2. Change in use or enlargements or improvements that will increase trip generation.

E. Reverse Frontage

1. Lots that front on more than one street shall be required to locate motor vehicle accesses on the street with the lower functional classification.

2. When a residential subdivision is proposed that would abut an arterial, it shall be designed to provide through lots along the arterial with access from a frontage road or interior local road. Access rights of these lots to the arterial shall be dedicated to Lake County and recorded with the deed. A berm or buffer yard may be required at the rear of through lots to buffer residences from traffic on the arterial. The berm or buffer yard shall not be located with the public right-of-way.

F. Flag Lot Standards

1. Flag lots shall not be permitted when the result would be to increase the number of properties requiring direct and individual access connections to the State Highway System or other arterials.

2. Flag lots may be permitted for residential development when necessary to achieve planning objectives, such as reducing direct access to roadways, providing internal platted lots with access to a residential street, or preserving natural or historic resources, under the following conditions:

a) Flag lot driveways shall be separated by at least twice the minimum frontage requirement of that zoning district.

b) The flag driveway shall have a minimum width of 10 feet and maximum width of 20 feet.

c) In no instance shall flag lots constitute more than 10 percent of the total number of building sites in a recorded or unrecorded plat, or three lots or more, whichever is greater.

d) The lot area occupied by the flag driveway shall not be counted as part of the required minimum lot area of that zoning district.

e) No more than one flag lot shall be permitted per private right-of-way or access easement.

G. Lot Width-to-Depth Ratios. To provide for proper site design and prevent the creation of irregularly shaped parcels, the depth of any lot or parcel shall not exceed 3 times its width (or 4 times its width in rural areas) unless there is a topographical or environmental constraint or an existing man-made feature such as a railroad line.

H. Shared Access. Subdivisions with frontage on the state highway system shall be designed to indirectly access the highway via a secondary road, either a county or a private road. Partitions or other land divisions of three or fewer parcels shall indirectly access the highway via a secondary road if feasible. If access via a secondary road is infeasible, the partition or other land division shall utilize a single shared access for highway access.

I. Connectivity. The street system of proposed subdivisions shall be designed to connect with existing, proposed, and planned streets outside of the subdivision.

1. Wherever a proposed development abuts unplatted land or a future development phase of the same development, street stubs shall be provided to provide access to abutting properties or to logically extend the street system into the surrounding area. All street stubs shall be provided with a temporary turn-around unless specifically exempted by the City Engineer and the restoration and extension of the street shall be the responsibility of any future developer of the abutting land.

2. Collector and local residential streets shall connect with surrounding streets to permit the convenient movement of traffic between residential neighborhoods or facilitate emergency access and evacuation. Connections shall be designed to avoid or minimize through traffic on local streets. Appropriate design, such as narrow streets, traffic control such as four-way stops, and traffic calming measures are the preferred means of discouraging through traffic.

J. Pedestrian and Bicycle Circulation.

1. On-site facilities shall be provided that accommodate safe and convenient pedestrian and bicycle access within new subdivisions, multi-family developments, and planned developments.

2. Bikeways shall be required along arterials.

K. Cul-de-sacs and Accessways.

1. Cul-de-sacs or permanent dead-end streets may be used as part of a development plan; however, through streets are encouraged except where topographical, environmental, or existing adjacent land use constraints make connecting streets infeasible. Where cul-de-sacs are planned, accessways shall be provided connecting the ends of cul-de-sacs to each other, to other streets, or to neighborhood activity centers.

2. Accessways for pedestrians and bicyclists shall be 10 feet wide and located within a 20-foot-wide right-of-way or easement. If the streets within the subdivision are lighted, the accessways shall also be lighted. Stairs or switchback paths may be used where grades are steep.

Insert the following section into Article 20:

Section 20.19 Traffic Impact Studies

A. An applicant shall submit a traffic impact study when a proposed land use action affects a transportation facility. The following vehicle trip generation thresholds shall determine the level and scope of transportation analysis required for a new or expanded development:

1. Transportation Impact Study: If a proposed development will generate 400 or more daily trip ends*, then a Transportation Impact Study (TIS) shall be required. The requirements of a TIS shall be established by ODOT and the County Planning Department.

2. Transportation Site Review: If a proposed development will generate 100 or more daily trip ends but less than 400 daily trip ends, then a Transportation Site Review shall be required. The requirements of a TSR shall be established by ODOT and the County Planning Department.

3. Projects that generate less than 100 daily trip ends may also be required to provide traffic analysis when, in the opinion of ODOT and the County Planning Department, a capacity problem and/or safety concern is caused and/or is adversely impacted by the development. ODOT and the County Planning Department shall determine the scope of this special analysis.

*Trip ends as defined by the Institute of Transportation Engineers (ITE), Trip Generation Manual, 6th Edition (or subsequent document updates), or trip generation studies of comparable uses prepared by an engineer.

Insert the following into Article 21 (page 82) - Off-Street Parking and Loading:

21.05 Bicycle parking.

A. A minimum of 2 bicycle parking spaces per use shall be required.

B. The following Special Minimum Standards shall be considered as supplemental requirements for the number of required bicycle parking spaces.

1. Multi-Family Residences. Every residential use of four (4) or more dwelling units shall provide at least one sheltered bicycle parking space for each unit. Sheltered bicycle parking spaces may be located within a garage, storage shed, basement, utility room or similar area. In those instances in which the residential complex has no garage or other easily accessible storage unit, the required bicycle parking spaces shall be sheltered under an eave, overhang, an independent structure, or similar cover.

2. Parking Lots. All public and commercial parking lots and parking structures shall provide a minimum of one bicycle parking space for every 10 motor vehicle parking spaces.

3. Schools. Elementary and middle schools, both private and public, shall provide one bicycle parking space for every 10 students and employees. High schools shall provide one bicycle parking space for every 5 students and employees. All spaces shall be sheltered under an eave, overhang, independent structure, or similar cover.

Insert the following into Article 28 Zoning Amendments:

Section 28.08: Amendments Affecting Transportation Facilities.

A. A Plan or land use regulation amendment significantly affects a transportation facility if it:

1. Changes the functional classification of an existing or planned transportation facility;

2. Changes standards implementing a functional classification system;

3. Allows types or levels of land use that would result in levels of travel or access that are inconsistent with the functional classification of a transportation facility; or

4. Would reduce the performance standards of the facility below the minimum acceptable level identified in the Transportation System Plan.

B. Amendments to the comprehensive plan and land use regulations which significantly affect a transportation facility shall assure that allowed land uses are consistent with the function, capacity, and performance standards of the facility identified in the Transportation System Plan. This shall be accomplished by one of the following:

1. Limiting allowed land uses to be consistent with the planned function, capacity, safety, and operational performance standards of the transportation facility;

2. Amending the Transportation System Plan to ensure that existing, improved, or new transportation facilities are adequate to support the proposed land uses consistent with the requirement of the Transportation Planning Rule; or,

3. Altering land use designations, densities, or design requirements to reduce demand for automobile travel and meet travel needs through other modes.

REVISIONS TO THE LAND DEVELOPMENT CODE

Amend Section 2.280 to reflect the street standards discussed in Chapter 7 of this Plan.

Section 2.030 Access; replace the existing text with the following:

A. All lots created under this ordinance shall have the minimum required frontage on a dedicated public or private street. If any lot abuts a street right-of-way that does not conform to the design specifications of this ordinance, the owner may be required to dedicate up to one-half of the total right-of-way width required by this ordinance.

B. Permit Required. Access onto public right of way or change in type of access shall require a permit. Permits are applied for at offices of the Community Development Department.

Add the following text to Section 3.080: Specific Approval Requirements, following existing No. 3.:

4. A partition must be accessed either by roads dedicated to the public or by way of United State Forest Service or Bureau of Land Management roads where the applicant has submitted a written agreement with the appropriate land management agency providing for permanent legal access to the parcels and any required maintenance. This provision shall not be subject to variance.

APPENDIX A

Summary of Existing Plans

APPENDIX A: SUMMARY OF EXISTING PLANS

LAKE COUNTY COMPREHENSIVE LAND USE PLAN (MAY 1980)

The Lake County Comprehensive Land Use Plan was adopted in May 1980 and amended in July 1981, April 1982, February 1985, and June 1989. The plan contains goals and policies for:

- Citizen Participation
- Planning Process
- Agricultural Lands
- Forest Lands
- Open Space, Scenic, Historic, and Natural Resources
- Air, Water, and Land Resource Quality
- Natural Hazards and Disaster Areas
- Recreation Needs
- Economic Development
- Housing
- Public Services and Facilities
- Transportation
- Energy
- Urbanization

The transportation goals, policies, recommendations, and findings are as follows:

State Transportation Planning Goal:

To encourage safe, convenient and economic transportation systems.

Plan Policies:

1. That the County Transportation Plan will be utilized as a guideline for Plan implementation.
2. That the Lake County/Lakeview Airport Master Plan and the Christmas Valley Airport Improvement Plan will be recognized as supplements to the Land Use Plan.
3. The publicly designated airports at Lakeview, Christmas Valley and Paisley shall be protected through the application of Airport Approach Zones as recommended and approved by the State Department of Aeronautics.
4. That partitioning or subdividing will be authorized only where road improvements capable of meeting present or future access needs are provided for, or made available.
5. That physical, social and economic considerations will become an integral part of all transportation planning.
6. That roads created by partitioning and subdividing will be designated to tie into existing or anticipated road systems, and that roads (and adjacent curbs and sidewalks) proposed within a UGB may be required to be constructed to the standards required by that city within the urban growth area.

7. That subdivision and major partitioning activity will be approved only in those areas where roads meet minimum recommended standards and winter road maintenance can be provided for all-weather vehicular access.
8. That transportation improvements will avoid dividing existing economic farm units, unless no feasible alternative exists.
9. That air and rail facilities will be protected from encroaching incompatible uses that may have a limiting effect on their future use.
10. That the transportation facilities will be centralized to the extent practical.
11. That road or street rights-of-way and other public lands will generally not be vacated; but shall be considered for park, open space, utilities and all other possible public use should vacations be contemplated.
12. That development requiring access to arterials will be approved only after consideration is given to proposed land uses(s) and traffic patterns in the area, not just the specific site. Area-wide needs supersede site-specific needs. Frontage roads and access collection points shall be provided wherever needed. Access control techniques will be used to coordinate traffic and land use patterns, and to help minimize possible negative impacts of growth.
13. That the number of access points to arterials will be kept to a minimum and cluster development of commercial and industrial activities encouraged.
14. That the cities and County support feasible programs to improve conditions for the transportation disadvantaged, and recognize potential pedestrian and bicycle demands in planning related decisions.
15. The County shall coordinate and cooperate with the state Highway Division in the implementation of those projects applicable to the County in the periodic Six-Year Highway Improvement Plans. Implementing regulation shall be designed to accommodate highway improvement projects as much as possible.
16. The handbooks published by the State Department of Transportation entitled: "Highway Compatibility Guidelines" and "Guidebook for Access Management" shall be utilized as guidelines in the implementation of relevant land use regulations.

Recommendations:

1. That a detailed street plan be developed for the Lakeview area, and that zoning ordinance revisions be made to require specific setbacks from centerlines of streets designated as arterials, collectors, and secondary routes.
2. That the cities and County provide more input into decision regarding railroad improvements.
3. That only new arterial or collector roads be accepted in to the County Road System.
4. That unimproved or unneeded County road rights-of-way be vacated in order that limited funds available for construction and maintenance can be used more effectively.
5. That minimum setbacks from arterial and collector rights-of-way be established for commercial and industrial uses.

Findings:

1. All feasible modes of transportation were considered. Needs of rail, air, highway/roadway, bicycle and pedestrian modes were recognized in the Plan decision-making. In addition to the recommendations contained in the Comprehensive Plan, a County Transportation Plan was prepared and adopted, and an Airport Master Plan is being prepared for the Lakeview Airport.
2. Both the Comprehensive Plan and Transportation Plan were based upon local, regional and State transportation needs and inventory information.
3. Because of the lack of feasible alternatives, it was difficult to consider the differences in social consequences that would result from utilizing differing combinations of transportation modes. However, to the extent possible such social consequences were recognized.
4. The County has no alternative but to rely principally on vehicular transport. Its location and available alternative modes of transport leave no other choice.
5. Both the comprehensive and Transportation Plans have attempted to minimize any adverse social, economic or environmental impacts and costs, and to conserve energy.
6. Both the Comprehensive and Transportation Plans have attempted to recognize the needs of the transportation disadvantaged and to improve services for such, and to facilitate the flow of goods and services so as to strengthen the local and regional economies.
7. The Transportation Plan is cross-referenced with the Comprehensive Plan and conforms therewith.
8. The Lakeview Public Facilities Plan of 1987, as adopted by the Town of Lakeview, contains information on Transportation facilities in the Lakeview Urban Area in which the County has certain planning responsibilities. Therefore, said Plan is hereby referenced and coordinated with this Plan.
9. It is in the public interest that the County coordinate and cooperate with the State Highway Division in the preparation and implementation of the Division's Six-Year Highway Improvement Plans and Programs.
10. A number of provisions related to certain highway improvement actions are set forth in State Statutes and are designed to minimize review processes related thereto and potential delays related to such review processes. It is in the public interest that such provisions be incorporated into local land use ordinances as much as possible.
11. State Statutes and implementing administrative rules contain a number of provisions governing certain uses and actions related to public highways, particularly those designates "Scenic;" it is in the public interest that similar provisions be included within local ordinances to insure maximum coordination with said State provisions.
12. It is important that Transportation Plans be updated periodically to reflect changing conditions and needs.

LAKE COUNTY AIRPORT – AIRPORT LAYOUT PLAN REPORT (MARCH 2001)

This study examines the configuration of facilities, addresses both current and long-term airport needs, and updates the previous Airport Master Plan and Airport Layout Plan, completed in 1979. The primary objective of this Airport Layout Plan Report is to identify current and future facility needs and the improvements necessary to maintain a safe, efficient, economical, and environmentally acceptable air

transportation facility. The report contains 20 recommendations, culminating in a 20-year Airport Capital Improvement Program containing 12 short-term projects and 18 long-term projects totaling $2,111,567.

LAKE COUNTY ATLAS: A COMPREHENSIVE PLAN SUPPLEMENT (MARCH 1979)

This atlas is intended to provide a basis upon which land use decisions can be made. It consists of the following sections:

Existing Land Use
Land Ownership
Zoning
Special Districts
Transportation Considerations
Meteorological Conditions
Water Resources
Terrestrial Resources
Wildlife and Fish
Hazard Areas
Renewable Energy Resources
Open Space Resources
Cultural Resources
Human Resources

The transportation section briefly discusses the existing road network, Oregon's functional highway classification system and how the two relate to land use planning.

SOUTH CENTRAL OREGON REGIONAL INVESTMENT PLAN (FEBRUARY 2000)

This plan outlines regional economic development constraints and opportunities for Klamath and Lake Counties. Long-term strategies and proposals to enhance the economic conditions and livability of these communities are discussed. Long-term goals are developed, and supporting objectives and specific strategies are presented. The study's goals include improving economic development, providing quality infrastructure to support growth, capacity building to maximize limited resources, improving access to health and human service for livability, maintaining strong public safety and emergency response capabilities, improving diverse community amenities, and maintaining a well balanced use of natural resources. Specific strategies to implement these goals related to the transportation system are described below.

Goal: Infrastructure

Objective 1: Provide physical infrastructure to entice and support new industry and commerce.

The region's general lack of airline connections and the isolation of parts of the region from reliable and affordable transportation inhibit the businesses of Lakeview from exporting goods and services. Existing commercial air service does not provide enough route options or alternatives to meet the needs of a growing region.

Strategies:

- Recommend priority road or alternative construction projects to ODOT especially as they pertain to long-haul trucking through Lake County on Highway 140 east.
- Seek funding for construction and maintenance for road and rail facilities to improve freight and passenger movement in Lake County.

- Recruit additional air service to Klamath Falls and Lakeview in the form of additional seats/carriers and destinations.
- Revitalize old commercial districts in Lakeview.

Goal: Housing, Health, and Human Services

Objective 1: Provide essential community services.

Many communities lack access to transportation to and from social, medical, dental, and other services for disabled and elderly residents.

Strategies:

- No specific strategies indicated

Goal: Community Amenities

Objective 1: Develop the community amenities that enhance the overall quality of life.

Lakeview lacks the funding to establish and maintain greenways, parks, and streetscapes.

Strategies:

- Improve and maintain community walking, hiking, and biking trails, parks, and athletic fields.
- Increase the effectiveness of code enforcement in cities.
- Develop a transportation plan for the urban area that includes all modes of transportation.

Goal: Economic Development

Objective 3: Recruit new industry and commerce especially in leading economic markets.

The Lakeview area is perceived as too far away from major markets and the area lacks commercial air service and long-haul trucking. Highways 140, 31, and 395 need to be more accessible for trucking freight year around.

Strategies:

- Develop and market transportation infrastructure capabilities, intermodal potential, and access to markets in the west coast.
- Continue federal, state, and local efforts to establish long-haul trucking capacity on Highways 140, 395, and 31.
- Develop attractive signage to encourage passing travelers to stop and improve interpretation of local history, geology, and other rural attractions.

Goal: Capacity Building

Objective 2: Develop collaborative projects between counties, cities, private industry and non-profit organizations to achieve goals of the plan.

There is a lack of regional coordination due to dispersed physical location, difficulty traveling during the winter, and lack of funding for such coordination. Better coordination could improve the economic conditions for the small communities in the region.

Strategies:

- Continue regional efforts in transportation planning projects and programs.
- Support coordinated land use and transportation planning for the Highway 140 corridor.

Specific projects to achieve these goals were prioritized submitted to the State Community Economic Revitalization Team for assignment to state and federal lead agencies for funding. On this prioritized list for Lake County is the Oregon Outback National Scenic By-Way Marketing Study by the Lake County Chamber of Commerce. This project would create marketing schemes and educational signs to show the value of spending more time in Lake County. Also on the prioritized list within the Town of Lakeview are a Community Center Swimming Pool Feasibility Study, Park and Recreation Development and Management Plan, and the Lakeview 2001 Streetscape.

TOWN OF LAKEVIEW PERIODIC REVIEW – LAKEVIEW DEPARTMENT OF CORRECTIONS FACILITIES IMPACT ASSESSMENT REPORT (JUNE 30, 1999)

The Town of Lakeview and Lake County, in an attempt to asses the impacts of the proposed Department of Corrections (DOC) minimum security work camp, had a local impact study preformed. The study's major focus was to assess the existing conditions of the area land use, transportation, economy, population growth, inmate family relocation, local government/infrastructure services, and social/cultural issues, and to address the impact the DOC facility would have on these local issues. The findings and goals of this report that are relevant to the long-range Transportation System Plan for Lake County and are summarized in the following paragraphs and table.

The Oregon Department of Transportation preliminary study concluded that approximately 400 trips per day (ADT) would be generated by the DOC facility. The impact to local residents and issues of the placement of the main entrance were of primary concern. Three of the four locations considered for the main entrance are within the Urban Growth Boundary. Potential road improvements were also considered to address the higher volumes of traffic in the area. A preliminary staff report by the DOC for the recommendation of the placement of the main entrance to the facility was reviewed and generalized in a table for the Facilities Impact Assessment. The Facilities Impact Assessment recommended that the DOC should perform a Traffic Impact Analysis, and that a Transportation System Plan be developed with the coordination of the County and DOC.

Table 12. (Lakeview DOC Facilities Impact Report pg. 30) Access Considerations

Main Entrance/Access	Intersection at State Hwy	Potential Road Improvements	Impact to Existing Residents
1. Hwy 140 at Roberta Ave. to 2-18 (Metzker Rd.)	Right turn lane at Roberta Ave on westbound Hwy 140	Pave 2-18 north of 2-17	Medium Inside UGB
2. Hwy 395 at 2-16 to 2-18	Left turn refuge at county road 2-16	Pave 2-16 and 2-18	Low Outside UGB
3. Hwy 395 at 2-17 to2-18(Hunters Lodge Gold Mohr Territory)	Left turn refuge at county road 2-17	Pave 2-18 north of 2-17, possible improvements at 2-17 to address topographic constraints, curves and creek.	Along 2-17 Medium Inside UGB
4. Hwy 395 at 2-18A to 2-18 (Missouri Rd. to Metzker Rd)	Left turn refuge at county road 2-18A	Pave 2-18 north of 2-17	Along 2-18A and 2-18 High Inside UGB

Source: DOC Preliminary Staff Report, (1996). Page 6, Agency Comments (ODOT)

Other transportation impacts addressed in the report were the sudden one time increase in population from the construction activity and the resulting increase of traffic. It was recommended that the Town and County establish outstanding road needs prior to increased traffic and consider System Development Charges as a way to finance future road improvements.

TOWN OF LAKEVIEW TRANSPORTATION SYSTEM PLAN (JUNE 2001)

The Town of Lakeview Transportation System Plan (TSP) guides the management of existing transportation facilities and the design and implementation of future facilities for the next 20 years. This Transportation System Plan constitutes the transportation element of the town's Comprehensive Plan and satisfies the requirements of the Oregon Transportation Planning Rule established by the Department of Land Conservation and Development. It identifies and prioritizes transportation projects for inclusion in the Oregon Department of Transportation's (ODOT's) Statewide Transportation Improvement Program (STIP) and the Town of Lakeview's Capital Improvement Program (CIP).

To safely and efficiently accommodate future vehicular travel in the Town of Lakeview, a number of roadway capacity, circulation, and upgrade project needs were identified. These projects include paving gravel roadways, improved signing and striping, as well as bicycle and pedestrian system improvements. The total estimated cost for the recommended improvements is $4.5 million over a 20-year planning period. The Town of Lakeview's share of these costs is $2.3 million, Lake County's share of these costs is $2.0 million, and ODOT's share of these costs is $0.2 million.

The TSP contains recommended text amendments to the town's transportation element of the Comprehensive Plan and the Zoning Ordinance. These changes will bring the Comprehensive Plan and the Zoning Ordinance into compliance with the Transportation Planning Rule.

TOWN OF LAKEVIEW PUBLIC FACILITIES PLAN DRAFT (FEBRUARY 2001)

The Public Facilities Plan represents the current state of the public facilities (at the time the document was written), and addresses future development up to the year 2020. Within this document is the Capitol Improvement Program, and the Public Facilities Development Plan. The Public Facilities Plan is broken down into three phases. Phase 1 is for capitol improvements that are scheduled to be completed by the year 2005, Phase 2 is for projects to be completed between the years 2005 and 2010, and Phase 3 is for projects to be completed between the years 2010 and 2020.

There is one capitol improvement project that is part of the transportation system. In Phase 1, paving county road 1-14 is to be completed. This would complete paving all of the county roads inside the Lakeview Urban Growth Boundary. The estimated cost for this project is $150,000.

TRANSPORTATION CORRIDOR ANALYSIS OF HIGHWAY 140 EAST OF KLAMATH FALLS TO THE NEVADA BORDER (JULY 2001)

There is a long-held belief in the Southern Oregon Region that substandard conditions on Highway 140 are constraining economic development by reducing freight-related travel along the corridor. The purpose of this corridor study was to examine this issue to determine opportunities to improve transportation and non-transportation infrastructure in the region in order to maximize economic benefits.

The following summarizes the major findings of the study:

- Low current and potential truck volumes on Highway 140 and its limited statewide strategic importance in terms of cross-border freight traffic in comparison to other routes indicate that the route does not merit designation as a Freight Transportation Corridor.
- Potential economic benefits to the Highway 140 corridor region from highway corridor improvements are primarily in the area of safety improvements and associated accident cost savings, as opposed to economic benefits to Klamath and Lake Counties.
- The estimated cost of base improvements necessary to remove truck length restrictions along the Highway 140 study corridor is $27.6 million. Additional improvements to address safety deficiencies given unrestricted truck usage would cost an estimated $22.8 million, for a total corridor improvement cost of $50.4 million.
- A limited number of current or possible frequent users of Highway 140 would realize benefits through the removal of truck length restrictions, including a few local commercial carriers that haul produce and other commodities into Nevada, local industries with customers or suppliers outside of the region, and federal government land management agencies. However, these local benefits are gained at a high cost given the low traffic volumes.

- Economic growth along the Highway 140 corridor and in the surrounding region is constrained as much or more by other factors, such as remote location, and lack of certain other infrastructure, such as the truck length restrictions on Highway 140.
- Promoting the tourism traffic segment will provide local spending increases far beyond increasing freight truck traffic through the area.

The following recommendations with respect to the Highway 140 corridor were made to the South Central Oregon Area Commission on Transportation and ODOT:

1. Discontinue efforts to pursue Freight Transportation Corridor designation for Highway 140 given the lack of supporting current/potential freight traffic volume and that the corridor is not of statewide strategic importance to Oregon.
2. Based on safety benefits and local/regional reliance on Highway 140, pursue recommended strategies to implement minimal necessary improvements to remove truck length restrictions.
3. Pursue economic development strategies for industry diversification and provision of necessary non-highway infrastructure.

CORRIDOR STRATEGY – US HIGHWAY 395 SOUTH (PENDLETON – CALIFORNIA BORDER)

The US Highway 395 South (Pendleton – California) Corridor Strategy was prepared by the Oregon Department of Transportation (ODOT). This report is not dated; however, it was prepared in 1996 or 1997.

The Corridor Strategy was developed to identify projects for the Oregon State Transportation Improvement Program (STIP). Development of the US 395 Corridor Strategy is the first step in the corridor planning process. Corridor planning is intended to implement the goals and policies set forth by the 1992 Oregon Transportation Plan (OTP), the 1991 and 1999 Oregon Highway Plans, and the modal plans for rail, freight, bike/pedestrian, aviation, and public transportation plus the safety action plan.

Generally, the Corridor Strategy translates the policies of the OTP into specific actions; describes the functions of each transportation mode, considers trade-offs, and shows how they will be managed; identifies and prioritizes improvements for all modes of travel; indicates where improvements would be made; resolves any conflicts with local land use ordinances and plans; and establishes guidelines for how transportation plans will be implemented.

The US 395 Corridor Strategy contains a corridor overview, which includes population and employment forecasts, highway data such as traffic volumes and pavement conditions and descriptions of other modes of travel (air, rail, bicycle, etc.). The overall corridor strategy is to "accommodate efficient movement of through travel, while maintaining environmental integrity, enhancing travel safety and supporting economic development." The report sets forth objectives, which are intended to embody this overall strategy for the corridor, and to set direction and provide guidance for corridor-wide transportation plans and improvements

ODOT's intent was to follow-up the Highway 395 Corridor Strategy with a Highway 395 Corridor Plan, which would build upon objectives developed in the Strategy to identify, refine, and facilitate the acceptance of specific decisions related to corridor transportation management, capital improvements and service improvements. The Corridor Plan would identify and discuss the decisions considered to

meet each objective, technical analysis of alternatives, and recommendations for action. The Highway 395 Corridor Plan was never prepared.

US HIGHWAY 20 CORRIDOR STRATEGY (BEND – VALE) (JUNE 10, 1996)

The US Highway 20 (Bend – Vale) Corridor Strategy was prepared by the Oregon Department of Transportation (ODOT) and Otak, Inc. and is dated June 10, 1996.

The Corridor Strategy was developed to identify projects for the Oregon State Transportation Improvement Program (STIP). Development of the US 20 Corridor Strategy is the first step in the corridor planning process. Corridor planning is intended to implement the goals and policies set forth by the 1992 Oregon Transportation Plan (OTP), the 1991 and 1999 Oregon Highway Plans, and the modal plans for rail, freight, bike/pedestrian, aviation, and public transportation plus the safety action plan.

Generally, the Corridor Strategy translates the policies of the OTP into specific actions; describes the functions of each transportation mode, considers trade-offs, and shows how they will be managed; identifies and prioritizes improvements for all modes of travel; indicates where improvements should be made; resolves any conflicts with local land use ordinances and plans; and establishes guidelines for how transportation plans will be implemented.

The US 20 Corridor Strategy contains an overview of the nearly 250-mile corridor, including general descriptions of each of the nine corridor segments, population and employment forecasts, highway data such as traffic volumes, travel times, pavement conditions, safety analysis and descriptions of other modes of travel (air, rail, bicycle, etc.). The overall corridor strategy is to, "accommodate efficient movement of through travel from US Highway 97 to I-84 by focusing on maintenance and safety improvements; while maintaining environmental integrity, and supporting economic development." The report sets forth objectives, which are intended to embody this overall strategy for the corridor, and to set direction and provide guidance for corridor-wide transportation plans and improvements.

The US 20 Corridor Strategy outlines policies and issues pertaining to each of the specific corridor objectives, which are broken into two categories as follows:

Transportation Performance Objectives

- Transportation balance and intermodal connection
- Regional connectivity
- Highway level of service
- Facility management
- Roadway conditions
- Safety

Transportation Impact Objectives

- Environmental
- Social and land use
- Energy
- Economic

The four underlying themes of the Corridor Strategy include: enhancing safety, environmental preservation, economic development, and partnering.

ODOT's intent was to follow-up the Highway 20 Corridor Strategy with a Highway 20 Corridor Plan, which would build upon objectives developed in the Strategy to identify, refine, and facilitate the

acceptance of specific decisions related to corridor transportation management, capital improvements and service improvements. The Corridor Plan would identify and discuss the decisions considered to meet each objective, technical analysis of alternatives, and recommendations for action. The Highway 20 Corridor Plan was never prepared.

OREGON'S OUTBACK SCENIC BYWAY MANAGEMENT AND MARKETING PLAN FOR STATE HIGHWAYS 31 AND 395 CORRIDOR (DRAFT) (NOVEMBER 15, 1996)

"Oregon's Outback Byway" runs between the junctions of State Highway 31 and US Highway 97, just south of LaPine to the Oregon/California state line on US Highway 395, at New Pine Creek. The total mileage is 145 miles.

The overall guiding management principles are:

- Private rights of land owners within the byway corridor will be recognized, honored, and achieved through the application of traditional tools such as: local land use plans, local zoning codes, and citizen involvement process through local County Commissioners.
- Public lands in the corridor will be managed to achieve a balance to allow economic development while protection the natural resource processes.

The management goals are:

- ***Goal I – Preserve the Rural Atmosphere –*** Maintain the existing rural lifestyle and landscape characteristics.
- ***Goal II – Promote Economic Stability –*** Use tourism to help diversify the economic base of the region.
- ***Goal III – Showcase the Outback Hospitality –*** Welcome and help visitors by educating and showcasing agriculture, timber and tourist industries, as well as informing them on the natural, historical and recreational attractions and opportunities.
- ***Goal IV – Enhance the Attractions –*** Maintain the natural and manmade landscape values that make this route unique.
- ***Goal V – Have fun, but Minimize Impact –*** Provide visitors with good facilities in safe and sound impact-free settings.

The Action Plan includes the following construction needs:

Construction Needs 1996 to 1997

A. Build a byway kiosk, with supporting byway information in Lakeview.

B. Put Up official Scenic Byway portal and trailblazer signs.

C. Warning signs that tell visitors about the Open Range Policy, that is, cattle are allowed to graze without fencing off the highway. Signs are needed near the Horse Ranch, north and south of Valley Falls and north of Lakeview and north of New Pine Creek.

D. Additional warning signs at deer crossing locations.

Construction Needs 1998 to 2001

A. Visitor kiosks at:

1. LaPine
2. Lakeview
3. New Pine Creek

B. Rest Stop improvements at:

1. Summer Lake
2. Chandler State Park

C. Wayside pull-off improvements at:

1. Widen and add fill to the existing wayside at the State's Travel Information Council beaver board that is located just east of the Horse Ranch on Highway 31.
2. Widen and add surface material at the new wayside where there is a good view of both Summer Lake and the restored school house.
3. Widen the existing wayside at the geologic beaver board just north of Valley Falls.
4. Add new wayside pull-offs at milepost 10 on Highway 31, mid Summer Lake, and south of Paisley.

D. Recreation facilities at:

1. Anna Reservoir area – a full service campground and RV park.
2. RV sewage dump stations at Summer Lake, Silver Lake, and Paisley.

E. Signs:

1. Byway portal and trailblazer signs.
2. Special visitor service facility signs, such as, RV sewage dump station locations, recreation sites, environmental education sites, hiking and horse trails, etc.
3. Signs that point to and name major features, such as, Mount Scott that is on the Highway 31 horizon near the LaPine junction, Table Mountain, Fremont Point, Slide Mount, Abert Rim, and Tague's Butte.
4. What services are available ahead signs, one mile north and south of the communities of Silver Lake, Summer Lake, Valley Falls, and New Pine Creek.
5. Information sign showing there is an existing interpretive kiosk one block east, at the junction of the road leading east to the Paisley Post Office.

F. Interpretive panels at:

1. Milepost 10 south of LaPine on Highway 31. Expand the existing interpretation to cover more of the history of the Summit Stage Station and the 1942 railroad town of Shevlin.
2. State of Oregon beaver board sign just east of the Horse Ranch on the geology of Fort Rock. The beaver board sign needs to be rehabilitated.

3. The watchable wildlife wayside north of Paulina Marsh on the interstate deer herd.
4. Silver Lake Commentary on the Christmas Eve tragedy and the history of the community of Silver Lake.
5. Highway 31 and the Christmas Valley Road. At the existing BLM kiosk add interpretation on Native American culture, geology of Table Mountain and Silver Lake, ranching, and wildlife.
6. Summer Lake rest stop on history, wildlife, fishery, geology, springs at Anna Reservoir and ranching.
7. South of Paisley to inform visitors on the ranches and agriculture visible along the road and the reclamation project.
8. At the existing State of Oregon beaver board sign just north of Valley Falls on the geology of Abert Rim. Add interpretation on the old lake geology, and the wildlife, waterfowl, shore birds, and photography and hunting in the area. The beaver board needs to be rehabilitated.
9. Lakeview (downtown or on Highway 395 at Hunter's Resort) that tell about the hang gliding in the area and the thermals that make Lakeview the "Hang Gliding Capital of the West."
10. New Pine Creek on the California National Historic Trail (Applegate Trail crossing the south end of Goose Lake), the Fremont National Forest opportunities, the history of New Pine Creek (oldest community in Lake County) and on Goose Lake Ferry.

Safety Needs 1998 to 2001

A. Highway Related:

1. Start efforts to redesign and rebuild the road junctions at Valley Falls and Lakeview
2. Start efforts to design and build a passing lane at Picture Rock Pass area.

APPENDIX B

State Highway and County Road Inventory

APPENDIX B

2002 State Highway Inventory
Lake County Transportation System Plan

Road Name	Jurisdiction	Classification	Speed Limit (mph)	ROW Width (feet)	Street Width (feet)	No. of Travel Lanes	On-Street Parking	Bikeway	SHOULDERS Width (feet)	SHOULDERS Side	SHOULDERS Paving	Sidewalk	Freight Route	2001 Pavement Conditions	Bridge
US 20 (Central Oregon Highway)															
Deschutes County Line - Glass Buttes (Milepost 75.0)	State	Arterial	55 mph		24	2	None	None	3	Both	Paved	None	Yes	Poor	
Glass Buttes (Milepost 75.0) - Harney County Line	State	Arterial	55 mph		24	2	None	None	3	Both	Paved	None	Yes	Very Good	
OR Highway 31 (Fremont Highway)															
Klamath County Line - Milepost 30.5	State	Arterial	55 mph		24	2	None	None	0-2	Both	Paved	None	No	Fair	
Milepost 30.5 - Road to Oatman Flat Road	State	Arterial	55 mph		24	2	None	None	0-2	Both	Paved	None	No	Poor	
Road to Oatman Flat Road - Milepost 41.0	State	Arterial	55 mph		24	2	None	None	0-2	Both	Paved	None	No	Poor	
Milepost 41.0 - Milepost 42.7	State	Arterial	55 mph		24	2	None	None	0-2	Both	Paved	None	No	Poor	
Milepost 42.7 - Trunk Rd	State	Arterial	55 mph		24	2	None	None	0-2	Both	Paved	None	No	Fair	03907A, 03908
Trunk Rd - 5th Street	State	Arterial	40 mph		24	2	None	None	8	Both	Paved	None	No	Fair	
5th Street - Foster Flat Road	State	Arterial	40 mph		24	2	None	None	2-4	Both	Paved	None	No	Fair	
Foster Flat Road - Milepost 56.2	State	Arterial	55 mph		24	2	None	None	0-2	Both	Paved	None	No	Good	03909A, 01552A
Milepost 56.2 - Milepost 58.0	State	Arterial	55 mph		24	2	None	None	0-3	Both	Paved	None	No	Under Const.	
Milepost 58.0 - Picture Rock Pass	State	Arterial	55 mph		24	2	None	None	0-3	Both	Paved	None	No	Poor	
Picture Rock Pass - Drury Lane	State	Arterial	55 mph		24	2	None	None	0-1	Both	Paved	None	No	Poor	
Drury Lane - Cross Road	State	Arterial	55 mph		24	2	None	None	0-1	Both	Paved	None	No	Good	
Cross Road - Hunter Hill	State	Arterial	55 mph		24	2	None	None	0-1	Both	Paved	None	No	Good	
Hunter Hill - Minkler Ranch	State	Arterial	55 mph		24	2	None	None	0-1	Both	Paved	None	No	Good	
Minkler Ranch - Milepost 82.7	State	Arterial	55 mph		24	2	None	None	0-1	Both	Paved	None	No	Good	
Milepost 82.7 - Milepost 86.0	State	Arterial	55 mph		24	2	None	None	4	Both	Paved	None	No	Good	
Milepost 86.0 - Harvey Ranch	State	Arterial	55 mph		24	2	None	None	0-1	Both	Paved	None	No	Good	0P032
Harvey Ranch - Kelly Creek	State	Arterial	55 mph		24	2	None	None	0-1	Both	Paved	None	No	Poor	
Kelly Creek - Hampton Creek	State	Arterial	55 mph		24	2	None	None	0-1	Both	Paved	None	No	Poor	
Hampton Creek - Milepost 95.0	State	Arterial	55 mph		24	2	None	None	0-1	Both	Paved	None	No	Poor	06666
Milepost 95.0 - Paisley NCL (Milepost 98.22)	State	Arterial	55 mph		24	2	None	None	0-1	Both	Paved	None	No	Fair	
Paisley NCL (Milepost 98.22)- Paisley SCL (Milepost 98.89)	State	Arterial	35 mph		24	2	None	None	10	Both	Paved	None	No	Fair	00572A,
Paisley SCL (Milepost 98.89) - Johnson Canyon Creek	State	Arterial	55 mph		24	2	None	None	0-2	Both	Paved	None	No	Fair	
Johnson Canyon Creek - Clover Flat Road	State	Arterial	55 mph		24	2	None	None	0-1	Both	Paved	None	No	Fair	01010, 03913
Clover Flat Road - Moss Creek	State	Arterial	55 mph		24	2	None	None	0-1	Both	Paved	None	No	Good	
Moss Creek - The Narrows Bridge	State	Arterial	55 mph		24	2	None	None	0-2	Both	Paved	None	No	Fair	18787
The Narrows Bridge - Valley Falls	State	Arterial	55 mph		24	2	None	None	0-2	Both	Paved	None	No	Fair	00571A, 18789
OR Highway 140 (Klamath Falls-Lakeview Highway)															
Klamath County Line - Forest Service Road (MP 64.5)	State	Arterial	55 mph		24	2	None	None	4	Both	Paved	None	No	Good	
Forest Service Road (MP 64.5) - Quartz Mountain Pass	State	Arterial	55 mph		36	3	None	None	4	Both	Paved	None	No	Good	
Quartz Mountain Pass - Milepost 70.5	State	Arterial	55 mph		24	2	None	None	4	Both	Paved	None	No	Good	03924A
Milepost 70.5 - Forest Service Road (MP 71.3)	State	Arterial	55 mph		36	3	None	None	4	Both	Paved	None	No	Good	
Forest Service Road (MP 71.3) - Drews Creek	State	Arterial	55 mph		24	2	None	None	3	Both	Paved	None	No	Good	1169
Drews Creek - Drews Gap	State	Arterial	55 mph		24	2	None	None	3	Both	Paved	None	No	Very Good	03925, 03926
Drews Gap - West Side/Pike Road	State	Arterial	55 mph		24	2	None	None	0	Both	-	None	No	Fair	03927, 02680, 05234, 05235, 02679, 02343
West Side / Pike Road - Maddock Corner	State	Arterial	55 mph		24	2	None	None	0	Both	-	None	No	Under Const.	
Maddock Corner - Lakeview City Limits	State	Arterial	55 mph		24	2	None	None	2-8	Both	Paved	None	No	Under Const.	18870, 18871, 18872, 02359, 18874, 18875
Lakeview City Limits - Fremont Highway (OR 31)	State	Arterial	55 mph		24	2	None	None	10	Both	Paved	None	No	Under Const.	
US 395 (Lakeview-Burns Highway)															
Harney County Line - Hogback	State	Arterial	55 mph		24	2	None	None	4	Both	Paved	None	No	Poor	
Hogback - Lake Abert (Milepost 74.0)	State	Arterial	55 mph		24	2	None	None	4	Both	Paved	None	No	Poor	
Lake Abert (Milepost 74.0) - Lake Abert (Milepost 81.5)	State	Arterial	55 mph		24	2	None	None	0-1	Both	Paved	None	No	Good	
Lake Abert (Milepost 81.5) - Milepost 85.7	State	Arterial	55 mph		22	2	None	None	0	Both	-	None	No	Good	0P040
Milepost 85.7 - Lake Abert Road	State	Arterial	55 mph		24	2	None	None	0	Both	-	None	No	Good	
Lake Abert Road - Milepost 89.7	State	Arterial	55 mph		24	2	None	None	0	Both	-	None	No	Poor	
Milepost 89.7 - Fremont Highway (OR 31)	State	Arterial	55 mph		24	2	None	None	4	Both	Paved	None	No	Poor	
US 395 (Fremont Highway)															
Valley Falls - Milepost 123.0	State	Arterial	55 mph		24	2	None	None	0-2	Both	Paved	None	No	Good	00765A
Milepost 123.0 - Loveless Creek	State	Arterial	55 mph		24	2	None	None	0-2	Both	Paved	None	No	Good	0M015, 0M014, 03915
Loveless Creek - Hunters Lodge	State	Arterial	55 mph		24	2	None	None	0-3	Both	Paved	None	No	Good	0M016, 0M017, 01989
Hunters Lodge - North 10th Street	State	Arterial	55 mph		24	2	None	None	4	Both	Paved	None	No	Fair	01990
North 10th Street - Lakeview S City Limits	State	Arterial	25 mph		24	2	Angle, both sides	None	10-14	Both	Paved	Both Sides	No	Under Const.	03917
S Lakeview City Limits - S. Fork Crane Creek	State	Arterial	55 mph		24	2	None	None	4	Both	Paved	None	No	Very Good	0P033, 03919A, 03920A
S. Fork Crane Creek - Milepost 149.1	State	Arterial	55 mph		24	2	None	None	10	Both	Paved	None	No	Very Good	
Milepost 149.1 - Cogswell Creek	State	Arterial	55 mph		24	2	None	None	4-8	Both	Paved	None	No	Very Good	
Cogswell Creek - Milepost 157.49	State	Arterial	55 mph		24	2	None	None	4	Both	Paved	None	No	Very Good	03921, 03922, 03923
Milepost 157.49 - California State Line	State	Arterial	40 mph		24	2	None	None	4	Both	Paved	None	No	Very Good	03921, 03922, 03923
OR Highway 140 (Warner Highway)															
Fremont Highway (OR 31) - Forest Boundary	State	Arterial	55 mph		24	2	None	None	4	Both	Paved	None	No	Very Good	
Forest Boundary - Milepost 2.4	State	Arterial	55 mph		24	2	None	None	4-5	Both	Paved	None	No	Very Good	19046
Milepost 2.4 - Milepost 3.2	State	Arterial	55 mph		24	2	None	None	5	Both	Paved	None	No	Very Good	
Milepost 3.2 - Ski Area Road	State	Arterial	55 mph		24	2	None	None	5	Both	Paved	None	No	Very Good	
Ski Area Road - Squaw Butte Creek	State	Arterial	55 mph		24	2	None	None	4-5	Both	Paved	None	No	Very Good	19047
Squaw Butte Creek - Mud Creek Rd	State	Arterial	55 mph		24	2	None	None	4	Both	Paved	None	No	Good	19048, 19049
Mud Creek Rd - Milepost 14.5	State	Arterial	55 mph		24	2	None	None	0	Both	-	None	No	Good	03935A
Milepost 14.5 - Parsnip Creek	State	Arterial	55 mph		24	2	None	None	0	Both	-	None	No	Good	03936A
Parsnip Creek - Milepost 19.0	State	Arterial	55 mph		24	2	None	None	0	Both	-	None	No	Good	06667A
Milepost 19.0 - Drake Creek	State	Arterial	55 mph		24	2	None	None	0	Both	-	None	No	Good	

APPENDIX B

2002 State Highway Inventory
Lake County Transportation System Plan

Road Name	Jurisdiction	Classification	Speed Limit (mph)	ROW Width (feet)	Street Width (feet)	No. of Travel Lanes	On-Street Parking	Bikeway	SHOULDERS			Sidewalk	Freight Route	2001 Pavement Conditions	Bridge
									Width (feet)	Side	Paving				
Drake Creek - Milepost 24.0	State	Arterial	55 mph		22	2	None	None	0	Both	-	None	No	Poor	03937A
Milepost 24.0 - Milepost 28.2	State	Arterial	55 mph		22	2	None	None	0	Both	-	None	No	Fair	
Milepost 28.2 - Milepost 35.0	State	Arterial	55 mph		24	2	None	None	2-3	Both	Paved	None	No	Fair	08848A, 08850, 08849, 09538
Milepost 35.0 - Milepost 39.0	State	Arterial	55 mph		24	2	None	None	3	Both	Paved	None	No	Fair	
Milepost 39.0 - Milepost 40.0	State	Arterial	55 mph		24	2	None	None	3	Both	Paved	None	No	Fair	
Milepost 40.0 - Milepost 42.45	State	Arterial	55 mph		24	2	None	None	1-2	Both	Paved	None	No	Poor	0P057
Milepost 42.45 - Blizzard Gap	State	Arterial	55 mph		22	2	None	None	2	Both	Paved	None	No	Poor	
Blizzard Gap - BLM Road	State	Arterial	55 mph		22	2	None	None	2	Both	Paved	None	No	Fair	
BLM Road - Milepost 53.0	State	Arterial	55 mph		22	2	None	None	2	Both	Paved	None	No	Fair	
Milepost 53.0 - Milepost 54.9	State	Arterial	55 mph		22	2	None	None	1	Both	Paved	None	No	Fair	
Milepost 54.9 - Milepost 56.3	State	Arterial	55 mph		22	2	None	None	1-2	Both	Paved	None	No	Under Const.	
Milepost 56.3 - Harney County Line	State	Arterial	55 mph		24	2	None	None	2	Both	Paved	None	No	Under Const.	

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2002 County Road Inventory

Lake County Transportation System Plan

Road Name	Road #	Segment Length (feet)	Jurisdiction	Classification	Speed Limit (mph)	ROW Width (feet)	Street Width (feet)	No. of Travel Lanes	On-Street Parking	Bikeway	Sidewalk	Surface	PCI	2001 Pavement Conditions	Bridge
UNNAMED CANYON CR?															
STATE LINE RD - MILL ST	1-01	681	County	Residential/Local	55 mph	Not Recorded	20	2	None	None	None	AC	69	Satisfactory	
UNNAMED MILL ST?															
HWY 395 - DEAD END	1-02	923	County	Residential/Local	55 mph	Not Recorded	20	2	None	None	None	AC	68	Satisfactory	
CHURCH STREET															
DEAD END EAST OF HWY 395 - HWY 395	1-03_1	1,767	County	Residential/Local	55 mph	Not Recorded	20	2	None	None	None	AC	71	Good	
HWY 395 - DEAD END	1-03_2	824	County	Residential/Local	55 mph	Not Recorded	20	2	None	None	None	AC	74	Good	
WEST STREET															
STATE LINE - CHURCH	1-04	246	County	Residential/Local	55 mph	Not Recorded	36	2	None	None	None	AC	73	Good	
CENTER STREET															
STATE LINE - CHURCH	1-05	288	County	Residential/Local	55 mph	Not Recorded	36	2	None	None	None	AC	80	Good	
SOUTH 9TH															
SOUTH I ST - RR TRACKS	1-10_1	1,625	County	Collector	55 mph	60	42	2	None	None	None	AC	82	Good	
RR TRACKS - SEWAGE LAGOON	1-10_2	1,416	County	Collector	55 mph	60	34	2	None	None	None	AC	65	Satisfactory	
SEWAGE LAGOON - ROBERTA AVE	1-10_3	1,384	County	Collector	55 mph	60	34	2	None	None	None	AC	79	Good	
STOCK DRIVE															
ROBERTA AVE - WEST SIDE RD	1-10_1	18,487	County	Collector	55 mph	60	24	2	None	None	None	AC	84	Good	#37C011
	1-10_1		County		55 mph	60			None	None	None				#37C012
	1-10_1		County		55 mph	60			None	None	None				#37C013
	1-10_1		County		55 mph	60			None	None	None				#37C014
WEST SIDE RD - PADGET RD	1-10_2	5,331	County	Collector	55 mph	60	24	2	None	None	None	AC	89	Good	
AIRPORT															
HWY 140 - AIRPORT ENTRANCE	1-10A	19,972	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	87	Good	#37C015
WEST SIDE															
HWY 140 - STOCK DRIVE	1-11_1	2,676	County	Collector	55 mph	60	24	2	None	None	None	AC	90	Good	
STOCK DRIVE - BUCK RD	1-11_2	4,771	County	Collector	55 mph	60	24	2	None	None	None	AC	89	Good	
BUCK RD - TUNNEL HILL	1-11_3	26,540	County	Collector	55 mph	60	24	2	None	None	None	AC	84	Good	
TUNNEL HILL - REED RD	1-11_4	8,013	County	Collector	55 mph	60	24	2	None	None	None	AC	85	Good	#37C030
REED RD - 300 FT SOUTH OF FENIMORE RD	1-11_5	21,163	County	Collector	55 mph	60	24	2	None	None	None	AC	90	Good	
300 FT SOUTH OF FENIMORE RD - END OF PAVEMENT	1-11_6	33,007	County	Collector	55 mph	60	24	2	None	None	None	AC	89	Good	#37C019
PADGET															
HWY 140 - WEST SIDE RD	1-11B	6,116	County	Residential/Local	55 mph	60 (Some is 101.6')	24	2	None	None	None	AC	79	Good	
REED															
WESTSIDE RD - GARRETT RD	1-11C	5,302	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	86	Good	
DOG LAKE															
GARRETT RD - NATIONAL FOREST RD	1-11D	22,034	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	86	Good	
GARRETT															
WESTSIDE RD - DOG LAKE RD	1-11E_1	14,755	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	82	Good	
DOG LAKE RD - WESTSIDE RD	1-11E_2	5,243	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	85	Good	
FRIDAY															
WESTSIDE RD - END OF PAVEMENT	1-11G	6,562	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	80	Good	
DUMILIEU															
WESTSIDE RD - END OF PAVEMENT	1-11H	6,408	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	87	Good	
T-BONE															
DUMILIEU RD - END OF PAVEMENT	1-11I	364	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	89	Good	
ANDY HILL															
HWY 140 - 950 FT SOUTH OF SHULTS RD	1-12_1	18,440	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	87	Good	
950 FT SOUTH OF SHULTS RD - WATER USERS RD	1-12_2	9,668	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	86	Good	
WATER USERS RD - MP 6.01	1-12_3	3,656	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	83	Good	
MILEPOST 6.01 - WESTSIDE RD	1-12_4	2,260	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	90	Good	
SHULTS															
ANDY HILL RD - WESTSIDE RD	1-12A	10,617	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	90	Good	
WATER USERS															
ANDY HILL RD - WESTSIDE RD	1-12B	8,014	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	83	Good	
TUNNEL HILL															
HWY 140 - WESTSIDE RD	1-13	16,168	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	89	Good	
STATE LINE															

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2002 County Road Inventory

Lake County Transportation System Plan

Road Name	Road #	Segment Length (feet)	Jurisdiction	Classification	Speed Limit (mph)	ROW Width (feet)	Street Width (feet)	No. of Travel Lanes	On-Street Parking	Bikeway	Sidewalk	Surface	PCI	2001 Pavement Conditions	Bridge
HWY 395 - END OF PAVEMENT	1-19	7,847	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	75	Good	
LAWSON															
STATE LINE RD - DEAD END	1-19A	3,273	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	81	Good	
RED HOUSE															
HWY 31 - END OF PAVEMENT	2-07	20,812	County	Collector	55 mph	60	24	2	None	None	None	AC	83	Good	
MILL															
HWY 31 - BRIDGE	2-08_1	3,523	County	Residential/Local	55 mph	60	30	2	None	None	None	AC	82	Good	#37C049
BRIDGE - FOREST SERVICE RD	2-08_2	1,690	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	78	Good	#37C050
BLUE															
GREEN ST - HWY 31	2-09	3,088	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	83	Good	
GREEN															
HWY 31 - BLUE ST	2-09	1,342	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	83	Good	
CLOVER FLAT															
HWY 31 - END OF PAVEMENT	2-10	1,600	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	85	Good	
HWY 31 - END OF PAVEMENT	2-10A	27,662	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	80	Good	
ALBERT RIM RD															
HWY 395 - END OF PAVEMENT	2-11	2,180	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	63	Satisfactory	#37C051
LAKE RIDGE															
DEAD END SOUTH OF STOCK DR - HWY 140	2-16_1	8,013	County	Collector	55 mph	60	24	2	None	None	None	AC	85	Good	
THOMAS CREEK															
HWY 140 - 500 FT NORTH OF PIERSON RD	2-16_2	19,239	County	Collector	55 mph	60	24	2	None	None	None	AC	85	Good	#37C024
500 FT NORTH OF PIERSON RD - LANDFILL	2-16_3	28,396	County	Collector	55 mph	60	24	2	None	None	None	AC	90	Good	#37C010
	2-16_3		County		55 mph	60			None	None	None				#37C029
LANDFILL - HWY 395	2-16_4	4,660	County	Collector	55 mph	60	24	2	None	None	None	AC	78	Good	
DAIRY CREEK LN															
LAKE RIDGE RD - NATIONAL FOREST ROAD/STOP SIGN	2-16A	13,825	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	80	Good	
OLD SMOKEY															
HWY 140 - HWY 395	2-17_1	11,200	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	89	Good	
HWY 395 - MISSOURI RD	2-17_2	2,388	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	77	Good	
RABBIT HILL															
OLD SMOKEY RD - GEYSER VIEW LN	2-18_1	4,950	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	81	Good	
GEYSERVIEW LN - ROBERTA AVE	2-18_2	9,140	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	100	Good	
GEYSER VIEW LN															
MISSOURI RD - HWY 395	2-18A_1	3,054	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	86	Good	
SUNNY SLOPE LN															
HWY 140 - DEAD END	2-18A_2	2,870	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	84	Good	
MISSOURI															
J ST - ROBERTA AVE	2-18B	4,261	County	Collector	55 mph	Not to exceed 100'	25	2	None	None	None	AC	83	Good	
PRECISION PINE															
LAKE RIDGE RD - END OF PAVEMENT	2-18C	720	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	90	Good	
HWY 140 - MISSOURI RD	2-18C	1,592	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	50	Satisfactory	
E GOLDMOHR LN															
SUNNY SLOPE LN - DEAD END	2-18D	1,523	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	85	Good	
NEW IDAHO															
HWY 140 - THOMAS CREEK LP	2-19	23,983	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	90	Good	#37C021
THOMAS CREEK															
NEW IDAHO RD - LAKE RIDGE RD	2-19A	2,626	County	Collector	55 mph	Not Recorded	24	2	None	None	None	AC	90	Good	
OSBORNE															
NEW IDAHO RD - LAKE RIDGE RD	2-19C	5,365	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	90	Good	
JASKA															
LAKE RIDGE RD - NEW IDAHO RD	2-19D_1	5,302	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	88	Good	
NEW IDAHO RD - END OF PAVEMENT	2-19D_2	467	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	30	Fair	
LEEHMANN															
HWY 140 - HWY 140	2-19E	14,525	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	82	Good	

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2002 County Road Inventory
Lake County Transportation System Plan

Road Name	Road #	Segment Length (feet)	Jurisdiction	Classification	Speed Limit (mph)	ROW Width (feet)	Street Width (feet)	No. of Travel Lanes	On-Street Parking	Bikeway	Sidewalk	Surface	PCI	2001 Pavement Conditions	Bridge
PIKE															
HWY 140 (WEST INT) - NEW IDAHO RD	2-19F	10,635	County	Residential/Local	55 mph	60 some 80' some 70'	24	2	None	None	None	AC	87	Good	
ROBERTA															
MISSOURI AVE - HWY 395	2-23_1	3,940	County	Collector	55 mph	100	25	2	None	Bike Lane	None	AC	88	Good	
HWY 395 - 3RD ST	2-23_2	2,675	County	Collector	55 mph	100	25	2	None	Bike Lane	None	AC	86	Good	
3RD ST - 9TH ST	2-23_3	2,613	County	Collector	55 mph	100	36	2	None	Bike Lane	None	AC	65	Satisfactory	
BOONE (PLUSH)															
HOGBACK RD - GOLDRUN	3-01	721	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	78	Good	
LAKE (PLUSH)															
HOGBACK RD - GOLDRUN	3-02	722	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	82	Good	
MORRIS (PLUSH)															
HOGBACK RD - DEAD END	3-03	620	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	79	Good	
UNNAMED ALLEY (PLUSH)															
HOGBACK RD - DEAD END	3-04	882	County	Residential/Local	55 mph	Not Recorded	18	2	None	None	None	AC	78	Good	
WARNER (PLUSH)															
BOONE ST - UNNAMED ALLEY	3-05	988	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	82	Good	
GOLDRUN (PLUSH)															
TAYLOR RANCH RD - LAKE	3-06	587	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	77	Good	
PLUSH-ADEL															
HWY 140 - GRAVEL PIT	3-10_1	41,460	County	Collector	55 mph	60	24	2	None	None	None	AC	80	Good	
GRAVEL PIT - FISH CREEK	3-10_2	34,256	County	Collector	55 mph	60	24	2	None	None	None	AC	78	Good	#37C042
FISH CREEK - TAYLORS FARM RD	3-10_3	18,336	County	Collector	55 mph	60	24	2	None	None	None	AC	75	Good	
TAYLOR RANCH															
HOGBACK RD - DEAD END	3-10A	2,867	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	81	Good	
HOGBACK RD															
TAYLORS FARM RD - HART MT RD	3-10D	5,140	County	Collector	55 mph	Not Recorded	24	2	None	None	None	AC	72	Good	#37C008
HART MT RD - END OF PAVEMENT	3-10E	23,254	County	Collector	55 mph	Not Recorded	24	2	None	None	None	AC	79	Good	
END OF PAVEMENT - HWY 395	3-10		County	Collector	55 mph	Not Recorded	24	2	None	None	None	G			#37C059
HART MT															
HOGBACK RD - FITZGERALD RD	3-12_1	10,490	County	Collector	55 mph	60	24	2	None	None	None	AC	73	Good	#37C001
FITZGERALD RD - 250 FT N. OF CATTLEGUARD	3-12_2	20,588	County	Collector	55 mph	60	24	2	None	None	None	AC	81	Good	#37C002
	3-12_2		County		55 mph	60			None	None	None				#37C003
	3-12_2		County		55 mph	60			None	None	None				#37C004
	3-12_2		County		55 mph	60			None	None	None				#37C005
	3-12_2		County		55 mph	60			None	None	None				#37C006
	3-12_2		County		55 mph	60			None	None	None				#37C007
250 FT N.OF CATTLEGUARD - MILEPOST 9.22	3-12_3	17,583	County	Collector	55 mph	60	24	2	None	None	None	AC	66	Satisfactory	
MILEPOST 9.22 - FLAGSTAFF LAKE RD	3-12_4	21,912	County	Collector	55 mph	60	24	2	None	None	None	AC	82	Good	
PLUSH CUTOFF															
HWY 140 - DRAKE CREEK	3-13_1	25,311	County	Collector	55 mph	60	24	2	None	None	None	AC	81	Good	
DRAKE CREEK - MCDOWELL CREEK RD	3-13_2	34,754	County	Collector	55 mph	60	24	2	None	None	None	AC	58	Satisfactory	
MCDOWELL CREEK RD - MILEPOST 16.73	3-13_3	28,284	County	Collector	55 mph	60	24	2	None	None	None	AC	64	Satisfactory	
MILEPOST 16.73 - PLUSH-ADEL RD	3-13_4	8,872	County	Collector	55 mph	60	24	2	None	None	None	AC	81	Good	
TWENTYMILE															
HWY 140 - END OF PAVEMENT	3-14_1	42,397	County	Collector	55 mph	60	24	2	None	None	None	AC	85	Good	#37C041
END OF PAVEMENT - CALIFORNIA STATE LINE	3-14_2		County	Collector	55 mph	60	26	2	None	None	None	G			#37C031
	3-14_2		County		55 mph	60			None	None	None				#37C034
COLEMAN VALLEY															
TWENTYMILE RD - END OF PAVEMENT	3-15	14,148	County	Collector	55 mph	60	24	2	None	None	None	AC	82	Good	
BEAR FLAT															
HWY 31 - PUMICE BUTTE RD	4-10_1	33,994	County	Collector	55 mph	60	25	2	None	None	None	AC	82	Good	#37C057
PUMICE BUTTE RD - KLAMATH COUNTY LINE	4-10_2	44,200	County	Collector	55 mph	60	25	2	None	None	None	AC	81	Good	
SILVER CREEK															
HWY 31 - CATTLEGUARD AT MP 5.18	4-11_1	27,344	County	Collector	55 mph	60	24	2	None	None	None	AC	81	Good	
CATTLEGUARD AT MP 5.18 - FREMONT NATIONAL FOREST	4-11_2	2,664	County	Collector	55 mph	60	24	2	None	None	None	AC	0	Poor	
EAST BAY															
HWY 31 - FREMONT NATIONAL FOREST/CATTLEGUARD	4-12	30,181	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	61	Satisfactory	
CARLON															
HWY 31 - EAST PATRICK RD	4-16	19,767	County	Collector	55 mph	Not Recorded	24	2	None	None	None	AC	81	Good	

APPENDIX B

2002 County Road Inventory
Lake County Transportation System Plan

Road Name	Road #	Segment Length (feet)	Jurisdiction	Classification	Speed Limit (mph)	ROW Width (feet)	Street Width (feet)	No. of Travel Lanes	On-Street Parking	Bikeway	Sidewalk	Surface	PCI	2001 Pavement Conditions	Bridge
ROCK VIEW															
FORT ROCK RD - DEAD END	5-01	1,324	County	Residential/Local	55 mph	Not Recorded	36	2	None	None	None	AC	54	Satisfactory	
ANTELOPE VISTA															
FORT ROCK RD - DEAD END	5-02	1,330	County	Residential/Local	55 mph	Not Recorded	36	2	None	None	None	AC	61	Satisfactory	
FORT ROCK															
HWY 31 - CABIN LAKE RD	5-10_1	33,751	County	Collector	55 mph	60 (some 400' sections)	24	2	None	None	None	AC	80	Good	
CABIN LAKE RD - 300 FT EAST OF HOUSE #63876	5-10_2	18,094	County	Collector	55 mph	61 (some 400' sections)	24	2	None	None	None	AC	70	Good	
300 FT EAST OF HOUSE #63876 - CONNLEY LN	5-10_3	29,852	County	Collector	55 mph	62 (some 400' sections)	24	2	None	None	None	AC	81	Good	
CONNLEY LN - NORTH LAKE SCHOOL ENTRANCE	5-10_4	32,588	County	Collector	55 mph	63 (some 400' sections)	24	2	None	None	None	AC	82	Good	
NORTH LAKE SCHOOL ENTRANCE - ARROW GAP RD	5-10_5	3,883	County	Collector	55 mph	64 (some 400' sections)	24	2	None	None	None	AC	89	Good	
CONNLEY															
BEG. PAVEMENT/HOUSE#83386 - FORT ROCK RD	5-10C	18,633	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	80	Good	
CABIN LAKE															
FORT ROCK RD - END OF PAVEMENT	5-11	5,504	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	73	Good	
COW CAVE															
CABIN LAKE RD - END OF PAVEMENT/FORT ROCK ENT.	5-11A	3,124	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	74	Good	
DERRICK CAVES															
FORT ROCK RD - MORRISON LN	5-12_1	22,764	County	Collector	55 mph	60	24	2	None	None	None	AC	76	Good	
MORRISON LN - KITTREDGE RD	5-12_2	26,216	County	Collector	55 mph	60	24	2	None	None	None	AC	86	Good	
MORRISON															
DERRICK CAVES RD - END OF PAVEMENT	5-12A	206	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	86	Good	
SINK LANE															
DERRICK CAVES RD - END OF PAVEMENT	5-12B_1	429	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	78	Good	
END OF PAVEMENT - HWY 20	5-12B_2		County	Collector	55 mph	60	28	2	None	None	None	G			
KITTREDGE															
DERRICK CAVES RD - END OF PAVEMENT	5-12C	1,090	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	82	Good	
PICTURE															
HWY 31 - END OF PAVEMENT	5-13_1	8,026	County	Collector	55 mph	60	24	2	None	None	None	AC	83	Good	#37C044
END OF PAVEMENT - BEGINNING OF PAVEMENT	5-13_2		County	Collector	55 mph	60	26	2	None	None	None	G			
BEGINNING OF PAVEMENT - FORT ROCK RD	5-13_3	1,652	County	Collector	55 mph	60	24	2	None	None	None	AC	76	Good	
ARROW GAP															
HWY 31 - FORT ROCK RD	5-14_1	40,368	County	Collector	55 mph	60	24	2	None	None	None	AC	82	Good	
FORT ROCK RD - HOUSE #84738	5-14_2	33,021	County	Collector	55 mph	60	24	2	None	None	None	AC	68	Satisfactory	
HOUSE #84738 - SNOWFLAKE RD	5-14_3	26,727	County	Collector	55 mph	60	24	2	None	None	None	AC	92	Good	
SNOWFLAKE RD - MILLICAN RD	5-14_4	9,252	County	Collector	55 mph	60	24	2	None	None	None	AC	83	Good	
MILLICAN RD - FOSSIL LAKE RD	5-14_5	31,756	County	Collector	55 mph	60	24	2	None	None	None	AC	83	Good	
FOSSIL LAKE RD - RADAR SITE ROAD (#94481)	5-14_6	31,752	County	Collector	55 mph	60	24	2	None	None	None	AC	83	Good	
RADAR SITE ROAD (#94481) - MILEPOST 37.52	5-14_7	25,279	County	Collector	55 mph	60	24	2	None	None	None	AC	84	Good	
MILEPOST 37.52 - BLM 6121	5-14_8	33,506	County	Collector	55 mph	60	24	2	None	None	None	AC	83	Good	
BLM 6121 - BLM 64D	5-14_9	13,558	County	Collector	55 mph	60	24	2	None	None	None	AC	85	Good	
BLM 64D - MILEPOST 51.35	5-14_A	25,904	County	Collector	55 mph	60	24	2	None	None	None	AC	73	Good	
MILEPOST 51.35 - OLD BURNS HWY	5-14_B	30,557	County	Collector	55 mph	60	24	2	None	None	None	AC	80	Good	
OLD BURNS HWY - HWY 395	5-14_C	14,880	County	Collector	55 mph	60	24	2	None	None	None	AC	79	Good	
MILLICAN															
ARROW GAP RD - MILEPOST 4.02	5-14C_1	21,250	County	Collector	55 mph	60	24	2	None	None	None	AC	80	Good	
MILEPOST 4.02 - MILEPOST 7.09	5-14C_2	16,219	County	Collector	55 mph	60	24	2	None	None	None	AC	84	Good	
MILEPOST 7.09 - FOSSIL LAKE RD	5-14C_3	14,327	County	Collector	55 mph	60	24	2	None	None	None	AC	82	Good	
FOSSIL LAKE RD - SINK LANE	5-14C_4		County	Collector	55 mph	60	30	2	None	None	None	G			
FOSSIL LAKE															
ARROW GAP RD - HOUSE #60369	5-14D_1	31,857	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	82	Good	
HOUSE #60369 - LOST FOREST RD	5-14D_2	11,267	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	81	Good	
LOST FOREST RD - MILLICAN RD	5-14D_3	19,821	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	83	Good	
OLD LAKE															
HWY 31 - OIL DRI RD	5-14F_1	23,372	County	Residential/Local	55 mph	60 (some 80' sections)	24	2	None	None	None	AC	79	Good	
OIL DRI RD - ROAD TO CEMETERY	5-14F_2	30,442	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	82	Good	
ROAD TO CEMETERY - BLM ROAD TO BLACK HILLS	5-14F_3	8,279	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	82	Good	
BLM ROAD TO BLACK HILLS - THORN ST	5-14F_4	13,501	County	Residential/Local	55 mph	60	24	2	None	None	None	AC	79	Good	
OIL DRI RD															
BEG. OF PAVEMENT/HOUSE#61643 - MILEPOST 4.74	5-14G_1	25,035	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	83	Good	
MILEPOST 4.74 - ARROW GAP RD	5-14G_2	17,102	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	80	Good	
ARROW GAP RD - OLD LAKE RD	5-14G_3	30,770	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	83	Good	

APPENDIX B

2002 County Road Inventory
Lake County Transportation System Plan

Road Name	Road #	Segment Length (feet)	Jurisdiction	Classification	Speed Limit (mph)	ROW Width (feet)	Street Width (feet)	No. of Travel Lanes	On-Street Parking	Bikeway	Sidewalk	Surface	PCI	2001 Pavement Conditions	Bridge
SOUTH 3RD															
ROBERTA AVE - RR TRACKS	6-09	2,785	County	Residential/Local	55 mph	Not Recorded	37	2	None	None	None	AC	83	Good	
SOUTH 10TH															
SOUTH E ST - HWY 395	6-10_1	703	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	66	Satisfactory	
HWY 395 - SOUTH M ST	6-10_2	2,034	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	69	Satisfactory	
SOUTH 11TH															
FOOTHILL DR - HWY 395	6-11_1	690	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	42	F	
HWY 395 - SOUTH M ST	6-11_2	2,030	County	Residential/Local	55 mph	Not Recorded	33	2	None	None	None	AC	70	Good	
SOUTH 12TH															
SOUTH E ST - HWY 395	6-12_1	716	County	Residential/Local	55 mph	Not Recorded	30	2	None	None	None	AC	59	Satisfactory	
HWY 395 - SOUTH I ST	6-12_2	725	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	74	Good	
SOUTH E ST															
10TH ST - 100 FT SOUTH OF FOOTHILL DR	6-20A	683	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	50	Satisfactory	
100 FT SOUTH OF FOOTHILL DR - END OF PAVEMENT	6-20B	2,050	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	60	Satisfactory	
SOUTH F															
9TH ST - DEAD END SOUTH OF 11TH ST	6-21	1,805	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	52	Satisfactory	
SOUTH H															
9TH ST - DEAD END SOUTH OF 12TH ST	6-23	2,364	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	46	Fair	
SOUTH I															
DEAD END NORTH OF 10TH ST - DEAD END	6-24	1,983	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	71	Good	
SOUTH J															
9TH ST - DEAD END SOUTH OF 11TH ST	6-25	1,584	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	65	Satisfactory	
SOUTH K															
9TH ST - DEAD END SOUTH OF 11TH ST	6-26	1,561	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	66	Satisfactory	
SOUTH L															
9TH ST - 10TH ST	6-27	640	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	75	Good	
SOUTH M															
9TH ST - END OF PAVEMENT	6-28	5,266	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	84	Good	
SOUTH P															
9TH ST - 3RD ST	6-31	2,596	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	82	Good	
2ND WEST SECTION															
RR TRACKS - NORTH R ST	7-13A1	1,045	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	86	Good	
NORTH S ST - NORTH V ST	7-13A2	1,040	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	83	Good	
NORTH J															
HWY 140 - 12TH ST	7-25_1	1,733	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	84	Good	
12TH ST - 9TH ST	7-25_2	600	County	Residential/Local	55 mph	Not Recorded	36	2	None	None	None	AC	86	Good	
9TH ST - 4TH ST	7-25_3	1,885	County	Residential/Local	55 mph	Not Recorded	36	2	None	None	None	AC	83	Good	
NORTH O															
HWY 140 - 2ND ST	7-30	876	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	85	Good	
NORTH P															
HWY 140 - 2ND ST	7-31	883	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	32	Fair	
NORTH Q															
HWY 140 - 2ND ST	7-32	884	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	32	Fair	
NORTH R															
HWY 140 - 2ND ST	7-33	896	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	86	Good	
NORTH S															
HWY 140 - CENTER ST	7-34	1,400	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	79	Good	
NORTH T															
HWY 140 - 2ND ST	7-35	685	County	Residential/Local	55 mph	Not Recorded	25	2	None	None	None	AC	36	Fair	
NORTH U															
HWY 140 - 2ND ST	7-36	700	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	64	Satisfactory	
NORTH V															
HWY 140 - 2ND ST	7-37	683	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	86	Good	

APPENDIX B

2002 County Road Inventory
Lake County Transportation System Plan

Road Name	Road #	Segment Length (feet)	Jurisdiction	Classification	Speed Limit (mph)	ROW Width (feet)	Street Width (feet)	No. of Travel Lanes	On-Street Parking	Bikeway	Sidewalk	Surface	PCI	2001 Pavement Conditions	Bridge
1ST(SILVER LAKE)															
HWY 31 - MAHOGANY ST	8-01	1,265	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	67	Satisfactory	
2ND(SILVER LAKE)															
HWY 31 - MAHOGANY ST	8-02	1,258	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	72	Good	
3RD (SILVER LAKE)															
HWY 31 - MAHOGANY ST	8-03	1,258	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	71	Good	
4TH (SILVER LAKE)															
HWY 31 - MAHOGANY ST	8-04	1,265	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	68	Satisfactory	
5TH (SILVER LAKE)															
HWY 31 - MAHOGANY ST	8-05	1,261	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	74	Good	
6TH (SILVER LAKE)															
HWY 31 - MAHOGANY ST	8-06	1,228	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	71	Good	
9TH (SILVER LAKE)															
HWY 31 - MAHOGANY ST	8-09	1,253	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	65	Satisfactory	
10TH (SILVER LAKE)															
HWY 31 - END OF PAVEMENT	8-10	1,532	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	72	Good	
CTR SILVER LAKE															
1ST ST - 6TH ST	8-11	1,296	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	63	Satisfactory	
SOUTH SILVER LAKE															
1ST ST - 10TH ST	8-12	2,315	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	68	Satisfactory	
JUNIPER															
9TH ST - 10TH ST	8-14	252	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	71	Good	
MAHOGANY(SILVER LAKE)															
1ST ST - 10TH ST	8-15	2,345	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	70	Good	
SNOWFLAKE															
ARROW GAP RD - HOLLY ST	9-11	425	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	78	Good	
CHRISTMAS TREE															
THORN ST - SUMMER ST/END OF PAVEMENT	9-15	7,931	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	81	Good	
RAINBOW															
HILL ST - ARROW GAP RD	9-21	5,283	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	82	Good	
HOLLY															
CHRISTMAS TREE LANE - SNOWMAN ST	9-68	1,355	County	Residential/Local	55 mph	Not Recorded	24	2	None	None	None	AC	85	Good	

APPENDIX C

Level of Service Criteria Descriptions

APPENDIX C
LEVEL OF SERVICE CRITERIA DESCRIPTIONS

This appendix describes the level-of-service (LOS) criteria for unsignalized intersections and two-lane rural roadway sections.

Unsignalized Intersections

The operational characteristics of selected unsignalized intersections within Lake County were evaluated using procedures outlined in the 1997 Highway Capacity Manual for unsignalized intersections. The eight highest volume intersections, located along the state highways within Lake County were analyzed using design hour volumes for existing and future volume conditions. Unsignalized intersections include Two-Way Stop-Controlled (TWSC), All-Way Stop Controlled (AWSC), and Roundabouts. This program calculates delay and LOS for the critical movements of an intersection, based on the control delay. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The LOS criteria for unsignalized intersections are presented in **Table C-1**.

It should be noted that the LOS criteria for unsignalized intersections are somewhat different than the criteria used for signalized intersections. The primary reason for this difference is that drivers expect different levels of performance from different kinds of transportation facilities. The expectation is that a signalized intersection is designed to carry higher traffic volumes than an unsignalized intersection. Additionally, there are a number of driver behavior considerations that combine to make delays at signalized intersections less onerous than at unsignalized intersections.

For example, drivers at signalized intersections are able to relax during the red interval, while drivers on the minor street approaches to TWSC intersections must remain attentive to the task if identifying acceptable gaps and vehicle conflicts. Also, there is often much more variability in the amount of delay experienced by individual drivers at unsignalized intersections than signalized intersections. For these reasons, it is considered that the total delay threshold for any given LOS is less for an unsignalized intersection than for a signalized intersection. While overall intersection LOS is calculated for AWSC intersections, LOS is only calculated for the minor approaches and the major street left turn movements at TWSC intersections. No delay is assumed for the major street through movements. For TWSC intersections, the overall intersection LOS is defined by the movement having the worst LOS (typically a minor street left turn).

TABLE C-1
LEVEL-OF-SERVICE CRITERIA
FOR TWO-WAY UNSIGNALIZED INTERSECTIONS

Level of Service	Delay Range
A	≤10
B	>10 and ≤15
C	>15 and ≤25
D	>25 and ≤35
E	>35 and ≤50
F	>50

Source: Transportation Research Board, Highway Capacity Manual, Special Report 209, page 10-25.

Two-lane Rural Roadways

The six LOS grades are described qualitatively for two-lane roadways in **Table C-2** below.

TABLE C-2
LEVEL OF SERVICE CRITERIA FOR TWO-LANE ROADWAYS

Service Level	Typical Traffic Flow Conditions
A	Motorists are able to drive at their desired speed which, without strict enforcement, would result in average speeds approaching 60 mph. Passing demand is well below passing capacity, and almost no platoons of three or more vehicles are observed.
B	Speeds of 55 mph or slightly higher are expected on level terrain. Passing demand needed to maintain desired speeds becomes significant and approximately equals the passing capacity.
C	Further increases in flow result in noticeable increases in platoon formation, platoon size, and frequency of passing impediment. Average speed still exceeds 52 mph on level terrain, even though unrestricted passing demand exceeds passing capacity. While traffic flow is stable, it is becoming susceptible to congestion due to turning traffic and slow-moving vehicles.
D	Unstable traffic flow as passing demand is very high. Average platoon sizes of 5 to 10 vehicles are common, although speeds of 50 mph can still be maintained under ideal conditions. This is the highest flow rate that can be maintained for any length of time over an extended section of level terrain without a high probability of breakdown
E	Under ideal conditions, speeds will drop below 50 mph. Average travel speeds on highways with less than ideal conditions will be slower, as low as 25 mph on sustained upgrades. Passing is virtually impossible and platooning becomes intense when slower vehicles or other interruptions are encountered.
F	Heavily congested flow with traffic demand exceeding capacity.

Source: Transportation Research Board, Highway Capacity Manual, Special Report 209. National Research Council, 1994.

APPENDIX D

Level of Service (Including V/C)
Calculation Summary Sheets for Existing Conditions

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*RSLP*
Agency/Co.	
Date Performed	*5/21/02*
Analysis Time Period	*Design Hour Volume*

Site Information

Intersection	*OR 140 & Hogback Rd*
Jurisdiction	
Analysis Year	*2002 Existing Conditions*

Project Description *Lake County TSP - Existing Intersection Operations Analysis*

East/West Street: *OR 140 (Warner Hwy)* | North/South Street: *Hogback Road*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*5*	*10*	*1*	*1*	*10*	*5*
Peak-Hour Factor, PHF	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*
Hourly Flow Rate, HFR	*6*	*12*	*1*	*1*	*12*	*6*
Percent Heavy Vehicles	*10*	--	--	*10*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*8*	*3*	*5*	*1*	*3*	*1*
Peak-Hour Factor, PHF	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*
Hourly Flow Rate, HFR	*9*	*3*	*6*	*1*	*3*	*1*
Percent Heavy Vehicles	*2*	*2*	*2*	*2*	*2*	*2*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (vph)	*6*	*1*		*18*			*5*	
C (m) (vph)	*1548*	*1555*		*967*			*902*	
v/c	*0.00*	*0.00*		*0.02*			*0.01*	
95% queue length	*0.01*	*0.00*		*0.06*			*0.02*	
Control Delay	*7.3*	*7.3*		*8.8*			*9.0*	
LOS	*A*	*A*		*A*			*A*	
Approach Delay	--	--	*8.8*			*9.0*		
Approach LOS	--	--	*A*			*A*		

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	RSLP
Agency/Co.	
Date Performed	5/21/02
Analysis Time Period	Design Hour Volume

Site Information

Intersection	OR 140 & Westside Rd
Jurisdiction	
Analysis Year	2002 Existing Conditions

Project Description: Lake County TSP - Existing Intersection Operations Analysis

East/West Street: OR 140 (KFalls-Lakeview Hwy) | North/South Street: Westside Road

Intersection Orientation: East-West | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	20	92	20	13	62	13
Peak-Hour Factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80
Hourly Flow Rate, HFR	24	114	24	16	77	16
Percent Heavy Vehicles	10	--	--	10	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LTR			LTR		
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	16	34	16	16	34	16
Peak-Hour Factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80
Hourly Flow Rate, HFR	19	42	19	19	42	19
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LTR	LTR		LTR			LTR	
v (vph)	24	16		80			80	
C (m) (vph)	1453	1398		643			647	
v/c	0.02	0.01		0.12			0.12	
95% queue length	0.05	0.03		0.42			0.42	
Control Delay	7.5	7.6		11.4			11.3	
LOS	A	A		B			B	
Approach Delay	--	--	11.4			11.3		
Approach LOS	--	--	B			B		

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*RSLP*	Intersection	*OR 31 & Christmas Valley-Wagon*
Agency/Co.		Jurisdiction	
Date Performed	*5/21/02*	Analysis Year	*2002 Existing Conditions*
Analysis Time Period	*Design Hour Volume*		

Project Description	*Lake County TSP - Existing Intersection Operations Analysis*
East/West Street: *OR 31 (Fremont Hwy)*	North/South Street: *Christmas Valley-Wagontire Rd*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*54*	*18*	*12*	*36*	*0*
Peak-Hour Factor, PHF	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*
Hourly Flow Rate, HFR	*0*	*67*	*22*	*14*	*44*	*0*
Percent Heavy Vehicles	*0*	--	--	*10*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*0*	*18*	*0*	*18*
Peak-Hour Factor, PHF	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*22*	*0*	*22*
Percent Heavy Vehicles	*0*	*0*	*0*	*2*	*0*	*2*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*					*LR*	
v (vph)		*14*					*44*	
C (m) (vph)		*1457*					*920*	
v/c		*0.01*					*0.05*	
95% queue length		*0.03*					*0.15*	
Control Delay		*7.5*					*9.1*	
LOS		*A*					*A*	
Approach Delay	--	--					*9.1*	
Approach LOS	--	--					*A*	

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*RSLP*	Intersection	*OR 31 & OR 140*
Agency/Co.		Jurisdiction	
Date Performed	*5/21/02*	Analysis Year	*2002 Existing Conditions*
Analysis Time Period	*Design Hour Volume*		
Project Description	*Lake County TSP - Existing Intersection Operations Analysis*		
East/West Street:	*OR 31 (Fremont Hwy)*	North/South Street:	*OR 140 (KFalls-Lakeview Hwy)*
Intersection Orientation:	*North-South*	Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*49*	*17*	*25*	*74*	*0*
Peak-Hour Factor, PHF	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*
Hourly Flow Rate, HFR	*0*	*61*	*21*	*31*	*92*	*0*
Percent Heavy Vehicles	*0*	--	--	*10*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*15*	*0*	*15*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*
Hourly Flow Rate, HFR	*18*	*0*	*18*	*0*	*0*	*0*
Percent Heavy Vehicles	*10*	*0*	*10*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*31*		*36*				
C (m) (vph)		*1466*		*832*				
v/c		*0.02*		*0.04*				
95% queue length		*0.06*		*0.14*				
Control Delay		*7.5*		*9.5*				
LOS		*A*		*A*				
Approach Delay	--	--	*9.5*					
Approach LOS	--	--	*A*					

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Version 4.1b

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*RSLP*	Intersection	*OR 31 & River Road in Paisley*
Agency/Co.		Jurisdiction	
Date Performed	*5/21/02*	Analysis Year	*2002 Existing Conditions*
Analysis Time Period	*Design Hour Volume*		

Project Description	*Lake County TSP - Existing Intersection Operations Analysis*
East/West Street: *OR 31 (Fremont Hwy)*	North/South Street: *River Road in Paisley*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*12*	*57*	*12*	*8*	*33*	*8*
Peak-Hour Factor, PHF	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*
Hourly Flow Rate, HFR	*14*	*71*	*14*	*9*	*41*	*9*
Percent Heavy Vehicles	*10*	--	--	*10*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*10*	*21*	*10*	*10*	*21*	*10*
Peak-Hour Factor, PHF	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*
Hourly Flow Rate, HFR	*12*	*26*	*12*	*12*	*26*	*12*
Percent Heavy Vehicles	*2*	*2*	*2*	*2*	*2*	*2*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (vph)	*14*	*9*		*50*			*50*	
C (m) (vph)	*1507*	*1462*		*765*			*769*	
v/c	*0.01*	*0.01*		*0.07*			*0.07*	
95% queue length	*0.03*	*0.02*		*0.21*			*0.21*	
Control Delay	*7.4*	*7.5*		*10.0+*			*10.0+*	
LOS	*A*	*A*		*B*			*B*	
Approach Delay	--	--	*10.0+*			*10.0+*		
Approach LOS	--	--	*B*			*B*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*RSLP*	Intersection	*OR 31 & US 395 near Valley Fal*
Agency/Co.		Jurisdiction	
Date Performed	*5/21/02*	Analysis Year	*2002 Existing Conditions*
Analysis Time Period	*Design Hour Volume*		

Project Description	*Lake County TSP - Existing Intersection Operations Analysis*
East/West Street: *OR 31 (Fremont Hwy)*	North/South Street: *US 395 (Lakeview-Burns Hwy)*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*64*	*20*	*2*	*40*	*0*
Peak-Hour Factor, PHF	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*
Hourly Flow Rate, HFR	*0*	*79*	*24*	*2*	*49*	*0*
Percent Heavy Vehicles	*0*	--	--	*10*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*29*	*0*	*0*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*
Hourly Flow Rate, HFR	*36*	*0*	*0*	*0*	*0*	*0*
Percent Heavy Vehicles	*10*	*0*	*10*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*2*		*36*				
C (m) (vph)		*1440*		*829*				
v/c		*0.00*		*0.04*				
95% queue length		*0.00*		*0.14*				
Control Delay		*7.5*		*9.5*				
LOS		*A*		*A*				
Approach Delay	--	--	*9.5*					
Approach LOS	--	--	*A*					

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*RSLP*
Agency/Co.	
Date Performed	*5/21/02*
Analysis Time Period	*Design Hour Volume*

Site Information

Intersection	*US 20 & County Rd*
Jurisdiction	
Analysis Year	*2002 Existing Conditions*

Project Description *Lake County TSP - Existing Intersection Operations Analysis*

East/West Street: *US 20 (Central Oregon Hwy)* | North/South Street: *County Road*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*79*	*26*	*18*	*52*	*0*
Peak-Hour Factor, PHF	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*
Hourly Flow Rate, HFR	*0*	*98*	*32*	*22*	*64*	*0*
Percent Heavy Vehicles	*10*	--	--	*10*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*27*	*0*	*26*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*
Hourly Flow Rate, HFR	*33*	*0*	*32*	*0*	*0*	*0*
Percent Heavy Vehicles	*2*	*2*	*2*	*2*	*2*	*2*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*22*		*65*				
C (m) (vph)		*1407*		*835*				
v/c		*0.02*		*0.08*				
95% queue length		*0.05*		*0.25*				
Control Delay		*7.6*		*9.7*				
LOS		*A*		*A*				
Approach Delay	--	--	*9.7*					
Approach LOS	--	--	*A*					

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*RSLP*
Agency/Co.	
Date Performed	*5/21/02*
Analysis Time Period	*Design Hour Volume*

Site Information

Intersection	*US 395 & Hogback Rd*
Jurisdiction	
Analysis Year	*2002 Existing Conditions*

Project Description *Lake County TSP - Existing Intersection Operations Analysis*

East/West Street: *US 395 (Lakeview-Burns Hwy)* | North/South Street: *Hogback Road*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*9*	*3*	*5*	*13*	*0*
Peak-Hour Factor, PHF	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*
Hourly Flow Rate, HFR	*0*	*11*	*3*	*6*	*16*	*0*
Percent Heavy Vehicles	*10*	--	--	*10*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*8*	*0*	*7*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*
Hourly Flow Rate, HFR	*9*	*0*	*8*	*0*	*0*	*0*
Percent Heavy Vehicles	*2*	*2*	*2*	*2*	*2*	*2*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*6*		*17*				
C (m) (vph)		*1553*		*1013*				
v/c		*0.00*		*0.02*				
95% queue length		*0.01*		*0.05*				
Control Delay		*7.3*		*8.6*				
LOS		*A*		*A*				
Approach Delay	--	--	*8.6*					
Approach LOS	--	--	*A*					

HCS2000: Two-Lane Highways Release 4.1b

Phone: Fax:
E-Mail:

Two-Way Two-Lane Highway Segment Analysis

Analyst RSLP
Agency/Co.
Date Performed 5/17/02
Analysis Time Period Design Hour Volume
Highway OR140 (Warner Hwy)
From/To Near junction with OR 31
Jurisdiction
Analysis Year 2002 Existing Conditions
Description Lake County TSP - two-lane highway analysis

Input Data

Highway class Class 2
Shoulder width 5.0 ft Peak-hour factor, PHF 0.88
Lane width 12.0 ft % Trucks and buses 14 %
Segment length 2.0 mi % Recreational vehicles 4 %
Terrain type Rolling % No-passing zones 50 %
Grade: Length mi Access points/mi 8 /mi
Up/down %

Two-way hourly volume, V 50 veh/h
Directional split 60 / 40 %

Average Travel Speed

Grade adjustment factor, fG 0.71
PCE for trucks, ET 2.5
PCE for RVs, ER 1.1
Heavy-vehicle adjustment factor, 0.824
Two-way flow rate,(note-1) vp 97 pc/h
Highest directional split proportion (note-2) 58 pc/h

Free-Flow Speed from Field Measurement:
Field measured speed, SFM - mi/h
Observed volume, Vf - veh/h
Estimated Free-Flow Speed:
Base free-flow speed, BFFS 60.0 mi/h
Adj. for lane and shoulder width, fLS 1.3 mi/h
Adj. for access points, fA 2.0 mi/h

Free-flow speed, FFS 56.7 mi/h

Adjustment for no-passing zones, fnp 0.9 mi/h
Average travel speed, ATS 55.0 mi/h

Percent Time-Spent-Following

Grade adjustment factor, fG 0.77
PCE for trucks, ET 1.8
PCE for RVs, ER 1.0
Heavy-vehicle adjustment factor, fHV 0.899
Two-way flow rate,(note-1) vp 82 pc/h

Highest directional split proportion (note-2)	49
Base percent time-spent-following, BPTSF	7.0 %
Adj.for directional distribution and no-passing zones, fd/np	17.2
Percent time-spent-following, PTSF	24.2 %

Level of Service and Other Performance Measures

Level of service, LOS	A
Volume to capacity ratio, v/c	0.03
Peak 15-min vehicle-miles of travel, VMT15	28 veh-mi
Peak-hour vehicle-miles of travel, VMT60	100 veh-mi
Peak 15-min total travel time, TT15	0.5 veh-h

Notes:
1. If vp >= 3200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split vp >= 1700 pc/h, terminate analysis-the LOS is F.

HCS2000: Two-Lane Highways Release 4.1b

Phone: Fax:
E-Mail:

Two-Way Two-Lane Highway Segment Analysis

Analyst RSLP
Agency/Co.
Date Performed 5/17/02
Analysis Time Period Design Hour Volume
Highway OR140 (K Falls-Lakeview Hwy)
From/To Near Tunnel Hill Road
Jurisdiction
Analysis Year 2002 Existing Conditions
Description Lake County TSP - two-lane highway analysis

Input Data

Highway class Class 1
Shoulder width 3.0 ft Peak-hour factor, PHF 0.88
Lane width 12.0 ft % Trucks and buses 14 %
Segment length 2.0 mi % Recreational vehicles 4 %
Terrain type Rolling % No-passing zones 50 %
Grade: Length mi Access points/mi 8 /mi
Up/down %

Two-way hourly volume, V 170 veh/h
Directional split 60 / 40 %

Average Travel Speed

Grade adjustment factor, fG 0.71
PCE for trucks, ET 2.5
PCE for RVs, ER 1.1
Heavy-vehicle adjustment factor, 0.824
Two-way flow rate,(note-1) vp 330 pc/h
Highest directional split proportion (note-2) 198 pc/h

Free-Flow Speed from Field Measurement:
Field measured speed, SFM - mi/h
Observed volume, Vf - veh/h
Estimated Free-Flow Speed:
Base free-flow speed, BFFS 60.0 mi/h
Adj. for lane and shoulder width, fLS 2.6 mi/h
Adj. for access points, fA 2.0 mi/h

Free-flow speed, FFS 55.4 mi/h

Adjustment for no-passing zones, fnp 2.7 mi/h
Average travel speed, ATS 50.2 mi/h

Percent Time-Spent-Following

Grade adjustment factor, fG 0.77
PCE for trucks, ET 1.8
PCE for RVs, ER 1.0
Heavy-vehicle adjustment factor, fHV 0.899
Two-way flow rate,(note-1) vp 279 pc/h

Highest directional split proportion (note-2)	167	
Base percent time-spent-following, BPTSF	21.7	%
Adj.for directional distribution and no-passing zones, fd/np	17.2	
Percent time-spent-following, PTSF	38.9	%

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.10	
Peak 15-min vehicle-miles of travel, VMT15	97	veh-mi
Peak-hour vehicle-miles of travel, VMT60	340	veh-mi
Peak 15-min total travel time, TT15	1.9	veh-h

Notes:
1. If vp >= 3200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split vp >= 1700 pc/h, terminate analysis-the LOS is F.

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Phone: Fax:
E-Mail:

Two-Way Two-Lane Highway Segment Analysis

Analyst RSLP
Agency/Co.
Date Performed 5/17/02
Analysis Time Period Design Hour Volume
Highway OR 31 (Fremont Hwy) - MP 26
From/To Between Klamath Co. & Fort Rck
Jurisdiction
Analysis Year 2002 Existing Conditions
Description Lake County TSP - two-lane highway analysis

Input Data

Highway class Class 1
Shoulder width 2.0 ft Peak-hour factor, PHF 0.88
Lane width 12.0 ft % Trucks and buses 14 %
Segment length 2.0 mi % Recreational vehicles 4 %
Terrain type Rolling % No-passing zones 50 %
Grade: Length mi Access points/mi 8 /mi
Up/down %

Two-way hourly volume, V 135 veh/h
Directional split 60 / 40 %

Average Travel Speed

Grade adjustment factor, fG 0.71
PCE for trucks, ET 2.5
PCE for RVs, ER 1.1
Heavy-vehicle adjustment factor, 0.824
Two-way flow rate,(note-1) vp 262 pc/h
Highest directional split proportion (note-2) 157 pc/h

Free-Flow Speed from Field Measurement:
Field measured speed, SFM - mi/h
Observed volume, Vf - veh/h
Estimated Free-Flow Speed:
Base free-flow speed, BFFS 60.0 mi/h
Adj. for lane and shoulder width, fLS 2.6 mi/h
Adj. for access points, fA 2.0 mi/h

Free-flow speed, FFS 55.4 mi/h

Adjustment for no-passing zones, fnp 2.3 mi/h
Average travel speed, ATS 51.1 mi/h

Percent Time-Spent-Following

Grade adjustment factor, fG 0.77
PCE for trucks, ET 1.8
PCE for RVs, ER 1.0
Heavy-vehicle adjustment factor, fHV 0.899
Two-way flow rate,(note-1) vp 222 pc/h

Highest directional split proportion (note-2)	133
Base percent time-spent-following, BPTSF	17.7 %
Adj.for directional distribution and no-passing zones, fd/np	17.2
Percent time-spent-following, PTSF	34.9 %

Level of Service and Other Performance Measures

Level of service, LOS	B
Volume to capacity ratio, v/c	0.08
Peak 15-min vehicle-miles of travel, VMT15	77 veh-mi
Peak-hour vehicle-miles of travel, VMT60	270 veh-mi
Peak 15-min total travel time, TT15	1.5 veh-h

Notes:
1. If vp >= 3200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split vp >= 1700 pc/h, terminate analysis-the LOS is F.

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Phone: Fax:
E-Mail:

Two-Way Two-Lane Highway Segment Analysis

Analyst RSLP
Agency/Co.
Date Performed 5/17/02
Analysis Time Period Design Hour Volume
Highway OR 31 (Fremont Hwy) - MP 58
From/To In Paisley
Jurisdiction
Analysis Year 2002 Existing Conditions
Description Lake County TSP - two-lane highway analysis

Input Data

Highway class Class 1
Shoulder width 10.0 ft Peak-hour factor, PHF 0.88
Lane width 12.0 ft % Trucks and buses 14 %
Segment length 1.0 mi % Recreational vehicles 4 %
Terrain type Level % No-passing zones 20 %
Grade: Length mi Access points/mi 16 /mi
Up/down %

Two-way hourly volume, V 135 veh/h
Directional split 60 / 40 %

Average Travel Speed

Grade adjustment factor, fG 1.00
PCE for trucks, ET 1.7
PCE for RVs, ER 1.0
Heavy-vehicle adjustment factor, 0.911
Two-way flow rate,(note-1) vp 168 pc/h
Highest directional split proportion (note-2) 101 pc/h

Free-Flow Speed from Field Measurement:
Field measured speed, SFM - mi/h
Observed volume, Vf - veh/h
Estimated Free-Flow Speed:
Base free-flow speed, BFFS 60.0 mi/h
Adj. for lane and shoulder width, fLS 0.0 mi/h
Adj. for access points, fA 4.0 mi/h

Free-flow speed, FFS 56.0 mi/h

Adjustment for no-passing zones, fnp 0.5 mi/h
Average travel speed, ATS 54.2 mi/h

Percent Time-Spent-Following

de adjustment factor, fG 1.00
PCE for trucks, ET 1.1
PCE for RVs, ER 1.0
Heavy-vehicle adjustment factor, fHV 0.986
Two-way flow rate,(note-1) vp 156 pc/h

Highest directional split proportion (note-2)	94	
Base percent time-spent-following, BPTSF	12.8	%
Adj.for directional distribution and no-passing zones, fd/np	1.6	
Percent time-spent-following, PTSF	14.4	%

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.05	
Peak 15-min vehicle-miles of travel, VMT15	38	veh-mi
Peak-hour vehicle-miles of travel, VMT60	135	veh-mi
Peak 15-min total travel time, TT15	0.7	veh-h

Notes:
1. If vp >= 3200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split vp >= 1700 pc/h, terminate analysis-the LOS is F.

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Phone: Fax:
E-Mail:

Two-Way Two-Lane Highway Segment Analysis

Analyst RSLP
Agency/Co.
Date Performed 5/17/02
Analysis Time Period Design Hour Volume
Highway OR 31 (Fremont Hwy) - MP 38
From/To Between Fort Rock & Silver Lak
Jurisdiction
Analysis Year 2002 Existing Conditions
Description Lake County TSP - two-lane highway analysis

Input Data

Highway class Class 1
Shoulder width 2.0 ft Peak-hour factor, PHF 0.88
Lane width 12.0 ft % Trucks and buses 14 %
Segment length 2.0 mi % Recreational vehicles 4 %
Terrain type Level % No-passing zones 20 %
Grade: Length mi Access points/mi 8 /mi
Up/down %

Two-way hourly volume, V 120 veh/h
Directional split 60 / 40 %

Average Travel Speed

Grade adjustment factor, fG 1.00
PCE for trucks, ET 1.7
PCE for RVs, ER 1.0
Heavy-vehicle adjustment factor, 0.911
Two-way flow rate,(note-1) vp 150 pc/h
Highest directional split proportion (note-2) 90 pc/h

Free-Flow Speed from Field Measurement:
Field measured speed, SFM - mi/h
Observed volume, Vf - veh/h
Estimated Free-Flow Speed:
Base free-flow speed, BFFS 60.0 mi/h
Adj. for lane and shoulder width, fLS 2.6 mi/h
Adj. for access points, fA 2.0 mi/h

Free-flow speed, FFS 55.4 mi/h

Adjustment for no-passing zones, fnp 0.5 mi/h
Average travel speed, ATS 53.8 mi/h

Percent Time-Spent-Following

.de adjustment factor, fG 1.00
PCE for trucks, ET 1.1
PCE for RVs, ER 1.0
Heavy-vehicle adjustment factor, fHV 0.986
Two-way flow rate,(note-1) vp 138 pc/h

Highest directional split proportion (note-2)	83
Base percent time-spent-following, BPTSF	11.4 %
Adj.for directional distribution and no-passing zones, fd/np	1.6
Percent time-spent-following, PTSF	13.0 %

Level of Service and Other Performance Measures

Level of service, LOS	B
Volume to capacity ratio, v/c	0.05
Peak 15-min vehicle-miles of travel, VMT15	68 veh-mi
Peak-hour vehicle-miles of travel, VMT60	240 veh-mi
Peak 15-min total travel time, TT15	1.3 veh-h

Notes:
1. If vp >= 3200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split vp >= 1700 pc/h, terminate analysis-the LOS is F.

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Phone: Fax:
E-Mail:

Two-Way Two-Lane Highway Segment Analysis

Analyst RSLP
Agency/Co.
Date Performed 5/17/02
Analysis Time Period Design Hour Volume
Highway OR 31 (Fremont Hwy) - MP 115
From/To Between SilverLake & Paisley
Jurisdiction
Analysis Year 2002 Existing Conditions
Description Lake County TSP - two-lane highway analysis

Input Data

Highway class Class 1
Shoulder width 2.0 ft Peak-hour factor, PHF 0.88
Lane width 12.0 ft % Trucks and buses 14 %
Segment length 2.0 mi % Recreational vehicles 4 %
Terrain type Rolling % No-passing zones 50 %
Grade: Length mi Access points/mi 8 /mi
Up/down %

Two-way hourly volume, V 80 veh/h
Directional split 60 / 40 %

Average Travel Speed

Grade adjustment factor, fG 0.71
PCE for trucks, ET 2.5
PCE for RVs, ER 1.1
Heavy-vehicle adjustment factor, 0.824
Two-way flow rate,(note-1) vp 155 pc/h
Highest directional split proportion (note-2) 93 pc/h

Free-Flow Speed from Field Measurement:
Field measured speed, SFM - mi/h
Observed volume, Vf - veh/h
Estimated Free-Flow Speed:
Base free-flow speed, BFFS 60.0 mi/h
Adj. for lane and shoulder width, fLS 2.6 mi/h
Adj. for access points, fA 2.0 mi/h

Free-flow speed, FFS 55.4 mi/h

Adjustment for no-passing zones, fnp 1.5 mi/h
Average travel speed, ATS 52.7 mi/h

Percent Time-Spent-Following

de adjustment factor, fG 0.77
PCE for trucks, ET 1.8
PCE for RVs, ER 1.0
Heavy-vehicle adjustment factor, fHV 0.899
Two-way flow rate,(note-1) vp 131 pc/h

Highest directional split proportion (note-2)	79
Base percent time-spent-following, BPTSF	10.9 %
Adj.for directional distribution and no-passing zones, fd/np	17.2
Percent time-spent-following, PTSF	28.1 %

Level of Service and Other Performance Measures

Level of service, LOS	B
Volume to capacity ratio, v/c	0.05
Peak 15-min vehicle-miles of travel, VMT15	45 veh-mi
Peak-hour vehicle-miles of travel, VMT60	160 veh-mi
Peak 15-min total travel time, TT15	0.9 veh-h

Notes:
1. If vp >= 3200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split vp >= 1700 pc/h, terminate analysis-the LOS is F.

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Phone: Fax:
E-Mail:

Two-Way Two-Lane Highway Segment Analysis

Analyst RSLP
Agency/Co.
Date Performed 5/17/02
Analysis Time Period Design Hour Volume
Highway OR 31 (Fremont Hwy) - MP 115
From/To Between Paisley & Valley Falls
Jurisdiction
Analysis Year 2002 Existing Conditions
Description Lake County TSP - two-lane highway analysis

Input Data

Highway class Class 1
Shoulder width 2.0 ft Peak-hour factor, PHF 0.88
Lane width 12.0 ft % Trucks and buses 14 %
Segment length 2.0 mi % Recreational vehicles 4 %
Terrain type Rolling % No-passing zones 50 %
Grade: Length mi Access points/mi 8 /mi
Up/down %

Two-way hourly volume, V 75 veh/h
Directional split 60 / 40 %

Average Travel Speed

Grade adjustment factor, fG 0.71
PCE for trucks, ET 2.5
PCE for RVs, ER 1.1
Heavy-vehicle adjustment factor, 0.824
Two-way flow rate,(note-1) vp 146 pc/h
Highest directional split proportion (note-2) 88 pc/h

Free-Flow Speed from Field Measurement:
Field measured speed, SFM - mi/h
Observed volume, Vf - veh/h
Estimated Free-Flow Speed:
Base free-flow speed, BFFS 60.0 mi/h
Adj. for lane and shoulder width, fLS 2.6 mi/h
Adj. for access points, fA 2.0 mi/h

Free-flow speed, FFS 55.4 mi/h

Adjustment for no-passing zones, fnp 1.4 mi/h
Average travel speed, ATS 52.9 mi/h

Percent Time-Spent-Following

de adjustment factor, fG 0.77
PCE for trucks, ET 1.8
PCE for RVs, ER 1.0
Heavy-vehicle adjustment factor, fHV 0.899
Two-way flow rate,(note-1) vp 123 pc/h

Highest directional split proportion (note-2)	74
Base percent time-spent-following, BPTSF	10.2 %
Adj.for directional distribution and no-passing zones, fd/np	17.2
Percent time-spent-following, PTSF	27.4 %

Level of Service and Other Performance Measures

Level of service, LOS	B
Volume to capacity ratio, v/c	0.05
Peak 15-min vehicle-miles of travel, VMT15	43 veh-mi
Peak-hour vehicle-miles of travel, VMT60	150 veh-mi
Peak 15-min total travel time, TT15	0.8 veh-h

Notes:
1. If vp >= 3200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split vp >= 1700 pc/h, terminate analysis-the LOS is F.

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Phone: Fax:
E-Mail:

Two-Way Two-Lane Highway Segment Analysis

Analyst RSLP
Agency/Co.
Date Performed 5/17/02
Analysis Time Period Design Hour Volume
Highway OR 31 (Fremont Hwy) - MP 135
From/To Between Valley Falls & Lakevie
Jurisdiction
Analysis Year 2002 Existing Conditions
Description Lake County TSP - two-lane highway analysis

Input Data

Highway class Class 1
Shoulder width 2.0 ft Peak-hour factor, PHF 0.88
Lane width 12.0 ft % Trucks and buses 14 %
Segment length 2.0 mi % Recreational vehicles 4 %
Terrain type Rolling % No-passing zones 50 %
Grade: Length mi Access points/mi 8 /mi
Up/down %

Two-way hourly volume, V 120 veh/h
Directional split 60 / 40 %

Average Travel Speed

Grade adjustment factor, fG 0.71
PCE for trucks, ET 2.5
PCE for RVs, ER 1.1
Heavy-vehicle adjustment factor, 0.824
Two-way flow rate,(note-1) vp 233 pc/h
Highest directional split proportion (note-2) 140 pc/h

Free-Flow Speed from Field Measurement:
Field measured speed, SFM - mi/h
Observed volume, Vf - veh/h
Estimated Free-Flow Speed:
Base free-flow speed, BFFS 60.0 mi/h
Adj. for lane and shoulder width, fLS 2.6 mi/h
Adj. for access points, fA 2.0 mi/h

Free-flow speed, FFS 55.4 mi/h

Adjustment for no-passing zones, fnp 2.1 mi/h
Average travel speed, ATS 51.5 mi/h

Percent Time-Spent-Following

Grade adjustment factor, fG 0.77
PCE for trucks, ET 1.8
PCE for RVs, ER 1.0
Heavy-vehicle adjustment factor, fHV 0.899
Two-way flow rate,(note-1) vp 197 pc/h

Highest directional split proportion (note-2)	118
Base percent time-spent-following, BPTSF	15.9 %
Adj.for directional distribution and no-passing zones, fd/np	17.2
Percent time-spent-following, PTSF	33.1 %

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.07	
Peak 15-min vehicle-miles of travel, VMT15	68	veh-mi
Peak-hour vehicle-miles of travel, VMT60	240	veh-mi
Peak 15-min total travel time, TT15	1.3	veh-h

Notes:
1. If vp >= 3200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split vp >= 1700 pc/h, terminate analysis-the LOS is F.

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Phone: Fax:
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Two-Way Two-Lane Highway Segment Analysis

Analyst RSLP
Agency/Co.
Date Performed 5/17/02
Analysis Time Period Design Hour Volume
Highway OR 31 (Fremont Hwy) - MP 150
From/To Between Lakeview & CA Border
Jurisdiction
Analysis Year 2002 Existing Conditions
Description Lake County TSP - two-lane highway analysis

Input Data

Highway class Class 1
Shoulder width 2.0 ft Peak-hour factor, PHF 0.88
Lane width 12.0 ft % Trucks and buses 14 %
Segment length 2.0 mi % Recreational vehicles 4 %
Terrain type Rolling % No-passing zones 50 %
Grade: Length mi Access points/mi 8 /mi
Up/down %

Two-way hourly volume, V 140 veh/h
Directional split 60 / 40 %

Average Travel Speed

Grade adjustment factor, fG 0.71
PCE for trucks, ET 2.5
PCE for RVs, ER 1.1
Heavy-vehicle adjustment factor, 0.824
Two-way flow rate,(note-1) vp 272 pc/h
Highest directional split proportion (note-2) 163 pc/h

Free-Flow Speed from Field Measurement:
Field measured speed, SFM - mi/h
Observed volume, Vf - veh/h
Estimated Free-Flow Speed:
Base free-flow speed, BFFS 60.0 mi/h
Adj. for lane and shoulder width, fLS 2.6 mi/h
Adj. for access points, fA 2.0 mi/h

Free-flow speed, FFS 55.4 mi/h

Adjustment for no-passing zones, fnp 2.3 mi/h
Average travel speed, ATS 51.0 mi/h

Percent Time-Spent-Following

.de adjustment factor, fG 0.77
PCE for trucks, ET 1.8
PCE for RVs, ER 1.0
Heavy-vehicle adjustment factor, fHV 0.899
Two-way flow rate,(note-1) vp 230 pc/h

Highest directional split proportion (note-2)	138
Base percent time-spent-following, BPTSF	18.3 %
Adj.for directional distribution and no-passing zones, fd/np	17.2
Percent time-spent-following, PTSF	35.5 %

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.09	
Peak 15-min vehicle-miles of travel, VMT15	80	veh-mi
Peak-hour vehicle-miles of travel, VMT60	280	veh-mi
Peak 15-min total travel time, TT15	1.6	veh-h

Notes:
1. If vp >= 3200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split vp >= 1700 pc/h, terminate analysis-the LOS is F.

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Phone: Fax:
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Two-Way Two-Lane Highway Segment Analysis

Analyst RSLP
Agency/Co.
Date Performed 5/17/02
Analysis Time Period Design Hour Volume
Highway US 20 (Central OR Hwy)
From/To Near Lake/Harney Co. line
Jurisdiction
Analysis Year 2002 Existing Conditions
Description Lake County TSP - two-lane highway analysis

Input Data

Highway class Class 1
Shoulder width 3.0 ft Peak-hour factor, PHF 0.88
Lane width 12.0 ft % Trucks and buses 14 %
Segment length 2.0 mi % Recreational vehicles 4 %
Terrain type Rolling % No-passing zones 50 %
Grade: Length mi Access points/mi 8 /mi
Up/down %

Two-way hourly volume, V 175 veh/h
Directional split 60 / 40 %

Average Travel Speed

Grade adjustment factor, fG 0.71
PCE for trucks, ET 2.5
PCE for RVs, ER 1.1
Heavy-vehicle adjustment factor, 0.824
Two-way flow rate,(note-1) vp 340 pc/h
Highest directional split proportion (note-2) 204 pc/h

Free-Flow Speed from Field Measurement:
Field measured speed, SFM - mi/h
Observed volume, Vf - veh/h
Estimated Free-Flow Speed:
Base free-flow speed, BFFS 60.0 mi/h
Adj. for lane and shoulder width, fLS 2.6 mi/h
Adj. for access points, fA 2.0 mi/h

Free-flow speed, FFS 55.4 mi/h

Adjustment for no-passing zones, fnp 2.7 mi/h
Average travel speed, ATS 50.0 mi/h

Percent Time-Spent-Following

de adjustment factor, fG 0.77
PCE for trucks, ET 1.8
PCE for RVs, ER 1.0
Heavy-vehicle adjustment factor, fHV 0.899
Two-way flow rate,(note-1) vp 287 pc/h

Highest directional split proportion (note-2)	172
Base percent time-spent-following, BPTSF	22.3 %
Adj.for directional distribution and no-passing zones, fd/np	17.2
Percent time-spent-following, PTSF	39.5 %

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.11	
Peak 15-min vehicle-miles of travel, VMT15	99	veh-mi
Peak-hour vehicle-miles of travel, VMT60	350	veh-mi
Peak 15-min total travel time, TT15	2.0	veh-h

Notes:
1. If vp >= 3200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split vp >= 1700 pc/h, terminate analysis-the LOS is F.

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Phone: Fax:
E-Mail:

Two-Way Two-Lane Highway Segment Analysis

Analyst RSLP
Agency/Co.
Date Performed 5/17/02
Analysis Time Period Design Hour Volume
Highway US 395 (Lakeview-Burns Hwy)
From/To Near junction with OR 31
Jurisdiction
Analysis Year 2002 Existing Conditions
Description Lake County TSP - two-lane highway analysis

Input Data

Highway class Class 2
Shoulder width 4.0 ft Peak-hour factor, PHF 0.88
Lane width 12.0 ft % Trucks and buses 14 %
Segment length 2.0 mi % Recreational vehicles 4 %
Terrain type Rolling % No-passing zones 50 %
Grade: Length mi Access points/mi 8 /mi
Up/down %

Two-way hourly volume, V 35 veh/h
Directional split 60 / 40 %

Average Travel Speed

Grade adjustment factor, fG 0.71
PCE for trucks, ET 2.5
PCE for RVs, ER 1.1
Heavy-vehicle adjustment factor, 0.824
Two-way flow rate,(note-1) vp 68 pc/h
Highest directional split proportion (note-2) 41 pc/h

Free-Flow Speed from Field Measurement:
Field measured speed, SFM - mi/h
Observed volume, Vf - veh/h
Estimated Free-Flow Speed:
Base free-flow speed, BFFS 60.0 mi/h
Adj. for lane and shoulder width, fLS 1.3 mi/h
Adj. for access points, fA 2.0 mi/h

Free-flow speed, FFS 56.7 mi/h

Adjustment for no-passing zones, fnp 0.6 mi/h
Average travel speed, ATS 55.5 mi/h

Percent Time-Spent-Following

Je adjustment factor, fG 0.77
PCE for trucks, ET 1.8
PCE for RVs, ER 1.0
Heavy-vehicle adjustment factor, fHV 0.899
Two-way flow rate,(note-1) vp 57 pc/h

Highest directional split proportion (note-2)	34
Base percent time-spent-following, BPTSF	4.9 %
Adj.for directional distribution and no-passing zones, fd/np	17.2
Percent time-spent-following, PTSF	22.1 %

Level of Service and Other Performance Measures

Level of service, LOS	A
Volume to capacity ratio, v/c	0.02
Peak 15-min vehicle-miles of travel, VMT15	20 veh-mi
Peak-hour vehicle-miles of travel, VMT60	70 veh-mi
Peak 15-min total travel time, TT15	0.4 veh-h

Notes:
1. If vp >= 3200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split vp >= 1700 pc/h, terminate analysis-the LOS is F.

APPENDIX E

Population and Employment Forecasts for Lake County

TECHNICAL MEMORANDUM
POPULATION AND EMPLOYMENT FORECASTS FOR LAKE COUNTY

This memorandum presents population and employment forecasts for Lake County, census county divisions (CCD), and the incorporated cities of Lakeview and Paisley. It briefly discusses historical population growth trends, the methodology for developing population forecasts, and the future population and employment trends estimated through the year 2022.

Methodology and Data Sources

Information used in this demographic analysis was gathered from a variety of sources. Historic and current population estimates were derived from the U.S. Census Bureau data. Population and employment projections (2005 through 2022) are based on the State of Oregon Office of Economic Analysis (OEA) projections. The OEA's projections were developed in January 1997 and include long-term (through year 2040) state population forecasts disaggregated by county. Employment information was developed from OEA's county-level employment forecasts (also completed in January 1997), which were based on covered employment payrolls reported by the Oregon Employment Department. Year 2022 employment and population projections were estimated using OEA's population and employment projections through 2025.

The OEA used business-cycle trends (as reflected by the Employment Department's employment forecasts) as the primary driver of population and employment for the short-term projections. Long-term forecasts shifted to a population-driven model, which emphasized demographics of the resident population, including age and gender of the population, with assumptions regarding life expectancy, fertility rate, and immigration.

David Evans and Associates, Inc. (DEA) used a similar methodology based on the OEA's county-distribution methodology to develop population and employment forecasts for each of the census county divisions and cities in Lake County. DEA calculated a weighted average growth rate for each jurisdiction (weighting recent growth more heavily than past growth) and combined that average growth rate with the projected countywide growth rate. This methodology assumes that growth rates will be similar over time. Often the physical constraints of any area limit its ability to sustain growth rates beyond the state or county average for long periods of time. Such constraints include availability of land and housing, congestion, and other infrastructure limitations.

This memorandum presents population and employment forecasts to determine future transportation needs. The amount of growth, and where it occurs, will affect traffic and transportation facilities in the study area. This report is not intended to provide a complete economic forecast or housing analysis, and it should not be used for any purpose other than that for which it is designed.

Historic Growth

Table 1 presents historic and current population levels for Lake County, the cities of Lakeview and Paisley, CCDs, and the State of Oregon. Overall, Lake County has grown at a much slower pace than the state as a whole. Lake County's population declined in the 1960s, grew in the 1970s, declined in the 1980s, and finally began increasing again in the 1990s. Towns like Lakeview and Paisley have declined in population where more rural areas have seen gradual increases in the number of new residents. The Silver Lake-Fort Rock CCD, which encompasses northern Lake County, grew by over three percent annually in the 1990's, and accounted for the majority of new residents in the county. As a whole, Lake County's population has grown by just 0.3 percent annually since 1990 to 7,422 people in 2000, and is still less than its high of 7,532 people in 1980. With the exception of northern Lake County, the rest of the County has declined in population in the last ten years, with most areas seeing gradual declines since 1960.

Table 1. Population Growth, 1960 to 2000

							AAGR*	
	1960	1970	1980	1990	2000	Number (1960-2000)	1960-2000	1990-2000
State of Oregon	1,768,687	2,091,385	2,633,105	2,842,321	3,421,399	1,652,712	1.66%	1.87%
Lake County	7,158	6,343	7,532	7,186	7,422	264	0.09%	0.32%
Lakeview CCD	5,751	4,831	5,356	5,088	5,064	(687)	-0.32%	-0.05%
Lakeview	3,260	2,705	2,770	2,526	2,474	(786)	-0.69%	-0.21%
Silver Lake-Fort Rock CCD	404	617	1,227	1,162	1,583	1,179	3.47%	3.14%
Summer Lake CCD	620	572	655	620	513	(107)	-0.47%	-1.88%
Paisley	219	260	343	350	247	28	0.30%	-3.43%
Warner Valley CCD	383	323	294	316	262	(121)	-0.94%	-1.86%

** Average annual growth rate*
Source: U.S. Census Bureau

Population and Employment Forecasts

Lake County is facing many of the same challenges as other areas in Oregon where a large proportion of the economy is dependent on natural resources, primarily agriculture, lumber and wood products. Lake County is attempting to diversify its economy by attracting new employers. Some have already opened or will be open for business in the near future, replacing some of the job losses in timber and wood products. [1] Lake County will also be the home to a new State of Oregon medium-security prison, which will be located north of Lakeview.

Population and employment forecasts are shown in Table 2. OEA's population and employment estimates show Lake County experiencing small population gains for the next 20 years, and as new job opportunities in northern and southwestern Lake County grow, employment gains will at least partially replace past losses in lost timber and wood products employment. However, like much of eastern Oregon, Lake County also has a number of seasonal employers, generally in agriculture, timber, and wood products. There are also a number of the seasonal government positions, primarily related to the timber and wood products sectors, and with the decline in the timber industry, government seasonal jobs are also harder to find. Due to the high number of seasonal positions in the County, long-term population and employment trends are difficult to predict, and are not likely to be as stable as the forecasts imply.

[1] Oregon Employment Department. (November, 2001). *2002 Regional Economic Profile, Region 11.*

Table 2. Population and Employment Forecast, 1999 to Year 2020 (Lake County and Oregon)

							2000-2022 Change	
	2000	2005	2010	2015	2020	2022	Number	AAGR*
Lake County								
Population	7,422	7,982	8,171	8,354	8,600	8,884	1,462	0.82%
Non-Agricultural Employment	2,290	2746	2,799	2,805	2,806	2,810	520	0.93%
State of Oregon								
Population	3,421,399	3,631,000	3,857,000	4,091,000	4,326,000	4,418,000	1,117,200	1.17%
Non-Agricultural Employment	1,601,718	1,718,659	1,814,276	1,882,653	1,947,702	1,974,361	367,561	0.96%

** Average annual growth rate*

Source: June 2002 Employment. "Oregon Economic Review and Forecast" (2000 state employment forecast); 2000 County Employment data. 2002 Regional Economic Profile, Region 11 (2000 county employment forecast);State of Oregon Office of Economic Analysis (2005-2020 employment and population forecasts); David Evans and Associates, Inc.(2022 employment and population forecasts disaggregated from Office of Economic Analysis state and county projections)

The OEA expects population and employment in Lake County to grow, with population growing at the average rate of 0.82 percent over the 20-year planning horizon and non-agriculture based employment growing at an average rate of 0.93 percent. Based on the OEA projections, DEA prepared population forecasts for the CCDs and incorporated jurisdictions within Lake County, which are shown in Table 3.

Table 3. Population Forecast, 2000 to Year 2022 (Lake County, County Census Divisions, and Cities)

							2000-2022 Change	
	2000	2005	2010	2015	2020	2022	Number	AAGR*
Lake County	7,422	7,982	8,171	8,354	8,600	8,884	1,462	0.82%
Lakeview CCD	5,064	5,500	5,630	5,756	5,926	6,122	1,058	0.87%
Lakeview	2,474	2,687	2,751	2,812	2,895	2,991	517	0.87%
Silver Lake-Fort Rock CCD	1,583	1,666	1,712	1,750	1,802	1,861	278	0.74%
Summer Lake CCD	513	540	553	565	582	601	88	0.72%
Paisley	247	260	265	271	279	288	41	0.70%
Warner Valley CCD	262	276	276	282	290	300	38	0.62%

** Average annual growth rate*

Source: U.S Census Bureau; State Of Oregon Office of Economic Analysis (county forecasts); and David Evans and Associates, Inc. (disaggregation of county forecast to CCDs and cities).

According to DEA's analysis, Lake County will grow at approximately 0.82 percent annually to nearly 8,900 residents in 2022. Southwestern and northern Lake County will experience the majority of this growth, growing at higher or nearly at the same rate as the County because new development may locate in areas near existing services (housing, grocery stores etc.). Lakeview and Silver Lake-Fort Rock CCDs are expected reach a population of approximately 6,122 and 1,861 respectively, by the year 2022, accounting for approximately 90 percent of the County's population. The Summer Lake and Warner Valley CCDs will also grow, but at a slower rate than the County. Lake County as a whole expects to add 1,462 people over the next twenty years, which is approximately a 20 percent increase from 2000.

APPENDIX F

Level of Service (Including V/C)
Calculation Summary Sheets for Future Conditions

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*RSLP*
Agency/Co.	
Date Performed	*9/17/02*
Analysis Time Period	*Design Hour Volume*

Site Information

Intersection	*OR 140 & Hogback Rd*
Jurisdiction	
Analysis Year	*2022 Future Conditions*

Project Description *Lake County TSP - Existing Intersection Operations Analysis*

East/West Street: *OR 140 (Warner Hwy)* | North/South Street: *Hogback Road*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*12*	*26*	*3*	*1*	*26*	*15*
Peak-Hour Factor, PHF	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*
Hourly Flow Rate, HFR	*14*	*32*	*3*	*1*	*32*	*18*
Percent Heavy Vehicles	*10*	--	--	*10*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*21*	*8*	*14*	*1*	*9*	*1*
Peak-Hour Factor, PHF	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*
Hourly Flow Rate, HFR	*26*	*9*	*17*	*1*	*11*	*1*
Percent Heavy Vehicles	*2*	*2*	*2*	*2*	*2*	*2*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (vph)	*14*	*1*		*52*			*13*	
C (m) (vph)	*1507*	*1526*		*886*			*795*	
v/c	*0.01*	*0.00*		*0.06*			*0.02*	
95% queue length	*0.03*	*0.00*		*0.19*			*0.05*	
Control Delay	*7.4*	*7.4*		*9.3*			*9.6*	
LOS	*A*	*A*		*A*			*A*	
Approach Delay	--	--	*9.3*			*9.6*		
Approach LOS	--	--	*A*			*A*		

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*RSLP*	Intersection	*OR 140 & Westside Rd*
Agency/Co.		Jurisdiction	
Date Performed	*9/17/02*	Analysis Year	*2022 Future Conditions*
Analysis Time Period	*Design Hour Volume*		

Project Description *Lake County TSP - Existing Intersection Operations Analysis*

East/West Street: *OR 140 (KFalls-Lakeview Hwy)* | North/South Street: *Westside Road*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*23*	*104*	*23*	*15*	*70*	*15*
Peak-Hour Factor, PHF	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*
Hourly Flow Rate, HFR	*28*	*129*	*28*	*18*	*87*	*18*
Percent Heavy Vehicles	*10*	--	--	*10*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*19*	*37*	*19*	*19*	*37*	*19*
Peak-Hour Factor, PHF	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*
Hourly Flow Rate, HFR	*23*	*46*	*23*	*23*	*46*	*23*
Percent Heavy Vehicles	*2*	*2*	*2*	*2*	*2*	*2*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (vph)	*28*	*18*		*92*			*92*	
C (m) (vph)	*1438*	*1375*		*609*			*612*	
v/c	*0.02*	*0.01*		*0.15*			*0.15*	
95% queue length	*0.06*	*0.04*		*0.53*			*0.53*	
Control Delay	*7.6*	*7.7*		*12.0*			*11.9*	
LOS	*A*	*A*		*B*			*B*	
Approach Delay	--	--	*12.0*			*11.9*		
Approach LOS	--	--	*B*			*B*		

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*RSLP*	Intersection	*OR 31 & Christmas Valley-Wagon*
Agency/Co.		Jurisdiction	
Date Performed	*9/17/02*	Analysis Year	*2022 Future Conditions*
Analysis Time Period	*Design Hour Volume*		

Project Description	*Lake County TSP - Existing Intersection Operations Analysis*
East/West Street: *OR 31 (Fremont Hwy)*	North/South Street: *Christmas Valley-Wagontire Rd*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*83*	*28*	*18*	*56*	*0*
Peak-Hour Factor, PHF	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*
Hourly Flow Rate, HFR	*0*	*103*	*34*	*22*	*69*	*0*
Percent Heavy Vehicles	*0*	--	--	*10*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*0*	*28*	*0*	*27*
Peak-Hour Factor, PHF	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*34*	*0*	*33*
Percent Heavy Vehicles	*0*	*0*	*0*	*2*	*0*	*2*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*					*LR*	
v (vph)		*22*					*67*	
C (m) (vph)		*1399*					*849*	
v/c		*0.02*					*0.08*	
95% queue length		*0.05*					*0.26*	
Control Delay		*7.6*					*9.6*	
LOS		*A*					*A*	
Approach Delay	--	--					*9.6*	
Approach LOS	--	--					*A*	

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*RSLP*	Intersection	*US 395 & OR 140*
Agency/Co.		Jurisdiction	
Date Performed	*9/21/02*	Analysis Year	*2022 Future Conditions*
Analysis Time Period	*Design Hour Volume*		
Project Description	*Lake County TSP - Existing Intersection Operations Analysis*		
East/West Street:	*US 395 (Fremont Hwy)*	North/South Street:	*OR 140 (Warner Hwy)*
Intersection Orientation:	*North-South*	Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*78*	*26*	*39*	*117*	*0*
Peak-Hour Factor, PHF	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*
Hourly Flow Rate, HFR	*0*	*97*	*32*	*48*	*146*	*0*
Percent Heavy Vehicles	*0*	--	--	*10*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*24*	*0*	*24*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*
Hourly Flow Rate, HFR	*29*	*0*	*29*	*0*	*0*	*0*
Percent Heavy Vehicles	*10*	*0*	*10*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*48*		*58*				
C (m) (vph)		*1409*		*730*				
v/c		*0.03*		*0.08*				
95% queue length		*0.11*		*0.26*				
Control Delay		*7.6*		*10.4*				
LOS		*A*		*B*				
Approach Delay	--	--	*10.4*					
Approach LOS	--	--	*B*					

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Version 4.1b

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*RSLP*	Intersection	*OR 31 & River Road in Paisley*
Agency/Co.		Jurisdiction	
Date Performed	*9/17/02*	Analysis Year	*2022 Future Conditions*
Analysis Time Period	*Design Hour Volume*		

Project Description	*Lake County TSP - Existing Intersection Operations Analysis*
East/West Street: *OR 31 (Fremont Hwy)*	North/South Street: *River Road in Paisley*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*9*	*41*	*8*	*13*	*61*	*13*
Peak-Hour Factor, PHF	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*
Hourly Flow Rate, HFR	*11*	*51*	*9*	*16*	*76*	*16*
Percent Heavy Vehicles	*10*	--	--	*10*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*11*	*22*	*11*	*11*	*22*	*11*
Peak-Hour Factor, PHF	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*
Hourly Flow Rate, HFR	*13*	*27*	*13*	*13*	*27*	*13*
Percent Heavy Vehicles	*2*	*2*	*2*	*2*	*2*	*2*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (vph)	*11*	*16*		*53*			*53*	
C (m) (vph)	*1454*	*1494*		*746*			*743*	
v/c	*0.01*	*0.01*		*0.07*			*0.07*	
95% queue length	*0.02*	*0.03*		*0.23*			*0.23*	
Control Delay	*7.5*	*7.4*		*10.2*			*10.2*	
LOS	*A*	*A*		*B*			*B*	
Approach Delay	--	--	*10.2*			*10.2*		
Approach LOS	--	--	*B*			*B*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*RSLP*	Intersection	*OR 31 & US 395 near Valley Fal*
Agency/Co.		Jurisdiction	
Date Performed	*9/17/02*	Analysis Year	*2022 Future Conditions*
Analysis Time Period	*Design Hour Volume*		

Project Description	*Lake County TSP - Existing Intersection Operations Analysis*
East/West Street: *OR 31 (Fremont Hwy)*	North/South Street: *US 395 (Lakeview-Burns Hwy)*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*127*	*40*	*3*	*81*	*0*
Peak-Hour Factor, PHF	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*
Hourly Flow Rate, HFR	*0*	*158*	*49*	*3*	*101*	*0*
Percent Heavy Vehicles	*0*	--	--	*10*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*59*	*0*	*0*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*
Hourly Flow Rate, HFR	*73*	*0*	*0*	*0*	*0*	*0*
Percent Heavy Vehicles	*10*	*0*	*10*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*3*		*73*				
C (m) (vph)		*1318*		*683*				
v/c		*0.00*		*0.11*				
95% queue length		*0.01*		*0.36*				
Control Delay		*7.7*		*10.9*				
LOS		*A*		*B*				
Approach Delay	--	--	*10.9*					
Approach LOS	--	--	*B*					

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*RSLP*
Agency/Co.	
Date Performed	*9/17/02*
Analysis Time Period	*Design Hour Volume*

Site Information

Intersection	*US 20 & County Rd*
Jurisdiction	
Analysis Year	*2022 Future Conditions*

Project Description *Lake County TSP - Existing Intersection Operations Analysis*

East/West Street: *US 20 (Central Oregon Hwy)* | North/South Street: *County Road*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*75*	*25*	*37*	*113*	*0*
Peak-Hour Factor, PHF	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*
Hourly Flow Rate, HFR	*0*	*93*	*31*	*46*	*141*	*0*
Percent Heavy Vehicles	*10*	--	--	*10*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*38*	*0*	*37*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*
Hourly Flow Rate, HFR	*47*	*0*	*46*	*0*	*0*	*0*
Percent Heavy Vehicles	*2*	*2*	*2*	*2*	*2*	*2*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*46*		*93*				
C (m) (vph)		*1415*		*758*				
v/c		*0.03*		*0.12*				
95% queue length		*0.10*		*0.42*				
Control Delay		*7.6*		*10.4*				
LOS		*A*		*B*				
Approach Delay	--	--	*10.4*					
Approach LOS	--	--	*B*					

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*RSLP*
Agency/Co.	
Date Performed	*9/17/02*
Analysis Time Period	*Design Hour Volume*

Site Information

Intersection	*US 395 & Hogback Rd*
Jurisdiction	
Analysis Year	*2022 Future Conditions*

Project Description *Lake County TSP - Existing Intersection Operations Analysis*

East/West Street: *US 395 (Lakeview-Burns Hwy)* | North/South Street: *Hogback Road*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*18*	*6*	*9*	*27*	*0*
Peak-Hour Factor, PHF	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*
Hourly Flow Rate, HFR	*0*	*22*	*7*	*11*	*33*	*0*
Percent Heavy Vehicles	*10*	--	--	*10*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*9*	*0*	*9*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*	*0.80*
Hourly Flow Rate, HFR	*11*	*0*	*11*	*0*	*0*	*0*
Percent Heavy Vehicles	*2*	*2*	*2*	*2*	*2*	*2*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*11*		*22*				
C (m) (vph)		*1534*		*977*				
v/c		*0.01*		*0.02*				
95% queue length		*0.02*		*0.07*				
Control Delay		*7.4*		*8.8*				
LOS		*A*		*A*				
Approach Delay	--	--	*8.8*					
Approach LOS	--	--	*A*					

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Phone: Fax:
E-Mail:

Two-Way Two-Lane Highway Segment Analysis

Analyst RSLP
Agency/Co.
Date Performed 9/18/02
Analysis Time Period Design Hour Volume
Highway OR140 (Warner Hwy)
From/To Near junction with OR 31
Jurisdiction
Analysis Year 2022 Future Conditions
Description Lake County TSP - two-lane highway analysis

Input Data

Highway class Class 2
Shoulder width 5.0 ft Peak-hour factor, PHF 0.88
Lane width 12.0 ft % Trucks and buses 14 %
Segment length 2.0 mi % Recreational vehicles 4 %
Terrain type Rolling % No-passing zones 50 %
Grade: Length mi Access points/mi 8 /mi
Up/down %

Two-way hourly volume, V 80 veh/h
Directional split 60 / 40 %

Average Travel Speed

Grade adjustment factor, fG 0.71
PCE for trucks, ET 2.5
PCE for RVs, ER 1.1
Heavy-vehicle adjustment factor, 0.824
Two-way flow rate,(note-1) vp 155 pc/h
Highest directional split proportion (note-2) 93 pc/h

Free-Flow Speed from Field Measurement:
Field measured speed, SFM - mi/h
Observed volume, Vf - veh/h
Estimated Free-Flow Speed:
Base free-flow speed, BFFS 60.0 mi/h
Adj. for lane and shoulder width, fLS 1.3 mi/h
Adj. for access points, fA 2.0 mi/h

Free-flow speed, FFS 56.7 mi/h

Adjustment for no-passing zones, fnp 1.5 mi/h
Average travel speed, ATS 54.0 mi/h

Percent Time-Spent-Following

Grade adjustment factor, fG 0.77
PCE for trucks, ET 1.8
PCE for RVs, ER 1.0
Heavy-vehicle adjustment factor, fHV 0.899
Two-way flow rate,(note-1) vp 131 pc/h

Highest directional split proportion (note-2)	79
Base percent time-spent-following, BPTSF	10.9 %
Adj.for directional distribution and no-passing zones, fd/np	17.2
Percent time-spent-following, PTSF	28.1 %

Level of Service and Other Performance Measures

Level of service, LOS	A
Volume to capacity ratio, v/c	0.05
Peak 15-min vehicle-miles of travel, VMT15	45 veh-mi
Peak-hour vehicle-miles of travel, VMT60	160 veh-mi
Peak 15-min total travel time, TT15	0.8 veh-h

Notes:
1. If vp >= 3200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split vp >= 1700 pc/h, terminate analysis-the LOS is F.

HCS2000: Two-Lane Highways Release 4.1b

Phone: Fax:
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Two-Way Two-Lane Highway Segment Analysis

Analyst RSLP
Agency/Co.
Date Performed 9/18/02
Analysis Time Period Design Hour Volume
Highway OR140 (K Falls-Lakeview Hwy)
From/To Near Tunnel Hill Road
Jurisdiction
Analysis Year 2022 Future Conditions
Description Lake County TSP - two-lane highway analysis

Input Data

Highway class Class 1
Shoulder width 3.0 ft Peak-hour factor, PHF 0.88
Lane width 12.0 ft % Trucks and buses 14 %
Segment length 2.0 mi % Recreational vehicles 4 %
Terrain type Rolling % No-passing zones 50 %
Grade: Length mi Access points/mi 8 /mi
Up/down %

Two-way hourly volume, V 210 veh/h
Directional split 60 / 40 %

Average Travel Speed

Grade adjustment factor, fG 0.71
PCE for trucks, ET 2.5
PCE for RVs, ER 1.1
Heavy-vehicle adjustment factor, 0.824
Two-way flow rate,(note-1) vp 408 pc/h
Highest directional split proportion (note-2) 245 pc/h

Free-Flow Speed from Field Measurement:
Field measured speed, SFM - mi/h
Observed volume, Vf - veh/h
Estimated Free-Flow Speed:
Base free-flow speed, BFFS 60.0 mi/h
Adj. for lane and shoulder width, fLS 2.6 mi/h
Adj. for access points, fA 2.0 mi/h

Free-flow speed, FFS 55.4 mi/h

Adjustment for no-passing zones, fnp 3.1 mi/h
Average travel speed, ATS 49.1 mi/h

Percent Time-Spent-Following

de adjustment factor, fG 0.77
PCE for trucks, ET 1.8
PCE for RVs, ER 1.0
Heavy-vehicle adjustment factor, fHV 0.899
Two-way flow rate,(note-1) vp 345 pc/h

Highest directional split proportion (note-2)	207
Base percent time-spent-following, BPTSF	26.2 %
Adj.for directional distribution and no-passing zones, fd/np	17.2
Percent time-spent-following, PTSF	43.4 %

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.13
Peak 15-min vehicle-miles of travel, VMT15	119 veh-mi
Peak-hour vehicle-miles of travel, VMT60	420 veh-mi
Peak 15-min total travel time, TT15	2.4 veh-h

Notes:
1. If vp >= 3200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split vp >= 1700 pc/h, terminate analysis-the LOS is F.

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Phone: Fax:
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Two-Way Two-Lane Highway Segment Analysis

Analyst RSLP
Agency/Co.
Date Performed 9/18/02
Analysis Time Period Design Hour Volume
Highway OR 31 (Fremont Hwy) - MP 26
From/To Between Klamath Co. & Fort Rck
Jurisdiction
Analysis Year 2022 Future Conditions
Description Lake County TSP - two-lane highway analysis

Input Data

Highway class Class 1
Shoulder width 2.0 ft Peak-hour factor, PHF 0.88
Lane width 12.0 ft % Trucks and buses 14 %
Segment length 2.0 mi % Recreational vehicles 4 %
Terrain type Rolling % No-passing zones 50 %
Grade: Length mi Access points/mi 8 /mi
Up/down %

Two-way hourly volume, V 235 veh/h
Directional split 60 / 40 %

Average Travel Speed

Grade adjustment factor, fG 0.71
PCE for trucks, ET 2.5
PCE for RVs, ER 1.1
Heavy-vehicle adjustment factor, 0.824
Two-way flow rate,(note-1) vp 457 pc/h
Highest directional split proportion (note-2) 274 pc/h

Free-Flow Speed from Field Measurement:
Field measured speed, SFM - mi/h
Observed volume, Vf - veh/h
Estimated Free-Flow Speed:
Base free-flow speed, BFFS 60.0 mi/h
Adj. for lane and shoulder width, fLS 2.6 mi/h
Adj. for access points, fA 2.0 mi/h

Free-flow speed, FFS 55.4 mi/h

Adjustment for no-passing zones, fnp 3.0 mi/h
Average travel speed, ATS 48.9 mi/h

Percent Time-Spent-Following

Grade adjustment factor, fG 0.77
PCE for trucks, ET 1.8
PCE for RVs, ER 1.0
Heavy-vehicle adjustment factor, fHV 0.899
Two-way flow rate,(note-1) vp 386 pc/h

Highest directional split proportion (note-2)	232
Base percent time-spent-following, BPTSF	28.8 %
Adj.for directional distribution and no-passing zones, fd/np	17.2
Percent time-spent-following, PTSF	46.0 %

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.14
Peak 15-min vehicle-miles of travel, VMT15	134 veh-mi
Peak-hour vehicle-miles of travel, VMT60	470 veh-mi
Peak 15-min total travel time, TT15	2.7 veh-h

Notes:
1. If vp >= 3200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split vp >= 1700 pc/h, terminate analysis-the LOS is F.

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Phone: Fax:
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Two-Way Two-Lane Highway Segment Analysis

Analyst RSLP
Agency/Co.
Date Performed 9/18/02
Analysis Time Period Design Hour Volume
Highway OR 31 (Fremont Hwy) - MP 58
From/To In Paisley
Jurisdiction
Analysis Year 2022 Future Conditions
Description Lake County TSP - two-lane highway analysis

Input Data

Highway class Class 1
Shoulder width 10.0 ft Peak-hour factor, PHF 0.88
Lane width 12.0 ft % Trucks and buses 14 %
Segment length 1.0 mi % Recreational vehicles 4 %
Terrain type Level % No-passing zones 20 %
Grade: Length mi Access points/mi 16 /mi
Up/down %

Two-way hourly volume, V 145 veh/h
Directional split 60 / 40 %

Average Travel Speed

Grade adjustment factor, fG 1.00
PCE for trucks, ET 1.7
PCE for RVs, ER 1.0
Heavy-vehicle adjustment factor, 0.911
Two-way flow rate,(note-1) vp 181 pc/h
Highest directional split proportion (note-2) 109 pc/h

Free-Flow Speed from Field Measurement:
Field measured speed, SFM - mi/h
Observed volume, Vf - veh/h
Estimated Free-Flow Speed:
Base free-flow speed, BFFS 60.0 mi/h
Adj. for lane and shoulder width, fLS 0.0 mi/h
Adj. for access points, fA 4.0 mi/h

Free-flow speed, FFS 56.0 mi/h

Adjustment for no-passing zones, fnp 0.5 mi/h
Average travel speed, ATS 54.1 mi/h

Percent Time-Spent-Following

Grade adjustment factor, fG 1.00
PCE for trucks, ET 1.1
PCE for RVs, ER 1.0
Heavy-vehicle adjustment factor, fHV 0.986
Two-way flow rate,(note-1) vp 167 pc/h

Highest directional split proportion (note-2)	100
Base percent time-spent-following, BPTSF	13.7 %
Adj.for directional distribution and no-passing zones, fd/np	1.6
Percent time-spent-following, PTSF	15.3 %

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.06	
Peak 15-min vehicle-miles of travel, VMT15	41	veh-mi
Peak-hour vehicle-miles of travel, VMT60	145	veh-mi
Peak 15-min total travel time, TT15	0.8	veh-h

Notes:
1. If vp >= 3200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split vp >= 1700 pc/h, terminate analysis-the LOS is F.

HCS2000: Two-Lane Highways Release 4.1b

Phone: Fax:
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Two-Way Two-Lane Highway Segment Analysis

Analyst RSLP
Agency/Co.
Date Performed 9/18/02
Analysis Time Period Design Hour Volume
Highway OR 31 (Fremont Hwy) - MP 38
From/To Between Fort Rock & Silver Lak
Jurisdiction
Analysis Year 2022 Future Conditions
Description Lake County TSP - two-lane highway analysis

Input Data

Highway class Class 1
Shoulder width 2.0 ft Peak-hour factor, PHF 0.88
Lane width 12.0 ft % Trucks and buses 14 %
Segment length 2.0 mi % Recreational vehicles 4 %
Terrain type Level % No-passing zones 20 %
Grade: Length mi Access points/mi 8 /mi
Up/down %

Two-way hourly volume, V 185 veh/h
Directional split 60 / 40 %

Average Travel Speed

Grade adjustment factor, fG 1.00
PCE for trucks, ET 1.7
PCE for RVs, ER 1.0
Heavy-vehicle adjustment factor, 0.911
Two-way flow rate,(note-1) vp 231 pc/h
Highest directional split proportion (note-2) 139 pc/h

Free-Flow Speed from Field Measurement:
Field measured speed, SFM - mi/h
Observed volume, Vf - veh/h
Estimated Free-Flow Speed:
Base free-flow speed, BFFS 60.0 mi/h
Adj. for lane and shoulder width, fLS 2.6 mi/h
Adj. for access points, fA 2.0 mi/h

Free-flow speed, FFS 55.4 mi/h

Adjustment for no-passing zones, fnp 0.8 mi/h
Average travel speed, ATS 52.8 mi/h

Percent Time-Spent-Following

ade adjustment factor, fG 1.00
PCE for trucks, ET 1.1
PCE for RVs, ER 1.0
Heavy-vehicle adjustment factor, fHV 0.986
Two-way flow rate,(note-1) vp 213 pc/h

Highest directional split proportion (note-2)	128
Base percent time-spent-following, BPTSF	17.1 %
Adj.for directional distribution and no-passing zones, fd/np	1.6
Percent time-spent-following, PTSF	18.7 %

Level of Service and Other Performance Measures

Level of service, LOS	B
Volume to capacity ratio, v/c	0.07
Peak 15-min vehicle-miles of travel, VMT15	105 veh-mi
Peak-hour vehicle-miles of travel, VMT60	370 veh-mi
Peak 15-min total travel time, TT15	2.0 veh-h

Notes:
1. If vp >= 3200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split vp >= 1700 pc/h, terminate analysis-the LOS is F.

HCS2000: Two-Lane Highways Release 4.1b

Phone: Fax:
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Two-Way Two-Lane Highway Segment Analysis

Analyst RSLP
Agency/Co.
Date Performed 9/18/02
Analysis Time Period Design Hour Volume
Highway OR 31 (Fremont Hwy) - MP 115
From/To Between SilverLake & Paisley
Jurisdiction
Analysis Year 2022 Future Conditions
Description Lake County TSP - two-lane highway analysis

Input Data

Highway class Class 1
Shoulder width 2.0 ft Peak-hour factor, PHF 0.88
Lane width 12.0 ft % Trucks and buses 14 %
Segment length 2.0 mi % Recreational vehicles 4 %
Terrain type Rolling % No-passing zones 50 %
Grade: Length mi Access points/mi 8 /mi
Up/down %

Two-way hourly volume, V 125 veh/h
Directional split 60 / 40 %

Average Travel Speed

Grade adjustment factor, fG 0.71
PCE for trucks, ET 2.5
PCE for RVs, ER 1.1
Heavy-vehicle adjustment factor, 0.824
Two-way flow rate,(note-1) vp 243 pc/h
Highest directional split proportion (note-2) 146 pc/h

Free-Flow Speed from Field Measurement:
Field measured speed, SFM - mi/h
Observed volume, Vf - veh/h
Estimated Free-Flow Speed:
Base free-flow speed, BFFS 60.0 mi/h
Adj. for lane and shoulder width, fLS 2.6 mi/h
Adj. for access points, fA 2.0 mi/h

Free-flow speed, FFS 55.4 mi/h

Adjustment for no-passing zones, fnp 2.2 mi/h
Average travel speed, ATS 51.4 mi/h

Percent Time-Spent-Following

Grade adjustment factor, fG 0.77
PCE for trucks, ET 1.8
PCE for RVs, ER 1.0
Heavy-vehicle adjustment factor, fHV 0.899
Two-way flow rate,(note-1) vp 205 pc/h

Highest directional split proportion (note-2)	123
Base percent time-spent-following, BPTSF	16.5 %
Adj.for directional distribution and no-passing zones, fd/np	17.2
Percent time-spent-following, PTSF	33.7 %

Level of Service and Other Performance Measures

Level of service, LOS	B
Volume to capacity ratio, v/c	0.08
Peak 15-min vehicle-miles of travel, VMT15	71 veh-mi
Peak-hour vehicle-miles of travel, VMT60	250 veh-mi
Peak 15-min total travel time, TT15	1.4 veh-h

Notes:
1. If vp >= 3200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split vp >= 1700 pc/h, terminate analysis-the LOS is F.

HCS2000: Two-Lane Highways Release 4.1b

Phone: Fax:
E-Mail:

Two-Way Two-Lane Highway Segment Analysis

Analyst RSLP
Agency/Co.
Date Performed 9/18/02
Analysis Time Period Design Hour Volume
Highway OR 31 (Fremont Hwy) - MP 115
From/To Between Paisley & Valley Falls
Jurisdiction
Analysis Year 2022 Future Conditions
Description Lake County TSP - two-lane highway analysis

Input Data

Highway class Class 1
Shoulder width 2.0 ft Peak-hour factor, PHF 0.88
Lane width 12.0 ft % Trucks and buses 14 %
Segment length 2.0 mi % Recreational vehicles 4 %
Terrain type Rolling % No-passing zones 50 %
Grade: Length mi Access points/mi 8 /mi
Up/down %

Two-way hourly volume, V 175 veh/h
Directional split 60 / 40 %

Average Travel Speed

Grade adjustment factor, fG 0.71
PCE for trucks, ET 2.5
PCE for RVs, ER 1.1
Heavy-vehicle adjustment factor, 0.824
Two-way flow rate,(note-1) vp 340 pc/h
Highest directional split proportion (note-2) 204 pc/h

Free-Flow Speed from Field Measurement:
Field measured speed, SFM - mi/h
Observed volume, Vf - veh/h
Estimated Free-Flow Speed:
Base free-flow speed, BFFS 60.0 mi/h
Adj. for lane and shoulder width, fLS 2.6 mi/h
Adj. for access points, fA 2.0 mi/h

Free-flow speed, FFS 55.4 mi/h

Adjustment for no-passing zones, fnp 2.7 mi/h
Average travel speed, ATS 50.0 mi/h

Percent Time-Spent-Following

de adjustment factor, fG 0.77
PCE for trucks, ET 1.8
PCE for RVs, ER 1.0
Heavy-vehicle adjustment factor, fHV 0.899
Two-way flow rate,(note-1) vp 287 pc/h

Highest directional split proportion (note-2)	172	
Base percent time-spent-following, BPTSF	22.3	%
Adj.for directional distribution and no-passing zones, fd/np	17.2	
Percent time-spent-following, PTSF	39.5	%

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.11	
Peak 15-min vehicle-miles of travel, VMT15	99	veh-mi
Peak-hour vehicle-miles of travel, VMT60	350	veh-mi
Peak 15-min total travel time, TT15	2.0	veh-h

Notes:
1. If vp >= 3200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split vp >= 1700 pc/h, terminate analysis-the LOS is F.

HCS2000: Two-Lane Highways Release 4.1b

Phone: Fax:
E-Mail:

Two-Way Two-Lane Highway Segment Analysis

Analyst RSLP
Agency/Co.
Date Performed 9/18/02
Analysis Time Period Design Hour Volume
Highway US 20 (Central OR Hwy)
From/To Near Lake/Harney Co. line
Jurisdiction
Analysis Year 2022 Future Conditions
Description Lake County TSP - two-lane highway analysis

Input Data

Highway class Class 1
Shoulder width 3.0 ft Peak-hour factor, PHF 0.88
Lane width 12.0 ft % Trucks and buses 14 %
Segment length 2.0 mi % Recreational vehicles 4 %
Terrain type Rolling % No-passing zones 50 %
Grade: Length mi Access points/mi 8 /mi
Up/down %

Two-way hourly volume, V 250 veh/h
Directional split 60 / 40 %

Average Travel Speed

Grade adjustment factor, fG 0.71
PCE for trucks, ET 2.5
PCE for RVs, ER 1.1
Heavy-vehicle adjustment factor, 0.824
Two-way flow rate,(note-1) vp 486 pc/h
Highest directional split proportion (note-2) 292 pc/h

Free-Flow Speed from Field Measurement:
Field measured speed, SFM - mi/h
Observed volume, Vf - veh/h
Estimated Free-Flow Speed:
Base free-flow speed, BFFS 60.0 mi/h
Adj. for lane and shoulder width, fLS 2.6 mi/h
Adj. for access points, fA 2.0 mi/h

Free-flow speed, FFS 55.4 mi/h

Adjustment for no-passing zones, fnp 2.9 mi/h
Average travel speed, ATS 48.7 mi/h

Percent Time-Spent-Following

Grade adjustment factor, fG 0.77
PCE for trucks, ET 1.8
PCE for RVs, ER 1.0
Heavy-vehicle adjustment factor, fHV 0.899
Two-way flow rate,(note-1) vp 410 pc/h

Highest directional split proportion (note-2)	246
Base percent time-spent-following, BPTSF	30.3 %
Adj.for directional distribution and no-passing zones, fd/np	18.4
Percent time-spent-following, PTSF	48.6 %

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.15	
Peak 15-min vehicle-miles of travel, VMT15	142	veh-mi
Peak-hour vehicle-miles of travel, VMT60	500	veh-mi
Peak 15-min total travel time, TT15	2.9	veh-h

Notes:
1. If vp >= 3200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split vp >= 1700 pc/h, terminate analysis-the LOS is F.

HCS2000: Two-Lane Highways Release 4.1b

Phone: Fax:
E-Mail:

Two-Way Two-Lane Highway Segment Analysis

Analyst RSLP
Agency/Co.
Date Performed 9/18/02
Analysis Time Period Design Hour Volume
Highway US 395 (Lakeview-Burns Hwy)
From/To Near junction with OR 31
Jurisdiction
Analysis Year 2022 Future Conditions
Description Lake County TSP - two-lane highway analysis

Input Data

Highway class Class 2
Shoulder width 4.0 ft Peak-hour factor, PHF 0.88
Lane width 12.0 ft % Trucks and buses 14 %
Segment length 2.0 mi % Recreational vehicles 4 %
Terrain type Rolling % No-passing zones 50 %
Grade: Length mi Access points/mi 8 /mi
Up/down %

Two-way hourly volume, V 75 veh/h
Directional split 60 / 40 %

Average Travel Speed

Grade adjustment factor, fG 0.71
PCE for trucks, ET 2.5
PCE for RVs, ER 1.1
Heavy-vehicle adjustment factor, 0.824
Two-way flow rate,(note-1) vp 146 pc/h
Highest directional split proportion (note-2) 88 pc/h

Free-Flow Speed from Field Measurement:
Field measured speed, SFM - mi/h
Observed volume, Vf - veh/h
Estimated Free-Flow Speed:
Base free-flow speed, BFFS 60.0 mi/h
Adj. for lane and shoulder width, fLS 1.3 mi/h
Adj. for access points, fA 2.0 mi/h

Free-flow speed, FFS 56.7 mi/h

Adjustment for no-passing zones, fnp 1.4 mi/h
Average travel speed, ATS 54.2 mi/h

Percent Time-Spent-Following

de adjustment factor, fG 0.77
PCE for trucks, ET 1.8
PCE for RVs, ER 1.0
Heavy-vehicle adjustment factor, fHV 0.899
Two-way flow rate,(note-1) vp 123 pc/h

Highest directional split proportion (note-2)	74
Base percent time-spent-following, BPTSF	10.2 %
Adj.for directional distribution and no-passing zones, fd/np	17.2
Percent time-spent-following, PTSF	27.4 %

Level of Service and Other Performance Measures

Level of service, LOS	A
Volume to capacity ratio, v/c	0.05
Peak 15-min vehicle-miles of travel, VMT15	43 veh-mi
Peak-hour vehicle-miles of travel, VMT60	150 veh-mi
Peak 15-min total travel time, TT15	0.8 veh-h

Notes:
1. If vp >= 3200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split vp >= 1700 pc/h, terminate analysis-the LOS is F.

HCS2000: Two-Lane Highways Release 4.1b

Phone: Fax:
E-Mail:

Two-Way Two-Lane Highway Segment Analysis

Analyst RSLP
Agency/Co.
Date Performed 9/18/02
Analysis Time Period Design Hour Volume
Highway US 395 (Fremont Hwy) - MP 135
From/To Between Valley Falls & Lakevie
Jurisdiction
Analysis Year 2022 Future Conditions
Description Lake County TSP - two-lane highway analysis

Input Data

Highway class Class 1
Shoulder width 2.0 ft Peak-hour factor, PHF 0.88
Lane width 12.0 ft % Trucks and buses 14 %
Segment length 2.0 mi % Recreational vehicles 4 %
Terrain type Rolling % No-passing zones 50 %
Grade: Length mi Access points/mi 8 /mi
Up/down %

Two-way hourly volume, V 260 veh/h
Directional split 60 / 40 %

Average Travel Speed

Grade adjustment factor, fG 0.71
PCE for trucks, ET 2.5
PCE for RVs, ER 1.1
Heavy-vehicle adjustment factor, 0.824
Two-way flow rate,(note-1) vp 505 pc/h
Highest directional split proportion (note-2) 303 pc/h

Free-Flow Speed from Field Measurement:
Field measured speed, SFM - mi/h
Observed volume, Vf - veh/h
Estimated Free-Flow Speed:
Base free-flow speed, BFFS 60.0 mi/h
Adj. for lane and shoulder width, fLS 2.6 mi/h
Adj. for access points, fA 2.0 mi/h

Free-flow speed, FFS 55.4 mi/h

Adjustment for no-passing zones, fnp 2.9 mi/h
Average travel speed, ATS 48.6 mi/h

Percent Time-Spent-Following

Grade adjustment factor, fG 0.77
PCE for trucks, ET 1.8
PCE for RVs, ER 1.0
Heavy-vehicle adjustment factor, fHV 0.899
Two-way flow rate,(note-1) vp 427 pc/h

Highest directional split proportion (note-2)	256
Base percent time-spent-following, BPTSF	31.3 %
Adj.for directional distribution and no-passing zones, fd/np	18.3
Percent time-spent-following, PTSF	49.6 %

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.16
Peak 15-min vehicle-miles of travel, VMT15	148 veh-mi
Peak-hour vehicle-miles of travel, VMT60	520 veh-mi
Peak 15-min total travel time, TT15	3.0 veh-h

Notes:
1. If vp >= 3200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split vp >= 1700 pc/h, terminate analysis-the LOS is F.

HCS2000: Two-Lane Highways Release 4.1b

Phone: Fax:
E-Mail:

Two-Way Two-Lane Highway Segment Analysis

Analyst RSLP
Agency/Co.
Date Performed 9/18/02
Analysis Time Period Design Hour Volume
Highway US 395 (Fremont Hwy) - MP 150
From/To Between Lakeview & CA Border
Jurisdiction
Analysis Year 2022 Future Conditions
Description Lake County TSP - two-lane highway analysis

Input Data

Highway class Class 1
Shoulder width 2.0 ft Peak-hour factor, PHF 0.88
Lane width 12.0 ft % Trucks and buses 14 %
Segment length 2.0 mi % Recreational vehicles 4 %
Terrain type Rolling % No-passing zones 50 %
Grade: Length mi Access points/mi 8 /mi
Up/down %

Two-way hourly volume, V 185 veh/h
Directional split 60 / 40 %

Average Travel Speed

Grade adjustment factor, fG 0.71
PCE for trucks, ET 2.5
PCE for RVs, ER 1.1
Heavy-vehicle adjustment factor, 0.824
Two-way flow rate,(note-1) vp 359 pc/h
Highest directional split proportion (note-2) 215 pc/h

Free-Flow Speed from Field Measurement:
Field measured speed, SFM - mi/h
Observed volume, Vf - veh/h
Estimated Free-Flow Speed:
Base free-flow speed, BFFS 60.0 mi/h
Adj. for lane and shoulder width, fLS 2.6 mi/h
Adj. for access points, fA 2.0 mi/h

Free-flow speed, FFS 55.4 mi/h

Adjustment for no-passing zones, fnp 2.9 mi/h
Average travel speed, ATS 49.8 mi/h

Percent Time-Spent-Following

.de adjustment factor, fG 0.77
PCE for trucks, ET 1.8
PCE for RVs, ER 1.0
Heavy-vehicle adjustment factor, fHV 0.899
Two-way flow rate,(note-1) vp 304 pc/h

Highest directional split proportion (note-2)	182
Base percent time-spent-following, BPTSF	23.4 %
Adj.for directional distribution and no-passing zones, fd/np	17.2
Percent time-spent-following, PTSF	40.6 %

Level of Service and Other Performance Measures

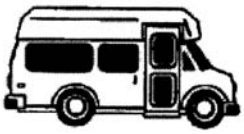
Level of service, LOS	C
Volume to capacity ratio, v/c	0.11
Peak 15-min vehicle-miles of travel, VMT15	105 veh-mi
Peak-hour vehicle-miles of travel, VMT60	370 veh-mi
Peak 15-min total travel time, TT15	2.1 veh-h

Notes:
1. If vp >= 3200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split vp >= 1700 pc/h, terminate analysis-the LOS is F.

APPENDIX G

Vehicle Description and Useful Life Standards

Vehicle Description and Useful Life Standards



Modified Vans and Mini-Vans
These vans and mini-vans are lift or ramp equipped and have the floor lowered and / or the roof raised to accommodate passengers in wheelchairs.
Passengers: 3 - 7
Useful Life: 4 Years and / or 100,000 miles
Price Range: $38,000 - $48,000

Non -Modified Vans, Mini-Vans, Station Wagons, and Sedans
These are vehicles that are standard Original Equipment Manufacturer (OEM) vehicles
Passengers: 3 - 14
Useful Life: 4 Years and / or 100,000 miles
Price Range: $18,000 - $25,000

Cut-Away Bus (aka Body-on-Chassis)
These vehicles are built on a mid-duty chassis and are lift equipped.
Passengers: 8 - 26
Useful Life: 7 Years and / or 200,000 miles
Price Range: $42,000 - $75,000

Full Size Transit Bus
These vehicles are built on heavy duty chassis and are Lift equipped.
Passengers: 20 - 40+
Useful Life: 12 Years and / or 600,000 miles
Price Range: $100,000 - $300,000+

APPENDIX H

Lake County Road Department 5-year Working Pavement Management Plan

TABLE H-1
LAKE COUNTY FIVE-YEAR WORKING PAVEMENT MANAGEMENT PLAN - 2002

Road #	Road Name	Treatment	Cost
1-10	Stock Drive	Crack Seal	$186.07
1-10	Stock Drive	Chip and Crack Seal	$81,342.80
1-10	South 9th	Chip and Crack Seal	$21,139.43
1-10A	Airport	Crack Seal	$835.65
1-11	West Side	Crack Seal	$2,468.26
1-11	West Side	Chip and Crack Seal	$116,776.00
1-11C	Reed	Crack Seal	$242.55
1-11D	Dog Lake	Crack Seal	$1,008.00
1-11E	Garrett	Crack Seal	$259.83
1-11H	DuMilieu	Crack Seal	$268.12
1-11I	T-Bone	Crack Seal	$12.61
1-12	Andy Hill	Crack Seal	$1,222.72
1-12B	Water Users	Crack Seal	$461.70
1-13	Tunnel Hill	Crack Seal	$559.98
2-09	Green	Crack Seal	$77.61
2-09	Blue St	Crack Seal	$178.58
2-10	Clover Flat	Crack Seal	$79.63
2-16	Lake Ridge	Crack Seal	$400.80
2-16A	Dairy Creek	Chip and Crack Seal	$60,830.00
2-17	Old Smokey	Crack Seal	$388.07
2-18A	Sunny Slope	Crack Seal	$153.98
2-18A	Geyser View	Crack Seal	$139.76
2-18B	Missouri	Chip and Crack Seal	$19,529.58
2-18D	E Goldmohr Ln	Crack Seal	$75.50
2-19A	Thomas Creek Lp	Crack Seal	$82.55
2-19D	Jaska	Crack Seal	$202.91
2-19F	Pike	Crack Seal	$445.14
2-23	Roberta	Crack Seal	$285.69
3-01	Boone	Chip and Crack Seal	$3,172.40
3-02	Lake Street	Chip and Crack Seal	$3,176.80
3-03	Morris	Chip and Crack Seal	$2,728.00
3-04	Alley	Chip and Crack Seal	$2,910.60
3-05	Warner	Chip and Crack Seal	$4,347.20
3-06	Goldrun	Chip and Crack Seal	$2,582.80
3-10	Plush-Adel	Chip and Crack Seal	$413,818.80
3-10A	Taylor Ranch	Chip and Crack Seal	$12,614.80
3-12	Hart Mtn	Chip and Crack Seal	$233,156.00
3-12	Hart Mtn	Chip and Crack Seal	$22,616.00
3-13	Plush Cutoff	Chip and Crack Seal	$150,405.20
3-13	Plush Cutoff	4 inch Overlay	$454,412.29
4-16	Carlon	Chip and Crack Seal	$86,974.80
5-10	Fort Rock	Crack Seal	$136.52
5-12	Derrick Caves	Crack Seal	$1,212.55
5-12A	Morrison	Crack Seal	$9.48
5-13	Picture	Crack Seal	$464.42
5-14	Arrow Gap	Crack Seal	$681.59
5-14C	Millican	Crack Seal	$873.58
5-14D	Fossil Lake	Crack Seal	$1,146.26
5-14G	Oil Dri	Crack Seal	$3,228.19
6-09	South 3rd	Crack Seal	$247.43
6-11	South 11th	4 inch Overlay	$9,476.00
6-12	South 12th	Chip and Crack Seal	$3,190.00
6-20	South E	4 inch Overlay	$9,379.87

6-23	South H	4 inch Overlay	$32,465.60
6-24	South I	Chip and Crack Seal	$8,725.20
6-27	South L	Chip and Crack Seal	$2,816.00
6-28	South M	Crack Seal	$282.53
6-31	South P	Chip and Crack Seal	$11,422.40
7-13	2nd St	Crack Seal	$107.75
7-25	North J	Crack Seal	$297.11
7-30	North O	Crack Seal	$43.43
7-33	North R	Crack Seal	$41.00
7-34	North S	Chip and Crack Seal	$6,160.00
7-37	North V	Crack Seal	$31.26
		TOTAL	**$1,795,007.38**

TABLE H-2
LAKE COUNTY FIVE-YEAR WORKING PAVEMENT MANAGEMENT PLAN - 2003

Road #	Road Name	Treatment	Cost
1-03	Church	Chip and Crack Seal	$9,500.33
1-05	Center	Chip and Crack Seal	$1,900.80
1-11	West Side	Chip and Crack Seal	$36,667.49
1-12	Andy Hill	Crack Seal	$86.03
1-12	Andy Hill	Chip and Crack Seal	$16,729.86
1-12	Shults	Crack Seal	$404.15
1-12B	Water Users	Chip and Crack Seal	$36,672.06
2-09	Green	Chip and Crack Seal	$6,140.99
2-09	Blue St	Chip and Crack Seal	$14,130.69
2-16	Thomas Creek	Crack Seal	$1,854.97
2-16	Thomas Creek	Chip and Crack Seal	$88,037.66
2-16	Lake Ridge	Chip and Crack Seal	$36,667.49
2-18	Rabbit Hill	Chip and Crack Seal	$21,780.00
2-18C	Precision Pine	Crack Seal	$27.42
2-18C	Precision Pine	4 inch Overlay	$21,863.47
2-19	New Idaho	Crack Seal	$913.40
2-19C	Osborne	Crack Seal	$204.22
2-23	Roberta	Chip and Crack Seal	$12,750.83
3-10	Hogback	Chip and Crack Seal	$23,520.64
3-14	Twenty Mile	Chip and Crack Seal	$194,008.66
4-10	Bear Flat	Chip and Crack Seal	$358,389.16
4-11	Silver Creek	Chip and Crack Seal	$120,313.60
5-10	Fort Rock	Chip and Crack Seal	$423,240.40
5-10C	Connley	Chip and Crack Seal	$81,985.20
5-11	Cabin Lake	4 in Overlay	$69,717.33
5-11A	Cow Cave	Chip and Crack Seal	$13,745.60
5-12	Derrick Caves	Chip and Crack Seal	$119,964.41
5-12B	Bowers	Chip and Crack Seal	$1,887.60
5-12C	Kittredge	Chip and Crack Seal	$4,796.00
5-13	Picture	Chip and Crack Seal	$43,995.77
5-14	Arrow Gap	Chip and Crack Seal	$1,018,381.40
5-14C	Millican	Chip and Crack Seal	$156,538.80
5-14D	Fossil Lake	Chip and Crack Seal	$280,446.49
5-14F	Old Lake	Chip and Crack Seal	$332,613.60
5-14G	Oil Dri	Chip and Crack Seal	$330,612.46
6-09	South 3rd	Chip and Crack Seal	$19,647.25
6-21	South F	4 inch Overlay	$25,780.21
7-13	North 2nd	Chip and Crack Seal	$4,759.04
7-25	North J	Chip and Crack Seal	$12,938.64
8-02	2nd Silver Lake	Chip and Crack Seal	$5,535.20
8-03	3rd Silver Lake	Chip and Crack Seal	$5,535.20
8-05	5th Silver Lake	Chip and Crack Seal	$5,548.40
8-06	6th Silver Lake	Chip and Crack Seal	$5,403.20
9-15	Christmas Tree	Chip and Crack Seal	$34,896.40
		TOTAL	**$4,000,532.52**

TABLE H-3
LAKE COUNTY FIVE-YEAR WORKING PAVEMENT MANAGEMENT PLAN - 2004

Road #	Road Name	Treatment	Cost
1-04	West	4 inch Overlay	$4,674.00
1-11B	Padget	Chip and Crack Seal	$26,910.40
1-11E	Garrett	Chip and Crack Seal	$64,922.00
1-11E	Garrett	Chip and Crack Seal	$24,951.65
1-11G	Friday	Chip and Crack Seal	$28,872.80
1-19	State Line	Chip and Crack Seal	$34,526.80
1-19A	Lawson	Chip and Crack Seal	$14,401.20
2-07	Redhouse	Chip and Crack Seal	$91,572.80
2-08	Mill Rd	Chip and Crack Seal	$26,812.50
2-10	Clover Flat	Chip and Crack Seal	$7,614.46
2-10A	Clover Flat	Chip and Crack Seal	$121,712.80
2-16	Thomas Creek	4 inch Overlay	$63,997.33
2-17	Old Smokey	Chip and Crack Seal	$10,507.20
2-18A	Sunny Slope	Chip and Crack Seal	$13,658.44
2-18D	E Goldmohr Ln	Chip and Crack Seal	$7,248.02
2-19D	Jaska	Reconstruct	$40,408.57
2-19E	Leehmann	Chip and Crack Seal	$63,910.00
2-23	Roberta	Chip and Crack Seal	$19,531.89
3-13	Plush Cutoff	1-03	$516,234.98
5-01	Rock View	4 inch Overlay	$29,499.99
5-12	Derrick Caves	4 inch Overlay	$312,625.61
5-14	Arrow Gap	1-03	$355,748.27
5-14	Arrow Gap	Crack Seal	$1,080.70
5-14C	Millican	Chip and Crack Seal	$77,186.87
6-28	South M	Chip and Crack Seal	$25,061.10
7-25	J Street	Chip and Crack Seal	$8,247.42
7-30	North O	Chip and Crack Seal	$4,168.92
8-10	10th St	Chip and Crack Seal	$6,740.80
8-14	Juniper	Chip and Crack Seal	$1,108.80
9-11	Snowflake	Chip and Crack Seal	$1,870.00
9-21	Rainbow	Chip and Crack Seal	$23,245.20
9-68	Holly	Crack Seal	$67.46
9-68	Holly	Chip and Crack Seal	$6,448.50
		TOTAL	**$2,035,567.48**

TABLE H-4
LAKE COUNTY FIVE-YEAR WORKING PAVEMENT MANAGEMENT PLAN - 2005

Road #	Road Name	Treatment	Cost
1-10	Stock Drive	Chip and Crack Seal	$26,385.26
1-10A	Airport	Chip and Crack Seal	$98,849.44
1-11	West Side	Chip and Crack Seal	$304,967.24
1-11C	Reed	Chip and Crack Seal	$26,241.72
1-11D	Dog Lake	Chip and Crack Seal	$109,055.10
1-11H	DuMilieu	Chip and Crack Seal	$31,715.76
1-12	Andy Hill	Chip and Crack Seal	$117,290.90
2-16	Thomas Creek	Chip and Crack Seal	$140,543.19
2-18	Rabbit Hill	Crack Seal	$433.93
2-18A	Geyser View	Chip and Crack Seal	$15,115.47
2-19A	Thomas Creek Loop	Chip and Crack Seal	$12,997.13
2-19F	Pike	Chip and Crack Seal	$52,636.88
5-10	Fort Rock	Chip and Crack Seal	$19,218.52
5-12A	Morrison	Chip and Crack Seal	$1,019.58
7-13	2nd Street	Chip and Crack Seal	$5,172.12
7-25	J Street	Chip and Crack Seal	$4,454.46
7-31	North P	Reconstruct	$79,460.38
7-32	North Q	Reconstruct	$79,550.37
7-33	North R	Chip and Crack Seal	$4,434.66
7-37	North V	Chip and Crack Seal	$3,380.44
		TOTAL	**$1,132,922.55**

TABLE H-5
LAKE COUNTY FIVE-YEAR WORKING PAVEMENT MANAGEMENT PLAN - 2006

Road #	Road Name	Treatment	Cost
1-04	West	Crack Seal	$6.34
1-05	Center	Crack Seal	$31.85
1-10	South 9th	Chip and Crack Seal	$10,092.29
1-11B	Padget	Crack Seal	$469.31
1-11E	Garrett	Crack Seal	$968.64
1-11G	Friday	Crack Seal	$483.87
1-11I	T-Bone	Chip and Crack Seal	$1,873.65
1-13	Tunnel Hill	Chip and Crack Seal	$83,222.78
1-19A	Lawson	Crack Seal	$232.63
2-08	Mill Rd	Crack Seal	$290.31
2-10A	Clover Flat	Crack Seal	$2,047.66
2-16	Thomas Creek	Crack Seal	$192.60
2-16A	Dairy Creek	Crack Seal	$1,019.72
2-17	Old Smokey	Chip and Crack Seal	$57,650.62
2-18	Rabbit Hill	Crack Seal	$351.94
2-18C	Precision Pine	Crack Seal	$27.35
2-19D	Jaska	Chip and Crack Seal	$27,291.39
2-19E	Leehmann	Crack Seal	$953.84
3-02	Lake	Crack Seal	$47.58
3-03	Morris	Crack Seal	$47.74
3-05	Warner	Crack Seal	$65.11
3-10A	Taylor Ranch	Crack Seal	$204.56
3-10E	Hogback	Chip and Crack Seal	$119,697.10
3-14	Twenty Mile	Crack Seal	$2,119.76
3-15	Coleman Valley	Chip and Crack Seal	$62,251.20
5-10C	Connley	Crack Seal	$1,380.12
5-11	Cabin Lake	Crack Seal	$94.54
5-12	Derrick Caves	Crack Seal	$940.85
5-12C	Kittredge	Crack Seal	$71.90
5-14	Arrow Gap	Crack Seal	$1,070.63
5-14	Millican	Crack Seal	$2,517.50
5-14D	Fossil Lake	Crack Seal	$2,904.26
5-14F	Old Lake	Crack Seal	$5,393.99
5-14G	Oil Dri	Crack Seal	$1,266.33
6-11	South 11th	Crack Seal	$11.85
6-20	South E	Crack Seal	$11.73
6-23	South H	Crack Seal	$40.61
6-31	South P	Crack Seal	$170.48
7-34	North S	Crack Seal	$107.46
7-35	North T	Reconstruct	$66,779.41
9-15	Christmas Tree	Crack Seal	$566.23
9-21	Rainbow	Crack Seal	$349.39
3'12		Overlay	$280,000.00
3-10		Overlay	$350,000.00
4-12		Overlay	$420,000.00
5-14		Overlay	$1,750,000.00
5-10		Overlay	$420,000.00
5-14G		Overlay	$420,000.00
		TOTAL	**$4,095,317.12**

APPENDIX I

Summary of Community Involvement

LAKE COUNTY
TRANSPORTATION ADVISORY COMMITTEE

Judy Graham	School District #7	1341 South 1st Street Lakeview, OR 97630	(541) 947-3347
Pat Creedican	ODOT - District 10	63055 N. Highway 97 Bend, OR 97701	(541) 388-6192
Mary Bradbury		115 South H Street Lakeview, OR 97630	(541) 947-4827
Rick DuMilieu	Lake County Road Master	PO Box 908 Lakeview, OR 97630	(541) 947-6048
Ann Crumrine	Lake County Road Department	PO Box 908 Lakeview, OR 97630	(541) 947-6048
Mike Stinson	ODOT - District 10	2557 Altamont Drive Klamath Falls, OR 97603	(541) 883-5565
Jim Platt	US Forest Service/BLM	1301 South G Street Lakeview, OR 97630	(541) 947-2177
Jim Bryant	ODOT - Region 4 Planner	63055 N. Highway 97 Bend, OR 97701	(541) 388-6437
Ray Simms	County Administrator	513 Center Street Lakeview, OR 97630	(541) 947-6003
Tim Bednar	ODOT - Lakeview Field Office	1269 South G Street Lakeview, OR 97630	(541) 947-2203
Carl Shumway		PO Box 3 Christmas Valley, OR 97641	(541) 576-2477
Daryl Anderson		PO Box 28 Lakeview, OR 97630	(541) 947-4407
John Albertson	Lake Co. Planning Commissioner	14377 Albertson Road Lakeview, OR 97630	(541) 947-4549
Phil McDonald	Lake County Sheriff	513 Center Street Lakeview, OR 97630	(541) 947-6027
Tom O'Leary		PO Box 36 Silver Lake, OR 97638	(541) 576-2568
Phil Fellows		648 Mill Street Paisley, OR 97636	(541) 943-3169
Swede Barber	ODOT - District 10 South	PO Box 1199 LaPine, OR 97739-1139	(541) 536-8354

Brad Winters	Lake Co. Planning Commissioner	513 Center Street Lakeview, OR 97630	(541) 947-6004
Bob Doran	ODOT - District 10 Manager	2557 Altamont Drive Klamath Falls, OR 97603	(541) 883-5662
Ray Bledsaw	Lake Co. Planning Commission	1150 South G Street Lakeview, OR 97630	(541) 947-2199
Bill Barry	Lake Co. Planning Commissioner	513 Center Street Lakeview, OR 97630	(541) 947-6004
Deana Johnston	Lake County Chamber	126 North E Street Lakeview, OR 97630	(541) 947-6040

LAKE COUNTY STAKEHOLDERS

Dale Chiono		PO Box 37, Summer Lake 97640	(541) 943-3164
Dee Lambert		PO Box 65, New Pine Creek 97635	(541) 947-4917
Kerry Hart	Fremont Sawmill	PO Box 1340, Lakeview 97630	(541) 947-2018
Dwayne Kemry		PO Box 215, Paisley 97636	(541) 943-3309
Sherman Radtke	Department of Corrections	PO Box 870, Lakeview 97630	(541) 947-6802
Bob Elder		43530 Highway 31, Paisley 97636	(541) 943-3230
Don Deter	Post Master	18 South G Street, Lakeview 97630	(541) 947-5606
Alan Parks		HC 84 Box 118, Silver Lake 97638	(541) 576-2199
Cook Laird		PO Box 13, Plush 97637	(541) 947-2453
Jerald Steward	Lake County Bike Committee	10 Park Court, Lakeview 97630	(541) 947-2538
Linda Michelson		739 North 7th St., Lakeview 97630	(541) 947-3976
Bill Fotz		HC 84 Box 391, Silver Lake 97638	(541) 576-2004
Ken Chartier	Fire Chief	245 North F St., Lakeview 97630	(541) 947-2504
Carl Tracy	Fire/Rescue	741 South 5th St., Lakeview 97630	(541) 947-2022
Dan Maple		PO Box 148, Christmas Valley 97641	(541) 576-2168
Dan Hollenkamp	BLM Lakeview District	HC 10, Box 337, Lakeview 97630	(541) 947-6185
Jane O'Keeffe	Lake County Commissioner	513 Center Street, Lakeview 97630	(541) 947-6004
Rod Callaghan	County Surveyor	513 Center Street, Lakeview 97630	(541) 947-6037
Dennis Mooney	True Value Hardware	4 North E Street, Lakeview 97630	(541) 947-4920
Toni & Marty Turman	Lake County Airport	HC 60 Box 186, Lakeview 97630	(541) 947-3592
Mark Klunder	Century Tel	844 South I Street, Lakeview 97630	(541) 947-2860
Ken Hamlington	County Planning Commission	PO Box 6, Fort Rock 97735	(541) 576-2393
Robert West		PO Box 197, Silver Lake 97638	(541) 576-2163
Roger Widenoja		85955 Raven Ridge Ln., Silver Lake 97638	(541) 576-3070
Ronald Johnson		PO Box 46, Christmas Valley 97641	(541) 576-2398
Ken Kestner	BLM	1300 South G Street, Lakeview 97630	(541) 947-6102

LAKE COUNTY STAKEHOLDER ISSUES

Name	Comments/Issues
Dale Chiono	• No transportation issues to address.
Dee Lambert	• Unable to get in touch with stakeholder.
Kerry Hart Fremont Sawmill	• Mentioned that OR 140 west (Klamath Falls-Lakeview Hwy) limits truck length which requires increased volume of trucks to transport freight in/out of Lakeview to/from the west. • Would like to maintain railroad service as approximately 30% of sawmill goods are shipped by railroad.
Dwayne Kemry	• Unable to get in touch with stakeholder.
Sherman Radtke Department of Corrections	• Mentioned that OR 140 west (Klamath Falls-Lakeview Hwy) has some winter problems with some bad curves and some sections of the road are shaded from the sun resulting in icy conditions on some sections of the highway for weeks on end. • Identified that Quartz Mountain pass was modified about 5-years ago to fix similar problems which are occurring today along OR 140 west at Bly Mountain Pass and Beatty curve. • Indicated that OR 140 east (Warner Hwy) has similar safety issues caused by sharp curves. Due to the sharp curves truck lengths allowed on OR 140 have been restricted. • Identified that left-turn refuge areas on OR 140 (Klamath Falls-Lakeview Hwy) and OR 31 (Fremont Hwy) may be needed at the entrances to the planned Lake County Minimum Security Facility.
Bob Elder	• Mentioned that there are length restrictions along OR 140, although he did not know what they currently were. • Indicated that poor pavement conditions exist along OR 31 (Fremont Hwy) between Paisley and Valley Falls. The highway is too flat for rain to drain off resulting in cars hydroplaning. His estimate of the location was near milepost 129.
Don Deter Post Master	• No transportation issues to address.
Alan Parks	• Identified that OR 31 (Fremont Hwy) in the northern section of Lake County between Valley Falls and US 97 has poor highway conditions. It seems as if the base and sub-base were constructed improperly and the highway overlay is just a temporary fix. The problems that existed before the overlay returns within a few years. • Mentioned that a significant portion of Lake County truck traffic occurs on the northern section of OR 31 (Fremont Hwy) between Fort Rock/Christmas Valley and US 97. • Indicated that along OR 140 east and west, possibly sign traffic to beware of large trucks needing space through sharp curves, therefore allowing truck traffic along restricted highways. • Mentioned that the county roads are in good condition. • Questioned if County Road Department and ODOT Roadway Maintenance Department could be combined to eliminate the two sets of equipment, etc.? Therefore, spend extra income on maintenance needs. • Questioned whether pavement markings (i.e. fog lines, centerline striping, etc.) could be shifted yearly 1-2 feet to maximize overall pavement conditions before pavement rutting occurs? By shifting travel patterns along highway rutting will take longer to form. Indicated this would only work on highways with substantial paved shoulders and other design considerations.
Cook Laird	• Unable to get in touch with stakeholder.

Name	Comments/Issues
Jerald Steward Lake County Bike Committee	• Identified safety problems, sharp curves and shade problems, along OR 140 west (Klamath Falls-Lakeview Hwy) and OR 140 east (Warner Hwy). Possibly need to straighten out curves to improve freight mobility along these routes. • Maintain railroad operations within Lake County. • Continue highway maintenance within Lake County. • Considering the low volume of traffic along state highways and county roads, the shoulders are wide enough for bicyclists to use. • Concerned with limited public transportation options. Would like to see an upgrade in transit equipment to better serve passengers versus freight.
Linda Michelson	• Unable to get in touch with stakeholder.
Bill Fotz	• Indicated that now that County Road #5-14 (Christmas Valley-Wagontire Road) is paved trucks use it as a cut through between US 395 (Lakeview-Burns Hwy) and US 97 (The Dalles-California Hwy). He doesn't think the road was designed for trucks that currently use it. • Mentioned that there are a number of unprotected intersections with a lot of near miss accidents. Possibly add more stop signs on minor approaches as well as more speed signs throughout the County. • Indicated that the s-curve on County Road #5-14 approximately 3-5 miles west of Christmas Valley between County Roads #5-14G and 9-13 has an accident history. Identified that a number of accidents have occurred over the years including some fatalities. • Wanted to know what the possibility of County Road #5-14 (Christmas Valley-Wagontire Road) being upgraded to a state highway?
Ken Chartier Fire Chief	• Unable to get in touch with stakeholder.
Carl Tracy Fire/Rescue	• Unable to get in touch with stakeholder.
Dan Maple	• Concerned with the condition of state highways throughout Lake County. Identified potholes, ruts, and washboard conditions exist along OR 31 (Fremont Highway). Specifically, mileposts 57 to 59 are in poor condition. Additionally, mentioned that the quick fix of only paving in the rutted strips doesn't solve the problem for trucks as pavement still throws them all over.
Dan Hollenkamp for Steve Ellis BLM Lakeview District	• Indicated that they would like to add an interpretive kiosk at the junction of US 395 (Lakeview-Burns Hwy) and OR 31 (Fremont Hwy) at Valley Falls. The interpretive kiosk would inform travelers about the Oregon Outback Scenic Byway. Need to work with ODOT to identify locations without safety issues for highway travelers. • Would like to add a similar interpretive kiosk at the junction of OR 31 (Fremont Hwy) and US 97 (The Dalles-California Hwy). Similar safety issues exist at this intersection. • The BLM/Outback Scenic Byway Partnership would like to develop a picnic area along OR 31 (Fremont Hwy) near milepost 34.5. The picnic area would include picnic sites, rest rooms, kiosks for interpretation, etc.
Jane O'Keeffe County Commissioner	• Unable to get in touch with stakeholder.
Rod Callaghan County Surveyor	• No transportation issues to address.
Dennis Mooney True Value Hardware	• Unable to get in touch with stakeholder.
Toni & Marty Turman Lake County Airport	• No transportation issues to address.

Name	Comments/Issues
Mark Klunder Century Tel	• Unable to get in touch with stakeholder.
Ken Hamlington Lake County Planning Commission	• No transportation issues to address.
Ray Bledsaw Lake County Planning Commission	• Indicated that OR 140 east (Warner Hwy) and OR 140 west (Klamath Falls-Lakeview Hwy) have safety issues including grade, sharp curves, and guardrail needs. Additionally, the truck length restrictions on OR 140 between Klamath Falls and Lakeview require significant out of direction travel for trucks. • Mentioned that OR 31 (Fremont Hwy) also has safety issues, especially during winter, including sharp curves and guardrail needs near Picture Rock Pass.
Deana Johnston Lake County Highway Advisory Committee	• Indicated that OR 140 east (Warner Hwy) and OR 140 west (Klamath Falls-Lakeview Hwy) have safety issues including sharp curves and guardrail needs. The sharp curves identified are near Bly and Beatty Creeks and guardrail should be added near Doherty Slide. • Mentioned two possible locations to improve safety for pedestrian and bicyclists by adding a separated pedestrian/bike path. The first location is north of Lakeview along OR 31 (Fremont Hwy) between Lakeview and the Hot Springs. The second location is south of Lakeview along OR 31 (Fremont Hwy) between Lakeview and the USFS/BLM office. Mentioned that lighting might be needed for nighttime use of the pedestrian/bike paths.
Swede Barber ODOT District 10 South	• Continue to enhance OR 31 (Fremont Hwy) because it acts as Lake County's "Lifeline". • Add another weather station (RWIS) near Valley Falls similar to the one in Paisley. Additionally, possibly add some cameras along state highways throughout Lake County. • Locals would like ODOT to modify the junction of US 395 (Lakeview-Burns Hwy) and OR 31 (Fremont Hwy) at Valley Falls to a "T" intersection similar to what was done a few years ago at the intersection of OR 31 (Fremont Hwy) and US 97 (The Dalles-California Hwy). • Continue to work with representatives to possibly add kiosks at both ends of the Oregon Outback Scenic Byway. Need to identify potential locations without safety issues for highway travelers.

SUMMARY
Transportation Advisory Committee (TAC) Meeting #1
May 7, 2001

TAC Meeting #1 for the Lake County Transportation System Plan (TSP) project was held on May 7, 2002 at the Lake County Administration Building. In attendance were:

Swede Barber, ODOT District 10 South
Rick DuMilieu, Lake County Road Department
Ann Crumrine, Lake County Road Department
Tom O'Leary
John Albertson, Lake County Planning Commissioner
Tim Bednar, ODOT Lakeview
Jim Bryant, ODOT Region 4
Mike Stinson, ODOT Klamath Falls
Ray Bledsaw, Lake County Planning Commissioner
Judy Graham, Lakeview School District
Darryl Anderson, County Engineer
Mary Bradbury
Phil Fellows
Ray Simms, County Administrator
Bill Barry, Lake County Commissioner
Brad Winters, Lake County Commissioner
David Knitowski, DEA
Ryan LeProwse, DEA

The meeting agenda covered seven primary items: 1) The Planning Process and Project Deliverables, 2) Role of the Transportation Advisory Committee, 3) Project Schedule, 4) Public Involvement, 5) Chapters 1 & 2 - Existing Plans and Policies/Goals and Objectives, 6) Identification/Discussion of existing Transportation Issues/Projects, and 7) Next Meeting.

The meeting opened with TAC member introductions.

1) The Planning Process and Project Deliverables

David Knitowski started off the meeting by highlighting DEA's history of preparing TSPs in rural Oregon and describing DEA's role in managing this project. He then summarized the transportation planning rule and how the TSP relates to other Transportation Planning efforts within ODOT.

Next, he reviewed the Chapters 1 through 9 of a transportation system plan and how they would be addressed in the Lake County TSP.

2) Role of the Transportation Advisory Committee (TAC)

David Knitowski identified the role of TAC members as the following:

- Attend and participate in meeting
- Define goals, identify problems, and develop solutions
- Review and comment on draft chapters

3) Project Schedule

David Knitowski outlined the project schedule with a completion date of November 2002. He mentioned that the TAC would be meeting once a month and asked what time and day would work best. The TAC members decided that TAC meetings should be held on the first Tuesday of each month from 10:00 am - 12:00 pm in Lakeview at the Lake County Administration Building.

4) Public Involvement

David Knitowski identified the four components of public involvement for the Lake County TSP as the following:

1. TAC members - will meet once a month to review draft chapters of the Lake County TSP.
2. Stakeholder Interviews - phone interviews.
3. Open Houses - two public open houses will be conducted with time and location to be determined.
4. Public Hearings - two public hearings with planning commission.

Ryan LeProwse summarized the stakeholder phone interviews that have been completed to date. Some of the common transportation issues identified by the stakeholders were:

- OR 140 east and west having safety issues including sharp curves, guardrail needs, and truck restrictions.
- Poor pavement conditions along state highways
- Pedestrian/bicycle facility needs

5) Chapters 1 & 2 - Existing Plans and Policies/ Goals and Objectives

David Knitowski introduced chapters 1 and 2 of the TSP and Appendix A. He asked the TAC to look over chapters 1 & 2 and Appendix A and either call or bring their comments with them to the next TAC meeting. For upcoming meetings TAC members will receive specific chapters approximately one-two weeks in advance of the meeting so they can come prepared with comments/questions.

Chapter 1 of the report is an introduction to the planning process and project deliverables. The first step in the planning process (Appendix A) is a review of existing information. David Knitowski identified the reports he has reviewed to date. Similar to the Lake County Airport Layout Plan, the Christmas Valley Airport will be conducting a similar plan within the next few months.

DEA has acquired ODOT's map of Lake County (Figure 1-1). This map will be updated to reflect road closures, street name changes, changes in boundaries, and new development.

The next step in the planning process (chapter 2) is to determine transportation goals and objectives. DEA prepared goals/objectives based upon the Lakeview TSP and other rural TSPs.

6) Existing Transportation Issues/ Projects

The TAC discussed issues related to transportation in Lake County. It was generally recognized that capacity is not an issue but there are some safety, pavement conditions, and signing issues.

Some of the transportation issues/projects mentioned in this preliminary discussion included:

- Highway 140 east and west has safety concerns including sharp curves - specific locations to be determined. Additionally, truck restrictions are limiting economic benefits.
- The need to improve poor pavement conditions along OR 31 (Fremont Hwy).
- Investigate changes to alignment, signing, and striping for the intersection of OR 140 (Warner Hwy) and OR 31 (Fremont Hwy). Possibly, add rumble strips indicating stop ahead along OR 140.
- Investigate changes to alignment, signing, and striping for the intersection of US 395 (Lakeview-Burns Hwy) and OR 31 (Fremont Hwy). Possibly, add rumble strips indicating stop ahead along US 395.
- Need school bus turnaround at Dent Creek Road along OR 140 (Klamath Falls-Lakeview Hwy).
- Explore directional signing to US 97 along Bear Flat Road within Silver Lake on OR 31.
- Better signing needed in general around Lake County.
- Darryl Anderson indicated that he would provide a list of intersection improvements needed.
- Verify safety issues at SPIS site along OR 31 (Fremont Hwy) near Milepost 50 (Harvey Road).
- Investigate the potential need for left-turn refuge lanes on OR 140 (Klamath Falls-Lakeview Hwy) and OR 31 (Fremont Hwy) at the entrances to the planned Lake County Department of Corrections Facility.
- Identify possible locations for bike lanes along county roads in addition to the one identified in Christmas Valley.
- Investigate options to address s-curve on County Road #5-14 (Christmas Valley-Wagontire Road).
- Potential need for a pavement preservation project along US 395 between Valley Falls and Riley due to funding problems for low ADT highway.
- The potential for a passing lane on OR 31 (Fremont Hwy)-Specific location to be determined.

7) Next Meeting

The next TAC meeting is scheduled for Tuesday, June 4, 2002 from 10:00 am to 12:00 pm at the Lake County Administration Building.

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SUMMARY
Transportation Advisory Committee (TAC) Meeting #2
June 4, 2002

TAC Meeting #2 for the Lake County Transportation System Plan (TSP) project was held on June 4, 2002 at the Lake County Administration Building. In attendance were:

Swede Barber, ODOT District 10 South
Tom O'Leary
John Albertson, Lake County Planning Commissioner
Tim Bednar, ODOT Lakeview
Jim Bryant, ODOT Region 4
Mike Stinson, ODOT Klamath Falls
Judy Graham, Lakeview School District
Mary Bradbury
Deanna Johnston
Phil Fellows
Ray Simms, County Administrator
Bill Barry, Lake County Commissioner
Brad Winters, Lake County Commissioner
David Knitowski, DEA
Ryan LeProwse, DEA

The meeting agenda covered six primary items: 1) Review of Draft Chapter 3: Transportation System Inventory, 2) Review of Draft Chapter 4: Current Transportation Conditions, 3) Comments on Draft Chapters 1-4, 4) Project Improvement List, 5) Next Steps, and 6) Next Meeting.

1) Review of Draft Chapter 3: Transportation System Inventory

Ryan LeProwse started off the meeting by reviewing Draft Chapter 3 of the Lake County TSP. Information summarized included: county road information, state highway information, US Forest Service and BLM Roads, other modes of transportation (i.e. transit, rail, airports, water, and pipeline), and the summary of identified needs.

2) Review of Draft Chapter 4: Current Transportation Conditions

Ryan then reviewed the findings from Draft Chapter 4 of the Lake County TSP. Information summarized included: existing volumes, two-lane highway operations, intersection operations, accident information, and summary of identified needs.

3) Comments on Draft Chapters 1-4

The next portion of the meeting asked TAC members for comments on Draft Chapters 1-4. The following comments were issued:

- Replace vpd (vehicles per day) to ADT (Average Daily Traffic).

- Bicycle Oregon has started as well as traveled through Lake County in the past. Shoulders need to be widened to accommodate bicycles. TAC members would like to develop priorities for widening shoulders to ODOT standards for existing/future bike routes. In addition to serving walkers and bicyclists, paved shoulders provide space for motorists to park in case of an emergency, allow for driver recovery, improve sight distance and highway capacity, and provide structural support to the highway.
- Ray Simms indicated that the County Road Department has comments in which DEA will call to obtain.
- ODOT's target for pavement condition is 70% "fair or better". With limited funding projected over the next few years, it will be difficult to increase the 67% of Lake County highways currently rated in "fair or better" condition.
- It was noted that a higher number of accidents occur than were reported. Deer/elk collisions as well as limited damage run-off the road accidents were indicated as other accidents that occur.
- A few counter measures were identified for deer/elk accidents including: thin out vegetation (clear zone - 50 ft each side of centerline) to improve visibility and limit food as well as bracket some areas for signing (i.e. migration routes, feeding grounds).
- In addition to animal accidents, the roadway segment along OR 31 between mileposts 109 and 120 was identified as having a number of small accidents probably not reported. The low skid resistance of the pavement and rutting in the area causes vehicles to hydroplane.
- ODOT is currently adding shoulders to the only SPIS site within the top 10%. The SPIS site is located along OR 31 at milepost 87.
- DEA will inventory fiber optic cable and add to Chapter 3.
- TAC members would like wilderness study areas identified on the maps.

4) Project Improvement List

Ryan LeProwse then went through the existing transportation issues/projects handout with the TAC to determine if the potential projects should be maintained in the TSP and what was the priority for each project. The revised projects and priorities are listed below:

1. Safety concerns including sharp curve near Antelope Canyon (Milepost 83) along OR 140 (Klamath Falls-Lakeview Hwy). - **Medium Priority**
2. Safety concerns along OR 140 (Warner Hwy). Mike Stinson will provide identified projects and funding issues. - **High Priority**
3. Project 3 was modified from the need to improve pavement conditions in specific locations to *Continuos Pavement Replacement*. - **No priority was determined**
4. Project was modified to Striping changes for the intersection of US 395 (Fremont Hwy) and OR 140 (Warner Hwy) including ballads (i.e. candlesticks) to direct traffic through large intersection. - **High Priority**
5. Project was modified to Striping changes for the intersection of US 395 (Lakeview-Burns Hwy) and OR 31 (Fremont Hwy) including ballads (i.e. candlesticks) to direct traffic through large intersection. - **Medium Priority**
6. Need for school bus turnaround at Dent Creek Road, approximately 20 miles west of Lakeview on OR 140 (Klamath Falls-Lakeview Hwy). - **High Priority**
7. Improve directional signing to US 97 along Bear Flat Road. Travelers tend to use other roads in the area versus Bear Flat Road. - **High Priority**

8. Need to improve signing (i.e. Lakeview → , Adel) throughout Lake County on State Highways, County Roads, BLM Roads, and US Forest Service Roads. - **Medium Priority**
9. Investigate the potential need for left-turn refuge lane heading northbound from US 395 (Fremont Hwy) to the county road which will access the planned Lake County Department of Correction Facility. - **Medium Priority**
10. Project investigating the need for a left-turn lane heading eastbound from OR 140 (Klamath Falls-Lakeview Hwy) to Roberta Avenue was dropped because it is within Lakeview Urban Growth Boundary (UGB) which was covered in the Lakeview TSP.
11. Identify possibly locations for bike lanes within Lake County TSP. Some of the initial locations identified were:
    - ½ mile long bike lane along Old Lake Road in Christmas Valley
    - Stock Drive between Lakeview UGB and Westside Road

- No priority was determined

12. Investigate options to address s-curve on County Road #5-14 (Christmas Valley-Wagontire Road). County is currently purchasing ROW near s-curve. - **Low Priority**
13. Need for pavement preservation projects along US 395 (Lakeview-Burns Hwy) between mileposts 36-70 and 78-90. These projects have been identified to address funding problems for low ADT highways. - **High Priority**
14. Identify locations along Fremont Highway for passing lanes. - **Low Priority**

New Projects

15. Improve signing and striping for the intersection of OR 31 (Fremont Hwy) and Christmas Valley-Wagontire Road. - **Low Priority**
16. Identify possible locations for sidewalks within Paisley and Christmas Valley. - **No priority was determined**
17. Potential for a rest area near Lakeview. A possible site is along OR 140 (Klamath Falls-Lakeview Hwy) near Antelope Canyon, approximately 12-13 miles west of Lakeview. - **No priority was determined**
18. Investigate the sharp curves, rock fall issues, and potential climbing lane near Picture Rock Pass along OR 31 (Fremont Hwy) near milepost 63. - **No priority was determined**

5) Next Steps

David Knitowski summarized the next steps of the planning process.

6) Next Meeting

The next TAC meeting is scheduled for Tuesday, July 2, 2002 from 10:00 am to 12:00 pm at the Lake County Administration Building.

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SUMMARY
Transportation Advisory Committee (TAC) Meeting #3
July 2, 2002

TAC Meeting #3 for the Lake County Transportation System Plan (TSP) project was held on July 2, 2002 at the Lake County Administration Building. In attendance were:

Ann Crumrine, Lake County Road Department
Jim Bryant, ODOT Region 4
Mike Stinson, ODOT Klamath Falls
Deanna Johnston, Lake County Chamber
Phil Fellows
Ray Simms, County Administrator
Bill Barry, Lake County Commissioner
Brad Winters, Lake County Commissioner
David Knitowski, DEA
Ryan LeProwse, DEA

The meeting agenda covered seven primary items: 1) Review of Appendix E: Population and Employment Forecasts, 2) Review of Draft Chapter 5: Travel Forecasts, 3) Review of Draft Chapter 9: Implementing Policies and Ordinances, 4) Comments on Draft Chapters 1-5 and 9, 5) Review of Project List, 6) Next Steps, and 7) Next Meeting.

1) Review of Appendix E: Population and Employment Forecasts

Considering the information from Appendix E is summarized in Draft Chapter 5, the review will be covered in the review of Draft Chapter 5.

2) Review of Draft Chapter 5: Travel Forecasts

Ryan LeProwse started off the meeting by reviewing Draft Chapter 5 of the Lake County TSP. Information summarized included: population trends and forecasts (existing and future), traffic volume forecasts (year 2022), future two-lane highway operations, and future intersection operations.

TAC members questioned the volumes reported by Census data over the years. They indicated that the numbers seemed low. Could possibly check population counts versus registered voters.

3) Review of Draft Chapter 9: Implementing Policies and Ordinances

David Knitowski then reviewed Draft Chapter 9 of the TSP. He summarized a few of the sections including bike lanes, sidewalks, shoulders, airport information, and intergovernmental cooperation/coordination. DEA then asked some questions of county representatives including:

Will the County accept local streets into there road system? (Page 9-7, Section C, #2)

-TAC members indicated that the County Commissioners and County Road Advisory Committee should be included in the process to accept or not accept new roads.

What are the minimum setbacks from county roads? (Page 9-7, Section C, #3)

-Ray Simms did not know for sure but he thought the existing setbacks were 45 feet from county roads and 60 feet from state highways.

Is 50 feet the minimum frontage of a lot on a public or private road? (Page 9-16, Section 20.16)

-TAC indicated to change 50 feet to 70 feet to be consistent with County standards.

Is the statement that direct accesses shall be prohibited on all state highways except district-level state highways feasible in Lake County? (Page 9-20, Section H, #2)

-TAC indicated to delete #2 because it does not apply in rural communities.

4) Comments on Draft Chapters 1-5 and 9

The next portion of the meeting asked TAC members for comments on Draft Chapters 1-5 and 9.

5) Project Improvement List

Ryan LeProwse then went through the identified transportation projects to determine to verify project description and priority. The revised projects and priorities are listed below:

1. Safety concerns along OR 140 (Warner Hwy). This project would involve localized curve improvements at three locations including Deep Creek Canyon, Greaser Canyon, and Dougherty Slide. - **High Priority**
2. Safety concerns including sharp curve near Antelope Canyon (Milepost 83) along OR 140 (Klamath Falls-Lakeview Hwy). - **Medium Priority**
3. Implement a Continuous Pavement Replacement Project. - **Medium Priority**
4. Signing and striping changes in addition to adding rumble strips for the intersection of US 395 (Fremont Hwy) and OR 140 (Warner Hwy). - **High Priority**
5. Signing and striping changes in addition to adding rumble strips for the intersection of US 395 (Lakeview-Burns Hwy) and OR 31 (Fremont Hwy). - **High Priority**
6. Install school bus turnaround at Dent Creek Road, approximately 20 miles west of Lakeview on OR 140 (Klamath Falls-Lakeview Hwy). - **High Priority**
7. Improve directional signing to US 97 along Bear Flat Road. - **High Priority**
8. Need to improve signing (i.e. Lakeview → , Adel ↑) throughout Lake County on State Highways, County Roads, BLM Roads, and US Forest Service Roads. - **Medium Priority**
9. Investigate the potential need for left-turn refuge lane heading northbound from US 395 (Fremont Hwy) to county roads which access the Lake Co. Dept. of Correction Facility. - **Medium Priority**
10. Upgrade substandard shoulders along state highways. - **Low Priority**
11. Localized shoulder improvements along state highways. Priority 1 is to add bike lanes within Lakeview between City Limits and UGB and Priority 2 is to add bike lanes outside of Lakeview UGB ½ mile - **Medium Priority**
12. Add bike lanes along county roads. Locations identified include:

- ½ mile long bike lane along Old Lake Road in Christmas Valley - **High Priority**
- Stock Drive between Lakeview UGB and Westside Road - **Low Priority**
- Lakeridge Road between Stock Drive and OR 140 - **Low Priority**

13. Investigate options to address s-curve on County Road #5-14 (Christmas Valley-Wagontire Road). - **Low Priority**
14. Pavement preservation projects along US 395 (Lakeview-Burns Hwy). - **High Priority**
15. Increase passing lane opportunities along Fremont Highway. - **Not Recommended** – instead, construct slow vehicle turn-outs which can also be used as chain-up and chain-down areas.
16. Signing and striping changes in addition to adding rumble strips for the intersection of OR 31 (Fremont Hwy) and Christmas Valley-Wagontire Road. - **High Priority**
17. Identify locations for sidewalks in the City of Paisley and the rural communities of Christmas Valley, Silver Lake, and Summer Lake. - **Not Recommended –** instead, accommodate pedestrians on roadway shoulders.
18. Provide a rest area near Lakeview. - **Not Recommended** – instead of constructing new facilities, enhance the existing facilities.
19. Address rock fall issues, add shoulders and guardrail, and investigate potential climbing lane near Picture Rock Pass along OR 31 (Fremont Hwy) near milepost 63. - **Medium Priority**
20. Replace dial-a-ride transit fleet. - **Medium Priority**
21. Upgrade substandard bridges. - **High Priority**
22. Identify chain-up and chain-down areas. - **Priority?**
23. Intersection improvements including signing and striping at the following intersections:
    - Bear Flat Road and OR 31 (Fremont Highway); - **Priority?**
    - Fort Rock Road and OR 31 (Fremont Highway); and - **Priority?**
    - Christmas Valley Road and US 395 (Lakeview-Burns Highway). - **Priority?**
24. Bank flattening through Nevada Curve along OR 140 (Warner Highway) near milepost 65.2. - **Priority?**

6) Next Steps

David Knitowski summarized the next steps of the planning process including the agenda for the 1st Public Meeting. DEA will be conducting two public meetings covering the same agenda with one located in Lakeview for southern Lake County residents and one in Christmas Valley for northern Lake County residents. The public meeting in Lakeview is scheduled for Tuesday, August 6, 2002 at 6:00 pm in Memorial Hall at the Lake County Administration Building. The public meeting in Christmas Valley is scheduled for Wednesday, August 7, 2002 at 7:00 pm in the Community Center. DEA will confirm these times and locations and send out flyers for each public meeting.

7) Next Meeting

The next TAC meeting is scheduled for Tuesday, August 6, 2002 from 10:00 am to 12:00 pm at the Lake County Administration Building.

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SUMMARY
Transportation Advisory Committee (TAC) Meeting #4
August 6, 2002

TAC Meeting #4 for the Lake County Transportation System Plan (TSP) project was held on August 6, 2002 at the Lake County Administration Building. In attendance were:

Swede Barber, ODOT LaPine
Tim Bednar, ODOT Lakeview
Ann Crumrine, Lake County Road Department
Rick DuMilieu, Lake County Road Department
Jim Bryant, ODOT Region 4
Mike Stinson, ODOT Klamath Falls
Mary Bradbury
Phil Fellows
Ray Simms, County Administrator
Bill Barry, Lake County Commissioner
Brad Winters, Lake County Commissioner
David Knitowski, David Evans and Associates, Inc.

The meeting agenda covered six items: 1) Review of Draft Chapter 6: Transportation Improvement Options, 2) Comments on Draft Chapters 1-6 and 9, 3) Roadway Design Standards, 4) Access Management Standards, 5) Special Transportation Areas, and 6) Next Steps.

1) Review of Draft Chapter 6: Transportation Improvement Options

David Knitowski summarized the recommendations for the 23 projects evaluated in the Draft Chapter 6 of the Lake County TSP. TAC members had the following comments:

Project #1 – Safety Improvements Along OR 140 – Add Deep Creek Canyon to Table 6-1.

Project #3 – Continuous Pavement Replacement – This project should be funded through ODOT's Statewide Transportation Improvement Program (STIP) and not through ODOT's maintenance budgets.

Project #4 – Intersection Improvements for the Intersection of US 395 and OR 140 (Warner Highway) – DEA to check crash history.

Project #5 – Intersection Improvements for the Intersection of OR 31 and US 395 – Show a larger turning radius for trucks on the recommended realignment.

Project #6 – Install School Bus Turnaround Near Dent Creek Road Along OR 140 – Are there other solutions? The TAC may need to reevaluate the recommendation. This improvement will not be needed if the student in this area moves. If recommended, ODOT will not construct this project until there is a pavement overlay project in the vicinity. Project may be eligible for hazard elimination funds or enhancement funds.

Project #8 – Improve Signing Throughout Lake County – Signing is generally adequate on the county roads and lacking on the Forest Service and Bureau of Land Management roads. DEA will follow up with the Forest Service and BLM.

Project #9 – Construct Left Turn Lanes to Lake County DOC from US 395 North of Lakeview – TSP states turn lanes are not recommended at this time because the projected traffic volumes don't meet the minimum needed to warrant the turn lanes. TSP should also state that this issue will be revisited when the DOC facility opens.

Project #10 – Upgrade Substandard Shoulders Along State Highways – The TSP should include a policy that ODOT bring highway shoulders up to ODOT's standards when highways are reconstructed.

Project #11 – Localized Shoulder Improvements Along State Highways – Remove projects inside the Lakeview UGB.

Project #12 – Add Bike Lanes Along County Roads – Adding bike lanes to Stock Drive would require widening four bridges. Solution: drop bike lanes at bridges. Other suggested bike lanes (inside Lakeview UGB): P Street (3rd Street to 9th Street); M Street (9th Street to County Road 1-14); and E Street (County Road 1-14 to US 395).

Project #13 – Address S-curve on County Road #5-14 in Christmas Valley – The project description and cost estimate should include overlaying the entire section and not just the shoulders. County Road Department to provide project length.

Project #16 – Intersection Improvements Including Signing and Striping Changes For Four Intersections – Take a stepped approach to the recommended improvements: High Priority – larger stop signs, STOP AHEAD signs, and double arrow signs (ODOT responsibility); Medium Priority – rumble strips (County responsibility); and, if those don't lower accident rates: Low Priority – flashing lights (ODOT responsibility).

Project #17 – Improve Sidewalk Connectivity in Paisley and Christmas Valley – Some concern about not showing sidewalks in these communities. DEA will follow up with representatives from each community.

Project #18 – Provide A Rest Area Near Lakeview – Current recommendation is to improve existing facilities. Add discussion about changing seasonal facilities to year-round facilities. Change reference to "Pine Creek Rest Area" to "Booth State Park Rest Area" and add discussion of Chandler and Goose Lake rest areas.

Project #19 – Improvements to OR 31 in Picture Rock Pass – Mike Stinson will verify cost estimate of $2.8 million.

Project # 21 – Upgrade Substandard Bridges – Need to add two other county bridges to list: Deep Creek Bridge at Adel and Drews Creek Bridge.

Project # 23 – Bank Flattening Through Nevada Curve Along OR 140 (Warner Highway) Near MP 65.2 – The project is not recommended for the Lake County TSP because the section of road is in Harney County. Keep discussion of the project in the TSP so that it can be included on ODOT's needs list.

2) Committee Comments on Draft Chapters 1 through 6 and 9

No members of the TAC had any other comments on Draft Chapters 1-6 and 9.

3) Roadway Design Standards

David Knitowski presented three roadway design standards for the TSP:

- Gravel County Roads – A gravel road standard shall be acceptable for roads that serve less than 200 vehicles per day (vpd). Gravel roads shall be 26 feet wide within a 60-foot right-of-way.

- Paved County Roads – A paved road standard shall be applied to roads that serve more than 200 vehicles per day (vpd). The standard shall include a 24-foot paved surface with 2½-foot gravel shoulders within a 60-foot right-of-way.

- State Highways – State highways shall be paved with 12-foot travel lanes and either 4-foot, 6-foot, or 8-foot paved shoulders depending on the average daily traffic (see ODOT Highway Design Manual, Table 4-5(r)) within a 60-foot right-of-way.

TAC members had the following comments:

- DEA to check these standards against what is required in the Land Development Ordinance.

- TSP should include a disclaimer that the county recognizes that some roads do not meet this standard and the county will only upgrade roads as funding permits.

- The county is not taking in any new roads and is only maintaining the existing inventory.

- TSP should state that county roads shall not have a grade greater than 6 percent.

- Public roads that are not county roads must be maintained by private property owners along road.

- If a road is not brought in to the county road system, does it need to be maintained by a home owners association?

- Add language to the TSP to allow road districts.

- There is an exceptions process for the state highways. If there are no safety problems, an engineer can write up an exception to these standards, wherein the roadway design standard will be implemented when funding becomes available.

4) Access Management Standards

David Knitowski presented access management standards for the state highways and county roads. Access management standards for the state highways shall conform with the 1999 Oregon Highway Plan. David presented different access management standards for county collector roads and county local roads. The response from the TAC was to have one standard for all county roads. The access spacing standard for public street intersections on county roads shall be 500 feet and the access spacing standard for private driveway intersections on county roads shall be 50 feet. Where this standard can not be met, access shall be provided to every lot.

5) Special Transportation Areas

David Knitowski described Special Transportation Areas. The 1999 Oregon Highway Plan allows for the designation of "Special Transportation Areas" (STAs) as a means to "foster compact development patterns in communities." The STA designation is also ODOT's way of recognizing that the function of the state highway is different along a "main street" or in a downtown where convenient local circulation for pedestrians and vehicles is critical to the vitality and economic success of downtown.

The primary objective of managing highway facilities in an STA is to provide access to community activities, businesses, and residences and to accommodate pedestrian movement along and across the highway in downtown, business districts, and community centers. Direct street connections and shared on-street parking are encouraged. Direct property access is very limited in an STA. Local auto, pedestrian, bicycle and transit movements to the business district or community center are generally as important as the through movement of traffic. Traffic speeds are slow, generally 25 mph or less.

The STA designation is a way for communities to get clear agreement from ODOT to manage the state highway as a main street. These features can include wider sidewalks, adding or retaining on-street parking, adding curb extensions, adding street trees, and other measures. There are several reasons for pursuing an STA designation. It gets ODOT approval about how the highway should be managed up front. It prescribes greater flexibility for state highway standards. It changes ODOT mobility and access management standards applied to that segment of the state highway. It may help a community's main street projects qualify for funding, like Immediate Opportunity Funds, Local Street Funding, Oregon Community Development funding, and Federal Transportation Enhancement Funding. State funding programs are emphasizing downtown redevelopment. And, it provides certainty for property owners and local officials about how the highway will be managed. It allows businesses and local governments to make planning and investment decisions along the highway, knowing that any future highway improvements will support, not detract from main street development.

6) Next Steps

David Knitowski summarized the next steps of the planning process including the agenda for the 1st Public Meeting. DEA will be conducting two public meetings covering the same agenda with one located in Lakeview for southern Lake County residents and one in Christmas Valley for northern Lake County residents. The public meeting in Lakeview is scheduled for Tuesday, August 6, 2002 at 6:00 pm in Memorial Hall at the Lake County Administration Building. The public meeting in Christmas Valley is scheduled for Wednesday, August 7, 2002 at 7:00 pm in the Community Center.

The next deliverables will be a draft of Chapter 7 – Street Standards, Access Management Standards, and Modal Plans, and Chapter 8 – Financial Plan.

The next TAC meeting is scheduled for Tuesday, October 1, 2002 from 10:00 am to 12:00 pm at the Lake County Administration Building.

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SUMMARY
Transportation Advisory Committee (TAC) Meeting #5
October 1, 2002

TAC Meeting #5 for the Lake County Transportation System Plan (TSP) project was held on October 1, 2002 at the Lake County Administration Building. In attendance were:

Tim Bednar, ODOT Lakeview
Ann Crumrine, Lake County Road Department
Rick DuMilieu, Lake County Road Department
Jim Bryant, ODOT Region 4
Mary Bradbury
Phil Fellows
Ray Bledsaw
Ray Simms, County Administrator
Brad Winters, Lake County Commissioner
David Knitowski, David Evans and Associates, Inc.
Ryan LeProwse, David Evans and Associates, Inc.

The meeting agenda covered four items: 1) Review of Draft Chapter 7: Transportation System Plan - Roadway Design Standards, Access Management Standards, Modal Plans, and Capital Improvement Program, 2) Review of Draft Chapter 8: Funding Options and Financial Plan, 3) Comments on Draft Chapters 1-9, and 4) Next Steps.

1) Review of Draft Chapter 7: Transportation System Plan

Roadway Design Standards

David Knitowski summarized the three roadway design standards presented in the Draft Chapter. The Lake County Roadmaster would like the road standards to be modified to the following:

- Gravel County Roads – Gravel roads shall be 26 feet wide with two 13-foot travel lanes within a 60-foot right-of-way.
- Paved County Roads – The paved county road standard shall include a 24-foot paved surface with 3-foot gravel shoulders within a 60-foot right-of-way.
- State Highways – State highways shall be paved with 12-foot travel lanes and either 4-foot, 6-foot, or 8-foot paved shoulders depending on the average daily traffic (see ODOT Highway Design Manual, Table 4-5(r)) within an 80- to 100-foot right-of-way.

TAC members had the following comments:

- Collector Roads can be paved or gravel surface.
- Local Roads can be paved or gravel surface.
- These standards shall be applied to new roads and rebuilds, not to maintenance projects.

- TSP should include a disclaimer that the county can deviate from road standards for roads constructed prior to adoption of the TSP and exceptions will be considered through variance process. Add statements to Chapter 7 as well as Chapter 9 (Policy and Ordinances).

- Modify Pavement Design standards from 8-inches of base rock to 15-inches of base rock for both asphalt and gravel road sections.

Access Management Standards

David Knitowski summarized the access management section of the TSP. Chapter 7 presented access management standards for the state highways and county roads. Access management standards for the state highways shall conform with the 1999 Oregon Highway Plan.

The TAC approved the 500-foot access spacing standards for public street intersections along county roads but indicated that Lake County should have different access management standards for private driveway intersections along county collector roads and county local roads. The access spacing standard for private driveway intersections on county collector roads and county local roads shall be 200 feet and 50 feet, respectively. Where this standard can not be met, access shall be provided to every lot. The TAC suggested adding language on access management restrictions to Chapter 9 (Policy and Ordinances).

Modal Plans

David Knitowski then summarized the modal plans presented in the TSP.

TAC members had the following comments on projects:

- **Project #6** - TAC members modified this project to combine the school bus turnaround with enhancement of the existing chain-up area along OR 140 (Klamath Falls-Lakeview Hwy) at Drews Valley. This project will enhance existing chain-up area and will allow school bus turnaround on site. The TAC recommends this project as medium priority.

- **Project #12** - Priority for bike lane projects in Christmas Valley were modified. The highest priority location would be between Old Lake Road and the Post Office. The other two proposed bike lanes in Christmas Valley were modified to medium priority.

- **Project #17** - Length of sidewalk improvements for City of Paisley sidewalks were estimated to be 2200 feet. In addition ODOT representatives have indicated that similar to Paisley, sidewalks should be added in Silver Lake. The length of the proposed sidewalks in Silver Lake was estimated by DEA to be ½ mile in length.

Capital Improvement Program (CIP)

David Knitowski then summarized the Capital Improvement Program (CIP) presented in the TSP. It should be noted that the overall cost for the Lake County 20-year CIP was reduced $62 million considering ODOT did not recommend project 10 as a stand-alone project. Instead ODOT recommends adding appropriate wide shoulders as routine maintenance and/or rehabilitation projects occur.

2) Review of Draft Chapter 8: Funding Options and Financial Plan

Next, David Knitowski summarized Chapter 8 - Funding Options and Financial Plan. Lake County representatives indicated that the Federal Timber Receipts Funding Program ends in 2006. Timber receipts funding beyond 2006 has not been established.

3) Committee Comments on Draft Chapters 1 through 9

No members of the TAC had any other comments on Draft Chapters 1-9.

4) Next Steps

David Knitowski summarized the next steps of the planning process including the agenda for the 2nd Public Meeting. The 2nd public meeting was scheduled for Tuesday, October 1, 2002 at 6:00 pm in Memorial Hall at the Lake County Administration Building in Lakeview.

The next deliverable will be the preliminary draft TSP.

The next and final TAC meeting is scheduled for Wednesday November 6, 2002 from 4:00 pm to 5:00 pm at the Lake County Administration Building.

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SUMMARY
Transportation Advisory Committee (TAC) Meeting #6
November 6, 2002

TAC Meeting #6 for the Lake County Transportation System Plan (TSP) project was held on November 6, 2002 at the Lake County Administration Building. In attendance were:

Don Robinson, ODOT Lakeview
Ann Crumrine, Lake County Road Department
Rick DuMilieu, Lake County Road Department
Bob Doran, ODOT District 10 Manager
Jim Bryant, ODOT Region 4
Phil Fellows
Ray Simms, County Administrator
Brad Winters, Lake County Commissioner
David Knitowski, David Evans and Associates, Inc.
Ryan LeProwse, David Evans and Associates, Inc.

The meeting agenda covered three items: 1) Review of Prioritized 20-Year Transportation Project List, 2) Review of Preliminary Draft TSP, and 3) Next Steps.

1) Review of Prioritized 20-Year Transportation Project List

David Knitowski summarized the 20-Year Transportation Project List which was sent as part of the Executive Summary. The list identifies Lake County's 20-Year Capital Improvement Program (CIP). The total cost for the 20-Year CIP is $81.4 million. The breakdown of high, medium, and low priority are:

- High Priority (2002-2006) - $58.1 million
- Medium Priority (2007-2011) - $6.1 million
- Low Priority (2012-2022) - $17.2 million

2) Review of Preliminary Draft TSP

The only comments received to date were from Jim Bryant and other ODOT staff. The TAC reviewed Jim Bryant's comments. The specific comments included the following:

Page 4-4 – Lake County should adopt a performance standard (Level of Service for county roads) as part of the TSP. --- County standard shall be LOS D.

Page 7-2 – Suggested changing Paved County Road standard from 3 foot gravel shoulder to 4 foot paved or gravel shoulder. --- TAC recommended leaving standard as shown in Preliminary Draft TSP.

Page 9-6 – Suggested modifying statement about which roads county will accept. --- County Commissioners must approve all new roads before they can be accepted into County Road System.

Jim's other comments were about moving some of the sections of Chapter 9 to other places in Chapter 9.

The only other comment was from Ray Simms regarding three fatalities which have occurred within the last six months near Dicks Creek Road. ODOT representatives indicated that within the last week they have received approval to place Truck Tipping Signs near Dicks Creek Road. Based on the new information a paragraph will be added to the crash analysis section of Chapter 4. Jim Bryant also mentioned that safety money is currently available for rural areas.

3) Next Steps

David Knitowski summarized the next steps of the planning process including the agenda for the Planning Commission Hearing. The Planning Commission Hearing was scheduled for Wednesday, November 6, 2002 at 6:00 pm in County Commissioner Meeting Room at the Lake County Administration Building in Lakeview.

Following the Planning Commission Hearing the only two meetings remaining are with the County Commissioners in December. The County Commissioner Hearings will be on Wednesday, December 4, 2002 at 2:30 p.m. in Paisley and on Wednesday, December 18, 2002 at 2:00 p.m. in Lakeview.

SUMMARY
Public Meeting #1 - Lakeview
August 6, 2002

Public Meeting #1 for the Lake County Transportation System Plan (TSP) project was held on August 6, 2002 at the Lake County Administration Building. In attendance were:

Tim Bednar, ODOT Lakeview
Jim Bryant, ODOT Region 4
Ray Simms, County Administrator
Ray Bledsaw, Planning Commission
Ken Kestner, BLM Lakeview
David Knitowski, David Evans and Associates, Inc.

Because only one member of the general public (Ken Kestner) attended, and he said he would attend the Wednesday public meeting in Christmas Valley, the Tuesday meeting in Lakeview was cancelled.

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SUMMARY
Public Meeting #1 – Christmas Valley
August 7, 2002

Public Meeting #1 for the Lake County Transportation System Plan (TSP) project was held on August 7, 2002 at the Christmas Valley Community Center. In attendance were:

Swede Barber, ODOT LaPine
Rick DuMilieu, Lake County Road Department
Jim Bryant, ODOT Region 4
Ray Simms, County Administrator
Ray Bledsaw, Planning Commission
Ken Kestner, BLM Lakeview
Carl Shumway
Robert West
Roger Widenoja
David Knitowski, David Evans and Associates, Inc.

David Knitowski made a brief presentation which included the following:

- Introduction
- Transportation Plan Overview
- Work Completed to Date
- Review of Identified Projects
- Questions and Comments

Questions and comments from the attendees included the following:

- County Road 5-13 between County Road 5-10 and OR 31 is gravel today, can it be paved? The response from the County Road Department was that unless it was an economic development project, it probably couldn't be done. The Road Department doesn't have secure funding. There are no new paving projects on the County's 7-year needs list. The Road Department only has funding to resurface 9 to 10 miles of paved road per year. Paving County Road 5-13 can be listed in the TSP as a need, but not as a funded project.
- 81 percent, not 86 percent, of the paved county roads are in fair or better condition.
- Need to add two other county bridges to the list for repair or replacement: Deep Creek Bridge at Adel and Drews Creek Bridge.
- County Roads 5-14 and 5-10 are the most heavily used county roads. Are traffic counts available for those roads? County Road 1-11 is also heavily used.
- Christmas Valley may need a traffic light on County Road 5-14 in the center of town (intersection of County Road 5-14F) and in front of the post office.

- Speeding on County Road 5-14 in Christmas Valley is an issue.
- Three potential bike paths in Christmas Valley were identified: on County Road 5-14F between County Road 5-14 and the park, on County Road 5-14 between the center of town and the post office, and between the center of town and the library.
- The solution to congestion at the post office may be better access management, or moving the post office to the center of town.
- The proposed access management standards need to account for 100-foot wide lots in Christmas Valley.
- Capital improvements identified in the Lakeview and Christmas Valley airport plans need to be included in the capital improvement program in the TSP.

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SUMMARY
Public Meeting #2 – Lakeview
October 1, 2002

Public Meeting #2 for the Lake County Transportation System Plan (TSP) project was held on October 1, 2002 at the Lake County Administration Building. In attendance were:

Rick DuMilieu, Lake County Road Department
Jim Bryant, ODOT Region 4
Ray Simms, County Administrator
Ronald Johnson
Alan Parks
David Knitowski, David Evans and Associates, Inc.
Ryan LeProwse, David Evans and Associates, Inc.

DEA handed out presentation material to all in attendance and then received questions/comments from the general public.

Ronald Johnson's questions/comments included:

- Truck traffic saves approximately 60 miles between Klamath Falls and Burns by traveling from US 97 across Bear Flat Road and then through Christmas Valley along the Christmas Valley-Wagontire Road to US 395.

- Truck traffic has increased significantly along Christmas Valley-Wagontire Road since Lake County paved the road.

- The travel distance is 400 miles shorter although 4 hours longer between Portland and Los Angeles via US 395 versus I-5. Considering most truck drivers are paid by the mile instead of per hour, Lake County should encourage use of US 395 by trucks for increased economic benefit.

- Accident rates are higher on freeways than on 2-lane highways.

- Other economic benefits from trucks include "Winnemucca to the Sea" and an alternate route to the new freeway proposed between I-82 and Bend.

Alan Park's questions/comments included:

- OR 31 (Fremont Hwy) in the northern section of Lake County between Silver Lake and Klamath/Lake County line has poor highway conditions. It seems as if the base and sub-base were constructed improperly and the highway overlay is just a temporary fix. The problems that existed before the overlay returns within a few years. Indicated that OR 31 was closed for approximately one month in 1992 or 1993 due to freeze/thaw of sub-base of highway.

- A significant portion of Lake County truck traffic occurs on the northern section of OR 31 (Fremont Hwy) between Fort Rock/Christmas Valley and US 97.

- The county roads are in good condition.

- Questioned if County Road Department and ODOT Roadway Maintenance Department could be combined to eliminate the two sets of equipment, staff, etc.? Therefore, Lake County could spend extra income on maintenance needs.

- Questioned whether pavement markings (i.e. fog lines, centerline striping, etc.) could be shifted yearly 1-2 feet to maximize overall pavement conditions before pavement rutting occurs? By shifting travel patterns along highway rutting will take longer to form. Indicated this would only work on highways with substantial paved shoulders and other design considerations.

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