

Jefferson County Transportation System Plan

Jefferson County, Oregon

June 2006

Prepared for:

Jefferson County
75 SE "C" Street
Madras, Oregon 97741

Prepared by:

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In Association With:

Angelo Eaton & Associates, Inc



KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING

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Project No. 7475.00

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Preface

This project was funded by the Oregon Department of Transportation (ODOT) and Jefferson County. This document does not necessarily reflect the views or policies of the State of Oregon.

The progress of this Transportation System Plan (TSP) was guided by Jefferson County Public Works and Planning Departments, City of Madras, ODOT, Technical Advisory Committee (TAC), and the Consultant Team identified below.

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The Technical Advisory Committee members and Jefferson County and City of Madras staff devoted a substantial amount of time and effort to the development of the Jefferson County Transportation System Plan (TSP), and their participation was instrumental in the development of the recommendations that are presented in this report.

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Section 1

Introduction

Introduction

1.1 OVERVIEW

Jefferson County, in conjunction with the Oregon Department of Transportation (ODOT), initiated a study of the county's transportation system in 2005. This transportation system plan (TSP) will guide the management and development of appropriate transportation facilities within Jefferson County, incorporating the county's vision, while remaining consistent with state, regional, and local plans. This plan provides Jefferson County with the necessary elements to be adopted as the transportation element of the Comprehensive Plan. This planning process also developed updated language for county ordinances to implement the TSP and comply with current state land use and transportation rules. In addition, this plan provides ODOT and other agencies with recommendations that can be incorporated into their respective planning efforts.

The contents of this TSP are guided by Oregon Revised Statute (ORS) 197.712 and the Department of Land Conservation and Development (DLCDD) administrative rule known as the Transportation Planning Rule (TPR). These laws and rules require that counties develop the following:

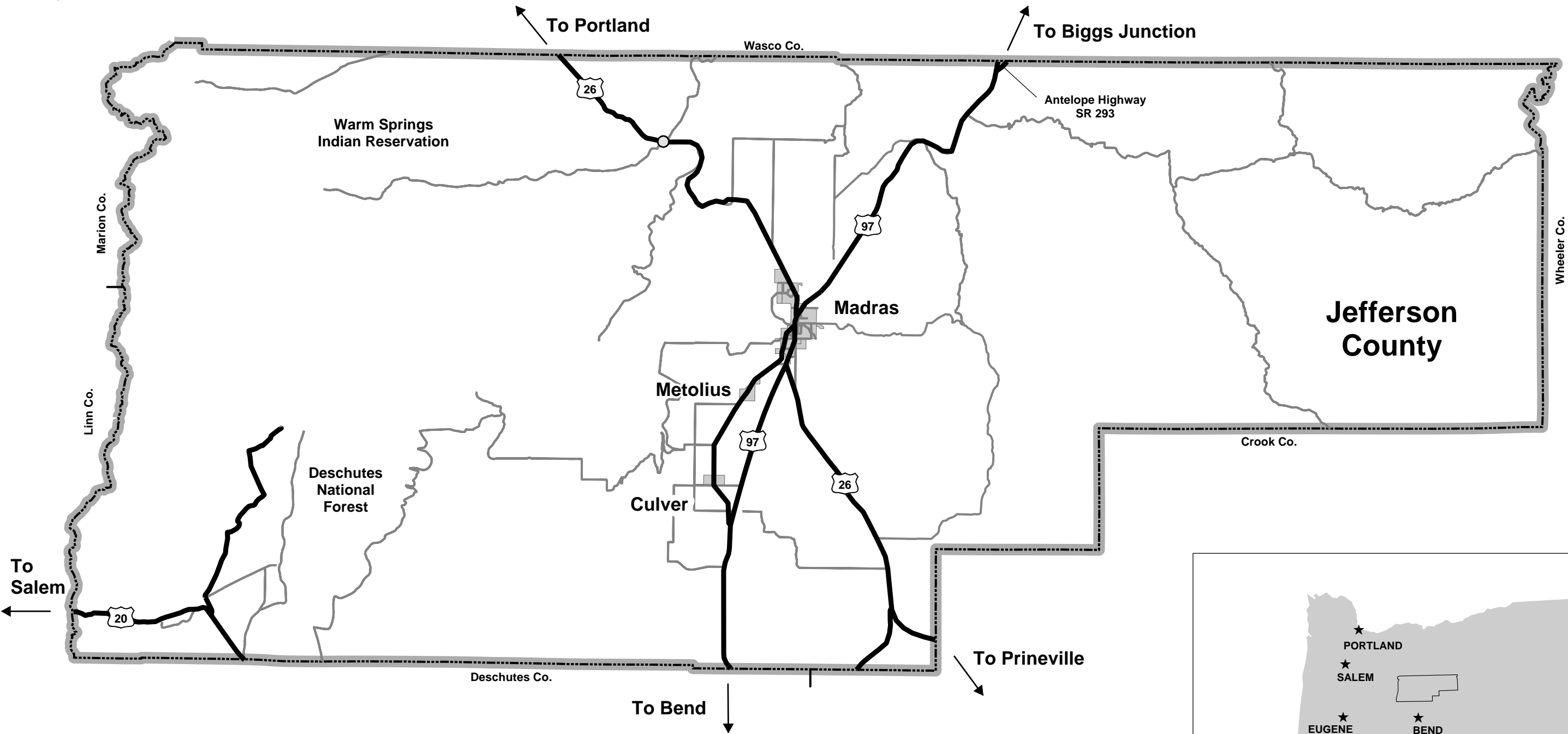
- A road plan for a network of arterial and collector streets;
- A public transit plan;
- A bicycle and pedestrian plan;
- An air, rail, water, and pipeline plan; and
- Policies and ordinances for implementing the transportation system plan.


It is further required that counties coordinate their respective plans with applicable city, regional, and state transportation plans. This TSP is consistent with these requirements. Although not required by the TPR for area outside of UGB, this TSP includes a review of the County's transportation financing capability to help identify future unfunded transportation needs and potential revenue sources.

1.2 STUDY AREA

Figure 1-1 shows a map of Jefferson County, including the urban growth boundaries (UGB) of each incorporated city. The primary study area for the Jefferson County TSP consists of all areas of Jefferson County located outside the UGBs of incorporated cities and the boundary of the Confederate Tribes of Warm Springs. Significant issues identified in local TSPs that affect State and County facilities inside UGBs are also shown because they influence the function and planning of the overall County transportation system.

Based on the requirements of the Transportation Planning Rule, the study of County roadways and intersections is generally limited to those with the highest classifications – collectors and arterials – as well as state highways. However, local street issues such as street connectivity design standards and safety issues are also discussed where appropriate.




UGB:
 Area inside UGB and Warm Springs Indian Reservation
 are not included in the study area, except to address
 operation and safety issues o state facilities



STUDY AREA MAP
JEFFERSON COUNTY, OREGON

 FIGURE
1-1

1.3 PUBLIC INVOLVEMENT

The Technical Advisory Committee (TAC) guided the planning process for the TSP. The TAC was made up of representatives from relevant state and federal agencies, local jurisdictions, local school districts, Jefferson County Sherriff Department and the Jefferson County Fire Department. A full list of the TAC is provided in the plan's preface. The TAC was responsible for reviewing the technical aspects of the TSP, and evaluating the TSP from a policy perspective. This work included reviewing the TSP goals and policies, as well as the transportation evaluation criteria.

In addition to the established advisory committees, three public open houses were used to inform citizens and businesses in Jefferson County of the TSP project goals and process, obtain information from the community on transportation issues and concerns, incorporate community feedback into the TSP. Jefferson County led the public involvement program by preparing and distributing newsletters, and conducting open houses, at key points during the TSP development.

1.4 TSP ORGANIZATION AND METHODOLOGY

The development of the Jefferson County Transportation System Plan began with a review of the local, regional, and statewide plans and policies that guide land use and transportation planning in Jefferson County. The reviewed documents are listed and briefly summarized in **Section 2** of this plan. Goals and policies for the TSP, as developed by the TAC and Jefferson County planning staff are presented in **Section 3**.

A technical analysis of the existing transportation facilities was performed, which allowed for an objective assessment of the system's existing physical characteristics, operational performance, safety, and general function. Upon completion of the existing conditions analysis, the focus of the project shifted to forecasting future travel demand and the corresponding long-term future transportation system needs. There was extensive coordination between Jefferson County and City of Madras staff in developing the forecast traffic conditions.

The existing and future conditions analyses revealed the transportation deficiencies to be addressed by the TSP. Many different transportation projects and alternatives were developed and considered to address these needs. The analyses of existing and future conditions and project alternatives are summarized in **Section 4** of this report.

Based on comments received from County staff, ODOT, and the TAC, a preferred plan was developed that reflected a consensus on which elements should be incorporated into the County's long-term transportation system. Having identified a preferred set of alternatives, the next phase of the planning process involved presenting and refining the individual elements of the TSP through a series of decisions and recommendations. The recommendations identified in **Section 5**, Transportation System Plan, include a Roadway System Plan, a Pedestrian System Plan, a Bicycle System Plan, and a Transit Plan, as well as plans for other transportation modes serving Jefferson County.

Section 6, Transportation Financing Plan, provides an analysis and summary of the alternative funding sources available to pay for the identified transportation system improvements.

Finally, **Section 7**, Glossary of Terms and Acronyms provides list of the terms and acronyms used in the document, along with its description.

The detailed technical memoranda that were developed during the TSP process that support each of the TSP sections are provided in a companion *Background Document*.

Section 2

Plan and Policy Review

Plan and Policy Review

2.1 INTRODUCTION

This section summarizes the plans and policies at the federal, state, regional, and local levels that directly impact transportation planning in Jefferson County. Although each document reviewed contains many policies, only the most pertinent policies and information are summarized here. This review provides a policy framework for the Jefferson County TSP process. A more detailed discussion of the plan and policy review is provided in Technical Memorandum #1, which is included in the TSP's *Background Document*.

2.2 DOCUMENTS REVIEWED

The Jefferson County TSP was developed to be consistent with all current adopted plans and policies. Several jurisdictions own, manage, and/or operate the transportation facilities serving Jefferson County. The Oregon Department of Transportation (ODOT), which has jurisdiction of the state highway system, has developed statewide plans for specific transportation modes, a statewide transportation improvement program, and specific area studies. Jefferson County has developed relevant planning documents, including the existing comprehensive plan. Transportation plans for individual cities were also reviewed.

The following sections list the major documents reviewed during the development of the TSP.

Federal

- Safe, Accountable, Flexible, and Efficient Transportation Equity Act - A Legacy for Users (SAFETEA-LU) and implementing regulations (23 CFR 450 and 49 CFR 613)

State/ODOT

- Transportation Planning Rule (OAR 660-12)
- Oregon Transportation Plan (1992)
- Oregon Highway Plan (1999)
- Oregon Bicycle and Pedestrian Plan (1995)
- Oregon Aviation Plan (2000)
- Oregon Rail Plan (2001)
- Oregon Public Transportation Plan (1997)
- Access Management Rule (OAR 734-051)
- Freight Moves the Oregon Economy (1999)
- Biggs Junction-Madras (US 97) Corridor Plan (Public Review Draft, 2002)
- US Highway 97 Corridor Strategy – Madras-California Border (Revised Draft Final 1995)
- US 26 Corridor Study – Heidi Junction-Madras (Public Review Draft, 1990)
- Oregon Highway 26 Corridor Strategy, Clackamas/Wasco County Line (East of Government Camp) to US Highway 97 (Madras) (Public Review Draft, 1995)

- Jefferson County Facility Community Impact Study, Oregon Department of Corrections (Draft #2, 1999)

Jefferson County

- Jefferson County Comprehensive Plan (1981)
- Jefferson County Zoning Ordinance (2003)
- Jefferson County Subdivision Ordinance (2000)
- Jefferson County Ordinance 0-110-02 - Administration of Right-of-Way, Road Design Standards, Road Construction Standards (2002)
- Jefferson County Transportation Plan (Final Draft, 1996)

Cities

- City of Culver Comprehensive Plan (1977)
- City of Madras Transportation System Plan (2003)
- City of Metolius Comprehensive Plan (1987)
- Madras City-County Airport, Airport Layout Plan Report (1997)

The documents reviewed for this project were relevant to the TSP process in varying degrees. Some of the key documents and elements from this review are described below.

In April 1991, the Land Conservation and Development Commission (LCDC), with the concurrence of ODOT, adopted the **Transportation Planning Rule (TPR)**, OAR 660 Division 12. The Transportation Planning Rule (TPR) requires all counties to complete a transportation system plan (TSP), including policies and ordinances to implement that plan. Jefferson County, an area outside an MPO, was required to complete and adopt a regional TSP and implementing measures by May 8, 1997 (660-012-0055). The TPR requires that local governments adopt land use regulations consistent with state and federal requirements "to protect transportation facilities, corridors, and sites for their identified functions OAR 660-012-0045(2)." The County's current TSP was completed in 1996 but was not adopted. This TSP is being prepared to comply with the TPR and to accurately reflect the current transportation system and predict the future needs of Jefferson County.

Adopted county ordinances were reviewed for compliance with the Transportation Planning Rule (OAR 660-12-0045). The review resulted in several recommendations to amend the County's Zoning Ordinance, Subdivision Ordinance, and road standards. Technical Memorandum #1 includes the TPR requirements and recommendations for compliance in Table 1. Recommendations include:

- County ordinances should include a clear process to review development applications and amendments to adopted plans or land-use regulations that "significantly affect" transportation facilities (OAR 660-12-0060).
- County should include category of facilities, improvements, and services that can be assumed to be "in-place" or committed and available to provide transportation capacity (i.e. included in STIP or funded through TSP), enabling applicants and decision makers to rely on transportation improvements that are "reasonably likely to be provided at the end of the planning period".

- County ordinances should be updated to adopt access spacing and engineering standards “to protect transportation facilities for their identified functions” (OAR 660-12-0045).
- County should adopt procedures to notify ODOT and other state jurisdictions whose facilities are affected by land-use applications.
- County should include standards, regulations and procedures to address pedestrian and bicycle facilities. The process should ensure connections between residential and activity centers, efficient circulation within proposed developments, availability of bicycle parking where applicable, etc

The **Oregon Transportation Plan** is a policy document developed by ODOT in response to federal and state mandates for planning for the future of Oregon’s transportation system. The OTP is intended to meet statutory requirements (ORS 184.618(1)) to develop a state transportation policy and comprehensive long-range plan for a multi-modal transportation system that addresses economic efficiency, orderly economic development, safety, and environmental quality.

The OTP consists of two elements: the Policy Element and the System Element. The Policy Element defines goals, policies and actions for the state for the next 40 years. The Plan’s System Element identifies a coordinated multi-modal transportation system, to be developed over the next 20 years, which is intended to implement the goals and policies of the Plan.

The 1999 **Oregon Highway Plan (OHP)**, an element and modal plan of the state’s comprehensive transportation plan (OTP), guides the planning, operations, and financing of ODOT’s Highway Division. Policies in the OHP emphasize the efficient management of the highway system to increase safety and to extend highway capacity, partnerships with other agencies and local governments, and the use of new techniques to improve road safety and capacity. These policies also link land use and transportation, set standards for highway performance and access management, and emphasize the relationship between state highways and local road, bicycle, pedestrian, transit, rail, and air systems.

The **Oregon Access Management Rules** (OAR 734-051) govern the issuance of permits for public and private accesses onto state highways. The rules affect all roadways under Oregon state jurisdiction within Jefferson County. In addition, for consistency, local access management rules should be updated to be consistent with the state rules in the vicinity of intersections and interchanges with state highways. The rules promote the protection of emerging development areas, rather than the retrofit of existing built-up roadways, and include spacing standards for the different types of state highways. The access management rules also include provisions for the commercial centers, urban business areas, and special transportation areas discussed in the OHP.

The **Oregon Bicycle and Pedestrian Plan** provides guidance to regional and local jurisdictions for the development of safe, connected bicycle and pedestrian systems. The plan includes two major sections: policies and implementation strategies and design, maintenance, and safety. The policy section contains relevant state and federal laws. This document was used to help develop criteria and general guidelines for bicycle and pedestrian facilities for the Jefferson County TSP.

The **Oregon Aviation Plan** identifies a primary state aviation system and system needs. The plan recommends policies to guide the state in protecting, maintaining, and developing the airport system. The **Madras City-County Airport, Airport Layout Plan Report** more specifically addresses the

aviation issues in Madras and Jefferson County, including an outline for future development and details of an airport layout plan.

The **2001 Oregon Rail Plan** addresses both freight and passenger rail transportation. The Plan's freight element has four major purposes: (1) describe Oregon's freight rail system in terms of the carriers and the individual properties that make up the state railroad system; (2) describe the commodities transported by rail in Oregon; (3) identify funding needs and potential funding sources for railroads in Oregon; and (4) assess what shippers want from rail service in Oregon. In Jefferson County, the Burlington Northern Santa Fe Railway (BNSF) and the Union Pacific Railroad (UP) serve the US 97 corridor. They provide vital transportation for industrial and agricultural freight in the area. The Madras Industrial Park, located northwest area of Madras, is one of the few places in Oregon that has access to more than one major railroad.

Freight Moves the Oregon Economy report summarizes a variety of information about issues and needs surrounding the transport of freight by roads, rail lines, waterways, aircraft, and pipelines. The document's stated purpose is to demonstrate the importance of freight to the Oregon economy and identify concerns and needs regarding the maintenance and enhancement of current and future mobility within the state of Oregon. State Highway 97 and 20 are a designated freight routes. The document notes that, in terms of volume of freight moved, "the U.S. 97 corridor is the most important north-south corridor east of the Cascade Mountains (Chapter 2, p. 28)." While no specific recommendations were identified for facilities in Jefferson County, the deficiencies and improvements discussed in this document are pertinent to how freight facilities are addressed in the County's TSP.

The **Jefferson County Comprehensive Plan** document presents the official goals and policies that are relevant to land use in Jefferson County, and addresses all applicable Oregon Statewide Planning Goals. Land use regulations and implementation actions are governed by the Comprehensive Plan. Revisions to the Plan were made in 1987, and that document was also reviewed for transportation related amendments.

In Part II (Inventories) of the Comprehensive Plan, it is noted that private automobile use is the major form of transportation in Jefferson County due to its large area and relatively low population density. Three major highways pass through the county – US 97, US 26 and US 20 – and much of the transportation policy is centered on these roadways.

Upon adoption, the TSP will become an element of the County's Comprehensive Plan. The goals and policies in the TSP will be the County's adopted long-range vision for transportation planning. Most of the policies in the Comprehensive Plan will not conflict with policies proposed for the TSP. Some adopted policies may no longer be valid; others are clearly out of date. Final proposed TSP goals, policies, and implementation measures was reviewed against the adopted Comprehensive Plan policies and recommended changes to the Comprehensive Plan are included in the *Background Document*.

The **Jefferson County Zoning Ordinance** establishes the zoning in the County, the uses permitted under each zoning (land use) category, and the regulations that apply in each zone. Standards for granting a condition use can be found in Section 602. The Zoning Ordinance also contains the County's site plan review procedure for approving new development in the County (Section 414). Transportation-related development standards are found in the regulations for each zoning category.

The **Jefferson County Transportation System Plan (TSP)** was originally prepared through the financial assistance of a state Transportation and Growth Management (TGM) grant. The preparation of the 1996 TSP 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. Although this TSP was not adopted, the planning effort resulted in land use and transportation recommendations for Jefferson County.

The 2003 update to the 1998 **City of Madras Transportation System Plan** (adopted 1999) began in 2000 with a grant from the State Transportation Growth Management program. This planning process resulted in a number of ordinances updating the Comprehensive Plan, Zoning and Subdivision Ordinances, and the TSP. The goals of the update project included revising the street width standards, refining the TSP access management standards to comply with the Oregon Highway Plan, updating the list of planned transportation improvements, and developing local circulation plans for three concept areas. Amendments to Chapters 4, 5, 6 and 7 of the 1998 TSP were adopted in 2003.

Where applicable, the Jefferson County TSP and Madras TSP should be consistent. General Madras TSP policies include identifying transportation needs to accommodate developing or underdeveloped areas (Goal 2), increasing the use of alternate modes of transportation (Goal 3), and enhancing the role of the Madras airport (Goal 4). Additional policies are included under the following categories: Transportation Facility Improvements, Protection of Transportation Facilities, Protect Public Use Airports, Coordinated Review of Land Use Decisions, Impacts of Development Proposals, and Pedestrian and Bicycle Circulation.

The City of Culver, incorporated in 1946, has a population of approximately 800 and is located 9 miles south of Madras. According to background information in the **City of Culver Comprehensive Plan**, the City's most significant natural resources are scenic views of the Cascade Mountains. There are no designated wilderness areas, historic or cultural areas, Oregon recreational trails, or wild and scenic waterways within the city limits. Culver Highway (Highway 361) leaves Highway 97 at Madras, precedes south through Metolius and Culver before rejoining Highway 97 south of Culver. The Comprehensive Plan describes the Culver Highway as a major federal aid secondary highway. With the exception of the Urbanization Policy that requires cooperation between the City and County when the Urban Growth Boundary is amended, the Comprehensive Plan does not contain background statements or policy regarding coordination with Jefferson County or the County's transportation system.

Incorporated in 1913, the City of Metolius is approximately 4 miles southwest of Madras. In 2001 the population of the City was 660. The **City of Metolius Comprehensive Plan** notes the City's limited economic growth potential, primarily due to the inability of the small population to support large commercial enterprises and its proximity to Madras, the population center of the County. The Transportation section notes that the automobile is the principal mode of transportation within the City. Freight is active through the City by truck and rail. The City is also served by the Madras Airport. At the time the Comprehensive Plan was adopted, there were only three paved roads in the City; Butte, 5th and 9th Streets. The lack of paved street has been identified as a problem by the residents of Metolius (General Discussion section, p. 24). The Comprehensive Plan addressed City/County coordination with regards to the Urban Growth Management Areas, described as areas outside the City limits but within the City's Urban Growth Boundary (UGB), and joint City/County adoption of UGB amendments, but does not contain other policy related to Jefferson County or the County's transportation system.

The **Oregon Highway 26 Corridor Strategy** is a “public review draft” and is described as the first step in the Corridor Planning process. The document describes the long-term (20-year) transportation improvement and performance objectives along Highway 26 for all modes of transportation along the Corridor. The portion of US Highway 26 within ODOT Region 4 is the subject of this Corridor Strategy and is defined as corridor segments 5, 6, and 7. Part of Section 6 (OR 216 to Deschutes River) and Section 7 (Deschutes River to Madras) run through Jefferson County. The Corridor Strategy is comprised of a series of performance and impact objectives. Transportation performance objectives relate to transportation balance/intermodal connectivity, regional connectivity, highway congestion, facility management, roadway conditions, and safety. Transportation impact objectives include environmental, social, land use, energy, and economic.

The stated purpose of the **Biggs Junction-Madras (US 97 North) Corridor Plan** is to “establish both short and long-term management direction for all modes of transportation in the corridor and to make major transportation tradeoff decisions.” The US Highway 97 Corridor between Biggs Junction and Madras stretches 91.94 miles from the junction of US 97 with I-84 at the Columbia River to the US Highway 26 intersection in north Madras. Prioritized improvements to corridor facilities and system and management decisions identified in the corridor plan are intended to provide the basis for updating the Statewide Transportation Improvement Program (STIP).

The Plan states that through local transportation system planning, such as the Jefferson County TSP update, ODOT and local governments in the corridor will cooperatively work together to ensure that city and county comprehensive plans and implementing ordinances achieve corridor plan management objectives. Jefferson County’s transportation planning efforts will need to be consistent with the recommendations of this Plan for the portion of US 26 that runs from the County border to Madras.

The **US 97 Corridor Strategy** addresses the US 97 Corridor, stretching 199.8 miles from the Highway 26 intersection in north Madras to the Oregon/California border. Only Segment 1 of this defined Corridor lies in Jefferson County. The objective of the Corridor Strategy is to determine relevant policies applicable to the corridor and to formulate objectives that attempt to balance various modes of transportation with the needs, issues and unique features of the Corridor. The six underlying strategy themes identified during the strategy development process include enhancing safety, facilities management and improvement, intermodal connections, interpretive opportunities and preservation of environmental quality, economic development, and partnering. These strategies were taken into consideration during the TSP process to ensure compliance.

Section 3

Goals and Policies

Goals and Policies

3.1 INTRODUCTION

This section provides the guiding principles for the future of the Jefferson County transportation system. The goals and objectives presented will guide the development of the transportation system in the County. The goals are: Mobility and Connectivity, Multimodal Elements, Safety, Environment, and Planning and Funding. Objectives for each goal are also provided, which identify clarify the course of action to achieve each goal.

3.2 GOALS AND POLICIES

The five goals proposed for the Jefferson County TSP are shown below:

GOAL 1: Mobility and Connectivity – Plan and develop an interconnected system of streets that will link communities and neighborhoods for all users and will address existing and future needs for transportation of people and goods in the region.

GOAL 2: Multimodal Elements – Provide a multimodal transportation system that permits safe, convenient, and economical transportation of goods and people consistent with planned development, natural resource use and environmental protection in coordination with other public agencies.

GOAL 3: Safety – Provide a transportation system that promotes the safety of current and future travel modes for all users.

GOAL 4: Environment – Provide a transportation system that balances transportation services with the need to protect the environment.

GOAL 5: Planning and Funding - Provide transportation systems that emphasize and encourage compact, interrelated multimodal development and revitalization, while ensuring livability and economic viability for all citizens.

Following sections summarize the objectives of each goal for Jefferson County.

GOAL 1: MOBILITY AND CONNECTIVITY

Objective

- Promote and maintain an integrated and linked network of arterial, collector, and local streets that relieves pressure from congested traffic facilities and minimizes travel distances for all users.
- Promote connectivity and mobility options between communities.
- Maintain Level of Service standards for efficient movement of people and goods.
- Recognize the importance of maintaining efficient through movement on major truck freight routes.

GOAL 2: MULTIMODAL ELEMENTS

Objective

- Encourage efforts to maintain current services and plan for expanded transit service for all users.
- Provide for protection and expansion of present airport facilities by coordinating with the Oregon Department of Aviation, Madras City-County Airport, and the City of Madras and develop regulations to reduce hazards and limit adverse impacts on surrounding unincorporated areas.
- Promote preservation of rail corridors with corporation with BNSF and Oregon Rail Division. If improvements are planned, minimize conflicts with adjoining land uses and ensure that adequate vehicular mobility is provided.
- Promote a safe, linked pedestrian and bicycle system that effectively connects residential areas to schools and other activity centers.
- Consider bicycle and pedestrian facilities needs during construction of new roads and during upgrading and maintaining existing roads.

GOAL 3: SAFETY

Objectives

- Provide a transportation system that allows for adequate emergency vehicle access to all land uses.
- Promote development of efficient emergency evacuation in the event of wildfire hazard or other emergency.
- Reduce incidence and severity of motor vehicle crashes.
- Reduce incidence and severity of crashes involving vulnerable users (e.g. children, elderly, pedestrians, bicycles) on roadways and crossings.

GOAL 4: ENVIRONMENT

Objectives

- Encourage innovative alternative travel modes or programs (e.g. dial-a-ride service, carpooling) and fuel sources in order to reduce single-occupancy vehicles, vehicle miles traveled, and reliance on fossil fuels.
- Provide a transportation system that encourages energy conservation, in terms of efficiency of the road network, use of existing transportation facilities, and standards developed for street improvements.
- Encourage development that allows for more multimodal transportation and decreases the reliance on motor vehicles.
- Provide a transportation system that maintains and enhances the surrounding environment and minimizes pollution to air, water, and noise, and preserve agricultural and forest land.

GOAL 5: PLANNING AND FUNDING

Objectives

- Provide reasonable and effective funding mechanisms for countywide transportation improvements identified in the transportation system plan that reflects responsible stewardship of public funds.
- Provide a process to educate and involve citizens in planning the transportation system and ensure that plans address public values and have the flexibility to respond to changing needs, thereby building communication between communities and their jurisdictions.
- Continue and increase planning coordination between Jefferson County, city governments, and the State to maintain a transportation system that is consistent with the goals and objectives of the community, the region, and the state.
- Ensure that the existing elements of the transportation system are conserved through maintenance and preservation, sustained system operations, and equipment replacement scheduling, through utilization of fiscal planning.

Section 4

Transportation System Inventory and Analysis

Transportation System Inventory

4.1 INTRODUCTION

The development of the Jefferson County Transportation System Plan (TSP) began with an assessment of current and forecast transportation system conditions. The current facilities for all transportation modes were inventoried and analyzed to identify any existing system deficiencies. This was followed by an analysis of anticipated future conditions. The future conditions analysis was conducted to approximate year 2025 conditions, based on population estimates for the area. Relevant transportation and land use projects were incorporated into the analysis to estimate future conditions, identify future transportation issues, and evaluate potential mitigations. Details of the technical analysis and project alternatives are provided in the *Background Document* that accompanies this plan. The key findings are summarized below for each transportation mode.

4.2 ROAD SYSTEM

Roadways serve the largest share of trips in Jefferson County, supporting many of the modes discussed in previous sections of this chapter. Motor vehicles, bicycles, pedestrians, transit, and freight transportation all rely on roadways to some degree. Roadways also provide vehicle, bicycle, pedestrian, and transit access to air and rail facilities.

The public roadway system within Jefferson County is primarily owned and maintained by the following agencies or jurisdictions:

- The **United States Forest Services (USFS)** owns and maintains the roadways within the Deschutes National Forest, located in the southwest area of the county. Most of the roadways are gravel and feature rural characteristics. These roadways are used primarily to access logging areas and provide emergency fire access. This study does not include a description of the specific roadways under USFS jurisdiction.
- The **Oregon Department of Transportation (ODOT)** owns 95.37 miles of roadway within the County, including some of those most heavily traveled. These highways provide regional mobility within the county and serve as major transportation links to other areas of the state.
- **Jefferson County** owns and maintains approximately 621 miles of roadway, of which approximately 267 miles are paved. The majority of the county roadways are concentrated in the central north-south portion of the County, which contains the irrigated lands and the population centers. In addition, the majority of the roads have rural characteristics: two travel lanes, no bike lanes, no sidewalks, and minimum shoulders.
- The **Confederated Tribes of Warm Springs** own and maintain the roadways within the Warm Springs Indian Reservation area. The reservation is located in the northwest area of the county between the Wasco County line and the Deschutes River. The roadways within the reservation are mainly used for logging and emergency fire access. This study does not include a description of the specific roadways under Warm Springs jurisdiction.

- The **incorporated cities** of Madras, Metolius, and Culver own and maintain the roadways within their city limits that are not maintained by ODOT or the County. These roadways provide local access and serve local trips. This study does not include the roadways within the urban growth boundary of the incorporate cities.

State Highways

The following state highways in Jefferson County are maintained by ODOT:

- **US 97 (The Dalles-California Highway 004)** is the main north-south route through central Oregon. This highway runs from the Washington state line near the Biggs Junction with Interstate 84, through the Cities of Madras, Bend, and Klamath Falls to the California state line. Approximately 36 miles of US 97 are located in Jefferson County. Within the County, Highway 97 is mostly a two-lane facility providing regional mobility from the Wasco County line in the north to the Deschutes County line in the south. The highway also serves as a secondary north-south route for I-5 considering that US 97 is approximately 10 miles shorter than the I-5 route between the California border and the Willamette Valley. In southern Oregon, US 97 passes through the Sisikyou Mountains at a lower elevation than the I-5 pass, making this a desirable secondary truck route, especially in the winter months. Several sections of the highway have passing lanes to accommodate heavy truck traffic throughout the corridor. *The 1999 Oregon Highway Plan (OHP) classifies US 97 as a statewide highway. Appendix "A" provides the OHP highway classification description.*
- **US 26 (Warm Springs Highway 053 and Madras-Prineville Highway 360)** is a two-lane highway facility that provides regional mobility between the northern Oregon Coast and the Oregon-Idaho border. US 26 is divided into two ODOT highways; Warm Springs Highway 053 and Madras-Prineville Highway 360. Highway 053 provides a connection from the Wasco County line to the southern fork of US 26 and US 97 and is approximately 21 miles in length. Highway 360 connects from the southern fork of US 26 and US 97 to the Crook County line and is approximately 16 miles long. US 26 is the main route for recreational and freight traffic from the Portland metro area to Central Oregon. The roadway is classified as a statewide highway in the OHP.
- **US 20 (Santiam Highway 126)** is a two-lane highway facility that provides east-west regional mobility through Central Oregon. This roadway serves as a secondary east-west route to I-84; however, the Santiam Pass through the Cascade mountain range makes this route less desirable for travelers during inclement weather conditions. Approximately 10 miles of US 20 is in the southwest corner of the County running through the Camp Sherman area from the Linn County line into Deschutes County. The roadway is classified as a statewide highway in the OHP.
- **Culver Highway 361** serves as the major route between the City of Madras and the cities of Metolius and Culver in Jefferson County. Highway 361 is approximately 12 miles long and runs north-south adjacent to US 97, from Madras through the Cities of Metolius and Culver, before re-connecting with US 97 just south of Culver. Highway 361 also provides access between US 97 and the Palisades State Park-Lake Billy Chinook Recreation Area. The roadway is classified as a district highway in the OHP.

- **Antelope Highway 293** provides the connection from US 97 to the City of Antelope in Wasco County. Only 0.71 miles of the highway is located within Jefferson County boundary. It is classified as district highway in the OHP.

County Roadways

The major County roads in the study area are:

- **SW Belmont Lane – J Street** is a major east-west route at the south end of the City of Madras Urban Growth Boundary (UGB). It connects to Palisades State Park recreation area to the east via rural connections. Between downtown Madras and residential areas to the east, J Street has an urban roadway design with bike lanes and sidewalks.
- **S Adams Drive** is a north-south route that runs parallel and to the east of US 26 and US 97 in downtown Madras. This roadway primarily serves local traffic traveling to businesses on the south end of Madras, and helps to relieve traffic from the US 97 couplet in downtown Madras.
- **SW Eureka Lane** is an east-west roadway at the south end of Metolius that connects Culver Highway to SW Feather Lane and Palisades State Park.
- **SW Gem Lane** provides a direct link between Culver Highway and Jordan Road leading to the Palisades State Park recreation area.
- **SW Iris Lane** is an east-west route connecting US 97 to Culver Highway and the City of Culver. This roadway serves as a primary access to Palisades State Park for vehicle trips originating south of Jefferson County.
- **SW Jericho Lane** provides another east-west connection from US 97 to Culver Highway and Palisades State Park. This road serves primarily residential and agricultural land uses, and provides a connection into the City of Culver.
- **E Ashwood Road** will serve as the primary access for the Madras Correctional Facility currently under construction. Presently this road serves the east side of the City of Madras.
- **Hay Creek Road** provides north-south access to rural areas to the east of Madras. It connects to US 97 near NE Quaaale Road on the north end and connects to US 26 via Ramms Road on the south end.
- **Jordan Road** provides access from Lake Billy Chinook to the west via a narrow bridge over the lake. The road connects the Three Rivers Ranch area to Palisades State Park and the incorporated cities on the east side of Lake Billy Chinook.

Functional Classification

A roadway's *functional classification* describes its role in the transportation system. The function and role of the roadway can be described in terms of the character of service the roadway provides. In general, the functional classification of a roadway is based on the varying degree of its two primary functions: 1) providing regional mobility, and 2) promoting local accessibility. The tools that are commonly used to govern the classification are roadway width, posted/design speed, right-of-way dedications, access spacing requirements, types of pedestrian and bicycle facilities provided, among other standards.

ODOT classifies its highways based on the 1999 Oregon Highway Plan (OHP) (Reference 4). Appendix “A” provides the description of the highway classifications. The classifications are mainly based on the significance of the highway in the statewide transportation system. “Statewide Highway” is given the highest priority and is considered to be a roadway of statewide significance. “Regional Highway” and “District Highway” provide regional and district level mobility, respectively. The classifications of the state highways within Jefferson County are provided in Table 4-1.

TABLE 4-1 STATE HIGHWAY CLASSIFICATION IN JEFFERSON COUNTY (JC)

Highway	Mile Post within JC	Classification	NHS	Freight Route	Scenic Byways
US 97 - The Dalles-California Highway 04	74.25 -112.86	Statewide	Yes	Yes	No
US 26 - Warm Springs Highway 053 and Madras-Prineville Highway 360	96.48 -117.58 0.00 -16.30	Statewide	Yes	Yes	No
US 20 - Santiam Highway 16	80.77 - 90.85	Statewide	Yes	No	Yes
Culver Highway 361	0.00 - 11.62	District	No	No	No
Antelope Highway 293	0.00 - 0.71	District	No	No	No

NHS: National Highway System

ODOT also provides functional classification for major county roadways. The roadways are primarily classified as arterials, collectors, and local roadways. Local jurisdictions typically establish the functional classification of roadways using this hierarchy.

The general definition of these classifications is provided below.

- **Arterials** represent the highest class of road. These roadways are intended to serve higher volumes of traffic, particularly through traffic, at higher speeds. They also serve truck movements and should emphasize traffic movement over local land access. In some cases, arterial streets are further designated as “major/principal” or “minor”. Major/principal arterials have higher design speed, fewer accesses per mile, and usually do not permit direct private driveways access.
- **Collectors** represent the intermediate roadway class. As their name suggests, these roadways collect traffic from the local street system and distribute it to the arterial street system. These roadways provide a balance between traffic movement and land access and should provide extended continuous stretches of roadway to facilitate traffic circulation through the county. Collector streets are sometimes divided into two categories – urban collector/rural major collector and minor collector. Urban collector/rural major collector have the same basic roadway design, but are differentiated by urban features like bike lanes and sidewalk. Minor collectors serve lower volume of traffic and have lower design speeds than urban collector/rural major collector.
- **Local** roads and streets are the lowest roadway class. Their primary purpose is to provide local land access and to carry locally generated traffic at relatively low speeds to the collector street system. Local streets should provide connectivity through neighborhoods, but should be designed to discourage cut-through vehicular traffic.

Figure 4-1 shows the classification of roadways within Jefferson County. The classification was based on preliminary ODOT data and does not represent the final classification for the TSP. The recommended functional classification system is shown in Figure 5-1.

Traffic Operations

An existing and future traffic analysis was conducted to evaluate operational condition and identify potential capacity constraints in the transportation system in Jefferson County. The traffic counts at the study intersections were developed from a compilation of counts obtained from ODOT and the average daily traffic (ADT) was obtained from permanent automatic traffic recorder (ATR) on state facilities and ODOT volume tables. Figure 4-2 shows the 2004 average daily traffic volume on major facilities in the County.

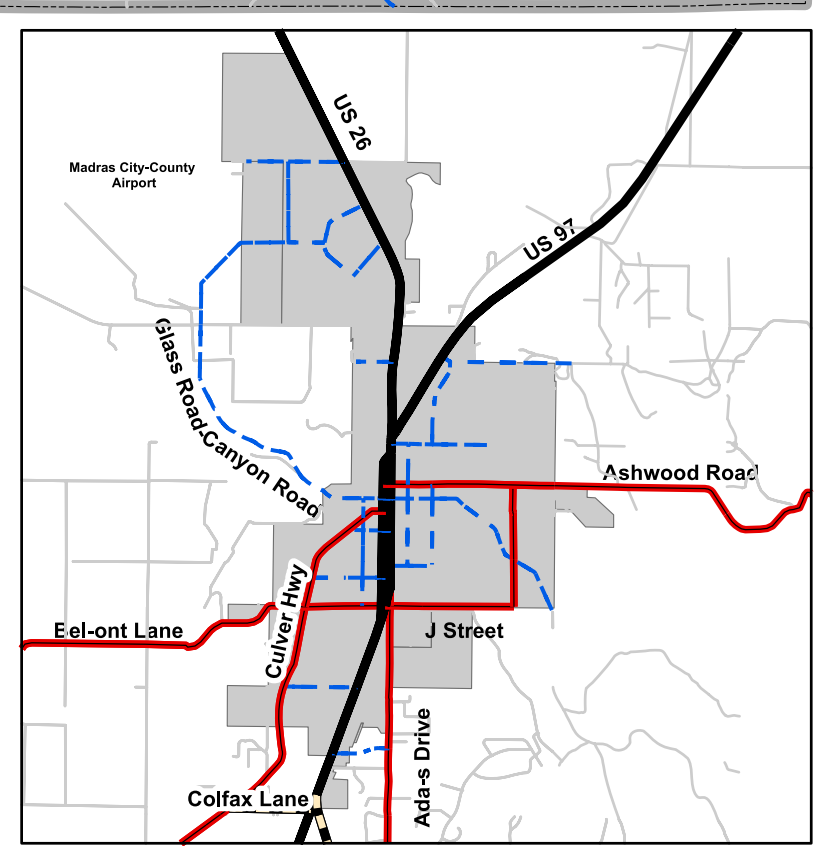
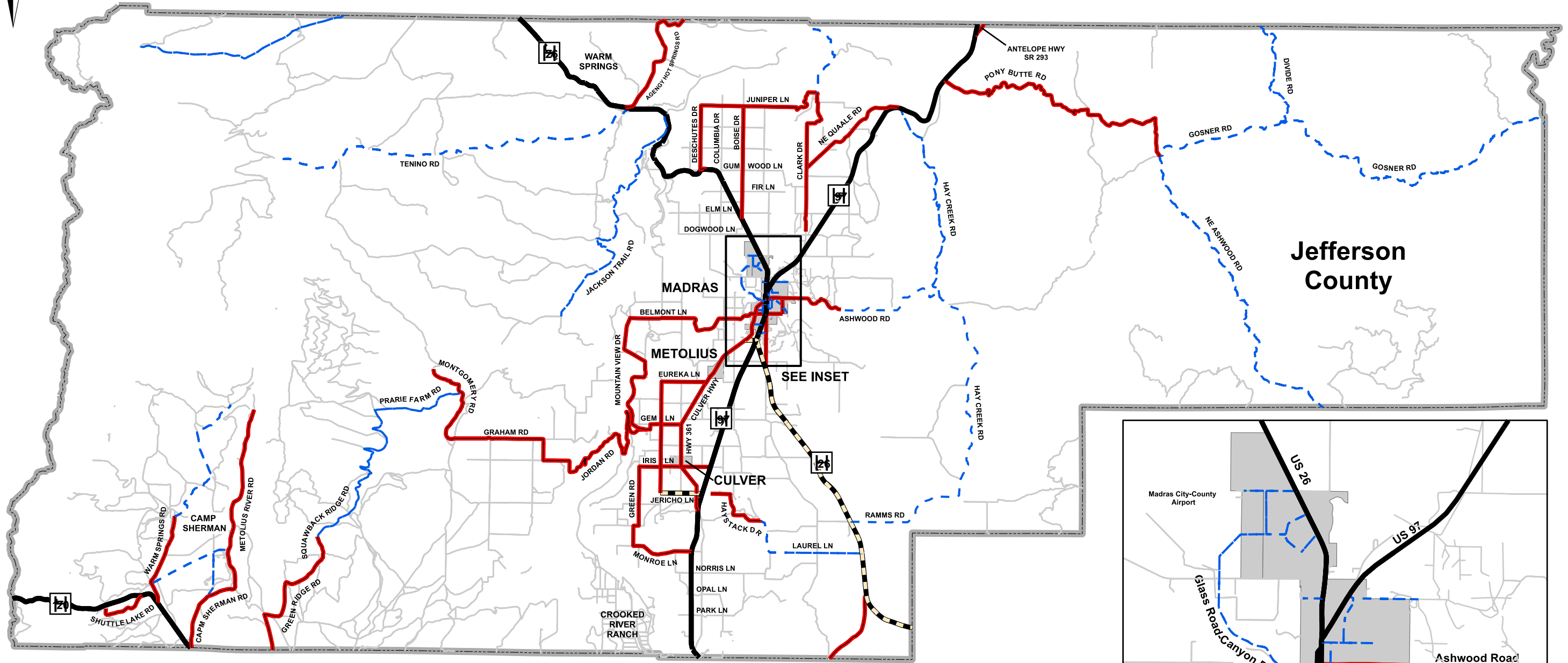
Based on the traffic volumes obtained from the sources mentioned above, the existing conditions traffic operational analysis was conducted on average daily traffic (ADT) and 30th highest hour traffic volumes. The ADT analysis was conducted on the roadway links and the 30th highest hour analysis was conducted on the study intersections identified through the TSP process. Table 4-2 shows the 2005 operational analysis results of the analysis. As shown in the table, the J Street/US 97 Northbound, J Street/US 97 Southbound and US 26/US 97 South intersections were found to operate at level-of-service “F” during the 2005 30th highest hour condition.






The future (year 2025) traffic volume estimates were developed based on the review of population and traffic volume growth in the County. After discussions with ODOT, Jefferson County and City staffs, it was concluded that traffic within the County will grow differently in each of the following geographic areas; City of Madras, US 97 south of Madras and the rest of the County. The roadways in these areas serve different land-uses and trip characteristics. Therefore, the 2025 forecast traffic volumes estimates resulted in three separate growth rates for these areas, as described below.

- Within the City of Madras, US 97/US 26 through downtown Madras serves higher portion of local trips than regional trips. It is anticipated that the traffic growth in the City will closely follow the rapid population growth in the City. Therefore, a growth factor of 3.37 percent per year was assumed for traffic growth in the City (see *Background Document* for detail growth rate analysis).
- US 97 south of Madras serves traffic from the City of Madras and the surrounding areas, as well as regional traffic to and from Deschutes County. In this area a growth factor of 2.37-percent per year was applied. Historically, traffic growth in this area has been consistent with population growth.
- For the rest of the County, ODOT future volume tables were used.

Figure 4-2 also shows the 2025 ADT at critical locations on the highway system. The future conditions traffic operational analysis identified intersections and road sections that are expected to have capacity or other operational problems by the year 2025. Table 4-2 also shows the intersections and roadway segments for which future needs were identified. In addition to the intersections identified in existing condition analysis, US 26/US 97 North, Dover Lane/US 97, US 97-South of Madras and US 26 (Warm Springs)-from Earl Street to Jefferson Street were identified as potential locations with operational concerns in year 2025. These locations were the

focus of the planning process for the roadway system; specifically, the development and analysis of roadway improvement alternatives.



- LEGEND**
-  Principal Arterial
 -  Minor Arterial
 -  Urban Collector/Rural Major Collector
 -  Minor Collector
 -  Local

NOTE: Based on ODOT data.

EXISTING FUNCTIONAL CLASSIFICATION MAP
JEFFERSON COUNTY OREGON

TABLE 4-2 EXISTING AND FUTURE ROADWAY AND INTERSECTION OPERATIONAL NEEDS SUMMARY

Intersection	Location	Needs	2005		2025	
			LOS	v/c	LOS	v/c
US-26/ US 97- North	At the Intersection	Operation	B	0.73	F	>1.0
J Street/ US 97 Northbound	At the Intersection	Operation	F	0.68	F	>1.0
J Street/ US 97 Southbound	At the Intersection	Operation	F	>1.0	F	>1.0
US-26/US 97- South	At the Intersection	Operation	F	0.33	F	>1.0
Dover Lane/US 97	At the Intersection	Operation	C	0.16	F	0.28
US 97	South of Madras	Operation / Safety	D	0.45	E	0.88
US 26 (Warms Springs)	Earl St. to Jefferson St.	Operation	D	0.50	E	0.74

NOTE: LOS = Level-of-Service v/c = Volume-to-Capacity Ratio

Freight Truck Transportation

Many of Oregon's goods and products are shipped by truck; the 1993 Oregon Commodity Flow Study found that 64 percent of the total freight value, and 76 percent of the total freight tonnage, is shipped by truck. When road and bridge infrastructure is unable to support truck movements, trucks must detour around the restricted roads, which add to the cost of freight shipments.

Oregon has designated a State Highway Freight System that serves the majority of the intrastate and interstate freight movements. US 97 and US 26 to Madras are the only highways on the state freight system in Jefferson County. These highways provide vital freight movement in Central Oregon. US 97 also serve as the secondary route for I-5 truck traffic, especially in winter months when the Siskiyou pass on I-5 becomes hazardous due to ice and snow conditions.

ODOT tracks truck volume percentages data for the state facility. The data is obtained from the permanent Automatic Traffic Recorder (ATR) stations located across the State. It showed that US 97 and US 26 in Jefferson County carry anywhere between 14 to 19 percent truck traffic.

Roadway Safety

The safety analysis of the roadway network in Jefferson County was conducted by analyzing the safety data provided by ODOT Transportation Data Section. ODOT conducts safety crash rate analyses on segments of state highway. Based on that data, US 97/US 26 through Madras and US 20 were found to have higher than statewide average crash rate for similar facilities. The high number of driveways and truck traffic on US 97 could be one of the reasons for the higher than average crash rate on this section. The higher than average crash rate on US 20 in Jefferson County can be attributed to the mountainous terrain as US 20 passes through the Willamette National Forest and the Santiam Pass.

The current statewide 2001 – 2003 Safety Priority Index System (SPIS) includes six sites in Jefferson County. All of the following locations are in the top fifteen percent of the State's SPIS from highest to lowest priority:

- US 26 at Warm Springs Agency Road
- US 26 at Dover Lane
- US 97 at D Street/Culver Highway
- US 97 at I Street and J Street
- US 97 at Milepost 106.00 (between US 97/Culver Highway-SR 361 and SW Monroe Lane)
- US 97 at G Street

In addition, the intersections of US 26 at Warm Springs Agency Road, US 26 at Dover Lane and US 97 at D Street/Culver Highway are in the top ten percent of the SPIS listing.

Historical crash data obtained at the study intersections showed that the US 97/Dover Lane, US 97/Iris Lane and US 97/US 26 North intersections have highest number of crashes. The TSP's *Background Document* provides the crash data and detail analysis.

For all of the intersections identified above, the majority of the crash types were rear-end collision, angle and turning crashes. These types of accidents are common in high-speed rural unsignalized environments where 1) adequate sight distance is not available for vehicles entering the highway, or 2) an adequate deceleration or turn pocket is not available for vehicles exiting the highway.

In addition, some of the intersections on the major highways in Jefferson County currently have skewed geometry, which creates negative operational and safety conditions. The forecasted increase in traffic volumes could potentially increase the safety risks at these locations. Based on field visits conducted in September 2005, potential safety issues have been identified at the following intersections because of the skewed intersection geometry:

- US 26/NW Gumwood Drive (both intersections)
- US 26/NW Columbia Drive
- US 26/NW Boise Drive
- US 97/SW Bear Drive
- US 97/SW Culver Highway (both intersections)
- US 97/NE Old US 97
- SW Culver Highway/SW Gem Lane
- SW Culver Highway/SW Iris Lane/SW Elbe Drive

The intersections shown above include roadways with a functional class of collector or higher. There are also several local street intersections that have skewed geometry, which could also result in safety issues along the state highways in the county.

Pavement Condition

ODOT monitors the pavement condition of state highways through the Pavement Management System, which determines whether the pavement is in Very Good, Good, Fair, Poor or Very Poor condition.

Jefferson County Public Works department also maintains a pavement condition and surface type database for county roadways. Based on the 1999 database, the county has a total of 121.01 miles of gravel roadway and 233.47 miles of roadway that are either gravel or native surface. Approximately 267 miles of the County roadways are paved. The database was analyzed to identify roadways that are either in very poor pavement condition, or have gravel/native surface. None of the major collectors in the County satisfy either of the two conditions. However, several minor collectors have either very poor pavement condition or have gravel/native surface type.

4.3 PEDESTRIAN & BICYCLE SYSTEM

The pedestrian and bicycle modes serve a variety of needs including relatively short trips to major attractors, recreational trips, circulation within parklands, and access to transit (generally for trips under ¼ mile to bus stops). Bicycle travel can be a viable commuting option, particularly in areas where bicycle lanes or paved shoulders and bicycle amenities like, secure parking, work-place showers, and bus-mounted bicycle racks, are provided. Walking is also a viable choice for commute trips in areas with mixed-use development and residential neighborhoods adjacent to employments centers. In rural areas of the County, walking and bicycling mainly serves as a form of recreation or exercise, rather than to serve as a viable mode of transportation for commerce.

In Jefferson County, the majority of pedestrian and bicycle trips are taken for variety of short trips, including trips to the school, recreational areas etc. However, the long distances between activity centers combined with the high speed and volume of traffic on major highways creates a transportation system that is unsafe for non-auto users. As a result, roadways with a low volume of traffic are preferred routes for pedestrian and bicycle use. The old alignment of US 97, where available and properly maintained, is often used by bicyclist for recreational purposes.

Bicycles

The *Oregon Bicycle and Pedestrian Plan* (Reference 8) identifies the following categories of bicycle and pedestrian design treatments; *Shared Roadway* on roadway with less than 3000 ADT; *Shoulder Bikeways* with six-foot shoulders; *Bike Lanes* on major collectors; *Multi-Use Path* adjacent to high traffic volume roadways; and *Wide Paved Shoulders* for walking on highways and rural County roadways.

Generally, most collectors in rural parts of Jefferson County is anticipated to carry fewer than 3,000 ADT, which is consistent with ODOT guidelines for shared bicycle use. However, most of the roadways are not signed to warn motorists of the potential for encountering bicyclists on the roadways. In addition, County roadways with low volume of traffic tend to have high speed motorists and poor sight distance, making it unsafe for bicyclists.

Willow Creek Trail in Madras is the main designated multi-use path located in Jefferson County. Multi-use paths are desirable to encourage bicycle and pedestrian activity. In addition, it could be a popular attraction for bicycle and pedestrian enthusiasts from outside the region. Due to the rural nature of the county, it will be desirable to plan for multi-use path where appropriate.

4.4 PUBLIC TRANSIT SERVICE

Existing public transportation service in Jefferson County includes fixed-route bus service operated by CAC Transportation Inc., a private transportation group based in Bend, Oregon. The Central Oregon Breeze service that CAC Transportation provides travels through Madras while providing two daily services from Bend to Portland.

In addition to the Breeze, the Central Oregon Council on Aging provides dial-a-ride service in Jefferson County. The dial-a-ride service provides door-to-door transportation for senior citizens and individuals with disabilities living in Jefferson County.

Public bus service and passenger rail services are not available in Jefferson County.

4.5 PIPELINE AND TRANSMISSION SYSTEM

Jefferson County is served by one major interstate transmission pipeline. The facility is a 36-foot diameter natural gas pipeline operated by Pacific Gas Transmission Company, whose local office is located in Redmond, OR. This line runs for approximately 30 miles through the county from the Cove Canyon area to the Lone Pine area enroute from Canada to California. The line transmits between 800 million and 1 billion cubic-feet of Canadian natural gas to California each day.

Additional pipeline transportation in and through Jefferson County includes transport of water and sewer within incorporated cities, and transmission lines for electricity and telephone service throughout the county.

4.6 RAIL SERVICE

Jefferson County's freight rail facilities are discussed in this section.

The Burlington Northern Santa Fe Railway (BNSF) and the Union Pacific Railroad (UP) serve the US 97 corridor through Oregon from the Washington State line to the California border through its Oregon Trunk Line. In Jefferson County, the line passes through the cities of Madras, Metolius, and Culver and provides vital transport for industrial and agricultural freight. The Madras Industrial Park is one of the few places in Oregon that has access to more than one major railroad.

BNSF's Oregon Trunk Line owns and operates approximately 40 miles of track in Jefferson County, which is used by UP via trackage rights. Currently, UP has one train operating daily in each direction, and BNSF operates 12 to 15 trains daily. The line carries approximately 8 million gross tons of freight per year.

There are no short-line rail options in Jefferson County.

According to the *2001 Oregon Rail Plan*, (Reference 9) BNSF has identified improvements needed to provide clearance sufficient for high-cube double-stack traffic for five tunnels located on an 88-mile stretch in Wasco and Jefferson Counties. A preliminary estimate of improvements totals \$6.3 million.

4.7 AIR

Six air transportation facilities, serve Jefferson County (one heliport and five airports). Of those, only two of the airport facilities are open to the public: the Madras/City-County Airport and the Lake Billy Chinook State Airport.

Madras/City-County Airport is located approximately three miles northwest of the City of Madras, just west of the Madras UGB. Access to Madras/City-County Airport is provided via Cherry Lane, which connects to US 26. The Madras/City-County Airport is included in the statewide air transportation study, and serves most large local business, commercial and heavy industrial firms, and the United States Forest Service. According to the 1997 Airport Layout Plan Report (Reference 11), the airport has 45 aircrafts based at the airport, with approximately 9,300 aircraft operations in 1994. The airport operation was planned to grow to around 11,570 operations by 2014 and 56 based aircrafts.

Lake Billy Chinook State Airport is located approximately 6 miles west of the City of Culver. Access is provided on Jordan Lane past the south end of Lake Billy Chinook. The airport is used by smaller operators and recreational pilots. There are approximately eight aircrafts based in the airport with 90-percent used for general aviation.

Section 5

Transportation System Plan

Transportation System Plan

5.1 INTRODUCTION

This section presents the individual transportation modal elements that comprise the Jefferson County Transportation System Plan (TSP). The TSP addresses those components necessary for the development of the future transportation network, including:

- Roadway System Plan;
- Public Transportation System Plan;
- Bicycle & Pedestrian System Plan; and
- Air/Water/Pipeline System Plan.

All of the TSP elements presented in this section are based on the requirements of the Oregon's Transportation Planning Rule (TPR). The modal plans have been developed based on the findings of the existing and future conditions analysis taking into consideration the interests of citizens, business owners, and governmental agencies, as expressed by the Technical Advisory Committee (TAC), County staff, and citizen input.

5.2 ROADWAY SYSTEM PLAN

The Jefferson County roadway system plan reflects the anticipated operations and circulation needs through the year 2025 and provides guidance on how to facilitate that travel over the next 20 years. The plan focuses on the County's collector and arterial system, although road standards are also provided for local roadways, as well as the state facilities within the County.

Proposed Functional Classifications

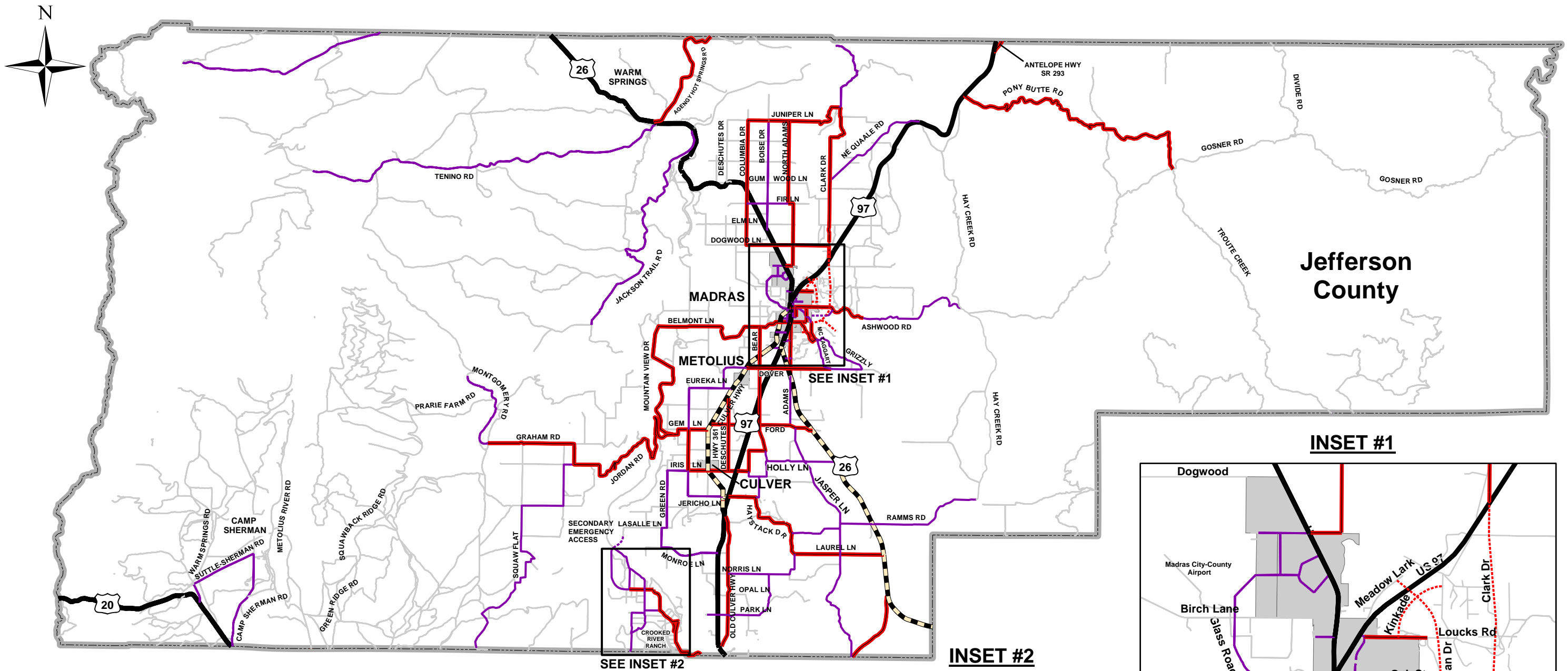
A roadway's functional classification determines its intended purpose, the amount and character of traffic it is expected to carry, the degree to which non-auto travel is emphasized, and the roadway's design standards. The classification considers the adjacent land uses and the kinds of transportation modes that should be accommodated. The public right-of-way must also provide sufficient space for utilities to serve adjacent land uses.

The functional classification system for Jefferson County categorizes the roadways as Principal Arterial, Minor Arterials, Major Collectors, Minor Collectors, or Local Streets or Roads. These classifications are derived from the descriptions provided in Section 4 with further detail classifications to meet the needs of the County. Table 5-1 provides a description of each category.

Figure 5-1 presents the proposed functional classifications for all existing and planned County roadway. The figure shows existing roadways and planned future roads. The recommended functional classification shown is based on public input and discussions with the County, City, and ODOT staff. The alignments of future roadways should be considered conceptual: the end points of the roads are the desired points, but not specifically fixed. In addition, the alignments between end points may vary depending on design requirements, land-use and environmental constraints identified at the time the roads construction.

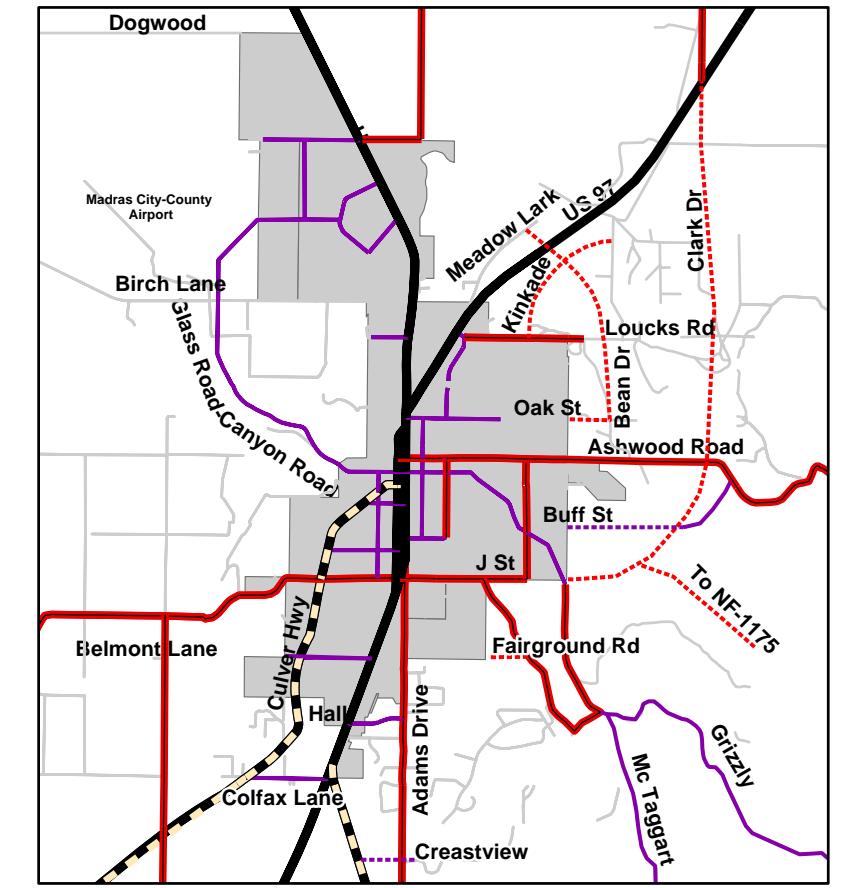
County Roadway Design Standards

The proposed roadway design standards are based on discussions with County staff and review of the Jefferson County road design standards adopted in 2002 (Ordinance 0-110-02). The standards take into consideration roadway functional and operational characteristics, including traffic volume, capacity, operating speed, and safety. The standards are necessary to ensure that as the street system develops, it will be capable of safely and efficiently serving the traveling public, while also accommodating the orderly development of adjacent lands.

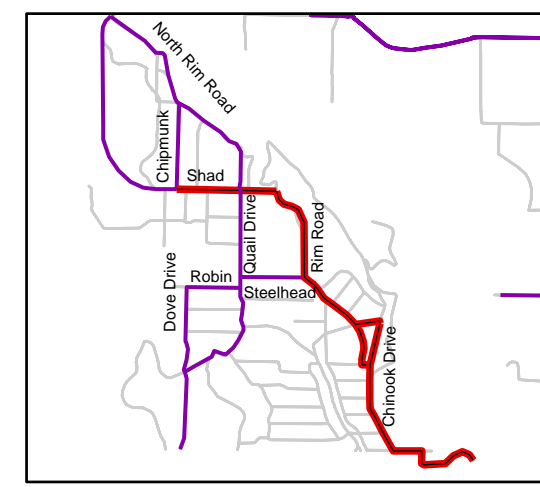


Jefferson County

INSET #1



INSET #2



LEGEND

	Principal Arterial		Planned Major Collector
	Minor Arterial		Planned Minor Collector
	Major Collector		
	Minor Collector		
	Local		

PROPOSED FUNCTIONAL CLASSIFICATION MAP
JEFFERSON COUNTY, OREGON

TABLE 5-1 JEFFERSON COUNTY FUNCTIONAL CLASSIFICATION DESCRIPTIONS

Functional Classification	Description	Typical ADT Range
Principal Arterial	Primary function is to carry high levels of regional vehicular traffic at high speeds; full access control, with access limited to interchanges; street crossings via grade separations; widely spaced access points; has a median; pedestrian and bicycle traffic discouraged or prohibited.	>7,500
Minor Arterial	Primary function is to serve both local and through traffic as it enters and leaves urban areas; connects the collector street system to freeways; provides access to other cities and communities; serves major traffic movements; access control may be provided through medians and/or channelization; restricted on-street parking; sidewalks and bicycle facilities provided; will be used by public transit in urban areas. Normally expected to have five lanes, but could have three lanes (minor arterial) if traffic volumes can be accommodated.	5,500 – 7,500
Major Collector	Primary function is to serve traffic between neighborhoods and community facilities; principal carrier between arterials and local streets; provides some degree of access to adjacent properties, while maintaining circulation and mobility for all users; carries lower traffic volumes at slower speeds than arterials; typically has two or three lanes; may provide on-street parking; pedestrian and bicycle facilities provided; may be used by public transit in urban areas.	2,500 – 6,000
Minor Collector	Primary function is to connect neighborhoods with arterials and major collector streets; has slower speeds to enhance community livability, as well as safety for pedestrians and bicyclists; on-street parking is usually provided; pedestrian and bicycle facilities are provided; bicycle facilities may be exclusive or shared roadways depending on traffic volumes, speeds, and extent of bicycle travel; may be used by public transit in urban areas.	500 – 2,500
Local Street	Primary function is to provide direct access to adjacent land uses; characterized by short roadway distances, slow speeds, and low volumes; offers a high level of accessibility; serves passenger cars, pedestrians, and bicycles, but not through trucks; may be used by public transit in urban areas; pedestrian facilities are provided in urban areas.	1 – 600

Some of the road design standards were provided in Ordinance 0-110-02, such as, right-of-way width, pavement width, pavement type, and maximum grade. These current standards were reviewed and modified based on discussions with the county. Standards for design speed, lane width, shoulder width, shoulder surface, minimum access spacing, stopping sight distance, minimum vertical distance and application specifications were also added. The County’s roadway design standards are shown by functional classification in Table 5-2.

In Jefferson County, the principal arterial and minor arterial standards are mainly applicable on state facilities that carry the highest volume of traffic. Major collectors include both two-lane and three-lane roadways. Three-lane roadway standard can be used on roadways with relatively high number of access points to improve traffic flow and safety. Minor collectors and local roads include roadway standards for low volume and high volume, which are based on average daily traffic (ADT) on those roadways. As shown in Ordinance 0-110-02, a category for industrial roadways was also included within the minor collector and local roadway standards. The industrial roadway standards are only applicable to roadways within designated industrial or commercial zones. No industrial roadways within the county have been identified at this time.

TABLE 5-2 PROPOSED JEFFERSON COUNTY ROADWAY DESIGN STANDARDS

	Principal Arterial	Minor Arterial	Major Collector		Minor Collector			Local Road			Agricultural/ Recreational (Land Access)
			3-Lane Road	2-Lane Road	High Volume	Low Volume	Industrial ⑥	High Volume	Low Volume	Industrial ⑥	
Typical ADT (Average Daily Traffic)	>7,500	5,500 – 7,500	4,000-6,000	2,500-4,500	2,500-1,500	600-1,200	500-1,000	150-600	0-150	100-500	50-100
Design Speed -Minimum ① -Recommended	⑤	45 50	40 45	40 45	30 40	30 35	40 40	25 30	25 25	30 30	25 30
Lane Width -Minimum ① -Recommended		12 ft. 12 ft.	12 ft. 12 ft.	12 ft. 12 ft.	11 ft. 12 ft.	11 ft. 12 ft.	14 ft. 14 ft.	11 ft. 12 ft.	10 ft. 12 ft.	14 ft. 14 ft.	9 ft. 9 ft.
Shoulder Width -Minimum ① -Recommended		6 ft. 8 ft.	5 ft. 6 ft.	5 ft. 6 ft.	4 ft. 6 ft.	4ft.	10 ft.	2 ft. 3 ft.	2 ft. 3 ft.	8 ft.	4 ft.
Shoulder Surface		A.C.	A.C.	A.C.	A.C.	A.C.	A.C. / Gravel	A.C.	A.C. / Gravel	A.C. / Gravel	A.C. / Gravel
Pavement Width		40 ft. ②	48 ft. ②	36 ft. ②	36 ft. ②	36 ft. ②	48 ft. ②	32 ft. ②	32 ft. ②	44 ft. ②	18 ft. ②
Recommended Minimum Access Spacing ③		500 ft.	300 ft.	300 ft.	150 ft.	125 ft.	150 ft.	100 ft.	75 ft.	100 ft.	75 ft.
Surface Type		4" A.C.	4" A.C.	3" A.C.	4" A.C.	2" A.C.	4" A.C.	2" A.C.	2" A.C.	4" A.C.	2" A.C.
Base Depth		8-10"	8-10"	10"	8-10"	10"	8-10"	8"	8"	8-10"	6"
Minimum ROW Width		80 ft.	60 - 80 ft.	60 - 80 ft.	72 ft.	60 ft.	60 ft.	60 ft.	50 ft.	60 ft.	50 ft.
Maximum Grade		8%	8%	8%	8%	10%	6%	10%	10%	6%	12%
Applicable Specifications		④	④	④	④	④	④	④	④	④	④

NOTES:

- Whenever any street or road is created or upgraded within either the UGB or 1 mile of any incorporated city, the policy outlined in the Goal and Policy section of this TSP with respect to the Urban Growth Management Agreement will apply (see Chapter 3, Policy 3.2.1-R)
 - In unincorporated areas, the County Engineer may recommend City of Madras urban roadway standards, if deemed appropriate.
- ① Design for Recommended Standard unless approved by the County Engineer
 ② Pavement width depends on design lane and shoulder widths
 ③ Lower spacing may be allowed when supported by a traffic study and approved by the County Engineer, or when no other public road access is possible.
 ④ Oregon Department of Transportation "Standard Specifications for Highway Construction" and the "Special Provisions" applicable to the project
 ⑤ Principal Arterial roadways within Jefferson County should meet standards for the corresponding functional classification provided in the Oregon Highway Design Manual.
 ⑥ Industrial roadway design standards are only applicable in designated Industrial or Commercial zones.

Sidewalks and bicycle lanes have not been included in the roadway design standards because majority of the County roadway are rural in nature and sidewalks are not a typical feature on these facilities. The standard includes shoulder widths which are adequate to accommodate a low volume of pedestrian and bicycle traffic. In addition, whenever any street or road is built or upgraded within the Urban Growth Boundary (UGB) or within one mile of any incorporated city, it is County’s policy to implement the City’s roadway standard. In the unincorporated areas outside the one mile threshold, where pedestrian and bicycle activities are relatively high, the County Engineer may recommend that the City of Madras urban roadway standards.

Access Management

Managing access to the County’s road system is necessary to preserve the capacity of the County’s arterial and collector system, by minimizing the number of points where traffic flow may be disrupted by traffic entering and exiting the roadway. Access management also enhances safety along all County roadways by minimizing the number of potential conflict points. Table 5-2 also shows the access spacing standard for all driveways and private roads accessing collector and arterial County facilities. The location, number of access points per tax-lot and other design issue should be resolved through discussion with County engineer.

Access to state facilities is governed by ODOT’s access management standards provided in the 1999 Oregon Highway Plan. Table 5-3 provides the spacing standard on ODOT facilities.

TABLE 5-3 ODOT HIGHWAY SPACING STANDARDS (IN FEET)

Posted Speed	ODOT Classification	Rural		Urban			
		Expressway	Other	Expressway	Other	UBA	STA
>= 55	Statewide	5280	1320	2640	1320		
	Regional	5280	990	2640	990		
	District	5280	700	2640	700		
50	Statewide	5280	1100	2640	1100		
	Regional	5280	830	2640	830		
	District	5280	550	2640	550		
40 & 45	Statewide	5280	990	2640	990		
	Regional	5280	750	2640	750		
	District	5280	500	2640	500		
30 & 35	Statewide		770		770	720	
	Regional		600		600	425	*
	District		400		400	350	
<= 25	Statewide		550		550	520	
	Regional		450		450	350	*
	District		400		400	350	

Note:

- Measurement of the approach road spacing is from center to center on the same side of the roadway
- Spacing for Expressway at-grade intersection only. Refer to Table 12, Appendix C of 1999 OHP for interchange spacing.
- UBA: Urban Business Area STA: Special Transportation Area
- Where driveways are allowed and where land-use permit, the minimum spacing for driveways is 175 feet or mid-block if the current block spacing is less than 350 feet. (See Note 4 in Appendix C, OHP)

ODOT's standards also apply to access spacing on County facilities located within the management area of a freeway or expressway interchange, as defined by OAR 734-051.

Traffic Operations Standards

As stated in the TSP's Goals and Policies section, the County has the obligation to maintain a safe, convenient, and economical transportation system. A maximum volume-to-capacity (v/c) ratio of 0.85 in rural areas and a v/c ratio of 0.95 in urban or transitional areas during a typical weekday peak hour should be maintained for all County-maintained intersections. At intersections where one or more approaches is maintained by a city or ODOT, the more restrictive of the County's or other agency's standards applies. For unsignalized intersections, the v/c ratio should be based on the intersection's critical movement. For signalized intersections, the ratio is based on the overall intersection operation. All intersection operations analyses follow the methodology described in the latest edition of the Highway Capacity Manual (HCM), published by Transportation Research Board (TRB).

Roadway improvement Projects

Based on the roadway needs identified in Section 4 of this document, various roadway improvement projects have been developed to address these needs. These projects provide new roadway connections, widen roadways to accommodate future traffic volumes, control access to improve mobility, and conduct corridor refinement planning to narrow down potential options. The list also includes projects that were identified to improve the geometry and address the safety needs of the intersection or section of the roadway. The project list comprises of consultant recommended alternative, which was refined by the Technical Advisory Committee, and will be subject to further refinement through public meetings and the TSP adoption process.

In a few cases, a more detailed analysis and/or public involvement effort will be required to resolve certain transportation issues. In these cases, the TSP identifies refinement plans.

Table 5-4 lists the financially un-constrained roadway improvement projects. Figures 5-2, 5-3 and 5-4 show the location of the projects. In addition, Table 5-3 provides the following descriptions:

- Project number (referenced to Figures 5-2, 5-3 and 5-4)
- Project name
- Project description (briefly describes the project)
- Project category (categorizes the project based on the major issue that it addresses). The categories are:
 - *Roadway Connectivity*: These projects provide the roadway links between various areas and improves the connectivity in the county
 - *Traffic Operation*: These projects provide the roadway capacity needed to accommodate future traffic volume and improve traffic operation on the roadway
 - *Safety*: These projects enhance the traffic safety by improving the geometry and/or operation of the roadway
- Source (shows the source of the project)

- Cost Estimate (provides preliminary cost only based on following assumption; \$2/sq.ft for 3” lift of asphalt, \$5/sq. ft. for new bike lane/shoulder/multi-use path, \$9/sq. ft. for upgrading existing roadway to collector standard, \$11/sq. ft. for new construction of roadway without curb, \$13/sq. ft for new construction of roadway with curb and sidewalk. The cost estimate does not include right-of-way or structure cost), and
- Potential funding source (which highlights non-binding funding source of the project).

The projects are also categorized into short-, mid-, and long-term projects. Short-term projects include those improvements or deficiencies that could be addressed within the next five years. Mid-term projects include those projects that are to be addressed within five to 10 years. Whereas, long-term projects will continue to be considered during planning projects, but will most likely not be addressed until 10 to 20 years from now.

TABLE 5-4 JEFFERSON COUNTY FINANCIALLY UNCONSTRAINED ROADWAY PROJECT LIST

No.	Project Name	Project Description	Project Category	Source	Cost Estimate ¹	Potential Funding Source			
						ODOT	County	City	Private
Short Term (0-5 years)									
1	US 97/SW Iris Lane Intersection Improvements	Construct NBLT, SBLT, and SBRT lanes on US 97. Designate SW Iris Lane as Culver Highway 361 from existing Culver Highway 361 to US 97.	Safety	ODOT STIP	\$1,240,000	P			
2	US 97/SW Jericho Lane Intersection Improvements	Construct NBLT, NBRT, SBLT, and SBRT lanes on US 97.	Safety	ODOT STIP	\$882,000	P			
3	Culver Highway 361/US 97 Intersection Improvements (See Figure 5-5)	Close eastbound approach of Culver Highway 361/US 97 in conjunction with intersection improvements at US 97/SW Iris Lane and US 97/SW Jericho Lane. Convert the westbound approach of Culver Highway 361/US 97 to a right-out and left-in access.	Safety	ODOT SPIS List	\$820,000	P			
4	US 97/SW Dover Lane Intersection Improvements	Construct NBLT, NBRT, SBLT, and SBRT lanes on US 97.	Safety	ODOT SPIS List	\$882,000	P			
5	US 26/SE Dover Lane Intersection Improvements	Install larger STOP signs, thermal plastic stop bar, and guide signs for Madras and Prineville. Add appropriate channelization for turning vehicles.	Safety	ODOT SPIS List	\$70,000	P			
6	Emergency Detour Route	Upgrade Old Culver Highway and Culver Highway 361 as Emergency Detour Route for US 97, including bridge. Designate Old Culver Highway as a minor collector.	Safety, Operation	JC TSP	\$6,946,000	P	S		
7	NW Gumwood Lane Closure (See Figure 5-6)	Close NW Gumwood Lane (both) access on US 26 in conjunction with intersection improvements at US 26/NW Columbia Drive.	Safety	JC TSP	\$485,000	P			
8	US 26/Warm Springs Agency Road Intersection Improvements	Install larger STOP sign, warning sign, and rumble strips, and illuminate the intersection.	Safety	ODOT SPIS List	\$50,000	P	S		

No.	Project Name	Project Description	Project Category	Source	Cost Estimate ¹	Potential Funding Source			
						ODOT	County	City	Private
9	US 97 Hay Creek Bridge	Bridge Replacement (STIP #00813A)	Safety	ODOT STIP	\$2,533,000	P			
10	NE Oak Street Extension to NE Bean Drive	Extend Oak Street east (from the future curvilinear connection to City View) to Bean Drive and following the existing Richards Lane alignment.	Roadway connectivity	JC TSP	\$850,000		S	S	P
11	SE Buff Road-SE E Street Extension	Extend SE E Street east to E Ashwood as a minor collector.	Roadway connectivity	Madras TSP	\$3,400,000		S	S	P
12	SE Buff Road-SE E Street/E Ashwood Road Roundabout	Construct modern roundabout at the future SE Buff Road-SE E Street/E Ashwood Road intersection	Operation, Safety	JC TSP	\$300,000		S	S	P
13	SE J Street Extension	Extend SE J Street east to E Ashwood Road as a major collector.	Roadway connectivity	Madras TSP	\$4,200,000		S	S	P
14	US 97 Passing Lanes - South of SW Dover Lane	Provide passing lane south of SW Dover Lane and connect to SW Eureka Lane.	Operation, Safety	US 97 Corridor Strategy	\$1,150,000	P			
15	US 97 Passing Lanes - South of SW Norris Lane to Deschutes County Line	Provide passing lane south of SW Norris Road (south of bridge) to SW Park Lane.	Operation, Safety	US 97 Corridor Strategy	\$6,700,000	P			
16	US 97 Passing Lane - From SW Ford Lane to SW Highland Lane	Provide a passing lane on US 97 from SW Ford Land to SW Highland Lane.	Operation, Safety	US 97 Corridor Strategy	\$3,000,000	P			
17	Culver Highway 361/SW Jericho Lane Safety Improvements	Identify safety issues and provide appropriate mitigations.	Safety	ODOT STIP	\$20,000	P	S		
18	Crooked River Ranch Secondary Access	Conduct engineering feasibility study for future secondary access across Crooked River, north of the ranch, near LaSalle Road.	Roadway Connectivity	JC TSP	\$150,000	S	P	S	S
19	US 97/US 26 South Interchange Study	Prepare Interchange Area Management Plan (IAMP) for the future interchange at the US 97/US 26 south intersection with the proposed US 97 truck bypass.	Operation	JC TSP	\$175,000	P	S	S	

No.	Project Name	Project Description	Project Category	Source	Cost Estimate ¹	Potential Funding Source			
						ODOT	County	City	Private
TOTAL Short Term Cost:					\$33,853,000				
Mid Term (5-10 years)									
20	NE Bean Drive Extension	Realign and extend NE Bean Drive north of NE Richards Lane (across US 97) to connect with NE Meadowlark Lane.	Roadway connectivity	JC TSP	\$5,100,000		S	S	P
21	SE Kinkade Road Extension	Extend SE Kinkade Road northeast from the UGB to NE Brown Drive.	Roadway connectivity	Madras TSP	\$3,510,000		S	S	P
22	NE Bean Drive/US 97 Intersection	Construct proper channelized intersection in conjunction with NE Bean Drive Extension to NE Meadowlark Lane	Operation, Safety	JC TSP	\$150,000	P	S		S
23	NE Meadowlark Lane Closure	Close NE Meadowlark Lane access to US 97 in conjunction with NE Bean Drive extension from US 97 to NE Meadowlark Lane.	Safety	JC TSP	\$10,000		S	S	P
24	NE Kinkade Road/NE Bean Drive Roundabout	Construct modern roundabout at the future Kinkade Road/Bean Drive intersection.	Operation, Safety	JC TSP	\$300,000		S	S	P
25	NE Kinkade Road/NE Loucks Road Roundabout	Construct modern roundabout at the future Kinkade Road/Loucks Road intersection	Operation, Safety	JCTSP	\$300,000		S	S	P
26	NE Loucks Road/NE Bean Drive Roundabout	Construct modern roundabout at the future Loucks Road/Bean Drive intersection	Operation, Safety	JCTSP	\$300,000		S	S	P
27	NE Clark Drive Extension to NE Loucks Road	Connect NE Clark Drive to NE Loucks Road as a major collector.	Roadway connectivity	Madras TSP	\$6,900,000		S	S	P
28	SE Fairgrounds Road East Extension	Extend SE Fairgrounds Road east, from the UGB to SE McTaggart Road, as major collector.	Roadway connectivity	JC TSP	\$2,800,000		S	S	P
29	Cherry Lane Closure	Close east approach of US 97/Cherry Lane.	Safety	JC TSP	\$10,000	P			
30	US 97/NE Cora Drive Closure (See Figure 5-7)	Close NE Cora Drive access to US	Safety	JC TSP	\$10,000	P			

No.	Project Name	Project Description	Project Category	Source	Cost Estimate ¹	Potential Funding Source			
						ODOT	County	City	Private
		97 in conjunction with intersection improvements at US 97/NE Clark Drive.							
31	US 97/NE Clark Drive Intersection Improvements (See Figure 5-7)	Realign NE Clark Drive to intersect US 97 at right-angle and provide appropriate channelization for turning vehicles.	Safety	JC TSP	\$800,000	P			
32	NE Clark Extension to E Ashwood	Connect NE Clark Drive to E Ashwood Road.	Roadway Connectivity	Madras TSP	\$5,000,000		S	S	P
33	NE Clark Drive/E Ashwood Road Roundabout	Construct modern roundabout at the future NE Clark Drive/E Ashwood Road intersection.	Operations, Safety	Madras TSP	\$300,000		S	S	P
34	US 97/NE Brown Drive Closure	Close NE Brown Drive access to US 97.	Safety	JC TSP	\$10,000	P			
35	US 97/26 - North Capacity Improvements	Add dual westbound left-turn lanes and northbound right-turn lane overlap at the US 97/US 26 intersection.	Operation	JC TSP	\$1,500,000	P		S	
36	Culver Highway 361/SW Bear Drive Safety Improvements	Identify safety issues and provide appropriate mitigations.	Safety	JC TSP	\$100,000	P	S		
37	SW Eureka Road Closure (See Figure 5-8)	Close west approach of US 97/SW Eureka Road.	Safety	JC TSP	\$10,000	P			
38	SW Eureka Road Extension (See Figure 5-8)	Extend east approach of SW Eureka Rd as a frontage road (parallel to US 97) to connect with future SW Bear Dr extension.	Roadway connectivity	JC TSP	\$1,000,000	P	S		
39	US 97/SE Bear Drive Roadway and Intersection Improvements (See Figure 5-8)	Realign Bear Drive to east of existing properties and intersect at right-angle with US 97 (north of existing intersection). Upgrade roadway conditions on Bear Drive to accommodate re-routed traffic from closures on US 97.	Safety	JC TSP	\$2,100,000	P			
40	SW Falcon Drive Closures	Close east and west approaches of US 97/SW Falcon Drive intersection.	Safety	JC TSP	\$10,000	P			

No.	Project Name	Project Description	Project Category	Source	Cost Estimate ¹	Potential Funding Source			
						ODOT	County	City	Private
41	SW Deschutes Road Extension	Extend SW Deschutes Road from SW Ford Lane to SW Highland Lane.	Roadway Connectivity	JC TSP	\$3,000,000		P		S
42	US 97/SW Ford Lane Intersection and Roadway Improvements	Add appropriate intersection channelization to accommodate turning vehicles. Upgrade SW Ford Lane to major collector roadway standards.	Operations, Safety	JC TSP	\$4,100,000	P			
43	Culver Highway 361/SW Gem Lane Improvements (See Figure 5-9)	Provide large radius on Culver Highway 361 and improve rail crossing. Realign SW Elbe Drive to the west.	Operation, Safety	JC TSP	\$916,000	P			
44	SW Highland Lane Closures	Close east and west approaches of US 97/SW Highland Lane intersection.	Safety	JC TSP	\$10,000	P			
45	Culver Highway 361/SW Iris Lane/SW Elbe Drive Intersection Improvements (See Figure 5-10)	Realign SW Elbe Drive to intersect perpendicular to Culver Highway 361. Construct a modern roundabout at Culver Highway 361/SW Iris Lane/SW Elbe Drive intersection.	Operation, Safety	JC TSP	\$253,000	P		S	S
46	SW Norris Road and SW Opal Road Closures	Close east and west approaches of US 97/SW Norris Road and US m97/SW Opal Road intersections.	Safety	JC TSP	\$20,000	P			
47	US 97 Truck Bypass Study (See Figure 5-11)	Conduct pre-NEPA and environmental assessments on alternative alignments of future US 97 Truck by-pass.	Operation, Safety	Madras TSP	\$250,000	P	S	S	S
48	US 20 Safety Improvements	Conduct safety audit of the highway section within Jefferson County.	Safety	JC TSP	\$25,000	P			
49	SE Laurel Road Paving	Upgrade SE Laurel Road to US 26 to major collector standard	Pavement	JC TSP	\$10,260,000		P		
50	Camp Sherman Road Roadway Improvements	Upgrade Camp Sherman Road to minor collector roadway standards.	Safety	JC TSP	\$9,240,000		P		S

No.	Project Name	Project Description	Project Category	Source	Cost Estimate ¹	Potential Funding Source				
						ODOT	County	City	Private	
TOTAL Mid-Term Cost:					\$58,294,000					
Long Term (10-20 years)										
51	US 97/US 293 Highway Intersection Improvements	Provide proper channelization at the intersection to accommodate turning vehicles.	Safety	JC TSP	\$300,000	P				
52	US 97/NE Quaale Drive Intersection Improvements (See Figure 5-12)	Realign NE Quaale Drive to intersect US 97 at right-angle and add appropriate channelization for turning vehicles.	Safety	JC TSP	\$150,000	P				
53	US 26/NW Columbia Drive Intersection Improvements (See Figure 5-13)	Close south approach of NW Columbia Drive at US 26, converting the intersection into one T-intersection.	Operation, Safety	JC TSP	\$85,000	P				
54	US 26/NW Fir Lane Intersection Improvements	Provide SBRT and NBRT slip lanes at the US 26/NW Fir Lane intersection.	Operation, Safety	JC TSP	\$880,000	P	S			
55	US 26/NW Boise Drive Intersection Improvements (See Figure 5-14)	Close east approach of NW Elm Lane. Convert NW Boise to one T-intersection. Close south approach of NW Boise Drive at US 26.	Operation, Safety	JC TSP	\$150,000	P				
56	SE Crestview Lane Extension	Extend SE Crestview Lane to US 26 as minor collector.	Roadway Connectivity	JC TSP	\$1,900,000		S	S	P	
57	US 26/S Adams Drive Intersection Improvements (See Figure 5-15)	Realign north and south approaches to intersect US 26 at a right-angle. Designate S Adams Drive as a major collector south of US 26 to Ford Lane.	Safety	JC TSP	\$500,000	P	S			
58	US 26/NW Dogwood Lane Intersection Improvements	Provide NBLT, NBRT, SBLT, and NBRT slip lanes at US 26/NW Dogwood Lane intersection.	Operation, Safety	JC TSP	\$225,000	P				
59	NW Dogwood Lane Roadway Improvements	Upgrade NW Dogwood Lane from NW Columbia Drive to NE Clark Drive to major collector roadway standards.	Operations, Safety	JC TSP	\$8,250,000		P			
60	North Adams Drive Roadway Improvements	Upgrade N Adams Drive from NE	Operations,	JC TSP	\$14,350,000		P			

No.	Project Name	Project Description	Project Category	Source	Cost Estimate ¹	Potential Funding Source			
						ODOT	County	City	Private
		Juniper Lane to NE Cherry Lane to major collector roadway standards.	Safety						
61	SW Columbia Drive Roadway Improvements	Upgrade roadway conditions to accommodate re-routed traffic from Highland Drive.	Operations, Safety	JC TSP	\$2,100,000	S	P		
62	SW Deschutes Drive Roadway Improvements	Upgrade SW Deschutes Road to minor collector roadway standards.	Operations, Safety	JC TSP	\$2,100,000	S	P		
63	SW Monroe Lane Roadway Improvements	Upgrade Monroe Lane to major collector standards in conjunction with closures at SW Norris Rd, SW Opal Rd.	Operations, Safety	JC TSP	\$6,150,000	S	P		
64	SW Park Lane Roadway Improvements	Upgrade SW Park Lane to minor collector roadway standards in conjunction with closures at SW Norris Road and SW Opal Road.	Operations, Safety	JC TSP	\$2,000,000	S	P		
65	NW Hickory Lane Paving	Pave NW Hickory Lane from NW Danube Drive to NW Boise Drive.	Pavement	JC TSP	\$1,500,000		P		
66	NE Clark Drive Paving	Pave NE Clark Drive from US 97 to the Town of Gateway.	Pavement	JC TSP	\$2,950,000		P		
67	NW Columbia Drive Roadway Improvements	Upgrade NW Columbia Drive north of US 26 and from NW Fir Lane to NW Dogwood Lane to major collector roadway standards.	Operations, Safety	JC TSP	\$4,100,000	S	P		
68	NW Fir Lane Roadway Improvements	Upgrade NW Fir Lane from NW Columbia Drive to N Adams Drive to minor collector roadway standards.	Operations, Safety	JC TSP	\$4,100,000	S	P		
69	US 26/US 97 North Interchange Study	Evaluate the need for an interchange at the north intersection of US 26/US 97.	Operations	JC TSP	\$100,000	P	S	S	S
70	Southern J Street Connection	Connect SE J Street to NF-1175 south of E Ashwood as a major collector.	Roadway Connectivity	JC TSP	\$3,800,000		S	S	P
71	US 97 Widening	Widen US 97 to four lanes from	Operation,	JC TSP	\$35,600,000	P			

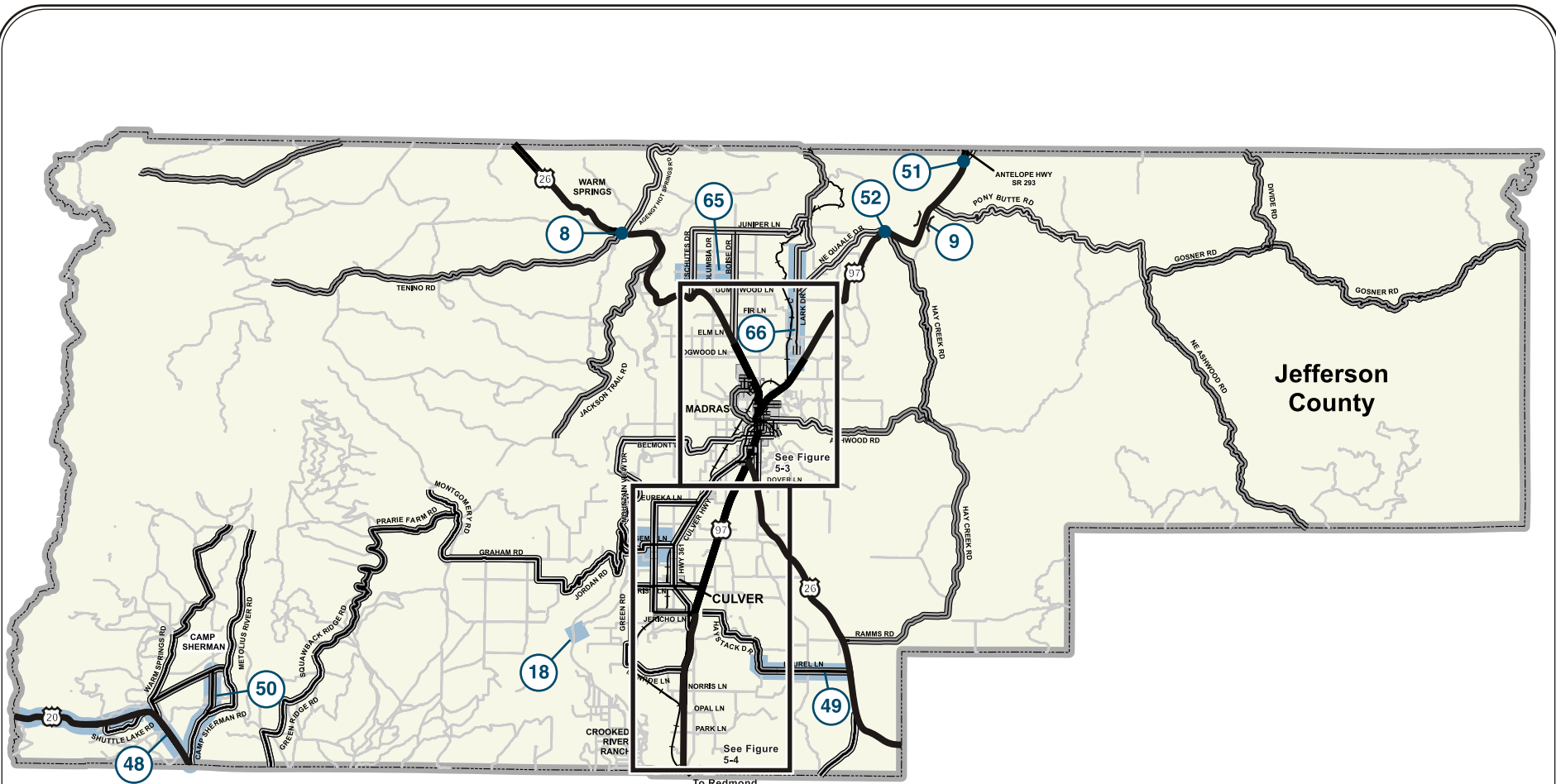
No.	Project Name	Project Description	Project Category	Source	Cost Estimate ¹	Potential Funding Source			
						ODOT	County	City	Private
		Madras to Deschutes County line. Provide appropriate channelization at intersections with major collectors.	Safety						
TOTAL Long-Term Cost:					\$91,290,000				
TOTAL UN-CONSTRAINED PROJECT COST					\$183,437,000				

¹: Cost estimate is planning level only. Does not include ROW cost.

JC TSP: Jefferson County Transportation System Plan

P : Primary party with potential funding and implementation responsibility

S : Secondary party in potential funding and implementation



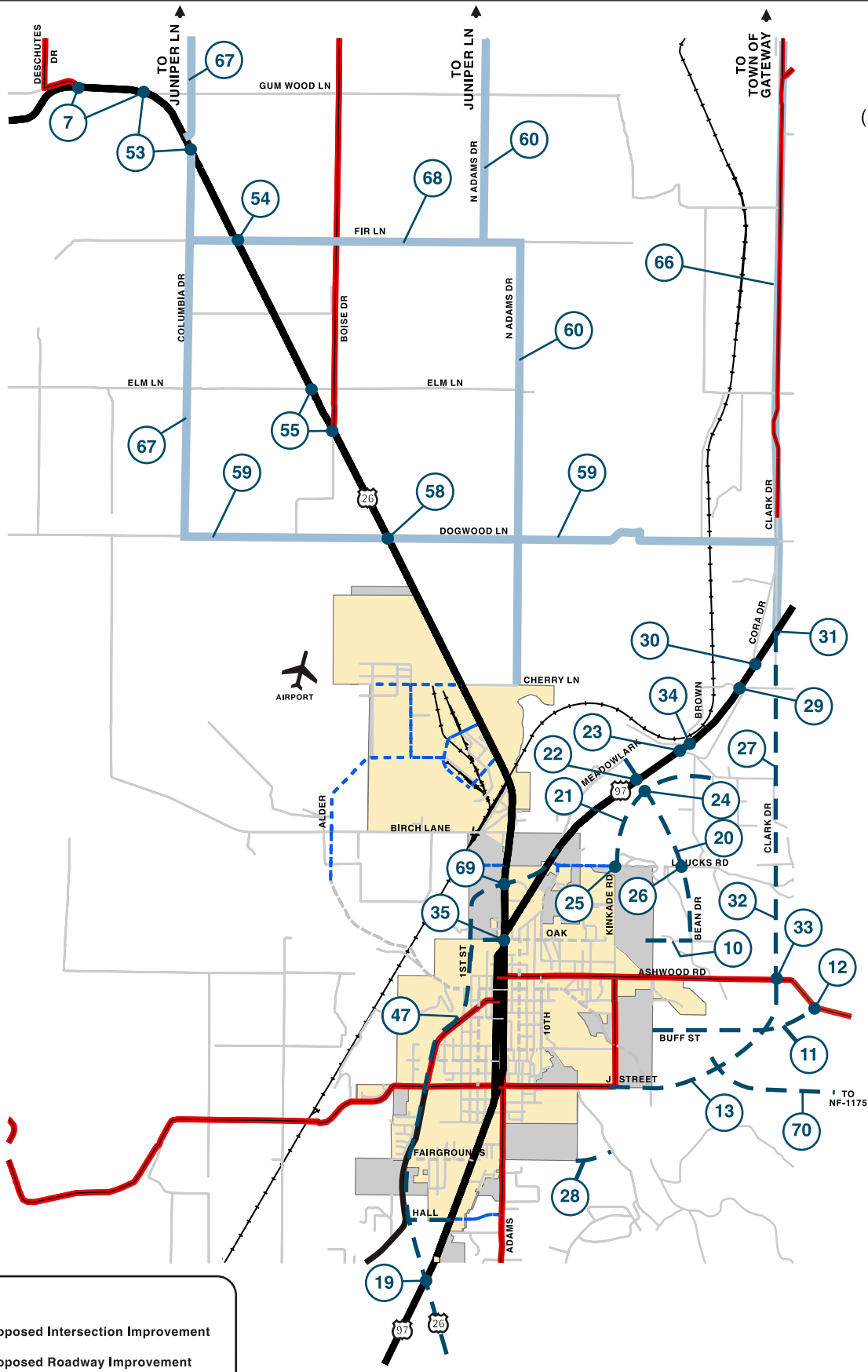
LEGEND

- Proposed Intersection Improvement
- Proposed Roadway Improvement
- ## Project Number
(See Table 5-4 for details)
- Proposed Bike-Ped Connections
- UGB

Note: See Figures 5-3 and 5-4 for complete project locations.

**Roadway Project Location Map (1 of 3)
Jefferson County, Oregon**

**FIGURE
5-2**

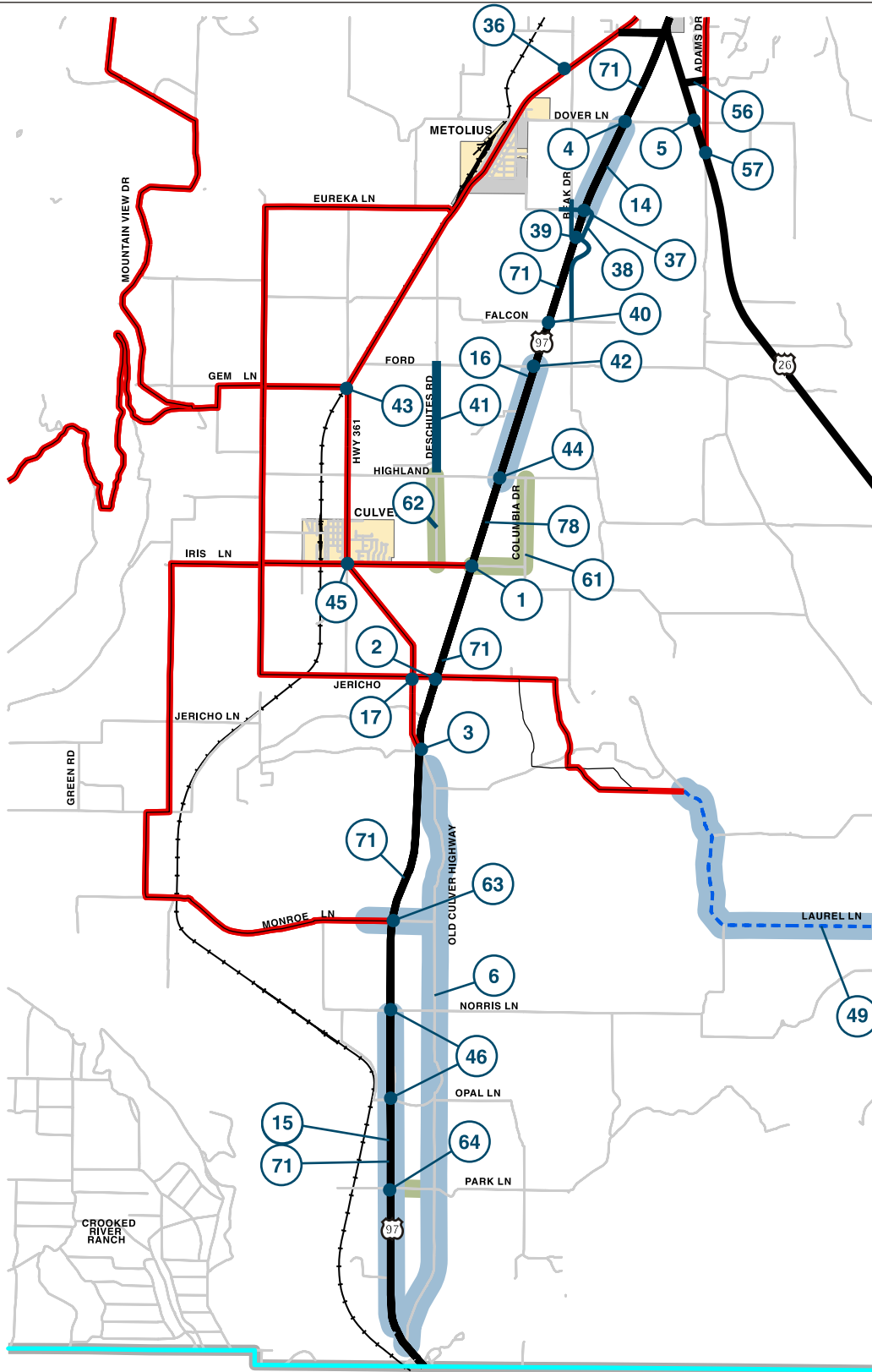


LEGEND

- Proposed Intersection Improvement
- Proposed Roadway Improvement
- ## Project Number (see project list (Table 5-4) for details)
- City Limits UGB
- Proposed Roadway Connection

Roadway Project Location Map (2 of 3)
Jefferson County, Oregon **FIGURE 5-3**

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LEGEND

- Proposed Intersection Improvement
- ## Project Number (see Table 5-4)
- City Limits UGB
- Proposed Roadway Connection
- Proposed Roadway Upgrade

Roadway Project Location Map (3 of 3)

FIGURE 5-4

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As shown in Table 5-4, it is estimated that Jefferson County has total transportation needs of approximately \$183 million for the next 20-years. Of which, approximately \$34 million is anticipated to be needed in the short-term (0-5 years) to address short-term needs, \$58 million for mid-term (5-10 years) and \$91 million to address the long-term (10-20 years) needs.

In order to provide a better understanding of the projects listed in Table 5-4, following sections describe the projects in detail. The descriptions are divided into project categories and further into short-, mid- and long-term project.

Roadway Connectivity

Planned roadway connections have been identified through input received from the public, and city, county, and ODOT staff. These roadways will provide connections to various parts of the county, including residential, commercial and recreational areas. The alignments of future roadways described below and shown in Figures 5-2, 5-3 and 5-4 should be considered conceptual: the end points of the roads are desirable, and the alignments between end points may vary depending on design requirements, land-use and physical and environmental constraints. Descriptions of short-, mid-, and long-term roadway connectivity projects within Jefferson County are shown below.

Short-Term Projects

#10 – NE Oak Street Extension to NE Bean Drive: Extend Oak Street east (from future curvilinear connection to City View) outside the UGB to NE Bean Drive and following the existing NE Richards Lane alignment. This project will extend the city grid network on the eastside of Madras and provide roadway connection for future development. The project should coordinate with the City of Madras NE Oak Street project inside the UGB.

#11 – SE Buff Road-SE E Street Extension: Extend SE E Street to E Ashwood Road as a minor collector to provide east-west connection east of Madras to facilitate future development. It should be coordinated with SE Buff Road and SE E Street extension project inside City of Madras UGB.

#13 – SE J Street Extension: Extend SE J Street east to E Ashwood Road as a major collector to provide east-west connection east of Madras to facilitate future development. It should be coordinated with SE J Street extension project inside City of Madras UGB.

#18 Crooked River Ranch Secondary Access: Conduct alternatives analysis and engineering feasibility study to identify future secondary access across Crooked River. This project will provide a secondary access to Crooked River Ranch for emergencies and a more accessible and efficient route to school. Discussions with County staff have identified that a crossing may be most feasible north of the ranch across from LaSalle Road.

Mid-Term Projects

#20 – NE Bean Drive Extension: Realign and extend NE Bean Drive north of NE Richards Lane (across US 97) to connect with US 97 and extend further to NE Meadowlark Lane as shown in Figure 5-2. The extension will provide an alternative connection to US 97 from the east side of Madras. The extension to NE Meadowlark Lane provides the opportunity to close the existing sub-standard intersection of NE Meadowlark Lane/US 97 and create a standard intersection with appropriate sight distance.

#21 – SE Kinkade Road Extension: Extend Kinkade Road northeast from UGB to NE Brown Drive to provide additional north-south roadway connection east of Madras. The extension provides alternative route to US 97 to access downtown Madras, hence improving connectivity in the area.

#27 – NE Clark Drive Extension to NE Loucks Road: Connect NE Clark Drive to NE Loucks Road as a major collector to provide an additional north-south roadway connection on the eastside of Madras and to facilitate future development.

#28 – SE Fairgrounds Road East Extension: Extend SE Fairgrounds Road east, from UGB to SE Grizzly Road, as a major collector to provide an alternative east-west connection to J Street on the southeast side of Madras.

#32 – NE Clark Drive Extension to E Ashwood Road: Extend NE Clark Drive south to intersect with E Ashwood Road to provide an additional north-south route east of Madras.

#38 – SW Eureka Road Extension: In conjunction with closure at SW Eureka Road, extend east approach of SW Eureka Road as a frontage road (parallel to US 97) to connect with future SW Bear Drive extension to provide alternative access to US 97.

#41 – SW Deschutes Road Extension: Extend SW Deschutes Road from SW Ford Lane to SW Highland Lane to provide additional north-south roadway connection west of US 97.

Long-Term Projects

#56 – SE Crestview Lane Extension: Extend SE Crestview Lane to US 26 as a minor collector to provide alternate access to US 26 from residential development to the east of Adams Drive.

#70 – Southern J Street Connection: Extend SE J Street southeast to NF-1175 to provide a southern east-west connection to anticipated future development east of Madras.

Traffic Operations

Traffic operations analyses were conducted for rural highway segments within the county and at key intersections along state routes in the county. The analyses were conducted in accordance with the *2000 Highway Capacity Manual* to identify specific future capacity and operation needs. Based on the results of the analysis, conceptual roadway and/or intersection improvements were identified. In some cases, existing roadways need to be upgraded to higher roadway standards to accommodate re-routed traffic from other roadways with access closed to the state highways. Descriptions of short-, mid-, and long-term traffic operations projects within Jefferson County are shown below.

Short-Term

#6 – Emergency Detour Route - Old Culver Highway Roadway Improvements: Upgrade Old Culver Highway to major collector roadway standard in conjunction with closures of SW Norris Road and SW Opal Road at US 97 to accommodate re-routed traffic. The roadway has been designated for emergency detour in case of closure of US 97 in the area. This project was also identified as a Safety Project.

#12 – SE Buff Road-SE E Street/E Ashwood Road Roundabout: Construct a modern roundabout at the future SE Buff Road-SE E Street/E Ashwood Road intersection to address future operational and safety concerns. A roundabout geometric and operational analysis should be conducted to

determine appropriate alignment and lane configuration. This project was also identified as a Safety Project.

#14 – US 97 Passing Lanes – South of SW Dover Lane: Construct passing lanes on US 97 south of SW Dover Lane and connect with SW Eureka Lane to improve operations and safety on US 97. This project was also identified as a Safety Project.

#15 – US 97 Passing Lanes – South of SW Norris Lane to Deschutes County Line: Construct passing lanes south of SW Norris Road (south of bridge) to SW Park Lane to improve operations and safety on US 97. This project was also identified as a Safety Project.

#16 – US 97 Passing Lane – From SW Ford Lane to SW Highland Lane: Construct passing lanes on US 97 from SW Ford Lane to SW Highland Drive to improve operations and safety on US 97. This project was also identified as a Safety Project.

#19 – US 97/US 26 South Interchange Study: Prepare Interchange Area Management Plan (IMAP) for the future interchange at the US 97/US 26 south intersection with the proposed US 97 truck bypass. The interchange will improve mobility and safety at the intersection. As an interim measure, a traffic signal, installed with adequate intersection sight distance, will provide appropriate accessibility and safety.

Mid-Term

#22 – NE Bean Drive/US 97 Intersection: Construct a new channelized intersection on US 97 with NE Bean Drive extension to NE Meadowlark Lane.

#24 - NE Kinkade Road/NE Bean Drive Roundabout: Construct a modern roundabout at the future NE Kinkade Road/NE Bean Drive intersection to accommodate future traffic volume at the intersection. A roundabout geometric and operational analysis should be conducted to determine appropriate alignment and lane configuration. This project was also identified as a safety project.

#25 – NE Kinkade Road/NE Loucks Road Roundabout: Construct a modern roundabout at the NE Kinkade Road/NE Loucks Road intersection to accommodate future traffic volume at the intersection. A roundabout geometric and operational analysis should be conducted to determine appropriate alignment and lane configuration. This project was also identified as a safety project.

#26 – NE Loucks Road/NE Bean Drive Roundabout: Construct a modern roundabout at the NE Loucks Road/NE Bean Drive intersection to accommodate future traffic volume at the intersection. A roundabout geometric and operational analysis should be conducted to determine appropriate alignment and lane configuration. This project was also identified as a safety project.

#33 – NE Clark Drive/E Ashwood Road Roundabout: Construct a modern roundabout at the future intersection of NE Clark Drive/E Ashwood Road to address future operational and safety concerns. A roundabout geometric and operational analysis should be conducted to determine appropriate alignment and lane configuration. This project was also identified as a safety project.

#35 – US 97/US 26 North Capacity Improvements: Intersection operational analysis revealed that the US 97/US 26 north intersections will not operate acceptably under year 2025 future conditions. To mitigate the capacity needs at this intersection, this project proposes to add dual westbound left-

turn lanes and a northbound right-turn overlap. This project will provide necessary capacity for high turning vehicle and truck traffic.

The operation of this intersection will also be impacted by the proposed US 97 Truck Bypass. Based on the final alignment of the by-pass, the lane configuration at the intersection would need to be updated.

#42 – US 97/SW Ford Lane Intersection Improvements: Add appropriate intersection channelization to accommodate turning vehicles at the intersection of US 97/SW Ford Lane and improve operations and safety at this intersection. Upgrade SW Ford Lane to major collector roadway standards. This project was also identified as a Safety Project.

#43 – Culver Highway 361/SW Gem Lane Intersection Improvements: Provide a larger radius on Culver Highway 361, realign SW Elbe Drive to the west of the Culver Highway 361/SW Gem Lane intersection to improve intersection geometry on Culver Highway 361 and queue distance from the rail crossing. Figure 5-9 illustrates a conceptual schematic of the proposed intersection improvements. This project was also identified as a Safety Project.

#45 – Culver Highway 361/SW Iris Lane/SW Elbe Drive Intersection Improvements: Realign SW Elbe Drive to intersect Culver Highway 361 closer to ninety degrees to improve operations and safety by eliminating fifth leg of the intersection. Construct a modern roundabout at the intersection to address future operational and safety concerns. A roundabout geometric and operational analysis should be conducted to determine appropriate alignment and lane configuration. The analysis should take into consideration that the existing connection of Culver Highway 361 to US 97 is proposed to be closed and SW Iris Lane is proposed to be designated as the state highway. This project was also identified as a Safety Project (See Figure 5-10).

#47 – US 97 Truck Bypass Study: Conduct pre-NEPA analysis and appropriate environmental assessments of the alternative alignments of future US 97 Truck bypass. The project will divert heavy vehicle traffic from downtown Madras and improve operation and safety of the highway through town. Figure 5-11 illustrates the concepts for the US 97 Truck bypass and provides the advantages and disadvantage. This project was also identified as a Safety Project.

Long-Term

#53 – US 26/NW Columbia Drive Intersection Improvements: Close the south approach of US 26/NW Columbia Drive, converting the intersection into a T-intersection. The traffic accessing the intersection from the south will be rerouted to Fir Lane. This project will improve skewed geometry, reduce conflicts and consolidate access on US 26. Figure 5-13 illustrates a conceptual schematic of the proposed intersection improvements. This project was also identified as a Safety Project.

#54 – US 26/NW Fir Lane Intersection Improvements: Construct southbound and northbound right-turn slip lanes at the US 26/NW Fir Lane intersection to improve operations and safety at this skewed intersection. This project was also identified as a Safety Project.

#55 – US 26/NW Boise Drive Intersection Improvements: Close the south approach of the US 26/NW Boise Drive intersection, converting the intersection into a T-intersection. The traffic accessing the intersection from the south will be rerouted to Dogwood Lane. Close east approach of the US 26/NW Elm Lane. The traffic will be re-routed to the realigned US 26/NW Boise Drive intersection. This project will reduce conflicts and consolidate access on US 26, and improve

operations and safety at this skewed intersection. Figure 5-14 illustrates a conceptual schematic of the proposed intersection improvements. This project was also identified as a Safety Project.

#58 – US 26/NW Dogwood Lane Intersection Improvements: Construct northbound left-turn, northbound right-turn, southbound left-turn, and southbound right-turn slip lanes at the US 26/NW Dogwood Lane intersection to improve operations and safety at this skewed intersection. This project was also identified as a Safety Project.

Based on the discussion with the City staff, the concept that currently appears to have the most advantages is Alternative 1C and Alternative 2. Alternative 1C connects to the US 97/US 26 North intersection as a west approach of the existing intersection. It then follows 1st Street and the existing Culver Highway alignment. Alternative 2 follows the existing alignment of Culver Highway until SW Loafers Lane, after which it diverts to intersect with US 97 near the existing US 97/US 26 South intersection. The new intersection with US 97 would be a grade separated interchange. Further detail conceptual analysis and feasibility studies will need to be conducted to determine the impact of the proposed truck by-pass and identify the preferred alternative.

#59 – NW Dogwood Lane Roadway Improvements: Upgrade NW Dogwood Lane, from NW Columbia Drive to NE Clark Drive, to major collector roadway standards to accommodate anticipated future increase in traffic volumes due to re-routed traffic from closures on US 26. This project was also identified as a Safety Project.

#60 – North Adams Drive Roadway Improvements: Upgrade North Adams Drive, from NE Juniper Lane to NE Cherry Lane, to major collector roadway standards to accommodate anticipated future increase in traffic volumes. This project was also identified as a Safety Project.

#61 – NW Columbia Drive Roadway Improvements: Upgrade NW Columbia Drive north of US 26 and from NW Fir Lane to NW Dogwood Lane to major collector roadway standards to accommodate re-routed traffic from closures on US 26. This project was also identified as a Safety Project.

#62 – SW Deschutes Drive Roadway Improvements: Upgrade SW Deschutes Road to minor collector roadway standards to accommodate re-routed traffic from closures on US 97. This project was also identified as a Safety Project.

#63 – SW Monroe Lane Roadway Improvements: Upgrade SW Monroe Lane to major collector roadway standard in conjunction with closures of SW Norris Road and SW Opal Road at US 97 to accommodate re-routed traffic. This project was also identified as a Safety Project.

#64 – SW Park Lane Roadway Improvements: Upgrade SW Park Lane to minor collector roadway standard in conjunction with closures of SW Norris Road and SW Opal Road at US 97 to accommodate re-routed traffic. This project was also identified as a Safety Project.

#67 – SW Columbia Drive Roadway Improvements: Upgrade SW Columbia Drive to minor collector standard to accommodate re-routed traffic from Highland Drive closure. This project was also identified as a Safety Project.

#68– NW Fir Lane Roadway Improvements: Upgrade NW Fir Lane from NW Columbia Drive to North Adams Drive to major collector roadways standards to accommodate anticipated future increase in traffic. This project was also identified as a Safety Project.

#69 – US 26/US 97 North Interchange Study: Evaluate the need for an interchange at the US 26/US 97 north intersection to provide higher mobility for future increase in truck traffic.

#71 – US 97 Widening: To increase capacity and safety on US 97, widen US 97 to four lanes from Madras to the Deschutes County Line in the long-term. The roadway would likely need a median divider with appropriate channelization at intersection with major collectors to accommodate turning traffic. This project was also identified as a Safety Project.

Safety

With the anticipated increase in traffic volume on the major highways, the safety of the roadways in the County will not only continue to be a major concern in the future, but safety risks could potentially increase at current locations of concern. The safety projects listed below aim to address three main safety concerns on state highways within Jefferson County, which include: tangent sections of highway without passing lanes, intersections with skewed geometry, and lack of proper turn lanes at intersections with relatively high turning movements. Descriptions of short-, mid-, and long-term safety projects within Jefferson County are shown below.

Short-Term

#1 – US 97/SW Iris Lane Intersection Improvements: Construct northbound left-turn, southbound left-turn, and southbound right-turn lanes at the US 97/SW Iris Lane intersection to accommodate turning vehicles and improve operations and safety. Designate SW Iris Lane as Culver Highway 361 from existing Culver Highway 361 to US 97.

#2 – US 97/SW Jericho Lane Improvements: Construct northbound left-turn, northbound right-turn, southbound left-turn, and southbound right-turn lanes at the intersection of US 97/SW Jericho Lane to accommodate turning vehicles and improve operations and safety.

#3 – Culver Highway 361/US 97 Intersection Improvements: Close eastbound approach of the Culver Highway 361/US 97 intersection in conjunction with intersection improvements at US 97/SW Iris Lane and US 97/SW Jericho Lane. Convert the westbound approach of the Old Culver Highway 361/US 97 to a right-out and left-in access (See Figure 5-5).

#4 – US 97/SW Dover Lane Intersection Improvements: Construct a northbound left-turn, southbound left-turn, northbound right-turn, and southbound right-turn lanes at the intersection of US 97/SW Dover Lane to provide a safe refuge for turning vehicles and improve operations.

#5 – US 26/SE Dover Lane Intersection Improvements: Install larger STOP signs, thermal plastic stop bar, and guide signs for Madras and Prineville to improve visibility of intersection and desired routes. Construct appropriate intersection channelization to accommodate turning vehicles and improve operations and safety.

#7 – NW Gumwood Lane Closure: Close NW Gumwood Lane (both north and south) access on US 26 in conjunction with intersection improvements at US 26/NW Columbia Drive to improve operations and safety at NW Gumwood. The traffic using the intersection to access US 26 will have to use the US 26/NW Columbia Drive intersection (See Figure 5-6).

#8 – US 26/Warm Springs Agency Road Intersection Improvements: Install larger STOP sign, warning sign, and rumble strips, and illuminate the intersection to increase visibility of intersection.

#9 – US 97 Hay Creek Bridge: Replace the Hay Creek Bridge on US 97, to provide a safer structure for vehicle access and improve operations.

#17 – Culver Highway 361/SW Jericho Lane Intersection Safety Improvements: Identify safety improvements at the Culver Highway 361/SW Jericho Lane intersection and provide appropriate mitigations.

Mid-Term

#23 – Meadowlark Lane Closure: Close NE Meadowlark Lane access to US 97 in conjunction with NE Bean Drive extension from US 97 to NE Meadowlark Lane to reduce conflicts and consolidate access on US 97.

#29 – Cherry Lane Closure: Close east approach of US 97/Cherry Lane to reduce conflicts and consolidate access on US 97. The traffic will be re-routed to Old US 97 and Meadowlark Lane.

#30 – US 97/NE Cora Drive Closure: Close NE Cora Drive access to US 97 in conjunction with intersection improvements at US 97/NE Clark Drive to reduce conflicts and consolidate access on US 97. NE Clark Drive will provide alternative route for traffic on NE Cora Drive (See Figure 5-7).

#31 – US 97/NE Clark Drive Intersection Improvements: Realign NE Clark Drive to intersect US 97 at right-angle and provide appropriate intersection channelization to accommodate turning vehicles and improve operations and safety at this skewed intersection (See Figure 5-7).

#34 – US 97/NE Brown Drive Closure: Close NE Brown Drive access to US 97 to reduce conflicts and consolidate access on US 97. Cherry Lane connection to US 97 will provide the alternative route for NE Brown Drive to connect to US 97.

#36 – Culver Highway 361/SW Bear Drive Intersection Safety Improvements: Evaluate the Culver Highway 361/SW Bear Drive intersection to identify safety issues and providing appropriate mitigations.

#37 – SW Eureka Road Closure: Close west approach of US 97/SW Eureka Road to reduce conflicts and consolidate access on US 97. In advance of the intersection of US 97/Eureka lane, extend east approach of the intersection as a frontage road (parallel to US 97) to connect with future Bear Drive extension. This project will provide alternative access to US 97.

#39 – US 97/SE Bear Drive Roadway and Intersection Improvements: Realign Bear Drive to extend north-east of existing properties and intersect US 97 at a right-angle (north of existing US 97/SE Bear Drive intersection) to reduce conflicts and consolidate access on US 97. Upgrade roadway conditions on Bear Drive to accommodate re-routed traffic from access closures on US 97 (See Figure 5-8).

#40 – SW Falcon Drive Closures: Close east and west approaches of US 97/SW Falcon Drive intersection to reduce conflicts and consolidate access on US 97. The intersection will improve the operation and safety of US 97. Alternate access to the highway is provided via SW Ford Lane.

#44 – SW Highland Lane Closures: Close east and west approaches of US 97/SW Highland Lane intersection to reduce conflicts and consolidate access on US 97. The intersection will improve the operation and safety of US 97. Alternate access to the highway is provided via SW Iris Lane and Ford Lane.

#46 – SW Norris Road and SW Opal Road Closures: Close east and west approaches of US 97/SW Norris Road and US 97/SW Opal Road intersections to reduce conflicts and consolidate access on US 97. The intersection will improve the operation and safety of US 97. Alternate access to the highway is provided via SW Monroe and SW Park Lane.

All projects on US 97 south of Madras provide interim measures to improve safety and operation of the highway, before the highway is widened to four lanes in the long-term future. Figure 5-16 summarizes the proposed access management plan on the highway.

#48 – US 20 Safety Improvements: Conduct a safety audit of the US 20 highway section within Jefferson County to identify sites that could benefit from safety improvements. US 20 has a higher crash rate than the statewide average for a similar facility and this project will provide a safety improvement plan.

#50 – Camp Sherman Road Roadway Improvements: Upgrade Camp Sherman Road to minor collector roadway standards to accommodate anticipated future increase in traffic volumes.

Long-Term

#51 – US 97/US 293 Highway Intersection Improvements: Provide proper channelization at the US 97/US 293 intersection to accommodate turning vehicles and improve operations and safety.

#52 – US 97/NE Quaale Drive Intersection Improvements: Realign NE Quaale Drive to intersect US 97 at a right-angle and provide appropriate intersection channelization to accommodate turning vehicles. Facilities will improve operations and safety at this skewed intersection (See Figure 5-12).

#57 – US 26/South Adams Drive Intersection Improvements: Realign north and south approaches of the US 26/South Adams Drive intersection to intersect US 26 at a right-angle to reduce conflicts and consolidate access on US 97 and provide safer intersection geometry. Designate South Adams Drive as a major collector south of US 26 to Ford Lane to accommodate re-routed traffic from road closures on US 97 (See Figure 5-15).

Pavement Condition

In addition to the connectivity, operations, and safety, there are also roadway conditions needs such as paving. Apart from the regular maintenance program of the County, following paving projects has been identified as priority projects. Based on discussions with county staff, all the projects are *Long-Term* projects, except project #49 SW Laurel Lane Roadway Improvements, which is categorized as a *Mid-Term* project.

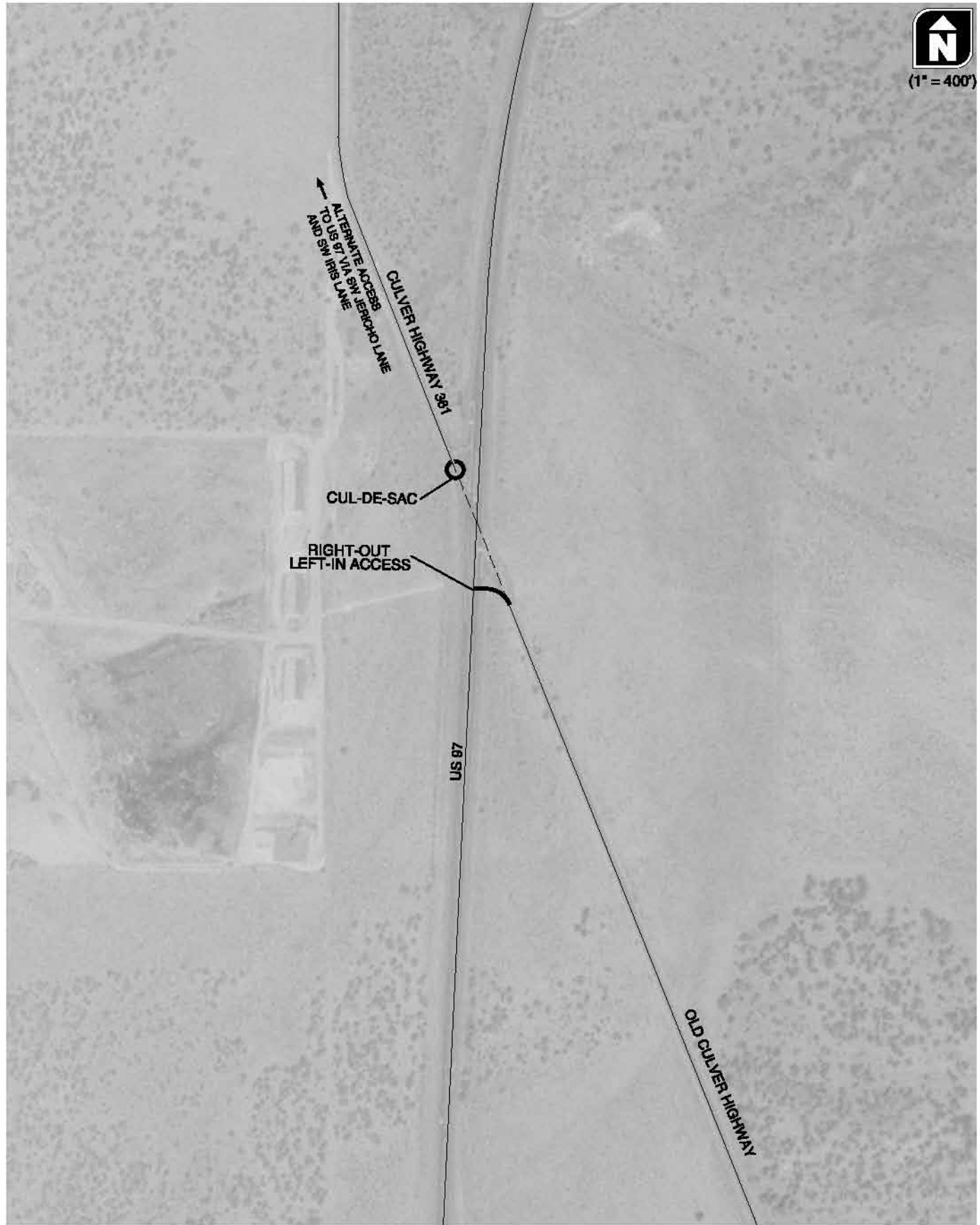
#49 – SE Laurel Lane Roadway Improvements: Upgrade SE Laurel Lane to major collector roadway standards to accommodate anticipated future increase in traffic volumes. The project provides improved connection to US 26. This project was also identified as a Safety Project.

#65 – NW Hickory Lane Paving: Pave NW Hickory Lane from NW Danube Drive to NW Boise Drive to improve access to agricultural land in the area.

#66 – NE Clark Drive Paving: Pave NE Clark Drive from US 97 to the Town of Gateway to improve access to agricultural land in the area and to the Town of Gateway. It also provides good bicycling facility for the public.



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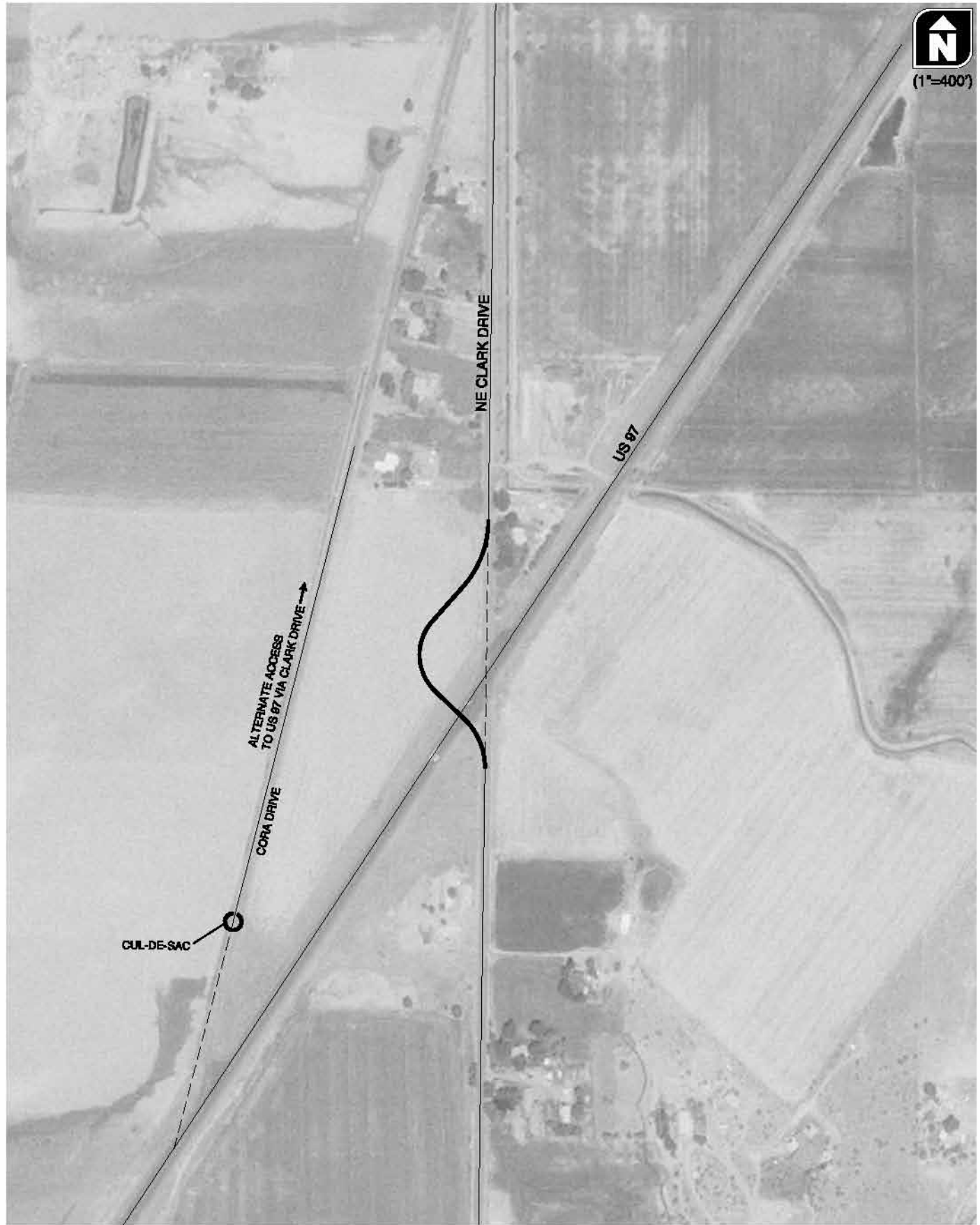
**CULVER HIGHWAY 362/US 97 IMPROVEMENT CONCEPT
PROJECT 3
JEFFERSON COUNTY, OREGON**

FIGURE
5-5

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**US 26/NW GUMWOOD LANE (NORTH) IMPROVEMENT CONCEPT
PROJECT 7
JEFFERSON COUNTY, OREGON**

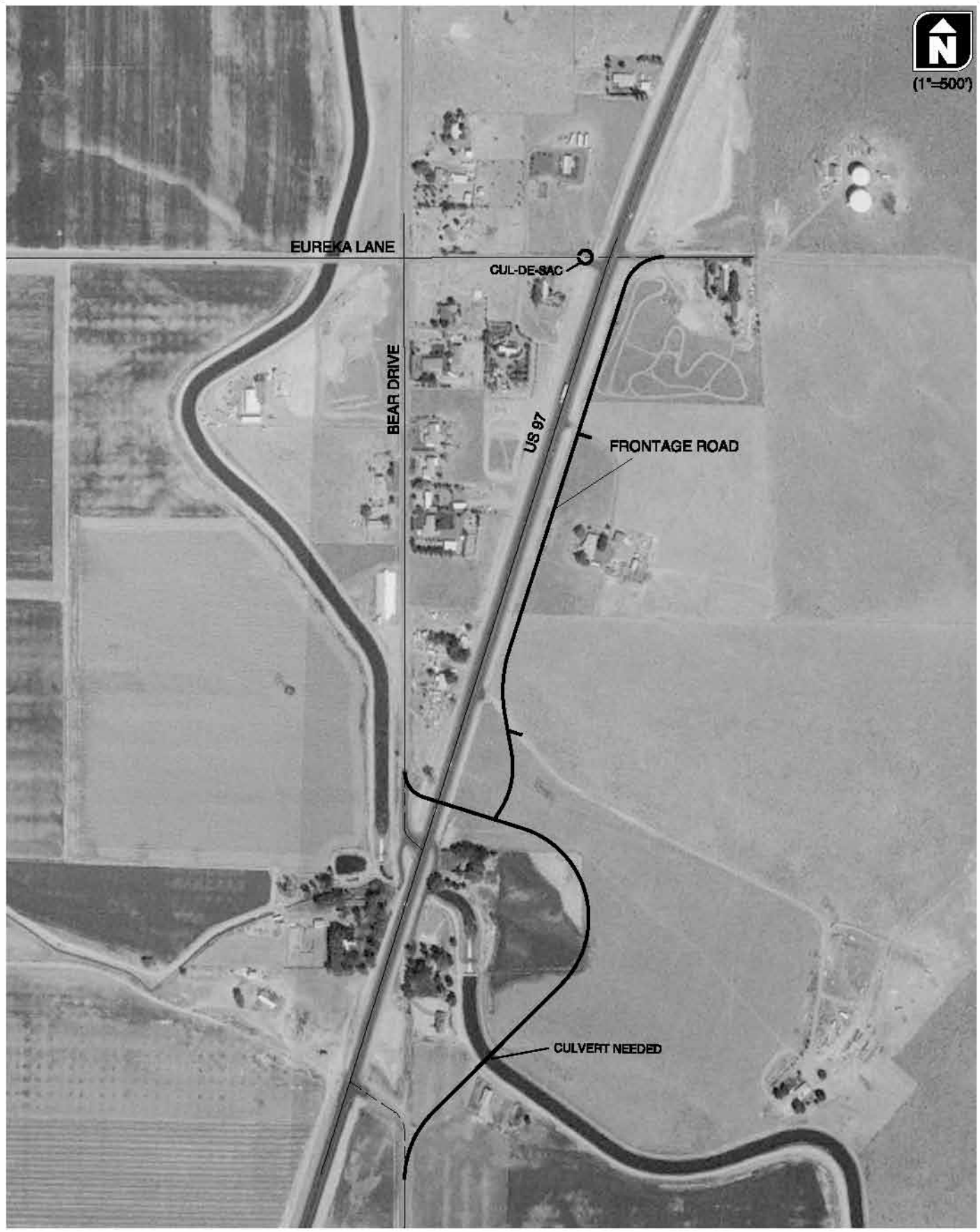


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**US 97/NE CLARK DRIVE IMPROVEMENT CONCEPT
PROJECTS 30 & 31
JEFFERSON COUNTY, OREGON**

**FIGURE
5-7**



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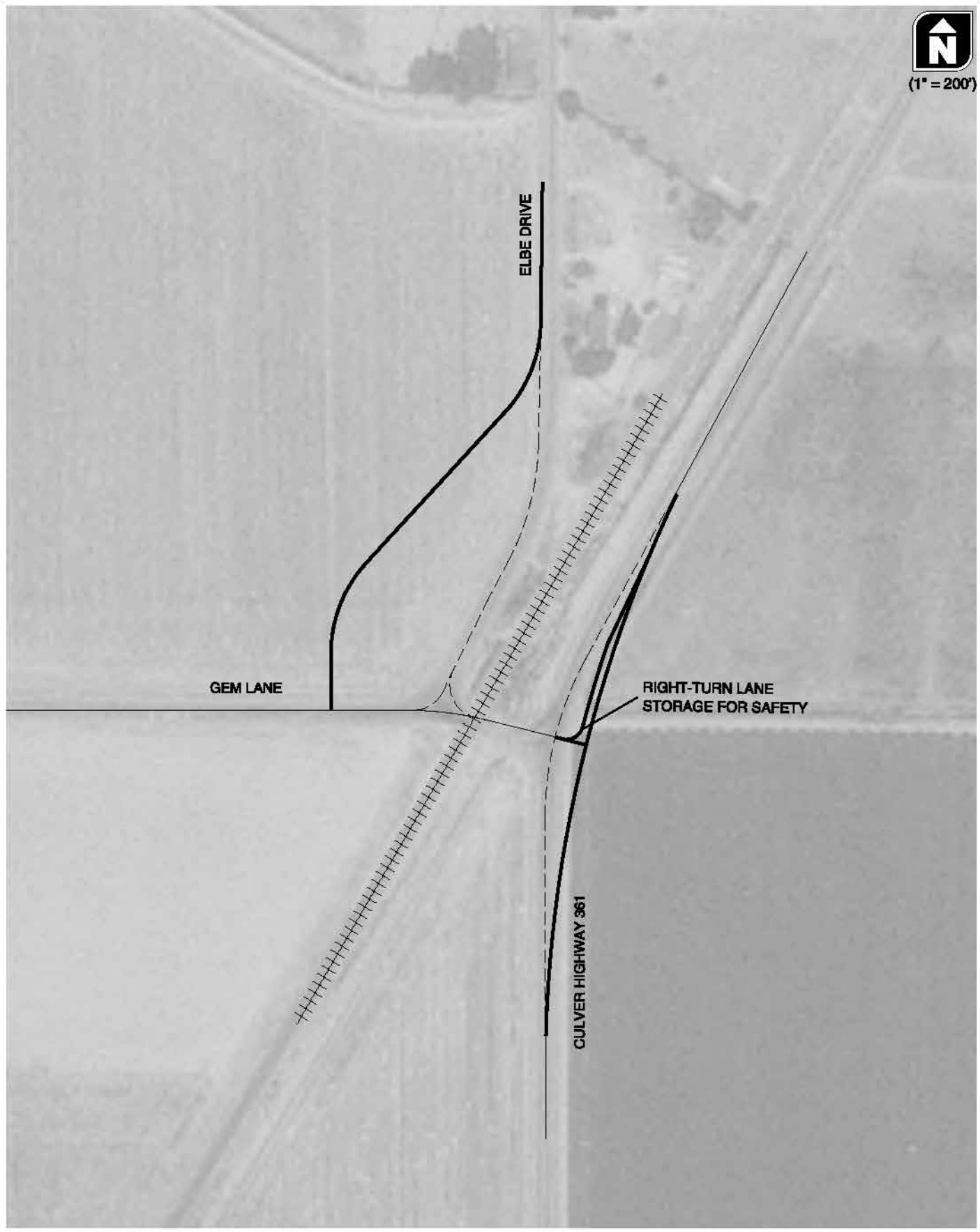
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**US 97/SE BEAR DRIVE/SE EUREKA LANE IMPROVEMENT
CONCEPT - PROJECTS 37, 38 & 39
JEFFERSON COUNTY, OREGON**

**FIGURE
5-8**



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**CULVER HWY 361/SW GEM LANE IMPROVEMENT CONCEPT
PROJECT 43
JEFFERSON COUNTY, OREGON**

**FIGURE
5-9**



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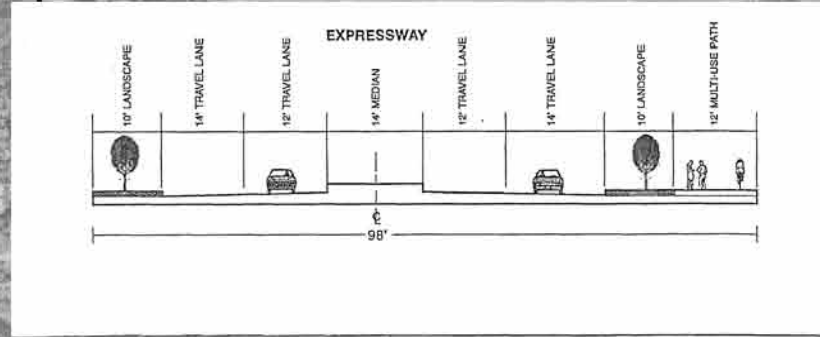
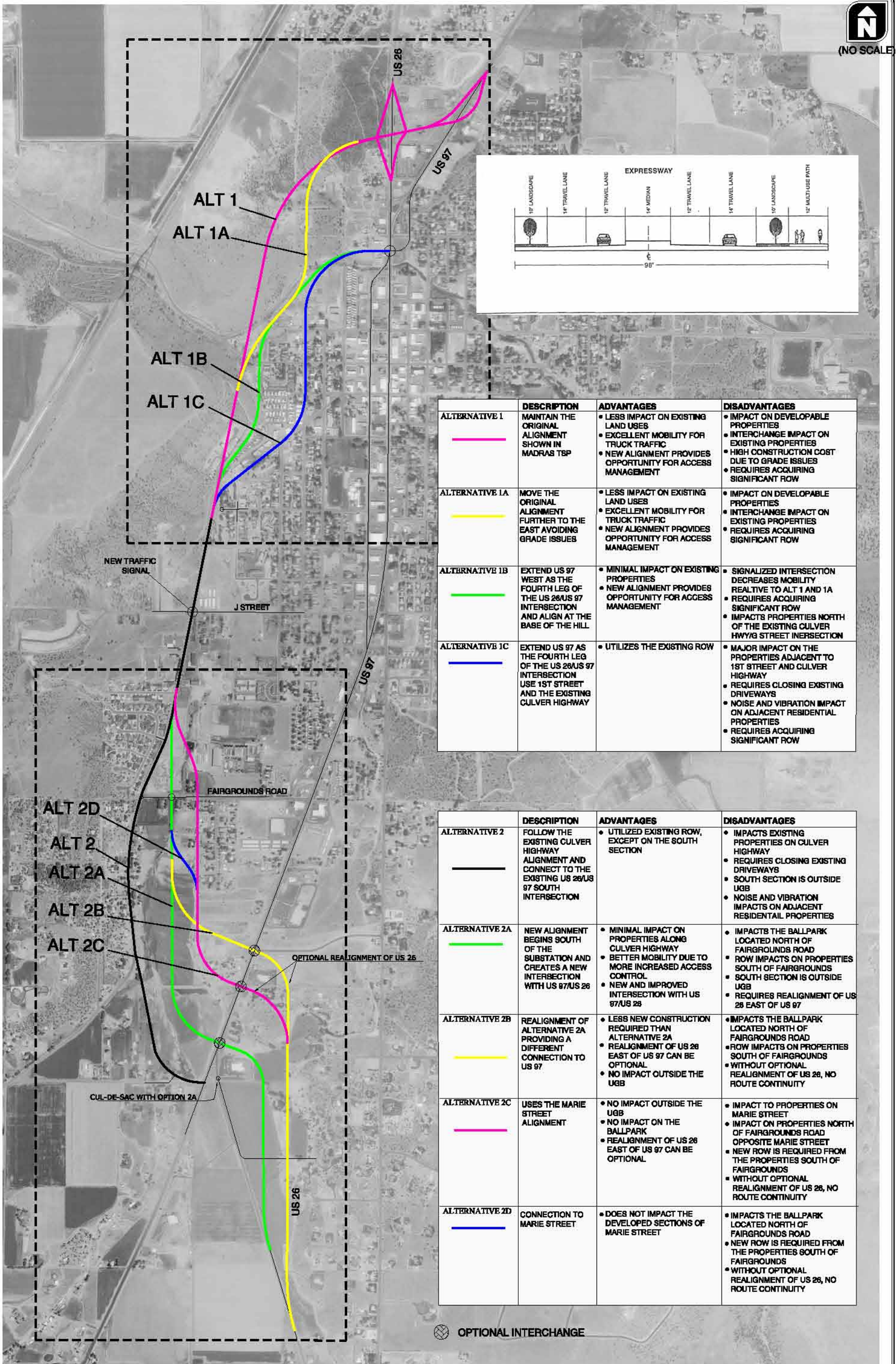
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- PROPOSED ALIGNMENT

**CULVER HWY 361/SW IRIS LANE IMPROVEMENT CONCEPT
PROJECT 45
JEFFERSON COUNTY, OREGON**

FIGURE
5-10



(NO SCALE)



	DESCRIPTION	ADVANTAGES	DISADVANTAGES
ALTERNATIVE 1	MAINTAIN THE ORIGINAL ALIGNMENT SHOWN IN MADRAS TSP	<ul style="list-style-type: none"> LESS IMPACT ON EXISTING LAND USES EXCELLENT MOBILITY FOR TRUCK TRAFFIC NEW ALIGNMENT PROVIDES OPPORTUNITY FOR ACCESS MANAGEMENT 	<ul style="list-style-type: none"> IMPACT ON DEVELOPABLE PROPERTIES INTERCHANGE IMPACT ON EXISTING PROPERTIES HIGH CONSTRUCTION COST DUE TO GRADE ISSUES REQUIRES ACQUIRING SIGNIFICANT ROW
ALTERNATIVE 1A	MOVE THE ORIGINAL ALIGNMENT FURTHER TO THE EAST AVOIDING GRADE ISSUES	<ul style="list-style-type: none"> LESS IMPACT ON EXISTING LAND USES EXCELLENT MOBILITY FOR TRUCK TRAFFIC NEW ALIGNMENT PROVIDES OPPORTUNITY FOR ACCESS MANAGEMENT 	<ul style="list-style-type: none"> IMPACT ON DEVELOPABLE PROPERTIES INTERCHANGE IMPACT ON EXISTING PROPERTIES REQUIRES ACQUIRING SIGNIFICANT ROW
ALTERNATIVE 1B	EXTEND US 97 WEST AS THE FOURTH LEG OF THE US 26/US 97 INTERSECTION AND ALIGN AT THE BASE OF THE HILL	<ul style="list-style-type: none"> MINIMAL IMPACT ON EXISTING PROPERTIES NEW ALIGNMENT PROVIDES OPPORTUNITY FOR ACCESS MANAGEMENT 	<ul style="list-style-type: none"> SIGNALIZED INTERSECTION DECREASES MOBILITY RELATIVE TO ALT 1 AND 1A REQUIRES ACQUIRING SIGNIFICANT ROW IMPACTS PROPERTIES NORTH OF THE EXISTING CULVER HWY/STREET INTERSECTION
ALTERNATIVE 1C	EXTEND US 97 AS THE FOURTH LEG OF THE US 26/US 97 INTERSECTION USE 1ST STREET AND THE EXISTING CULVER HIGHWAY	<ul style="list-style-type: none"> UTILIZES THE EXISTING ROW 	<ul style="list-style-type: none"> MAJOR IMPACT ON THE PROPERTIES ADJACENT TO 1ST STREET AND CULVER HIGHWAY REQUIRES CLOSING EXISTING DRIVEWAYS NOISE AND VIBRATION IMPACT ON ADJACENT RESIDENTIAL PROPERTIES REQUIRES ACQUIRING SIGNIFICANT ROW

	DESCRIPTION	ADVANTAGES	DISADVANTAGES
ALTERNATIVE 2	FOLLOW THE EXISTING CULVER HIGHWAY ALIGNMENT AND CONNECT TO THE EXISTING US 26/US 97 SOUTH INTERSECTION	<ul style="list-style-type: none"> UTILIZED EXISTING ROW, EXCEPT ON THE SOUTH SECTION 	<ul style="list-style-type: none"> IMPACTS EXISTING PROPERTIES ON CULVER HIGHWAY REQUIRES CLOSING EXISTING DRIVEWAYS SOUTH SECTION IS OUTSIDE UGB NOISE AND VIBRATION IMPACTS ON ADJACENT RESIDENTIAL PROPERTIES
ALTERNATIVE 2A	NEW ALIGNMENT BEGINS SOUTH OF THE SUBSTATION AND CREATES A NEW INTERSECTION WITH US 97/US 26	<ul style="list-style-type: none"> MINIMAL IMPACT ON PROPERTIES ALONG CULVER HIGHWAY BETTER MOBILITY DUE TO MORE INCREASED ACCESS CONTROL NEW AND IMPROVED INTERSECTION WITH US 97/US 26 	<ul style="list-style-type: none"> IMPACTS THE BALLPARK LOCATED NORTH OF FAIRGROUNDS ROAD ROW IMPACTS ON PROPERTIES SOUTH OF FAIRGROUNDS SOUTH SECTION IS OUTSIDE UGB REQUIRES REALIGNMENT OF US 26 EAST OF US 97
ALTERNATIVE 2B	REALIGNMENT OF ALTERNATIVE 2A PROVIDING A DIFFERENT CONNECTION TO US 97	<ul style="list-style-type: none"> LESS NEW CONSTRUCTION REQUIRED THAN ALTERNATIVE 2A REALIGNMENT OF US 26 EAST OF US 97 CAN BE OPTIONAL NO IMPACT OUTSIDE THE UGB 	<ul style="list-style-type: none"> IMPACTS THE BALLPARK LOCATED NORTH OF FAIRGROUNDS ROAD ROW IMPACTS ON PROPERTIES SOUTH OF FAIRGROUNDS WITHOUT OPTIONAL REALIGNMENT OF US 26, NO ROUTE CONTINUITY
ALTERNATIVE 2C	USES THE MARIE STREET ALIGNMENT	<ul style="list-style-type: none"> NO IMPACT OUTSIDE THE UGB NO IMPACT ON THE BALLPARK REALIGNMENT OF US 26 EAST OF US 97 CAN BE OPTIONAL 	<ul style="list-style-type: none"> IMPACT TO PROPERTIES ON MARIE STREET IMPACT ON PROPERTIES NORTH OF FAIRGROUNDS ROAD OPPOSITE MARIE STREET NEW ROW IS REQUIRED FROM THE PROPERTIES SOUTH OF FAIRGROUNDS WITHOUT OPTIONAL REALIGNMENT OF US 26, NO ROUTE CONTINUITY
ALTERNATIVE 2D	CONNECTION TO MARIE STREET	<ul style="list-style-type: none"> DOES NOT IMPACT THE DEVELOPED SECTIONS OF MARIE STREET 	<ul style="list-style-type: none"> IMPACTS THE BALLPARK LOCATED NORTH OF FAIRGROUNDS ROAD NEW ROW IS REQUIRED FROM THE PROPERTIES SOUTH OF FAIRGROUNDS WITHOUT OPTIONAL REALIGNMENT OF US 26, NO ROUTE CONTINUITY

S:\PLOT\proj\7475 project alts.dwg Jun 14, 2006 - 7:11pm - open Layout Tab: FIG 5-11

US 97 TRUCK BY-PASS ALTERNATIVES PROJECT 47 MADRAS, OREGON

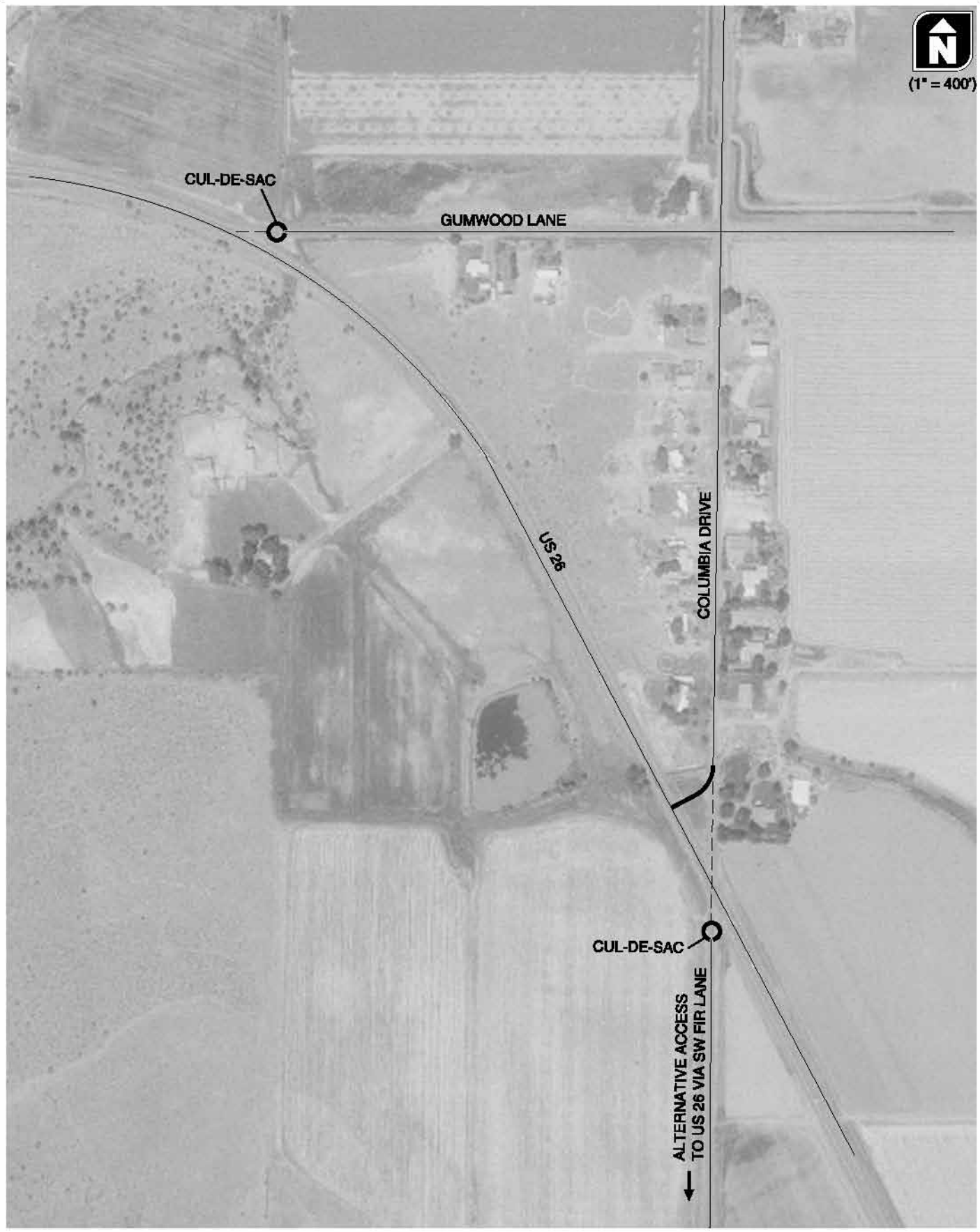
FIGURE 5-11



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US 97/NE QUALE ROAD IMPROVEMENT CONCEPT
 PROJECT 52
 JEFFERSON COUNTY, OREGON

FIGURE
5-12



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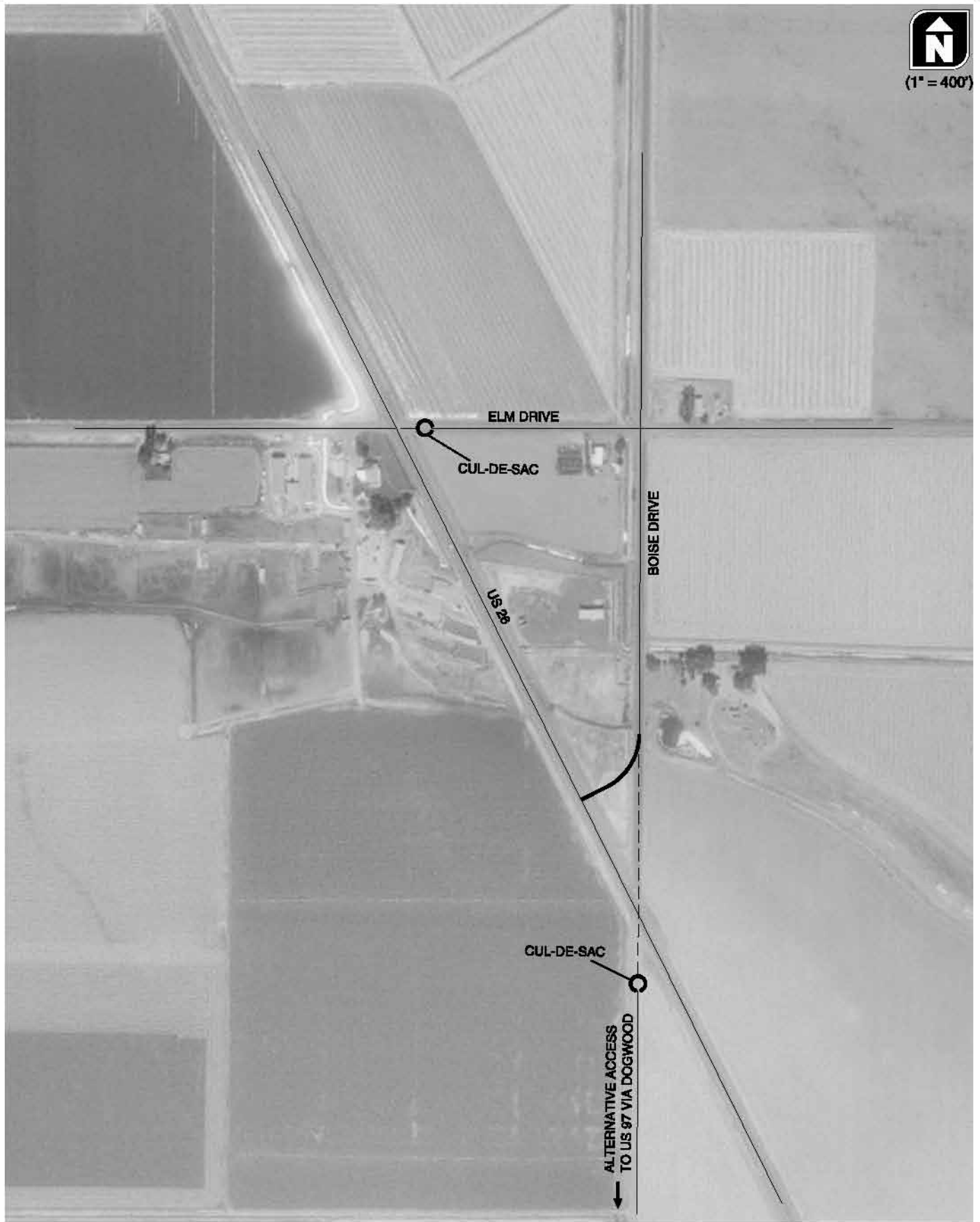
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**US 26/NW COLUMBIA DRIVE IMPROVEMENT CONCEPT
PROJECT 53
JEFFERSON COUNTY, OREGON**

FIGURE
5-13



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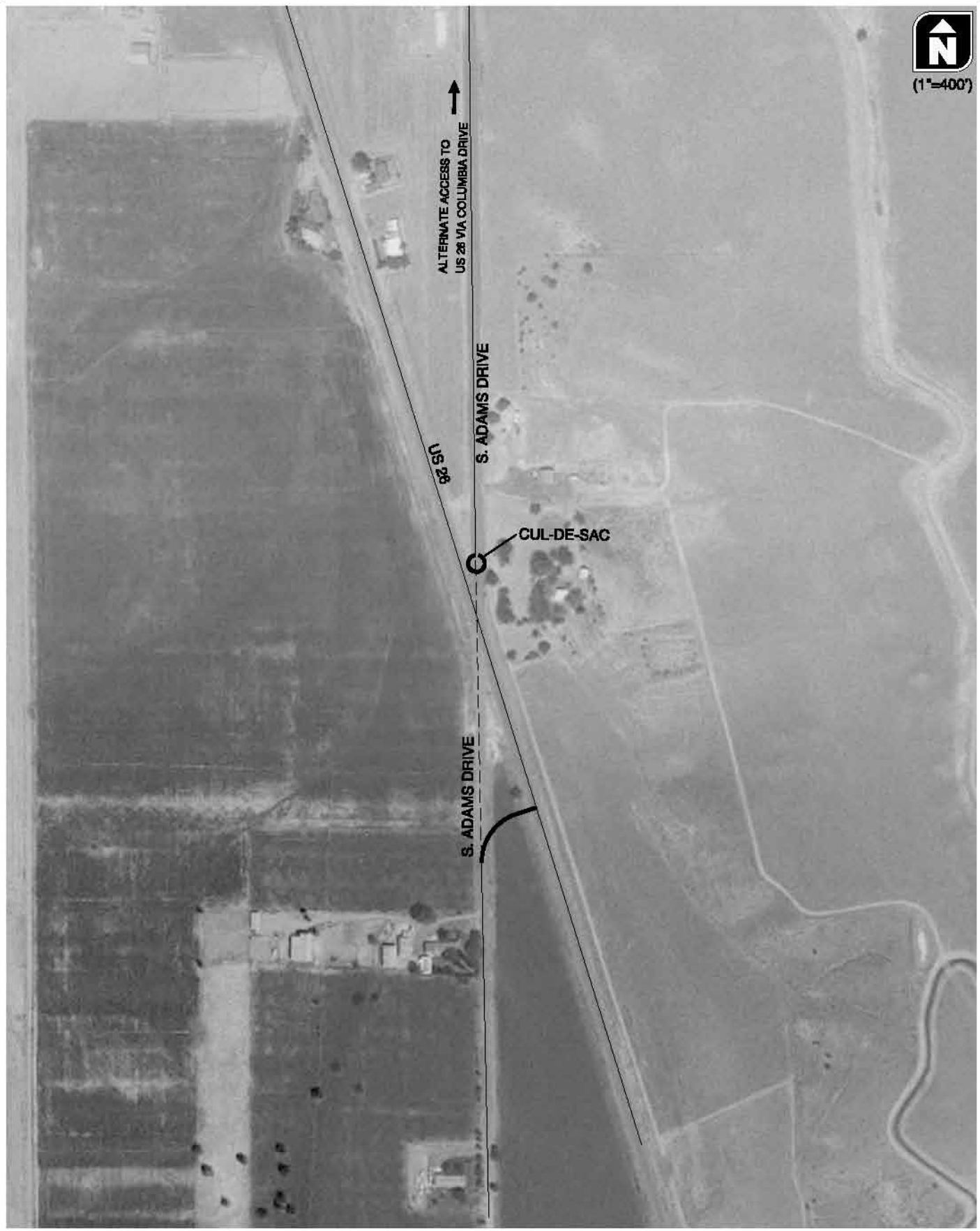


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- EXISTING TO REMAIN
- - - EXISTING TO BE REMOVED
- PROPOSED ALIGNMENT

**US 26/NW BOISE DRIVE IMPROVEMENT CONCEPT
PROJECT 55
JEFFERSON COUNTY, OREGON**

FIGURE
5-14



S:\PLOT\zoo\Project\7475 project\alta.dwg Jun 14, 2006 - 7:05pm - open Layout Tab: FIG 5-15

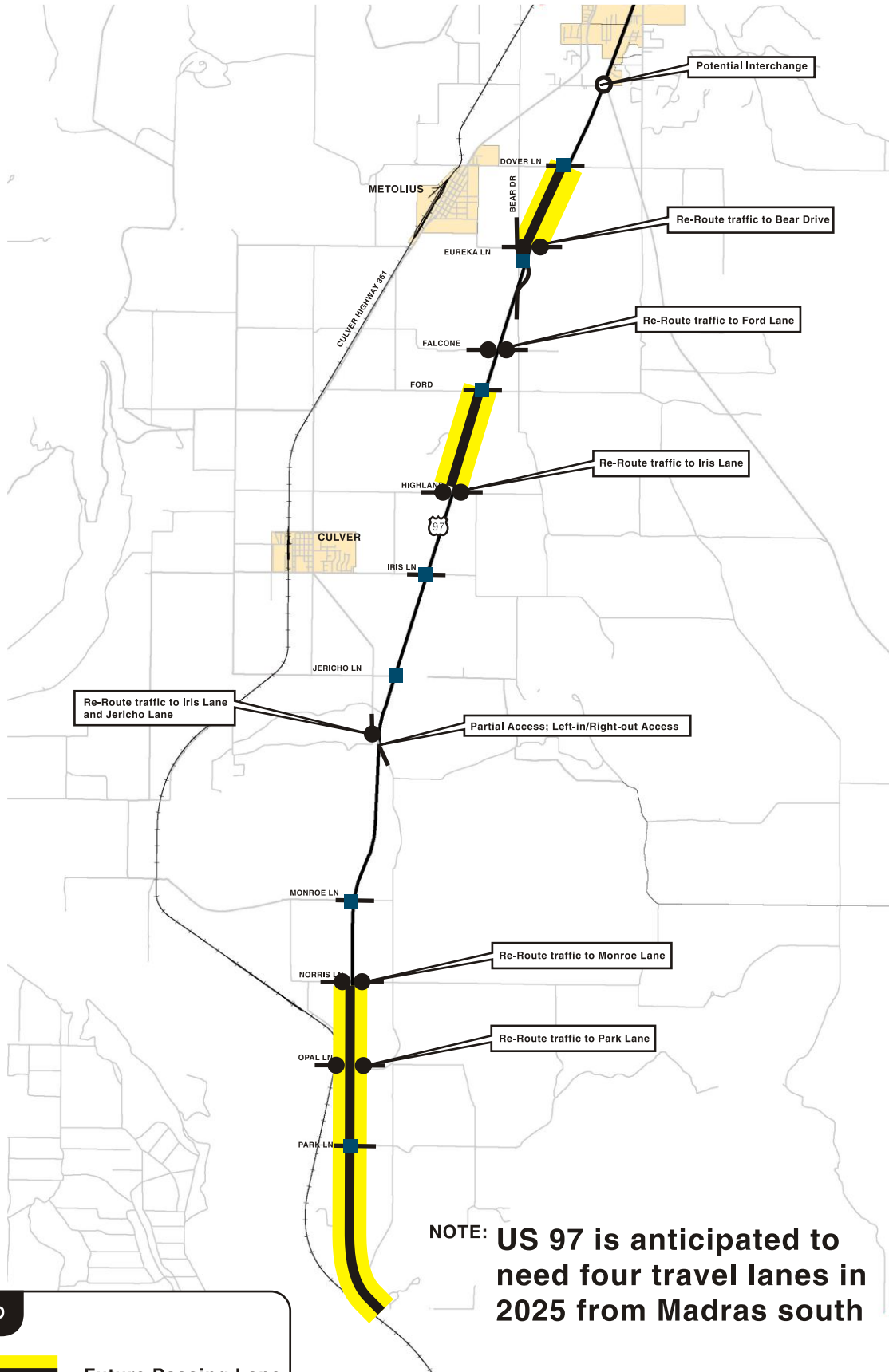
- EXISTING TO REMAIN
- - - EXISTING TO BE REMOVED
- PROPOSED ALIGNMENT

**US 26/S. ADAMS DRIVE IMPROVEMENT CONCEPT
PROJECT 57
JEFFERSON COUNTY, OREGON**



**FIGURE
5-15**



(NO SCALE)



LEGEND

-  Future Passing Lane
-  Closed Access
-  Full Access

NOTE: US 97 is anticipated to need four travel lanes in 2025 from Madras south

US97 Access Management Concept South of Madras Jefferson County, Oregon

5.3 Public Transportation Plan

Although Jefferson County does not provide public transportation services, the County should provide policies and facilities that support the provision and usage of transit service. Transit service provides mobility to County residents who do not have access to automobiles, and provides an alternative to driving for those who do.

Public transportation service within Jefferson County includes fixed-route service operated by CAC Transportation Inc., a private transportation group based in Bend, Oregon. The Central Oregon Breeze travels through Madras while providing two daily services from Bend to Portland. In addition to the Breeze, the Central Oregon Council on Aging provides dial-a-ride service in Jefferson County. The council provides door-to-door transportation to senior citizens and individuals with disabilities living in Jefferson County.

As the population of Jefferson County increases, the demand for multimodal facilities between cities and major residential and commercial development will become more important. To address the transit needs, the TSP has identified the need for transit planning and demand analysis. A potential solution is a public dial-a-ride service that will provide the needed transit service to the section of the population that does not have access to a motor vehicle. In addition it will help reduce the reliance in single-occupancy vehicle and encourage multi-modal transportation. Therefore, the following *Mid-Term* project has been identified. Table 5-5 provides the project list for multimodal transportation in the County. Figure 5-17 provides the multi-modal project location map.

T1– Feasibility Study for Public Dial-A-Ride Service: Conduct feasibility study to provide a dial-a-ride transit service between Madras, Metolius, Culver, and Crooked River Ranch.

5.4 PEDESTRIAN AND BICYCLE PLAN

The future population growth in the incorporated areas of the County will increase the need of expanding the existing multi-use paths in the County and to provide new paths in and around the incorporated areas to encourage residents and visitors to ride bicycle for transportation. Providing a connected network of pedestrian facilities is important for:

- Serving shorter pedestrian trips from neighborhoods to area activity centers, such as schools, churches, and neighborhood commercial uses;
- Providing access to public transit; and
- Meeting residents' recreational needs.

In rural Jefferson County, the standards provide paved shoulders on higher-volume roadways to facilitate safe pedestrian and bicycle travel. As development occurs, and as County funding permits, gaps in the existing pedestrian and bicycle systems will be filled. Within one-mile of any City's urban growth boundary, urban containment boundaries and urban reserve areas, it is County's policy to implement the City's pedestrian and bicycle standard. In the unincorporated areas outside the one mile threshold, where pedestrian and bicycle activities are relatively high, the County Engineer may recommend that the City of Madras sidewalks, bicycle lanes, landscape medians standard be implemented, if deemed appropriate.

The need to develop a recreational pathway and trail system carries forward into this TSP. Although funding constraints generally do not allow the development of this system through TSP projects, the

County may wish to consider developing alternative funding sources to develop the recreational trail system. One recreational project that is included in the TSP is developing a trail from Lake Billy Chinook to Pete Skeen Ogden state park.

The bicycle plan establishes a network of bicycle lanes and routes that connect the County's bicycle trip generators to provide a safe, interconnected bicycle system for recreational and commuter use. Bicycle lanes or paved shoulders are designated on arterial and collector street segments. The County may also wish to designate and sign bicycle routes in locations where a continuous roadway system does not exist, to provide route guidance to bicyclists.

Based on the public comments and future needs, the following short-, mid-, and long-term bicycle and pedestrian projects for Jefferson County have been identified. Table 5-5 shows the pedestrian and bicycle project list.

Short-Term

#PB1 – SW Gem Lane and SW Jordan Road Roadway Improvements: Designate Gem Lane as a primary bicycle route to provide bicycle access to Lake Billy Chinook. Construct bicycle lanes and/or shoulders on Gem Lane and Jordan Road to improve multimodal safety along these roadways.

Mid-Term

#PB2 – Madras/Metolius/Culver Bicycle Connections: Widen shoulders to accommodate bicycles on Culver Highway between Madras, Culver, Metolius and install signage along the Culver Highway to provide a designated bicycle connection between the cities.

#PB3 – Bike Access to Lake Billy Chinook: Continue to maintain and upgrade Gem Lane to provide an alternate bicycle trail from Madras to Lake Billy Chinook.

#PB4 – Westside Bicycle Route: Improve Mountain View Drive and Belmont Lane with wider shoulders to accommodate bicycles and designate both roadways as a bicycle route. This project will provide a scenic bicycle route west of Madras and access to Lake Billy Chinook.

#PB5 – Multi-Modal Trail: Coordinate with the City of Madras to extend the Madras City Trail outside of the UGB into future development areas. The project will provide future multimodal connections to future residential areas in the County.

Long-Term

#PB6 – Madras to Town of Gateway Bicycle Route: Construct six-foot shoulders on NE Clark Drive and the planned NE Clark Drive Extension to accommodate bicycles and pedestrians. Designate both roadways as a bicycle route from Madras to the Town of Gateway to provide bicycle connections north of Madras.

#PB7 – Palisades to Peter Skene Multi-Use Path: Designate SW Gem Lane, SW Feather Drive, SW Green Drive, SW Monroe Lane, and Old Culver Highway 361 as bicycle routes to provide bicycle connection from Palisades State Park to Peter Skene Ogden State Park.

5.5 RAIL PLAN

The Burlington Northern Santa Fe Railway (BNSF) and the Union Pacific Railroad (UP) serve the US 97 corridor through Oregon from the Washington State line to the California border through its Oregon Trunk Line. According to the *2001 Oregon Rail Plan*, BNSF has identified future improvements needed to provide clearance sufficient for high-cube double-stack traffic for five tunnels located on an 88-mile stretch in Wasco and Jefferson Counties. A preliminary estimate of improvements totals \$6.3 million. County Public Works division should coordinate improvements with BNSF to incorporate public's concern.

In addition, based on discussions with BNSF staff, there may be plans to minimize the number of rail crossings within Jefferson County to improve safety. Therefore, the following *Short-Term* project has been identified.

RR1 – Rail Crossing and Circulation Study: Conduct a study on potential rail crossing closures and/or upgrades at all existing rail crossings in the County to improve safety and maintain vehicle circulation in the County. The study will identify the associated impacts to traffic circulation and roadway connectivity. The study should be integrated with Highway 97 access and circulation plans to ensure that there are not conflicting recommendations.

5.6 AIRPORT PLAN

The Madras/City-County Airport is the main facility that provides air transportation service in Jefferson County. The airport is anticipated to continue provide the service in the long-term. The 1997 Airport Layout Plan Report provides the future needs of the facility. The plan should be updated to enhance its services to the citizen of Jefferson County.

The secondly public airport in the County, Lake Billy Chinook State Airport, is used by smaller operators and recreational pilots. In conversation with County and City staff, no future access and roadway needs have been identified for this facility, therefore, no specific plan is being proposed at this time.

5.7 TRANSMISSION PLAN

Jefferson County is served by one major interstate transmission pipeline operated by Pacific Gas Transmission Company. No future needs were identified for this transmission pipeline. Therefore, no changes or alternatives have been developed for this mode of transportation.

TABLE 5-5 JEFFERSON COUNTY FINANCIALLY UNCONSTRAINED MULTI-MODAL PROJECT LIST

No.	Project Name	Project Description	Project Category	Source	Cost Estimate ¹	Potential Funding Source				
						ODOT	County	City	Private	
Short Term (0-5 years)										
PB 1	SW Gem Lane and SW Jordan Road Roadway Improvements	Designate SW Gem Lane as primary access to Lake Billy Chinook. Add bike lane and/or shoulders on SW Gem Lane and SW Jordan Road.	Access, Bike/Ped	JC TSP	\$2,000,000		P	S	S	
RR 1	Rail Crossing and Circulation Study	Conduct a study on potential railroad crossing closure and/or upgrade.	Rail Safety	JC TSP	\$50,000	P	S			
T1	Public Dial-A-Ride Service Feasibility Study	Conduct feasibility study to provide dial-a-ride transit service between Madras, Metolius, Culver and Crooked River Ranch.	Transit, Planning	JC TSP	\$50,000	S	P	S	S	
TOTAL Short Term Cost:					\$2,100,000					
Mid Term (5-10 years)										
PB 2	Madras/Metolius/Culver Bicycle Connection	Widen shoulders on Culver Highway 361 to provide bicycle connection to Madras/Metolius/Culver. Install bicycle route signs.	Ped/Bike	JC TSP	\$3,800,000	P	S	S		
PB 3	Bike Access to Lake Billy Chinook	Continue to maintain and upgrade SW Gem Lane to provide bike access to Lake Billy Chinook.	Ped/Bike	JC TSP	\$2,000,000		P	S		
PB 4	Westside Bike Route	Provide wider shoulders on SW Mountain View Drive and SW Belmont Lane to accommodate bicycles and designate both roadways as bicycle routes.	Ped/Bike	JC TSP	\$5,300,000		P	S		
PB 5	Multi-Modal Trail	Coordinate with the City of Madras to extend the city trail outside of the UGB into future development areas.	Ped/Bike	JC TSP	\$1,500,000		S	P	S	
TOTAL Mid-Term Cost:					\$12,600,000					
Long Term (10-20 years)										
PB 6	Madras to Town of Gateway Bicycle Route	Provide six foot shoulders on NE Clark Drive and NE Clark Drive extension. Designate both roadways as a bicycle route from Madras to the Town of Gateway.	Ped/Bike	JC TSP	\$9,580,000	S	P			S
PB 7	Palisades to Peter Skene Bicycle Connection	Designate SW Gem Lane, SW Feather Drive, SW Green Drive, SW Monroe Lane, and Old Culver Highway 361 as a bicycle connection from Palisades State Park to Peter Skene Ogden	Ped/Bike	JC TSP	\$4,500,000	S	P	S	S	
TOTAL Long-Term Cost:					\$14,080,000					
TOTAL UN-CONSTRAINED PROJECT COST					\$28,780,000					

¹: Cost estimate is planning level only. Does not include ROW cost.

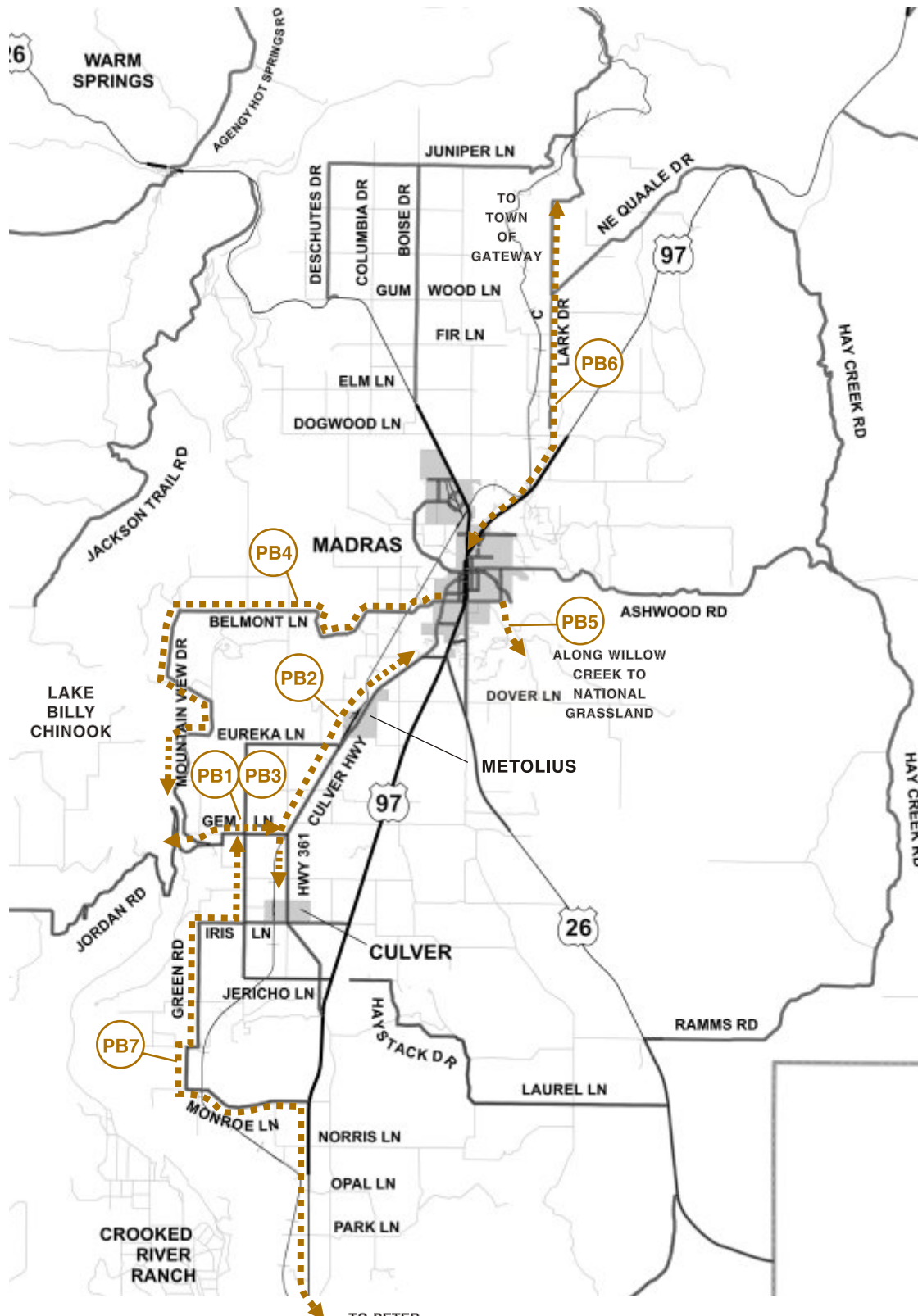
JC TSP: Jefferson County Transportation System Plan

P : Primary party with potential funding and implementation responsibility

S : Secondary party in potential funding and implementation



(NO SCALE)



LEGEND

- Pedestrian & Bicycle Project Number (see Table 5-4 for details)
- Transit Project Number (see Table 5-4 for details)
- Rail Road Project Number (see Table 5-4 for details)
- Proposed Bike-Ped Connections
- City Limits
- UGB

- T1 Dial-a-ride Feasibility Study
- RR1 Rail Crossing and Circulation Study

**Multi-Modal Project Location Map
Jefferson County, Oregon**

**FIGURE
5-17**

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Section 6

Transportation Financing

Transportation Financing

The Transportation Planning Rule (OAR 660-12-040) does not require that county TSPs include a financing plan. However, developing such a plan is prudent for determining which needs cannot be funded at current revenue levels, and therefore the County has decided to incorporate a financing plan into its TSP. The finance overview presented in this section is intended to provide historical context for road expenditures and revenues in Jefferson County and to identify primary sources for capital project funding. Analyses of past funding availability and projections were conducted, in collaboration with County staff, to explore the potential for various funding mechanisms.

6.1 COUNTY PROJECTS

Section 5 identified transportation projects that meet County's transportation needs until the year 2025 based on the forecasted traffic growth in the County. The future transportation needs of the County were determined using the information received from two sources: 1) comments received from the public, County, ODOT, and City staff; and 2) technical analysis of future traffic operations and safety on major roadways in the County. A list of financially un-constrained transportation projects was identified to address the County's needs. The projects address various transportation issues such as roadway connectivity, traffic operations, safety, pedestrian and bicycle needs, and air, rail, and transit planning needs.

The project list, presented in Table 5-4, provides an estimated planning level cost and potential funding source for each project, in addition to project names and descriptions. The planning level cost does not include right-of-way or structures costs. The potential funding sources were divided into four categories (ODOT, County, City, and Private) and primary or secondary sources of funding were identified for each project. For projects on state facilities, ODOT was identified as the primary funding source. The County was identified as the primary source of funding for projects on County roadways. Cities were identified as the primary source of funding for projects within the respective City's UGBs. Similarly, private funding sources were identified as primary source of funding for projects around areas where development is likely to occur.

For the purpose of this memorandum, the projects where the County was labeled as the primary source of funding in Section 5, were identified for the funding analysis. The county's role on projects labeling the County as a secondary source of funding should be discussed at the time of the project implementation.

Table 6-1 lists the projects that have been identified in Section 5 with the County as a primary source of funding. As shown in the table, in the short-term (0-5 years), there is a need for approximately \$2.2 million total, or \$0.44 million annually, needed to meet the needs of the transportation system on County facilities. Similarly, in the mid-term (5-10 years) and long-term (10-20 years), there is a need for approximately \$29.8 and \$61.7 million, respectively.

6.2 COUNTY FUNDING HISTORY

The Public Works Department's audited budget was reviewed to determine the County's ability to fund various transportation projects. Financial data from the 2000-2001 to 2004-2005 fiscal years were obtained from the County's finance office. Each revenue source and the amount of funding

that has been distributed to the Public Works Department within the last five years is discussed in this section of this memorandum.

State Revenue

State revenue is the largest funding source for the County's public works department. This funding includes motor-vehicle revenue, land sales revenue, weed contracts, and ODOT project funds. The Ashwood Bridge, funded by OTIA during the 2004-2005 fiscal year, is an example of the state revenue granted from ODOT project funds. ODOT project funds also provided funding to the C Street Project in the City of Culver between 2000 and 2003.

Federal Grants

Federal grants serve as one of the primary funding sources for the Public Works Department. The majority of the federal grants come from forest reserve rentals, however, other sources for federal grants include, federal mineral leases and FEMA reimbursement.

Federal Revenue

Federal revenue is paid to the County for federal use of County land during the given fiscal year.

TABLE 6-1 JEFFERSON COUNTY FINANCIALLY-UNCONSTRAINED PROJECT LIST WITH COUNTY AS PRIMARY SOURCE OF FUNDING

No.	Project Name	Project Description	Project Category	Source	Cost Estimate ¹	Potential Funding Source			
						ODOT	County	City	Private
Short Term (0-5 years)									
18	Crooked River Ranch Secondary Access	Conduct engineering feasibility study for future secondary access across Crooked River, north of the ranch, near LaSalle Road.	Roadway Connectivity	JC TSP	\$150,000	S	P	S	S
PB1	SW Gem Lane and SW Jordan Road Roadway Improvements	Designate SW Gem Lane as primary access to Lake Billy Chinook. Add bike lane and/or shoulders on SW Gem Lane and SW Jordan Road.	Access, Bike/Ped	JC TSP	\$2,000,000		P	S	S
T1	Public Dial-A-Ride Service Feasibility Study	Conduct feasibility study to provide dial-a-ride transit service between Madras, Metolius, Culver and Crooked River Ranch.	Transit, Planning	JC TSP	\$50,000	S	P	S	S
TOTAL Short Term Cost:					\$2,200,000				
Mid Term (5-10 years)									
41	SW Deschutes Road Extension	Extend SW Deschutes Road from SW Ford Lane to SW Highland Lane.	Roadway Connectivity	JC TSP	\$3,000,000		P		S
49	SE Laurel Road Paving	Upgrade SE Laurel Road to US 26 to major collector standard	Pavement	JC TSP	\$10,260,000		P		
50	Camp Sherman Road Roadway Improvements	Upgrade Camp Sherman Road to minor collector roadway standards.	Safety	JC TSP	\$9,240,000		P		S
PB3	Bike Access to Lake Billy Chinook	Continue to maintain and upgrade SW Gem Lane to provide bike access to Lake Billy Chinook.	Ped/Bike	JC TSP	\$2,000,000		P	S	
PB4	Westside Bike Route	Provide wider shoulders on SW Mountain View Drive and SW Belmont Lane to accommodate bicycles and designate both roadways as bicycle routes.	Ped/Bike	JC TSP	\$5,300,000		P	S	
TOTAL Mid-Term Cost:					\$29,800,000				
Long Term (10-20 years)									
59	NW Dogwood Lane Roadway Improvements	Upgrade NW Dogwood Lane from NW Columbia Drive to NE Clark Drive to major collector roadway standards.	Operations, Safety	JC TSP	\$8,250,000		P		
60	North Adams Drive Roadway Improvements	Upgrade N Adams Drive from NE Juniper Lane to NE Cherry Lane to major collector roadway standards.	Operations, Safety	JC TSP	\$14,350,000		P		

No.	Project Name	Project Description	Project Category	Source	Cost Estimate ¹	Potential Funding Source			
						ODOT	County	City	Private
61	SW Columbia Drive Roadway Improvements	Upgrade roadway conditions to accommodate re-routed traffic from Highland Drive.	Operations, Safety	JC TSP	\$2,100,000	S	P		
62	SW Deschutes Drive Roadway Improvements	Upgrade SW Deschutes Road to minor collector roadway standards.	Operations, Safety	JC TSP	\$2,100,000	S	P		
63	SW Monroe Lane Roadway Improvements	Upgrade Monroe Lane to major collector standards in conjunction with closures at SW Norris Rd, SW Opal Rd.	Operations, Safety	JC TSP	\$6,150,000	S	P		
64	SW Park Lane Roadway Improvements	Upgrade SW Park Lane to minor collector roadway standards in conjunction with closures at SW Norris Road and SW Opal Road.	Operations, Safety	JC TSP	\$2,000,000	S	P		
65	NW Hickory Lane Paving	Pave NW Hickory Lane from NW Danube Drive to NW Boise Drive.	Pavement	JC TSP	\$1,500,000		P		
66	NE Clark Drive Paving	Pave NE Clark Drive from US 97 to the Town of Gateway.	Pavement	JC TSP	\$2,950,000		P		
67	NW Columbia Drive Roadway Improvements	Upgrade NW Columbia Drive north of US 26 and from NW Fir Lane to NW Dogwood Lane to major collector roadway standards.	Operations, Safety	JC TSP	\$4,100,000	S	P		
68	NW Fir Lane Roadway Improvements	Upgrade NW Fir Lane from NW Columbia Drive to N Adams Drive to minor collector roadway standards.	Operations, Safety	JC TSP	\$4,100,000	S	P		
PB6	Madras to Town of Gateway Bicycle Route	Provide six foot shoulders on NE Clark Drive and NE Clark Drive extension. Designate both roadways as a bicycle route from Madras to the Town of Gateway.	Ped/Bike	JC TSP	\$9,580,000	S	P		S
PB7	Palisades to Peter Skene Bicycle Connection	Designate SW Gem Lane, SW Feather Drive, SW Green Drive, SW Monroe Lane, and Old Culver Highway 361 as a bicycle connection from Palisades State Park to Peter Skene Ogden	Ped/Bike	JC TSP	\$4,500,000	S	P	S	S
TOTAL Long-Term Cost:					\$61,680,000				
TOTAL UN-CONSTRAINED PROJECT COST					\$96,780,000				

¹: Cost estimate is planning level only. Does not include ROW cost.

P : Primary party with potential funding and implementation responsibility

S : Secondary party in potential funding and implementation

Interfund Transfers

Funding is also received by the Department from interfund transfers within the county. During the last five years, transfers have been made from landfill dumping fees, system development charges (SDC), and the general fund.

License and Permits

In the past, licensing and permits have also served as the Department’s funding source. Home remodels and/or additions, plumbing, right of way, and driveway permits provide revenue to this funding source.

Miscellaneous Fees

The Department also collects miscellaneous fees that provide some additional funding. These fees usually consist of service charges for various Public Works services.

Sales and Miscellaneous Revenue

Sales of various materials, equipment, and supplies also provide some revenue to the Department. This includes taxes from property foreclosures and office rentals.

Reimbursed Items

Funding from reimbursed items include transfers from other funds, reimbursement from miscellaneous funds, and fuel service reimbursement.

Table 6-2 shows the amount of funding received from each revenue source during the last five years.

TABLE 6-2 PUBLIC WORKS DEPARTMENT HISTORICAL REVENUE SOURCES

Revenue Source	Fiscal Year				
	2000/2001	2001/2002	2002/2003	2003/2004	2004/2005
Federal Grants	\$382,348	\$521,331	\$746,613	\$546,597	\$539,101
Federal Revenue	-	\$16,087	\$16,549	\$18,864	\$16,078
State Revenue	\$898,203	\$906,889	\$953,793	\$1,408,370	\$1,245,698
Interfund Transfers	\$48,000	\$78,500	\$7,200	\$59,700	\$72,658
License & Permits	\$20,057	\$21,501	\$20,340	\$19,347	\$17,565
Misc. Fees	\$8,187	\$8,016	\$7,830	\$7,704	\$7,631
Sales & Misc. Revenue	\$4,558	\$3,379	\$4,562	\$24,953	\$3,164
Reimbursed Items	\$182,124	\$374,736	\$140,065	\$134,085	\$247,403
TOTAL	\$1,543,477	\$1,930,439	\$1,896,952	\$2,219,620	\$2,149,298

Since 2001, the average revenue of the County’s Public Works Department has been approximately \$2 million dollars. The revenue has remained relatively constant during the review period.

Current Transportation System Development Charges (SDC)

Many jurisdictions require new developments to mitigate their impact on the public system by contributing to the capital improvement funds identified by the jurisdiction. SDC’s constitute a

mandatory collection method based upon ORS 223.297 through 223.314 to assure the construction of improvements to facilities as contemplated in the transportation capital improvements plan.

According to ordinance ORS 223.297, an SDC is defined as a reimbursement fee, an improvement fee, or a combination thereof, assessed or collected at the time of increased usage of a capital improvement or issuance of development permit, building permit, or connection to the capital improvement. SDC's do not include any fees assessed or collected as part of a local improvement district, a charge in lieu of a local improvement district assessment, the cost of complying with requirements or conditions imposed upon a land use decision, expedited land division, or limited land use decision. The SDC's may only be spent on capital improvements associated with the systems for which the fees are assessed including expenditures relating to payment of debts.

Jefferson County currently administers transportation and park system development charges to new developments in the County. The SDC ordinance was adopted in 1996. The transportation SDC has been set up at \$86.92/daily trip generated by the new development in Crooked River Ranch and \$90.56/daily trips generated by the new development in unincorporated County. On an average, County collects approximately \$89,000 in transportation SDC annually. However, the current SDC dollars have been allocated to financing the construction of "J" Street, in collaboration with City of Madras. It will only be available for other transportation improvement projects after the financing of "J" Street is complete. With the current rate of SDC collection, the SDC fund is anticipated to be available for other improvements in 2015.

Past Expenditures

The Public Works Department's expenditures were also found in the five year audited budget. The five areas of expenditures are described in the remainder of this section.

Road Administration

Road Administration is responsible for issuing permits, processing payroll, tracking costs, budgeting, accounts payable, accounts receivable, personnel records, training, safety, and limited information services. The expenditures in this program include personal services, such as county staff salaries and benefits, and material services, such as county office overhead. Expenditures for capital outlays are also included in this program. This category incurs the largest amount of expenditures in the county.

Bridge, Culvert, and Sign Division

The *Bridge, Culvert, and Sign Division* is responsible for maintaining and repairing, bridges, guardrails, and culverts. In addition, this division is also responsible for installing, repairing, and replacing signs, pavement markings, and striping. The expenditures within this division include maintenance and repair, as well as, materials and services (i.e. replacement parts, etc.).

Operations and Maintenance

Operations and Maintenance is responsible for operating and maintaining services on the County road system. This program is comprised of road surface maintenance (i.e. grading, sweeping), roadside drainage, winter maintenance (i.e. snow plowing, sanding, anti-icing) and removal of roadside hazards (i.e. trees, rock outcroppings, etc.). Expenditures in this division include, materials and services (i.e. asphalt, maintenance vehicles, etc.), and capital outlays.

Weed Control Division

The *Weed Control Division* is responsible for vegetation control on the County road system. This involves maintaining, pruning, removing, and planting vegetation and other landscaping within the County right-of-way. The expenditures within this division include materials and services.

Non-Divisional

Non-Divisional expenditure is not related to any specific division. It mainly includes fund transfer to other governmental services.

Table 3 shows the amount of funding expended in each of the above divisions in the last five years.

TABLE 6-3 PUBLIC WORKS DEPARTMENT HISTORICAL EXPENDITURES

Expenditure	Fiscal Year				
	2000/2001	2001/2002	2002/2003	2003/2004	2004/2005
Road Administration	\$962,984	\$911,431	\$960,283	\$1,036,809	\$1,017,929
Bridge Culvert And Sign	\$59,522	\$78,375	\$232,823	\$274,922	\$253
Operation and Maintenance	\$436,068	\$538,558	\$577,303	\$574,648	\$582,907
Weed Control	\$141,551	\$130,984	\$137,363	\$153,576	\$157,884
Non Divisional	\$69,141	\$174,929	\$175,000	\$175,000	\$175,000
TOTAL	\$1,669,266	\$1,834,277	\$2,082,772	\$2,214,955	\$1,933,973

As shown in Table 3, the annual revenue collected by the County’s Public Works Department is mainly spent on administrative tasks, and the operation and maintenance of the County facilities. The County does not have additional resources identified for capital improvement projects.

6.3 POTENTIAL FUNDING SOURCES

Approximately \$8.1 million is required within the next five years to implement the short-term County projects. Jefferson County does not have an identified funding source for these projects at this time. Therefore, funding sources need to be explored to establish a capital funding program that addresses modernization, preservation, operations, and safety of the County’s transportation infrastructure.

The following programs are funding sources that could potentially be established or enhanced to fund transportation infrastructure projects in the County.

Statewide Transportation Improvement Program (STIP)

Every two years, the ODOT allocates funding to improvement projects on state and local facilities through its four-year funding program, the Statewide Transportation Improvement Program (STIP). The STIP has provisions for funding local projects that are outside ODOT jurisdiction. Local jurisdictions are required to apply for this funding. Historically, Jefferson County has not consistently received STIP funding. With the adoption of the TSP, the County would be in a stronger position to pursue funding for projects listed in the TSP as these projects will comply with ODOT’s Transportation Planning Rule (TPR). However, it should be noted that simply by the virtue of being listed in the TSP does not guarantee STIP funding.

Updated System Development Charges (SDC)

The current SDC program is based on evaluation of transportation needs conducted in 1996. Since then, the transportation demand in the area has increased dramatically, thanks to the growth in Central Oregon. The SDC program charge should be based on the projected needs of the transportation system outside the urban growth boundary (UGB) over a 20-year planning horizon. Once the system development charge (SDC) eligible projects within the county have been identified and the total cost to implement the projects has been estimated, an SDC cost per trip assessment can be developed based on the trip generation potential of future development. As a result, the SDC program should be updated with the transportation project list presented in the TSP.

Local Improvement District (LID)

Local Improvement Districts (LID) are created to finance road improvements through special assessments against benefited properties. An LID provides a mechanism to coordinate installation and funding of improvements between one or more property owners. LIDs may be formed when property owners petition the County for the purpose of constructing and funding public improvements in their neighborhood. At times, an LID may be formed when the County determines that improvements are necessary. Special assessments to the properties benefiting from the improvements can be implemented by the county through the formation of an LID. Typical improvements made through the LID process are to streets, water lines, sewers, sidewalks, and traffic signals.

LIDs are initiated either by written petition from property owners or directly by a Board of County Commissioners (BOCC). In some cases, the BOCC may desire to require installation of public improvements that are considered essential to the welfare of the county and shall initiate an LID to construct and assess the sidewalk costs to adjacent property owners. An LID can also be initiated when a certain percentage of the benefiting property owners petition to the BOCC to initiate an LID to construct the improvements.

For example, only, the following process is currently used in Deschutes County, Oregon for establishing an LID:

- *The Petition* - A petition requesting improvements to a road, signed by not less than 25% of the owners of land abutting the proposed improvements, is filed with the Board of County Commissioners (BOCC). An \$800.00 filing fee must accompany the petition.
- *Feasibility Study* - The Department shall complete a feasibility study and shall include:
 - Extent of the Project
 - Boundary for the LID
 - Description of the Design
 - Consistency with Applicable Land Use Regulations
 - Determination of the Not to Exceed Cost
 - Recommendation of Method of Assessment
 - Nature of Benefited Properties
 - Description and Assessed Value of Each Lot
 - Financial Feasibility of the Improvement

- *Abandon or Proceed* - A decision is then made to abandon or proceed with the local improvement district based on the feasibility study results.
- *Meetings* - The Department will conduct one or more neighborhood meetings with the affected property owners.
- *Mail Poll* - The Department will conduct a mail poll of owners. At least 60% of the owners must approve the project to continue the LID.
- *Board of County Commissioners (BOCC)* - Based on the mail poll, the BOCC will decide if the LID should continue.
- *Public Hearing* - The Department will mail each owner a notice of a public hearing in which they will have a chance to object to the LID. At the hearing, the BOCC will decide the future of the LID based on the objections received.
- *Modifications* - Following the hearing, the Board may modify the proposed LID, estimated cost or method of assessment in response to information received; in this case, an additional hearing will be held.
- *Lien* - If the LID continues, the Board shall have the County Clerk place in the records a Notice of Proposed Lien on the benefited property.
- *LID Construction Bid* - The Road Department will have a contractor construct the improvements within the LID, according to applicable public bidding laws and adopted road standards.
- *Project Cost* - After the road construction is completed and the final cost is tabulated, each property owner is notified by mail of the final cost of the improvement and the amount assessed to each owner. The notice will contain the date of a public hearing to hear objections as to the amount of assessment.
- *Payment for LID* - After the public hearing, the Board will establish the final assessment. Each property owner will be mailed a notice of final assessment and given the choice of paying the full assessment at that time or paying the assessment in installments. The terms for installment payments will be contained in the notice (usually semi-annual payments over a ten-year period).

Municipal Bonds

Municipal bonds are debt issued to fund public infrastructure projects by jurisdictions and institutions like the U.S. government, local governments, water districts, companies, and many other types of institutions. When an investor buys bonds, he or she is lending money to fund the public project with an agreement that the seller of the bond agrees to repay the principal amount of the loan at a specified time. The interest that investors receive is exempt from some income taxes.

Jefferson County has the potential to issue municipal bonds to secure funding for various transportation projects (for example; secondary access to Crooked River Ranch, etc.).

Various Tax

It is within Jefferson County jurisdiction to levy taxes to fund public infrastructure projects that are needed to accommodate future growth in the County. The tax could be in the form of local gas tax, ad valorem tax (Latin for “according to value”), or other forms of tax.

CONCLUSION

Jefferson County’s TSP identifies the roadway connectivity, operation, safety, pedestrian, bicycle, transit and railroad needs of the County for the next 20 years. It also supports the anticipated population and economic growth of the County. In summary, the short-term, mid-term and long-term needs of the County are as follows:

Short-Term Needs:

Total Number of Projects:	22
Total Estimated Cost of Projects:	\$35,953,000
County’s Primary Responsibility:	3 projects; \$2,200,000

Mid-Term Needs:

Total Number of Projects:	35
Total Estimated Cost of Projects:	\$70,894,000
County’s Primary Responsibility:	5 projects; \$29,800,000

Long-Term Needs:

Total Number of Projects:	23
Total Estimated Cost of Projects:	\$105,370,000
County’s Primary Responsibility:	12 projects; \$61,680,000

Section 7

Glossary of Terms and Acronyms

Glossary of Terms and Acronyms

Arterial - A functional classification for roadways, indicating a roadway with a high mobility function intended to connect urban areas and collector streets; typically carrying relatively high traffic volumes.

Collector - A functional classification for roadways; primary function is to serve traffic between neighborhoods and community facilities.

DLCD - (Department of Land Conservation and Development) An Oregon state agency that administers all land use planning statutes and executive and commission policies that affect land.

Functional Classification - A system of classifying roadways according to their intended purpose, the amount and character of traffic they are expected to carry, the degree to which non-auto travel is emphasized, and the roadway design standards.

LOS - (Level of Service) A concept developed to quantify the degree of comfort (including such elements as travel time, number of stops, total amount of stopped delay, and impediments caused by other vehicles) afforded to drivers as they travel through an intersection or roadway segment. Six grades are used to denote the various level of service from A to F.

MPO - (Metropolitan Planning Organization) An organization which has the responsibility of planning, programming and coordination of federal highway and transit investments within urbanized areas.

STIP - (Statewide Transportation Improvement Program) The Oregon Department of Transportation's (ODOT) short term capital improvement program, providing project funding and scheduling information for the department and the state's metropolitan planning organizations. It is a four-year program developed through the coordinated efforts of the department, federal and local governments, area commissions on transportation, tribal governments and the public.

TPR - (Transportation Planning Rule) A rule adopted by DLCD and ODOT in April 1991 governing transportation planning requirements for all cities and counties in Oregon.

TSP - (Transportation System Plan) The long-range plan to guide transportation investments in a city or county. The TSP requirements are set forth in the TPR.

UCB - Urban Containment Boundary

UGB - (Urban Growth Boundary) A local government regulatory measure for delineating limits for urban growth over a period of time. Land within the UGB is made available for urban development while land outside the UGB remains primarily rural for farming, forestry, or low-density residential development.