

# **JEFFERSON COUNTY TRANSPORTATION SYSTEM PLAN**

***FINAL DRAFT***

*July 1996*

*Prepared for:  
Jefferson County  
75 SE "C" Street  
Madras, Oregon 97741*

*Created for the ODOT/DLCD Transportation  
and Growth Management Grant Program*

*Prepared by David Evans and Associates, Inc.*

*This project was partially funded by a grant from the Transportation and Growth Management (TGM) Program, a joint program of the Oregon Department of Transportation and the Department of Land Conservation and Development. TGM grants rely on federal Intermodal Surface Transportation Efficiency Act and Oregon Lottery Funds.*

*The contents of this document do not necessarily reflect the views or policies of the State of Oregon.*

## TABLE OF CONTENTS

EXECUTIVE SUMMARY .....	v
CHAPTER 1: INTRODUCTION.....	1-1
THE PLANNING AREA .....	1-1
PLAN ORGANIZATION .....	1-6
Community Involvement.....	1-6
Goals and Objectives:.....	1-7
Review and Inventory of Existing Plans, Policies, and Public Facilities .....	1-7
Future Transportation System Demands .....	1-7
Transportation System Improvements .....	1-7
Modal Plans and Implementation Program .....	1-8
Funding Options .....	1-8
Recommended Policies and Ordinances.....	1-8
CHAPTER 2: GOALS AND OBJECTIVES.....	2-1
CHAPTER 3: TRANSPORTATION SYSTEM INVENTORY .....	3-1
ROADWAY SYSTEM .....	3-1
State Highways .....	3-1
Arterial and Collector Roadways.....	3-2
BICYCLE SYSTEM .....	3-4
PEDESTRIAN SYSTEM.....	3-4
PUBLIC TRANSPORTATION.....	3-4
RAIL SERVICE.....	3-5
AIR SERVICE .....	3-5
PIPELINE SERVICE .....	3-5
WATER SERVICE.....	3-5
CHAPTER 4: CURRENT TRANSPORTATION CONDITIONS .....	4-1
1994 TRAFFIC VOLUMES .....	4-1
1994 OPERATING CONDITIONS .....	4-5
ACCIDENT ANALYSIS .....	4-9
CHAPTER 5: TRAVEL FORECASTS .....	5-1
LAND USE .....	5-1
Historic .....	5-1
Projected.....	5-2
TRAFFIC VOLUMES .....	5-2
Historic .....	5-2
Forecasting Methodology.....	5-3
HIGHWAY SYSTEM CAPACITY .....	5-4

Analysis Results.....	5-4
Improvement Options .....	5-6
CHAPTER 6: TRANSPORTATION IMPROVEMENT OPTIONS ANALYSIS .....	6-1
NO-BUILD ALTERNATIVE.....	6-1
RECOMMENDED TRANSPORTATION SYSTEM IMPROVEMENT OPTIONS.....	6-2
STATE HIGHWAY SYSTEM IMPROVEMENTS .....	6-2
STIP Projects .....	6-3
Passing Lanes.....	6-3
LOCAL TRANSPORTATION SYSTEM IMPROVEMENT OPTIONS .....	6-7
Local Intersection Improvement Projects .....	6-8
Culver And Metolius Improvements .....	6-15
Adopt Policy Protecting Camp Sherman's Rural Character .....	6-16
STREET IMPROVEMENTS CONSIDERED BUT NOT RECOMMENDED .....	6-17
Northern Access to Crooked River Ranch .....	6-17
Improved East-West Connections Between Highways 97 and 26 .....	6-17
CHAPTER 7: ROAD STANDARDS, ACCESS MANAGEMENT, MODAL PLANS AND IMPLEMENTATION PROGRAM.....	7-1
RURAL STREET CLASSIFICATION STANDARDS .....	7-1
Rural Local Streets .....	7-2
Rural Collector Streets.....	7-5
Rural Arterial Streets .....	7-6
URBAN STREET STANDARDS .....	7-6
Urban Residential Streets .....	7-6
Alleys .....	7-7
Urban Collector Streets .....	7-8
Urban Arterial Streets .....	7-8
BICYCLE LANES .....	7-9
SIDEWALKS.....	7-9
CURB PARKING RESTRICTIONS.....	7-9
ACCESS MANAGEMENT.....	7-10
Access Management Techniques.....	7-10
General Access Management Guidelines .....	7-11
Special Access Management Areas in Jefferson County .....	7-12
TRANSPORTATION DEMAND MANAGEMENT .....	7-13
MODAL PLANS .....	7-15
Bicycle Plan .....	7-15
Pedestrian System .....	7-16
Public Transportation .....	7-16
Rail Service .....	7-16
Air Service .....	7-16
Pipeline Service .....	7-16

TRANSPORTATION SYSTEM PLAN IMPLEMENTATION .....	7-17
Land Use Policy and Ordinance Amendments.....	7-17
Development Code Amendments .....	7-18
Planning Coordination.....	7-18
JEFFERSON COUNTY TSP CAPITAL IMPROVEMENT PLAN .....	7-19
STATE HIGHWAY IMPROVEMENTS.....	7-20
STIP Projects .....	7-20
Highway 97 and 26 Passing Lanes .....	7-20
LOCAL SYSTEM IMPROVEMENTS .....	7-20
Intersection Geometry Improvements .....	7-20
Culver And Metolius Improvements .....	7-23
Camp Sherman Rural Character Protection Policy .....	7-24
CHAPTER 8: JEFFERSON COUNTY FUNDING PLAN.....	8-1
JEFFERSON COUNTY TRANSPORTATION PLAN FUNDING REQUIREMENTS .....	8-1
LOCAL AND STATE FUNDING OPTIONS.....	8-3
JEFFERSON COUNTY TRANSPORTATION SYSTEM PLAN FUNDING RECOMMENDATIONS.....	8-5
CHAPTER 9: RECOMMENDED POLICIES AND ORDINANCES: ELEMENTS REQUIRED BY THE TRANSPORTATION PLANNING RULE.....	9-1
Recommended Ordinances for Approval Process.....	9-2
PROTECTING THE EXISTING AND FUTURE OPERATION OF FACILITIES.....	9-3
PROCESS FOR COORDINATED REVIEW OF LAND USE DECISIONS .....	9-20
Recommended Process for Applying Conditions to Development Proposals .....	9-21
Recommended Regulations to Provide Notice to Public Agencies.....	9-21
Recommended Regulations to Assure that Amendments are Consistent with the Transportation System Plan .....	9-22
SAFE AND CONVENIENT PEDESTRIAN AND BICYCLE CIRCULATION.....	9-23
Recommended Ordinances for Bicycle and Pedestrian Circulation and Access .....	9-26
APPENDICES	

## LIST OF TABLES

<u>Table</u>	<u>Page</u>
3-1. 1991 Oregon Highway Plan Levels of Importance.....	3-3
4-1. Level of Service Descriptions .....	4-6
4-2. 1994 Worst Case Scenarios on Heavily Traveled Segments of Roads in Jefferson County .....	4-8
4-3. US Highway 97 Accident Locations .....	4-9
5-1. Jefferson County Population Trends.....	5-1
5-2. Historic Growth Rates on State Highways .....	5-3
5-3. 2015 Worst Case Scenarios on Heavily Traveled Segments of Roads in Jefferson County .....	5-5
6-1. Jefferson County STIP Projects .....	6-3
6-2. Jefferson County TSP Recommended Passing Lanes.....	6-4
6-3. Proposed Jefferson County Intersection Improvement Options .....	6-8
7-1. Recommended Street Standards for Jefferson County.....	7-2
7-2. Recommended Shoulder Widths On Rural Roads .....	7-5
7-3. Access Management Guidelines for State Highways in Jefferson County .....	7-11
7-4. Jefferson County TSP Capital Improvements Plan.....	7-21
9-1. Recommended Street Standards.....	9-30
9-2. Recommended Shoulder Widths.....	9-31

## LIST OF FIGURES

<u>Figure</u>	<u>Page</u>
1-1. Jefferson County Transportation System Plan Study Area.....	1-2
1-2. Cities of Culver and Metolius .....	1-3
1-3. Crooked River Ranch .....	1-4
1-4. Camp Sherman.....	1-5
4-1. 24 Hour Traffic Volumes For Highways 97 and 26: North of Madras .....	4-2
4-2. 24 Hour Traffic Volumes For Highways 97 and 26: South of Madras .....	4-3
4-3. 24 Hour Traffic Volumes For Highway 20 in Jefferson County .....	4-4
6-1. Recommended Passing Lanes For Highway 97 and 26 North of Madras .....	6-5
6-2. Recommended Passing Lanes For Highway 97 and 26 South of Madras .....	6-6
6-3. Jefferson County Intersection Improvement Projects .....	6-9
6-4. Dover, Iris and Jericho Lanes/Highway 97 Intersection Improvement Projects .....	6-10
6-5. Highway 361/Highway 97 Intersection Improvement Project .....	6-12
6-6. Bear Drive/Highway 361 Intersection Improvement Project .....	6-13
6-7. Gem Lane/BNNR Tracks Intersection Improvement Project.....	6-14
7-1. Rural Street Design Standards .....	7-3
7-2. Urban Street Design Standards .....	7-4

## EXECUTIVE SUMMARY

The preparation of the Jefferson County Transportation System Plan was a cooperative effort of Jefferson County, the Cities of Madras, Culver, Metolius, the unincorporated communities of Camp Sherman and the Crooked River Ranch, and the Oregon Department of Transportation (ODOT). The purpose of this plan is to enable Jefferson County to comply with the requirements of the Oregon Transportation Planning Rule (OTP), and to guide transportation and land use planning decisions within the county over the next 20 years. The plan includes specific recommendations on transportation improvements to improve the operation and safety of the existing transportation network within Jefferson County.

In developing the Jefferson County Transportation System Plan, David Evans and Associates (DEA) instituted a comprehensive work program to collect and analyze technical information relating to the County transportation system. The planning process included the formulation of goals and objectives, an inventory and analysis of existing conditions, projections of future conditions, and recommended actions on specific public improvements, access management, and funding. The transportation system plan also includes suggested policies and ordinances to implement the transportation system improvements through the Jefferson County Comprehensive Plan and Development Code.

The population growth rate within Jefferson County has been high in the last few years. However, the historic growth trend has been relatively low outside the incorporated cities. Based on past history and current trends, Jefferson County is projected to grow at an average annual rate of 2.3 percent through 2015. The existing transportation system, with some modifications to improve operation and safety, is expected to function at an acceptable level into the future. If the rate of growth within Jefferson County continues at an unusually high rate, then the recommended transportation improvement projects will need to be constructed sooner than proposed by this system plan.

A series of Management Team, Technical Advisory Committee, and public meetings were held in the County during the course of the study to gather information, identify issues and concerns, and to share study findings and recommendations. The individuals on the Management and Technical Advisory Committee also provided advice and direction on the preparation of the City of Madras Transportation Management Plan which was prepared on a concurrent schedule. The information gathered from all the meetings was used to formulate and refine the Jefferson County Transportation Plan.

The Jefferson County Transportation System Plan contains a number of land use/transportation policies and improvement projects that will provide the direction for the County to comply with the Oregon Transportation Planning Rule and to make needed improvements to the existing transportation network. The following land use/transportation policies are recommended:

- \* Jefferson County needs to complete an inventory of the county road system.
- \* Jefferson County needs to adopt road standards and a functional roadway classification policy that will ensure the safe and efficient operation of the transportation system throughout the county.
- \* Jefferson County, working with the City of Madras, needs to adopt a policy to guide the orderly transfer of jurisdiction for county roads that will be annexed to the city.
- \* Jefferson County needs to coordinate a regional funding strategy for transportation with the incorporated cities and ODOT.
- \* Jefferson County needs to adopt a set of land use and transportation policies and ordinances to implement the TSP. The policies and ordinances will help guide orderly development and enable Jefferson County to plan future system improvements in a cost effective manner.
- \* Jefferson County needs to adopt a policy to encourage the protection of the rural character of Camp Sherman.
- \* Jefferson County needs to adopt a traffic impact analysis ordinance for large development projects.

Specific Improvement Projects include:

- \* Construct passing lanes on Highway 97 north and south of Madras, and passing lanes on Highway 26 north of Madras.
- \* Improve the following road intersections:
  1. Dover Lane/Highway 97
  2. Iris Lane/Highway 97
  3. Jericho Lane/Highway 97
  4. Juniper Butte/Highway 97
  5. Bear Drive/Highway 361
  6. Gem Lane/Burlington Northern Railroad Tracks



- \* Improve the sections of Highway 361 within Culver and Metolius to urban standards, to include wider pavement, marked bike lanes, and curbs, gutters and sidewalks.

Long Range Planning includes:

- \* Monitor the Cherry Lane/Highway 97 intersection for possible future safety related improvements. A traffic analysis of this intersection should be considered at the next periodic review cycle for Jefferson County.

## **CHAPTER 1: INTRODUCTION**

The Jefferson County Transportation System Plan (TSP) provides guidance for the management of the of transportation facilities and recommendations for future improvements. This TSP was prepared to consider the County transportation planning needs 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.

### **THE PLANNING AREA**

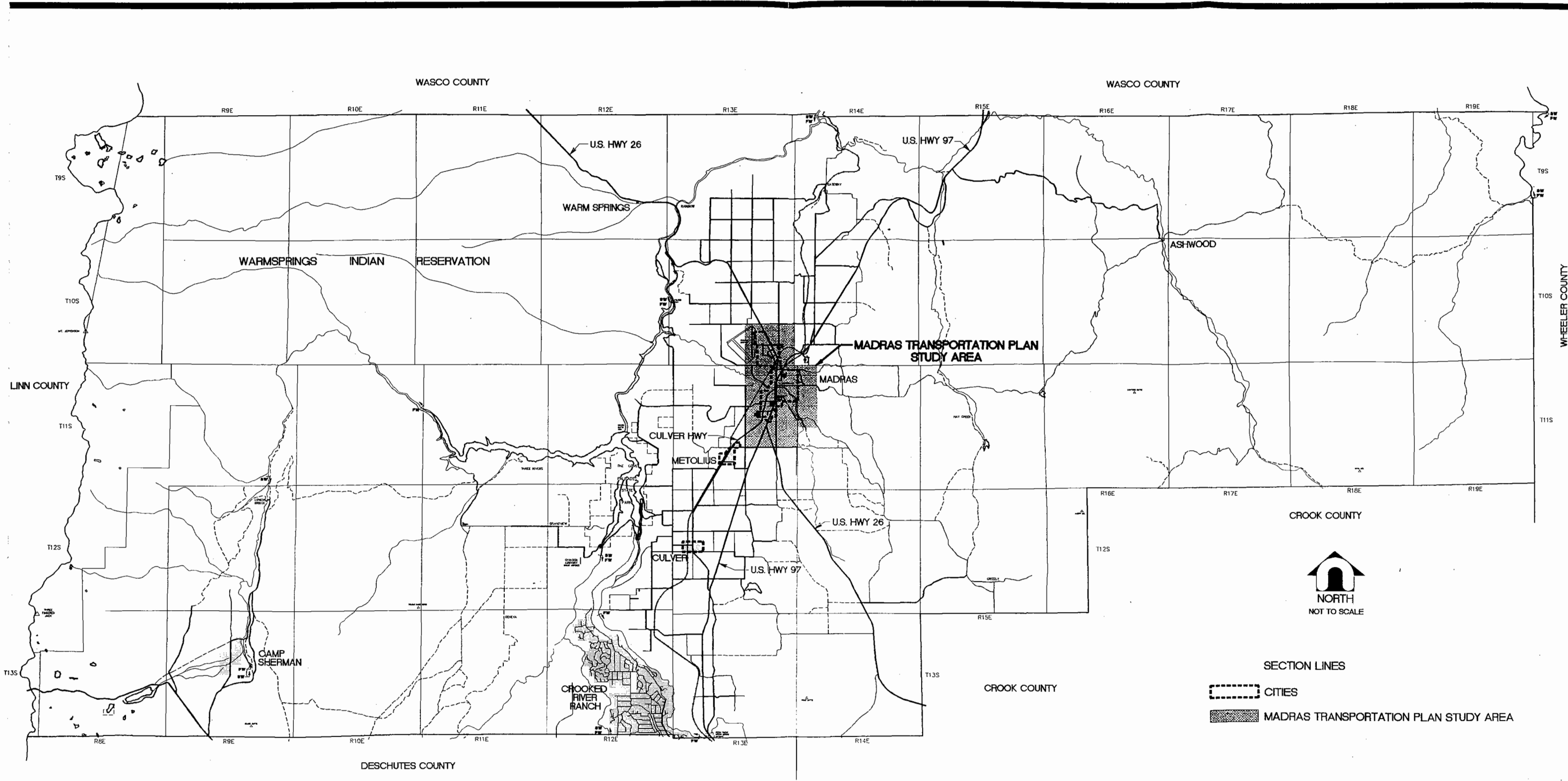
Located in Central Oregon, Jefferson County connects the Cascade Mountains to the high desert region of Oregon (Figure 1-1). Jefferson County is bordered to the north by Wasco County, to the south by Deschutes and Crook Counties, to the east by Wheeler County, and to the west by Linn County. The Jefferson County TSP study area encompasses the entire county except for the Madras Urban Area. This TSP includes Camp Sherman and the portion of the Crooked River Ranch located within Jefferson County. The state highways covered in the Jefferson County TSP include Highways 20, 97, 26, and 361. Culver and Metolius are the only two incorporated cities included in this TSP. These areas are shown on Figures 1-2, 1-3, and 1-4.

The planning area, shown in Figure 1-1, does not include the Madras urban area, which occupies the urban core of the County. The Madras urban area will have its own TSP in coordination with the County and State TSPs. It should be noted that the Madras Transportation Plan area extends beyond that City's current Urban Growth Boundary (UGB). This larger boundary was selected for the Madras planning area because Madras is expected to grow beyond the present UGB during the next 20 years.

The northwest portion of the County is occupied by the Confederated Tribes of Warm Springs. The Oregon Department of Transportation (ODOT) is planning to conduct a separate transportation study for the Warm Springs/Highway 26 area, so it is excluded from the Jefferson County TSP study area as well.

U.S. Highways 26 and 97 are the two most important highways in Jefferson County. Highway 97 (The Dalles-California Highway) runs north-south through the center of the county, bisecting U.S. 26 at the City of Madras. U.S. 26 (Portland to Prineville) traverses the County at a northwest to southeast diagonal and intersects with U.S. 97 in Madras. U.S. 20, linking Central Oregon to Salem and the mid-Willamette Valley) runs through a major recreation area in the southwest corner of the County.

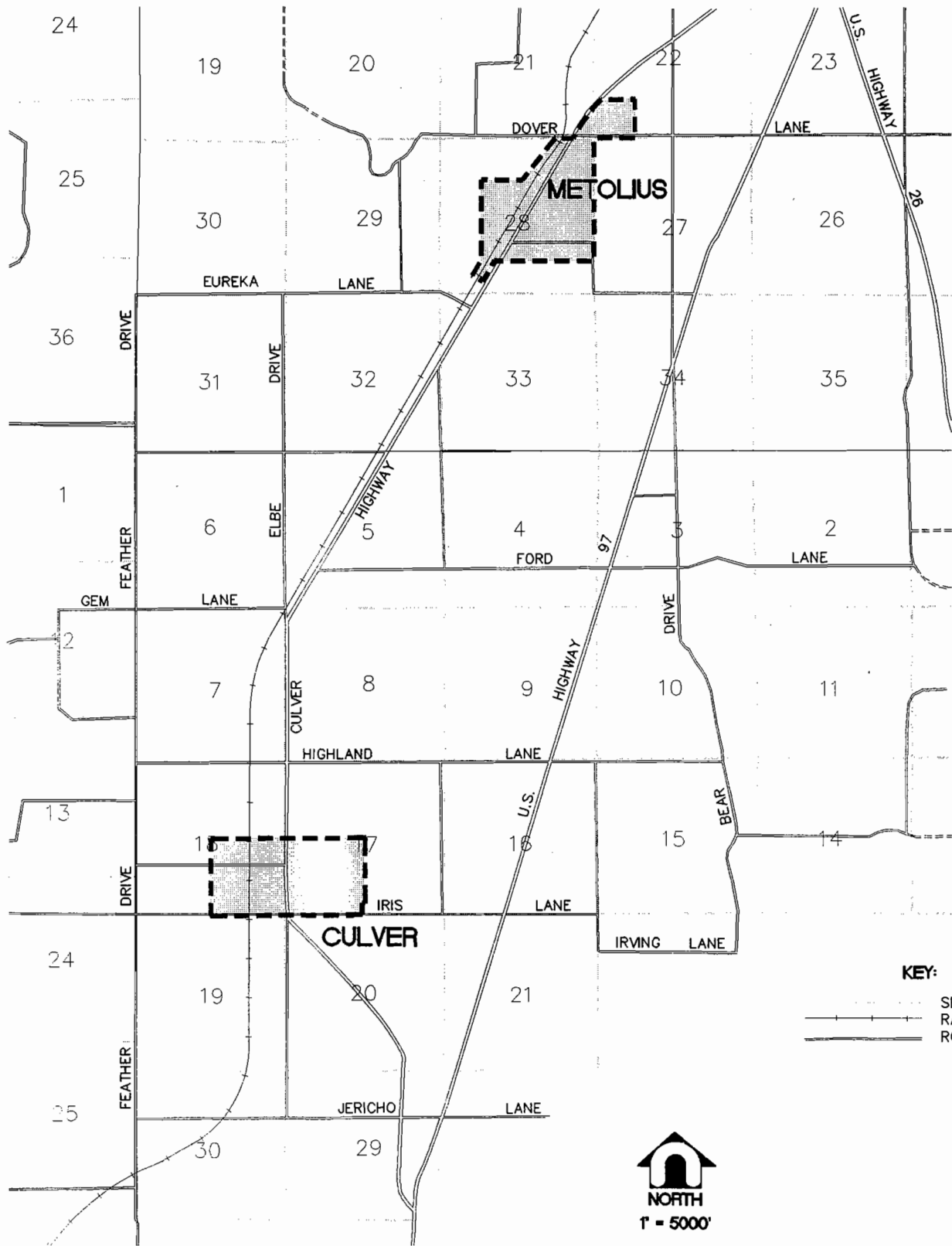
The majority of the County land area is zoned either Forest Management, Rangeland, or Exclusive Farm Use. These rural areas are sparsely populated which is not expected to change during the planning period because of the resource land use designations. Most commercial, residential, manufacturing, and industrial zones are located within the Madras urban area.



scale NOT TO SCALE design  
 date 11/16/95 drawn JHL  
 file JEFF0003/JEFF3-1.DWG

**DEA**  
 DAVID EVANS AND ASSOCIATES, INC  
 709 NW WALL STREET, SUITE 102  
 BEND, OREGON 97701 (503)389-7614

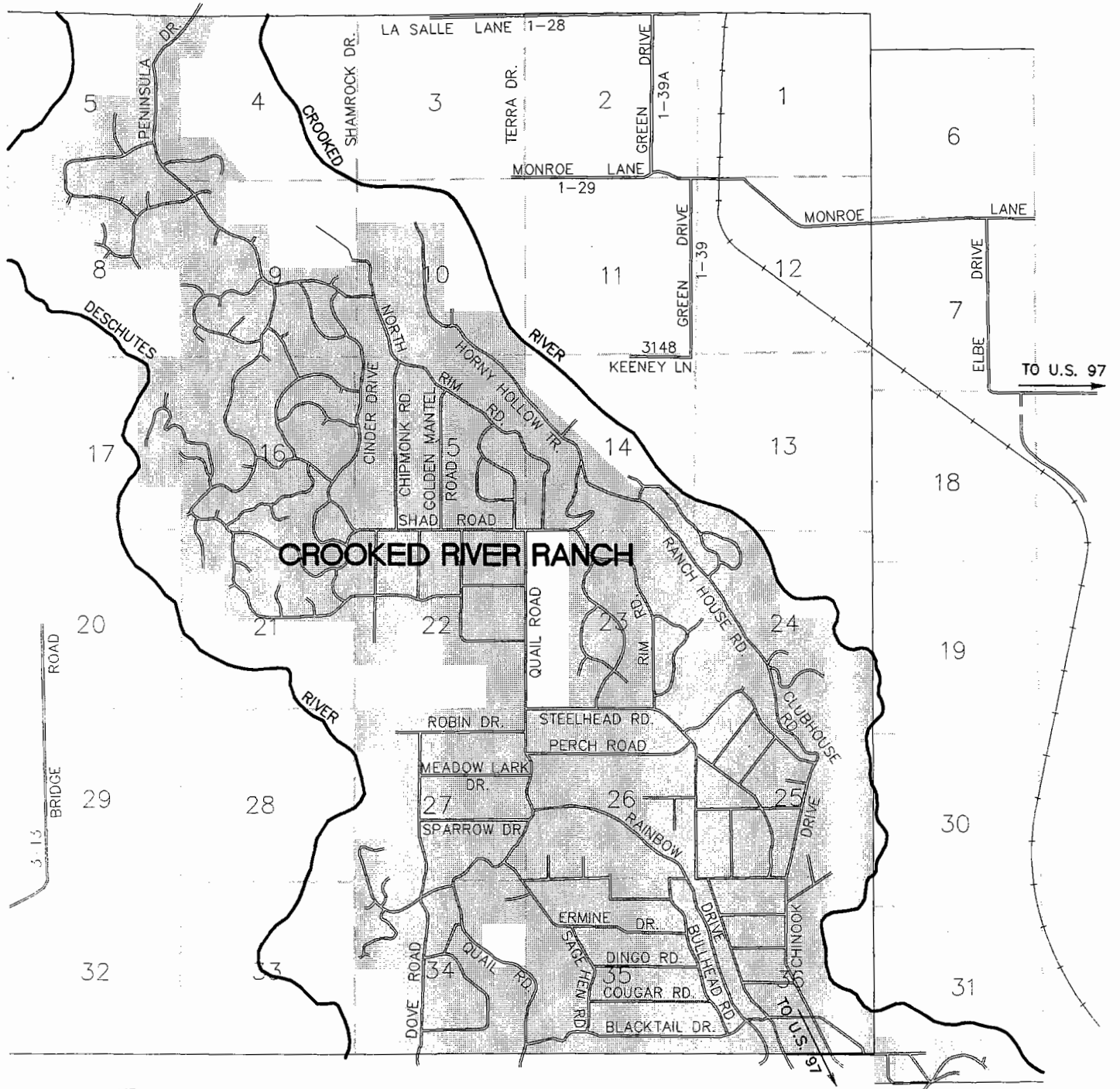
**FIGURE 1-1  
 JEFFERSON COUNTY  
 TRANSPORTATION SYSTEM  
 PLAN STUDY AREA**



scale 1" = 5000' design  
 date 11-15-95 drawn  
 file O:\JEFF0003\JEFF3-2.DWG

**DEA**  
 DAVID EVANS AND ASSOCIATES, INC  
 709 NW WALL STREET, SUITE 102  
 BEND, OREGON 97701 (503)389-7614

FIGURE 1-2  
 CITIES OF CULVER  
 AND METOLIUS



**KEY:**

-  SECTION LINE
-  RAILROAD
-  RIVER
-  ROAD

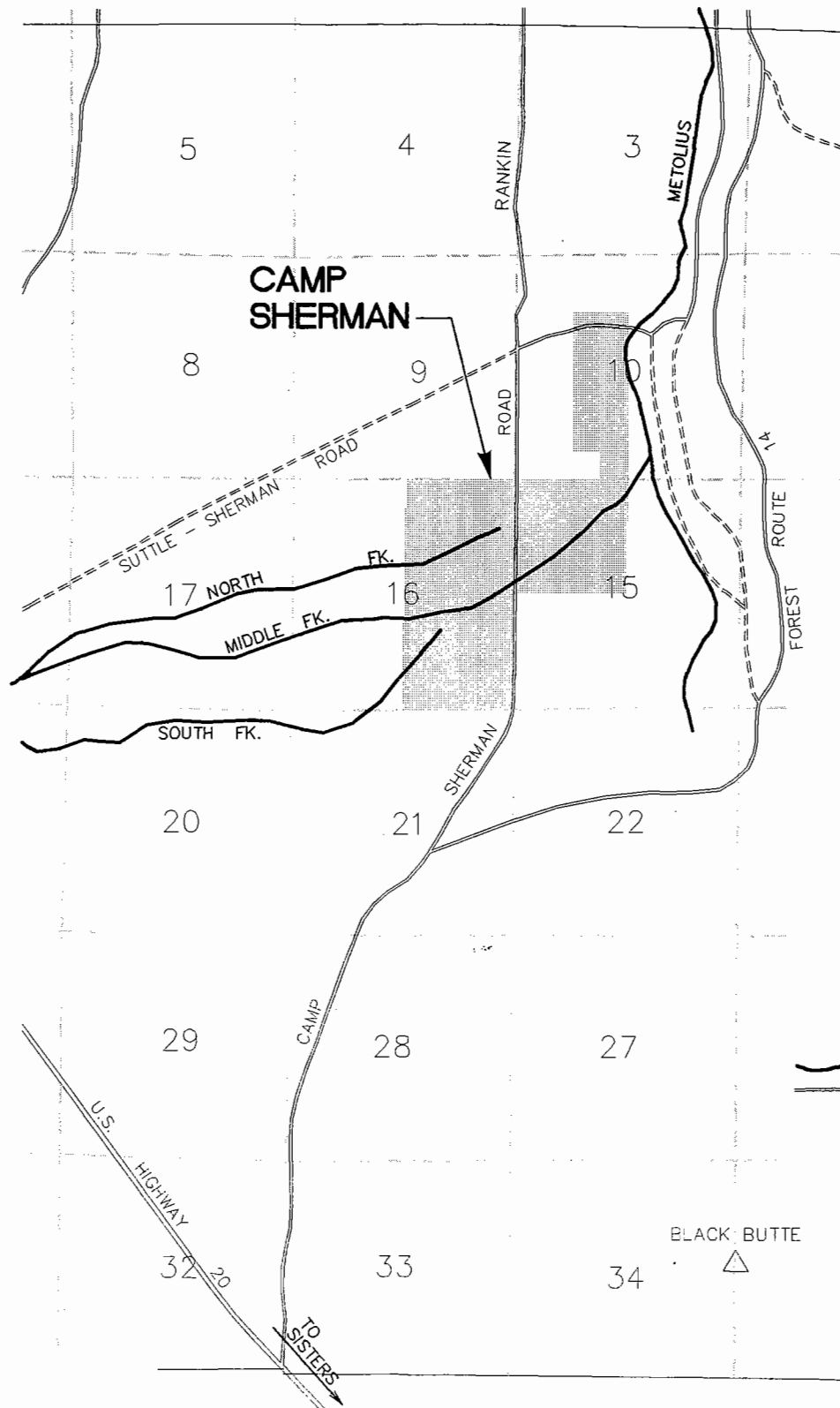


scale 1" = 4500' design  
 date 11-15-95 drawn  
 file O:\JEFF0003\JEFF3-3.DWG



DAVID EVANS AND ASSOCIATES, INC.  
 709 NW WALL STREET, SUITE 102  
 BEND, OREGON 97701 (503)389-7614

**FIGURE 1-3**  
**CROOKED RIVER RANCH**



**KEY:**  
 SECTION LINE  
 RIVER  
 ROAD



scale 1" = 4000' design  
 date 11-15-95 drawn  
 file O:\JEFF0003\JEFF3-4.DWG

**DEA**  
 DAVID EVANS AND ASSOCIATES, INC  
 709 NW WALL STREET, SUITE 102  
 BEND, OREGON 97701 (503)389-7614

**FIGURE 1-4  
 CAMP SHERMAN**

Lesser amounts of urban land use designations can be found in the Culver and Metolius UGBs. These urban areas support the majority of the population in Jefferson County. Smaller pockets of resort and rural residential zoning occur in the southern portion of the County in the vicinity of Camp Sherman. Again, the population of this area is very low and is expected not to increase at a significant rate during the next 20 years.

## **PLAN ORGANIZATION**

The Jefferson County Transportation Plan follows a detailed work program that include the collection and analysis of extensive transportation and land use information and consultation with County Staff and the general public. Key tasks of the Jefferson County TSP work plan are:

- \* Implementation of a Public Involvement Program (Chapter 1)
- \* Formulation of Project Goals and Objectives (Chapter 2)
- \* Review of Existing Transportation and Land Use Plans and Conditions (Chapter 3, Appendix B)
- \* Development of Population/Employment and Travel Forecasts (Chapter 4 and 5)
- \* Evaluation of Transportation System Improvements (Chapter 6)
- \* Formulation of Modal Plans and an Implementation Program (Chapter 7)
- \* Development of Capital Improvement Plan Funding Options (Chapter 8)
- \* Preparation of Implementation Policies and Ordinances (Chapter 9)

**Community Involvement:** Community involvement was an important part of developing the TSP. Interaction with the community was achieved in two ways: holding open community meetings and forming a Transportation Advisory Committee. Since the City of Madras TSP was developed concurrent with the Jefferson County plan, community involvement efforts were combined for the two jurisdictions. The combined community involvement program involved having one Technical Advisory Committee for both planning efforts and holding joint public meetings. This combined effort enabled residents throughout the County to learn about and provide input on both rural and urban transportation issues. Through this process, both the County and the City of Madras are better positioned to coordinate future transportation system projects.

The Transportation Advisory Committee (TAC) was formed to provide guidance to the consultant, to review work products, and to aid the County in making decisions regarding the plan. The TAC consisted of representatives from Crooked River Ranch, Camp Sherman, Culver, Metolius, Jefferson County, City of Madras, and ODOT. TAC meetings were held throughout the planning process.

Four community meetings were held during the planning process. The first two were held in Camp Sherman and Crooked River Ranch at the beginning of the process in a workshop format to solicit public input on issues and problems to be addressed. The results of these meetings formed the basis for the transportation goals and objectives. A third meeting was held in conjunction with the Madras TSP mid-process for community review and comments on the early draft TSP. The fourth and final

meeting was also held in conjunction with the Madras TSP to receive comments on the final draft TSP.

**Goals and Objectives:** A set of project goals and objectives was developed early in the planning process with assistance by the Transportation Advisory Committee and from input from the first community meeting. The goals and objectives were used to formulate and evaluate system improvements for Jefferson County. The project goals and objectives are discussed in Chapter 2.

**Review and Inventory of Existing Plans, Policies, and Public Facilities:** To begin the planning process, existing plans and policies were reviewed and an inventory of public facilities was conducted. The purposes of these efforts were twofold. The review establishes the history of planning in the County, including how population and employment were projected and how those projections compare with current measurements, what street system improvements were planned and which were implemented, how other transportation facilities were planned and implemented, and how the County is currently managing its ongoing development.

The inventory of existing facilities catalogs the current transportation system and identifies how that system currently operates. The results of the inventory are described in Chapter 3 (Current Transportation Conditions), while Chapter 6 (Transportation Improvement Projects) describes measures to address existing system deficiencies.

**Current Transportation Conditions:** The current transportation volumes of the state highways within Jefferson County are detailed in Chapter 4. The highway volumes were available for Highways 20, 26, and 97. Jefferson County did not have a road inventory or traffic volumes for county arterial or collector roads.

**Future Transportation System Demands:** The Transportation Planning Rule requires the TSP to address a 20-year forecasting period. The 20-year travel forecasts were developed based on traffic volumes along the state highways and projections of population and employment developed for the Madras TSP. This process (described in greater detail in Chapter 4) provides a conservative estimate of the transportation needs of Jefferson County. Traffic volume information was not available for any of the county roads in the study area.

**Transportation System Improvements:** Once the public and TAC input, inventory, goals and objectives, and travel forecasting were completed, a series of roadway system improvement options were identified. The first option evaluated was "No Build," which is the existing street system plus any committed street system improvements. Capacity deficiencies for Highways 20, 26 and 97 were projected within the 20-year plan period. In addition, several safety and access management issues were identified during the inventory and public involvement process. Improvement options to correct these problems were identified. After comparing the options with the goals and objectives established at the beginning of the process and with criteria for determining the benefits and costs of



each alternative, a number of transportation system improvements were developed. The specific transportation system improvements recommended for Jefferson County are detailed in Chapter 6.

**Modal Plans and Implementation Program:** The TSP includes all appropriate transportation modes. The street system plan was developed from the inventory, forecasting, and public input process described above. The bicycle and pedestrian plans were developed based on the requirements set forth by the Transportation Planning Rule and on public input. The public transportation, air, water, rail, and pipeline plans were developed based on discussions with the owners and operators of those facilities. Road standards, access management guidelines, modal plans, and an implementation program are detailed in Chapter 7.

**Funding Options:** The funding options examined methods for financing the transportation improvements recommended in Chapter 8. Since the majority of the selected improvement options are on or adjacent to State highways, Jefferson County will need to closely coordinate future funding with ODOT.

**Recommended Policies and Ordinances:** Specific comprehensive plan policy and zoning code ordinance amendments have been formulated to implement the Jefferson County TSP. The policies and ordinances conform with the requirements for the Oregon Transportation Planning Rule and will enable Jefferson County to put the transportation plan into effect. The recommended policies and ordinances developed for small Oregon jurisdictions are detailed in Chapter 9.

## CHAPTER 2: GOALS AND OBJECTIVES

The purpose of the TSP is to provide a guide for Jefferson County to fulfill its transportation goals and objectives. The following goals and objectives were developed from information supplied by the Transportation Advisory Committee, County Staff, and public responses at community meetings.

Goals and objectives pertaining to the Madras urban area were developed as part of the City's TSP. Throughout the planning process, each element of the plan was evaluated against the parameters discussed below.

The overall mission of the Jefferson County TSP is to develop a transportation system that enhances the liveability of Jefferson County and accommodates growth and development through careful planning and management of existing and future transportation facilities. The following goals were developed to achieve this mission:

### **Goal 1: Improve Circulation and Safety Along Highways U.S. 97 and U.S. 26**

#### ***Objectives:***

- A. Control traffic speed along the state highways, especially through the urban areas of Metolius and Culver.
- B. Improve coordination between managing agencies to enhance road maintenance, especially during the winter months.
- C. Consider all reasonable alternatives for efficiently managing the existing transportation system.
- D. Develop access management standards.

Goal 1 was addressed through the formulation of specific improvement options detailed in Chapter 6, the modal plans and implementation program in Chapter 7, and comprehensive plan policies and zoning code ordinances detailed in Chapter 9.

### **GOAL 2: Improve and Enhance Traffic Circulation on the Local Street System**

#### ***Objectives:***

- A. Develop an efficient grid system for each community, considering pedestrian and bicycle circulation, as well as local motor vehicular traffic needs.
- B. Ensure planning coordination between Jefferson County, city governments, and the State.
- C. Identify potential truck routes.
- D. Examine the need for speed reduction in specific areas.
- E. Identify local problem spots and recommend solutions.

This goal was addressed in the formulation of improvement options for Jefferson County discussed in Chapter 6.

### **GOAL 3: Identify Transportation System Needs to Accommodate Developing or Undeveloped Areas Without Undermining the Rural Nature of Communities**

#### ***Objectives:***

- A. Identify improvements to existing policies and standards that address street connectivity and spacing.
- B. Integrate new arterial and collector routes into improved city grid systems with an emphasis on taking the pressure off of traditionally heavy traffic collectors.
- C. Consider a no build alternative and investigate the closure of roads which are not vital to the transportation system, specifically in the Camp Sherman area.
- D. Consider the potential for a northern access to Crooked River Ranch.

The land use planning is in place which will protect resource lands and the rural character of Jefferson County. Goal 3 has been addressed through the development and evaluation of specific improvement options in Chapter 6, and formulation of a specific policy to protect the rural character of Camp Sherman detailed in Chapter 6 and 9.

### **GOAL 4: Increase the Use of Alternative Modes of Transportation (Walking, Bicycling, and Transit) Through Improved Access, Safety, and Service**

#### ***Objectives:***

- A. Provide sidewalks and crossings on arterial and collector streets within the urban areas of Culver and Metolius.
- B. Provide shoulders on rural collectors and arterials.
- C. Provide appropriate bikeways on collectors and arterials within the urban areas of Culver and Metolius.
- D. Examine the potential for a trail between Metolius, Culver, and Madras.
- E. Promote alternative modes and carpool programs through community awareness and education.
- F. Plan for expanded transit service.

The rural character of the county and the distance between destinations will limit the use or introduction of non-motorized travel modes in Jefferson County during the next 20 years. The objectives of Goal 4 have been addressed through the preparation of specific Transportation Modal Plans (Chapter 7).

## **CHAPTER 3: TRANSPORTATION SYSTEM INVENTORY**

As part of the planning process, DEA conducted a limited inventory of the existing transportation system in Jefferson County. This inventory covered the street system as well as the pedestrian system, bikeways, public transportation, rail, air, water, and pipelines. In addition to these transportation modes, transportation demand management measures were also reviewed. Lastly, census data was examined to determine travel mode distributions.

The transportation system inventory examined all modes of transportation for people and goods in Jefferson County except for those facilities which are within the Madras Study Area. The Madras TSP provides a detailed discussion of those transportation facilities within the Madras Urban Area. This section describes the travel modes within Jefferson County and, when possible, the approximate usage of that mode.

### **ROADWAY SYSTEM**

The Jefferson County Roads Inventory includes information that was available on the current transportation conditions on the existing roadways within the county. Jefferson County is in the process of conducting an inventory of their entire transportation system that will extend beyond the completion of the TSP. No current traffic count information on county roads was available for this TSP. Traffic counts along the major state highways within Jefferson County were obtained from ODOT. Traffic counts of some key intersections in the Madras planning area are included in that plan. The analysis of the state highway traffic count information was used to define existing roadway functions.

The existing transportation inventory was conducted for Jefferson County through the use of the County and ODOT data, as well as on-site inspection. The transportation system in Jefferson County consists primarily of state highways and county roadways. Inventory elements included:

- location and jurisdiction
- right-of-way width
- general conditions (such as pavement)

#### **State Highways**

Jefferson County is served by four highways: U.S. 97, U.S. 26, U.S. 20, State 361. All of the highways within Jefferson County are under the jurisdiction and are maintained by ODOT. The state highways are the most heavily traveled roadways within the county.

The 1991 Oregon Highway Plan classifies the state highway system into four levels of importance: Interstate, Statewide, Regional, and District. ODOT has established primary and secondary

functions for each type of highway and objectives for managing the operations for each one, as shown in Table 3-1. Jefferson County includes all of the highway classifications except for "interstate."

- *Statewide Highways.* Highway 97, The Dalles-California Highway, runs north-south through the center of Jefferson County. Highway 26, runs northwest and southeast traversing the center of the County at a diagonal and intersecting with Highway 97 at the north end of Madras. Highway 97 is the major north/south highway route through Central Oregon. It provides a direct connection to Interstate 84 to the north and California on the south. Highway 97 also the primary link to other Central Oregon communities such as Redmond and Bend. Within Madras, Highway 97/26 has divided north-south travel lanes. The section of Highway 26 north of Madras in Jefferson County is of statewide importance. All of Highway 20 within Jefferson County is also of statewide significance. Highway 20 connects Central Oregon to Salem and the Willamette Valley and crosses a major recreation area as it runs through the southwest corner of the County.
- *Regional Highways.* Highway 26 provides a direct east-west link with Eastern Oregon communities. The section of Highway 26 south of Madras is of regional importance. Highway 26 is joined with a section of Highway 97 in the Madras urban area extending from the north end of the City to south of town.
- *District Highways.* Highway 361, the Culver Highway, connects the cities of Culver and Metolius to Madras and Highway 97. It is a primary rural route for agricultural trade and recreational travel to Lake Billy Chinook.

### **Arterial and Collector Roadways**

The four major highways (20, 26, 97, and 361) within Jefferson County serve as arterial roadways. The rural access roads traversing Jefferson County serve for the most part as collectors to the arterial system.

For the most part, Jefferson County roadways are designed to access agricultural areas and small communities. The routes of these rural access roads do not follow a regular pattern (such as a grid pattern) and occur on an as-needed basis throughout the county, often following historic travel patterns. In the rural communities of Crooked River Ranch and Camp Sherman, roads are laid out to serve subdivision lots and central commercial areas.

**TABLE 3-1**

**1991 Oregon Highway Plan Levels of Importance**

<b>Service Level</b>	<b>Description</b>
<b><i>Interstate Highways</i></b>	
Function	To provide connections and links to major cities, regions of the state, and other states. A secondary function in metropolitan areas is to provide connections and links for regional trips within the metropolitan area. Connections are primarily with roadways that serve areas of regional significance or scope.
Management Objective	To provide for safe and efficient high-speed continuous-flow operation in urban and rural areas.
<b><i>Statewide Highways</i></b>	
Function	To provide connections and links to larger urban areas, ports and major recreation areas that are not directly served by interstate highways. Statewide highways provide links to the interstate system and alternate links to other states. A secondary function is to provide links and connections for intra-urban and intra-regional trips. Connections are primarily with roadways that serve areas of regional significance or scope.
Management Objective	To provide for safe and efficient high-speed continuous-flow operation in rural areas and high to moderate-speed operations with limited interruptions of flow in urban and urbanizing areas.
<b><i>Regional Highways</i></b>	
Function	To provide connections and links to areas within regions of the state, between small urbanized areas and larger population centers, and to higher level facilities. A secondary function is to serve land uses in the vicinity of these highways.
Management Objective	To provide for safe and efficient high-speed continuous-flow operation in rural areas, except where there are significant environmental constraints, and moderate to low-speed operation in urban and urbanizing areas with moderate interruptions to flow.
<b><i>District Highways</i></b>	
Function	To serve local traffic and land access. Highways included in this level primarily serve local functions and are of relatively low significance from a statewide perspective. They are often routes that held a higher function during early development of Oregon's highway system. With the passage of time and the construction of other through routes, the importance of these highways from a statewide perspective has diminished. They now serve a similar function to County roads and streets.
Management Objective	To provide for 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 with a moderate to high level of interruptions to flow.

Source: *1991 Oregon Highway Plan, Appendix A, Level of Importance Policy*

In addition to County roads, Federal roads and right-of-ways maintained by the Forest Service and the Bureau of Land Management are located throughout the county, providing access to many isolated locations. The land areas under the jurisdiction of federal agencies have not been included as part of the Jefferson County TSP.

## **BICYCLE SYSTEM**

Typically, bicyclists are accommodated on shared roadways throughout Jefferson County. On shared roadways, bicyclists share the travel lanes with motorists without special provisions or designated space. Sufficient shoulders for cyclists are absent on most rural County roads.

Except for portions of the Culver Highway, the state highways in Jefferson County generally provide adequate shoulders for cyclists. Outside of the Madras urban area, population densities are low and destinations widely spaced, lessening the practicality of bicycling as transportation. However, recreational riding is popular in Jefferson County. There are no bikeways in Culver or Metolius, and bicycle parking is generally absent in these communities.

## **PEDESTRIAN SYSTEM**

In most of Jefferson County, pedestrians share the road with motor vehicles and bicycles by using roadway shoulders where these are present. As noted above, shoulders are absent on most Jefferson County roads.

Except for portions of the Culver Highway, the state highways in Jefferson County generally provide adequate shoulders for pedestrians. Outside of Culver and Metolius, population densities are low and destinations widely spaced, making walking less of a transportation option. However, it is a popular form of exercise and recreation throughout the County. Pedestrian facilities are notably lacking in the small urban areas of Metolius and Culver, and in the rural developments of Crooked River Ranch and Camp Sherman.

## **PUBLIC TRANSPORTATION**

Public transportation in Jefferson County consists of a minibus for local trips, van shuttle for trips to Redmond and Bend, and bus line service for long distance trips. No specific expansions of any of these services is currently planned by any of the transit providers.

Central Oregon Council on Aging's Dial-A-Ride program provides transportation for elderly and disabled. The program serves the local communities surrounding Madras three days a week (Tuesday, Wednesday and Friday), and offers transportation to Bend on Thursdays. The service was established to provide transport to necessary services such as shopping and doctor visits as well as to the Madras Senior Center.

Greyhound Bus Lines provides daily service from Madras to Portland, Yakima, Bend, and Klamath Falls. Riders can make connections to and from any other city in Bend. Bus travel in and out of Jefferson County has decreased over the last decade.

The existing public transportation services meet the basic requirements of the Oregon Transportation Plan. Connections are possible between the services provided, and the service frequency meets the required daily trip to a larger city.

## **RAIL SERVICE**

The Burlington Northern Rail line (BNNR), operated by contract by the Union Pacific Railroad Company, provides vital transport for industrial and agricultural freight through Jefferson County. The Oregon Trunk Line through Jefferson County is classified as a line-haul carrier and is limited to rail yard operating speeds of 20 mph. The majority of the railroad use is concentrated at the Madras Industrial Park where multiple agricultural and industrial businesses ship materials and products via rail. At present, the rail service is sufficient. However, every effort should be made to maintain this service or even expand should growth exceed the projections assumed in the travel forecasting process.

The railroad does not provide commercial passenger service. A more complete discussion of the freight rail service provided to the Madras Industrial Park is covered in the Madras Transportation System Plan.

## **AIR SERVICE**

Jefferson County is currently served by two airports. The City-County Airport, located northwest of Madras, is used by most of the large local business, commercial, and heavy industrial firms as well as the United States Forest Service. The Madras City-County Airport is discussed in more detail in the Madras TSP.

Lake Billy Chinook State Airport also serves the County and is used by smaller operators and recreational pilots. For commercial passenger service, the Redmond Airport is located about 26 miles south in Deschutes County.

## **PIPELINE SERVICE**

Jefferson County is served by a major natural gas line. This line runs through the County from the Cove Canyon area to the Lone Pine area enroute from Canada to California. The line is operated by Pacific Gas and Transmission Company.

## **WATER SERVICE**

There are no significant water borne transportation facilities in Jefferson County.



## CHAPTER 4: CURRENT TRANSPORTATION CONDITIONS

As part of the planning process, the current operating conditions for the transportation system were evaluated. This evaluation focused on street system operating conditions since the automobile is the dominant mode of transportation in Jefferson County. Accident data was also examined to identify any hazardous locations.

### 1994 TRAFFIC VOLUMES

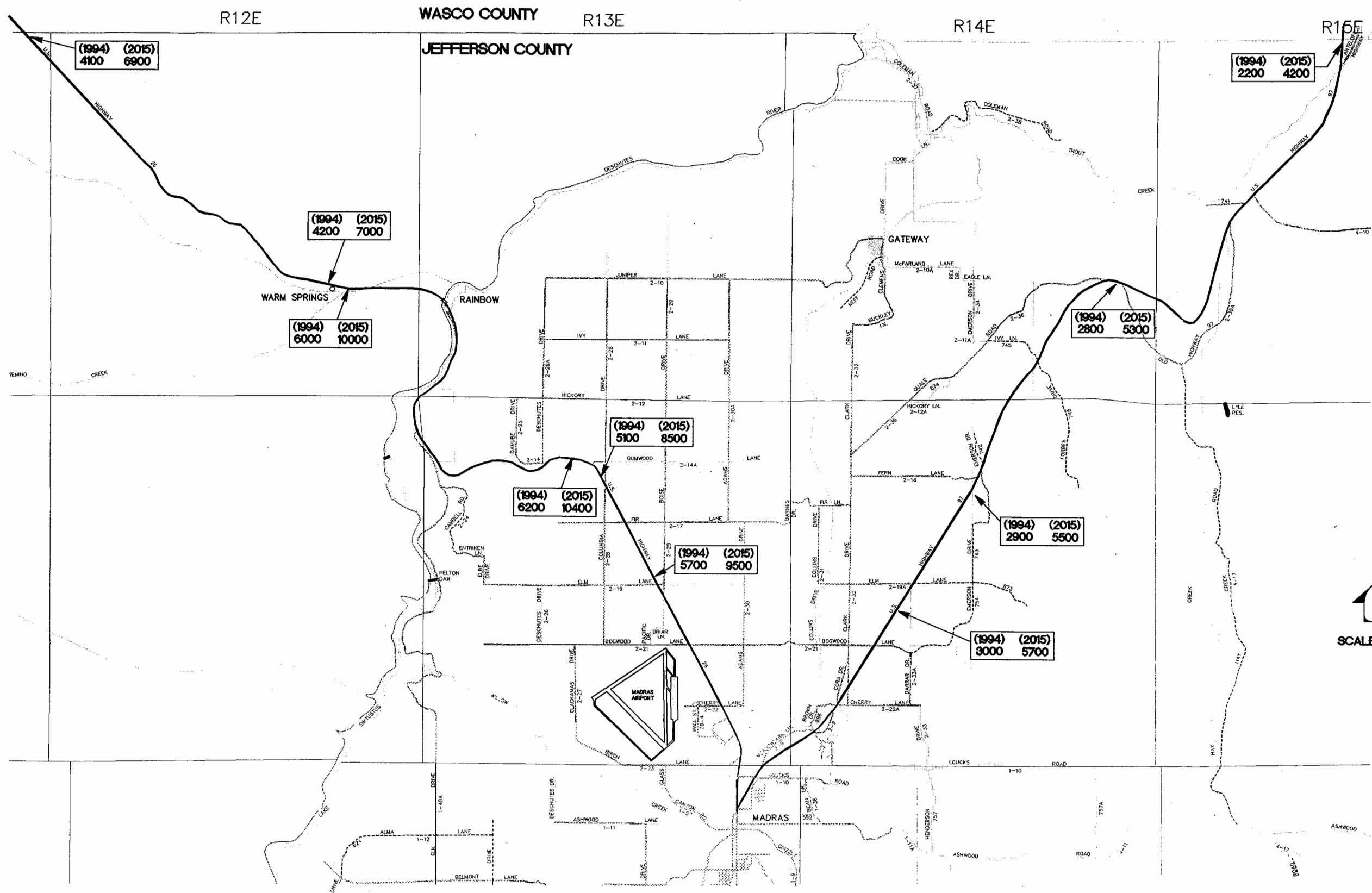
The four state highways (97, 26, 20, and 361) carry the highest traffic volumes in Jefferson County. Twenty-four hour volumes are shown on Figures 4-1 and 4-2 for the highways 97 and 26 segments located north and south of the Madras Urban Area. The Culver and Metolius Urban Areas are also excluded in Figures 4-1 and 4-2. Traffic volumes for Highway 20 are shown on Figure 4-3.

The highest volumes on any road in Jefferson County can be found on Highway 97 south of Madras. A combination of traffic contributes to these high volumes. Through traffic traveling north-south is high on this segment of Highway 97 because it consists of the interstate traffic from Washington and California as well as the traffic to and from Portland. At the same time, the intercity commuter traffic between Madras to the north and Bend, Redmond, and Terrebonne to the south is also very high. Because of the high component of through and intercity traffic, volumes on this section of highway are fairly consistent from south of the Madras urban area to the Jefferson-Deschutes county line.

On the segment of Highway 97 north of Madras, traffic volumes are considerably lower for several reasons. First, the through traffic element on this segment does not include traffic to and from Portland, which travels on Highway 26 north of Madras. Second, because there are no nearby communities on this section of Highway 97, intercity commuter traffic is small. As a result, volumes drop off significantly further north from the Madras urban area.

The segment of Highway 26 northwest of Madras has the second highest traffic volumes in Jefferson County. Like the southern Highway 97 segment, the high volumes are attributable to both through traffic and commuting. The through traffic to and from Portland uses this segment of Highway 26. Warm Springs and Madras are both located on this segment of highway, and there are many trips between these areas. Traffic volumes are greatest near the Madras urban area and again through Warm Springs. Between these communities, volumes are slightly lower.

The segment of Highway 26 southeast of Madras has the lowest traffic volumes of any highway segment in Jefferson County. Both through traffic and intercity commuting (between Madras and Prineville) occur on this highway segment, but the demand is considerably lower than others. Volumes are fairly consistent throughout this section of highway.



**24 HOUR TRAFFIC VOLUMES  
FOR HIGHWAYS 97 + 26:  
NORTH OF THE MADRAS STUDY AREA**

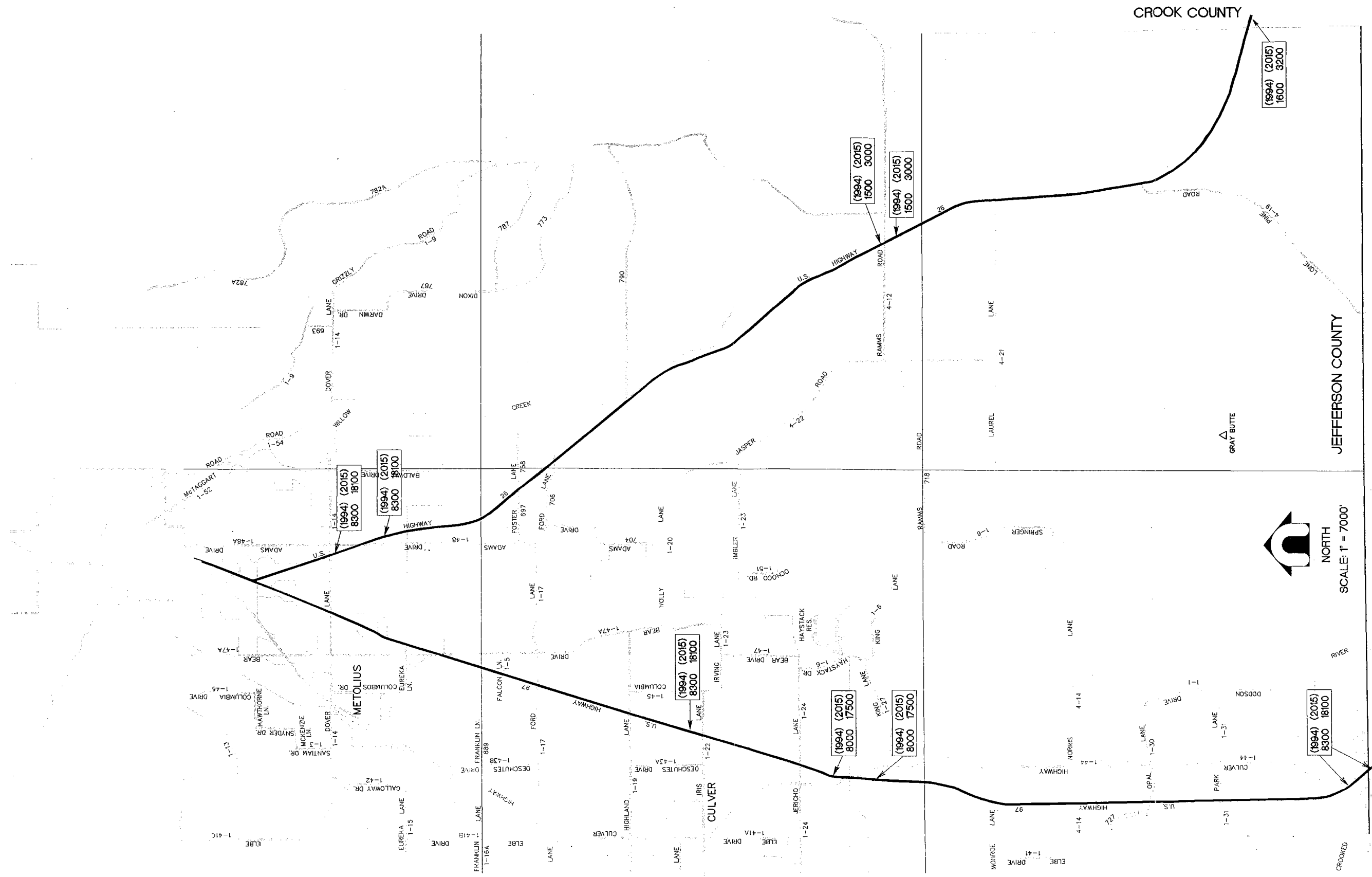
**ae**  
DAVID EVANS AND ASSOCIATES, INC  
709 NW WALL STREET, SUITE 102  
BEND, OREGON 97701 (503)389-7814



SCALE: 1" = 9000'

scale 1" = 9000' design  
date 11-19-95 drawn  
file C:\MADR006\NCOL\INE\DWG

FIGURE 4-1

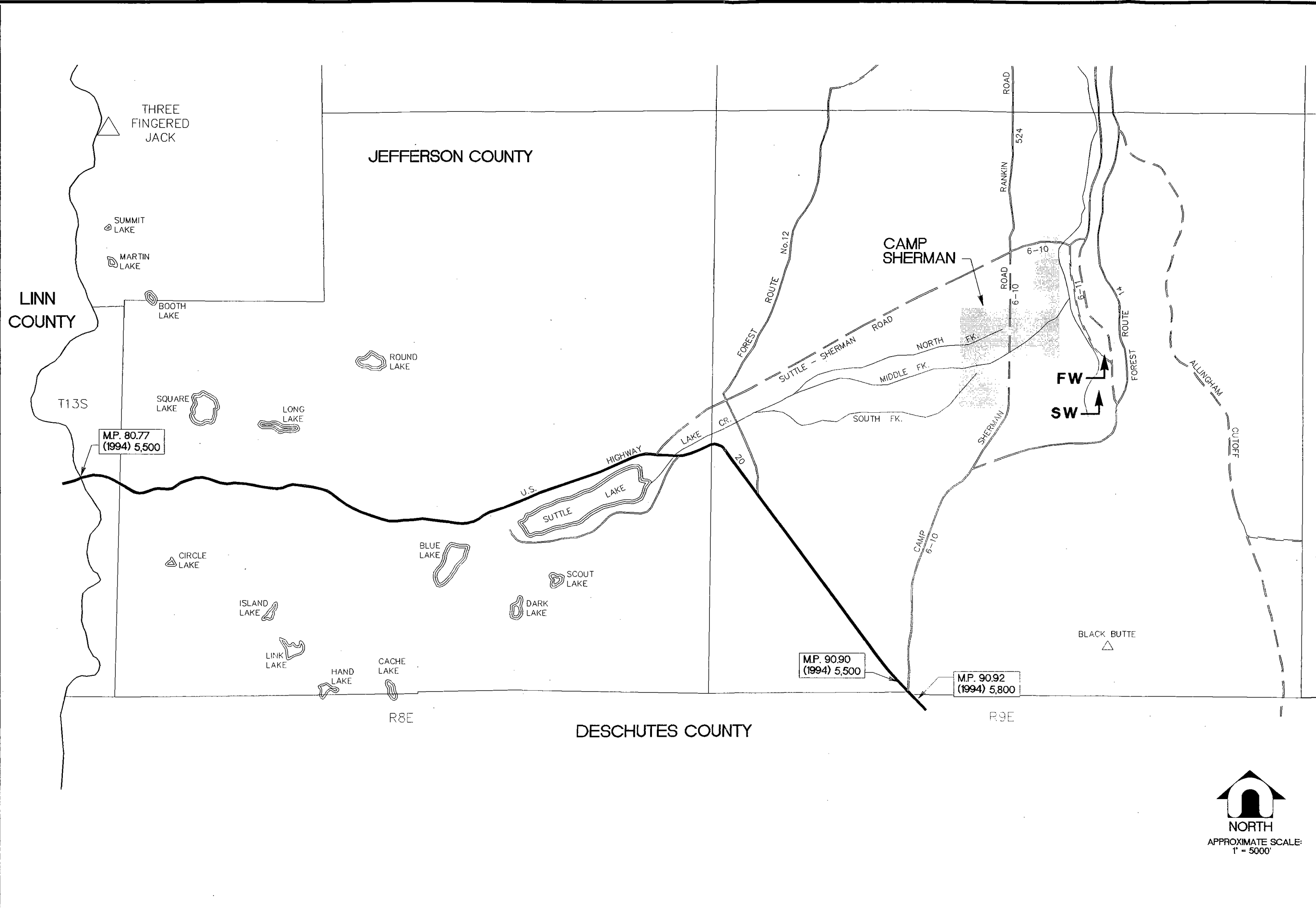


**24 HOUR TRAFFIC VOLUMES  
FOR HIGHWAYS 97, 26, AND 361  
SOUTH OF THE MADRAS STUDY AREA**

**DESA**  
DAVID EVANS AND ASSOCIATES, INC  
709 NW WALL STREET, SUITE 102  
BEND, OREGON 97701 (503)389-7614

scale 1" = 3000' design  
date 11-15-95 drawn  
file O:\MADR0006\SCOLINE.DWG

**FIGURE 4-2**



24 HOUR TRAFFIC VOLUMES  
FOR HIGHWAY 20  
JEFFERSON COUNTY

**de**  
DAVID EVANS AND ASSOCIATES, INC  
709 NW WALL STREET, SUITE 102  
BEND, OREGON 97701 (503)389-7614

scale	NOT TO SCALE	design	SMU
date	4/24/96	drawn	SMU
file	C:\JEFFCOO3\SHRYTRAND.WG		



FIGURE 4-3

The short segment of Highway 20 in Jefferson County has traffic volumes similar to those on Highway 26 north of Madras. This segment carries some east-west through traffic and high volumes of recreational traffic to Camp Sherman immediately adjacent to this highway segment as well as communities further east. Commuter traffic is fairly low since there are only smaller, more distant cities west of this highway segment.

The Culver Highway (Highway 361) carries a moderate amount of traffic. Almost all of this traffic is associated with travel to and from Culver and Metolius. A large part of the traffic is traveling northward to Madras and the other state highways and primary access to the Lake Billy Chinook State Airport. Some is traveling southward to Highway 97. Volumes on this section of highway are greatest near the Madras urban area with smaller peaks in Culver and Metolius. Between cities, the volumes drop off.

## **1994 OPERATING CONDITIONS**

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

On the state highways, two types of operating conditions were evaluated: 1) unsignalized intersection capacity for side streets approaching the highway and 2) two-lane rural highway capacity. For unsignalized intersections, the ability for vehicles to enter the highways from a side street was evaluated together with the ability for highway vehicles to make a left turn onto a side street. Both types of movements are dependent on the number of gaps in the highway traffic stream. The two-lane rural highway evaluation examines the ability of the highway itself to service the traffic demand. It considers operating speed, the number and length of platoons, and the ability to pass slow-moving vehicles. Table 4-1 presents the level of service criteria for these operations.

The Oregon Highway Plan (OHP) establishes operating level of service standards for the state highway system<sup>1</sup>. For Highways of Statewide Importance in rural areas, such as Highways 97, 26, and 20, operating conditions should be at LOS B or better. For Highways of District Importance, such as Highway 361, operating conditions should be at LOS C or better in rural areas and LOS D or better in urban areas.

---

<sup>1</sup> 1991 Oregon Highway Plan, Appendix A, Table 1, *Operating Level of Service Standards for the State Highway System*.

**TABLE 4-1**  
**Level of Service Descriptions**

Level of Service	Unsignalized Intersections	Rural Highways
A	Operations with reserve capacity greater than 400 passenger cars per hour; little or no delay.	The highest quality of traffic service occurs when motorists are able to drive at their desired speed. LOS A, would result in average speeds approaching 60 mph on two-lane highways. The passing frequency required to maintain these speeds has not reached a demanding level. Passing demand is well below passing capacity, and almost no platoons of three or more vehicles are observed. Drivers would be delayed no more than 30 percent of the time by slow-moving vehicles.
B	Operations with reserve capacity of 300 - 399 passenger cars per hour; short traffic delays.	LOS B characterizes the region of traffic flow wherein 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 at the lower boundary of LOS B. Drivers are delayed up to 45 percent of the time on the average. The number of platoons forming in the traffic stream begins to increase dramatically.
C	Operations with reserve capacity of 200 - 299 passenger cars per hour; average traffic delays.	Further increases in flow characterize LOS C, resulting 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. At higher volume levels, chaining of platoons and significant reductions in passing capacity begin to occur. While traffic flow is stable, it is becoming susceptible to congestion due to turning traffic and slow-moving vehicles. Percent time delays are up to 60 percent.
D	Operations with reserve capacity of 100 - 199 passenger cars per hour; long traffic delays.	Unstable traffic flow is approached as traffic flows enter LOS D. Passing becomes extremely difficult. Passing demand is very high, while passing capacity approaches zero. Mean platoon sizes of 5 to 10 vehicles are common, although speeds of 50 mph can still be maintained under ideal conditions. The fraction of no passing zones along the roadway section usually has little influence on passing. Turning vehicles and/or roadside distractions cause major shockwaves in the traffic stream. The percentage of time motorists are delayed approaches 75 percent.
E	Operations with reserve capacity of 0 - 99 passenger cars per hour; long traffic delays.	LOS E is defined as traffic flow conditions on two-lane highways having a percent time delay of greater than 75 percent. 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 virtually impossible under LOS E conditions, and platooning becomes intense when slower vehicles or other interruptions are encountered.
F	Operations where demand volume exceeds capacity of lane, causing extreme delays and queuing.	As with other highway types, LOS F represents heavily congested flow with traffic demand exceeding capacity. Volumes are lower than capacity, and speeds are below capacity speed.

Source: 1985 Highway Capacity Manual, p. 10-9 for Unsignalized Intersections, p. 8-5 and 8-6 for Rural Highways.

To evaluate the operations of each highway segment, the highest volume locations were analyzed. This scenario presents a worst case operating condition on each highway segment. For example, on Highway 97 south of Madras, the highest volume location (8,300 ADT) occurs just outside of the Madras urban area, south of the junction with Highway 26. At this location, highway congestion is greatest and it is most difficult to turn onto or cross the highway from a side street.

For the worst case scenario analysis, side street conditions were evaluated for a representative roadway and not a specific intersection. This methodology was used because side street volumes were not available for the analysis. However, because most of Jefferson County is rural land, volumes on the side streets accessing the highways are very low outside of the cities. An evaluation of available capacity will indicate if long delays are expected or if capacity is adequate to meet any side street demand.

The evaluation is summarized in Table 4-2. Level of service is shown for side streets and highway left turns. The highway mainline volumes show both level of service and the volume to capacity ratio.

Based on this analysis, it appears that most of the highway system and highway approaches in Jefferson County operate within acceptable levels. However, there are a few highway segments where traffic operations do not meet ODOT criteria: Highway 97 south of Madras, Highway 26 north of Madras, and Highway 20 at Camp Sherman. Each of these Highways is of Statewide Significance, with an operating goal of LOS B.

On Highway 97 south of Madras, the segment of highway with the lowest LOS is expected to operate at LOS C/D with a volume-to-capacity ratio of 0.33. This LOS indicates that on the busiest section of the highway, around the junction with Highway 26, congestion is beginning to occur. On a two-lane highway, this means that the average speed on the highway is impacted by slow-moving vehicles and that it is becoming harder to pass because of high volumes in the opposite direction. Although this segment has the lowest level of service on Highway 97 south of Madras, volumes are very high for the roadway between the Jefferson-Deschutes county line and Madras. The entire section would be expected to experience about this level of congestion.

On Highway 26 north of Madras, the segment of highway with the lowest LOS is expected to operate at LOS C with a volume-to-capacity ratio of 0.23. Although congestion on this segment is not as great as on Highway 97, drivers are experiencing some delays behind slow-moving vehicles, platoons of three to five vehicles are forming, and passing is becoming more difficult. This condition would exist not only on the worst segment of highway, but for the entire section between the Madras urban area and Warm Springs.

On Highway 20 at Camp Sherman, the segment of highway with the lowest LOS is expected to operate at LOS C with a volume-to-capacity ratio of 0.22. Conditions on this segment are very similar to those on the north section of Highway 26. Congestion is building and drivers are

experiencing some delays. This condition would be present for the entire length of Highway 20 in Jefferson County.



**TABLE 4-2**  
**1994 Worst Case Scenarios**  
**On Heavily Traveled Segments of Road in Jefferson County**

		Side Street	Highway Left Turn	Highway Mainline
<b>Highway 97 North of Madras</b>	Northbound		A	B-0.15
	Southbound		A	B-0.15
	Eastbound	A		
	Westbound	A		
<b>Highway 97 South of Madras</b>	Northbound		A	C/D-0.33
	Southbound		A	C/D-0.33
	Eastbound	C		
	Westbound	C		
<b>Highway 26 North of Madras</b>	Northbound		A	C-0.23
	Southbound		A	C-0.23
	Eastbound	B		
	Westbound	B		
<b>Highway 26 South of Madras</b>	Northbound		A	A-0.06
	Southbound		A	A-0.06
	Eastbound	A		
	Westbound	A		
<b>Highway 361 South of Madras</b>	Northbound		A	B-0.14
	Southbound		A	B-0.14
	Eastbound	A		
	Westbound	A		
<b>Highway 20 at Camp Sherman</b>	Northbound	A		
	Southbound	A		
	Eastbound		A	C-0.22
	Westbound		A	C-0.22

## ACCIDENT ANALYSIS

Accident data provided by ODOT was examined for the period from January of 1990 through December of 1994. These data include both on-highway and off-highway accidents in Jefferson County.

In Jefferson County (including the urban area of Madras), there were a total of 816 accidents over the four-year period. This included 28 fatal, 360 non-fatal, and 428 property damage accidents. There were no particular locations which showed a consistent accident pattern; the accidents were generally scattered throughout the County. There were no indications that any one location is particularly unsafe or hazardous.

Based on comments made at the three community meetings, many County residents indicated that they believe that US 97 between Madras and Terrebonne is unsafe. However, the accident rate for this entire 16 mile section of highway is close to average for rural highways of this type statewide and is substantially below the accident rate in Madras. Some smaller sections do have a somewhat higher accident rate. A stretch of highway just south of the Jefferson County line in Terrebonne has had a series of personal injury accidents in the last five years (Table 4-3). Deschutes County and ODOT officials may want to explore the cause of these accidents.

**TABLE 4-3**  
**Top Five Accident Locations on Highway 97 Between Madras and Terrebonne**

Rank	MilePost	Location	Number of Accidents	Accident Rate
1	111.5	Terrebonne, Deschutes County	27*	1.42
2	112	Deschutes County	16	1.05
3	98.0	Jefferson County	15	1.08
4	97	Jefferson County	11	.75
5	105	Jefferson County	10**	.75
5	102	Jefferson County	10	.75

\* 31 people injured in those 27 accidents.

\*\* 2 people were killed in one accident.

\*\*\*There was an average of .88 accidents per million vehicle miles for Oregon rural highways in 1994.

From: ODOT 1990-1994 Five Year Accident Priority.

## CHAPTER 5: TRAVEL FORECASTS

The traffic volume forecasts for Jefferson County are based on historic growth on the State highway system, historic population growth, and projected population growth. Forecasts were only prepared for the State highway system in the county, since the volumes on these roadways are much higher than on any of the roads in the County.

### LAND USE

Land use and population growth play an important part in projecting future traffic volumes. Historic trends and their relationship to historic traffic demand are the basis of those projections. Both historic and projected population for Jefferson County are summarized in Table 5-1.

**TABLE 5-1**  
**Jefferson County Population Trends**

	1970	1980	1990	1994 estimate	2015 projected
Jefferson County	8,548	11,599	13,676	15,410	24,660
<i>Census Divisions:</i>					
Ashwood	683	350	326	330	370
Culver	3,065	2,744	3,470	3,860	4,980
Grandview	172	230	351	430	840
Madras	3,304	6,448	7,129	8,070	13,550
Warm Springs	1,324	1,827	2,400	2,720	4,920
<i>Incorporated Cities:</i>					
Culver	407	514	570	645	900
Madras	1,689	2,235	3,443	4,500	8,950
Metolius	270	451	450	545	890

### Historic

Jefferson County has experienced strong growth over the last 25 years, almost doubling in size since 1970. The average annual growth rate was about 2.5 percent per year (80 percent total). Much of this growth was concentrated in the Madras urban area, which has had an average annual growth rate of 3.9 percent per year. The Madras Census Division makes up more than half the Jefferson County population. There was significant growth in the Camp Sherman and Crooked River Ranch areas (Grandview Census Division). In addition, the Warm Springs area also grew at a rapid rate.

### Projected

Population projections in Jefferson County were based on historic growth rates and forecasts by Portland State University Center for Population Research. Factors that will affect the future growth rate of Jefferson County include employment opportunities, available land area for development, and community efforts to manage growth.

In Jefferson County, Madras has the largest industrial land base provided with public services. It is expected that industrial uses will continued to be attracted to the Madras Industrial Park, providing a employment base for Madras and the nearby communities of Metolius and Culver, as well as the Warm Springs reservation.

Much of the land area outside of the Madras urban area is designated as resource land. This land use designation limits the amount of new residential development that can occur outside established urban growth boundaries. In addition, certain rural areas of Jefferson County are anxious to minimize the impacts of growth. Camp Sherman, in particular, does not want new roads constructed within the project area and is working with the Forest Service to close certain roads.

Taking into consideration all of these factors, Jefferson County population is expected to grow about 60 percent (2.3 percent per year) in the next 20 years. This growth rate is very similar, although slightly lower, than historic growth trends. The Madras urban area continues to be a significant contributor to growth in the County. Other areas that expect significant growth are the Warm Springs reservation and the Grandview Census Division, which includes Camp Sherman and part of the Crooked River Ranch. Growth in the communities of Culver and Metolius is expected to be slower than overall county growth, although populations are expected to increase about 25 to 30 percent over the next 20 years.

## **TRAFFIC VOLUMES**

Traffic volume projections are based on historic growth trends for highway volumes and land use and on the future land use projections.

### **Historic**

Before projecting future traffic growth, it is important to examine past growth trends on the Jefferson County roadway system. Historic data is only available for the State highway system in the County; however, these roadways carry far more traffic than any other streets in the county outside of the Madras urban area.

Jefferson County has six distinct State highway sections within its boundaries: Highway 97 north and south of Madras, Highway 26 north and south of Madras, and Highway 361 south of Madras, and Highway 20 at Camp Sherman. Table 5-2 summarizes the historic average growth rate on each of these sections.

**TABLE 5-2**  
**Historic Growth Rates on State Highways**

Highway Section	Average Annual Growth Rate 1974-1994	Total Growth 1974-1994
Highway 97 North of Madras	3.1%	85%
Highway 97 South of Madras	3.8%	110%
Highway 26 North of Madras	2.5%	65%
Highway 26 South of Madras	3.3%	90%
Highway 361 South of Madras	3.3%	90%
Highway 20 at Camp Sherman	4.8%	155%

In all cases, growth on the highways exceeded the population growth in Jefferson County itself. This relationship reflects the modern trend toward an increase in per capita vehicle miles travelled, so that through traffic is probably growing at a higher rate than the County population. It also indicates that trips in and out of the County, such as intercity commuter trips, are also increasing.

### **Forecasting Methodology**

The forecasting methodology used to project 2015 traffic volumes assumes that the relationship between population and traffic demand will continue to remain the same. This methodology forecasts significant traffic growth over the next 20 years, and is probably conservative since the goal of the Transportation Planning Rule (TPR) is to reduce reliance on the automobile. Carpooling, vanpooling, transit, alternative shift scheduling, and other transportation demand management measures are all designed to reduce the number of auto trips per capita that will be made in the future.

Historically, population in Jefferson County has grown at a rate of about 2.4 to 2.5 percent per year. During that same period, traffic volumes on the state highway system grew at a higher rate, depending on the section of highway.

In the future, population in Jefferson County is projected to grow at a rate of about 2.3 to 2.4 percent per year. This rate is almost the same as the historic rate, with a similar distribution of growth within the County as well.

Because the historic and projected population rates are virtually the same, it was assumed that the historic and projected growth in traffic demand would also be the same. For example, the average rate of traffic increase over the past 20 years on Highway 97 north of Madras was 3.1 percent. During roughly the same period, population grew by 2.4 percent a year. The projected population

increase for Jefferson County is 2.3 percent a year for the next 20 years. Therefore, this forecast assumes Highway 97 will experience a 3.1 percent growth in traffic each year for the next 20 years.

Using the methodology previously described, traffic volumes are projected to grow between 65 and 155 percent over the next 20 years. These volumes are shown on Figures 4-2 and 4-3 in Chapter 4.

## **HIGHWAY SYSTEM CAPACITY**

By the year 2015, the projections show that travel conditions would worsen in Jefferson County, with several highway sections and side streets expected to be highly congested. Highway segments that are not expected to meet ODOT standards by the year 2015 include parts of Highway 97 both north and south of Madras, Highway 26 north of Madras, and Highway 20 at Camp Sherman. Side street accesses along these segments are also expected to experience significant delays. The results of the unsignalized intersection and rural highway analyses are shown in Table 5-3.

### **Analysis Results**

On Highway 97 north of Madras, the projections indicate that conditions would drop to Level Of Service C (LOS C) by the year 2015. This indicates that slow-moving vehicles would impact the overall travel speed on the highway, platoons would be longer and more frequent, and passing would be more difficult. These conditions would exist primarily on the segments of highway closest to the Madras urban area. Further north on the highway, conditions would be at LOS B.

On Highway 97 south of Madras, the projections indicate that conditions would drop to LOS E by the year 2015 and side streets would also experience significant delays. All of this section of highway from the Madras urban area to the Jefferson-Deschutes county line would see reductions in average travel speed consistently below 50 miles per hour, with long platoons of vehicles, and virtually no opportunity to pass. Side streets on this highway section would operate at LOS E, indicating traffic delays of a minute or more.

On Highway 26 north of Madras, the projections indicate that conditions would drop to LOS D by the year 2015 with side streets operating at LOS D as well. Conditions on this section of highway would not be as congested as the southern section of Highway 97; however, average speeds would begin to drop to around 50 miles per hour and passing would be very difficult. Side street accesses would experience delays of about 30 to 60 seconds. This level of operation would apply from the Madras urban area to Warm Springs.

On Highway 20 at Camp Sherman, the projections indicate that conditions would drop to LOS E by the year 2015 for both the highway section and the side streets. Conditions will be similar to those described for the southern section of Highway 97.

**TABLE 5-3**  
**2015 Worst Case Scenarios**  
**On Heavily Traveled Segments of Road in Jefferson County**

		Side Street	Highway Left Turn	Highway Mainline
<b>Highway 97 North of Madras</b>	Northbound		A (A)	C-0.29 (B-0.15)
	Southbound		A (A)	C-0.29 (B-0.15)
	Eastbound	B (A)		
	Westbound	B (A)		
<b>Highway 97 South of Madras</b>	Northbound		C (A)	E-0.73 (C/D-0.33)
	Southbound		A (A)	E-0.73 (C/D-0.33)
	Eastbound	E (C)		
	Westbound	E (C)		
<b>Highway 26 North of Madras</b>	Northbound		A (A)	D-0.38 (C-0.23)
	Southbound		A (A)	D-0.38 (C-0.23)
	Eastbound	D (B)		
	Westbound	D (B)		
<b>Highway 26 South of Madras</b>	Northbound		A (A)	B-0.13 (A-0.06)
	Southbound		A (A)	B-0.13 (A-0.06)
	Eastbound	A (A)		
	Westbound	A (A)		
<b>Highway 361 South of Madras</b>	Northbound		A (A)	C-0.28 (B-0.14)
	Southbound		A (A)	C-0.28 (B-0.14)
	Eastbound	B (A)		
	Westbound	B (A)		
<b>Highway 20 at Camp Sherman</b>	Northbound	E (A)		
	Southbound	E (A)		
	Eastbound		B (A)	D-0.59 (C-0.22)
	Westbound		A (A)	D-0.59 (C-0.22)

Note: The analysis results for 1994 Worst Case Scenarios are presented in parentheses.

## **Improvement Options**

The Highway 97/26 corridor is the major transportation facility in the County and is categorized as a Highway of Statewide Importance. One method ODOT has for improving the movement of traffic along state highways is to construct passing lanes. In accordance with this, ODOT has a goal of passing lanes at least every three miles (discussed further in Chapter 6). These passing lanes currently do not exist and are improvements included in the TSP. Passing lanes will also increase the capacity of the corridor.

Little can be done to improve the capacity of the side street accesses along the highway corridors. Because these sections are serving rural lands, with very low demand at any particularly intersection, traffic signals are not necessary. Improvements included in Chapter 6 (Transportation Improvement Projects) recommend projects and strategies to enhance intersection safety and perhaps provide some minor increases in capacity by revising geometry.



## **CHAPTER 6: TRANSPORTATION IMPROVEMENT OPTIONS ANALYSIS**

As required by the Oregon Transportation Planning Rule, transportation alternatives were formulated and evaluated for the Jefferson County Transportation System Plan. From this alternative analysis, a list of transportation system improvement options were developed based on the technical analysis and input from the public involvement program. A range of transportation system improvements were formulated to address the goals and objectives of the Jefferson County TSP.

As part of this analysis, all travel modes were considered. The proposed transportation system improvements recommended for the Jefferson County TSP include both state highway and county road related projects. This section of the TSP describes the individual improvements and their associated costs. It starts with the required "No-Build" alternative, and include recommended improvements and improvements considered but not recommended for Jefferson County.

### **NO-BUILD ALTERNATIVE**

The "No-Build" alternative establishes the baseline for developing and evaluating transportation system improvements for a community. This alternative assumes that no major changes will be made to the existing transportation system over the next 20 years. By comparing the unchanged transportation system with the future traffic demand, a determination can be made as to what transportation improvements will be needed during the planning period.

As shown in Chapters 4 and 5, the Jefferson County transportation system does not currently have major deficiencies. Likewise, based on the low projected population and traffic volume growth during the next 20 years, major improvements to the existing system are not anticipated. Rather, a range of improvements were developed to address existing safety concerns and improve the movement of traffic along the state highway and county roads within Jefferson County.

In the "No-Build" alternative for Jefferson County, future transportation system improvements are not critical to correct either existing or future problems. If no improvements are made during the 20 year planning period, the existing state highway and county road system is still expected to operate at an acceptable level, except for a segment of Highway 97 south of the Madras urban area. However, if no improvements are made during the next 20 years, it is expected that traffic safety on the road systems within the County will decline over time. This reduction in safety will be caused by the increased incidence of accidents along state highways and at the intersections of county roads with the state highways. Based on safety considerations, the "No-Build" scenario was not considered to be an acceptable alternative for the Jefferson County planning area.

### **RECOMMENDED TRANSPORTATION SYSTEM IMPROVEMENT OPTIONS**

The recommended transportation system options were developed through information derived from County and ODOT Staff, the TAC, and the general public and from an analysis of the future projected population and traffic volume increases over the next 20 years. As stated above, traffic safety was the major consideration in formulating transportation system improvement options for Jefferson County. In this analysis, all of the system improvements are directed to the state highway routes and county roads because the use of other transportation modes are not now nor expected to be significantly important during the planning period.

The transportation system improvement analysis focussed on Highways 97 and 26 and on the major county roads. The need to add additional passing lanes was the major improvement option identified for the state highway routes within Jefferson County. Passing lanes have been recommended for specific highway segments to improve traffic movements in and out of the Madras urban area where the majority of population growth is expected to occur within the county. An assumption has been made that the construction of new passing lanes will be funded by ODOT during the next 20 years.

A range of local transportation system improvements have been recommended including the reconstruction of existing county road intersections, improving the main streets in the Cities of Culver and Metolius, and a comprehensive plan policy to protect the Camp Sherman area. A number of state highway/county road intersection improvement options have been identified to improve traffic safety. All of these improvements would occur at existing intersections that already experience problems related to their geometric design. The Culver and Metolius improvement option would provide sidewalks and bicycle lanes consolidate driveways, and address traffic safety issues related to State Highway 361. The Camp Sherman policy recommendation would consider livability factors of this recreational area. Jefferson County would be expected to be the lead funding agency for all the local system improvements identified in the TSP.

## **STATE HIGHWAY SYSTEM IMPROVEMENTS**

The Oregon Department of Transportation has a comprehensive transportation improvement and maintenance program that covers the entire state highway system. The Statewide Transportation Improvement Program (STIP) identifies all the highway improvement projects in Oregon. The STIP lists specific projects, the counties in which they are located, and their construction year. In addition, each ODOT Region also has other ongoing improvement programs for some improvement and maintenance activities. In Region 4, the construction of additional passing lanes along US Highways 97 and 26 have been planned and programmed to address traffic safety and traffic flow issues. Both the STIP and Region improvement and maintenance programs are coordinated with highway corridor and system planning efforts.

### **STIP Projects**

In the 1996-1998 STIP, published in 1995, identified six major highway improvement projects within Jefferson County. These projects have been programmed to be constructed during the next three years to address specific traffic safety problems and to increase traffic flow and capacity. The six Jefferson County STIP projects are shown in Table 6-1. Four of the projects are for transportation related projects along US Highway 97 while two have been identified along US Highway 26 within Jefferson County. The costs of the six specific STIP projects are discussed in Chapter 7.

**TABLE 6-1**  
**Jefferson County STIP Projects**

<b>HIGHWAY</b>	<b>PROJECT</b>	<b>DESCRIPTION</b>	<b>CONSTRUCTION YEAR</b>
1. US Highway 97	Madras-Crooked River	Shoulder Widening Overlay	1996
2. US Highway 97	Crooked River Bridge	New Bridge	1997
3. US Highway 97	Hwy 26 at Depot Road	Left-Turn Lane	1997
4. US Highway 97	Hay Creek Bridge	New Bridge	1998
5. US Highway 26	Hwy 26 Overlay M.P. 96.4-M.P. 103.2	Overlay	1998

**Passing Lanes**

The need to consider the construction of new passing lanes along the state highway routes within Jefferson County was determined from the analysis of the existing traffic movement patterns and the expected increase of traffic over the next 20 years. The analysis showed that traffic volumes are and will continue to be heaviest near the Madras area where the majority of population within the county is concentrated. The construction of new passing lanes on Highway 97 and 26 outside the Madras area can improve the traffic flow and reduce accidents caused by unsafe passing movements.

Detailed below are a number of suggested passing lane projects for both Highway 97 and 26 within Jefferson County (Table 6-2). The timing for constructing the new passing lanes will be dependent on available state funding and will require a more detailed analysis by ODOT. No passing lane additions have been recommended for Highway 361 because they are not warranted by traffic volumes and no passing lane additions are recommended for Highway 20 because only a short segment of this highway is located within Jefferson County.

**Highway 97 Passing Lanes**

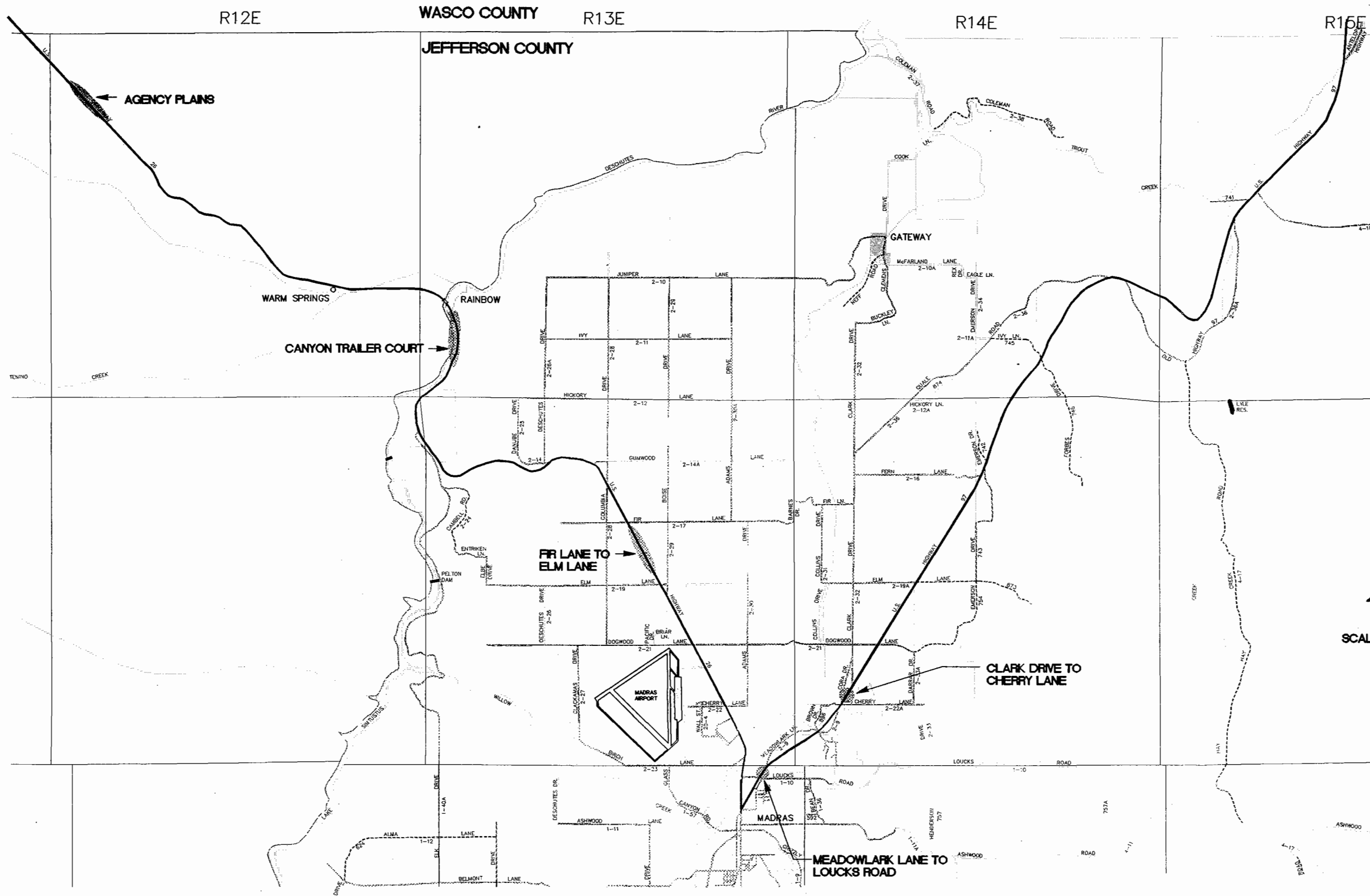
At the present time, there are only two sets of passing lanes on Highway 97 within Jefferson County. One set of passing lanes is located along Highway 97 northeast of Madras. The other segment is located on the 17 mile section of highway south of Madras. ODOT is in the processing of developing a transportation strategy for Highway 97 to improve the movement of all vehicles and improve traffic safety. This four part strategy calls for the installation of new passing lanes, continuous four highway sections, separated crossings, and frontage roads. In Jefferson County the new highway strategy recommends that ultimately improving Highway 97 from Madras to LaPine as a four-lane, controlled access facility. At this point, however, only passing lanes will be needed to improve traffic movements and safety. In Madras, Highway 97 is already divided into continuous lanes and a separated crossing will be considered at the Highway 97/26 junction on the north end of town.

This new strategy recommends that passing lanes be constructed at approximate three mile intervals along the entire length of Highway 97 within Oregon. The siting of new passing lanes requires the consideration of available straight sections of highway and potential conflicts with intersecting roads. The recommended passing lanes are detailed below and shown on Table 6-2.

**TABLE 6-2  
Jefferson County TSP Recommended Passing Lanes**

<b>Highway 97</b>	
North of Madras	Loucks Road/Meadowlark Lane
	Cherry Lane/Clarks Lane
South of Madras	Dover Lane
	Eureka Lane
	Iris Lane
	Jericho Lane
	Park Lane
<b>Highway 26</b>	
North of Madras	Fir Lane/Elm Lane
	Canyon Trailer Court

North of Madras, new passing lanes are recommended for the Highway 97 segments located in the vicinity of Loucks Road/Meadowlark Lane and Cherry Lane/Clarks Lane (Figure 6-1). As proposed one north bound passing lane would be constructed for each highway segment. These passing lane segments would help to disperse traffic leaving the Madras urban area. It is recommended that the Loucks Road/Meadowlark Lane segment be constructed first when

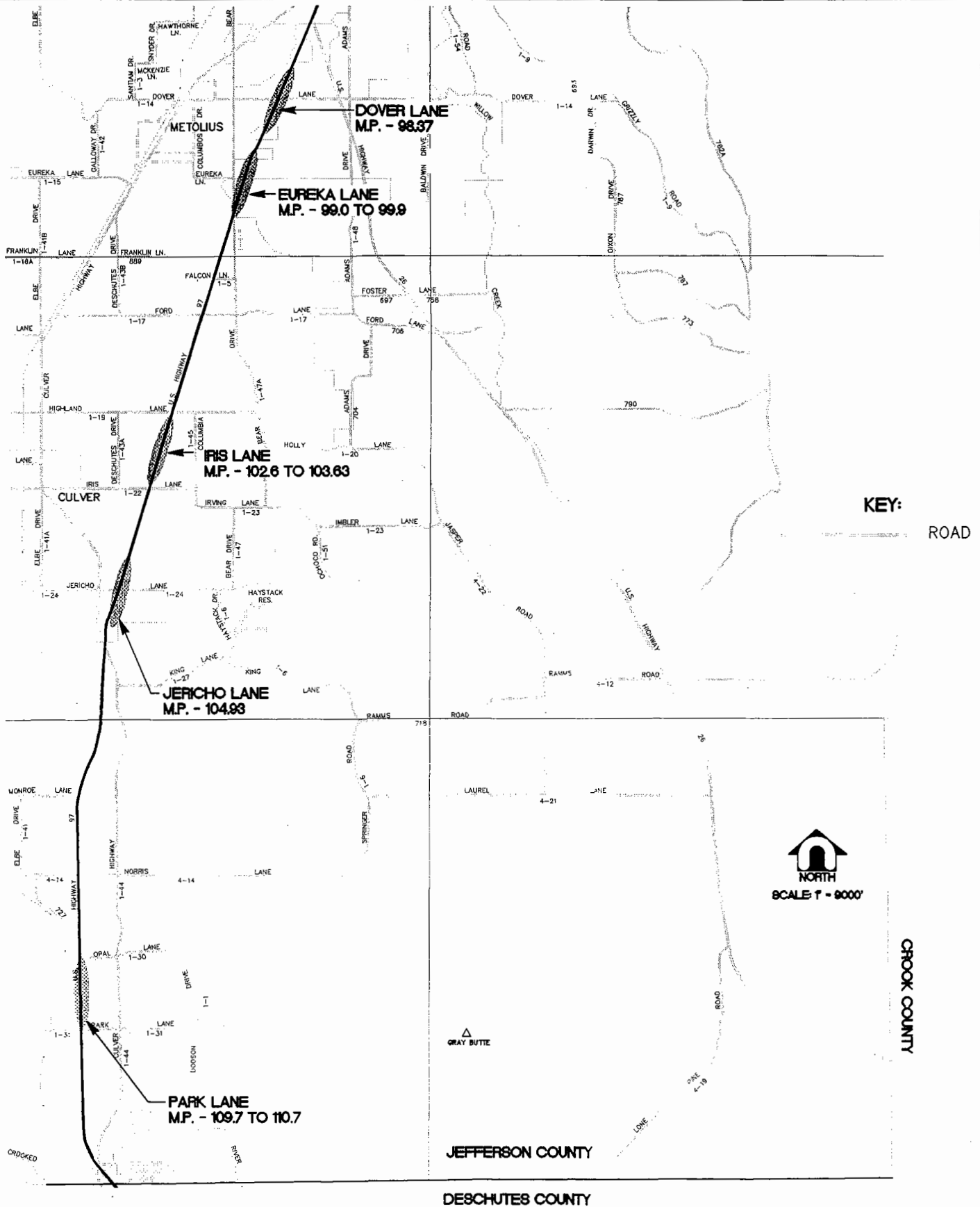


**RECOMMENDED PASSING LANES  
FOR HIGHWAYS 97 + 26  
NORTH OF THE MADRAS STUDY AREA**

**DEB**  
**DAVID EVANS AND ASSOCIATES, INC**  
 709 NW WALL STREET, SUITE 102  
 BEND, OREGON 97701 (503)398-7814

scale 1" = 9000' design  
 date 11-15-95 drawn  
 file C:\JEFF\0003\PASS\LN\NO.DWG

**FIGURE 6-1**



DAVID EVANS AND ASSOCIATES, INC  
 709 NW WALL STREET, SUITE 102  
 BEND, OREGON 97701 (503)389-7614

FIGURE 6-2  
 RECOMMENDED PASSING LANES  
 FOR HIGHWAY 97, SOUTH OF  
 MADRAS STUDY AREA

scale 1" = 9000' design  
 date 11-15-95 drawn  
 file 0:/JEFF0003/PASSLANE.DWG

funding becomes available to ODOT. Each passing lane would be approximately be a mile in length and cost approximately \$1 million to construct based on 1995 dollars.

A total of five potential passing lane locations have been identified for the section of Highway 97 located south of the Madras urban area (Figure 7-2). Starting at the north end and heading south they are located in the vicinity of Dover lane, Eureka Lane, Iris Lane, Jericho Lane, and Park Lane. Like the passing lanes proposed north of Madras, these new passing lanes would be expected to help to disperse traffic leaving Madras heading south to Redmond and Bend. Each proposed passing lane project would consist of new south and north bound travel lanes approximately one mile in length. The cost of each passing lane project is expected to cost approximately \$1 million dollars. It is recommended that the Dover Lane, Iris Lane and Jericho Lane segments be given primary consideration for future ODOT funding as part of the Jefferson County TSP.

### **Highway 26 Passing Lanes**

No passing lanes are presently located in the segment of Highway 26 southeast of Madras, a distance of approximately 15 miles. In the north approximate 10 mile Highway 26 segment, only one passing lane is in place. This passing lane is in the north bound lane on a steep grade north of the unincorporated community of Warm Springs in the vicinity of Agency Plains.

Because of the low existing and projected traffic volumes for the section of Highway 26 south of the Madras Urban Area, no passing lanes have been recommended. This section of the Highway is expected to continue to operate at an acceptable level with the current two lane configuration.

A total of two passing lane segments have been identified for the section of Highway 26 located north of Madras (Figure 6-1). Heading north from Madras, the potential passing lane segments are located in the vicinity of Fir Lane/Elm Lane and the Canyon Trailer Court. Each would be constructed in the north bound lane for an approximate distance of one mile. The expected cost of each passing lane would be approximately \$1 million.

## **LOCAL TRANSPORTATION SYSTEM IMPROVEMENT OPTIONS**

Through the transportation analysis and input provided from the public involvement program, multiple improvement projects were identified. These options included correcting the geometric design of existing roadway/highway intersections, improving sections of Highway 361 within the Culver and Metolius urban areas, and formulating a policy to protect the livability of the Camp Sherman area.

All of these transportation improvements are expected to be needed during the 20 year TSP planning horizon. Like with the state highway projects, the local improvements were determined to be necessary to address existing safety issues and not related to high or projected traffic volumes. The intersection improvements are tied to correcting the existing deficiencies of the existing local road

and highway connections. Jefferson County is expected to be the lead agency in funding the local transportation system improvements. The local improvement options are detailed below:

**Local Intersection Improvement Projects**

A number of intersections in Jefferson County were identified during the planning process as needing improvements. These projects are described below, summarized in Table 6-3, and their locations shown in Figure 6-3.

**TABLE 6-3  
Proposed Jefferson County Intersection Improvements**

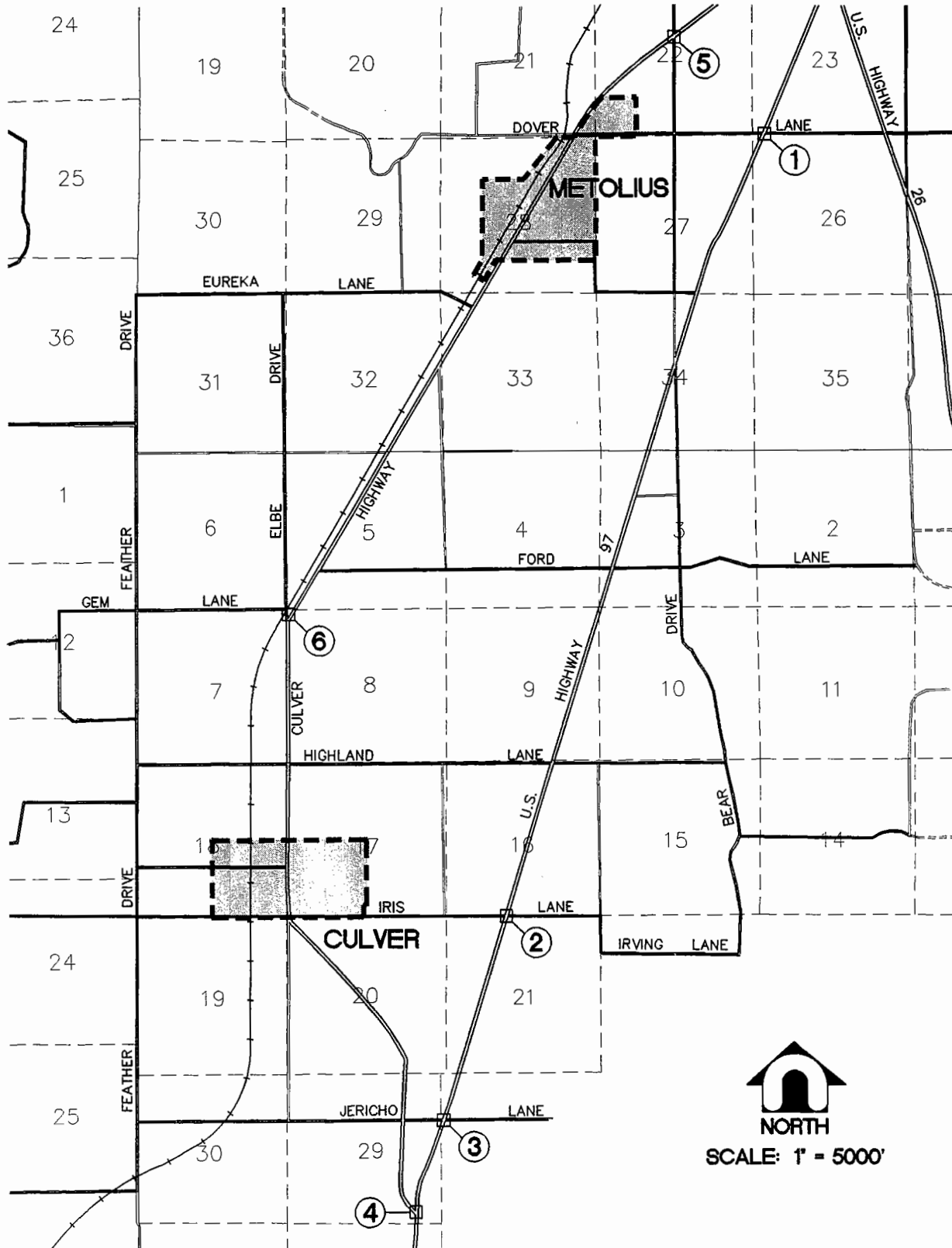
<b>Intersection</b>	<b>Cost</b>	<b>Recommendation</b>
1. Dover Lane/Highway 97	\$180,000 (All Const., No ROW)	Near-term
2. Iris Lane/Highway 97	\$180,000 (All Const., No ROW)	Near-term
3. Jericho Lane/Highway 97	\$180,000 (All Const., No ROW)	Near-term
4. Highway 361/Highway 97	\$125,000 (\$100,000 Const., \$25,000 ROW)	Near-term
5. Bear Drive/Highway 361	\$400,000 (\$340,000 Const., \$60,000 ROW)	Long-term
6. Gem Lane/BNNR Tracks	\$580,000 (\$500,000 Const., \$80,000 ROW)	Long-term
<b>Total</b>	<b>\$1,645,000</b>	

*Projects 1, 2 and 3: Dover, Iris and Jericho Lanes and Highway 97 Intersections*

Projects 1, 2, and 3 of Table 6-3 will include the addition of left-turn pockets to meet ODOT standards, as shown in Figure 6-4. All three are located at major crossings of the highway, and were identified by ODOT and the TAC. None of the three intersections meet the turning warrants for a left-turn, nor is there a significant accident record for any of them. However, all three intersections have been included for safety concerns and are important basic street improvements.

All three intersection improvements are recommended for the near-term, since they are relatively inexpensive and will serve a moderate number of users.

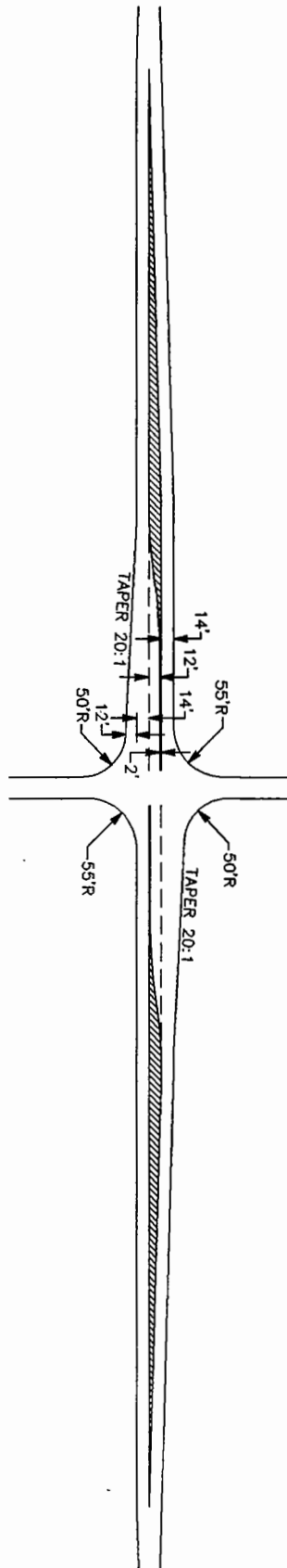




scale 1" = 5000'      design  
 date 11-17-95      drawn  
 file O:\JEFF0003\JEFF3-1.DWG

**DEA**  
 DAVID EVANS AND ASSOCIATES, INC  
 709 NW WALL STREET, SUITE 102  
 BEND, OREGON 97701 (503)389-7814

FIGURE 6-3  
 JEFFERSON COUNTY  
 INTERSECTION IMPROVEMENTS  
 PROJECTS 1-6



scale NTS design  
 date 11-17-95 drawn  
 file 0:MADR0006/RD1.DWG

**DEA**  
 DAVID EVANS AND ASSOCIATES, INC  
 709 NW WALL STREET, SUITE 102  
 BEND, OREGON 97701 (503)380-7814

FIGURE 6-4  
 DOVER, IRIS, AND  
 JERICO LANES /  
 HIGHWAY 97  
 PROJECTS 1, 2, + 3

#### *Project 4: Highway 361/Highway 97 Intersection*

Highway 361 (Culver Highway) and Highway 97 currently meet at a very acute angle, making left turns (while southbound) off of Highway 361 onto northbound Highway 97 particularly difficult. The intersection does not conform to current ODOT design standards. The construction of a two-way road between the highways, north of the existing intersection (Figure 6-5), will improve turning movements, and constitutes an important near-term basic road improvement.

Although this project does not meet warrants and has no significant accident record, ODOT recommended this project for inclusion in the TSP for safety reasons. ODOT expects the use of this intersection to increase, and eventually, this intersection should be reconstructed to provide a 90° intersection.

#### *Project 5: Bear Drive/Highway 361 Intersection*

Bear Drive crosses Highway 361 at an acute angle, and sight distance for turning movements off of 361 onto Bear Drive are inadequate because of a hill located to the west of the intersection. Bear Drive should be realigned to create a 90° intersection and left turn lanes should be added to Highway 361, as shown in Figure 6-6. Because of the relatively low volumes of traffic both at present and expected in the future, this is recommended as a long-term project.

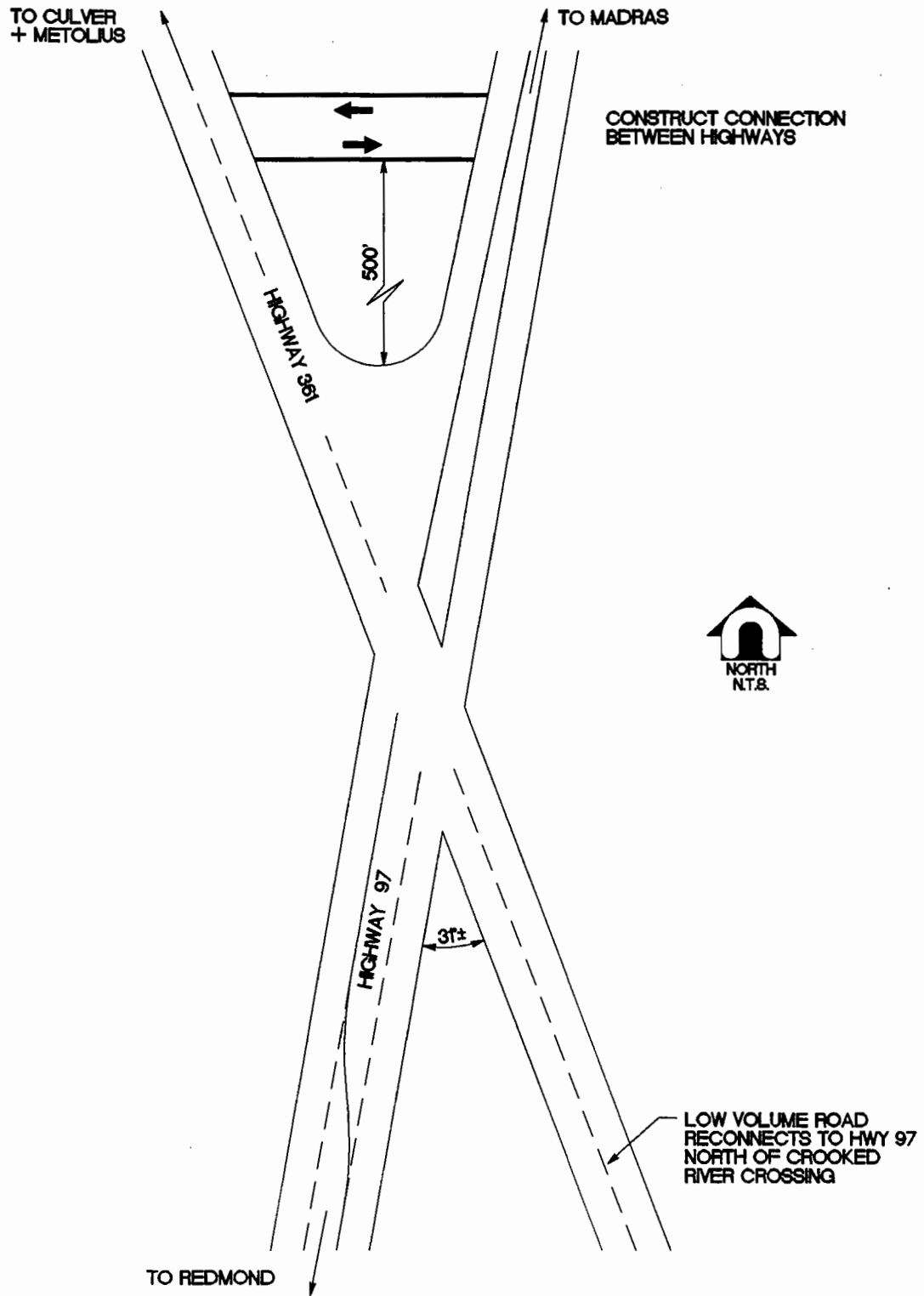
Although this project does not meet warrants and has no significant accident record, ODOT recommended this project for inclusion in the TSP for safety reasons.

#### *Project 6: Gem Lane/BNNR Tracks Intersection*

Where Gem Lane crosses the BNNR tracks, there are presently line-of-sight problems generated by the grade differences between Gem Lane at Highway 361 and the railroad tracks. Elbe Drive, east of the tracks, compounds the problem by being located too close to the tracks.

Elbe Road should be realigned to provide greater separation between the tracks and the intersection with Gem Drive west of the tracks (Figure 6-7). On the east side of the tracks, the grade of Highway 361 should be raised to the same elevation of the tracks, and widened to provide a left turn lane.

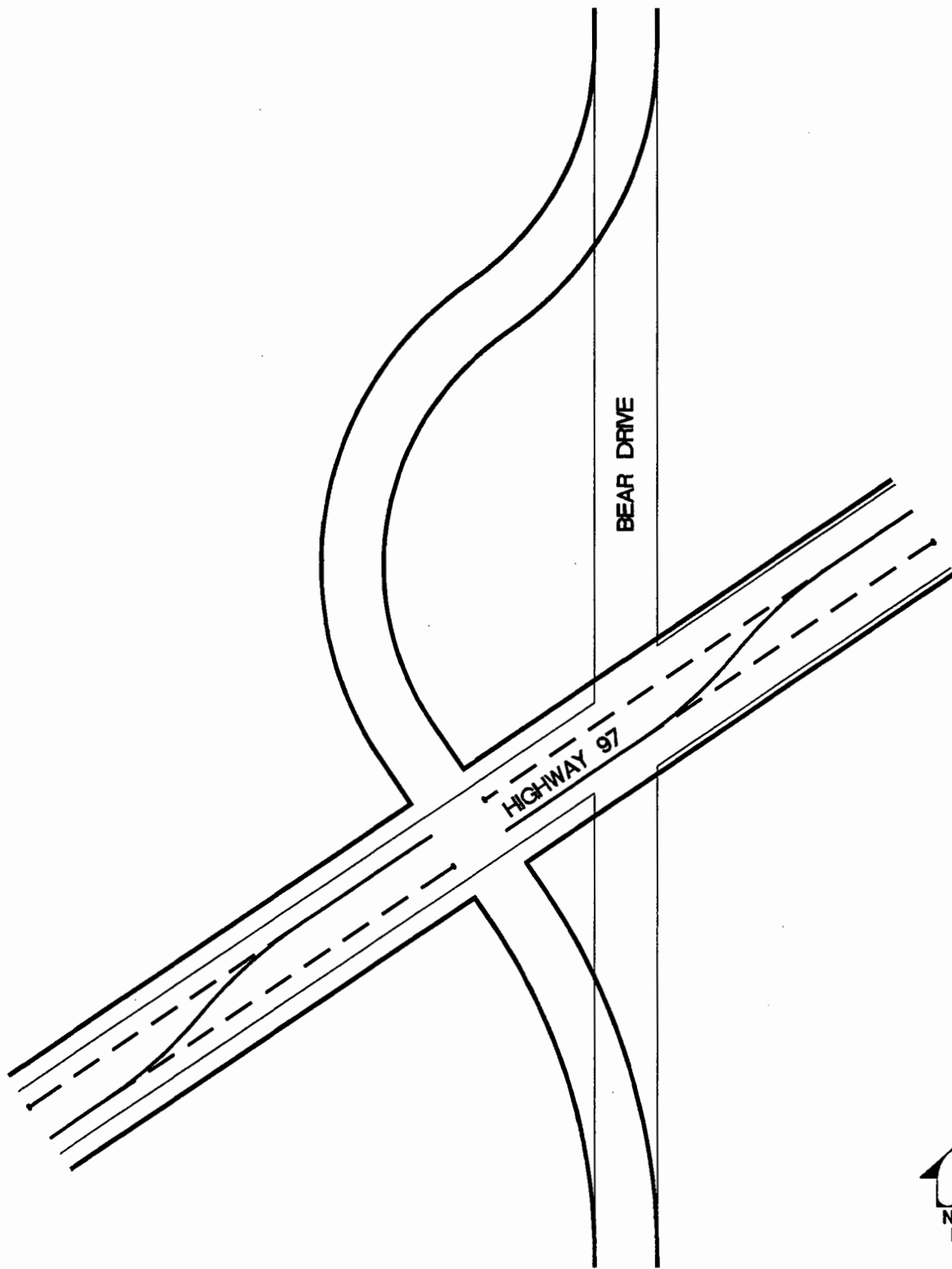
Although this project does not meet warrants and has no significant accident record, this project was identified by the TAC and consultant as an important basic street improvement for safety reasons. Because of the low volume of traffic both at present and expected in the future, this is recommended as a long-term project.



scale NTS design  
 date 11-17-95 drawn  
 file O:\MADRO006\RD2.DWG

**DEA**  
 DAVID EVANS AND ASSOCIATES, INC  
 709 NW WALL STREET, SUITE 102  
 BEND, OREGON 97701 (503)389-7614

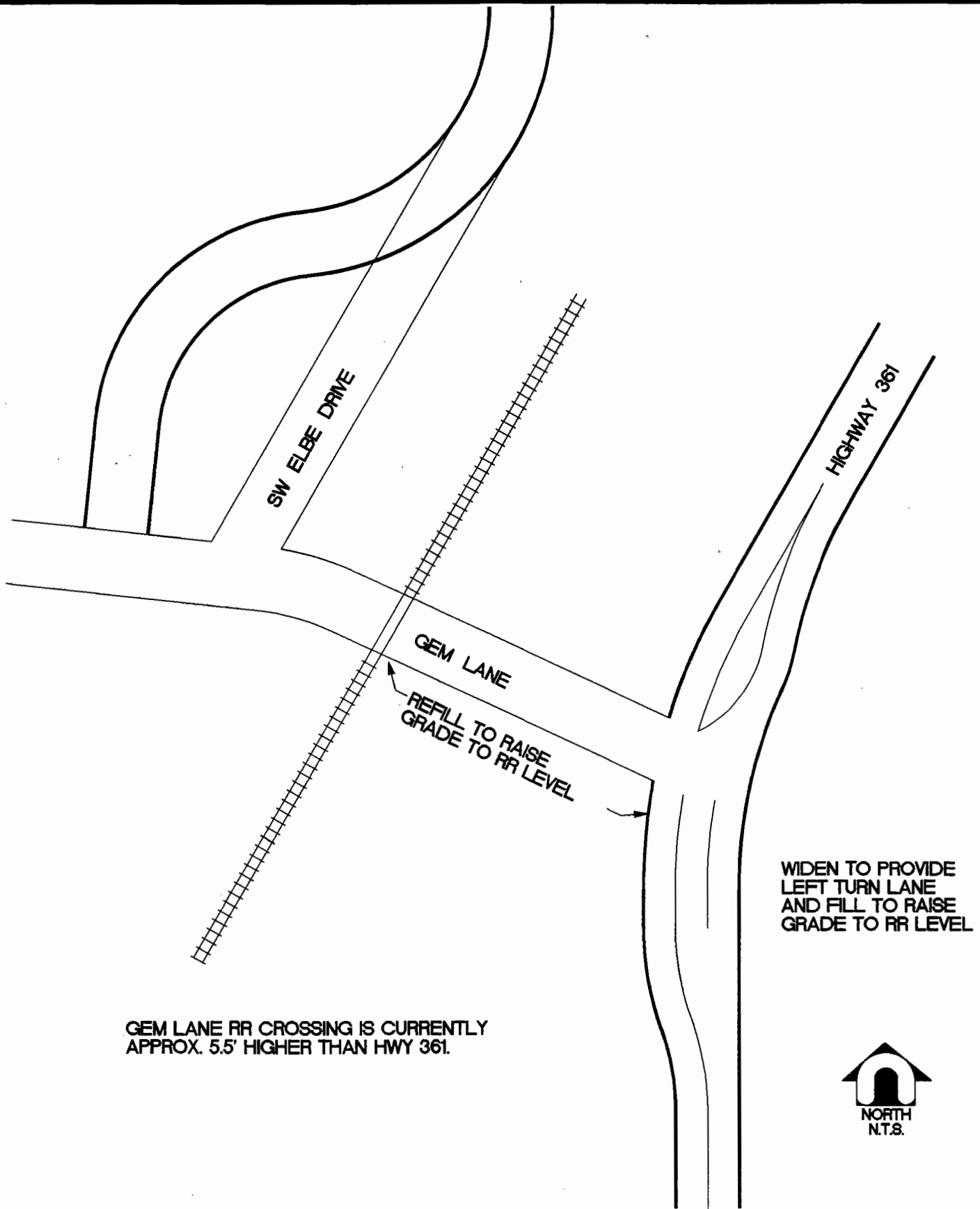
FIGURE 6-5  
 HIGHWAY 361 /  
 HIGHWAY 97  
 PROJECT 4



scale NTS design  
 date 11-17-95 drawn  
 file O:\MADRO006\RD3.DWG

**DEA**  
 DAVID EVANS AND ASSOCIATES, INC  
 709 NW WALL STREET, SUITE 102  
 BEND, OREGON 97701 (503)389-7614

FIGURE 6-6  
 BEAR DRIVE /  
 HIGHWAY 361  
 PROJECT 5



GEM LANE RR CROSSING IS CURRENTLY APPROX. 5.5' HIGHER THAN HWY 361.

scale NTS design  
 date 11-17-95 drawn  
 file O:\MADR0006\RD4.DWG

**DEA**  
 DAVID EVANS AND ASSOCIATES, INC  
 709 NW WALL STREET, SUITE 102  
 BEND, OREGON 97701 (503)389-7614

FIGURE 6-7  
 GEM LANE  
 PROJECT 6

### *Project 7: Potential Future Local Intersection Improvement Project*

Cherry Lane is located north of the City of Madras following a west to east alignment in two separate segments. The western segments extends from the Madras/Jefferson County Airport east across Highway 26 to a point near Adams Drive. The eastern segment of Cherry Lane extends from Barnes Drive east across Highway 26 to a point near Adams Drive. The eastern segment of Cherry Lane extends from Barnes Drive east across Highway 97 to Henderson Drive. The improvement of a section of the western Cherry Lane segment, Between the airport and Highway 26, has been identified as a local improvement project in the Madras Transportation System Plan.

The eastern Cherry Lane segment was not specifically identified as a project in either the Madras or Jefferson County Transportation System Plans. However, it is the position of Jefferson County that Cherry Lane/Highway 97 intersection, in the eastern segment, will need to be improved during the next 20 years based on current residential growth patterns. The need for a future intersection improvement may be dictated by a significant expansion of a residential subdivision along Brown Drive area. At present, this intersection does not have an accident record or meet traffic warrants for a left-turn lane, nor was it identified by either the TAC or ODOT as an intersection of concern for safety reasons. No specific intersection improvement has been proposed and not cost estimates have been calculated for this intersection.

The need to improve the Cherry Lane/Highway 97 intersection needs to be monitored by Jefferson County over the next 20 years. A future intersection improvement project can be added to the Jefferson County TSP at a regular Periodic Review cycle or initiated as comprehensive plan amendment by the County. As an interim measure, it is recommended that Jefferson County adopt a traffic impact analysis ordinance for development projects in Jefferson County. Such an ordinance would enable the County to require land developers to submit a traffic impact study for residential developments that could adversely impact the Cherry Lane/Highway 97 intersection.

Additional road and intersection improvement projects may be identified during the 20 year life of the Jefferson County transportation System plan. As with Cherry Lane/Highway 97 intersection, a traffic analysis will be necessary to justify other transportation projects. Again, with the adoption of a traffic impact analysis ordinance, Jefferson County will be able to require land developers to provide the necessary information to evaluate future road and intersection impacts.

### **Culver And Metolius Improvements**

Highway 361 (Culver Highway) runs from north to south through both Culver and Metolius. In each community, the Culver Highway serves as the main street for residents, businesses, and

visitors. There is presently no access management through these cities. The addition of sidewalks, curbs, and limited driveway cuts within the downtown area of both cities will enhance traffic movements along the highway and improve the safety of pedestrians and motorists. These improvements will become more important as each community grows and traffic along the Culver Highway increases over the next 20 years.

It is recommended that the sections of the Culver Highway within both Culver and Metolius be improved to a more urban standard. Specific transportation improvements recommended as part of the Jefferson County Transportation System Plan include the addition of sidewalks, curbs, and driveways within the downtown core of each community. The cost of these improvements for each city are expected to be \$2,000,000.

### **Adopt Policy Protecting Camp Sherman's Rural Character**

Camp Sherman is a quiet rural residential area that places a high value on its natural resources. The residents of Camp Sherman are supportive of maintaining the rural character and natural setting of the area. Some of the techniques that have been suggested and recommended by area residents to protect the livability of Camp Sherman include: closing some roads, not constructing new roads or widening existing roads, controlling private drive accesses, and providing separated paths for pedestrian and bicycle travel.

Because of the relatively small population of the Camp Sherman area and the fact that it has only one access onto the state highway, there is no need projected for additional roads to be constructed in the area. In addition, communication with the Deschutes National Forest, Sisters Ranger District, indicates that the Transportation Element of the *Draft Metolius Wild and Scenic River Plan Environmental Impact Statement* may recommend the following changes to County roads:

- Road 64, on the lower Metolius River, may be gated and closed to public motorized access beyond Monty Campground; and seasonally closed between Monty Campground and the confederated Tribes property.
- Road 1419-700, upstream from Camp Sherman Village on the east side of the Metolius River, may be closed to motorized vehicles above the Livingston Bridge. A small section of new road (less than ¼ mile) would be provided from the Tract C bridge to Road 1419-800 as an alternate access for Tract C.

It is recommended that Jefferson County adopt a policy of retaining the rural character of Camp Sherman. There would be no costs to the County for this option.



## **STREET IMPROVEMENTS CONSIDERED BUT NOT RECOMMENDED**

### **Northern Access to Crooked River Ranch**

Crooked River Ranch is currently served by a single access. Although the majority of Crooked River Ranch is located in Jefferson County, the access is actually located in Deschutes County. This results in significant out of direction travel by residents of Crooked River Ranch with destinations in Madras. In addition, emergency egress and ingress to the development is limited.

The only available solution to this problem is to construct a new road and bridge across the Crooked River Gorge. This would be a major undertaking, with very high engineering and construction costs. In addition, there would be significant environmental concerns for this project.

The estimated cost for this road and bridge is approximately \$13.7 million including right-of-way costs. Given the relatively low usership anticipated for this structure and its very high cost, it is not recommended.

### **Improved East-West Connections Between Highways 97 and 26**

East-west travel is somewhat restricted within portions of Jefferson County, particularly between Highway 97 and Highway 26 south of Madras. After examination, it appears that the Highland/Bear Lane/Holly Lane road alignment would have the greatest potential to provide a useful "short-cut" between highways. These roads are currently a combination of gravel and pavement.

Assuming some need for reconstruction, the cost to improve these roads to accommodate additional traffic is approximately \$3,640,000. Due to its high cost and low traffic volumes, this project is not recommended.

## **CHAPTER 7: ROAD STANDARDS, ACCESS MANAGEMENT, MODAL PLANS AND IMPLEMENTATION PROGRAM**

The dominant feature of the Jefferson County transportation system is its roadway system, and this is not expected to change over the next 20 years. The roadway system provides for trucks, cars, bicycles, and pedestrians. Components of the street system plan include street classification and street design standards, access management guidelines, specific transportation system modal plans, and an implementation program. It is expected that Jefferson County will be able to use this information to inventory their transportation system and evaluate system improvements in order to make sound transportation planning decisions during the next 20 years.

Street classification standards relate the design of a roadway to the function performed by that roadway. The function is determined by operational characteristics such as traffic volume, desired operating speed, safety, capacity, and ability to serve all modes. Street standards are necessary to provide a community with roadways that are relatively safe, attractive, and easy to administer when new roadways are planned or constructed. They are based on experience and policies and publications of the profession.

Jefferson County presently does not have a complete road inventory and do not have a functional classification system in place. It is the intent of the County Public Works Department to prepare an inventory of the entire county transportation system. After this inventory has been completed, the County intends to adopt a road functional classification system. The purpose of this section of the TSP is to provide recommendations on road standards that would be appropriate for Jefferson County.

The development of the Jefferson County Transportation System Plan and the recent adoption of the City of Madras TSP, provides the County with an opportunity to review and revise road standards to more closely fit with the functional road classifications, and the goals and objectives of the Transportation System Plan.

### **RURAL STREET CLASSIFICATION STANDARDS**

Existing Jefferson County Ordinances require an 80-foot right-of-way for arterials, 60 feet for collectors, and 40 feet to 60 feet for local residential roads. Paved road width recommendations are not given in the County development ordinances.

The recommended road standards for Jefferson County are summarized in Table 7-1, displayed in Figures 7-1 & 7-2, and described in detail on the following pages. The recommended rural road standards should be applied to the non-urban areas outside UGBs, and the urban road standards should be applied to urban areas within designated UGBs.

**TABLE 7-1**  
**Recommended Street Standards for the Jefferson County**

Classification	Pavement Width	Right-of-Way Width	Min. Posted Speed
<i>Rural (outside UGB)</i>			
Local Residential	24-36	60	25
Collector	32-36	60	25-35
Arterial	36-40	60	35-55
<i>Urban (inside UGB)</i>			
Local Residential	32	54	15-25
Collector	48	72	25-35
Arterial	50	80	25-45
Downtown Commercial	48	74	15-25
Alleys	20-24	20-24	15

**Rural Local Streets**

Local residential streets are intended to serve the adjacent land without carrying through traffic. These streets should be designed to carry less than 1,200 vehicles per day. If the forecast volume exceeds 1,200 vehicles per day, as determined in the design stage, the street system configuration should either be changed to reduce the forecast volume or the street designed as a collector.

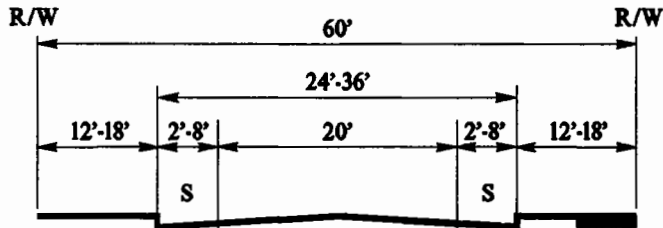
The design of a residential street affects its safety, livability, and traffic operation. Local streets should accommodate the every day life of a neighborhood as well as motor vehicle access. Excess motor vehicle speed and volume can adversely affect the function and liveability of a residential area.

Excess speed can be controlled by proper design. Local streets, especially through residential areas, should not be too wide. An unconstrained space encourages travel above the speed limit. Narrow street profiles, on-street parking, and landscape strips tend to slow drivers. However, sufficient paved shoulder width should be provided on rural roads for pedestrians and bicyclists (see Table 7-2).

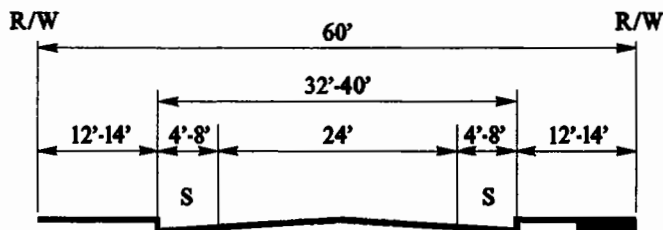
**LEGEND**

R/W = RIGHT-OF-WAY LINE  
S = SHOULDER

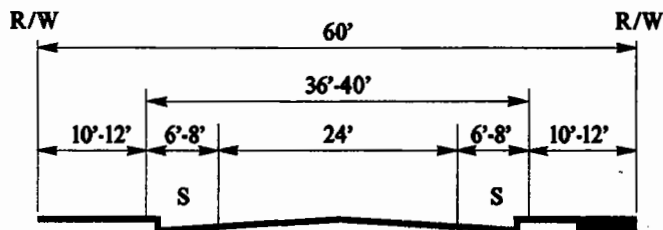
**A. LOCAL STREET**



**B. COLLECTOR**

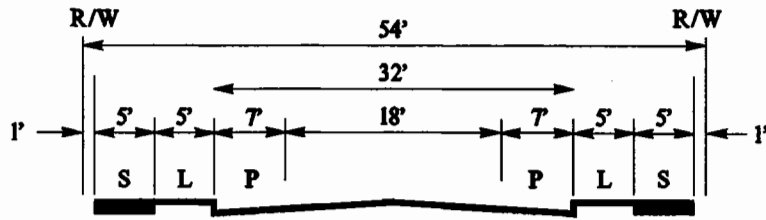


**C. ARTERIAL**



**FIGURE 7-1  
RURAL STREET DESIGN  
STANDARDS**

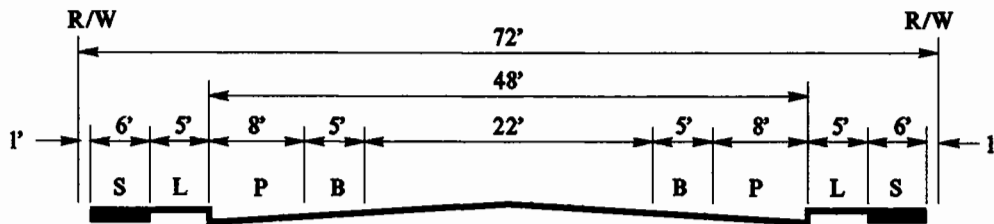
**A. LOCAL STREET**



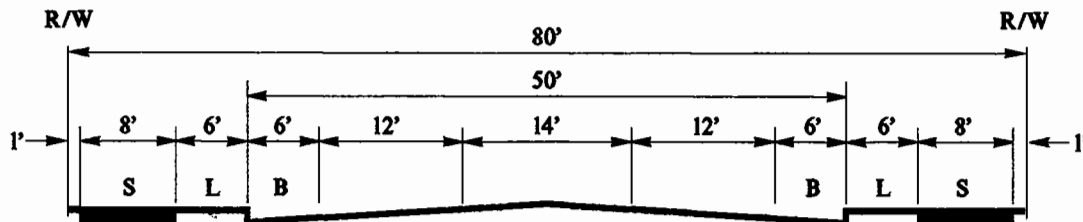
**LEGEND**

- B = BIKE LANE
- P = PARKING
- S = SIDEWALK
- L = LANDSCAPE STRIP
- R/W = RIGHT-OF-WAY LINE

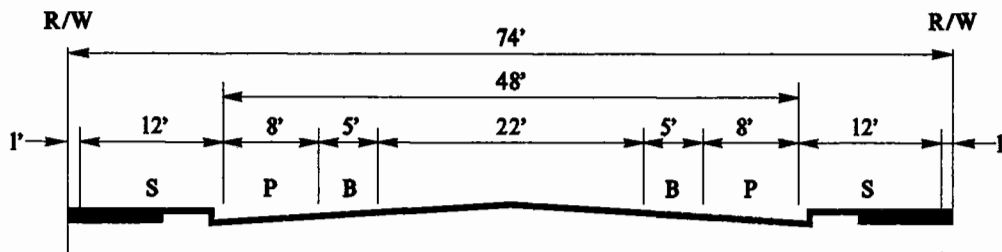
**B. COLLECTOR**



**C. ARTERIAL**



**D. DOWNTOWN COMMERCIAL**



**FIGURE 7-2  
URBAN STREET DESIGN  
STANDARDS**

The recommended standard for a rural local residential street is a 24 to 36-foot roadway within a 60-foot right-of-way, as shown on Figure 7-1. The width of the roadway and right-of-way is determined by the width of the shoulder, assuming two 10-foot travel lanes as a constant. The narrower streets and travel lanes generally improve the neighborhood aesthetics, and discourage speeding. They also reduce right-of-way needs, construction cost, storm water run-off, and vegetation clearance. The width of the shoulder is determined by anticipated traffic volumes, as shown in Table 7-2. It is expected that on rural local streets, parking will be off-pavement. For the most part, rural streets will not include sidewalks. Pedestrians are generally accommodated on the shoulder of the road, as are bicyclists. However, in areas with high pedestrian or bicycle use, a pathway should be considered, preferably located on both sides of the roadway, separated from the roadway by at least 5 feet of greenbelt or drainage swale.

**TABLE 7-2  
Recommended Shoulder Widths on Rural Roads**

<b>Road Use</b>	<b>Rural Arterials</b>	<b>Rural Collectors</b>	<b>Rural Local Streets</b>
ADT under 400	4 ft	2 ft	2 ft
ADT 400-DHV* 100	6 ft	4 ft	2 ft
DHV 100-200	6 ft	6 ft	4 ft
DHV 200-400	8 ft	8 ft	6 ft
DHV over 400	8 ft	8 ft	8 ft

\* DHV (Design Hour Volume) is the expected traffic volume in the peak design hour (usually at commuter times), usually 13 to 25% of ADT.

**Rural Collector Streets**

Collector streets are primarily intended to serve abutting lands and local access needs of neighborhoods. They are intended to carry between 1,200 and 10,000 vehicles per day. Collectors can serve residential, commercial, industrial, and mixed land uses.

Figure 7-1 shows a cross section with a 60-foot right-of-way and a 32 to 40-foot paved width. This width allows two 12 to 14-foot travel lanes and 4 to 8-foot shoulders. The width of the roadway and right-of-way is determined by the width of the shoulder. The width of the shoulder is determined by anticipated traffic volumes, as shown in Table 7-2. It is expected that on rural collector streets, parking will be off-pavement.

For the most part, rural collectors will not include sidewalks. Pedestrians are generally accommodated on the shoulder of the road, as are bicyclists. However, in areas with high pedestrian or bicycle use, a pathway should be considered, preferably located on both sides of the roadway, separated from the roadway by at least 5 feet of greenbelt or drainage ditch.

If traffic volume forecasts exceed 5,000 vehicles per day, then driveways serving single family houses, duplexes, or triplexes should not be permitted on that section.

### **Rural Arterial Streets**

Arterial streets form the primary roadway network within and through a region. They provide a continuous roadway system which distributes traffic between different neighborhoods and districts. Generally, arterial streets are high capacity roadways which carry high traffic volumes with minimal localized activity. Residential property should not face or be provided with direct access onto arterial streets.

Figure 7-1 shows a cross section with a 60-foot right-of-way and a 36 to 40-foot paved width. This width allows two 12-foot travel lanes and 6 to 8-foot shoulders. The width of the roadway and right-of-way is determined by the width of the shoulder. The width of the shoulder is determined by anticipated traffic volumes. No on-street parking should be allowed on arterial streets.

For the most part, rural arterials will not include sidewalks. Pedestrians are generally accommodated on the shoulder of the road, as are bicyclists. However, in areas with high pedestrian or bicycle use, a pathway should be considered, preferably located on both sides of the roadway, separated from the roadway by at least five feet of greenbelt or drainage ditch.

## **URBAN STREET STANDARDS**

### **Urban Residential Streets**

The design of a residential street affects its traffic operation, safety, and livability. The residential street should be designed to enhance the livability of the neighborhood as well as to accommodate less than 1,200 vehicles per day. Design speeds should be 15-25 MPH. When traffic volumes exceed approximately 1,000 to 1,200 vehicles per day, the residents on that street will begin to notice the traffic as a noise and safety problem. To maintain neighborhoods, local residential streets should be designed to encourage low speed travel and to discourage through traffic.

A good well-connected grid system of relatively short blocks can minimize excessive volumes of motor vehicles by providing a series of equally attractive or restrictive travel options. This street pattern is also beneficial to pedestrians and bicyclists.

The standard for a local residential street should be a 32-foot roadway, curb face within a 54-foot right-of-way, as shown on Figure 7-2, Section A. Five-foot wide sidewalks should be provided on each side of the roadway, located one foot from the right-of-way line to provide a five-foot planting strip.

The 32-foot cross section will accommodate passage of two lanes of moving traffic in each direction with curb parking. On low volume residential streets where curb parking may occur on both sides of the street, traffic will move freely but slowly. Narrower streets improve neighborhood aesthetics and discourage speeding and through traffic. They also reduce right-of-way needs, construction costs, storm water run-off, and the need to clear vegetation.

Sidewalks must be included on all urban streets as an important component of the pedestrian system. When sidewalks are located directly adjacent to the curb, they can include such impediments as mailboxes, street light standards, and sign poles, which reduce the effective width of the walk. Sidewalks buffered from the street by a planting strip eliminate obstructions in the walkway, provide a more pleasing design as well as a buffer from traffic, and make the sidewalk more useable by disabled persons. To maintain a safe and convenient walkway for at least two adults, a five-foot sidewalk should be used in residential areas.

Cul-de-sac, or "dead-end" residential streets are intended to serve only the adjacent land in residential neighborhoods. These streets should be short, serving a maximum of 20 single family houses. Because the streets are short and traffic volumes relatively low, the street width can be narrower than a standard residential street, allowing for the passage of two lanes of traffic when no vehicles are parked at the curb or one lane of traffic when vehicles are parked at the curb.

The street width of a cul-de-sac should be 24 feet, curb face-to-curb face within a 40-foot right-of-way, as shown in Figure 7-2, Section A. A five-foot-wide sidewalk should be located one foot from the right-of-way line on each side of the roadway, providing a five-foot planting strip.

Because cul-de-sac streets limit street and neighborhood connectivity, they should only be used where topographical or other environmental constraints prevent street connections. Where cul-de-sacs must be used, pedestrian and bicycle connections to adjacent cul-de-sacs or through streets should be included.

### **Alleys**

Alleyways can be a useful way to diminish street width by providing rear access and parking to residential areas. Including alleys in a subdivision design allows homes to be placed closer to



street and eliminates the need for garages to be the dominant architectural feature. This pattern, once common, has been recently revived as a way to build better neighborhoods. In addition, alleys can be useful in commercial and industrial areas, allowing access by delivery trucks that is off the main streets. Alleys should be encouraged in the urban areas of Jefferson County.

### **Urban Collector Streets**

Collector streets are primarily intended to serve abutting lands and local access needs of neighborhoods. They are intended to carry between 1,200 and 10,000 vehicles per day, including limited through traffic, at a design speed of 25-35 MPH. The collector can serve residential, commercial, industrial, or mixed land uses.

Figure 7-2 shows a cross section with a 72-foot right-of-way and a 48-foot paved width. The 50-foot curb-to-curb distance allows two travel lanes, two bicycle lanes, and parking on both sides of the street. The roadway can also be striped to provide two travel lanes plus left-turn lanes at intersections or driveways by removing parking for short distances.

Six-foot wide sidewalks should be provided on each side of the roadway, buffered by a 5-foot-wide landscape strip. In commercial or business areas, the sidewalks may be 8-feet wide or extend to the property line, and may be adjacent to the curb to facilitate loading and unloading at the curb.

If traffic volume forecasts exceed 5,000 vehicles per day on a collector, then driveways serving single family houses, duplexes, or triplexes should not be permitted on that section.

### **Urban Arterial Streets**

Arterial streets form the primary roadway network within and through a region. They provide a continuous roadway system which distributes traffic between different neighborhoods and districts. Generally, arterial streets are higher capacity roadways that carry high traffic volumes with minimal localized activity. Design speeds should be between 25 and 45 MPH. Residential property should not face or be provided with access onto arterial streets.

Arterial streets are intended to serve as primary routes for travel between major urban activity centers. These streets function in a similar manner to minor arterial streets but generally carry a much higher traffic volume. The design standard for an urban arterial is shown in Figure 7-2.

Two-way arterial streets should consist of two or three-lane cross sections; therefore, 80 feet of right-of-way should be reserved, as shown on Figure 7-2, Section C. A 50-foot paved width should provide two 12-foot travel lanes, two six-foot bike lanes, and a 14-foot center refuge lane, if needed. It should be noted that the inclusion of a center turn lane should not be necessary in most situations if the access management standards for arterials described below are followed.

The 12-foot wide center refuge lane could also be developed with a raised median between left-turn lanes. The raised median should be 10 feet wide curb face to curb face, and the adjacent travel lanes should be widened to 12 feet.

Arterials should be planned to include 6-foot-wide bike lanes on both sides, and at least 8-foot wide sidewalks buffered with a 6-foot-wide landscape strip. In commercial or business areas, the sidewalks should be 10 to 12 feet wide when located adjacent to the curb.

## **BICYCLE LANES**

In cases where a bikeway is proposed within the street right-of-way, the roadway striping should be reconfigured to provide a five-foot bikeway (collector streets) or a six-foot bikeway (arterial streets) on each side of the street, as shown on the cross sections in Figure 7-2. Occasionally, the roadway pavement must be widened to accommodate bicycle lanes.

Bike lanes on one-way streets should be located on the right side of the roadway, be one-way, and flow in the same direction as vehicular traffic. The striping should be done in conformance with the *Oregon Bicycle and Pedestrian Plan* (1995). In cases where curb parking will exist with a bike lane, the bike lane will be located between the parking and travel lanes. In some situations, curb parking may have to be removed to permit a bike lane.

The bikeways on new streets or streets to be improved as part of the street system plan will be added when the improvements are made.

On arterial and collector streets that are not scheduled to be improved as part of the street system plan, improvements should be implemented based on traffic volumes. When forecast traffic volumes exceed 2,500 to 3,000 vehicles per day, bike lanes should be added to the existing roadway. The striping of bike lanes on streets that provide access to schools should be high priority.

## **SIDEWALKS**

A complete pedestrian system should be implemented in urban areas. Where possible, paved streets should have sidewalks constructed on both sides of the roadway as shown in Figure 7-2. Sidewalks on residential and collector streets should have at least a 5-foot wide paved width with a 5-foot wide landscape strip separating it from the street. Arterial streets should have the same standards except in commercial areas where sidewalks should have an 8 to 12-foot wide paved width where sidewalks are adjacent to the street.

## **CURB PARKING RESTRICTIONS**

Curb parking should be prohibited at least 25 feet from the end of an intersection curb return to provide sight distance at street crossings.

## **ACCESS MANAGEMENT**

Access Management is an important tool for maintaining a transportation system. The lack of a prudent access management plan can result in excessive numbers of accesses along highways and arterial streets. ODOT is in the process of establishing access management guidelines for all state highways through the corridor planning process. Outside of Madras, the major urban area in Jefferson County, this is most likely to occur along the Culver Highway through the small cities of Culver and Metolius. Too many access points diminish the function of an arterial, mainly due to delays and safety hazards created by turning movements. Traditionally, the response to this situation is to add traffic lanes to the street. However, widening the street generally leads to increases in traffic and, in a cyclical fashion, require increasingly expensive capital investments to continue to expand the roadway.

Reducing capital expenditures is not the only argument for access management. Additional driveways along arterial streets lead to an increased number of potential conflict points between vehicles entering and exiting the driveway, and through vehicles on the arterial streets. This not only leads to increased vehicle delay and a deterioration in the level of service on the arterial, but also leads to a reduction in safety.

Research has shown a direct correlation between the number of access points and collision rates. In addition, the wider arterials that can ultimately result from poor access management can diminish the liveability of a community. Therefore, it is essential that all levels of government maintain the efficiency of existing arterial streets through better access management.

### **Access Management Techniques**

The number of access points to an arterial can be restricted through the following techniques:

- Restricting spacing between access points (driveways) based on the type of development and the speed along the arterial
- Sharing of access points between adjacent properties
- Providing access via collector or local streets where possible
- Constructing frontage roads to separate local traffic from through traffic
- Providing service drives to prevent spill-over of vehicle queues onto the adjoining roadways
- Providing of acceleration, deceleration, and right turn only lanes
- Offsetting driveways to produce T-intersections to 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

- Installing side barriers to the property along the arterial to restrict access width to a minimum

### **General Access Management Guidelines**

Access management is hierarchical, ranging from complete access control on freeways to increasing use of streets for access purposes, parking and loading at the local and minor collector level. Table 7-3 describe recommended general access management guidelines for Jefferson County.

**TABLE 7-3  
Access Management Guidelines for State Highways in Jefferson County**

Functional Classification	Intersection				Signal Spacing <sup>(3)</sup>	Median Control <sup>(4)</sup>
	Public Road		Private Drive <sup>(2)</sup>			
	Type <sup>(1)</sup>	Spacing	Type	Spacing		
Urban Arterial	At grade	1/4 mi	Lt/Rt Turns	300-500'	1/2 mi	Partial/None
Urban Collector	At grade	500'	Lt/Rt Turns	100'	1/4-1/2 mi	None
Urban Local Street	At grade	200-400'	Lt/Rt Turns	Access to each lot	N/A	None
Downtown Commercial	At grade	200-400'	Lt/Rt Turns	100'	400	None
Alley (Urban)	At grade	200-400'	Lt/Rt Turns	Access to each lot	N/A	None
Rural Arterial	At grade	1 mi	Lt/Rt Turns	1200'	None	None
Rural Collector	At grade	1/4 mi	Lt/Rt Turns	300'	1/2 mi	None
Rural Local Street	At grade	200-400'	Lt/Rt Turns	Access to each lot	N/A	None

(1) For most roadways, at-grade crossings are appropriate.

(2) Generally, no signals are allowed at private access points on statewide and regional highways. If warrants are met, alternatives to signals include median closing. Allowed moves and spacing requirements may be more restrictive than those shown to optimize capacity and safety. Any access to a State Highway requires a permit from the ODOT District Office. Access will generally not be granted where there is reasonable alternative access.

(3) Generally, signals should be spaced to minimize delay and disruptions to through traffic. Signals may be spaced at intervals closer than those shown to optimize capacity and safety. Pedestrian crossing is often benefitted by a closer intervals of signal placing.

(4) Partial median control allows well-defined and channelized breaks in the physical median barrier between intersections. Use of physical median barriers can be interspersed with segments of continuous left-turn lane, or, if demand is light, no median at all. Medians can be beneficial to crossing pedestrians.

These access management restrictions 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, the access to roadways will meet these guidelines. However, where there is a recognized problem, such as an unusual number of collisions, these techniques and standards can be applied to retrofit existing roadways.

To summarize, Access Management Strategies consist of managing the number of access points and/or 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.

### **Special Access Management Areas in Jefferson County**

Access Management is important for promoting safe and efficient travel for both local and long distance users along Highway 97 and Highway 26 corridors. The 1991 Oregon Highway Plan specifies an access management classification system for all state facilities. Although Jefferson County may designate state highways as arterial roadway within their system, the access management categories are recommended to follow the guidelines of the OHP. This section of the Transportation System Plan describes the state highway access management categories and what specific segments of roadways within Jefferson County should be designated for access management control.

Highways 97 and 26 through Jefferson County are roadway facilities of statewide significance. The long-term plan for the management of Highway 97 is ultimately a four-lane, controlled access facility. At present, Oregon Highway Plan Category 4 "Limited Control" applies to both Highway 97 and 26 within Jefferson County. This classification permits at-grade intersections or interchanges at a minimum spacing of one-quarter mile. Private driveways are recommended to have a minimum spacing of 500 feet from each other and from other intersections. Both left and right turning movements in and out of driveways along category 4 roadways are permitted. It is recommended that driveways be spaced 500 feet apart, intersections be spaced a minimum of one-quarter mile apart, and traffic signals be limited to a one-half mile spacing. The requirements are similar to the general access management guidelines specified for major arterial streets.

The Culver Highway (Highway 361) is designated as a District Level Highway. The Oregon Highway Plan suggests a category 6 access management designation for district highways. The same control standards recommended for the non-urban segments of Highways 97 and 26 would apply to the Culver Highway. Private driveways are recommended to be spaced 500 feet apart and public road intersections spaced at one-quarter mile intervals.

Highways 97 and 26 in the Madras TSP planning area have been identified as special access management areas. The Highway 97 segment extends north from Dover Lane to Meadowlark Lane. The segment of Highway 26 from the Highway 97 intersection to Dogwood Lane is also considered a special access management area. The Madras TSP recommends different access management

standards for the highway segments considered urban within the Madras UGB from the more rural segments south and north of the city. If the need for access management guidelines for other segments of Highway 97, 26 or 361 within Jefferson County is identified then the same urban and rural standards should generally be applied.

State Highway 361 through the downtowns of Culver and Metolius may be treated more as urban arterials than as rural highways. Since the downtown areas are both located on the Culver Highway, a State highway facility, these two areas will be discussed together. Both Culver and Metolius lack defined access points for commercial businesses in the downtown area. This is particularly true for Culver. There are no curbs, so access is continuous along the highway. The current situation has the potential to create conflicts and to compromise the safety and capacity of the roadway. Pedestrians are not accommodated, and the unlimited access creates particular safety hazards for them, since the movement of vehicles is unpredictable. In addition, clear access points to businesses, along with sidewalks, are important to define a downtown area of a town.

In urban areas such as Culver and Metolius, this classification should be treated as an urban arterial. Generally, this urban arterials permit at-grade intersections or interchanges at a minimum spacing of one-quarter mile and private driveways with a minimum spacing of 300 feet from each other and from intersections, with both left and right turns permitted in and out of the driveways. Traffic signals are permitted at a minimum of one-half mile spacing.

However, in areas with centralized commercial development, such as downtowns that have on-street parking instead of large lots and that have high levels of pedestrian use, these standards can be too restrictive. Shorter block lengths and a well-developed grid system are important to a downtown area, along with convenient and safe pedestrian facilities. Downtown commercial arterials typically have blocks 200-400 feet long, driveway access at 100-foot intervals, and signals every 400 feet. The streets in downtown areas should have sidewalks and crosswalks, along with on-street parking.

Culver and Metolius should consider designating a central business district, and strive to reach either the downtown or urban arterial standards. Driveway accesses to businesses should be defined, and restricted to every 100 feet at a minimum. Further suggestions for improving the downtown areas of Culver and Metolius are included Chapter 8 (Transportation Improvement Projects).

## **TRANSPORTATION DEMAND MANAGEMENT**

As discussed in Chapter 4, TDM strategies can reduce or spread peak hour roadway use to more efficiently use the existing transportation system, eliminating or postponing the need to widen or build new roadways. TDM strategies include carpooling and vanpooling, alternative work schedules, bicycle and pedestrian facilities, and programs focused on high density employment areas.

In Jefferson County, TDM could reduce the number of work trips from Culver and Metolius to the Madras Industrial Park. Although TDM strategies are not warranted due congestion or other capacity-related problems at present, establishing these practices now can prevent future needs and reduce transportation costs and air quality impacts.

Central Oregon already has a ridesharing program to encourage *carpooling*. It was established in September of 1993 and already has a database of about 100 people. The service allows interested drivers to call a toll-free number, provide information about their trip, and receive a list of others in their general area.

The County can work with larger employers to establish a carpool and vanpool program. These programs, especially oriented to workers living in Culver, Metolius, or Crooked River Ranch, will help to reduce the travel and parking requirements. Employers can encourage ridesharing by subsidizing vanpools, establishing preferential car and vanpool parking and convenient drop-off sites, and through other promotional incentives.

The Madras Industrial Park has already instituted some *alternative work schedules* by *staggering work shifts* for off-peak hours. Alternative work schedules are especially effective with large employers that can spread the peak period traffic volumes over a longer time period. Staggered work schedules should continue to be encouraged with new industries, and be coordinated to reduce peak traffic demands.

*Bicycling* and *pedestrian* commuting can be an important TDM strategy. However, the low population densities and long travel distances in Jefferson County make it unlikely that these non-motorized mode will be a significant TDM tool outside of the urban areas. In spite of this, bicycle and pedestrian use can be encouraged by implementing facilities (adding shoulder width where needed), and by providing bicycle parking, showers and locker facilities at places of employment.

The ability for people to work at home with the *telecommuting* technology is likely to continue to grow during the next two decades. During the past ten years, the percent of people working at home has more than doubled. This can be particularly important for a rural county like Jefferson, as more people have the mobility to move from the cities and continue to work effectively through technology links.

## **MODAL PLANS**

## **Bicycle Plan**

At present in Jefferson County, bicyclists share the roadway with motorists on almost all roads except Highways 97 and 26. While it is often appropriate for bicyclists and motorists to share the roadway on quiet local residential streets where bicycle use and motor vehicle traffic are expected to be very low, or where motor vehicle speeds are less than 20 MPH, it is more appropriate to provide marked shoulders on rural collectors and arterials and bike lanes on urban collectors and arterials.

In addition to accommodating bicyclists and pedestrians, shoulders protect the roadway edge from ravelling and increase safety for motorists. The majority of the rural roads in Jefferson County lack adequate shoulders, although most have adequate right-of-way to accommodate them.

As Jefferson County's roads (including those within the rural residential communities of Crooked River Ranch and Camp Sherman) are paved, repaved, or reconstructed, shoulders should be widened to meet the standards shown in Figures 14 and 15. New roads should be constructed with adequate shoulders, and as existing roads are surfaced or resurfaced, the appropriate shoulder widths should be added. Costs for shoulder additions are approximately \$2/sq. ft.

Within the urban areas of Culver and Metolius, bike lanes are appropriate on the Culver Highway. Bike lanes are generally recommended for higher motor vehicle volumes than those found in these two cities; however, bike lanes provide a more comfortable situation than a shared roadway, particularly for children. Bike lanes can also improve conditions for pedestrians by shortening the crossing distance and buffering the sidewalk.

Bike lanes must be one-way, 5 or 6 feet wide, and located adjacent to the curb, except where there is curb parking or a right-turn lane. Where these conditions occur, the bike lane is located between the through travel lane and the parking or right-turn lane. The bike lane is marked in the same direction as the adjacent travel lane. The striping is done in conformance with the *Oregon Bicycle and Pedestrian Plan* (1995).

Multi-use paths are popular in rural areas, especially when they provide a viable alternative to a busy highway. No paved separated paths are found in Jefferson County outside of Madras (Willow Creek Trail). A separated path from Metolius to Madras has been suggested; however, the feasibility of such a path has not been examined. If constructed, paths should follow the design standards of the *Oregon Pedestrian and Bicycle Plan* (1995).

## **Pedestrian System**

In rural areas, it is typical to accommodate pedestrians on roadway shoulders. Except for the main State highways, Jefferson County's roads are almost entirely lacking adequate shoulders, although most have adequate right-of-way to accommodate shoulders.



Because of this, as Jefferson County's roads, including those within the rural residential communities of Crooked River Ranch and Camp Sherman, are paved, repaved, or reconstructed, shoulders should be widened to meet the standards shown in Figures 14 and 15. New roads should be constructed with adequate shoulders. In addition to accommodating bicyclists and pedestrians, shoulders protect the roadway edge from raveling and increase safety for motorists. Costs for shoulder additions are approximately \$2/sq. ft.

### **Public Transportation**

The existing public transportation services (described in Chapter 4) meet the basic requirements of the Oregon Transportation Plan. Connections are possible between the services provided, and the service frequency meets the required daily trip to a larger city.

### **Rail Service**

The Union Pacific Railroad Company, that uses the Burlington Northern Railroad line, provides vital transport for freight through Jefferson County. At present, the rail service is sufficient, and growth projections for Jefferson County do not strongly support a need for increased rail service. However, every effort should be made to maintain this service or even expand should growth exceed the projections assumed in the travel forecasting process. In addition, there was considerable interest expressed by the public in making passenger rail available.

### **Air Service**

The current levels of air service available to Jefferson County are likely to be adequate for the next 20 years. However, expansion of the Madras Airport may be necessary, as discussed in the Madras TSP.

### **Pipeline Service**

There is no forecasted need to expand the Pacific Gas Transmission Company with a natural gas pipeline that runs through Jefferson County. No other pipeline services are anticipated.

## **TRANSPORTATION SYSTEM PLAN IMPLEMENTATION**

The implementation of the Jefferson County Transportation System Plan will include amending County transportation and land use policies and ordinances and establishing a schedule for the selected improvement options. In order to implement the Transportation System Plan to conform with the Oregon Transportation Planning Rule (TPR), Jefferson County will be required to amend sections of the County comprehensive plan and development code. The timing of future transportation system improvements also needs to be identified as part of the TPR conformance.

The plan implementation is important for Jefferson County in order to comply with State laws and regulations and to plan for future transportation system improvements. This implementation program is geared towards providing Jefferson 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.

A list of model policy and ordinance amendments is provided in Chapter 9 of this report. The specific policy and ordinance amendments are in conformance with the Oregon Transportation Planning Rule. The proposed comprehensive plan policy and zoning code ordinance amendments will require approval by the Board of County Commissioners and the Department of Land Conservation and Development (DLCDD). It is recommended that review and approval of these model policies and ordinances be closely coordinated with the City of Madras to promote consistency in future transportation planning in Jefferson County.

The second part of the implementation program is the formulation of a 20 year Capital Improvement Plan (CIP). The purpose of a CIP is to list what transportation system improvements should be constructed and identify when they should be built and how such improvements can be funded. It is recommended that Jefferson County integrate the TSP projects into the existing or new county Capital Improvement Plan and the ODOT STIP, and that CIP planning be coordinated with all the incorporated cities in the County.

### **Land Use Policy and Ordinance Amendments**

Jefferson County will need to amend the County comprehensive plan and development code as part of the Transportation Plan implementation process. Amendments will need to be made to specific comprehensive plan land use and transportation policies and development code regulations. The recommended amendments highlighted below and fully detailed in Chapter 9.

Land use policies will need to be added or amended to also conform with the requirements of Section 660-12-045 of the Transportation Planning Rule. These amendments need to be consistent with the transportation policy amendments and the development code amendments. The land use comprehensive plan policy amendments are expected to include:

- Policy to provide for consolidated review of land use decisions required to permit transportation projects.
- Policy regulating zoning to protect actual transportation corridors and the land uses along the corridor routes.
- Policy to regulate land uses around the Madras and Lake Billy Chinook Airports.
- Policy to allow for conditions on land development projects to protect transportation facilities, corridors, and sites.

- Policy to encourage walking and cycling within new residential areas and commercial districts.

### **Development Code Amendments**

The Jefferson County Development Code and Subdivision Ordinance will need to be amended to conform with the Transportation Planning Rule. The code and ordinance amendments are the tools by which the individual comprehensive plan policies are implemented within a community. Major code and ordinance amendments that will need to be considered include:

- Transportation Improvement Project Procedures
- Right-Of-Way Acquisition Procedures
- Highway Related Uses Zoning Guidelines
- Local Transportation System Operations
- ODOT Coordination Process
- Transportation Facility Protection Guidelines
- Access Management Guidelines
- Alternative Transportation Mode Guidelines
- Airport Compatibility Guidelines
- Development Review And Approval Process
- Traffic Impact Analysis Requirements

### **Planning Coordination**

The success of implementing the Jefferson County TSP will depend on effective coordination with other governmental agencies responsible for transportation facilities and planning within the County. The Jefferson County TSP needs to be coordinated with the implementation of the Madras TSP, the Highway 97 Corridor Plan, special ODOT planning studies, and local comprehensive plans. In part, the required coordination can be accomplished by Jefferson County adopting an ordinance to notify ODOT of all land use actions that will impact the state highway system. The County should consider a similar policy or ordinance to establish coordination procedures with all the incorporated cities within the county. Such notification procedures will enable Jefferson County and all the other jurisdictions to be informed about transportation projects and planning efforts.

Planning coordination can also be used as a tool for the County, cities, and ODOT to work together on funding the needed transportation improvements within Jefferson County during the next 20 years. Cooperation on funding transportation improvements and even maintenance will become important for the transportation improvement projects identified in the Jefferson County TSP. Funds for transportation improvements and maintenance are decreasing at all levels of government. This trend is expected to continue at the same time that traffic is growing on state highways, rural roads, and urban streets. Jefferson County should consider implementing a process to involve ODOT and the Cities in the County's capital improvement planning process. A cooperative process can help the

County to identify a range of funding sources to finance needed transportation projects and system maintenance. This process can be effective method to fund the most important transportation projects within the county regardless of jurisdictional boundaries. Other opportunities for interagency cooperation may include consideration of transferring maintenance responsibilities among the different units of government.

## **JEFFERSON COUNTY TSP CAPITAL IMPROVEMENT PLAN**

The preparation of the Jefferson County Transportation System Plan identified the need for both state highway and local road improvements during the next 20 years. These transportation improvement options were developed from an analysis of the County's transportation system and from public input at the four community meetings held during the course of the project. The Technical Advisory Committee determined that the local system improvements would be needed in Jefferson County to address existing traffic safety issues and to comply with the goals and objectives of the project. ODOT identified the need for new passing lanes along Highway 97 and 26. Finally, Jefferson County identified the need to improve the Cherry Lane/Highway 97 intersection improvement option.

At the present time, the Jefferson County transportation system operates at an acceptable level of service. Although traffic on highways and roads within the County will increase in the future, the overall County transportation system is expected to continue to operate at an acceptable level of service through the next 20 years. Highways 26, 97, and the Culver Highway are expected to see the greatest increase in traffic as Jefferson County and Central Oregon continues to grow. To enable these highways to operate effectively and efficiently, it will be important to make improvements to protect traffic flow and traffic safety. Jefferson County will need to coordinate County transportation system improvements with ODOT and the City of Madras. This coordination on the timing of improvements will be vital to maximize the use of limited state and local funds.

The recommended state highway and local road improvement options are shown on Table 7-4 A time period during the planning period when these improvements should be made is also provided. It is recommended that specific improvements be constructed as state and local funding becomes available. It is expected that the state highway improvements will be incorporated into the STIP plan by ODOT. The local road improvement projects can form the basis of a new county road plan. Chapter 8 provides recommendations on how the state highway and local road improvements can be funded during the next 20 years.

## **STATE HIGHWAY IMPROVEMENTS**

### **STIP Projects**

The 1996 Statewide Transportation Improvement Program (STIP) has identified a total of six highway related projects. These projects range from the construction of new bridges to new

roadway overlay projects. The five STIP projects are estimated to cost 28.6 million and are programmed to be constructed during the next five years.

### **Highway 97 and 26 Passing Lanes**

It is the objective of ODOT to construct new passing lanes on state highways at incremental distances to improve traffic flow and safety. To meet the ODOT guidelines, a number of new passing lanes have been recommended for both Highway 97 and Highway 26 within Jefferson County. The Jefferson County TSP CIP (Table 7-4) recommends that a total of seven new passing lanes be constructed in Highway 97 and two new passing lanes be constructed in Highway 26. As proposed, four passing lanes would be constructed within the first 10 years of the plan while the remaining five would be constructed during the second 10 year period. As discussed in Chapter 6, the selection of which passing lanes are constructed first is a determination that should be made by ODOT in consultation with Jefferson County

## **LOCAL SYSTEM IMPROVEMENTS**

### **Intersection Geometry Improvements**

A total of six intersection improvement projects were selected as part of the Jefferson County Transportation System Plan to improve traffic safety of local roads with either highways or railroad tracks. As traffic increases along state highways within the County, it will become more difficult for motorists to turn-on and turn-off from the local roads. The first four intersection improvements: Dover Lane, Iris Lane, Jericho Lane, and Juniper Butte, all intersect with Highway 97 south of Madras. It is recommended that these four intersection improvements be considered as short term improvement projects and be scheduled during the first 10 years of the TSP. The two other intersection improvements: Bear Drive/Highway 361 and Gem Lane/BNNR Tracks, are considered long term improvement projects which should be scheduled during the last 10 years of the plan. It is expected that these improvements will be financed with both County and State funds, so coordination on scheduling will be critical to their success.

The Cherry Lane/Highway 97 intersection improvement was recommended by Jefferson County after the draft TSP Plan was prepared so no cost estimate for this improvement option has been prepared. It is recommended that it be considered as a possible future option of the Jefferson TSP, and that it be evaluated in more detail when the TSP is updated by Jefferson County.

Note: The improvement of the section of Cherry Lane, located from Highway 26 to the Airport, has been identified as an improvement project in Option 3 of the Madras TSP.

**TABLE 7-4**  
**Jefferson County Transportation System Plan Capital Improvement Plan**

<b>Project Description</b>	<b>Time Frame 1995-2005</b>	<b>Time Frame 2006- 2015</b>	<b>Total</b>
<b>State Highway System</b>			
<b>STIP Projects</b>			
Madras Crooked River Overlay	\$5,773,000		\$5,773,000
Crooked River Bridge	\$18,456,000		\$18,456,000
Hwy 26 @ Depot Road	\$350,000		\$350,000
Hay Creek Bridge	\$1,534,000		\$1,534,000
Hwy 26 Overlay	\$2,032,000		\$2,032,000
<b>Subtotal</b>	<b>\$28,612,000</b>		<b>\$28,612,000</b>
<i>Highway 97 Passing Lanes</i>			
North of Madras 2	\$1,000,000	\$1,000,000	\$2,000,000
South of Madras 5	\$2,000,000	\$3,000,000	\$5,000,000
<i>Highway 26</i>			
North of Madras 2	\$1,000,000	\$1,000,000	\$2,000,000
<b>Subtotal</b>	<b>\$4,000,000</b>	<b>\$5,000,000</b>	<b>\$9,000,000</b>
<b>Subtotal State System</b>	<b>\$32,612,000</b>	<b>\$5,000,000</b>	<b>\$37,612,000</b>
<b>Local Road System</b>			
Dover Lane / Highway 97	\$180,000		\$180,000
Iris Lane / Highway 97	\$180,000		\$180,000
Jericho Lane / Highway 97	\$180,000		\$180,000
Highway 361 / Highway 97	\$125,000		\$125,000
Bear Drive / Highway 361		\$400,000	\$400,000
Gem Lane / BNNR Tracks		\$580,000	\$580,000
<i>Culver and Metolius Improvements</i>			
City of Culver / Highway 361*	\$1,000,000	\$1,000,000	\$2,000,000
City of Metolius / Highway 361*	\$1,000,000	\$1,000,000	\$2,000,000
<b>Subtotal (Local System)</b>	<b>\$2,665,000</b>	<b>\$2,980,000</b>	<b>\$5,645,000</b>
<b>Total CIP Costs</b>	<b>\$34,810,000</b>	<b>\$7,980,000</b>	<b>\$42,790,000</b>

\* Includes bicycle/pedestrian improvements.

## **Culver And Metolius Improvements**

Highway 361 (Culver Highway) serves as the main street in both the Culver and Metolius. The Jefferson County Transportation System Plan has identified the need for improvements along the Highway 361 within each city and to establish policies on access management. These improvement and policy improvement option is needed to maintain adequate traffic flows on the highway, improve turning movements on and off the local streets and businesses, and provide safe routes for pedestrians and bicyclists. It is recommended that the Culver and Metolius improvements be scheduled in a series of phases over the course of the next 20 years. The phasing approach is recommended as the overall cost of constructing the needed improvements at one time would be cost prohibitive to ODOT and any local contributions from Jefferson County or the individual cities. Phasing the improvements will also allow ODOT, Jefferson County, and each city to coordinate the design of the public improvements.

It is recommended that the Cities of Culver and Metolius amend their comprehensive plans and development codes to address access management issues as a short term project to implement the Jefferson County Transportation System Plan. The adoption of access management policies and ordinances will be an important step to gain State funding for Highway 361 improvements within Culver and Metolius. The consideration of access management ordinances can be scheduled for the next DLCD Periodic Review cycle of each city. Jefferson County should also consider appropriate access management policies and ordinances for all State Highways, and arterial and major collectors throughout the County.

As discussed above (Roadway System), a more urban pedestrian system should be implemented along the Culver Highway in the cities of Culver and Metolius. The highway should have sidewalks on both sides of the roadway. These sidewalks should be 5 to 8 feet wide and set back from the street with a 5 or 6-foot wide landscape strip. Curb sidewalks less than 8 feet wide are discouraged because it is difficult to construct them to meet the requirements of the Americans with Disabilities Act, and because they are less safe and pleasant for pedestrians to use. In addition, adequate crossings should be provided at all intersections within the downtown areas.

Consideration should be given to providing curb extensions to shorten crossing distances and to alert motorists to the presence of pedestrians. These are rounded extensions of the sidewalk located at intersections. Curb extensions allow motor vehicle turning movements while improving visibility for both the pedestrian and motorists, as well as shortening pedestrian crossing distances.

Costs for adding sidewalks in Culver and Metolius are relatively low if the addition is within the existing right-of-way. A 6-foot wide sidewalk with curb and a 6-foot wide landscape strip would cost about \$35 per linear foot.

Metolius would require about 1,600-2,000 linear feet of sidewalk. Meeting the standards described above, the cost would be approximately \$125,000. Two sets of curb extensions would cost about \$9,000.

Culver would require a similar amount of sidewalk. Meeting the standards described above, the cost would be approximately \$125,000. Two sets of curb extensions would cost about \$9,000.

Note: The cost of sidewalk improvements are included in the total cost to improve Highway 361 within Culver and Metolius.

### **Camp Sherman Rural Character Protection Policy**

The consideration of a comprehensive plan policy to protect the rural character of Camp Sherman should be considered as a short term improvement option of the Jefferson County Transportation System Plan. The formulation of appropriate policies will require involvement of the U.S. Forest Service and the residents of Camp Sherman. The logical time for the County to consider a comprehensive plan policy or policy amendment to protect the rural character of the Camp Sherman area would be during the next County Periodic Review cycle.



## **CHAPTER 8: JEFFERSON COUNTY FUNDING PLAN**

The successful implementation of the Transportation System Plan will require that Jefferson County work with ODOT and the incorporated cities to secure adequate funding to finance new transportation projects during the next 20 years. The formulation of a comprehensive Capital Improvement Plan (CIP) will enable Jefferson County to schedule the construction and funding of new improvements that address existing capacity and safety issues and those improvements that will be needed to accommodate future population and employment throughout the urban area. This chapter provides an analysis of available funding options that can be considered by Jefferson County and provides a framework for development of a 20 year Capital Improvement Plan.

The Jefferson County Transportation System Plan identifies the need for nearly \$43 million (1995 dollars) in funding to finance the transportation system improvements over the next 20 years. It is expected that transportation system improvements will be made to state highways and county roads within Jefferson County. This Transportation System Plan cost estimate only covers the costs associated with constructing new transportation system improvements and does not cover any costs associated with maintaining the current or future system. This funding analysis assumes that there will be a cost sharing of future improvements by Jefferson County, the incorporated cities and ODOT. Close coordination on scheduling and funding transportation improvements will be vital for the timely construction of the identified transportation system improvements.

Although this Transportation System Plan considers a 20 year planning horizon, the timing for specific transportation system improvements will be governed by the rate of population and employment growth within the county. In recent years, and Jefferson County has been growing at a high rate. If this recent high growth pattern continues, Jefferson County and ODOT may need to consider constructing Transportation System Plan improvements at an accelerated rate. If, however, the growth rate levels off, then it is more likely the County and ODOT will be able to schedule future transportation system improvements over the entire 20 year Transportation System Plan life span.

### **JEFFERSON COUNTY TRANSPORTATION PLAN FUNDING REQUIREMENTS**

The funding of transportation projects identified in the Jefferson County Transportation System Plan will require the cooperation and coordination of State, County, and City governments. Roadway and Infrastructure improvements recommended in this TSP can be funded from a variety of Federal, State, and local sources. Much of the recommended improvements involve multiple modes and jurisdictions, making them eligible for cooperative funding sources. Cooperation and coordination of funding will vital to finance the identified transportation improvement projects within the next 20 years.

The assistance of ODOT will be important for all the improvement options located along state highways within Jefferson County. Funding sources available to the State include ISTEA, Corridor,

and maintenance programs. Jefferson County will also need to participate in those projects that will extend beyond the state highway corridor. Likely County funding will be generated from the Capital Improvement Program (CIP). The Cities of Culver and Metolius would be expected with financing improvements associated with Highway 361 that is considered as the main street within each community.

ODOT has suggested that intersection improvements on state facilities should generally be planned on a cost-sharing basis of 75 percent of the improvement cost borne by ODOT and 25 percent by the local jurisdiction. Jefferson County could fund its share of these improvement costs from the County CIP, gas tax monies, system development charges, or other road improvement funds.

The cooperation on funding among the different levels of government will allow projects to be financed through a variety of sources. This method encourages limited funding of different levels of government to be leveraged. This method of financing transportation projects is becoming more common around Oregon as competition increases for limited federal and state highway improvement funds. Potential funding sources for the specific improvement projects identified in the Jefferson County Transportation plan are listed below.

**Highway 97 and 26 Passing Lanes**—This option may be eligible for ODOT Corridor Improvement Funds because it includes capacity improvements consistent with ODOT policies. It is expected that ODOT would take the lead role in financing the Highway 97 and 26 passing lanes within Jefferson County.

**Intersection Improvements**—The three intersection improvements that are recommended involve Highway 97 (at Dover, Iris and Jericho Lanes). It is recommended that ODOT and Jefferson County work together to formulate a plan to fund the Highway 361 intersection improvements.

**Culver and Metolius Improvements**—This recommended option calls for roadway improvements of Highway 361 through Culver and Metolius to help slow and control increasing traffic on the Culver Highway. Since this is an ODOT facility, ODOT corridor improvement funds may be available for all or a portion of this project. The addition of bike lanes and pedestrian facilities may make it eligible for more ISTEA funding. It is likely that the Cities of Culver and Metolius would participate in some of the improvement costs that would extend beyond the boundaries of the State highway right-of-way.

**Camp Sherman**—This recommended option involves no financial contribution on the part of Jefferson County. It is a policy statement only. No ODOT or County funds would be expected to be used on improvements within Camp Sherman.

This Chapter provides information on available funding techniques available to ODOT and Jefferson County to finance the construction of new transportation system improvements over the next 20 years. It also includes specific recommendations on what actions should be taken by ODOT and

Jefferson County to secure the needed funding during the planning period. A detailed discussion on a range of funding techniques that could be considered to finance TSP improvements is provided in Appendix "B" of this plan.

## **LOCAL AND STATE FUNDING OPTIONS**

Jefferson County does not have an updated Capital Improvement Plan (CIP) for transportation projects. The County is in the process of developing a comprehensive inventory of their road system. After the inventory has been completed, a classification will be applied based on the amount of service. A new CIP is expected to be prepared after the inventory and road classification phases are completed. The intent of the new CIP will be to plan transportation projects for the entire County and to coordinate funding construction with all the incorporated cities. The projects identified in the Jefferson County Transportation System Plan and the Madras Transportation System Plan can form the basis for a new County CIP.

The County does not have a Systems Development Charge (SDC) fee program in place at the present time. The County Public Works Department has been evaluating the feasibility of instituting a transportation SDC, similar to the Madras fee, for the unincorporated areas of the county. Like Madras, Jefferson County would apply the transportation SDC to development permit fees for construction projects. The funds generated from the SDC program would be used to finance County transportation projects in the future. Some of these funds could be used to upgrade county roads within the Madras Urban Area. At this point, Jefferson County has not yet determined the amount of revenue a transportation SDC would generate in the County.

Local Improvement Districts (LIDs) are a public works infrastructure funding option available to the County. Past LIDs have been used for a range of projects such as road improvements and the extension of water mains. LIDs have not been used in the County as frequently as in Madras, because of the impact on the County Public Works budget. In Jefferson County, the funds to finance LIDs are taken directly from the Public Works operating budget. Through this LID funding method, Public Works has had to limit funding for identified transportation projects. Unless the County changes their LID funding process, it is likely that LIDs will be limited in the future.

Jefferson County has considered the idea of implementing a local gasoline tax to finance new road projects. The consideration of implementing a local gas tax will likely wait until after Jefferson County has completed work on their comprehensive road inventory and development of a new road improvement plan. It is the position of the County that it will be difficult to gain passage of a local gas tax unless the public understands how the new revenues will be spent throughout the County. The previous work done in considering a possible local gas tax did not progress to a point to provide estimates on expected gas tax revenues.

A short term serial levy has received the most consideration by Jefferson County as a funding method to supplement limited property taxes and State revenue sharing moneys for county

transportation system improvements. The serial levy would likely be established to run from one to three years and would be used to finance specific transportation projects within the unincorporated areas of the county. Revenues generated from such a levy could be used to fund some county road projects in and around Madras. However, as with the consideration of a SDC fee, Jefferson County will not likely consider a special transportation serial levy until after work has been completed on the road inventory and the application of uniform road classifications.

The State of Oregon provides funding for all highway related transportation projects through the Statewide Transportation Improvement Program (STIP) administered by the Oregon Department of Transportation. The STIP outlines the schedule for ODOT projects throughout the State. The STIP, which identifies transportation for a three year funding cycle, is updated on an annual basis. Starting with the 1998 budget year, ODOT will then identify projects for a four year funding cycle. In developing this funding program, ODOT must verify that the identified projects comply with the Oregon Transportation Plan (OTP), ODOT Modal Plans, Corridor Plans, compliance with local comprehensive plans, and ISTEA Planning Requirements. The STIP must fulfill ISTEA planning requirements for a staged, multi-year, Statewide, intermodal program of transportation projects. Specific transportation projects are prioritized based on a review of the ISTEA planning requirements and the different State plans. ODOT consults with local jurisdictions before highway related projects are added to the STIP.

The state highway-related projects identified in the Jefferson County Transportation System Plan 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 Region 4. The Transportation System Plan will provide ODOT with a prioritized project list for the Jefferson County area for the next 20 years. The City of Madras, Jefferson County and ODOT will need to communicate on an annual basis to review the status of the STIP and the prioritization of individual projects within the Highway 97 and 26 Highways corridors. Ongoing communication will be important for the City, County, and ODOT to coordinate the construction of both local and state transportation projects.

ODOT also has the option of making some highway improvements as part of their ongoing highway maintenance program. The type of road construction projects that can be included within the ODOT maintenance programs includes intersection realignments, addition of turn lanes, and striping for bike lanes. The addition of a left-turn lane, from Highway 26 onto Depot Road, is the type of project that may be constructed through the ODOT maintenance program. Maintenance related construction projects are usually done 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 ODOT funding technique that will likely have future application to the Jefferson County Transportation System Plan is the use of state and federal transportation dollars for off-system improvements. Until the passage and implementation of ISTEA, state and federal funds were

limited to transportation improvements within highway corridors. ODOT now has the authority and ability to fund transportation projects that are located outside the boundaries of the highway corridors. The criteria for determining what off-system improvements can be funded has not yet been clearly established. It is expected that this new funding technique will be used to finance local system improvements that reduce traffic on state highways or reduce the number of access points for future development along state highways.

## **JEFFERSON COUNTY TRANSPORTATION SYSTEM PLAN FUNDING RECOMMENDATIONS**

In the funding requirements section, a total of \$14.6 million in State and Local transportation improvement projects were identified for Jefferson County. This total includes the funds needed for both State highway and local street system improvements. The analysis assumed that ODOT would continue to be the primary funding agency for the \$9 million identified for improvements to Highway 97 and 26 within the study area. Jefferson County would have primary funding responsibility for the \$5.6 million in local transportation system improvements during the next 20 years.

The available funding techniques for the Jefferson County Transportation System Plan have been detailed in the preceding section. Based on an analysis of historic local funding techniques, it is expected that Jefferson County will not be able to fund the Transportation System Plan improvement projects unless existing fees are increased and new funding sources are dedicated transportation. Even with Jefferson County and ODOT adopting new funding techniques, it may be difficult to fund all the Transportation System Plan projects during the 20 year planning cycle. The County may want to consider a process to prioritize the local transportation system funding based on a further analysis of available funding.

Jefferson County and ODOT should implement the following actions to fund the Transportation System Plan projects:

### *Systems Development Charges (SDC) Fee*

It is recommended that Jefferson County continue their evaluation of a County-Wide transportation SDC. As part of the County-wide evaluation, it is also recommended that Jefferson County implement a transportation SDC for the Madras Transportation System Plan planning area. Fee revenues received from new development within the Madras Transportation System Plan area should be dedicated to the basic street grid improvements identified in the Transportation System Plan. These County generated funds can be used to finance county road improvements that are part of the basic street grid in the Madras Urban Area.

### *Local Gas Tax*

It is recommended that Jefferson County consider passage of a local gasoline tax dedicated to transportation improvements. A portion of these gas tax revenues should be used to finance the local basic street grid improvements within the Transportation System Plan boundaries.

### *Street Design Standards*

It is recommended that Jefferson County amend the City/County Urban Growth Management Agreement (UGMA) to require city street design standards for new development within the Madras urban growth area.

### *Off-System Funding*

It is recommended that ODOT continue the evaluation of funding off-system improvements in the Jefferson County Transportation System Plan area. Local street improvement projects that will reduce use of either Highway 97 or 26 should be considered for possible future funding.

## CHAPTER 9: RECOMMENDED POLICIES AND ORDINANCES: ELEMENTS REQUIRED BY THE TRANSPORTATION PLANNING RULE

### APPROVAL PROCESSES FOR TRANSPORTATION FACILITIES

Section 660-12-045(1) of the Transportation Planning Rule requires that jurisdictions amend 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. Small jurisdictions must consider the level of review necessary for transportation projects, and include policy and ordinance language to give clear guidance:

#### Recommended Policies for Approval Process

Policies should clarify the approval process for different types of projects. The following policies are recommended to be adopted in the Transportation System Plan:

- *Changes in the specific alignment of proposed public road and highway projects shall be permitted without plan amendment if the new alignment falls within a transportation corridor identified in the Transportation System Plan.*
- *Transportation projects involving the operation, maintenance, repair, and preservation of existing facilities that are consistent with the Transportation System Plan, the classification of that roadway and approved road standards shall be allowed without land use review, except where specifically regulated (i.e., within a floodplain).*
- *Dedication of right-of-way, authorization of construction and the construction of facilities and improvements, where the improvements are consistent with the Transportation System Plan, the classification of the roadway and approved road standards shall be allowed without land use review.*
- *Changes in the frequency of transit, rail and airport services, consistent with the Transportation System Plan, shall be allowed without land use review.*
- *For State projects that require an Environmental Impact Study (EIS) or Environmental Assessment (EA), the draft EIS or EA shall serve as the documentation for local land use review, if local review is required.*
  - (1) *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;*
  - (2) *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.*
- *For counties (and cities with incorporated lands outside the Urban Growth Boundary) uses permitted outright under ORS 215.213(1)(m) through (p) and ORS 215.283(1)(k) through (n),*

*consistent with the Transportation System Plan, the classification of the roadway, and approved road standards, shall be allowed without land use review.*

### **Recommended Ordinances for Approval Process**

Once Jefferson County has completed its Transportation System Plan, there are two directions that the City and County may take to govern review of transportation projects. The City and County can decide that *all* projects identified in the Transportation System Plan are permitted outright, with no further land use review, subject only to the standards established by the Plan. This is the simplest approach, requiring the least amount of administration. This approach is recommended for the portion of the project area that is outside the Urban Growth Boundaries of the incorporated cities within Jefferson County, since all major projects will be associated with the State Highway and be subject to ODOT's review process.

For projects within the incorporated city UGBs, particularly Madras, there are significant differences in level of detail provided for the projects included in the Transportation System Plan and the studies that are usually required for construction. For example, it is not possible to clearly identify the amounts of grading, cuts and fills, vegetation removal, or other environmental impacts in the Transportation System Plan. These are frequently issues of great concern to the community. Clear revelation of the impacts of a project within the public forum of land use regulation is an opportunity to build community support and to develop mitigation measures, if needed. Also, it is important to note that some transportation projects in rural areas may require goal exceptions or other findings to address State statutes or rules.

Therefore, it is recommended that Jefferson County and the cities review transportation projects within the UGB as regulated land use actions, using conditional use language such as the following. This language is recommended for inclusion in the supplementary provisions section or as a new section within the development code.

#### *\_\_\_ Standards for Transportation Projects*

##### *\_\_\_ Uses Permitted Outright*

- A. Normal operation, maintenance, repair, and preservation activities associated with transportation facilities.*
- B. Installation of culverts, pathways, fencing, guardrails, lighting, and similar types of improvements that take place within the existing right-of-way.*
- C. Projects specifically identified in the Transportation System Plan as not requiring further land use regulation.*
- D. Landscaping as part of a transportation facility.*
- E. Emergency measures necessary for the safety and protection of property*



*F. Acquisition of right-of-way for public roads, highways, and other transportation projects identified in the Transportation System Plan are permitted outright, except for those that are located in exclusive farm use or forest zones.*

*\_\_\_.\_\_\_ Conditional Uses Permitted*

*A. Construction, reconstruction, or widening of highways, roads, bridges or other transportation projects that are: (1) not specifically identified in the Transportation System Plan or (2) not designed and constructed as part of a subdivision or planned development subject to site plan and/or conditional use review, shall comply with the Transportation System Plan and applicable standards, and shall address the following criteria. For State projects that require an EIS or EA, 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 and social patterns, including noise generation, safety, and zoning.*
- 2. The project is designed to minimize avoidable environmental impacts, to identified wetlands, wildlife habitat, air and water quality, and cultural resources.*
- 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. Construction of rest areas, weigh stations, and temporary storage and processing sites.*

*C. If review under this Section indicates that the use or activity is inconsistent with the Transportation System Plan, the procedure for a plan amendment, including any necessary goal exceptions, shall be undertaken prior to or in conjunction with the conditional permit review.*

*\_\_\_.\_\_\_ Time Limitation on Transportation-Related Conditional Use Permits*

*C. Authorization of a conditional use shall be void after a period specified by the applicant as reasonable and necessary based on season, right-of-way acquisition, and other pertinent factors. This period shall not exceed three years.*

## **PROTECTING THE EXISTING AND FUTURE OPERATION OF FACILITIES**

Section 60-12-045(2) of the Transportation Planning Rule requires that jurisdictions protect future operation of transportation corridors. For example, an important arterial for through traffic should be protected in order to meet the community's identified needs. In addition, the proposed function of a future roadway must be protected from incompatible land uses. It is also important to preserve the operation of existing and proposed transportation facilities, such as airports, that are vulnerable to

the encroachment of incompatible land uses. A set of proposed ordinances to protect the function of general use airports is included below.

Other future transportation facilities that small jurisdictions may wish to protect include the space and building orientation necessary to support future transit, and right-of-ways or other easements for accessways, paths, and trails. Policies are suggested below that will demonstrate the desire of the community to protect these transportation facilities.

Protection of existing and planned transportation systems can be provided by ongoing coordination with other relevant agencies, adhering to the road standards, and to the access management policies and ordinances suggested below.

### **Recommended Policies for Protection of Transportation Facilities**

Policies applicable to all small jurisdictions:

- *The function of existing and planned roadways as identified in the Transportation Plan shall be protected through the application of appropriate access control measures.*
- *Land use decisions shall include a consideration of their impact on existing or planned transportation facilities (for example, is there adequate capacity for motor vehicles on the adjacent street system).*
- *The function of existing or planned roadways or roadway corridors shall be protected through the application of appropriate land use regulations; for example, residential uses shall not have direct access off of a proposed arterial.*
- *The potential to establish or maintain accessways, paths, or trails shall be considered prior to the vacation of any public easement or right-of-way.*
- *Right-of-way for planned transportation facilities shall be preserved through all practical means. This will include exactions, voluntary dedication, setbacks, or other appropriate means.*

Policies applicable to small jurisdictions that include airports:

- *The function of existing or planned general use airports shall be protected through the application of appropriate land use designations to assure future land uses are compatible with continued operation of the airport.*

Policies applicable to small jurisdictions that include or plan transit:

- *The function of existing, planned, or future transit shall be protected by identifying potential transit corridors and encouraging transit-compatible land uses and site planning (i.e., retaining space for bus pull-outs and orienting major new buildings to the street with good pedestrian access).*

## **Recommended Access Control Ordinances**

The following policies and ordinance are recommended to support the access management standards.

### *Section 1. Intent and Purpose*

*The intent of this ordinance is to manage access to land development while preserving the flow of traffic in terms of safety, capacity, functional classification, and level of service. Major roadways, including highways and other arterials, serve as the primary network for moving people and goods.*

*These transportation corridors also provide access to businesses and homes and have served as the focus for commercial and residential development. If accesses are not properly designed, these roadways will be unable to accommodate the access needs of development and retain their primary transportation function. This ordinance balances the right of reasonable access to private property with the right of the citizens of the (city/county) and the State of Oregon to safe and efficient travel.*

*To achieve this policy intent, state and local roadways have been categorized by function and classified for access purposes based upon their level of importance, with highest priority on the Oregon Highway System and secondary priority on the primary network of regional arterials. Regulations have been applied to these roadways for the purpose of reducing traffic accidents, personal injury, and property damage attributable to poorly designed access systems, and to thereby improve the safety and operation of the roadway network. This will protect the substantial public investment in the existing transportation system and reduce the need for expensive remedial measures. These regulations also further the orderly layout and use of land, protect community character, and conserve natural resources by promoting well-designed road and access systems and discouraging the unplanned subdivision of land.*

### *Section 2. Applicability*

*This ordinance shall apply to all arterials and collectors within (city/county) and to all properties that abut these roadways. The access classification system and standards of the Oregon Department of Transportation shall apply to all roadways on the State Highway System.*

### *Section 3. Conformance with Plans, Regulations, and Statutes*

*This ordinance is adopted to implement the access management policies of the (city/county) as set forth in the Transportation System Plan and the State Highway Access Management policies.*

### *Section 4. Definitions*

- 1. Access. A way or means of approach to provide vehicular entrance or exit to a property.*
- 2. Access Classification. A ranking system for roadways used to determine the appropriate degree of access management. Factors considered include functional classification, the appropriate local government's adopted plan for the roadway, subdivision of abutting properties, and existing level of access control.*

3. *Access Connection.* Any driveway, street, turnout or other means of providing for the movement of vehicles to or from the public roadway system.
4. *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.
5. *Corner Clearance.* The distance from an intersection of a public or private road to the nearest access connection, measured from the closest edge of the pavement of the intersecting road to the closest edge of the pavement of the connection along the traveled way.
6. *Cross Access.* A service drive providing vehicular access between two or more contiguous sites so the driver need not enter the public street system.
7. *Easement.* A grant of one or more property rights by a property owner to or for use by the public, or another person or entity.
8. *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. (see also Service Roads)
9. *Functional Area (Intersection).* That area beyond the physical intersection of two roads that comprises decision and maneuver distance, plus any required vehicle storage length.
10. *Functional Classification.* A system used to group public roadways into classes according to their purpose in moving vehicles and providing access.
11. *Joint Access (or Shared Access).* A driveway connecting two or more contiguous sites to the public street system.
12. *Lot.* A parcel, tract, or area of land whose boundaries have been established by some legal instrument, which is recognized as a separate legal entity for purposes of transfer of title, has frontage upon a public or private street, and complies with the dimensional requirements of this code.
13. *Lot, Corner.* Any lot having at least two (2) contiguous sides abutting upon one or more streets, provided that the interior angle at the intersection of such two sides is less than one hundred thirty-five (135) degrees.
14. *Lot Depth.* The average distance measured from the front lot line to the rear lot line.
15. *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.
16. *Lot, Through.* (also called a double frontage lot). A lot that fronts upon two parallel streets or that fronts upon two streets that do not intersect at the boundaries of the lots.
17. *Lot Frontage.* That portion of a lot extending along a street right-of-way line.
18. *Nonconforming Access Features.* Features of the property access that existed prior to the date of ordinance adopting and do not conform with the requirements of this code.
20. *Parcel.* A division of land comprised of one or more lots in contiguous ownership.

21. *Plat.* An exact and detailed map of the subdivision of land.
22. *Private Road.* Any roadway for vehicular travel which is privately owned and maintained and which provides the principal means of access to abutting properties.
23. *Public Road.* A road under the jurisdiction of a public body that provides the principal means of access to an abutting property.
24. *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 code and any applicable plans and policies of the (city/county).
25. *Right-of-Way.* Land reserved, used, or to be used for a highway, street, alley, walkway, drainage facility, or other public purpose.
26. *Significant Change in Trip Generation.* A change in the use of the property, including land, structures or facilities, or an expansion of the size of the structures or facilities causing an increase in the trip generation of the property exceeding: (1) local—10 percent more trip generation (either peak or daily) and 100 vehicles per day more than the existing use for all roads under local jurisdiction; or (2) State—exceeding 25 percent more trip generation (either peak or daily) and 100 vehicles per day more than the existing use for all roads under state jurisdiction.
27. *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.
28. *Substantial Enlargements or Improvements.* A 10 percent increase in existing square footage or 50 percentage increase in assessed valuation of the structure.

#### *Section 5. Corner Clearance*

1. *Corner clearance for connections shall meet or exceed the minimum connection spacing requirements for that roadway.*
2. *New connections shall not be permitted within the functional area of an intersection or interchange as defined by the connection spacing standards of this code, unless no other reasonable access to the property is available.*
3. *Where no other alternatives exist, the (permitting department) may allow construction of an access connection along the property line farthest from the intersection. In such cases, directional connections (i.e. right in/out, right in only, or right out only) may be required.*

#### *Section 6. Joint 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 is encouraged.*
3. *Shared parking areas shall be permitted a reduction in required parking spaces if peak demands do not occur at the same time periods.*
4. *Pursuant to this section, property owners shall:*
- a. *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;*
  - b. *Record an agreement with the deed that remaining access rights along the roadway will be dedicated to the (city/county) and pre-existing driveways will be closed and eliminated after construction of the joint-use driveway;*
  - c. *Record a joint maintenance agreement with the deed defining maintenance responsibilities of property owners.*
5. *The (city/county) may reduce required separation distance of access points where they prove impractical, provided all of the following requirements are met:*
- a. *Joint access driveways and cross access easements are provided in accordance with this section.*
  - b. *The site plan incorporates a unified access and circulation system in accordance with this section.*
  - c. *The property owner shall enter a written agreement with the (city/county), recorded with the deed, that pre-existing connections on the site will be closed and eliminated after construction of each side of the joint use driveway.*
6. *The (permitting department) may modify or waive the requirements of this section where the characteristics or layout of abutting properties would make a development of a unified or shared access and circulation system impractical.*

## *Section 7. Access Connection and Driveway Design*

### *1. Driveway width shall meet the following guidelines:*

- a. 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.*
  - b. For two-way access, each lane shall have a minimum width of 10 feet and a maximum of four lanes shall be allowed. Whenever more than two lanes are proposed, a median should be considered to divide the entrance and exit lanes. If used, a median should be a minimum of 8 feet wide.*
- 2. 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.*
  - 3. 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.*

## *Section 8. Requirements for Phased Development Plans*

- 1. In the interest of promoting unified access and circulation systems, development sites under the same ownership or consolidated for the purposes of development and comprised of more than one building site shall not be considered separate properties in relation to the access standards of this code. The number of connections permitted shall be the minimum number necessary to provide reasonable access to these properties, not the maximum available for that frontage. All necessary easements, agreements, and stipulations shall be met. This shall also apply to phased development plans. The owner and all lessees within the affected area are responsible for compliance with the requirements of this code and both shall be cited for any violation.*
- 2. All access must be internalized using the shared circulation system of the principle development or retail center. Access shall be designed to avoid excessive movement across parking aisles and queuing across surrounding parking and driving aisles.*

## *Section 9. Emergency Access*

- 1. In addition to minimum side, front, and rear yard setback and building spacing requirements specified in this code, all buildings and other development activities such as landscaping, shall be arranged on site so as to provide safe and convenient access for emergency vehicles.*

## *Section 10. Transit Access*

- 1. In commercial or office zoning districts where transit service is available or is planned to be available; provisions shall be made for adequate transit access. Suggested provisions include area for bus pull-outs and shelters, and pedestrian access from the stop to adjacent land uses.*

## *Section 11. Nonconforming Access Features*

1. *Permitted access connections in place as of (date of adoption) that do not conform with the standards herein shall be designated as nonconforming features and shall be brought into compliance with applicable standards under the following conditions:*
  - a. *When new access connection permits are requested;*
  - b. *Substantial enlargements or improvements;*
  - c. *Significant change in trip generation; or*
  - d. *As roadway improvements allow.*

#### *Section 12. Reverse Frontage*

1. *Access to double frontage lots shall be required 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 the (city/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 within the public right-of-way.*

#### *Section 13. Flag Lot Standards*

1. *Flag lots shall not be permitted when their effect 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.*

#### *Section 14. Lot Width-to-Depth Ratios*

1. *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.*

#### *Section 15. Shared Access*

- 1. Subdivisions with frontage on the state highway system shall be designed into shared access points to and from the highway. Normally a maximum of two accesses shall be allowed regardless of the number of lots or businesses served. If access off of a secondary street is possible, then access should not be allowed onto the state highway. If access off of a secondary street becomes available, then conversion to that access is encouraged, along with closing the state highway access.*
- 2. New direct accesses to individual one and two family dwellings shall be prohibited on all but District-level State Highways.*

#### *Section 16. Connectivity*

- 1. The street system of a proposed subdivision shall be designed to coordinate with existing, proposed, and planned streets outside of the subdivision as provided in this Section.*
- 2. 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 Public Works Director, and the restoration and extension of the street shall be the responsibility of any future developer of the abutting land.*
- 3. Minor collector and local residential access 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 and traffic control such as four-way stops and traffic calming measures are the preferred means of discouraging through traffic.*

#### *Section 17. Subdivisions*

- 1. A subdivision shall conform to the following standards:*
  - a. Each proposed lot must be buildable in conformance with the requirements of this Code and all other applicable regulations.*
  - b. Each lot shall abut a public or private street for the required minimum lot frontage for the zoning district where the lots are located.<sup>2</sup>*
  - c. If any lot abuts a street right-of-way that does not conform to the design specifications of this Code, the owner may be required to dedicate one-half the right-of-way width necessary to meet minimum design requirements.*

---

<sup>2</sup> Communities are encouraged to consider reducing lot widths and front yard setbacks to create a more pedestrian friendly street environment. These steps expand development options and can help to slow traffic on residential streets.

2. Further subdivision of the property shall be prohibited unless applicants submit a plat or development plan in accordance with requirements in this Code.
3. The (approving Department) shall consider a proposed Subdivision upon the submittal of the following materials.
  - a. An application form provided by the (city/county);
  - b. (\_\_\_\_\_) copies of the proposed Subdivision plat;<sup>3</sup>
  - c. A statement indicating that water and/or sanitary sewer service is available to the property; and
  - d. Land descriptions and acreage or square footage of the original and proposed lots and a scaled drawing showing the intended divisions and proposed street system shall be prepared by a professional land surveyor registered in the State of Oregon. In the event a lot contains any principal or accessory structures, a survey showing the structures on the lot shall accompany the application.

#### 4. Review Procedure

- a. The (approving official) shall transmit a copy of the proposed Subdivision to the appropriate (departments or officials) for review and comment.
- b. If the proposed Subdivision meets the conditions of this section and otherwise complies with all applicable laws and ordinances, the (approving official) shall approve the Subdivision by signing the application form.
- c. Upon approval of the Subdivision, the (approving official) shall record the plat on the appropriate maps and documents, and shall, at the applicant's expense, record the plat in the official county records.

#### Section 18. Site Plan Review Procedures for Access Management

1. Applicants shall submit a preliminary site plan for review by (name of department responsible for conducting review). At a minimum, the site plan shall show:
  - a. Location of existing and proposed access point(s) on both sides of the road where applicable;
  - b. Distances to neighboring constructed access points, median openings (where applicable), traffic signals (where applicable), intersections, and other transportation features on both sides of the property;
  - c. Number and direction of lanes to be constructed on the driveway plus striping plans;
  - d. All planned transportation features (such as sidewalks, bikeways, auxiliary lanes, signals, etc.);
  - e. Parking and internal circulation plans including walkways and bikeways;
  - f. A detailed description of any requested variance and the reason the variance is requested.

---

<sup>3</sup> The number of copies required should be based on number of entities that will review the plan under adopted procedures.]

2. *Subdivision and site plan review shall address the following access criteria:*
  - a. *All proposed roads shall follow the natural topography and preserve natural features of the site as much as possible. Alignments shall be planned to minimize grading.*
  - b. *Access shall be properly placed in relation to sight distance, driveway spacing, and other related considerations, including opportunities for joint and cross access.*
  - c. *Residential units shall front on local streets and minor collectors rather than major roadways.*
  - d. *The road system shall provide adequate access to buildings for residents, visitors, deliveries, emergency vehicles, and garbage collection.*
  - g. *An internal pedestrian system of sidewalks or paths shall provide connections to parking areas, entrances to the development, and open space, recreational, and other community facilities associated with the development. Streets shall have sidewalks on both sides. Pedestrian linkages shall also be provided to the peripheral street system.*
  - i. *The access shall be consistent with the access management standards adopted in the Transportation System Plan.*
3. *Any application that involves access to the State Highway System shall be reviewed by the Oregon Department of Transportation for conformance with state access management standards.*

*Section 19. Variance Standards for City/County Facilities*

1. *The granting of the variation shall be in harmony with the purpose and intent of these regulations and shall not be considered until every feasible option for meeting access standards is explored.*
2. *Applicants for a variance from these standards must provide proof of unique or special conditions that make strict application of the provisions impractical. Applicants shall include proof that:*
  - a. *Indirect or restricted access cannot be obtained;*
  - b. *No engineering or construction solutions can be applied to mitigate the condition; and*
  - c. *No alternative access is available from a street with a lower functional classification than the primary roadway.*
3. *No variance shall be granted where such hardship is self-created.*

## **Rules to Protect Public Use Airports**

Oregon Laws, 1995, Chapter 285 established that the policy of the State of Oregon is to encourage and support the continued operation and vitality of Oregon's airports. ODOT is directed to develop proposed rules establishing permissible commercial and recreational airport uses and activities on airport lands and proposed rules regarding land use compatibility safety standards of these uses and activities. The Land Conservation and Development Commission is directed to adopt these proposed rules implementing the provisions of uses, activities, and safety standards not more than 180 days after receiving the draft rule. The rules are expected to be adopted during the Fall of 1996.

Measures to protect public use airports will be expanded to include 62 additional privately owned, private use airports. Airport Compatibility and Land Use Compatibility Guidelines documents have been an element of the Oregon State Aviation System Plan since 1978 and are used as a standard for communities to follow in developing policies and ordinances to protect Oregon's airports.

The current direction that the initial rule making is taking closely follows the existing Oregon Airport Land Use Compatibility Guidelines regarding safety areas around airports that would entail establishment of an airport overlay zone. Land identified to be used for airport purposes will be zone as an airport zone with specific uses allowed outright. This airport zone might be established as an airport overlay zone that would allow other uses as long as they do not conflict with airport uses.

### **1. Recommended Policies to Protect Public Use Airports**

The Oregon Airport Land Use Compatibility Guidelines (November 1994), which have been distributed to all County and City planning departments, provides guidance for policy development. The following are examples of policies that may be appropriate to protect smaller airports:

- *To avoid danger to the public safety from potential aircraft accidents, commercial and residential uses resulting in concentrations of people shall not be permitted beneath the airport approach surfaces and an area within \_\_\_\_\_ feet parallel from the runway centerline.*
- *Land uses around the airport shall be required to provide an environment which will not be adversely affected by noise and safety problems and will be compatible with the airport and its operations.*
- *The airport is recognized as an important transportation facility. Its operation, free from conflicting land uses, is in the best interests of the citizens of the (city/county); therefore, incompatible land uses will be prohibited on the lands adjacent to the airport.*
- *The (city/county) shall encourage cooperation between the (city/county), and the Oregon Aeronautics Section when reviewing any land use development near the airport.*

- *The (city/county) and the Oregon Aeronautics Section shall work together in developing an airport Master Plan for the airport.*
- *The (city/county) will cooperate and coordinate with the (city/county), and the Oregon Aeronautics Section in the protection of the airport and future expansion areas from potential adverse effects posed by incompatible land uses.*
- *The (city/county) shall create local airport Advisory Committees for each airport. This committee shall be responsible for advising the sponsors during the development of airport Master plans, implementing ordinances or in individual land use actions.*
- *The land use element of the airport Master Plan shall become part of this comprehensive plan and guide land use decision making in the vicinity of these transportation facilities.*
- *The Airport Runway Protection Zones shall be protected from development that could conflict with aircraft approach safety, or threaten surrounding development.*
- *Development in highly hazardous areas, such as land within a floodway or under the Airport Runway Protection Zone will be restricted or prohibited.*
- *Because of potential bird hazards to airborne aircraft, land uses beneath designated airport approach surfaces within 500 feet off the approach end of runway(s) accommodating piston engine aircraft, and within 10,000 feet of the approach end of runway(s) accommodating jet aircraft shall not create water impoundments, sanitary landfills, or sewer treatment plants.*
- *The (city/county) shall adopt and implement an Airport Overlay Zone supporting land use compatibility around the airport.*
- *The (city/county) support:*
  - *Land Use Zoning with respect to the airport land use plan and noise contours;*
  - *A comprehensive capital-improvements program for land acquisition for airport expansion and safety; and*
  - *Frequent updating of the Airport Master Plan and related land use plans to keep the planning program current with changes in community goals.*

## **2. Recommended Ordinances to Protect Public Use Airports**

The Oregon Airport Land Use Compatibility Guidelines (November 1994), which have been distributed to all County and City planning departments, provide examples for ordinance development. The following Airport Overlay Zone is an example of zoning that is appropriate to protect many smaller airports.

### **AIRPORT OVERLAY ZONE**

*SECTION 1. Purpose. In order to carry out the provisions of (this/these) overlay zone(s), there are hereby created and established certain zones which include all of the land lying beneath the*

*Airport Imaginary Surfaces as they apply to the airport in the (city/county). Such zones are shown on the current airport Airspace and Runway Protection Zone drawings, prepared by \_\_\_\_\_ and dated \_\_\_\_\_.*

*Further, 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 people of the (city/county).*

*SECTION 2. Special Definitions.*

- 1. Airport Approach Safety Zone. The land that underlies the approach surface, excluding the RPZ.*
- 2. Airport Hazard. Any structure, tree, or use of land which exceeds height limits established by the Airport Imaginary Surfaces.*
- 3. 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.*
- 4. 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 (34:10 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.*
- 5. 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 and airport elevation) and upward extending to a height of 350 feet above the airport elevation.*
- 6. Horizontal Surface. A horizontal plane 150 feet above the established airport elevation, the perimeter of which is constructed by swinging arcs of 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.*

7. *Noise Sensitive Area.* Within 1,500 feet of an airport or within established noise contour boundaries exceeding 55 DNL.
8. *Nonprecision Instrument Runway.* A runway having an existing instrument approach procedure utilizing air navigation facilities with only horizontal guidance, or area type navigation equipment, for which a straight-in nonprecision instrument approach procedure has been approved, or planned, or indicated on an FAA or state planning document or military service airport planning document.
9. *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.
10. *Precision Instrument Runway.* A runway having an existing instrument approach procedure utilizing an Instrument Landing System (ILS), Microwave Landing System (MILS), Global Positioning Satellite (GPS) or a Precision Approach Radar (PAR). It also means a runway for which a precision approach system is planned and is not indicated by an FAA approved airport layout plan; any other FAA or state planning document, or military service airport planning document.
11. *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.
12. *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.
13. *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).
14. *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.

15. *Visual Runway. A runway that is intended solely for the operation of aircraft using visual approach procedures with no instrument approach procedures has been approved, or planned, or indicated on an FAA or state planning document or military service airport planning document.*

*SECTION 3. 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.*

*1. Agricultural operations (other than forestry or livestock farms).*

*2. Golf courses (but not club houses).*

*3. Automobile parking facilities.*

*SECTION 4. Conditional uses within the Airport Approach Safety Zone.*

*1. A structure or building accessory to a permitted use.*

*2. 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 (city/county) a Hold Harmless Agreement and Aviation and Hazard Easement and submits them to the airport sponsor and the (city/county) Planning Departments.*

*3. 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.*

*4. Buildings and uses of public works, public service, or public utility nature.*

*SECTION 5. Procedures. An applicant seeking a conditional use shall follow procedures set forth in the urban growth management plan/agreement between the (city/county). Information accompanying the application shall also include the following:*

*1. Property boundary lines as they relate to the Airport Imaginary Surfaces.*

*2. Location and height of all existing and proposed buildings, structures, utility lines, and roads.*



*In accordance with OAR Chapter 738 Division 100, City or County Planning Authority shall notify the owner of the airport and Aeronautics Section on 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.*

*SECTION 6. Limitations.*

- 1. To meet the standards established in FAA Regulations, Part 77 and OAR Chapter 738 Division 70, no structure shall penetrate into the Airport Imaginary Surfaces as defined above.*
- 2. No place of public assembly shall be permitted in the Airport Approach Safety Zone or RPZ.*
- 3. No structure or building shall be allowed within the RPZ.*
- 4. 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.*
- 5. No glare producing materials shall be used on the exterior of any structure located within the Airport Approach Safety Zone.*
- 6. In noise sensitive areas (within 1,500 feet of an airport or within established noise contour boundaries of 55 DNL 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 DNL 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 DNL. The planning and building department will review building permits or noise sensitive developments.*
- 7. 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 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.*

## **PROCESS FOR COORDINATED REVIEW OF LAND USE DECISIONS**

A lack of coordination between State and local decision processes can result in costly delays and changes in public road and highway projects, as well as some maintenance and operation activities. 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. The

following recommended policies will demonstrate the community's desire to establish coordinated review. Ordinance language for coordinated review is provided within the suggested ordinances for Access Management.

### **Recommended Policies for Coordinated Review**

- The (city/county) shall coordinate with the Department of Transportation to implement the highway improvements listed in the *Statewide Transportation Improvement Program (STIP)* that are consistent with the Transportation System Plan and comprehensive plan.
- The (city/county) shall consider the land use findings of ODOT's draft EISs and EAs as integral parts of the land use decision-making procedures. Other actions required, such as a goal exception or plan amendment, will be combined with review of the draft EA or EIS and land use approval process. In addition, if a project must comply with standards or conditions to be allowed in a particular development zone, these conditions and standards will be applied during review of the draft EIS or EA.

## **Recommended Process for Applying Conditions to Development Proposals**

Section 660-12-045(2)(e) of the Transportation Planning Rule requires that jurisdictions develop a process that allows them to apply conditions to development proposals in order to minimize impacts on transportation facilities.

In addition, the Site Plan review process of the small jurisdiction's codes should include a requirement to provide data on the potential traffic impacts of a project through a traffic impact study or, at the minimum, an estimation of the number of trips expected to be generated. Recommended language to be included under Site Plan Criteria is as follows:

- *The proposed use shall impose an undue burden on the public transportation system. For developments that are likely to generate more than 400 average daily motor vehicle trips (ADTs), the applicant shall provide adequate information, such as a traffic impact study or traffic counts, to demonstrate the level of impact to the surrounding street system. The developer shall be required to mitigate impacts attributable to the project.*
- *The determination of impact or effect and the scope of the impact study should be coordinated with the provider of the affected transportation facility.*

Conditions such as the following should be included in the Site Plan Review sections, to be applied in the event that a proposed project is demonstrated to potentially have an adverse effect on the transportation system. These are additional to the conditions imposed by the recommended Access Management Ordinance included previously.

- *Dedication of land for streets, transit facilities, sidewalks, bikeways, paths, or accessways shall be required where the existing transportation system will be impacted by or is inadequate to handle the additional burden caused by the proposed use.*
- *Improvements such as paving, curbing, installation or contribution to traffic signals, construction of sidewalks, bikeways, accessways, paths, or streets that serve the proposed use where the existing transportation system may be burdened by the proposed use.*

## **Recommended Regulations to Provide Notice to Public Agencies**

Review of land use actions is typically initiated by a Notice. This process is usually defined by a Procedures Ordinance or Noticing Policy. This Ordinance or Policy should be amended to provide for Notice to ODOT regarding any land use action on or adjacent to a State facility. Similarly, all actions by a city or county potentially affecting another jurisdiction's road should require notice to that jurisdiction's public works department. In addition, the policy should be to notice providers of public transit and special interest transportation groups such as truckers, railroad, bicyclists, pedestrians, and the disabled on any roadway or other transportation project.

Information that should be conveyed to reviewers includes:

- *Project location.*
- *Proposed land use action.*
- *Location of project access point(s).*

Additional information that could be supplied to the review upon request (provided the information is available) includes:

- *Distances to neighboring constructed access points, median openings, traffic signals, intersections, and other transportation features on both sides of the property;*
- *Number and direction of lanes to be constructed on the driveway, plus striping plans;*
- *All planned transportation features (lanes, signals, bikeways, sidewalks, crosswalks, etc.);*
- *Trip generation data or appropriate traffic studies;*
- *Parking (motor vehicle and bicycle) and internal circulation plans for vehicles and pedestrians;*
- *Plat map showing property lines, right-of-way, and ownership of abutting properties; and*
- *A detailed description of any requested variance.*

### **Recommended Regulations to Assure that Amendments are Consistent with the Transportation System Plan**

Section 660-12-045(2)(g) of the Transportation Planning Rule requires that jurisdictions develop regulations to assure that all development proposals, plan amendments, or zone changes conform with the Transportation System Plan. This requirement can be addressed by adding a policy to the Comprehensive Plan, as follows:

- *All development proposals, plan amendments, or zone changes shall conform with the adopted Transportation System Plan.*

Within the zoning ordinance, development proposals can be addressed through Site Plan Review, discussed above. Zone changes and plan amendments are partially addressed by the standard language found in most codes, such as follows:

- *The applicant must show that the proposed change conforms with the Comprehensive Plan...*

The following statements should be added to the local ordinance and policy language governing zone changes and plan amendments:

- *A plan or land use regulation amendment significantly affects a transportation facility if it:*

- a. *Changes the functional classification of an existing or planned transportation facility;*
- b. *Changes standards implementing a functional classification system;*
- c. *Allows types or levels of land use that would result in levels of travel or access what are inconsistent with the functional classification of a transportation facility; or*
- d. *Would reduce the level of service of the facility below the minimum acceptable level identified in the Transportation System Plan.*

■ *The presence of a transportation facility or improvement shall not be a basis for an exception to allow residential, commercial, institutional, or industrial development on rural lands (OAR 660-12-060(4)).*

■ *Amendments to acknowledged comprehensive plans and land use regulations which significantly affect a transportation facility shall assure that allowed land uses are consistent with the identified function, capacity, and level of service of the facility. This shall be accomplished by either:*

- (a) *Limiting allowed land uses to be consistent with the planned function of the transportation facility;*
- (b) *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 this division; or,*
- (c) *Altering land use designations, densities, or design requirements to reduce demand for automobile travel and meet travel needs through other modes.*

## **SAFE AND CONVENIENT PEDESTRIAN AND BICYCLE CIRCULATION**

Bicycling and walking are often the most appropriate mode for short trips. Especially in smaller cities where the downtown area is compact, walking and bicycling can replace short auto trips, reducing the need for construction and maintenance of new roads. However, the lack of safe and convenient bikeways and walkways can be a strong discouragement for these mode choices. The Transportation Planning Rule requires that jurisdictions plan for bicycling and walking as part of the overall transportation system.

### **Recommended Policies for Pedestrian and Bicycle Circulation**

To comply with the objectives of the Transportation System Plan and the Transportation Planning Rule, it is recommended that the small jurisdiction amend its Comprehensive Plans with policies such as the following to protect, support, and encourage bicycle and pedestrian travel.

- *It is the policy of the (city/county) to develop a network of streets, accessways, and other improvements, including bikeways, sidewalks, and safe street crossings to promote safe and convenient bicycle and pedestrian circulation within the community.*
- *The (city/county) shall require streets and accessways where appropriate to provide direct and convenient access to major activity centers, including downtown, schools, shopping areas, and community centers.*
- *In areas of new development the (city/county) shall investigate the existing and future opportunities for bicycle and pedestrian accessways. Many existing accessways such as user trails established by school children distinguish areas of need and should be incorporated into the transportation system.*
- *Bikeways shall be included on all new arterials and collectors within the Urban Growth Boundary except on limited access freeways. Retrofitting existing arterials and collectors with bike lanes shall proceed on a prioritized schedule as appropriate and practical. (For example, it is often not appropriate to displace onstreet parking in a downtown commercial area for bikelanes).*
- *Sidewalks shall be included on all new streets within the Urban Growth Boundary except on limited access freeways. Retrofitting existing streets with sidewalks shall proceed on a prioritized schedule.*
- *Priority shall be given to accessways to major activity centers within the Urban Growth Boundary, such as the downtown commercial center, schools, and community centers.*
- *Bikeways and pedestrian accessways shall be connected to local and regional travel routes.*
- *Bikeways and pedestrian accessways shall be designed and constructed to minimize potential conflicts between transportation modes. Design and construction of such facilities should follow the guidelines established by the Oregon Bicycle and Pedestrian Plan.*
- *Maintenance and repair of existing bikeways and pedestrian accessways (including sidewalks) shall be concomitant with the maintenance and repair of motor vehicle facilities.*
- *Bicycle parking facilities shall be provided at all new residential multiplex (four units or more), commercial, industrial, recreational, and institutional facilities.*
- *A citizens advisory committee should be established to protect and promote bicycle and pedestrian transportation within the Urban Growth Boundary.*

## **Recommended Ordinances for Bicycle Parking**

The lack of safe and convenient bicycle parking can waste resources and further discourage bicycling as a transportation mode, as well as irritate non-cyclists, the following are recommended ordinances:

- *A minimum of 2 bicycle parking spaces per use (one sheltered and one unsheltered) should be required.*
- *Racks for up to 8 bicycles may be placed within the area of a motor vehicle parking space, reducing the overall motor vehicle parking requirement.*
- *The following Special Minimum Standards should be considered as supplemental requirements for the number of required bicycle parking spaces.*
  - *Multi-Family Residences. Every residential use of 4 or more dwelling units shall provide at least one sheltered bicycle parking space for each unit. 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.*
  - *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.*
  - *Schools. Elementary, middle, and high schools, both private and public, shall provide one bicycle parking space for every 10 students and employees, all of which shall be sheltered under an eave, overhang, independent structure, or similar cover.*
  - *Colleges. Colleges, universities, and trade schools shall provide one bicycle parking space for every 10 motor vehicle spaces plus one space for every dormitory unit. Fifty percent of the bicycle parking spaces shall be sheltered under an eave, overhang, independent structure, or similar cover.*
  - *Downtown Areas. In downtown areas with on-street parking, bicycle parking for customers shall be provided along the street at a rate of at least one space per use. Spaces may be clustered to serve up to six bicycles; at least one cluster per block shall be provided. Bicycle parking spaces shall be located in front of the stores along the street, either on the sidewalks or in specially constructed areas such as pedestrian curb extensions. Inverted "U" style racks are recommended (see illustration Note: not supplied with this draft). Bicycle parking shall not interfere with pedestrian passage, leaving a clear area of at least 5 feet between the parked bicycle and the store front. Customer spaces are not required to be sheltered. Sheltered parking (within a building, or under an eave, overhang, or similar structure) shall be provided at a rate of one space per 10 employees, with a minimum of one space per store.*
  - *Rural Schools, Service Centers, and Industrial Parks. Where a school, service center, or industrial park is located 5 or more miles from the closest urban area or rural residential*

*subdivision with a density of more than one dwelling unit per 20 acres, a minimum of two bicycle parking spaces per use shall be required.*

■ *The following formulas for Calculating the Number of Required Bicycle Parking Spaces are recommended.*

- *Fractional numbers of spaces shall be rounded up to the next whole space.*
- *For facilities with multiple uses (such as a commercial center), the bicycle parking requirements shall be calculated by using the total number of motor vehicle parking spaces required for the entire development.*

### **Recommended Ordinances for Bicycle and Pedestrian Circulation and Access**

Sections 660-12-045(3)(b), (c), and (d) of the Transportation Planning Rule deal with providing facilities for safe and convenient pedestrian and bicycle circulation and access, both within new residential and commercial development, and on public streets. In order for walking and bicycling to be viable forms of transportation, especially in the smaller urban centers where they can constitute a significant portion of local trips, the proper facilities must be supplied. In addition, certain development design patterns, such as orienting commercial uses to the street and placing parking behind the building, make a commercial district more accessible to non-motorized transportation and to existing or future transit.

The Transportation Planning Rule specifies that, at a minimum, sidewalks and bikeways be provided along arterials and collectors in urban areas, and separate bicycle and pedestrian facilities be provided where these would safely minimize trips distances by providing a “short cut.” The small jurisdiction should consider enhancing the existing City codes by including the following recommended ordinances, additions and recommendations. The recommendations should be placed within the appropriate section of the zoning or subdivision ordinance:

It may be necessary to include all or some of the following definitions to bring the Zoning or Subdivision Code up to date:

1. *Access Corridor. A separate travel way for pedestrians and bicyclists to minimize travel distances within and between subdivisions, planned unit developments, residential areas, transit stops (if appropriate), or within and between nearby neighborhood activity centers such as schools, parks, and services.*
2. *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.*
3. *Bicycle Facilities. A general term denoting improvements and provisions made to accommodate or encourage bicycling, including parking facilities and all bikeways.*



4. *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:
  - a. *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 users.
  - b. *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.
  - c. *Shoulder Bikeway.* The paved shoulder of a roadway that is 4 to 6 feet wide; typically shared with pedestrians in rural areas.
  - d. *Shared Roadway.* A travel lane that is at least 14 feet wide and is shared by bicyclists and motor vehicles.
  - e. *Multi-use Trail.* An unpaved path that accommodates all-terrain bicycles; typically shared with pedestrians.
5. *Pedestrian Facilities:* A general term denoting improvements and provisions made to accommodate or encourage walking, including sidewalks, accessways, crosswalks, ramps, paths, and trails.

Required elements for a site plan should include the design and location of bicycle parking and bicycle and pedestrian circulation elements such as accessways, walkways, and transit facilities. The following language should be added to the small jurisdiction's Land-Use regulations:

1. *Bicycle Parking.* The development shall include the number and type of bicycle parking facilities required in the *Off-Street Parking and Loading* section of this Title. The location and design of bicycle parking facilities shall be indicated on the site plan.
2. *Pedestrian Access and Circulation.*
  - a) *Internal pedestrian circulation shall be provided in new commercial, office, and multi-family residential developments through the clustering of buildings, construction of hard surface walkways or similar techniques.*
3. *Commercial Development Standards.*
  - a) *New commercial buildings, particularly retail shopping and offices, should be oriented to the street, near or at the setback line. A main entrance should be oriented to the street. For lots with more than two front yards, the building(s) should be oriented to the two busiest streets.*
  - b) *Off-street motor vehicle parking for new commercial developments should be located at the side or behind the building(s).*
4. *All site plans (industrial and commercial) shall clearly show how the site's internal pedestrian and bicycle facilities connect with external existing or planned facilities or systems.*

The city/county Subdivision Ordinances should reflect the intent of the Transportation Planning Rule by adding the following provision to development requirements.

- *Approval of Subdivision Tentative Plans and Final Plats. Information required should include the location and design of all proposed pedestrian and bicycle facilities, including access corridors.*

The small jurisdiction should consider upgrading its Design Standards to include a section such as the following:

*1. Pedestrian and Bicycle Circulation within Subdivision.*

- a) The tentative plan for a proposed subdivision shall include bicycle and pedestrian facilities and improvements within the subdivision, including accessways as necessary to provide more direct connections through the subdivision. The tentative plan shall demonstrate how the subdivision's internal pedestrian and bikeway system provides safe and convenient connections to the surrounding transportation system.*

The small jurisdiction Subdivision Ordinance should incorporate the following language into the existing requirements for cul-de-sac design.

*2. Cul-de-Sacs and Accessways.*

- a) Cul-de-sacs or permanent dead-end streets (not including temporary stubs) should be discouraged, except where topographical or environmental constraints or incompatible existing abutting street patterns make connecting streets infeasible. In such instances, accessways (paths) for pedestrians and bicyclists connecting the ends of cul-de-sacs to streets or neighborhood activity centers on the opposite side of the block should be provided.*
- b) Accessways for pedestrians and bicyclists should 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 should also be lighted.*
- c) The Hearings Body or Planning Director may determine, based upon evidence in the record, that an accessway is inappropriate or impracticable. Such evidence may include but is not limited to:
  - i) The nature of abutting existing development makes the construction of an access corridor impracticable;*
  - ii) The access corridor would cross a natural area with significant habitat, and construction of the access corridor would be incompatible with the protection of natural values;*
  - iii) The access corridor would cross topography where slopes exceed 30% or the corridor grade would exceed an 18% grade; or**

- iv) A cul-de-sac or dead-end street abuts rural resource land at the urban growth boundary, except where the adjoining land is designated as urban reserve.

Adding these provisions will satisfy the requirements of the Transportation Planning Rule by creating more favorable conditions for pedestrians and bicyclists within new developments. The small jurisdiction may decide that additional provisions could further encourage transportation alternatives.

In addition to the above provisions, the recommended bikeway and sidewalk road standards for new road construction or the reconstruction of existing roads within an Urban Area should be enhanced to include specifications for bikeways and sidewalks. In addition, the Transportation Planning Rule directs local governments to establish overall standards for streets that consider and reduce excessive widths for local streets in order to reduce construction costs and enhance bicycle and pedestrian access, while providing for the operational needs of the facility. Narrower streets improve neighborhood aesthetics and discourage speeding and through traffic. They also reduce right-of-way needs, construction costs, storm water run-off, and the need to clear vegetation. In most cases, full AASHTO standards are excessively wide for small jurisdictions, except for on State Highways. The following are recommended standards that will meet the intent of the Transportation Planning Rule.

**Table 9-1  
Recommended Street Standards**

Classification	Pavement Width (ft)	Sidewalk/Shoulder Width (ft)	Bikeway/Shoulder Width (ft)	Right-of-Way Width (ft)	Min. Posted Speed (MPH)
<i>Urban (inside UGB)</i>					
Local Residential	28 <sup>1</sup>	5 <sup>2</sup>	None	50	15-25
Collector	44 <sup>3</sup>	6	5	60	25-35
Arterial	34-47 <sup>4</sup>	6-8	6	70	25-45
Downtown Commercial	44 <sup>5</sup>	12	5	70	15-25
Alleys	20-24	None	None	20-24	10
<i>Rural (outside UGB)</i>					
Local Residential	24-36 <sup>6</sup>	see Table 4-2		60	25
		see Table 4-2			
		see Table 4-2			
Collector	22-38			60	25-35
Arterial	32-40			60	35-55

<sup>1</sup> Includes parking on both sides of the street.

<sup>2</sup> All sidewalks except downtown commercial should be set one foot from the right-of-way line to allow for an at least 4-foot wide landscape strip or buffer.

<sup>3</sup> Includes parking on both sides and 10-foot travel lanes.

<sup>4</sup> Range indicates two 11-foot or three lanes with a 13-foot center turn lane; no parking allowed.

- <sup>5</sup> Parking on both sides of the street.  
<sup>6</sup> Range reflects shoulder width (see Table 9-2).

### *Urban Street Standards*

- 1. Urban Local Streets. See Table 9-1. The standard for a local residential street should be a 28-foot roadway. Five-foot wide sidewalks should be provided on each side of the roadway, located one foot from the right-of-way line to provide a five-foot planting strip.*
- 2. Urban Collectors. See Table 9-1. All new collectors shall include two 10-foot travel lanes, two 5-foot bicycle lanes, and parking on both sides of the street. The roadway can also be striped to provide two travel lanes plus left-turn lanes at intersections or driveways by removing parking for short distances. Six-foot sidewalks shall be provided on each side of the roadway, one foot from the right-of-way line to allow a five-foot-wide planting strip. In commercial or business areas, the sidewalks may be eight feet wide or extend to the property line, and may be located adjacent to the curb to facilitate loading and unloading at the curb.*
- 3. Urban Arterials. See Table 9-1. All new arterials shall have two 11-foot wide travel lanes. Where a center turn lane is indicated, it shall be a maximum of 13 feet wide. All new arterials should include marked 6-foot wide bike lanes on both sides of the street. New arterials shall include 6-foot wide sidewalks located one foot from the right-of-way on both sides of the street, buffered from the street with a planting strip of at least 5 feet located between the sidewalk and the street. In downtown core areas, the sidewalk shall be 12 feet wide with no buffer required.*
- 4. Retrofitting existing arterials, collectors, and local streets to include bike lanes and sidewalks should be accomplished on a prioritized schedule. Less than full standards may be appropriate because of existing land uses (i.e., onstreet parking in a commercial downtown area). The guidelines provided by the most recent edition of the Oregon Bicycle and Pedestrian Plan should be followed.*

### *Rural Streets*

- 1. Rural Local Streets. See Table 9-1. Local streets shall have two 10-foot travel lanes. The street may include shoulders (see Table 9-2); however, bikeways typically are not needed on rural local streets, since motor vehicle speeds should be slow and population densities are low. If rural subdivision densities are greater than one dwelling per acre, or if a school or other neighborhood attraction is located within walking (½ mile) or bicycling distance (2 miles) of a rural subdivision, then either sidewalks, pathways, or 6-foot shoulders on both sides of the roadway should be provided.*
- 2. Rural Collectors. See Table 9-1. All rural collectors shall have two 11-foot travel lanes and include shoulders (see Table 9-2). In rural areas where rural subdivisions, schools, or commercial centers attract pedestrians, the shoulder should be 6 feet, regardless of ADTs.*

3. *Rural Arterials.* See Table 9-1. All rural arterials shall have two 12-foot travel lanes and include shoulders (see Table 9-2). In rural areas where rural subdivisions, schools, or commercial centers attract pedestrians, the shoulder should be 6 feet, regardless of ADTs.

**Table 9-2  
RECOMMENDED SHOULDER WIDTHS**

Road Classification	ADT under 400	ADT 400- DHV* 100	DHV 100-200	DHV 200-400	DHV over 400
Rural Arterials	4 feet	6 feet	6 feet	8 feet	8 feet
Rural Collectors	2 feet	4 feet	6 feet	8 feet	8 feet
Rural Local	2 feet	4 feet	6 feet	6 feet	8 feet

\* DHV (Design Hour Volume) is the expected traffic volume in the peak design hour (usually at commuter times), usually 13 to 25% of ADT.

## APPENDIX A

### TRANSPORTATION SYSTEM PLAN REQUIREMENTS

The Jefferson County TSP must 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 affected jurisdictions. The TSP lays the framework for a community coordinate all transportation projects and planning activities with federal, state, and other local jurisdictions. The pertinent elements of the Transportation Planning Rule and State Transportation Plan are described in this chapter.

#### Goal 12

In the mid-1970s, Oregon adopted 19 Statewide Planning Goals to be implemented in comprehensive plans. Goal 12 (Transportation) is: *To provide and encourage a safe, convenient and economic transportation system.* Each city, county, and metropolitan area has developed the transportation element of their comprehensive plan 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 TRANSPORTATION PLANNING RULE

The Transportation Planning Rule was developed by the Oregon Land Conservation and Development Commission and ODOT, and adopted in April 1991 (amended April 1995). The Transportation Planning Rule implements Goal 12, and applies to all levels of government.

The Transportation Planning Rule requires that cities, counties, Metropolitan Planning Organizations 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 objective of the Transportation Planning Rule is to encourage a multi-modal transportation network throughout the state that reduces reliance on the automobile and ensures 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 Transportation Planning Rule affects all jurisdictions, with requirements that vary based on population size and the geographic location of each jurisdiction. It also sets forth a schedule for compliance. Jurisdictions outside of Metropolitan Planning Organizations, such as Jefferson County, must complete plans by May 1997.

### **Transportation Planning Rule Requirements for Jefferson County**

Jefferson County is categorized by the Transportation Planning Rule as a "small" jurisdiction county (populations between 2,500 and 25,000), located outside of a major urban area. In preparing its local transportation system plan, Jefferson County must *...establish a system of transportation facilities and services adequate to meet identified local transportation needs and shall be consistent with regional TSPs and adopted elements of the state TSP.*

The following plan elements are required in order to satisfy the Transportation Planning Rule:

- A street system plan for a network of arterial and collector roadways
- A public transportation plan
- A bicycle and pedestrian system plan
- An air, rail, water, and pipeline plan
- Transportation funding options.
- Policies and land use regulations for implementing the TSP

The first four items are addressed in Chapter 8 (Transportation Improvement Projects). The transportation funding options are presented in Chapter 9 (Funding Options).

The proposed policies and land use regulations are included as Appendix A of this report. These include land use and subdivision ordinance amendments to protect transportation facilities for their identified functions. In particular, these amendments include street standards and access control measures. The County will also amend land use and subdivision ordinances to require bicycle parking facilities and facilities for safe, convenient, and direct pedestrian and bicycle access within and between residential, commercial, employment, and institutional areas.

## **OREGON TRANSPORTATION PLAN**

The Oregon Transportation Plan 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 Oregon Transportation Plan process. The preferred plan presented in the Oregon Transportation Plan 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.*

## **Inventory**

In its inventory of existing facilities, the Oregon Transportation Plan identifies several transportation facilities of significance in Jefferson County:

- The Mount Hood Highway (Highway 26 through and west of Jefferson County, Ochoco Highway (Highway 126 west of Jefferson County and 26 through and east of Jefferson County) and Highway 97 are highways of statewide significance. As defined in the Oregon Highway Plan, the function of a statewide highway is *...to provide connections and links to larger urban areas, ports and major recreation areas that are not directly served by interstate highways.*
- Jefferson County currently has intercity bus service provided by Greyhound Bus Lines. Travel is possible along both east-west and north-south corridors.
- The Burlington Northern Railway provides vital transport for industrial and agricultural freight through Jefferson County via the Oregon Trunk Line, a line-haul carrier serving the County.

## **Minimum Levels of Service by 2015**

The minimum levels of service expected to be in place by 2015 set standards for performance for each mode of travel and for all jurisdictions. The following levels of service apply to Jefferson County:

- *Local public transit services and elderly and disadvantaged service providers should regularly connect with intercity passenger services.*
- *Intercity passenger service should be available for an incorporated city or groups 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.*
- *Local transit and elderly and disadvantaged services should be coordinated with intercity bus services.*
- *Highway freight accessing intermodal truck/rail terminals or moving within Oregon should experience level of service C or better on Oregon highways during off-peak periods.*



- *Branch rail lines within Oregon should be maintained to allow a minimum speed of operation of 25 miles per hour whenever upgrading can be achieved with a favorable benefit-cost ratio.*
- *Minimum levels of service and minimum tolerable conditions for state highways are included in the Oregon Highway Plan.*
- *Bicycle and pedestrian networks should be developed and promoted in all urban areas to provide safe, direct and convenient access to all major employment, shopping, educational and recreational destinations in a manner that would double person trips by bicycle and walking.*
- *Secure and convenient bicycle storage available to the public should be provided at all major employment and shopping centers, park and ride lots, passenger terminals and recreation destinations.*

### **Jefferson County Comprehensive Plan**

The Transportation Element of the Jefferson County Comprehensive Plan was prepared in response to Goal 12, and was adopted in 1981. The Comprehensive Plan has not yet been fully updated. The implementation of the TSP will require Jefferson County update the transportation section of the comprehensive plan. In addition, it is likely that the land use section of the comprehensive plan will also need to be updated at the same time. As part of this comprehensive plan update process, Jefferson County will also need to formulate new ordinances or amend existing ones to implement the TSP. The logical time to update the Jefferson County Plan and Development Code will be the first Periodic Review cycle after the formal adoption of the TSP. According the Transportation Planning Rule (OAR 660-12-055(5)), Jefferson County qualifies for partial exemption from the Rule because the County has a population of less than 25,000.

A review of the Transportation Element of the Jefferson County Comprehensive Plan is included in Appendix C.

## **APPENDIX B**

### **FUNDING OPTIONS**

In order to finance future transportation system improvements within the Jefferson County urban area, it will be important to consider a range of alternative funding sources. The use of alternative revenue funding is a trend throughout Oregon as the full implementation of Measure 5 has significantly reduced property tax revenues. The alternative revenue sources covered in this chapter may not all be appropriate for Jefferson County. However, a full overview is being provided to enable County to consider a range of options to finance future transportation improvements during the next 20 years.

#### **1. Property Taxes**

Property taxes are the major revenue source for Oregon cities and counties. Property taxes are levied through 1) tax base levies, 2) serial levies, and 3) bond levies. The most common method is tax base levies which are continuous and are allowed to increase by 6 percent per annum. Serial levies are limited by amount and time they can be imposed. Bond levies are for specific projects and are limited by time based on the debt load of the local government.

The historic dependence on property taxes is changing with the passage of Ballot Measure 5 in the early 1990's. With the 1995/1996 budget year, Ballot Measure 5 will be fully implemented. In brief, Ballot Measure 5 limits the property tax rate for purposes other than payment of certain voter approved general obligation indebtedness. With full implementation in the current budget year, 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. Excluded from the limitation is debt service used to retire voter approved general obligation bonds. Ballot Measure 5 requires that all non-school taxing districts property tax rate be reduced if together they exceed \$10 per \$1,000 per assessed valuation by 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. This proportional reduction in the taxing rate is commonly referred to as compression of the tax rate.

## **2. Debt Financing Techniques**

There are a number of debt financing options available to the County. The use of debt to finance capital improvements must be balanced with the County's ability to make future debt service payments and to deal with the impact on its overall debt capacity and underlying credit rating. Debt financing should be viewed not as a source of funding, but as a time shifting of funds available to the County. Its use should be incorporated into the overall financing plan which may include some "pay-as-you-go" funding methods which utilize currently available revenues to meet a portion of the County's transportation needs.

While a wide variety of debt financing techniques exist, some of the primary financing tools used for transportation related projects are listed below. These include general obligation bonds, limited tax general obligation bonds, local improvement district bonds, and special tax revenue bonds.

### **2a. General Obligation Bonds**

General obligation bonds (GOs) are voter approved bond issues and represent the least expensive borrowing mechanism available to municipalities. GO 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 the debt is paid off. The property tax levy is distributed equally throughout the taxing jurisdiction according to assessed value of property. General obligation debt is typically used to make public improvement projects that will benefit the entire community.

State statutes require that the general obligation indebtedness of a municipality not exceed three percent of the municipality's true cash value. Bonds issued for water, sewer, and other utility purposes are excluded from this limitation. Since general obligation bonds would be issued subsequent to voter approval, they would not be restricted to the limitations set forth in Ballot Measure 5 described earlier.

### **2b. Limited Tax General Obligation 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, investors typically require a higher rate of return than they would from a more secure, tax-backed general obligation issue. Since LTGOs are not voter approved, they are subject to limitations under Ballot Measure 5.

## **2c. Local Improvement District Bonds**

Local improvement districts (LIDs) may be formed to construct local improvements such as street and sidewalk repairs and improvements. They are formed either through petition by the benefitted property owners who seek a set of public improvements or through the legislative process of the city council. After the district is formed, public improvements may be made and the costs of those improvements distributed among the properties within the LID according to their respective benefit.

The benefit is set by formula by the city council when the district is formed. Once the benefit and cost have been set, an assessment is levied against the benefiting properties. The owners of the benefitted properties may pay in one up-front assessment or apply for assessment financing. In Oregon this means that the city will issue bonds and allow the property owners to pay their assessment over time. Since the security of special assessment bonds lies solely with the assessment payments, potential investors and rating agencies apply a much more rigorous credit evaluation than would they would be a general obligation issue backed by property taxes. As a result, it may be very difficult to sell special assessment bonds at reasonable rates for projects that have marginal credit quality.

In Oregon Statute, municipalities are allowed to issue Bancroft bonds which pledge the city's full faith and credit to the assessment bonds. As a result, the bonds become general obligations of the city but are paid with the assessments. Historically, this provided a city with the ability to pledge its full faith and credit in order to obtain a lower borrowing cost without needing to receive 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 Measure 5 described above. As a result, since 1991, Bancroft bonds have been unused by municipalities who were required to compress their tax rates.

One of the challenges of utilizing a local improvement district is managing the risk of prepaid assessments. Property owners typically have the option to pre-pay assessments in order to forgo paying continued interest payments. However, when the city first issues bonds it commits to meeting a specific stream of debt service payments at certain rates to investors. When a prepayment occurs, the city loses expected interest payments in future years. As a result, the city must actively invest such prepayments in order to maintain previously expected cash flows. The challenge of investing numerous small streams of prepayments can be administratively daunting. More often than not prepayments are left in low interest earning accounts. As a result, when the city is required to make debt service payments, it is forced to make up the difference of a low savings rate and the higher borrowing cost of the issue. To counter this potential difficulty, a city can structure bonds to allow for early redemption. This helps to mitigate the risks posed by prepayments. However, since the predictability of debt service streams are less sure, the investor will require a higher rate of return, thus leaving the city, and ultimately the assessed property owners, with a higher cost of borrowing.

## **2d. Special Tax Revenue Bonds**

Counties and cities may issue revenue bonds based on the expected receipt of special taxes. Examples of such revenues are gas taxes, hotel-motel taxes, or system development charges. Generally speaking, the more predictable the revenue source, the easier it is to support debt financing with the revenue. These types of bonds are more complicated to issue and usually restrict the other uses of the dedicated revenues so the bond holders can be assured timely payment.

A few cities in Oregon have secured revenue bond issues with State gas taxes or other special transportation revenues. In many cases, local governments have become accustomed to using state gas tax revenues solely for maintenance needs. Using gas tax revenues to pay debt service on bonds instead of funding maintenance would require an issuer to either reduce its maintenance budget or provide some other source of funding for maintenance needs.

## **3. System Development Charges**

System Development Charges (SDC) are becoming increasingly popular in funding public works infrastructure needed for new development within local communities. Local governments have the legal authority to charge property owners and/or developers fees for improving the local public works infrastructure. The charges are most often targeted towards improving community water, sewer, or transportation systems. Cities and counties must have specific infrastructure plans in place that comply with State guidelines in order to collect System Development Charges.

Jefferson County has explored the feasibility of implementing a System Development Charge fee program. The County's program would likely be similar to the one currently in place within the City of Madras. Jefferson County would also likely have the System Development Charges directed only towards transportation system improvements within the County. As dictated by the State guidelines, Jefferson County would need to prepare a transportation inventory and adopt a systems development charge ordinance before fees could be applied to development projects.

It may be appropriate for the City of Madras and Jefferson County to consider a transportation SDC for the unincorporated urban area around Madras. The boundaries of the area to be included can coincide with the area covered by the Madras Transportation System Plan. SDC generated from the area outside the city could be targeted towards maintaining and upgrading county roads. In order to put a SDC in place outside of Madras, Jefferson County would need to adopt a SDC Ordinance with a plan showing how the fees would be calculated and how revenues would be spent in the future. In addition, Madras and Jefferson County would need to amend the City/County Urban Growth Management Agreement (UGMA) to specify how SDC fees would be collected and what urban land areas would be included in the SDC zone.

#### **4. State Gas Taxes**

Gas Tax revenues received from the State of Oregon are used by all counties and cities to fund street and road construction and maintenance. In Oregon, the State collects gas taxes, vehicle registration fees, overweight/overheight fines and weight/mile taxes and returns a portion of the revenues to cities and counties through an allocation formula. The State retains approximately 60 percent while allocating 15.5 percent to cities and 24.5 percent to counties.

The Oregon Constitution permits counties and incorporated cities to levy additional local gas taxes with the stipulation that the moneys generated from the taxes will be dedicated to street related improvements and maintenance within the jurisdiction. At present, only a few governments (City of Woodburn, Multnomah and Washington Counties) levy a local gas tax. Based on a very preliminary analysis of a one cent per gallon tax, it is expected that Jefferson County could generate from \$30,000 to \$40,000 per year for street maintenance and construction.

The City of Madras and Jefferson County have held past discussions on implementing a local gas tax. In addition, Jefferson, Crook, and Deschutes Counties have discussed the feasibility of seeking passage for a tri-county local gas tax levy. To date, these discussions have not led to any specific action. Most recently, the cities of Madras, Prineville, and Redmond have discussed the idea of promoting a 1 to 2 cent local gasoline tax dedicated towards transportation. In the scenario of a three city local gas tax, it would be expected that tax revenues would be disbursed based the amount of gasoline sold within each community. It would be expected that Madras would direct its share of the gas tax revenue transportation maintenance and improvement projects within the corporate city limits. With the implementation of the Madras and Jefferson County Transportation System Plans, both the City of Madras and Jefferson County should renew discussions regarding a local gas tax to fund future street construction and maintenance.

#### **5. Vehicle Registration Fees**

The Oregon Vehicle Registration Fee is currently \$30 bi-annually for regular passenger vehicles and is allocated to the State, counties and cities for road funding. Cities receive 15.57 percent, counties 24.38 percent, while the State retains 60.05 percent. Oregon counties are granted such authority, which would allow Jefferson County to impose a vehicle registration fee that covered the entire county. The Oregon Revised Statutes would allow Jefferson County to impose a biannual registration fee for all passenger cars licensed within the County. Although both counties and special districts have this legal authority, vehicle registration fees have not been imposed by local jurisdictions. In order for a local vehicle registration fee program to be viable in Jefferson County, all the incorporated cities and the county would need to formulate an agreement which would detail how the fees would be spent on future street construction and maintenance.

#### **6. 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 city government or property owners. Cities and counties 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 cost of local improvements are generally spread out among a group of property owners along a public street or within a specified area. The cost can be allocated based on property frontage or other methods such as traffic 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 apply for assessment financing through the city. Since the passage of Ballot Measure 5, local government have most often funded local improvement districts through the sale of special assessment bonds. Although the interest rate for these special assessment bonds are higher than General Obligation (GO) bonds, they are not subject to the limitation of Ballot Measure 5.

Jefferson County also has a Local Improvement Ordinance that covers the unincorporated areas of the County. County personnel have expressed reservations about using LIDs as a financing tool to fund transportation projects because of the impact on the Public Works Department budget. When Jefferson County has formed a LID, the County's up-front contribution has come directly out of the Public Works Department's operating budget. Because of this process, the County Public Works Department has not promoted the use of LIDs to finance transportation improvements to County roads. The Public Works Department would rather require that property owners and developers construct public transportation improvements to city standards within incorporated city urban growth boundaries. By requiring conformance to city standards at the time of development, there would not be a need to form an LID in the future. In addition, such a policy would also enable the cities to accept county roads when new properties are annexed and eliminate the need for Jefferson County to improve roads to individual city standards.

## **7. Grants and Loans**

The majority of the grant and loan programs available today are geared towards economic development, and not specifically for construction of new streets. Typically, grant programs target areas that lack basic public works infrastructure needed to support new or expanded industrial businesses. Because of the popularity of some grant programs such as the Oregon Special Public Works Fund, the emphasis has shifted to more of a loan program. The loan programs often require an equal match from the local jurisdiction as a condition of approval. Two common State grant/loan programs are described below.

### **7a. ODOT Immediate Opportunity Grant Program**

ODOT administers a grant program designed to assist local and regional economic development efforts. The program is funded to a level of approximately \$5,000,000 per year through state gas tax revenues. ODOT officials use the following as primary factors in determining eligible projects:

- Funding used to improve public roads;
- Used for an economic development related project of regional significance;
- Primary project must create primary employment; and
- Preference to grantee providing local funds to match grant (lesser matches may also be considered).

The maximum amount of any grant under the program is \$500,000. Local governments which have received grants under the program include Washington County, Multnomah County, Douglas County, City of Hermiston, Port of St. Helens, and the City of Newport.

### **7b. Oregon Special Public Works Fund**

The Special Public Works Fund (SPWF) program was created by the 1995 State Legislature as one of the 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 which support commercial and industrial development that result 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. SPWF awards can be used for improvement, expansion, and new construction of public sewage treatment plants, public water supply works, public roads, and public transportation.

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. The maximum loan amount per project is \$11,000,000 and the term of the loan cannot exceed the useful life of the project or 25 years, whichever is less. Interest rates for loans funded with the State of Oregon Revenue Bonds are based on the rate the State may borrow through the Oregon Economic Development Department Bond Bank. The Department may also make loans directly from the SPWF and the term and rate on direct loans can be structured to meet project needs. The maximum grant per project is \$500,000, but may not exceed 85 percent of the total project cost.

Entities to date that have received SPWF funding for projects including some type of transportation related improvement are the City of Cornelius, City of Woodburn, City of Forest Grove, City of Portland, City of Reedsport, City of Wilsonville, City of Redmond, City of Bend, City of Bend, and Douglas County.